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Volume XX, Nr. 4, 2014, Timişoara, Romania
ISSN 2065-376X

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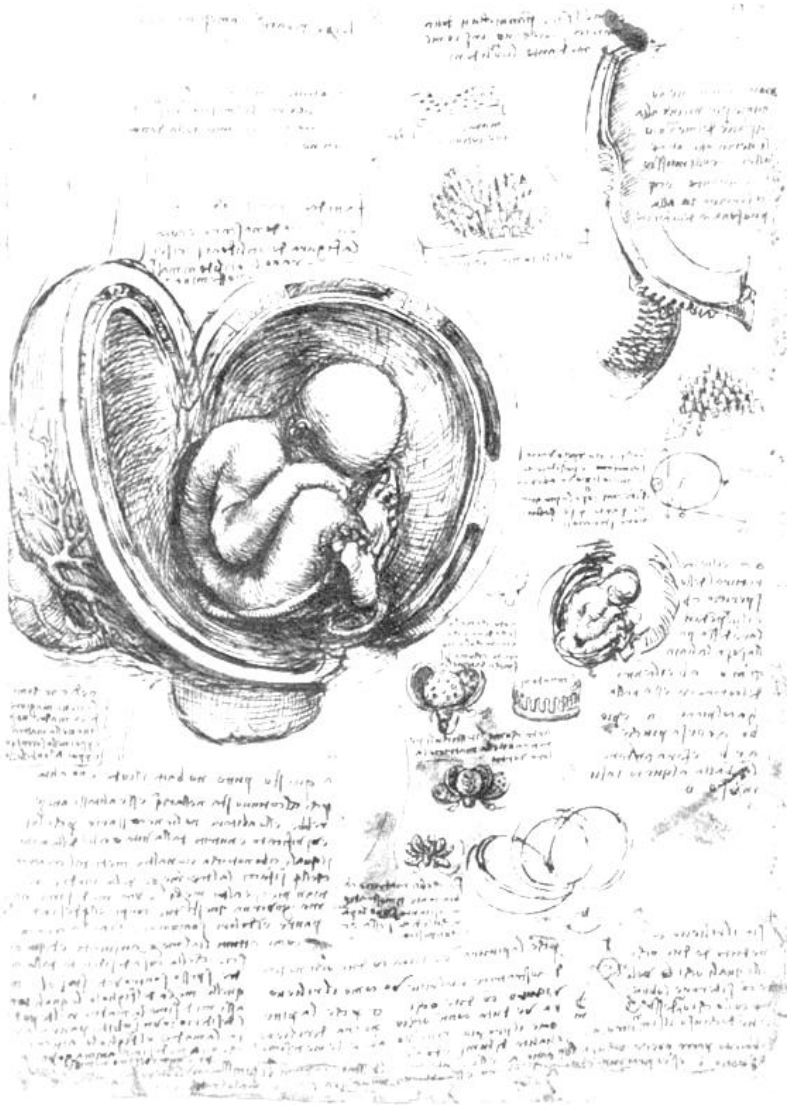

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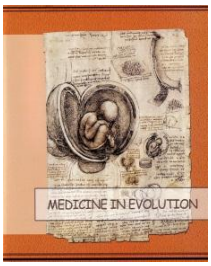

IMMUNOHISTOCHEMICAL ANALYSIS (ER & KI-67) OF PREMALIGNANT LESIONS IN BREAST CANCER PATIENTS FROM A HOSPITAL-BASED SERIES OF CASES

ADRIAN DUMITRU[1], ALEXANDRU PROCOP[1], MIRCEA TAMPA[4], CLARA MATEI[4], ANDREEA ILIESIU[2], LUMINITA MITRACHE[1], OANA PATRASCU[1], MARIANA COSTACHE[2], MONICA CIRSTOIU[3], MARIA SAJIN[2]

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ABSTRACT

The identification as well as the characterization of breast premalignant lesions in terms of increased risk of progression or recurrence has become a crucial issue nowadays as improved imagistic procedures are detecting cancer earlier. The presence of different lesions within the same breast adjacent to malignancyis an aspect that can prove the multistep progression to cancer. The goals of our study were to identify the mainly occurring lesions adjacent to malignancy,and study the histological appearancesof Ki-67 index and estrogen receptor status in such lesions and justify their possible identities as premalignant lesions.

Key words: *breast cancer, ductal carcinoma in situ, premalignant, ER, Ki-67*

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INTRODUCTION

Breast cancer is the second leading malignancy in Romanian women, after cervical cancer. It has different histological types that reflect not only histological features but also clinical and biological aspects.

Although the frequency of breast cancer in Romania has increased continuously during the last years, characterization of the breast cancer immune-profile is still not frequently done and premalignant lesions such as florid (proliferative) hyperplasia are rarely mentioned in histopathological reports. The premalignant breast lesions represent a broad spectrum of neoplastic changes with variable risk of progression.

Nowadays it is not possible todetermine with absolute certainty which of these lesions will progress further to cancer. This uncertainty is reflected in the histological classification used in mammography screenings where these premalignant lesions are classified as '*B3: lesions of uncertain malignant potential*' [1].This elusion may reside in the existing contradictory data on morphological and immunohistochemical phenotype.

Some observers do not agree that these lesions are "premalignant "and they consider them to be just risk markers [2,3]. Current studies [2] show that evaluation of these lesions may provide useful information on carcinogenesis as well as biological insights into the origin and functional significance of these distinct phenotypes.

Our study aims isto provide a complex analysis of morphological and immunohistochemical phenotypes of the peritumoral lesions with malignant potential associated with the most frequent types of breast cancer which were observed and diagnosed from 2012 to September 2014 in the Department of Pathology of Emergency University Hospital, Bucharest, Romania.

MATERIAL AND METHODS

A 3-year period (January 2012 - September 2014) retrospective review of our own database of patients diagnosed with breast cancer was performed. The medical records of 83 randomly selected patients with invasive breast cancer who underwent surgery were reviewed. The data collection and processing were made through Microsoft Office Excel 2010. Sections were immunostained for hormone receptors, E-cadherin, p63, Ki67, EGFR and basal cytokeratins.

RESULTS

We reviewed sections from 83 randomly selectedcases. The mean age at presentation was 58.3 (range 36–87 years). 82%of thepatients had a palpable mass in their breast and the remaining patients were diagnosed after mammographic examination. The laterality of the lesions was as follows: left-sided in 64% of thepatients and right-sided in 36% patients.We found 59 IDC, 9 ILC, 8 IDC+ILC and 7 other types (2 tubular carcinomas, 2 mucinous carcinomas, 1 medullary carcinoma, 1 invasive cribriform carcinoma and 1 metaplastic carcinoma). 47% of thecases had simultaneous epithelial changes, from benign apocrine changes, adenosis, intraductal papillary neoplasms, LCIS, usual ductal hyperplasia to florid atypical ductal hyperplasia and DCIS.

We found outthat the immunohistochemical profile of some pre-malignant lesions is heterogeneous and discordant. A total of 50 cases were selected for immunohistochemical studies -15 cases which showed non-proliferative lesions, 18 cases which showed proliferative lesions without atypia and 17 cases which showed atypia. ER positivity was found in 28 cases out of 50. Proliferative lesions with atypia including in situ lesionsshowed increased ER, themajority of the proliferative lesions without atypia showed ER negativity and few showed ER positivity.

Ki-67 positivity was found in 27 cases of proliferative lesions with atypia and 9 cases of proliferative lesions without atypia.The proliferative index values are very high in cases of lesions belonging to atypical ductal hyperplasia and DCIS.

We also evaluated 3 multicentric/multiple breast carcinomas (no special type)with mismatch immunohistochemical ER expression profile. The principal focal lession was a grade 3 invasive breast carcinoma NST with strong ER expression, but the secondary tumoral foci with the same histhological grade and appearance had diminished ER expression. Similar findings were noticed when we evaluated the proliferation index (Ki-67). Some tumoral foci had strong ER expression and appeared as high grade, but had a rather low proliferative index (under 15%).

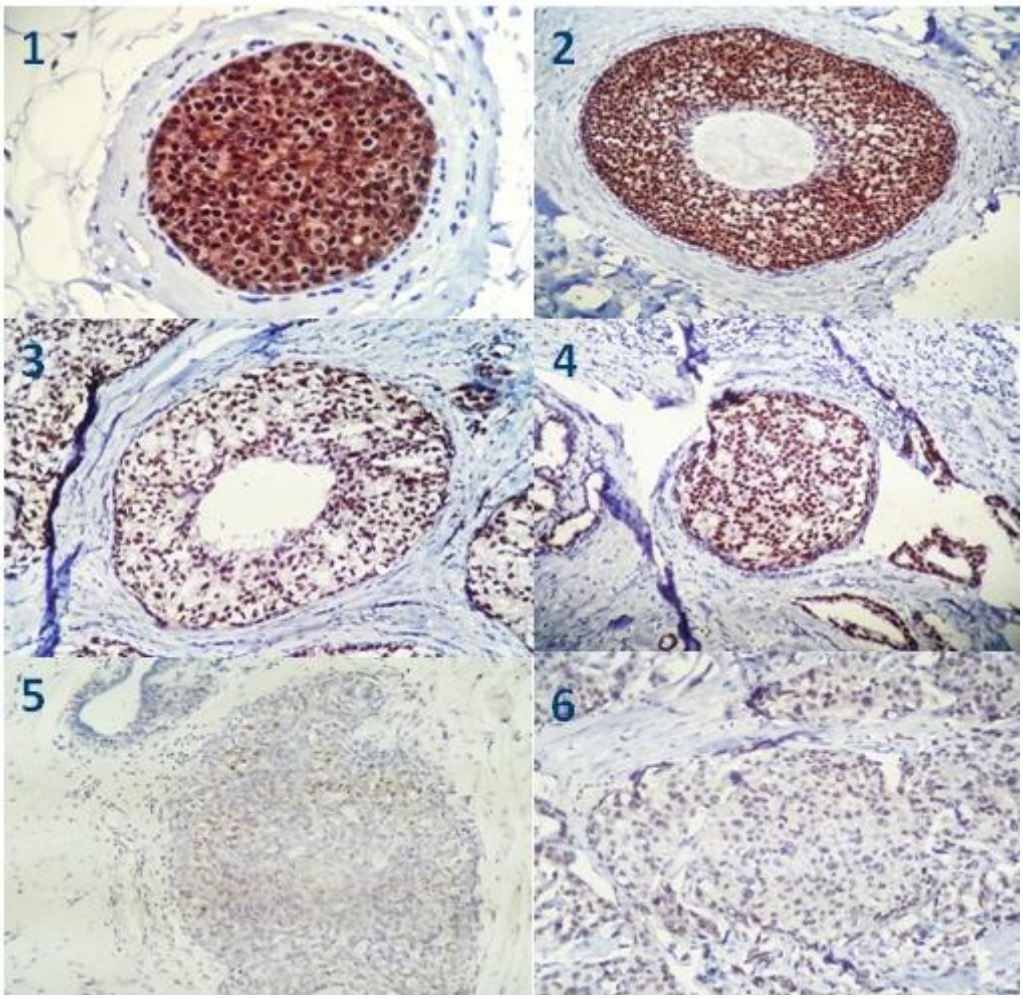


*Figure. Loss of ER expression in adjacent premalignant lesions in a patient with invasive breast cancer (no special type)**Fig. 1 & 2** Grade 1 DCIS, ER +++ **Fig. 3 & 4** Grade 2 DCIS, ER + **Fig. 5** DCIS with microinvasion ER+/- **Fig.6** Invasive breast cancer (NST), ER-*

DISCUSSIONS

It is noticeable that the neoplastic process begins earlier than at the DCIS stage [4], but which histological lesions are precisely involved in this process and what drives them in progression is not fully understood.Lesseris known about prognostic factors in premalignant disease than in invasive breast cancer, although awareness in this area is increasing rapidly.No single factor so far appears to be powerful enough in predicting the promotion of invasive breast cancer and panels of multiple factors will be more helpful in the near future. This should not be surprising, given the high amount of biological complexity ofthese lesions.

Nearly all ADH express high levels of ER, implying that highly ER-positive premalignant lesions maybe particularly susceptible to hormonal therapy [5].

In 5 cases of ER- IDC we found simultaneous strongly positive ER DCIS, suggesting that some ER-negative breast cancers arise from ER-positive or otherwise estrogen-responsive premalignant lesions.

The difference in expression of ER is actually explicable: we can assume that the expression is switched off during invasion or that many ER positive DCIS do not transform to IDC. In other studies [2] c-erbB2 expression follows a similar pathway (there is a higher frequency of c-erbB2-positive DCIS compared with c-erbB2 + IDC).

The incidence of ER expression is a function of DCIS grade [6,11]. We found outthat most DCIS lesions were ER-positive, especially in well and moderately differentiated tumors. However, a large fraction of grade 3 DCIS lacked ER expression. ER expression was also less marked among cases with comedonecrosis.We also noted 2 cases with strongly positive ER breast cancer (no special type) with concomitant ER negative DCIS. Since a number of studies did not find significant diversity in genetic alterations or gene expression profiles between the tumor cells of DCIS and invasive carcinomas so far [7, 8, 9, 10], the authors also focus on the possible role of the tumoral microenvironment to better explain the changeover from DCIS to invasive breast cancer.

The authors point out that morphological classifications go some way to predicting prognosis, but more practical approaches are required to better understand andadaptindividual therapy.We have to take into account not only molecular changes in the tumor cells, but also the host microenvironment that(This microenvironment) provides a complex ambience of cellular and noncellular components that interact with the neoplastic cells andinflict key functions such as growth, differentiation, angiogenesis and invasion.

CONCLUSIONS

Our retrospective study revealed that morphological diagnosis of premalignant breast lesions is demanding, given the multitude of histopathological aspects, each with different possible biological behaviour.

Therefore, the evaluation of these lesions with pre-malignant potential may also be useful in further classifying ER-negative breast cancers and may be important for pathologists to evaluate the ER status of DCIS occurring in the presence of ER-negative invasive cancer, as this subgroup should be considered for chemoprevention.

Further knowledge in this field will surely provide enhanced prognostic and predictive factors and will find innovative therapeutic opportunities to promote individualized treatment in patients

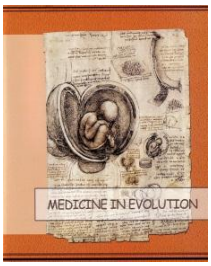
with breast cancer or premalignant breast lesions.

Conflict of interests: None to declare.

Acknowledgement: This paper is partly supported by the Sectorial Operational Programme Human Resources Development (SOPHRD), financed by the European Social Fund and the Romanian Government under contract number POSDRU 141531. We undersign, certificate that the procedures and the experiments we have done respect the ethical standards in the Helsinki Declaration of 1975, as revised in 2000 (5), as well as the national law.

REFERENCES

1. Amendoeira I, Apostolikas N, Bellocq JP, Bianchi S, Boecker W, Borisch B, Bussolati G, Connolly CE, Cserni G, Decker T, Dervan P, Drijkonin-gen M, Ellis IO, Elston CW, Eusebi V, Faverly D, Heikkila P, Holland R, Kerner H, Kulka J, lacquemier J, Lacerda M, Martinez-Penuela J, De Miguel C, Nordgren H, Peterse JL, Rank F, Regitnig P, Reiner A, Sapino A, Sigal-Zafrani B, Tanous AM, Thorstenson S, Zozaya E, Wells CA. Quality assurance guidelines for pathology: Cytological and histological non-operative procedures. In: Perry N, Broeders M, de Wolf C, Toernberg S, Holland R, von Karsa L, editors. European guidelines for quality assurance in breast cancer screening and diagnosis. Luxembourg: Office for Official Publications of the European Communities; 2006. pp. 221–255.
2. Coradini D, Boracchi P, Oriana S, Biganzoli E, Ambrogi F. Cell identity disruption in breast cancer precursors. *Anticancer Res.* 2014 Mar;34(3):1307-19.
3. Tavassoli FA, Eusebi V. Tumors of the Mammary Gland. Washington, DC: *American Registry of Pathology*; 2009.
4. Kühn T. Ductal carcinoma in situ: the clinical perspective. Breast Care. 2010;5:227–232
5. Cunha POR, Ornstein M, Jones JL. Progression of ductal carcinoma in situ from the pathological perspective. *Breast Care*. 2010; 5:233–239
6. Hussein MR, Abd-Elwahed SR, Abdulwahed AR Alterations of estrogen receptors, progesterone receptors and c-erbB2 oncogene protein expression in ductal carcinomas of the breast. *Cell Biol Int.* 2008 Jun;32(6):698-707
7. Burkhardt L, Grob TJ, Hennann I, Burandt E, Choschzick M, Janicke F, Muller V, Bokemeyer C, Simon R, Sauter G, Wilczak W, Lebeau A: Gene amplification in ductal carcinoma in situ of the breast. *Breast Cancer Res Treat* 2009; DOI: 10.1007/sl0549-009-0675-8.
8. Ma XJ, Salunga R, Tuggle JT, Gaudet J, Enright E, McQuary P, Payette T, Pistone M, Stecker IC, Zhang BM, Zhou YX, Varnholt H, Smith B, Gadd M, Chatfield E, Kessler J, Baer TM, Erlander MG, Sgroi DC. Gene expression profiles of human breast cancer progression. *Proc Nati Acad Sei U S A*. 2003;100:5974–5979
9. Dietrich D, Schuster M, Lesche R, Haedicke W, Kristiansen G. Multiplexed methylation analysis–a new technology to analyse the methylation pattern of laser microdissected cells of normal breast tissue, DCIS and invasive ductal carcinoma of the breast,*Verh Dtsch Ges Pathol*. 2007;91:197–207
10. van der Groep P, van Diest PJ, Menko FH, Bart J, de Vries EG, van der Wall E. Molecular profile of ductal carcinoma in situ of the breast in BRCA1 and BRCA2 germline mutation carriers. *J Clin Pathol*. 2009;62:926–930.
11. Dobrescu A, Chang M, Kirtani V, Turi GK, Hennawy R, Hindenburg AA Study of Estrogen Receptor and Progesterone Receptor Expression in Breast Ductal Carcinoma In Situ by Immunohistochemical Staining in ER/PgR-Negative Invasive Breast Cancer. *ISRN Oncol*. 2011



THE PERIPHERAL T-CELLLYMPHOMA-A DIAGNOSIS CHALLENGING FOR CLINICIANS AND PATHOLOGISTS

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ABSTRACT

Background: *Peripheral T lymphomas, also known as peripheral T-cell lymphomas, are a high grade malignancy non-Hodgkin's lymphomas. They represents a rare variant of lymphomas which can pose serious issues in practical diagnosis.*

Material and methods*: This descriptive study was realised during the years 2008-2013, data obtaining from the registers of Pathology Department of Tirgu Mures. Information extracted was: age, sex, clinical diagnosis, histopathological diagnosis and immunohistochemical information. For final diagnosis, immunohistochemical reaction with monoclonal antibodies were performed: CD3, CD20, LCA, CD4, CD45 RO, CD 30, CD68 and Ki-67.*

Results *From a total number of 29 cases confirmed by histopathological analyses, 12 cases were found in 2008. Regarding the spread of cases by age, eight cases were registered in fifth decade of life. There were 11 cases of peripheral T-cell lymphoma in woman and 18 cases in man. By sites of involvement, most patients (19 cases) present with peripheral lymph node involvment.*

Discussions *Other studies realized in 2006 and 2010 show a 25-30% incidence of NOS type, compared with the data obtained in our study. Immunohistochemical markers help to appoint this type of limphoma in Non-Hodgkin lymphoma and differential diagnosis. According „CD30 + limphoproliferative disorders" an exact differenciation between NOS and anaplastic ALK negative is hard to do. Both are CD30 positive and the difference between them is done at the molecular.*

Conclusion *This type of lymphoma reqiures a series of specific immunohistochemical reaction and a pathologist experienced in the diagnosis of lymphhoma.*

Key words: *peripheral T-cell lymphomas, immunohistochemistry, ALK*

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INTRODUCTION

Peripheral T lymphomas, also known as peripheral T-cell lymphomas, are a high grade malignancy non Hodgkin's lymphomas. They represents a rare variant of lymphomas which can pose serious issues in practical diagnosis. The diseases are divided in three categories: NOS (non otherwise specified), angioblastic form and anaplastic lymphoma kinase (ALK) positive or negative (ALK +/ALK-).

NOS peripheral T lymphoma, represents 30% of total peripheral T lymphomas and encompasses a wide heterogeneous variety of lymphomas, which today can not be differentiated or included into other T lymphoma categories[1].NOS can be localized nodal or extranodal (e.g. bone marrow, liver, spleen, skin, GI tract) [2; 3].

Angioimmunoblastic lymphoma is characterized by monoclonal proliferation of follicular T helper lymphocytes. Clinical description includes: generalized lymphadenopathies, enlarged spleen, cutaneous and pleural lesions, pericardial infiltrations, central nervous system symptoms, polyclonal hipergammaglobulinemia and sometimes is associated with the presence of circulating immune complexes, cold agglutinins, rheumatoid factor and anti smooth muscle antibodies. This neoplasm is considered to be an antigen dependent process, most likely represented by the Epstein- Barr virus. Because of certain states of immunodeficiency, patients are susceptible to infections and secondary neoplasms (B cell type most often). [4]

Anaplastic lymphoma, regarding to presence or absence of ALK tyrosine-kinase, is divided into two subcategories: ALK+ characterized by CD30 positive marker, mostly affecting males in their early 30's [5] and ALK – which is supposed to be a final stage of evolution in the T cell line lymphomas,[6] known for having bad prognosis and for involving more frequent middle-aged people.

PURPOSE: The aim of this study was to evaluate the casuistry of peripheral T-cell lymphomas diagnosed by histopathological examination of tissues in Pathology Department of Tirgu Mures during the years 2008-2013 for/to analyse clinical features, histopathological and demographic aspects of patients diagnosed with peripheral T- cell Lymphoma.

MATERIAL AND METHODS

Studied cases: this descriptive study was realised during the years 2008-2013, data obtaining from the registers of Pathology Department of Tirgu Mures. Information extracted was: age, sex, clinical diagnosis, histopathological diagnosis and immunohistochemical information obtained from histopathological bulletin/newsletters. Major criteria for inclusion in this study was peripheral T-cell lymphoma diagnosis.

For final histopathological diagnosis, immunohistochemical reaction with monoclonal antibodies was carried out/ were performed: CD 3 (mark T lymphocytes), CD 20 (mark B lymphocytes), LCA (leucocyte common antigen, expressed on the surface of most human leukocyte), CD4 (mark T helper lymphocytes), CD45 RO (positive in 80% of T- cell lymphomas), CD 30 (expressed in Reed-Sternberg cells and in most anaplastic large cell lymphomas), CD 68 (mark histiocytes). And to assess the proliferation index, it was performed Ki 67.

Image aquirement: Photography was performed using a Nikon E800

optical microscope attached to a Nikon E 100 camera. We avoided excessive handling of color and shades to keep morphological details

RESULTS

From a total number of 29 cases confirmed by histopathological analyses, 12 cases were found/registered in 2008, eight cases in 2009, three cases in 2010, three cases in 2013, two cases in 2011 and one case in 2012.

Regarding the spread of cases by age, eight cases were registered in fifth decade of life, five patients in the sixth decade of life and five patients in seventh decade of life were diagnosed with peripheral T-cell lymphoma. (figure 1.) Extreme ages of developing periferal T cell lymphoma in our study, were three and 77 years.

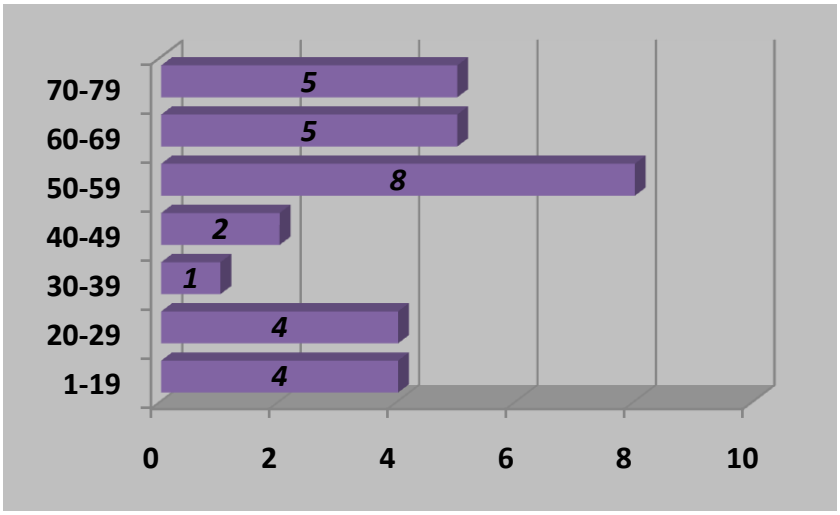


Figure 1. ***Distribution by age group of peripheral T cell lymphoma***

There were 11 cases of peripheral T-cell lymphoma in woman and 18 cases in man.

By sites of involvement, most patients (19 cases) present with peripheral lymph nodeinvolvment, six cases of axillary lymphadenopathy, seven cases with laterocervical lymphadenopathy and three cases with supraclavicular lymphadenopathy. Among uncommon sites include one case of femoral lymphadenopathy, one case of submandibular lymphadenopathyand one case with generalized lymphadenopathy. Extranodal presentation occured: one case in spleen, one case in tonsils, two cases in the mediastinum, two cases in the central nervous system (one sacral and one thoracic), skin- one case, one case in mastoid processus and one case in retroperitoneum.

Microscopic, it was observed effacement of the normal arhitecture of lymph node with paracortical or diffuse infiltrates. (Figure 2.) the cytological spectrum is very broad from monomorphous to polymorphous. Often the cells are medium to large sized, with irregular, vesicular, pleomorphic nuclei, with proeminent nucleoli and many mitotic figures. (Figure 3) clear cells and Reed-Sternberg like cells are seen. An inflamatory background including small lymphocytes, eosinophils, plasma cells and epitheloid histiocites, was often seen.

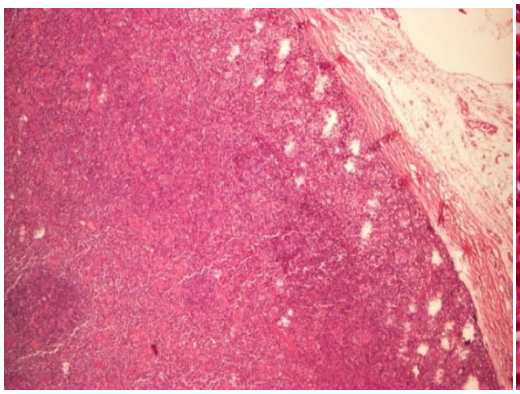


Figure 2. Peripheral T cell lymphoma with effacement of normal arhitecture of lymph node, Ob. 2x, HE staining

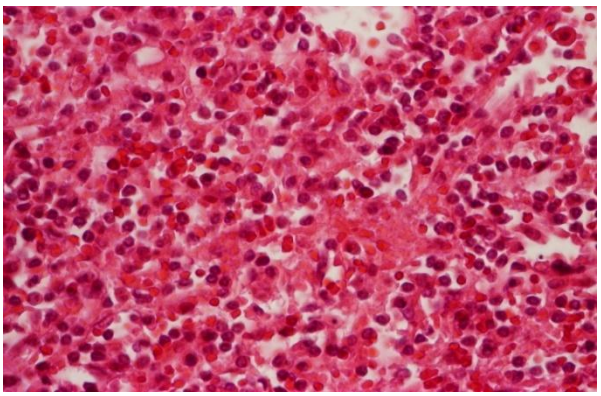


Figure 3. Atipical cells with many mitotic figures in peripheral T-cell lymphoma of the spleen, Ob 20x, HE stainig.

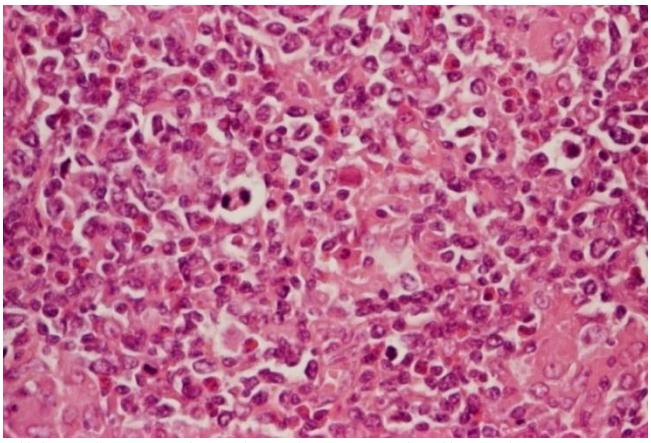


Figure 4. Peripheral T-cell lymphoma in lymph node. Atipical cells with many mitotic figures, Ob. 20x, HE staining

DISCUSSIONS

During the period 2008-2013, in Department of Pathology in Tirgu Mures county, 29 patients were diagnosed with peripheral T-cell lymphoma of which 24 cases with NOS, two cases with angioimunoblastic lymphoma and and three cases with anaplastic large cell lymphoma. Distribution by years of cases describe a steady decrease in the incidence from 12 cases in 2008 at one case in 2012 and three cases in 2013.

Demographic, we observed a higher incidence in men (18 cases) than in women, with a sex-ratio of 1.63 and with an average age of 43 in men, compared to average age of 55 in women.

Studies thar used similar criteria have been reported in the literature. In retrospective study realiseed by Andrea Gallamini et all, conducted on 385 patients, they observed that the frequency of disease frequency was 1.8 times higher in men than in women. Also the sixth decade of life was the most affected. [7]

Regarding the diagnostic methods, were used microscopic and immunohistochemical analysis. In 12 cases (41.4% of cases) CD3 and CD 45 RO was positive, 14 cases (48.3% of cases) was only CD3 positive and 3 cases (10.33 % of cases) was CD45 RO positive. Specific B-cell marker, CD 20 was positive especially on remaining/ left follicles in 72. 4% of cases (21 patients). A number of histiocytes was observed in two cases, revealed by CD 68 positivity.

In 11 cases (38% of cases), peripheral T-cell lymphoma was subclassified. Thus, there are described three cases of anaplasic T-cell

lymphoma ALK positive, two cases of angioimmunoblastic lymphoma, five cases of peripheral T-cell lymphoma, Lennert variant and one case of peripheral T-cell lymphoma, follicular variant.

In this study was observed that mainly affected organs are lymph nodes (19 cases) and that in 79.2% of cases effacement of normal arhitecture was present. Regarding the type of lymphoma, the most diagnosed was NOS (24 cases).

The study of Pier Paolo Piccaluga et all[8], realized in 2010, shows a 25-30% incidence of NOS type, compared with the data obtained in this study. Similar finding were obtained in the study lead by Philip Went et all [9] in 2006.

Immunohistochemical markers help to appoint this type of limphoma in Non-Hodgkin lymphoma and differential diagnosis. According „CD30 + limphoproliferative disorders" in 2010 [10] an exact differenciation between NOS and anaplastic ALK negative is hard to do. Both are CD30 positive and the difference between them is done at the molecular.

This study has its obvious limits by the low number of cases and reporting to cases from a single cnter. But this may present a challenge to extend the study and the others centers in Romania.

CONCLUSION

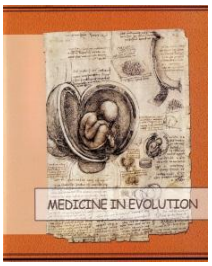
The data of this study we conclude following: (1) from a total number of 29 cases diagnosed during 2008- 2013 period in Department of Pathology in Tirgu Mures, highest incidence was registred in 2008 with a total of 12 cases, incidence being in a steady decrease until 2013. (2) Average age of developing peripheral T-cell lymphoma is higher in women (55 years) than in men (43 years). (3) Peripheral T-cell lymphoma is more common nodal (19 cases), observing and rare sites (ten cases). (4) This type of lymphoma reqiures a series of specific immunohistochemical reaction and a pathologist experienced in the diagnosis of lymphhoma.

REFERENCES

1. Harry L. Ioachim, L. Jeffery Medeiros – *Ioachim's Lymph Node Pathology 4th edition;*
2. Analysis of Cutaneous Lymphomas in a Medical Center in Bahia, Brazil, Achiléa L. Bittencourt et all, American Journal of Clinical Pathology, *140,* 348-354; 2013
3. CT features of peripheral T-cell lymphoma in the gastrointestinal tract in Chinese population and literature review Ling Zhu, Journal of Medical Imaging and Radiation Oncology **Volume 56, Issue 2,** pages 143–150; April 2012
4. Peripheral T-cell and NK-cell lymphomas in the WHO classification: pearls and pitfalls, Elaine S Jaffe et all; Modern Pathology 26, S71–S87; 2013
5. Delsol G et all. Anaplastic large cell lymphoma (ALCL), ALK-positive. In: Swerdlow SH, Campo E, Harris NL, Jaffe ES, Pileri SA, Stein H, Thiele J, Vardiman JW, editors. WHO Classification of Tumours of Haematopoietic and Lymphoid Tissue. Lyon: IARC Press; pp. 312–316; 2008.
6. Mason DY et all, Anaplastic large cell lymphoma, ALK-negative. In: Swerdlow SH, Campo E, Harris NL, Jaffe ES, Pileri SA, Stein H, Thiele J, Vardiman JW, editors. WHO Classification of Tumours of Haematopoietic and Lymphoid Tissue. Lyon: IARC Press, pp. 317–319; 2008.
7. Andrea Gallamini, Caterina Stelitano, Roberta Calvi et al. – "*Peripheral T-cell lymphoma unspecified (PTCL-U): a new prognostic model from a retrospective*

multicentric clinical study". Blood Journal, 2004, 103:2474-2479;
8. Pier Paolo Piccaluga, Claudio Agostinelli, Anna Gazzola, et al. – *„Prognostic Markers in Peripheral T-cell Lymphoma"*. Current Hematologic Malignancy Reports, 2010, 5:222-228;
9. Philip Went, Claudio Agostinelli, Andrea Gallamini, et al. – *„Marker Expression in Peripheral T-cell Lymphoma: A proposed Clinical-Pathologic Prognostic Score"*. Journal of Clinical Oncology, 2006, 24: 2472-2479;
10. Laurence de Leval, Philippe Gaulard - *„CD30+ lymphoproliferative disorders"*. The Hematology Journal, 2010, 35 :1627-1630.

EVOLUTION OF CAROTID ATHEROSCLEROSIS IN TYPE 2 DIABETES AND HYPERTENSION



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ABSTRACT

Aim and Objectives: To investigate the relationships between carotid atherosclerosis, evaluated by cIMT and plaques and the presence of diabetes associated or not with hypertension in comparison with a control group.

Material and Methods: A cross sectional study was done between the years 2010 and 2014 on a population of 315 patients with age between 31 and 80 years, 164 patients (52.1%) with diabetes, including 79 (48.2%) hypertensives and a control group of 151 (47.9%). Carotid arteries were imaged with an ultrasound system Sonoscape SSI 8000 equipped with software that automatically identified the borders of the CCA and calculated cIMT.

Results: There were significant differences between the diabetes and control group concerning cIMT, weight, BMI, history of hypertension, blood pressure values, LDL, HDL cholesterol and glucose ($p < 0.05$ for all comparisons). Mean cIMT and plaques correlated best with age, being 0.72±0.15 mm under 50 years, 0.82±0.35 mm between 50-64 years, 0.92±0.34 mm between 65-74 years and 0.96±0.26 mm over 75 years. Carotid plaques were present in diabetes under 50 years at 10.5%, in the 50-64 years group at 16.6%, in the 65-74 years group at 31.1% and over 75 years at 56.6%. cIMT correlated significantly with the duration of diabetes, the presence of microabuminuria and the presence of cardiovascular diseases ($p < 0.05$).

Conclusions: Our study found a statistical significant association between increased cIMT, plaques, type 2 diabetes mellitus and hypertension. Other factors associated with increased cIMT were age, male gender, low HDL cholesterol, high LDL cholesterol levels, duration of diabetes, presence of microalbuminuria, of coronary heart disease or cerebrovascular disease.

Key words: *diabetes mellitus – hypertension – carotid atherosclerosis*

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INTRODUCTION

Patients with type 2 diabetes mellitus have a two to fourfold increased incidence of CVD compared to persons without diabetes.[1] Carotid intima-media thickness (cIMT) is considered as a surrogate marker for coronary and peripheral artery disease, because it is easily obtained and is therefore recommended by guidelines for cardiovascular (CV) risk stratification.[2] Both cIMT and total carotid plaque area are associated with future risk of ischemic stroke and myocardial infarction.[3] Several studies have shown close associations between cIMT and conventional atherosclerotic risk factors such as age, obesity, smoking, hypertension, dyslipidemia, including LDL-C, HDL-C, impaired glucose tolerance and diabetes mellitus (DM).[4, 5]

AIM AND OBJECTIVES

To investigate the relationships between carotid atherosclerosis, evaluated by cIMT and plaques and the presence of diabetes associated or not with hypertension in comparison with a control group.

MATERIAL AND METHODS

The present study is an observational cross-sectional prospective one of an ambulatory population from 12 general practitioners offices from Timiş County, between 2010 and 2014. Of the 315 enrolled individuals, a number of 164 (52.1%) had diabetes type 2, of which 79 (48.2%) associated hypertension and 151 (47.9%) represented the control group.

Carotid arteries were imaged with ultrasound system Sonoscape SSI 8000 with high-resolution B-mode system and linear ultrasound transducer of 7.5 MHz, respecting the Mannheim Consensus (Figure 1). We examined a minimum of 10 mm length of both common carotids, 5 mm below the carotid bulb (Figure 2). The system was equipped with software that automatically identified the borders of the CCA and calculated cIMT (Figures 3, 4). Plaque was defined as >50% focal wall thickening from the surrounding vessel wall, distinct from the adjacent boundary.

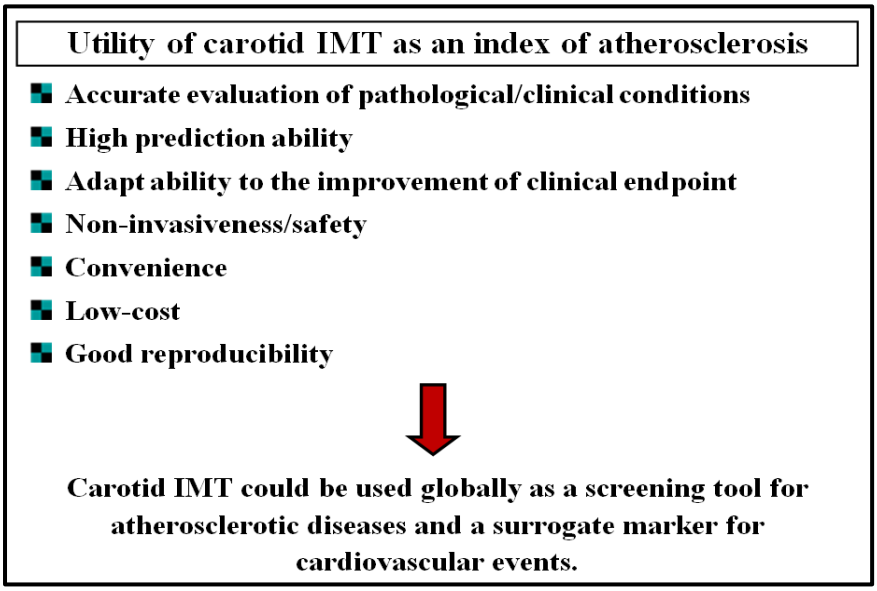


Figure 1. The utility of carotid intima-media thickness (IMT) as an index of atherosclerosis

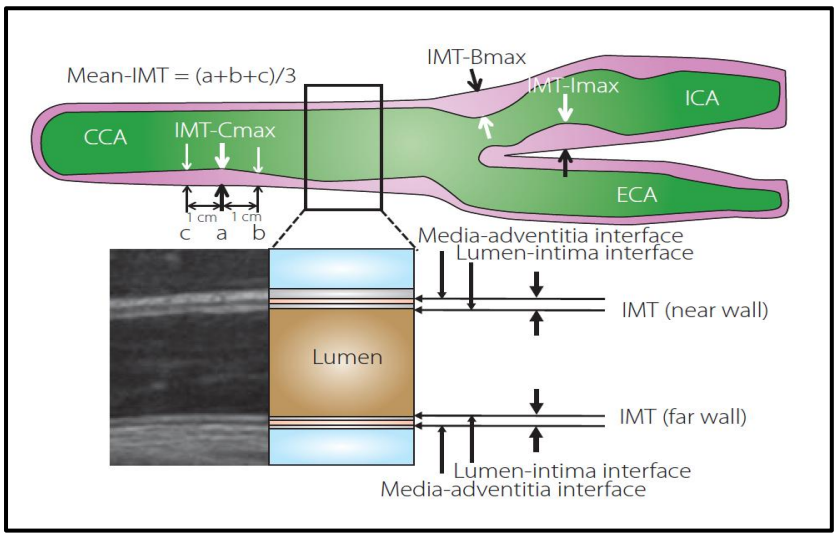


Figure 2. Measurement of cIMT

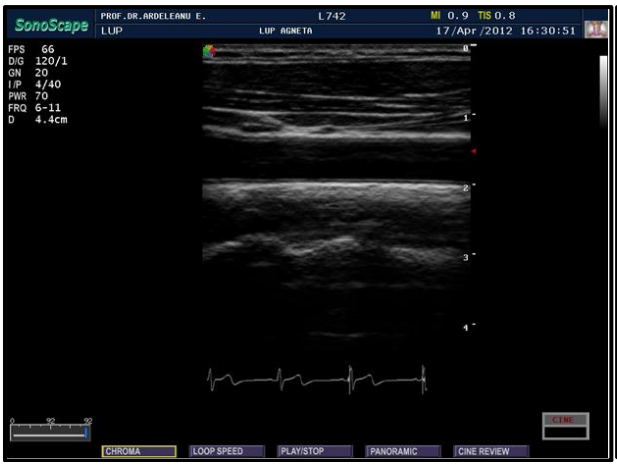


Figure 3. B-mode ultrasound. CIMT is seen as a double echogenic line at the far wall of the CCA

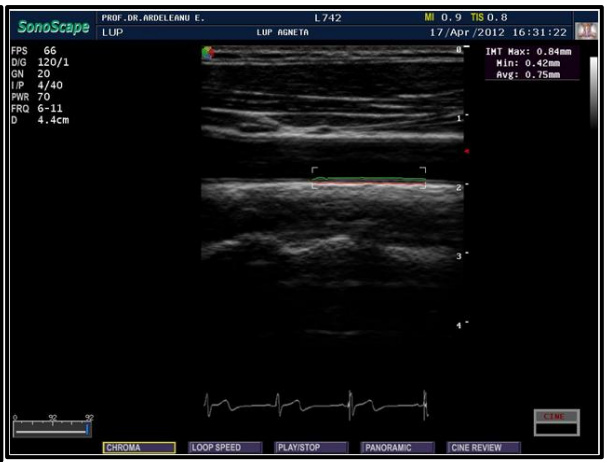


Figure 4. CIMT automatic measurement on a longitudinal view

STATISTICAL ANALYSIS

The study data were expressed as mean ± SD for continuous variables and as frequencies or percentages for categorical variables. Differences in mean values were assessed using t-test. Categorical variables were compared using chi-square tests. Linear regression analysis was used to determine the relationships between continuous variables. Comparisons were considered significant in the presence of p value <0.05. Pearson's correlation was done between continuous variables and cIMT. Simple and multiple backward linear regression analysis (with cIMT as the outcome variable) were performed. All statistical analyses used the Software Stata 9.2.

RESULTS AND DISCUSSIONS

The patient's characteristics are described in Table I.

Table I. Baseline characteristics of the study groups

Characteristics	Control group (n = 151)	Diabetes group (n = 164)	p value
Mean IMT (mm)	0.76 ± 0.21	0.89 ± 0.42	p <0.05

Characteristics	Control group (n = 151)	Diabetes group (n = 164)	p value
Age (years)	53.6 ± 9.7	56.0 ± 7.4	NS
Male (%)	51% (77)	52.4% (86)	NS
Height (cm)	166.6 ± 10.1	165.9 ± 8.5	NS
Weight (kg)	73.1 ± 13.3	86.2 ± 12.7	p <0.05
Waist (cm)	90.8 ± 1.2	93 ± 1	NS
BMI	27.01 ± 0.66	34.32 ± 1.26	p <0.05
Smokers (%)	23.2% (35)	24.4% (40)	NS
History of hypertension (%)	29.1% (44)	47.6% (78)	p <0.001
History of hypercholesterolemia (%)	30.5% (46)	35.4% (58)	NS
SBP (mmHg)	133.5 ± 10.9	152.1 ± 10.5	p <0.001
DBP (mmHg)	75.1 ± 7.3	88.6 ± 6.5	p <0.05
LDL cholesterol (mg/dl)	124±7.2	148±8.9	p <0.05
HDL cholesterol (mg/dl)	46±10.2	41±7.8	p <0.05
Total cholesterol (mg/dl)	215.0 ± 34.4	267.3 ± 36.7	p <0.05
Triglycerides (mg/dl)	149.4 ± 41.0	161.2 ± 51.4	NS
Glucose (mg/dl)	89±7	148±31	p <0.001

From the total group of 164 diabetic patients, 30 were under 50 years, 46 between 50-64 years, 55 between 65-74 years, and 33 had ≥75 years (Figure 5).

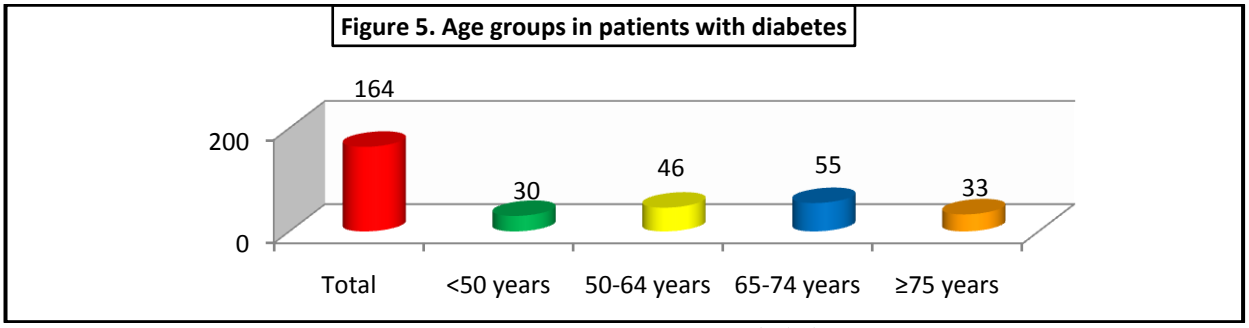


Figure 5. Age groups in patients with diabetes

When analysing cIMT for each cardiovascular risk factor, there were statistical important differences concerning the presence or absence of hypertension, low values of HDL-C, age, increased LDL-C and increased blood glucose. No differences were observed concerning smoking, triglycerides and increased waist circumference. In our study diabetes was statistic significantly associated with increased cIMT. When separated by gender, cIMT showed a trend to be higher in male patients (Table I and figures 6, 7, 8).

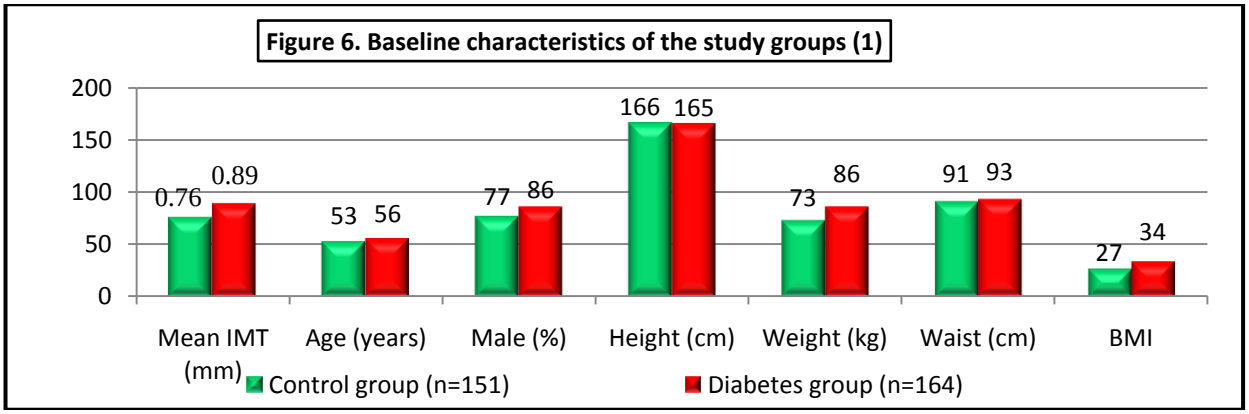


Figure 6. Baseline characteristics of the study groups (1)

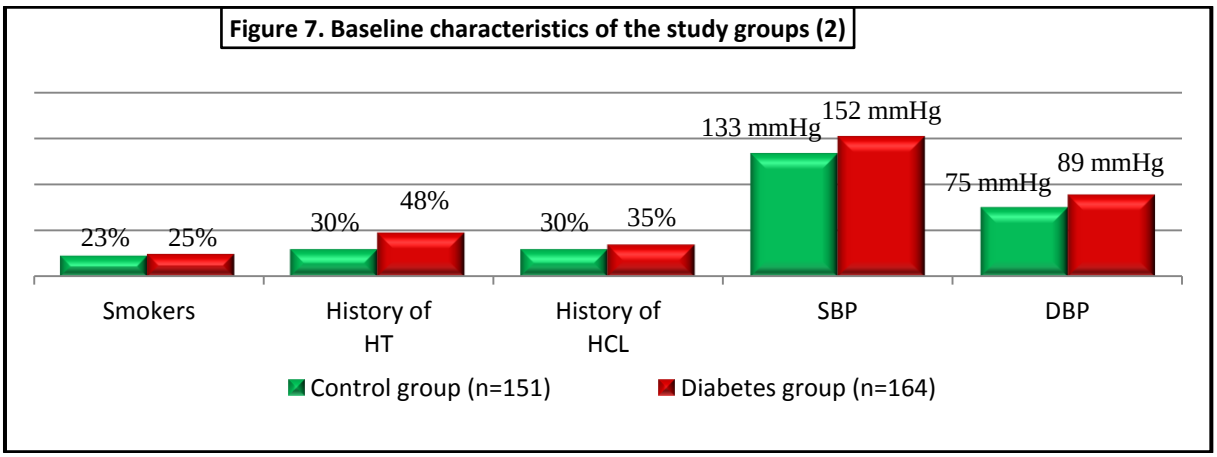


Figure 7. Baseline characteristics of the study groups (2)

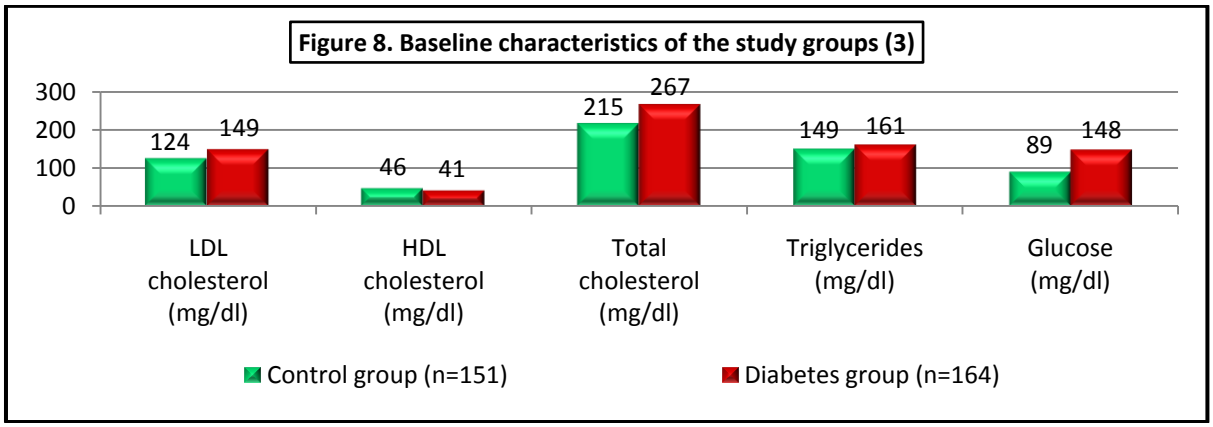


Figure 8. Baseline characteristics of the study groups (3)

cIMT and plaques showed important differences according to age groups. In the age group less than 50 years, mean cIMT was 0.72±0.15 mm, in the 50-64 years group mean cIMT was 0.82±0.35 mm, in the 65-74 years group mean cIMT was 0.92±0.34 mm and in the over 75 years group mean cIMT was 0.96±0.26 mm.

Carotid plaques were present in the study group under 50 years at 10.5%, in the 50-64 years group at 16.6%, in the 65-74 years group at 31.1% and over 75 years at 56.6% (Table II and figure 9).

Incidence of carotid lesions in the study groups was 11.2% in the control group of 151 patients, 27% in the nonhypertensive diabetes group consisting of 85 patients, and 41.7% in the hypertensive diabetes group consisting of 79 patients (Figure 10).

Table II. Mean cIMT and plaques in different age groups

Total (n=164)	**<50 years (n=30)**	**50-64 years (n=46)**	**65-74 years (n=55)**	**≥75 years (n=33)**	**p value**
cIMT (mm)	0.72±0.15	0.82±0.35	0.92±0.34	0.96±0.26	0.002
Plaques (%)	10.5%	16.6%	31.1%	56.5%	

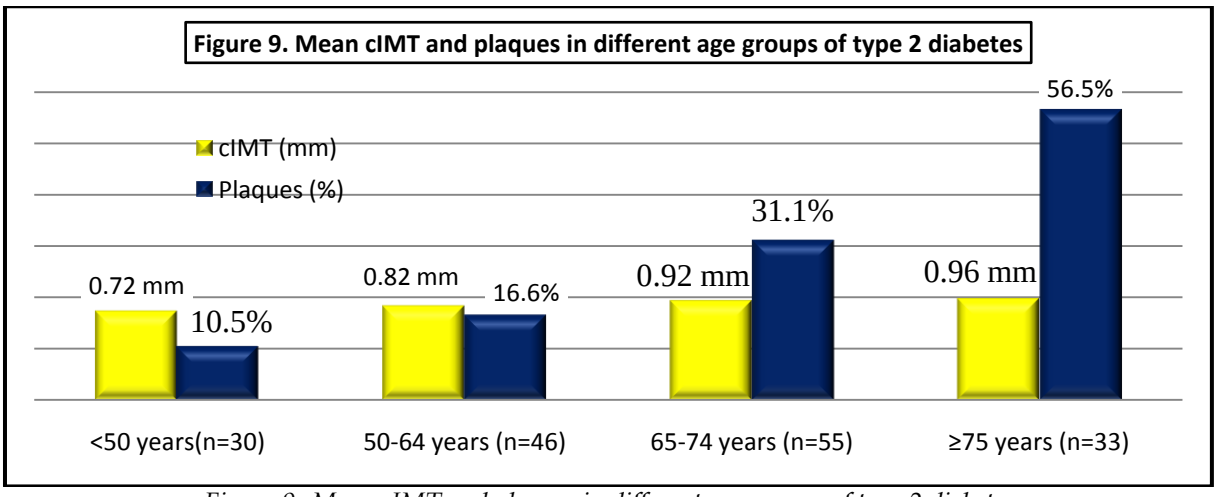


Figure 9. Mean cIMT and plaques in different age groups of type 2 diabetes

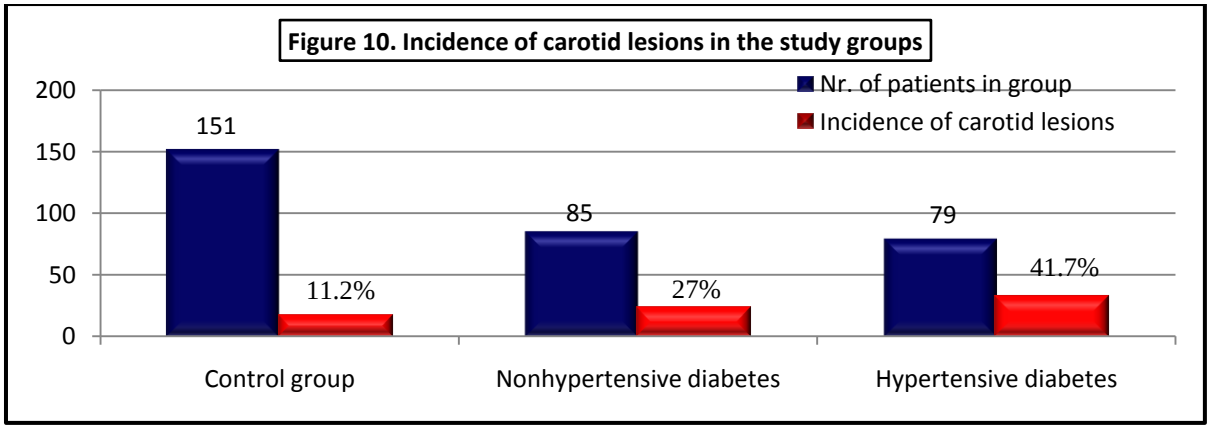


Figure 10. Incidence of carotid lesions in the study groups

Mean cIMT was 0.84 mm in the newly diagnosed patients with diabetes mellitus, 0.9 mm in patients with 1-3 years duration of disease, 0.93 mm in patients with 3-10 years duration, and 0.98 mm in patients >10 years duration of diabetes mellitus (Figure 11).

cIMT and plaques correlated with microalbuminuria in the diabetes group. Mean cIMT was 0.92±0.42 mm in patients with microalbuminuria, respectively 0.83±0.39 mm in patients with normal albuminuria, and plaques were present in 27.6% patients with microalbuminuria, respectively in 20.8% patients with normal albuminuria (Table III and figure 12).

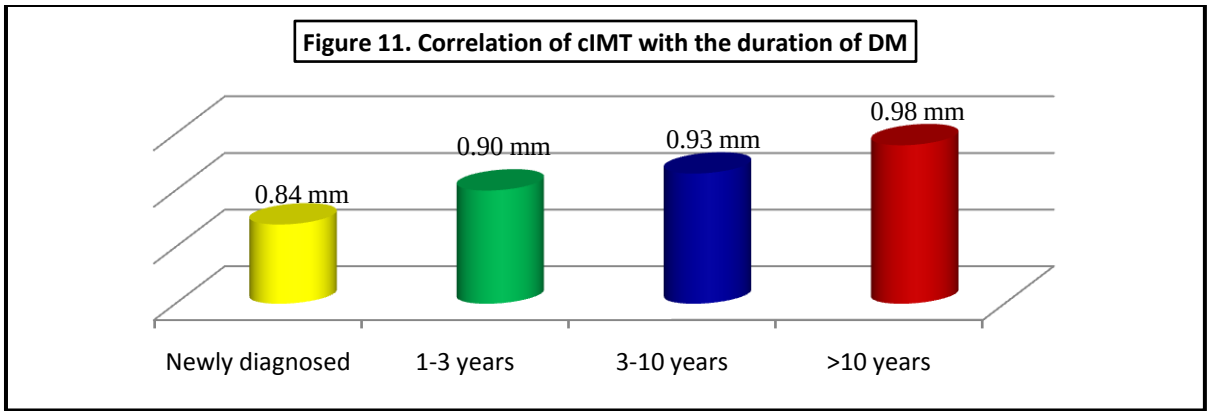


Figure 11. Correlation of cIMT with the duration of DM

Table III. cIMT and plaques in DM with microalbuminura and normal albuminuria

Total (n=164)	Microalbuminuria (n=48)	Normal albuminuria (n=116)	P value
cIMT (mm)	0.92±0.42	0.83±0.39	p <0.05
Plaques (%)	27.6%	20.8%	p <0.05

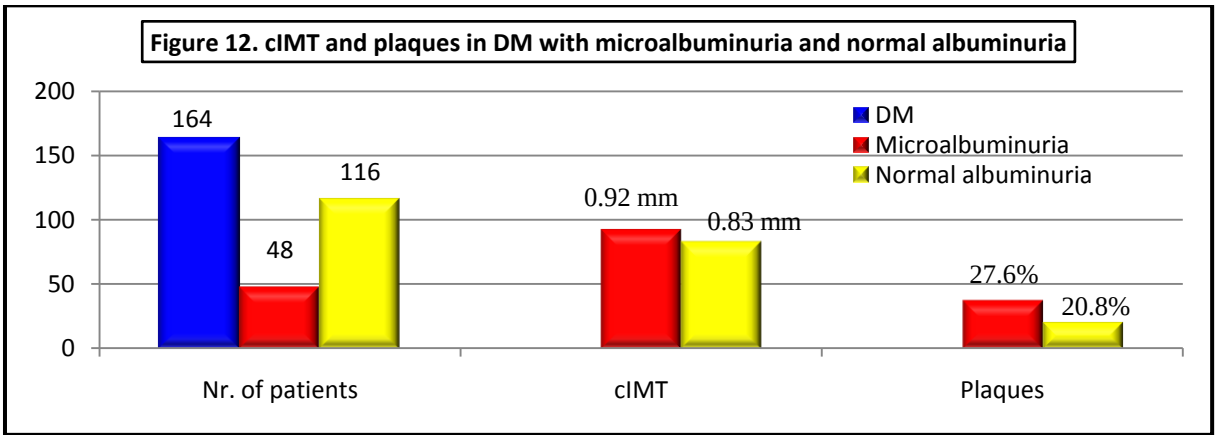


Figure 12. cIMT and plaques in DM with microalbuminuria and normal albuminuria

Patients with CAD had mean cIMT of 1.13±0.4 mm in the diabetes group, respectively 0.74±0.11 mm in the control group, and patients without CAD had mean cIMT of 0.92±0.34 mm in the diabetes group, respectively 0.62±0.12 mm in the control group (Table IV and figure 13).

Table IV. Correlation of cIMT and CAD in type 2 diabetes and the control group

	CAD	cIMT (mm)
Diabetes group	yes	1.13 ± 0.40
	no	0.92 ± 0.34
Control group	yes	0.74 ± 0.11
	no	0.62 ± 0.12

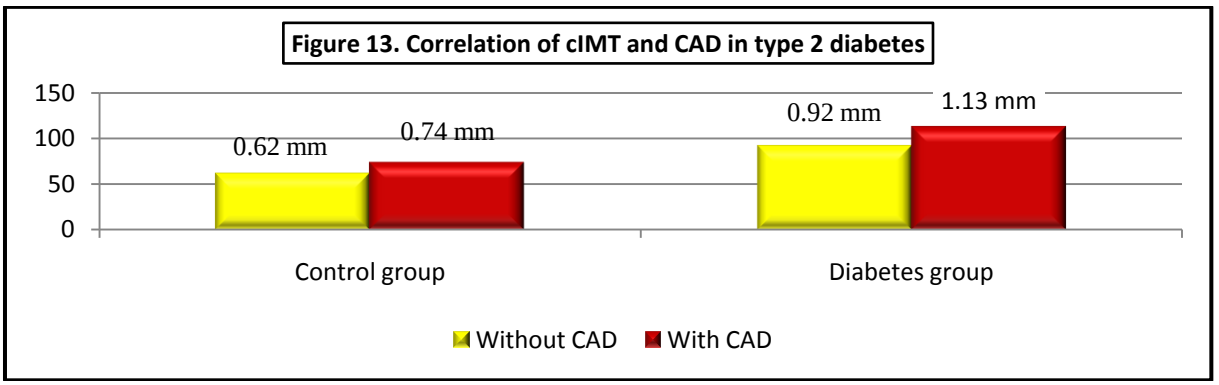


Figure 13. Correlation of cIMT and CAD in type 2 diabetes

Figure 14. Mean cIMT of 0.931 in a patient with DM

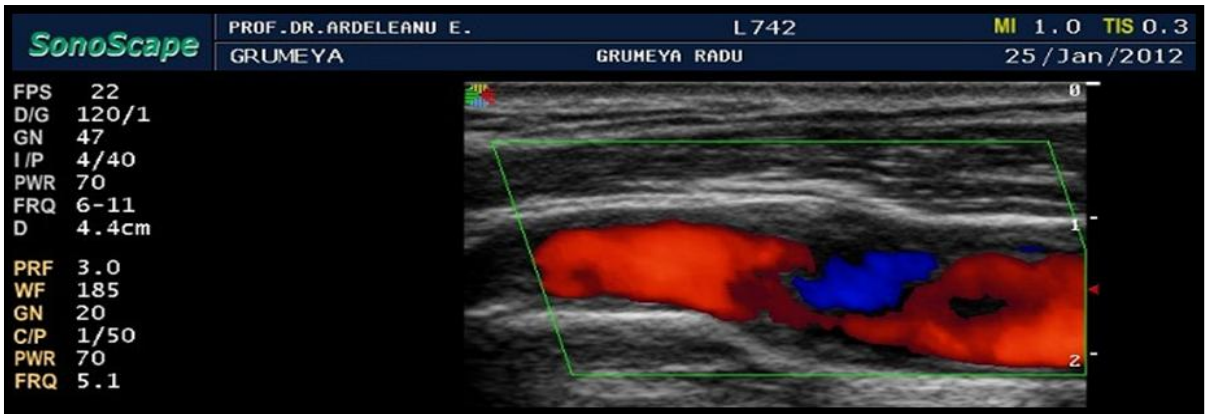


Figure 15. Elevated cIMT and bulb plaques in a patient with DM

Figure 16. Atherosclerotic plaque in a patient with DM

Figure 17. CIMT of 0.74 mm and bulb plaques in DM

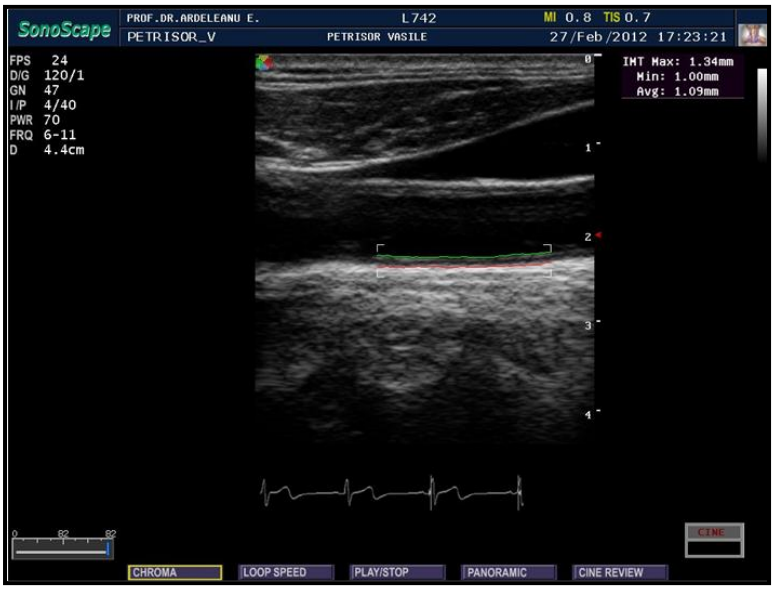


Figure 18. cIMT 1.09 in a patient with DM

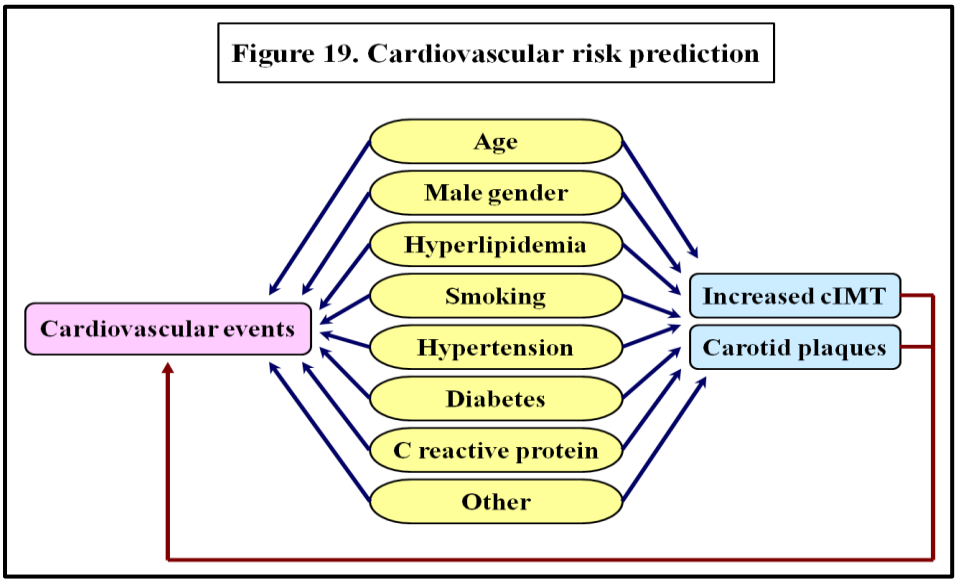


Figure 19. Cardiovascular risk prediction

Carotid artery wall analysis identifies early stages of atherosclerosis, by the identification of non-occlusive plaques and thickened cIMT.[6] Both parameters are independent predictors of future CV events, including myocardial infarction, stroke, and cardiac death and can be used in clinical practice for CV risk assessment. The American Society of Echocardiography's recommendation is of combining cIMT and carotid plaque for optimal CV risk prediction. Although cIMT and carotid plaques share a common pathophysiologic substrate, cIMT might be associated more with arterial aging and carotid plaques should represent a better surrogate marker of CV atherosclerosis.[7]

The strong association between changes in BP and cIMT may be because the hemodynamic change due to BP has a stronger impact on cIMT, while injuries caused by LDL-C changes affect the carotid IMT only slowly. Evidence from randomized controlled trial data also showed different effects of BP and cholesterol lowering treatment on carotid atherosclerosis.[8,9] Microalbuminuria is highly predictive not only for the

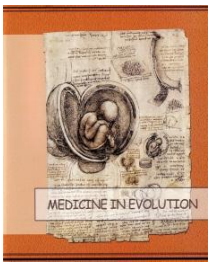
development of diabetic nephropathy but also for subsequent atherosclerotic vascular disease. The predictive value of microalbuminuria for atherosclerotic vascular disease has been shown in several epidemiologic studies of type 2 diabetes, type 1 diabetes, and nondiabetic populations.[10] Dysfunction of the vascular endothelium and chronic low-grade inflammation are key features of the initiation of atherosclerosis.[11]

CONCLUSIONS

1. Diabetes mellitus confers an increased risk for CV morbidity and mortality.
2. Our study found a statistical significant association between increased cIMT, plaques, type 2 diabetes mellitus and hypertension.
3. Other factors associated with increased cIMT were age, male gender, low HDL cholesterol, high LDL cholesterol levels, duration of diabetes, presence of microalbuminuria and of coronary heart disease or cerebrovascular disease.
4. Hypertension is a strong predictor of increased cIMT.

REFERENCES

1. Katakami N., Kaneto H., Shimomura I. Carotid ultrasonography: A potent tool for better clinical practice in diagnosis of atherosclerosis in diabetic patients. J Diabetes Investig., 2014; 5(1):3-13
2. Iglesias del Sol A. et al. Is Carotid Intima-Media Thickness Useful in Cardiovascular Disease Risk Assessment? The Rotterdam Study. Stroke, 2001; 32:1532-1538
3. Marini M.A. et al. Cardiometabolic Risk Profiles and Carotid Atherosclerosis in Individuals With Prediabetes Identified by Fasting Glucose, Postchallenge Glucose, and Hemoglobin A1c Criteria. Diabetes Care, 2012; 35(5):1144-1149
4. Lorenz M.W. et al. Prediction of Clinical Cardiovascular Events With Carotid Intima-Media Thickness. Circulation, 2007; 115:459-467
5. Lundby-Christensen L. et al. Carotid intima-media thickness in individuals with and without type 2 diabetes: a reproducibility study. Cardiovascular Diabetology, 2010; 9(40)
6. Ouk Chin S. et al. Risk Factors for the Progression of Intima-Media Thickness of Carotid Arteries: A 2-Year Follow-Up Study in Patients with Newly Diagnosed Type 2 Diabetes. Diabetes & Metabolism Journal, 2013, 37(5); 365-374
7. Poanta L.I. Association between fatty liver disease and carotid atherosclerosis in patients with uncomplicated type 2 diabetes mellitus. Medical Ultrasonography, 2011; 13(3):215-219
8. The writing group of the Diabetes Control and Complications Trial. Intensive Diabetes Therapy and Carotid Intima–Media Thickness in Type 1 Diabetes Mellitus. N Engl J Med, 2003; 348(23): 2294-2303
9. Yamasaki Y. et al. Carotid Intima-Media Thickness in Japanese Type 2 Diabetic Subjects. Diabetes Care, 2000; 23(9):1310-1315
10. Lange L.A. et al. Heritability of Carotid Artery Intima-Medial Thickness in Type 2 Diabetes. Stroke, 2002; 33:1876-1881
11. Yokoyama H. et al. Subclinical atherosclerosis is increased in type 2 diabetic patients with microalbuminuria evaluated by intima-media thickness and pulse wave velocity. Kidney International, 2004; 66:448-454



BETTER IMPROVEMENT DURING THE TIME OF THE EVOLUTION AND RECUPERAT OF PATIENTS WITH ACUTE MYOCARDIAL INFARCTION TREATED WITH HIGH DOSES OF ATORVASTATIN

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ABSTRACT

Background: *For few years, early statin therapy in acute coronary patients is already usual in our coronary unit, but high dose of atorvastatin still needs to adjust for long term, according to current guidelines. Late hospitalisation of this type of patients is also improved in our unit, this study continue another study in our unit seven years ago. Few studies have evaluated the full parameters of acute coronary patients for long term treated with high doses of atorvastatin. This study continue our effort to improve the long term evolution of acute coronary patients in our unit.* ***Objective:*** *To assess the improvement of secondary prevention of patients with acute myocardial infarction, we observed for 36 month the long term evolution of patients in Banat region, hospitalized in our coronary unit and we analysed the clinical and paraclinical evolution in time, in order to see if the results are better comparative 7 years ago, when we evaluated similar category of patients.* ***Method:*** *Patients with acute coronary infarction and severe unstable angina are hospitalized in our coronary hospital unit and they are treated according to the current guidelines. Part of these patients is treated with 80 mg/day atorvastatin for long term, 36 months. We study carefully the evolution of patients treated in our coronary unit comparative with a group of patients treated with 80 mg/day atorvastatin for 36 month and we evaluate all patients at 6, 12, 24 and 36 months for primary and secondary end-points of cardiovascular morbidity and mortality, plasmatic lipid levels, PCR level, stress cardiac testing and cognitive performance. We study the evolution of patients treated nowadays compare with patients treated seven years ago, when addressability was lower and accessibility to the best treatment was lower too.* ***Results:*** *We included 216 patients with acute myocardial infarction and severe unstable angina hospitalized in 4-6 hours after the onset of coronary event. The maximum daily dose of atorvastatin (80mg/zi) was administered to a lot of 102 patients, the rest of the patients received the usual treatment according to the valid therapeutic guides, and other statins in usual dose, meaning the control lot is based on 114 patients. After 6 months from onset, in the group of patients treated with 80 mg atorvastatin, major events (primary end points) took place for 31 (17,4%), 35 (19,6%), 36 (20,2%) compared to 38 patients (22%), 44 (25%), 48 (28%) in the control group, p<0,01. Secondary end-points results are significant better in atorvastatin group (p<0,01). In both groups of patients, the evaluation of the plasmatic lipids at the onset of the coronary event was similar. At 6 months, the decreased level of total cholesterol, of the LDL and of the triglycerides was complete in the lot of patients with high dose of atorvastatin; this result maintained at 12, 24 and 36 months. Protein C plasmatic level (PCR) decreased with 83% compared to 79% in the control lot. All the patients were evaluated for physical performance at 6, 12, 24 and 36 months, with better performance in atorvastatin group. Cognitive performance evaluation withg Mini Mentale Scale Examination (MMSE) showed a Mild Cognitive Impairment for both groups, no significant differences in groups.* ***Conclusion:*** *The present observational study continues our effort in improving the therapy of acute coronary patients in our unit. This study is a continuation of another study for these type of patients, 7 years ago, and proves that a better addressability and a long term aggressive therapy with atorvastatin has significant benefits in cardiovascular mortality and morbidity, in safety conditions and early physical performance recovery.*

Key words: *evolution of the acute myocardial patent, atutvastatin high doses, reabilitations*

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INTRODUCTION

Acute coronary patient are treated with statins because of their important proved benefits for short and long term. Patient's outcomes are improved because of the long term high doses atorvastatin therapy, but also because of improvement of addressability and implementation of current guidelines. For few years, early statin therapy in acute coronary patients is already usual in our coronary unit, but high dose of atorvastatin still needs to adjust for long term, according to current guidelines. Late hospitalisation of this type of patients is also improved in our unit, this study continue another study in our unit seven years ago, in order to obtain better results. The effect of statins in this type of patients late hospitalised in coronary units is difficult to show; only few studies there are in medical literature. Major and minor end points of this observational study are evaluated during a long period of time after acute coronary patients tardy hospitalized and treated with high doses of atorvastatin for long term. This study continues our involvement in treating this type of patients, in order to gain long term benefits for patients in our region, in Banat.

MATERIAL AND METHODS

Acute coronary patients included in the present observational study are adults above 18 years, hospitalized in our emergency coronary unit relatively tardy, in 4-6 hours after the onset of the myocardial infarct, regardless of the presence or absence of dyslipidaemia. We included the patients with acute myocardial infarction (with or without pre-hospital thrombolysis) and severe unstable angina, treated in coronary units and monitored adequately during the critical period. They received 80 mg atorvastatin daily, after which they were attentively clinical monitored, biological, electrophysiological and cardiac stress testing, cognitive performance evaluation after 6, 12, 24 and 36 months. Exclusion criteria are for patients that were scheduled for revascularization interventions, the myocardial infarct patients with Q wave in the last 6 weeks, coronary by pass undertaken in the last 3 months, PTCA in the last 6 months, severe anaemia (Hb<8mg/%), dialysis patients (IRC stadium IV), insulin-dependent diabetes, pregnancy and nursing. All the patients are treated according to the current therapeutic guidelines in Europe and Romania and all patients gave us a written consigns. Recommendations for the complete regiments of diet are in concordance with the current therapeutic guides.

Physical performance of coronary patients was carefully monitored, using in graduated the loading dose: 45W, 60W, 80W and 100W and all the patients follow the current guidelines recommendations.

Cognitive performance evaluation is based on Mini Mental Scale Examination (MMSE) for all patients.

We compare the clinical and paraclinical evolution of these patients with hospitalized patients with similar characteristics who received usual pathology specific treatment, except the maximum atorvastatin dose administered just after admission in the study. Preliminary analyses of the results at 6, 12, 24 and 36 months from the hospitalization of acute myocardial infarct patients were effectuated.

END POINTS: Immediately after the hospitalisation of the acute coronary patients, the patients were monitored in details for primary and

secondary end-points, meaning major and minor ischemic events. Primary end-points are death, non-fatal acute myocardial infarct, cardiac arrest with resuscitation and recurrent symptomatic myocardial ischemia with objective evidence requiring emergency re-hospitalization. Every patients included has a clinical and electrocardiographic evaluation, then biological (cardiac enzyme data criteria), psychological. The traced secondary end-points are the period of time until the occurrence of the primary end-points, the occurrence of fatal and non-fatal stroke events (AVC), revascularizations (PTCA and by pass), re-hospitalization (aggravated angina, newly diagnosed or aggravated congestive cardiac insufficiency that needed hospitalization) and the plasma level of the lipids in comparison with moment zero when the patients were admitted into the study.

Clinically and paraclincal exams are done for all patients: plasma lipids (total cholesterol, triglycerides, LDL, HDL), PRC, fibrinogen, VSH, glycaemia, hemoleucograma, LDH, urea, creatinine, ionograma, ECG, echocardiography, cardiac stress testing and psychological evaluation.

RESULTS

From a total of 378 acute coronary patients, we included in this study 216 patients between May 2009 – December 2010, patients with acute myocardial infarction and severe unstable angina hospitalized in 4-6 hours after the onset of coronary event, in accordance with the pre-set inclusion criteria. The moment of the admission of the patients into the study overlapped with the moment of their hospitalization. The maximum daily dose of atorvastatin (80mg/day) was administered daily for 36 months to a lot of 102 patients, the rest of the patients received the usual treatment according to the valid therapeutic guides, and other statins in usual dose, meaning the control lot is based on 114 patients. The clinical and paraclinical monitoring of all the patients was undertaken at 6, 12, 24 and 36 months from the hospitalisation.

The analysis of clinical and demographical data of the patients from the two groups is similar at the moment of the inclusion to the study (Table 1).

Table 1. **The baselines characteristics of the acute coronary patients (number/%)**

Age (years)	63	_
Men	143	66%
White raise	216	100%
Time from the onset (hours)	4,8	_
Cardiovascular history		
* Heart failure	18	8.3%
* Cerebrovascular disease	19	8.7%
* Peripheral vascular disease	19	8.6%
* Myocardial Infarction	56	26.1%
* PTCA revascularization	60	28%
* BY PASS revascularization	136	6.3%
Cardiovascular Risk Factors		
* Smoking	104	48.4%
* HTA	121	56.2%
* diabetes mellitus	51	23.6%
* dyslipidemia	92	42.4%

ECG diagnosis permitted us to split the two lots of patients (the control lot and the lot with acute myocardial infarct patients treated with atorvastatin 80 mg/day) in 3 groups (table 2) : Group I includes 91 patients (42%) with severe unstable angina. Group II includes 69 patients (32%) with acute myocardial infarction (AMI) without ST segment Elevation, group III includes 56 patients (26%) with AMI with ST segment Elevation (Fig 1).

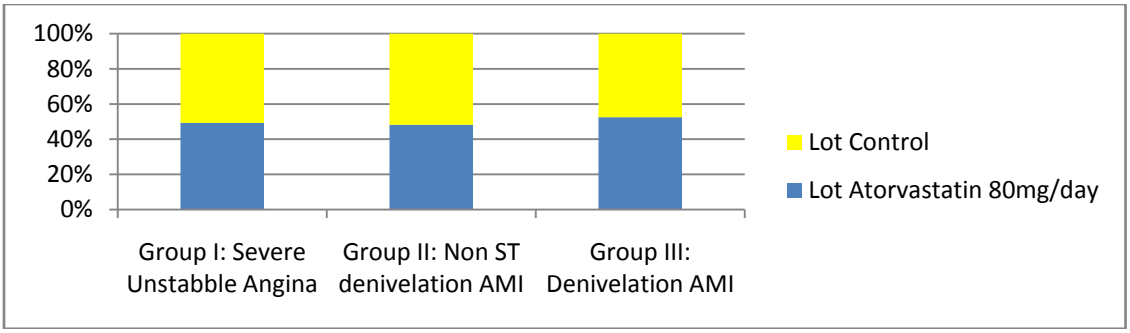


Figure 1. Groups of patients monitored for 36 months, ECG diagnosed

In Group I (patients with Severe Unstable Angina) there are 43 patients in lot atorvastatin 80mg/day and 48 patients in control lot. Group II (Non ST Elevation Myocardial Infarct) comprises 33 patients treated with atorvastatin 80mg/day and 36 patients in control lot. Group III (ST Elevation Myocardial Infarct) comprises 26 patients treated with atorvastatin 80mg/day and 30 patients in control lot.

The daily therapy with 80 mg/day of atorvastatin started in 43 hours after the hospitalization.

The planning for the clinical monitoring of the patients was scheduled at 6, 12, 24 and 36 months from the onset of the acute coronary event. All the data about the patients was centralized in accordance to the preset planning, with the exception of 2 patients that got lost off the group of patients that received atorvastatin 80 mg/day (0,92%), respectively 3 patients that got lost in the control lot (1.3%).

The compliance of the patients to the therapy, meaning the number of days in which the patient strictly followed the prescribed medication, was 99.08 % in the atorvastatin lot and 98.7 % in the control group. The medication of the acute coronary event was prescribed in accordance with the valid therapeutic guidelines, according to the clinical and paraclinical diagnosis of each patient (table 2). Aspirin, heparin, nitrates and beta-blockers were administered to most of the patients included in the study.

Table 2. Medications During Hospitalization of the acute coronary patients (nr/%)

Aspirin	199	92.00%
Antiplatelet agents	26	12.00%
Heparin	164	76.00%
Oral anticoagulants	17	8.00%
Fibrinolysis Agents	15	7.00%
Nitrates	194	90.00%
Beta blockers	168	78.00%
Ca Chanel Blockers	114	53.00%
ACE Inhibitors	97	45.00%
Digoxin	30	14.00%
Statins	216	100.00%

PARACLINICAL RESULTS: In both groups of patients, the evaluation of the plasmatic lipids at the onset of the coronary event was similar, with an average level of the LDL cholesterol of 126 mg/dl, triglycerides 184 mg/dl and HDL 45 mg/dl. At 6 months, the decreased level of total cholesterol, of the LDL and of the triglycerides was complete in the lot of patients with high dose of atorvastatin; this result maintained at 12, 24 and 36 months (Fig. 2, 3).

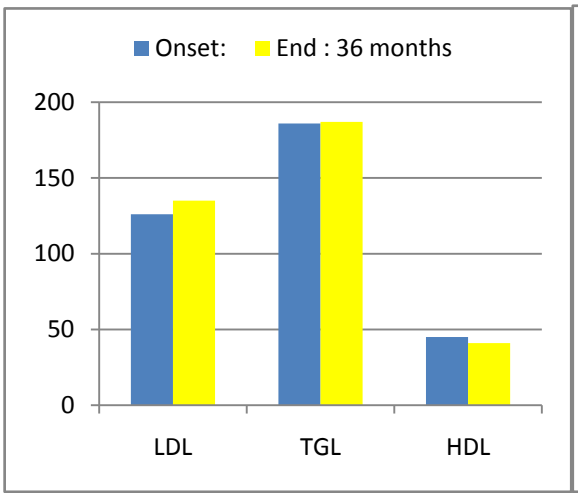


Figure 2. Lipid plasmatic evolution in 36 months in acute coronary patients in control lot

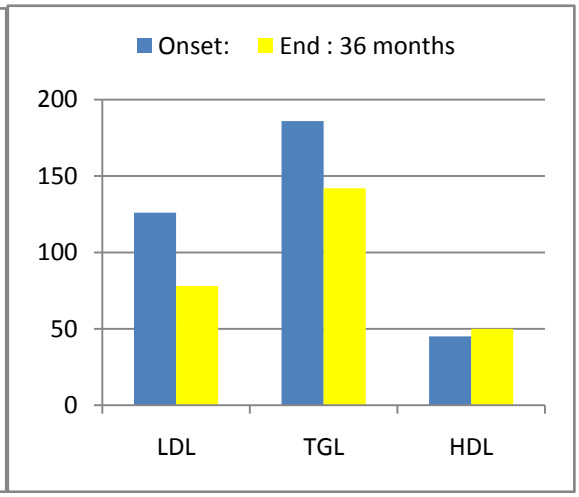


Figure 3. Atorvastatin 80mg/day

By the end of the study, in the control group of patients, the seric level of the LDL cholesterol increased with 12% (average 135 mg/dl), comparing to the atorvastatin lot where the seric level of the LDL cholesterol decreased with 40% (average 78 mg/dl). Triglycerides increased with 8% (average 187 mg/dl) in the control lot, compared to the decreasing with 16% (average 142 mg/dl) of the triglycerides level in the atorvastatin lot. In the control lot the seric level of HDL cholesterol decreased with 6% (average 41 mg/dl) comparing to the atorvastatin lot where the seric level of HDL increased with 8% (average 50 mg/dl).

In the group of patients treated with atorvastatin 80 mg/day for 36 months, reactive protein C plasmatic level (PCR) decreased from an average value of 11,8 mg/l to 1,6 mg/l, representing a decrease of 83% compared to 79% in the control lot, at the debut PCR having an average value of 12 mg/l and after 24 months 2,8 g/l.

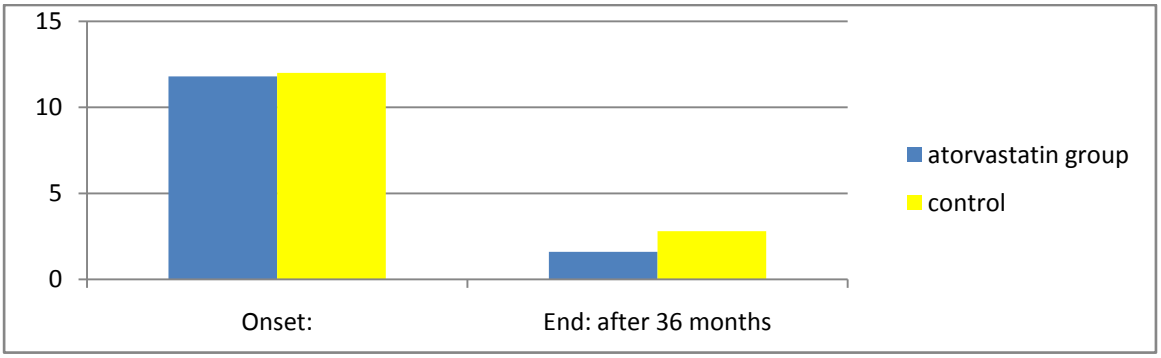


Figure 4. PCR evolution in 36 months in acute coronary patients

RESULTS OF THE END-POINTS: Over the six-months period of the study, in the lot of acute myocardial infarct patients treated

with 80 mg atorvastatin, major events (primary end-points) took place for 25 patients (13,8%) compared with 34 patients (18,6%) in the control lot, p=0,09 (Figure 5). The therapy with 80 mg/day of atorvastatin diminished the number of fatal cardiac events after 6 months of treatment from the onset. However, in the group of patients treated with 80 mg/day atorvastatin, the number of recurrent ischemic events with emergency re-hospitalization was registered in lower cases (5 patients, 2,77%) comparative control group (11 patients, 6,04%), p= 0,05.

After 12, 24 and 36 months, the recorded differences between the two lots were significant from a statistical point of view, regardless of the ECG diagnosis and stress cardiac testing results of the IMA at the debut (group I, group II and group III).

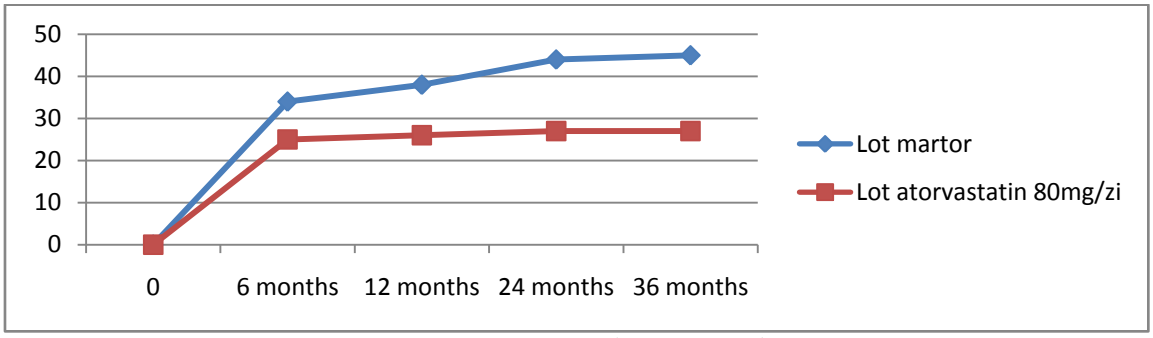


Figure 5. Primary End-Points Results

Over the 12, 24 and 36 months period of the study, in the lot of acute myocardial infarct patients treated with 80 mg atorvastatin, major events (primary end points) took place for 31 (17,4%), 35 (19,6%), 36 (20,2%) compared to 38 patients (22%), 44 (25%), 48 (28%) in the control group.

Significant statistical differences of the combined secondary end points were registered between the lot of patients treated with atorvastatin 80mg/day from the onset and the control lot at 36 months (Figure 6). Over the 36 months period of the study, in the lot of acute coronary patients treated with 80 mg atorvastatin, the cumulative secondary endpoint was reduced with 33%, p=0,01. The administration of 80 mg/day of atorvastatin diminished the number of secondary end-points, after 36 months from the onset.

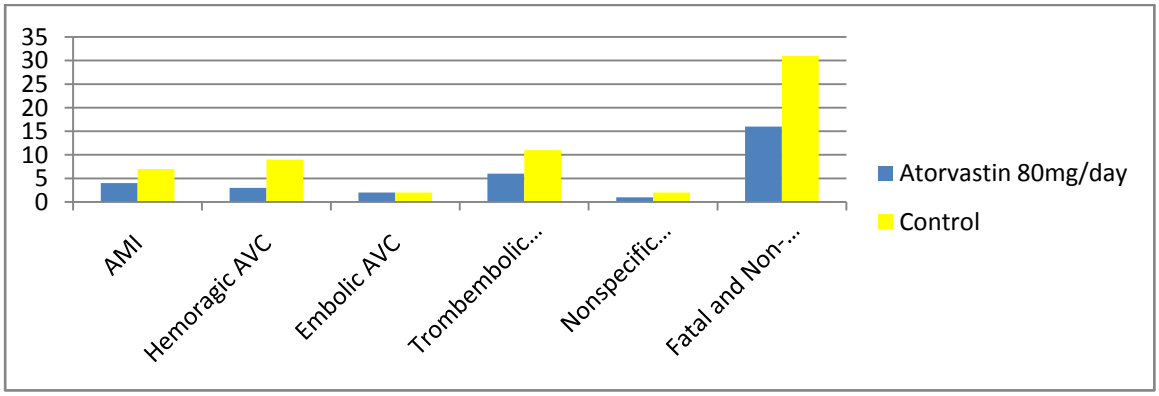


Figure 6. Secondary End-Points Results

In the lot of patients treated with atorvastatin 80 mg/day, 14 fatal and non-fatal cerebrovascular events were registered (in 16 patients, 8,88%): 4 recurrent IMA, 3 hemorrhagic AVC, 1 embolic AVC, 5 of systemic tromboembolic nature, 1 case of

unspecified etiology, compared with a total of 39 events the control lot.

Non-fatal recurrent AVC (stroke) was registered in 4 patients in the lot of patients treated with atorvastatin 80mg (2,3%) and in 12 cases from the control lot (6%), p=0,01, significant statistic differences.

All patients were evaluated for physical performances evaluation for 45W, 60W, 80W and 100W loading dose. 29% of patients in the group of patients treated with atorvastatin 80mg/day performed at 100W loading dose and 16% in control group (Table 3). At 36 months after onset, 42% patients in the group of patients treated with 80mg/day atorvastatin performed al 100W loading dose and 22% in control group (Table 4).

Table 3. Physical Performance evaluation in 6 months after onset

Loading Dose	Control	Atorvastatin 80mg/day
45 W	80%	82%
60 W	54%	65%
80 W	43%	54%
100 W	16%	29%

Table 4. Physical Performance evaluation in 36 months after onset

Loading Dose	Control	Atorvastatin 80mg/day
45 W	95%	95%
60 W	70%	75%
80 W	60%	83%
100 W	22%	42%

Mini Mental Scale Examination (MMSE) is used for all patients at first hospitalization and after 6, 12, 24 and 36 months, 30 is normal score. After 6 months, score is 22 in atorvastatin group and 21 in control group, p=0,9, no significant differences, and this result maintain in 12, 24 and 36 moths. At the end of study, score is 24 in group treated with atorvastatin and 21 in control group, p=0,06.

SAFETY: No serious adverse effects appeared in our groups of patients included in study. Increased hepatic transaminases (three times the normal value) appeared in 11 patients (6,1%), for whom the treatment with atorvastatin was stopped and who where excluded from the study. No case of documented myositis was registered, but mild muscular pain witch does not has impact in compliance of patients.

DISCUSSIONS

Hypercholesterolemia in coronary patients is a risk factor to be in control, especially in coronary patients. Primary prevention and the secondary prevention must be implemented for all patients, especially in the acute coronary syndromes and the acute myocardial infarct. For the latter ones, the decrease of the cholesterol values is correlated with a favourable prognostic in the post-infarct evolution.

The prognostic of acute coronary syndrome patients in general, and the acute myocardial infarct in particular, with or without ST segment elevation, is significantly increased due to aggressive decreasing of LDL values below 70mg%. In MIRACL study, 3086 patients with acute myocardial infarction were treated with 80mg/day atorvastatin for short time (16 weeks) and the risk of major cardiovascular events was reduced with 16%, the risk for re-hospitalization was reduced with

26%and LDL was reduced below 80mg% in coronary patients, with or without PTCA. Important to underline that, for last 5 years, in our unit we perform PTCA for times more than before. Such change suggest improvement of addressability in our studied patients due to significant earlier medical address and assistance.

Such emergency cases require emergency therapy, but insufficiently prompt seven years ago, when addressability was 8-9 hours after the onset of coronary event. For this reason, we considered necessary such a lot of acute coronary patients, with better addressability, 4-6 hours, to whom a maximum daily dose of atorvastatin was administered, for a period of 36 months, with the monitoring of the clinical and paraclinical evolution, including physical and cognitive performance.

In our coronary unit we obtain excellent result for long term, because of increased addressability, a better management of individual treatment and better compliance. After 36 months, early daily therapy with 80 mg atorvastatin for acute coronary patients with acute myocardial infarction and severe unstable angina, reduced major recurrent ischemic events with 28% and with 34% minor recurrent ischemic events. The lipid markers evolution was very good: the plasmatic level of the LDL cholesterol decreased with 42%, triglycerides decreased with 17% and the plasmatic level of HDL cholesterol increased by 9%. These results are improved in compare with our anterior study, when addressability was lower, the access to high dose of atorvastatin was difficult and the compliance of patients was lower.

Also, the evaluation for long term of this type of patients has more complexity, included also physical and cognitive performance examination and we gain a better improvement of Mild Cognitive Impairment, not statistical significant, but important for patients. This improvement is due to the increasing of high-density lipoprotein cholesterol (HDL), using daily high doses of atorvastatin for long term.

CONCLUSIONS

High doses atorvastatin therapy is an excellent method to improve the evolution of acute coronary patients early treated.

There are parameters to evaluate the outcome of these patients: primary and secondary cardiovascular end-points, plasmatic lipid and PCR levels, physical performance, cognitive performance.

Early addressability of acute coronary patients is a strategic issue in our region, for the complications of the diseases and for physical performance.

Early administration of 80 mg/day atorvastatin in acute coronary patients late hospitalised, with or without ST segment elevation, is necessary immediately after the ischemic event and for long term the same dose.

The aggressive significant decrease of the plasmatic lipids and of the PCR (atherosclerotic inflammation marker) at the administration of atorvastatin in maximum dose of 80 mg/day, for 36 months, reduced the major cardiovascular events by 28% and the secondary cardiovascular events by 34%, better results comparative 7 years ago, when we obtain only 25% improvement in primary end-point, and 33% secondary end-points.

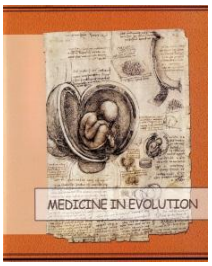
Atorvastatin was generally well tolerated in our patient population. There were no documented cases of myositis, but 3 cases with muscular pain. Levels of serum transaminases exceeding 3 times the normal levels were detected in 11 patients, but these patients were excluded.

In conclusion, this observational study proved that our initiative to increase the effort in improving the therapy of acute coronary patients in our unit is excellent for the good of patients in our region for long term. This continue our anterior study 7 years ago and proves that a better addressability and a long term aggressive therapy with atorvastatin has benefits in cardiovascular mortality and morbidity, in safety conditions and early physical and cognitive performance recovery.

REFERENCES

1. Scandinavian Simvastatin Survival Study Group. Randomized trial of cholesterol lowering in 4444 patients with coronary heart disease: the Scandinavian Simvastatin Survival Study (4S). Lancet. 1994;344:1383-1389;
2. Sacks FM, Pfeifer MA, Moye LA, et al. The effect of pravastatin on coronary events after myocardial infarction in patients with average cholesterol levels. N. ENgl. J Med. 1996;335:1001-1009;
3. The long term intervention with pravastatin in Ischemic Disease (LIPID) Study Group. Prevention of cardiovascular events and death with pravastatin in patients with coronary heart disease and broad range of initial cholesterol levels. N. Engl. J Med. 1998;339:1349-1357;
4. Fragmin and Fast Revascularization During Instability in Coronary Artery Disease (FRISC II) Investigators. Invasive compared with non-invasive treatment in unstable coronary-artery disease: FRISC II prospective randomized multicentre study. Lancet 1999;354:708-715;
5. Gotto AM, Whitney E, Stein EA. Et al. Relation between baseline and on-treatment lipid parameters and first acute major coronary events in the Air Force/Texas Coronary Atherosclerosis Prevention Study (AFCAPS/TexCAPS). Circulation. 2000;101:477-484;
6. Knatterud GL, Rosenberg Y, Campeau L, et al, for the Post CABG Investigators. Long Term effects on clinical outcomes of aggressive lowering of low density lipoprotein cholesterol levels and low-dose anticoagulation in the Post Coronary Artery Bypass Graft Trial. Circulation. 2000;102:157-165;
7. Laufs U, Endres M, Huang Z, et al. Atrovastatin upregulates type III nitric oxide syntheses in trombocytes, decreases platelets activation and protects from cerebral ischemia in normocholesterolemic mice. Stroke. 2000;31:2437-2449;
8. Guyant G, Jaeschke R, Heddle N, Cook D, Shannon H, Walter S, et al. Interpreting study results: confidence intervals. Basic statistics for clinicians. 1995; 152:169-173;
9. G.G. Schwats, A.Olsson, M.Ezekowitz et all. Effects of atorvastatin on the early recurrent ischemic events in acute coronary syndromes. Jama. 2001;285;1711-1718.
10. Folstein M. et all. A Practical Methhod of Grading the Cognitive State of Patients for Clinician. Journal of Psychiatric Research 1975, 12(3): 189-198; 12. Crichton GE. Et all, Higher HDL Cholesterol is Associated with Better Cognitive Function: the Maine Syracuse Study, PubMed 2014, electronic database

CHALENGES IN CEREBROSPINAL FLUID LEAKS OF ANTERIOR SKULL BASE FRACTURES



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ABSTRACT

A cerebrospinal fluid (CSF) with rhinorrhea occurs when there is a communication between the dura and the skull base and discharge of CSF from the nose. A spinal fluid leak from the intracranial space to the nasal respiratory tract could be very dangerous because of the risk of an infection. This article reviewed the causes, diagnosis and treatment of CSF leakage. The most challenging part is to determine the precise site of the dural breach. That can be done with different types of paraclinical examinations such as Computer Tomography, Magnetic Resonance. Beta-2 transferrin is the first choice biochemical analysis to perform because of its high sensitivity and specificity. Most of CSF leaks are resolved spontaneously. The timing for surgery and CSF drainage procedures must be decided with great care and with a clear strategy. This article reviewed the diagnosis and treatment of posttraumatic CSF leakage of anterior skull base fractures.

A PUBMED search of the National Library of Medicine was conducted.

Key words: *cerebrospinal fluid, CSF leak, head injury, skull base fractures*

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INTRODUCTION

Epidemiology of cerebrospinal fluid leaks :

80% of CSF leaks result from head trauma, 16% from surgical procedures, and the remaining 4% are nontraumatic. Of the traumatic leaks, more than 50% are evident within the first 2 days, 70% within the first week, and almost all present within the first 3 months.

Delayed presentation may result from wound contraction or scar formation, necrosis of bony edges or soft tissue, slow resolution of edema, devascularization of tissues, posttreatment tumor retraction, or progressive increases in intracranial pressure (secondary to brain edema or other process).

Anterior skull base leaks are more common than middle or posterior leaks, due to the firm adherence of the dura to the anterior basilar skull. The most common sites of CSF rhinorrhea following accidental trauma are the sphenoid sinus (30%), frontal sinus (30%), and ethmoid/cribriform (23%) (Fig.1). Temporal bone fractures with resultant CSF leak can present with CSF otorrhea or rhinorrhea via egress through the Eustachian tube with an intact tympanic membrane (Fig.2). When looking at surgical trauma, the most common sites of CSF leak are ethmoid/cribiform (80%), followed the frontal sinus (8%) and sphenoid sinus (4%). After neurosurgical procedures the most common site of CSF leak is the sphenoid sinus (67%) because of the high number of pituitary tumors that are addressed via transsphenoidal approach.

CSF rhinorrhea can be divided in traumatic and non-traumatic: the traumatic group can be divided in accidental and iatrogenic. The non-traumatic group is associated to brain tumors (intracranial and extracranial tumors, cholesteatoma, or tuberculoma are know to erode the bone directly), skull base congenital defects and meningoceles or meningoencephaloceles. CSF leak most commonly occurs following trauma (80-90% of cases) and the majority of cases presenting within the first three months. Other etiologies include: postoperative defect (10 %), spontaneous leak (3-4 %), tumor, and inflammation.Usually the fracture involves some portion of the anterior cranial fossa floor with the leaks occurring through the cribriform plate or ethmoid sinus roof into the nose. Another frequently seen anterior fossa fracture site is the posterior wall of the frontal sinus through which CSF can escape into the nose via the nasofrontal duct. Less common are middle cranial fossa fractures that can cause leakage to the nose via the sphenoid sinus or Eustachian tube (2).

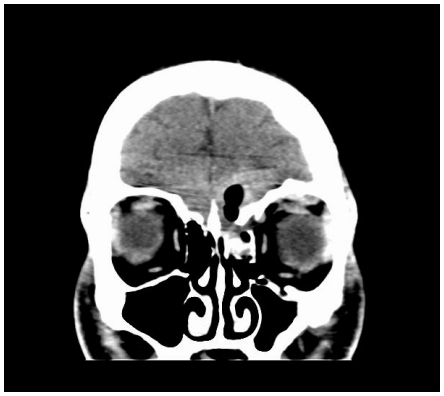


Figure 1. Coronal and CT scan demonstrating a defect in the roof of the left ethmoid sinus and pneumocefalus

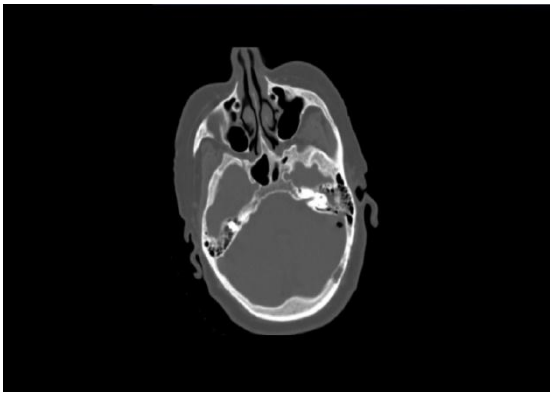


Figure 2. Axial CT image of a middle fosa fracture

Diagnosis through nasal inspection and performance of laboratory tests of the fluid can be conducted.

Traditionally the presence of a halo sign (clear ring surrounding a central bloody spot) on gauze, tissue, or linen has been used to predict CSF leak following trauma. This halo forms as blood and CSF separate; however, this test should only be used to arouse suspicion as tears, saliva, and other non-CSF rhinorrhea can give falsepositive results. Historically the components of the rhinorrhea (including glucose, protein, and electrolytes) have been measured to confirm the diagnosis of CSF. These tests, however, should not be relied on, as their sensitivity and specificity are unacceptably low.

Analysis of the CSF leak may be carried out when rhinorrhea is found by the physician and is in sufficient in quantity. The test used for the analysis depended on each physician's practice: determination of glucose in the leak with a reagent strip, chemical analysis of the leak (investigation of the chemical composition of the leak: concentration of glucose, chlore, and proteins in the leak), and/or investigation of beta 2 transferrin in the leak. In some cases, there is contamination of the material with blood or other secretions, so the test with beta-2 transferrine becomes mandatory (4). Beta-2 transferrin is a carbohydrate-free (desialated) isoform of transferrin, which is almost exclusively found in the CSF (11) and blood or nasal secretion does not disturb the test (12). Beta-2 transferrin is not present in blood, nasal mucus, tears or mucosal discharge. Beta-2 transferrin was reported to have a sensitivity of near 100% and a specificity of about 95% in a large retrospective study (14). In the presence of a skull base fracture on CT and a clinical CSF leak, there is no need for a further confirmatory test. In cases where a confirmatory test is needed, the beta-2 transferrin assay is the test of choice because of its high sensitivity and specificity (13). Beta-trace protein (bTP) is another marker that has been used for the detection of CSF. This protein is produced by the meninges and choroid plexus and is released into CSF. It is present in other body fluids, including serum, but at much lower concentrations than in CSF. Detection of bTP has 100% sensitivity and specificity in cases of confirmed CSF rhinorrhea, but cannot be reliably used in patients with renal insufficiency or bacterial meningitis, because serum and CSF levels of bTP substantially increase with reduced glomerular filtration rate and decrease with bacterial meningitis.

Accurate identification of the site of CSF leakage is necessary for a successful surgical repair. The most reliable methods of distinguishing between a traumatic or neoplastic lesion and a spontaneous CSF rhinorrhea are high-resolution computed tomography (CT) and magnetic resonance (MR) imaging (5). MR images can identify a brain herniation into the ethmoid or frontal sinuses (6). CT with or without intrathecal contrast and preoperative nasal endoscopy are frequently used to preoperatively localize the site of the leak (7). Patients with head injuries and features of periorbital haematoma are at greater risk of unobserved dural tear and delayed CSF leakage. Frontal and ethmoid fractures in particular are also associated with CSF leakage (8). Radiographic exams like simple skull X rays are quite ineffective, however it can reveal indirect signs like fractures and pneumoencephalus (4).

Various combinations of planar tomography and CT, contrast-enhanced CT cisternography and 3D skull base reconstruction (fig.3), MR with Constructive in Stady State

protocol or CISS (Fig. 4) have been used in the diagnosis of CSF leak. Although cisternography has minimal inherent risks, such as infection and lumbar CSF leak, it significantly increases expense and adds patient discomfort. Stone et al. (9) suggest that high-resolution CT is a useful screening examination for the initial workup of CSF rhinorrhea or otorrhea. When the clinical and imaging findings coincide, further evaluation using CT cisternography and radionuclide cisternography is often unnecessary.

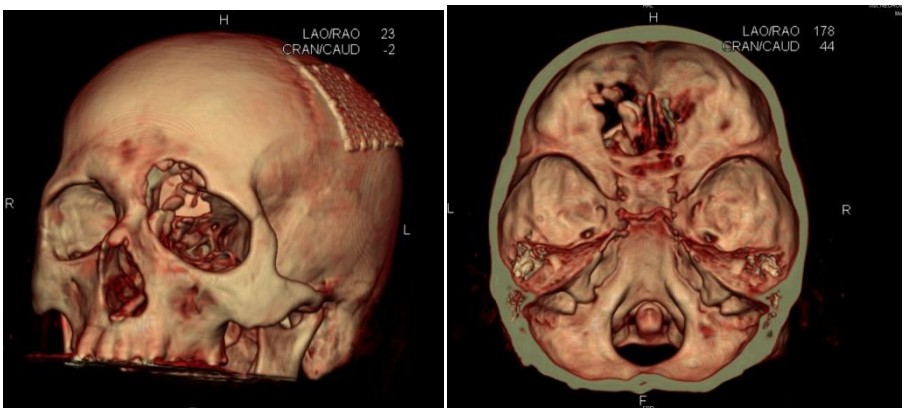


Figure 3. Image of 3D CT reconstruction of skull base. Anterior fossa skull baze fracture

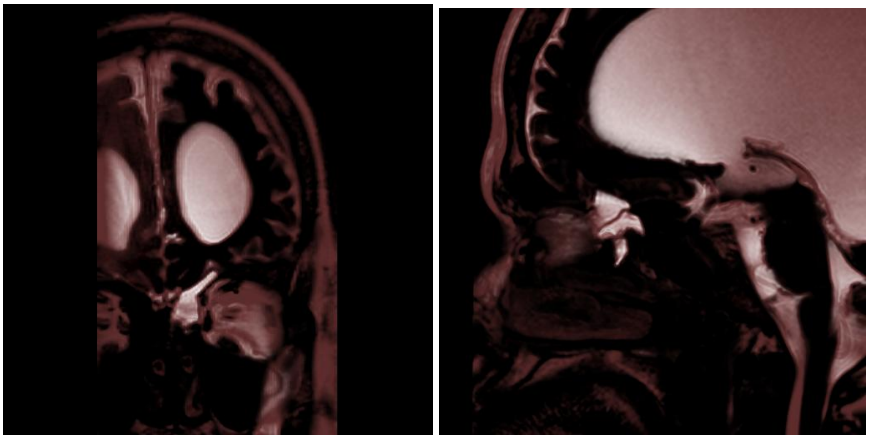


Figure 4. MR with Constructive in Stady State protocol

Clinical questions

Do Prophylactic Antibiotics Prevent Meningitis in Posttraumatic CSF Leaks? Bacterial meningitis is the major cause of morbidity and mortality in patients with CSF leaks, making antibiotic prophylaxis a reasonable suggestion; however, this topic has been the source of significant controversy. The primary concern is that a CSF leak presents a direct route of infection from the contaminated nasal cavity to the intracranial space; however, unwarranted antibiotic use has the potential to select for resistant organisms. The reported incidence of meningitis in patients with posttraumatic CSF fistulas varies widely from 2% to 50%, with 10% being a generally accepted rate. Most of the controversy stems from two separate meta-analyses published 1 year apart.

A meta-analysis showed a statistically significant reduction in the incidence of meningitis with prophylactic antibiotic therapy for patients with traumatic CSF leakage. This article was followed by a meta-analysis published in 1998 by Villalobos and colleagues, which concluded that antibiotic prophylaxis after basilar skull fracture does not decrease the incidence of meningitis, independent of active CSF leak. However, critiques of these meta-

analyses point out that neither of these studies included an extensive review of the literature and that the conclusions drawn were based mainly on retrospective and observational studies. Further, it was suggested that the meta-analysis by Brodie (18) omitted one of the largest case series addressing this question. Recently a Cochrane Database review was performed to address these deficiencies. The analysis included 208 patients from 4 randomized controlled trials and an additional 2168 patients from 17 nonrandomized controlled trials. The analysis concluded that the evidence does not support the use of prophylactic antibiotics to reduce the risk of meningitis in patients with basilar skull fractures or basilar skull fractures with active CSF leak. Analysis of both randomized and nonrandomized controlled trials failed to show a benefit or adverse effects of prophylactic antibiotic use in patients with active CSF leak; therefore, the current available literature suggests that prophylactic antibiotics do not decrease the risk of meningitis.

Most of CSF leaks close spontaneously within 7 to 10 days (12, 14, 15). Although most trauma-related CSF leaks resolve without intervention, conservative treatment of CSF leaks may lead to bacterial meningitis, therefore surgical closure of leaks or defects at the skull base should be considered treatment of choice to prevent ascending meningitis (16). CSF fistulae persisting for > 7 days had a significantly increased risk of developing meningitis (15). In the first 7 days of diagnosed CSF leak daily lumbar punctures or continuous lumbar drainage may be used to decrease the CSF volume and therefore closing the dural breach. The goal of surgical therapy is repair of the dural defect contributing to the CSF leak (9). The surgical management of CSF leak has changed significantly after the introduction of functional endoscopic surgery in the management of CSF fistula. Intracranial approaches should be reserved for more complicated CSF rhinorrhea which results from extensive comminuted fractures of the anterior cranial base and is accompanied with intracranial complications.

It is ethically justifiable to keep antibiotic prophylaxis in patients with CSF fistulae until other studies settle the question.

DISCUSSIONS

One of the main challenges in CSF fistula remains the diagnostic and localization of the dural breach trough the various methods. The most sensitive imaging method remains the MR investigation that will be a gold standard in this pathology.

The treatment management is still a controversy: some consider that the surgical management should be started within 24h for avoiding the risks of meningitis and some consider that the non surgical treatment should be at first choice.

In matter of surgical treatment the endoscopic treatment should be the gold standard and only for complex skull base fractures the intracranial approach should be used.

CONCLUSION

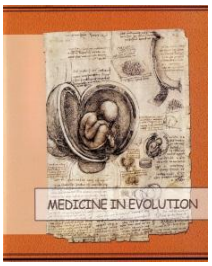
Post-traumatic CSF leaks are rare and will usually resolve without surgical intervention. Successful management in refractory cases often involves a combination of observation, CSF diversion, and/or extracranial and intracranial procedures (19). The factors that had a critical influence on outcome are level of consciousness on admission and presence of additional

intracranial pathology associated with CSF leakage within cases of traumatic CSF fistulae due to skull base fractures. Prophylactic antibiotics may be effective and should be considered in this group of patients (20). Treatment decisions should be dictated by the severity of neurological decline during the emergency period and the presence/absence of associated intracranial lesions. The timing for surgery and CSF drainage procedures must be decided with great care and with a clear strategy (14).

REFERENCES

1. Sandner A, Kern CB, Bloching MB. Experiences with the subfrontal approach to manage extensive fractures of the frontal skull base. Laryngorhinootologie 2006;85:265-71.
2. Calcaterra TC, Moseley JI, Rand RW. Cerebrospinal rhinorrhea: extracranial surgical repair. West J Med 1977;127:279-83.
3. Jones NS, Becker DG. Advances in the management of CSF leaks. BMJ 2001;322:122- 3.
4. Landeiro JA, Flores MS, Lazaro BC, Melo MH. Surgical management of cerebrospinal fluid rhinorrhea under endoscopic control. Arq Neuropsiquiatr 2004;62:827-31.
5. Benedict M, Schultz-Coulon HJ. Spontaneous cerebrospinal rhinorrhea. Etiology--differential diagnosis—therapy. HNO 1991;39:1-7. 6. Fu Y, Komiyama M, Nagata Y, Tamura K, Yagura H, Yasui T et al. MR findings in traumatic cerebrospinal fluid leakage with special reference to indications of the need for dural repair. No Shinkei Geka 1993;21:319-23.
6. Jones ME, Reino T, Gnoy A, Guillory S, Wackym P, Lawson W. Identification of intranasal cerebrospinal fluid leaks by topical application with fluorescein dye. Am J Rhinol 2000;14:93-6.
7. Choi D, Spann R. Traumatic cerebrospinal fluid leakage: risk factors and the use of prophylactic antibiotics. Br J Neurosurg 1996;10:571-5.
8. Stone JA, Castillo M, Neelon B, Mukherji SK. Evaluation of CSF leaks: high-resolution CT compared with contrast-enhanced CT and radionuclide cisternography. AJNR Am J Neuroradiol 1999;20:706-12.
9. Reisinger PW, Hochstrasser K. The diagnosis of CSF fistulae on the basis of detection of beta 2-transferrin by polyacrylamide gel electrophoresis and immunoblotting. Clin Chem Clin Biochem 1989;27:169-72.
10. Reisinger PW, Lempart K, Hochstrasser K. New methods of diagnosing cerebrospinal fluid fistulas using beta 2-transferrin or prealbumin—principles and methodology. Laryngol Rhinol Otol 1987;66:255-9.
11. Chan DT, Poon WS, IP CP, Chiu PW, goh KY. How useful is glucose detection in diagnosing cerebrospinal fluid leak? The rational use of CT and Beta-2 transferrin assay in detection of cerebrospinal fluid fistula. Asian J Surg 2004;27:39-42.
12. Yilmazlar S, Arslan E, Kocaeli H, Dogan S, Aksoy K, Korfali E et al. Cerebrospinal fluid leakage complicating skull base fractures: analysis of 81 cases. Neurosurg Rev 2006;29:64-71.
13. Bernal-Sprekelsen M, Alobid I, Mullol J, Trobat F, Tomas-Barberan M. Closure of cerebrospinal fluid leaks prevents ascending bacterial meningitis. Rhinology 2005;43:277-81.
14. Anand VK, Murali RK, Glasgold MJ. Surgical decisions in the management of cerebrospinal fluid rhinorrhoea. Rhinology 1995;33:212-8..
15. Brodie HA. Prophylactic antibiotics for posttraumatic cerebrospinal fluid fistulae. A meta-analysis. Arch Otolaryngol Head Neck Surg 1997;123:749-52.
16. Bell RB, Dierks EJ, Homer L, Potter BE. Management of cerebrospinal fluid leak associated with craniomaxillofacial trauma. J Oral Maxillofac Surg 2004;62:676-84.
17. Friedman JA, Ebersold MJ, Quast LM. Post-traumatic cerebrospinal fluid leakage. World J Surg 2001;25:1062-6.

OUR EXPERIENCE: DETECTION OF E6/E7-MRNA IS BETTER THAN DNA-HPV DETECTION



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ABSTRACT

Problem statement. *E6 and E7 proteins produced by high-risk HPV have an essential role in carcinogenesis. Detection of mRNA for these proteins shows direct viral activity and corresponds to initiation and maintaining of pre-cancerous activity. Studies have suggested that detection of high-risk E6/E7 mRNA may be a better indicator of disease progression than DNA detection. Carcinogenic HPV E6/E7 mRNA may achieve similar clinical sensitivity and Negative Predictive Value (NPV) as carcinogenic HPV DNA, while possibly achieving better clinical specificity and Positive Predictive Value (PPV).*

Method. *We present our one-year experience using APTIMA® HPV Assay, a method approved by the FDA in 2011. The method used is nucleic acid sequence based amplification (NASBA), which identifies the E6/E7 proteins and not HPV virions like the DNA detection.*

Results. *We achieved better clinical staging of the dysplasia and reduced the number of cases that were previously referred to colposcopy.*

Key words: *HPV, E6/E7 mRNA, oncoproteins, cervical lesion, APTIMA® HPV*

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INTRODUCTION

Human papillomavirus (HPV) is necessary for the development of cervical carcinoma, and incorporation of molecular testing for HPV in screening and patient management has been proposed (1,3,7). Sufficient scientific evidence exists to recommend HPV DNA testing in the triage of women with equivocal cytology and in follow-up after the treatment of precursor lesions.

However, due to a low clinical specificity and positive predictive value, HPV DNA testing has so far not been recommended as primary screening in Europe (2,7,8).

In general, diagnostic HPV tests have to demonstrate accuracy, reproducibility and clinical utility before they can be used in patient management and implemented in cervical cancer screening programmes (5).

HPV E6/E7 mRNA testing for high-risk types seems to correlate better with the severity of the lesion compared with HPV DNA testing, and is a potential marker for the identification of women at risk of developing cervical carcinoma (8).

E6 and E7 proteins produced by high-risk HPV have an essential role in carcinogenesis. Detection of mRNA for these proteins shows direct viral activity and corresponds to initiation and maintaining of pre-cancerous activity (4,9,10).

We present our one-year experience using APTIMA® HPV Assay, a method approved by the FDA in 2011. The method used is nucleic acid sequence based amplification (NASBA), which identifies the E6/E7 proteins and not HPV virions like the DNA detection (12,13).

The APTIMA® HPV assay:

- utilizes proven second generation nucleic acid target amplification technology
- has instrumentation and workflow advantages that makes the assay highly automated and easy to run
- detects HPV E6/E7 mRNA with equivalent clinical sensitivity and higher specificity than current HPV DNA tests.

MATERIAL AND METHODS

We studied 178 cases of HPV E6/E7 mRNA testing. 130 of these patients had a Pap test with the following cytological proportions (fig 1.).

In the **CII/CIII** category 15 cases were diagnosed with L-SIL and 6 cases with NILM.

In the **CIII** group 30 patients had L-SIL and 6 patients had H-SIL.

118 patients who were tested for HPV E6/E7 had a negative result, 49 had a positive result and 11 women had an inconclusive test.

European and American studies showed better specificity of the HPV mRNA detection compared with HPV-DNA, a contrary result was the sensitivity, in favor for HPV-DNA.

Benevolo et.al. showed HPV-DNA sensitivity of 99%,91% and 96% for ASC-US, L-SIL and H-SIL respectively and a specificity of 29%, 13% and 4%. The sensitivity for HPV mRNA was 83%, 62% and 67% for the 3 categories and the specificity was 82%, 76% and 45%.

We compared our results to an Italian study (Broccolo et.al., University of Milano) who also analized the Aptima HPV performance.

The specificity in our study (91%) was higher than the sensitivity (81%). All the patients with positive results were referred to colposcopy and the subsequent management was cervical cone biopsy/cauterization for most of the CIII lesions, treatment with Aldara

(immunomodulator) and hysterectomy (CIV) (fig 2,3).

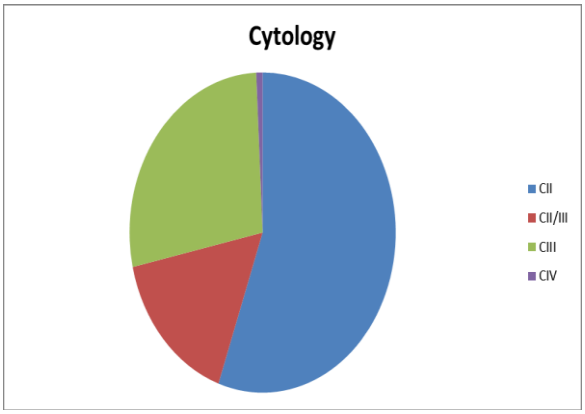


Figure 1. Citology distribution

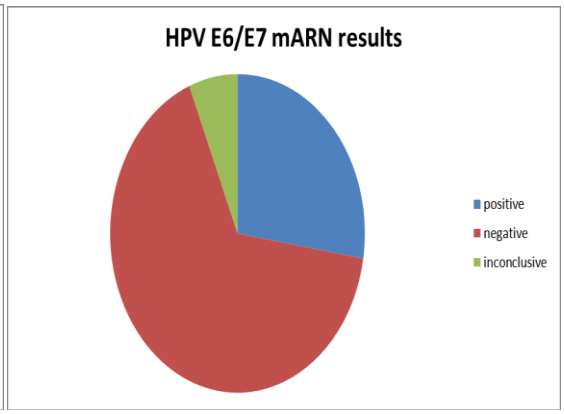


Figure 2. Aptima test results

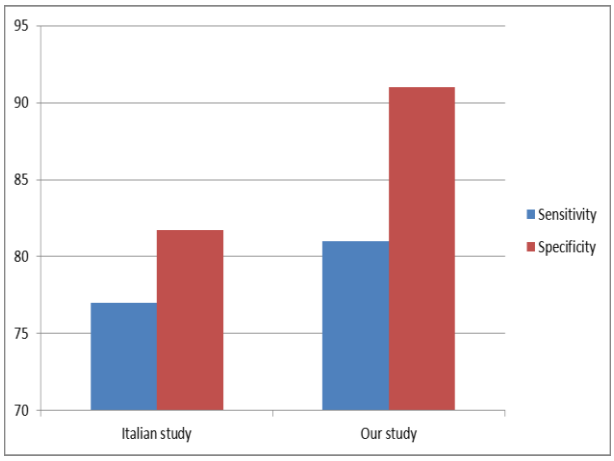


Figure 3. Sensitivity and Specificity in Milano study and our study

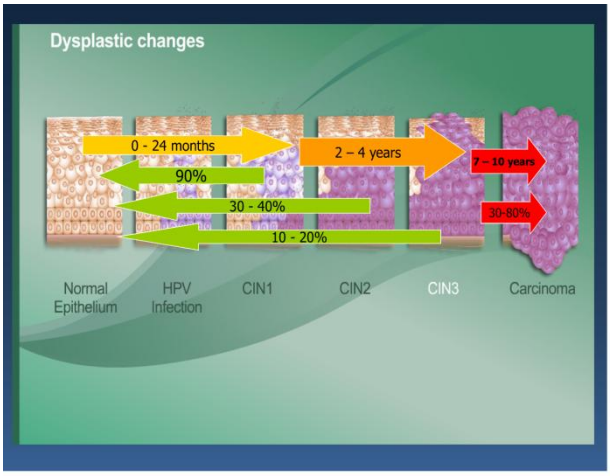


Figure 4. Dysplastic changes

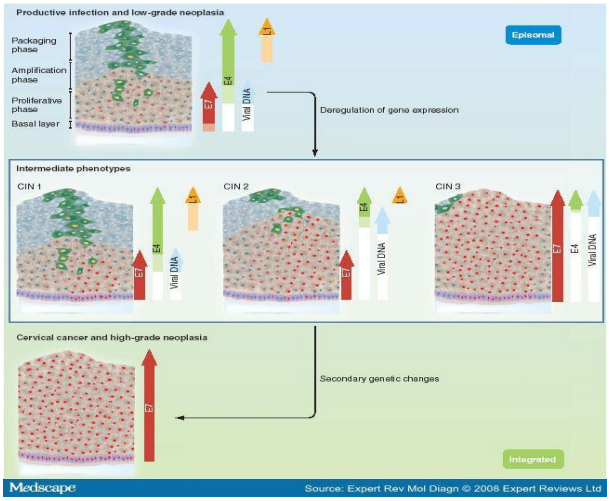


Figure 5. E7 expression in different histological grades

CONCLUSIONS

From 178 patients, 66.2% tested negative for HPV E6/E7 proteins. The colposcopy referral decreased with 15.5%. After cytology, HPV mRNA test and colposcopy, 34.8% of the patients had a cone biopsy, 20.2% underwent a cervical cauterization and 24.7% had a conservative treatment (most of patients with CII).

The specificity of our HPV mRNA study was 91%, better than the

specificity of the HPV DNA test in most of the recent studies.

HPV mRNA testing rationale:

- persistant infection:HPV integrates,over expression of E6/E7 mRNA occurs.

- infection is less likely to regress

- higher grade lesion and cancer may occur with HPV presence

- detection of E6/E7 mRNA may be more specific for assessing progression of clinical disease

Dysplastic changes and period needed for progression/regression after HPV infection can be observed in fig 4,5 (6,11,12).

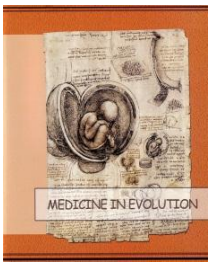
Regresion from carcinoma to CIN 3/CIN 2 is never observed,instead from CIN 3/CIN 2 to normal epithelium we observed regression between 10-30% (10).

The progression from CIN 3 to carcinoma is well demonstrated in many studies ,and occurs in 30-80% of cases.

REFERENCES

1. Andersson E, Kärrberg C, Rädberg T, Blomqvist L, Zetterqvist BM, Ryd W, Lindh M, Horal P (2011) Type-specific human papillomavirus E6/E7 mRNA detection by Real-Time PCR improves identification of cervical neoplasia. J Clin Microbiol 49(11):3794-9
2. Benevolo M, Vocaturo A, Caraceni D, French D, Rosini S, Zappacosta R, Terranatos I, Ciccocioppo L, Frega A, Rossi PG (2011) Sensitivity specificity and clinical value of (HPV) E6/E7 mRNA assay as a triage test for cervical cytology and HPV DNA test. J Clin Microbiol 49(7):2643-50
3. Bhatla N, Dar L, Rajkumar Patro A, Kumar P, Pati SK, Kriplani A, Gulati A, Broor S, Iyer VK, Mathur S, Shah KV, Gravitt PE (2008) Human papillomavirus-type distribution in women with and without cervical neoplasia in north India. Int J Gynecol Pathol 27(3):426-30
4. Bosch FX, Manos MM, Munoz N, Sherman M, Jansen AM, Peto J, Schiffman MH, Moreno V, Kurman R, Shah KV (1995) Prevalence of human papillomavirus in cervical cancer: a worldwide perspective. International biological study on cervical cancer (IBSCC) study group. J Natl Cancer Inst 87:796-802
5. Boulet GA, Horvath CA, Berghmans S, Bogers J (2008) Human papillomavirus in cervical cancer screening: important role as biomarker. Cancer Epidemiol Biomarkers Prev 17(4):810-7
6. Burger EA, Kornor H, Klemp M, Lauvrak V, Kristiansen IS (2011) HPV mRNA tests for the detection of cervical intraepithelial neoplasia: a systematic review. Gynecol Oncol 120(3):430-8
7. Castellsagué X (2008) Natural history and epidemiology of HPV infection and cervical cancer. Gynecol Oncol 110:S4-S7
8. Castle PE, Gutierrez EC, Leitch SV, Maus CE, McMillian RA, Nussbaumer WA, Vaughan LM, Wheeler CM, Gravitt PE, Schiffman M (2011) Evaluation of a new DNA test for detection of carcinogenic human papillomavirus. J Clin Microbiol 8:3029-3032
9. Cattani P, Siddu A, D'Onghia S, Marchetti S, Santangelo R, Vellone VG, Zannoni GF, Fadda G (2009) RNA (E6 and E7) assays versus DNA (E6 and E7) assays for risk evaluation for women infected with human papillomavirus. J Clin Microbiol 47(7):2136-2141
10. Stanley M: Pathology and epidemiology of HPV infection in females. Gynecol Oncol 2010, 117(Suppl 2):5-10.
11. .Faridi R, Zahra A, Khan K, Idrees M: Oncogenic potential of Papillomavirus (HPV) and its relation with cervical cancer. Virol J 2011, 8:269.
12. de Villiers EM, Fauquet C, Broker TR, Bernard HU, Zur H: Classification of papillomaviruses. Virology 2004, 324:17-27.

PREVENTION ISSUES IN BIOLOGICAL RISK AT A WATER-CANAL OPERATOR FROM TIMISOARA



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ABSTRACT

Objective. *Our study aims to demonstrate the need to implement preventive measures, including legislating mandatory vaccinations for certain categories of occupational exposedpersonnel.*

Material and methods.*We conducted an analysis of working conditions; job study for several categories of workers exposed and analyzed the results of microbiological assays performed in Timisoara Canal-Water Company.*

Results. *Staff worker of the analyzed company is exposed to multiple risk factors, such as activity in the external environment, so season's weather; exercise medium-high effort, postural demands, risk of accidents, chemicals such as hydrogen sulfide and ammonia, noise and mechanical vibration, but also the biological risk.*

Microbiological measurements revealed a great number of total germs in airmicroflora, on surfaces and workers' hands. Detected germs are classified as pathogens and conditioning pathogens, and belong most frequently in group 2.

Observing the technological process at different work stations has allowed the identification of activities, technological moments and working methods with high potential for contamination / infection of workers. They are entering in canals and cleaning them, reaching hoses with unprotected hands, failure to use protective equipment, accident (cut, pierced, and scratching) at all workplaces both, in the channel and in the wastewater production department.

Conclusions. *Given that the activity involves a high risk of contamination and infection of workers with pathogen germs, it is necessary health education of staff, initiation of workplace health promotion activities, the control of correct use of protective equipment and permanent adequate occupational medicine check-in. Prophylactic vaccinations are recommended by the Code of vaccination (Government Decision no. 1092 of 16/08/2006 on the protection of workers from risks related to exposure to biological agents at work), without target indications. There is necessary to initiate a common legislation by occupational health and vaccination commissions of the Ministry of Health.*

Key words: *biohazard, water utility workers, prevention*

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INTRODUCTION

Ramazzini is considered the founder of modern occupational medicine; he wrote the first treatise on this branch of medicine and medical practice introducing the key question, "liceatquoqueinterrogationemhancadii cere, & quam artemexerceat" (I may venture to add one more question: what occupation does he follow?)"[7].

In light of the above, the Romanian legislation, namely the HG 1169/2011 which amends HG 355/2007 regarding workers' health surveillance is accurate that "preventive health services that provide health surveillance of workers are hiring medical exam work, periodically check-ins, special surveillance and workplace health promotion" [9].

According to the literature, the staff in contact with wastewater presents occupational exposure to a sum of risk factors with significant impact on health[1,2,3,4,8,9,10,12]. This obliges the identification and monitoring of risks,by dynamic measures, to improve working conditions and apply technical, organizational and medical preventive measures.

PURPOSE

This paper contains an analysis of occupational risks of workers from a water-canal company in Timisoara and aims to identify appropriate ways of prevention.

Our study aims to demonstrate the need to implement preventive measures, including legislating mandatory vaccinations for certain categories of occupational exposed personnel.

MATERIAL AND METHODS

We examined working conditions;job study regarding occupational exposure for some categories of workers exposed to specific risks in a society of communal administration (Section canal and wastewater treatment) and analyzed the results of the chemical and microbiological pollutants carried in dynamics between 2004 and 2013.

From which, based on Romanian legislation and the requirements of current European demands, were made proposals to improve working conditions and an effective prophylaxis for that jobs which accumulate a large number of risk factors.

For staff worker insisted on aspects of health education at all medical checks, both individually and in groups of workers.

RESULTS

The working environment bulletinsanalysis made in dynamic and complemented by visits to workplaces and observation method were found following occupational hazards:

Table 1. Risk factors identified in CANAL section (Canal, Wastewater plant)) [2,5,7,12]

Professional Risk Factors					
Physical	Ergonomic	Chemical	Biological	Psychological	Accidents
-Climateunfavourable (weather, heat) -Noise (pumps, motors, street, pick	-Posture(standing, bent prolonged squatting, kneeling)	-Hydrogen sulphide -Ammonia -Welding fumes	-Allergens -Bacteria -Viruses -Parasites -Rats (urine,	-Works under fault conditions, on the road, the height	-Electrocution -Acute poisoning (suffocation) -Falls to the

Professional Risk Factors					
Physical	Ergonomic	Chemical	Biological	Psychological	Accidents
hammer, etc.) -Vibrations -Poor lighting (in canal) -Works in water (broken pipes, basins)	-Wearing manipulation of masses up to 50 kg -Forced positions -Medium-high physical effort -Sustained effort -Works in tight spaces	-Carbonoxide -Carbondioxide -Chlorine -Volatile organic compounds -Methane -Calcium hypochlorite	manure, bite) -Waste water -Insects -Bio-aerosols -Exotoxins -Endotoxins	-Interpersonal relations -Commute	same level -Fall from height -Explosions -Splitting, crushing - banks - Collapse -Trauma -Road accident -Drowning -Burn -Isolation -Frostbite -Injuries

Note that working personnel operates outdoors in percentage of over 80% of working time. Risks above are common and vary with the workplace: cleaning station, channel, on surface and inside the channel.

Chemical risks identified and measured in the atmosphere of workplaces, all were under permissible values in normal working conditions. Occupational accidents risk remains - much reduced in recent years by revamping –as occupational acute poisoning by failure of the methodology and work security rules. In 1996 the company held a fatal work accident caused by acute professional intoxication with toxic fumes in a sewer in Timisoara, and in 2001 an event occurred that resulted in temporary disability of one day, for a worker after the unauthorized intrusion within a cesspool cleanermachine for cleaning it.

Another current problem on chemical hazards to company personnel is given by breach of the law on waste neutralization and discharges to sewer are monitored 36 companies in Timisoara and 16 in Timiș County. Following inspections in 2013, for example, found that 26 companies have exceeded of the maximum allowed by law (NTPA 002/2005) for substances discharged into the sewer and considered dangerous [11]. Laboratory analysis of wastewater discharged into the sewer by the companies indicated most frequently monitored exceeded for phosphorus, organic and ammonia loading. In addition to potential knownpolluters, illicit discharges and drains can occur in canal system. The staff can be exposed and affected by these substances.

Biological risk is a permanent threat to workers.Rats and mice urine protein,when driedconverts into aerosol allergen. Biological contaminants are often invisible and can move through the air as bio aerosols. Microbiological contaminants are represented by viruses, bacteria, fungi (yeasts and molds), some of them potentially infectious agents, allergic or irritant. To grow bacteria and fungi need nutrients, moisture and heat. Viruses require a host organism. Airmicrofloraconsists in microorganisms in suspension that can be find at a point, in the air of a room.

Biological risk assessment is performed by determinations of airmicroflora (open plate method, determination of TNG = total number of viable mesophilic bacteria, expressed as CFU = colony forming units per cubic meter of air),surfaces wash, staff hands, and throat and nasalswabs.

Measurements made in dynamics, in spring time, showed significant variations of all track parameters.

The channel TNG (total number of germs) was 73.6 / cm^2highlighted the hose or handle sewage truck. Isolated: coagulase-negative Staphylococci, Escherichia coli, Bacillus cereus, Bacillus sp. Hemolytic flora were present at levels of 10.2 / cm^2. On hand staff: Staphylococcus aureus, SCN, OchrobactrumAnthropi, Bacillus sp. TNG on hand ranged between 137-161 / cm^2 and hemolytic flora was 60-80 / cm^2 during the activity. Citrobacter sp. and normal flora were found in pharyngeal exudate and Staphylococcus aureus and Enterobacter cloacae in nasal exudate of the workers.

At wastewater treatment plantair-microflorameasurements showed 45-430 TNG / mc air, in 2013, compared with 2004-2009 when the values were between 1,575 and 11,023. Isolated: coagulase-negative staphylococci (CNS), Streptococcus viridans, molds, Bacillus sp., Pseudomonas fluorescens/ putida, Raoutellaterrigena. Hemolytic flora was 0-50 TNG / m^3 air. Bacteriological examinations of the surfaces showed 4.8 to 130.4 NTG / cm^2 and hemolytic flora between 1 to 4.4 NTG / m^3 air. Identifiedentities: SCN, Bacillus sp., Pseudomonas fluorescens / putida, Raoutellaterrigena, Bacillus cereus, molds. On staff hands TNG was 200-21504 / cm^2 and hemolytic flora between 24-14,204 / cm^2: E. coli, SCN, Bacillus sp, Pseudomonas aeruginosa, Pantoea spp. Nasopharyngeal swab (6 workers), all exhibited SCN, Staphylococcus aureus (2) and beta haemolytic streptococci group C.

DISCUSSIONS

The water utility sector workers are exposed to germs that may belong to all biological risk groups, but the presence of certain pathogens and pathogenic condition is difficult to prove.

Staff working in wastewater treatment and serving sewer system come in direct contact with wastewater. These are waste, storm water, and can be discharged by hospitals, care facilities, population, industrial and agricultural companies. The risk of disease is increased in these staff. Hence the need for assure accurate and as targeted prophylaxis for these category of workers. Recognition of risk, technical measures and use appropriate protective equipment are common and generally enacted.

The problem is that the field worker's clothes are soaked with sewage and time they are changed is variable. For these workers there is an increased risk of contamination by skin contact and by accident (cutting, puncture, etc.) with chemical and microbiological contaminated water. Increased risk of contamination is represented by bio aerosols present in these jobs.

Most pathogens that contaminate the water come from human or animal feces, rarely from urine. Although the main route of transmission is through ingestion of water, it is possible to infection by washing, bathing and inhalation. Laboratoriesstaffthat analyze these waters is exposed in turn the risk of disease. Assessment of water quality is done indirectly by determining the degree of contamination with representatives of normal microflora, which removes the external environment with human or animal excreta. Two microbiological parameters for which testing drinking and bathing water are the Escherichia coli (E.coli) and intestinal enterococci. For natural bathing waters quality is defined by Decision no. 546/2008 concerning the management of bathing water. Thus, excellent quality

corresponding values: Intestinal enterococci in 200/100 ml 500/100 ml Escherichia coli under. Drinking water standards are more stringent permissible value for the above mentioned parameters are zero.

Personnel exposed to waste water is at risk of developing infectious diseases such as severe evolution leptospirosis, typhoid, other diarrheal diseases, and tetanus, rabies, caused by the presence of tetanuswound, risk of rodent bite, contact with their feces.

There are no standards and exposure limits for these jobs. Risk assessment of exposure to biological agents shall be in accordance with the GD1092 / 2008, by identifying the types of biological agents present in the workplace and their classification in the four groups of biological risk.

In Romania there is enacted mandatory vaccinations and / or recommended for personnel exposed to biological hazards, which lead to various interpretations and ways to implement the recommendations of existing rules.

CONCLUSIONS

Biological risk, classified as emerging risk, is the main factor, difficult to identify and quantify that can affect canal and wastewater treatment plant workers' health.

The study highlights the need to develop standardized methods for investigating microbiological contaminants from the air, to produce comparing results on which to be developed microbiologicalrules for workplace air quality.

It is necessary to bring together, in a joint effort, the committee of Occupational Medicine, Vaccinology and Infectious diseases and Epidemiology of the Romanian Ministry of Health to develop a vaccination guide for occupationally exposed workers at biological risk, as public health measure.

ACKNOWLEDGEMENTS

I would like to acknowledge the company management for the co-operation and for providing consent for publication of this paper. I also wish to thank Professor Dr. BrigithaVlaicu and Professor Dr. Elena-Ana Pauncu for providing expert help with the environmental and occupational study. The skillful laboratory assistance of Regional Center for Public Health and Department of Public Health Timisoara, Timispersonnel is gratefully acknowledged.

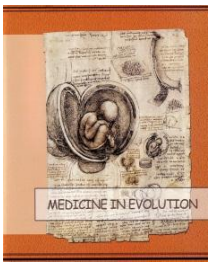
This study was funded by "Parteneriat Interuniversitar pentru Creşterea Calităţii şi Interdisciplinarităţii Cercetării Doctorale Medicale prin Acordarea de Burse Doctorale – DOCMEDNET", Contract Code: POSDRU 88/1.5/S/78702.

REFERENCES

1. Jebereanu L. Biological Risk in Exposure to Wastewaters in a Regional Operating Company, ActaMedicaTransilvanica, supl, AN.XVI, Nr. 3, Sept. 2011, 96-99.
2. Jebereanu L., Jebereanu S.A., Vlaicu B., Păuncu E.A., Risk factors and health status of a group of workers exposed at waste water in Timisoara city, StudiaUniversitatis"VasileGoldiş"Seria ŞtiinţeleVieţii (Life Sciences Series), Apr.-Jun. 2013, Volume 23, issue 2, 163-168.
3. Jebereanu L., Chronic Diseases at Wastewater Workers from Timişoara, AGORA, Psycho-Pragmatica, semestrial journal, Psychology Social Work, 2014, Volume VIII, No.1, 161-172.
4. MA Al-Batanony, MK El-Shafie, Work-Related Health Effects among Wastewater Treatment Plants Workers,

The International Journal of Occupational and Environmental Medicine, 2011, Vol 2 Number 4; 237-244
5. Nisipeanu S, Ștepa R, Haiducu M, Chiurtu R, ARCON 92-083/2008 O șansăpentruviitorularhivelor. Dezinfestareprintratamentcuradiațiiionizante, http://www.irasm.ro/arcon/pub/sa1_incdpm.pdf
6. Păuncu E-A, Medicinamuncii, teorieşipractică, EdituraOrizonturiUniversitare, Timişoara, 2008, 309-324.
7. Ramazzini B. Diseases of workers: Latin text of 1713 revised with translation and notes by Wilmer Cave Wright. New York: The Classics of Medicine Library, Division of Gryphon Editions, 1983.
8. Sulojeva J, Percovs A, Maļukova J, Urbane V, Occupational Safety Management Aspects on Municipal Waste Water Treatment Plant, Scientific Journal of Riga Technical University Safety of Technogenic Environment, Vol 1, 2011, 62-68
9. Hotărârea de Guvern 1169/2011 care modificășicompletează Hotărârea de Guvern 355/2007 privindsupraveghereasănătățiilucrătorilor, MonitorulOficial al României
10. Hotărârea de Guvern 1092/2006, privindprotecțialucrătorilorîmpotrivariscurilor legate de expunerea la agențibiologiciînmuncă; MonitorulOficial al României
11. http://www.aquatim.ro/aquastiri/2013/08/23/pericolul-nevazut-din-apa/
12. http://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/publication/wcms_192394.pdf

LYELL'S SYNDROME: A CHALLENGE IN ESTABLISHING THE ETIOLOGIC DIAGNOSIS



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ABSTRACT

Lyell's syndrome is a rare, life-threatening reaction characterized by extensive necrosis and detachment of the epidermis. Drugs are the major precipitating factors, with more than 100 medicines being described as potential etiologic factors over time. We report on the case of a 33 years old male patient who addresses our clinic with a general eruption consisting of macules as well as extensive, painful erosions of the oral, ocular and genital mucosa. The patient has been previously administered clarithromycin, acyclovir and allopurinol for influenza-like symptoms, herpes simplex infection and hyperuricemia; all of these drugs, as well as herpes simplex virus infection, have been reported as potential precipitating factors for Lyell's syndrome. The simultaneous presence of multiple risk factors raises difficulties in defining the etiologic diagnosis in this particular case.

Key words: *Lyell's syndrome, toxic epidermal necrolysis, adverse drug reaction, herpes virus*

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INTRODUCTION

Toxic epidermal necrolysis (TEN, Lyell's syndrome) is an acute, life-threatening mucocutaneous reaction characterized by skin tenderness and erythema, followed by extensive necrosis and detachment of the epidermis (1, 2). It is a rare and severe disease with an incidence of 0.4 to 1.2 cases per million person-years and a mortality of 30 to 50%, thus having a significant impact on public health. (1-4). It can affect all ages, races and both sexes. Females are more frequently affected, with a ratio of 1.5:1. The incidence increases with age and it is higher after the fourth decade. Although all races are concerned, studies show that blacks are seven times more likely to die from the disease than whites. (1,4,5) Drugs are the major precipitating factors, being responsible for at least 80% of the cases. More than 100 drugs have been reported as potential etiologic factors especially in adults. Infectious agents such as *Mycoplasma pneumoniae*, herpes simplex virus or hepatitis A have been reported to cause TEN, especially in children. Other infectious agents, such as HIV, have a great impact on the incidence of the affliction. Therefore, the annual incidence in this particular group is 1000-fold higher than in the general population. (1,6,7,8)

CLINICAL CASE

We report the case of a 33 years old male patient from the urban area who addresses our clinic with a macular eruption affecting the face, trunk, proximal extremities and thighs, as well as extensive, painful erosions of the oral, ocular and genital mucosa. The patient asserts that the lesions had first occurred a few hours before presentation. The anamnesis revealed that he had had an influenza-like prodrome consisting of malaise, fever, headache, cough and rhinitis for which he self-administered Clarithromycin one day before admission. He also reports having had cold sores for which his general practitioner prescribed Acyclovir one day before presentation. The patient had been chronically treated with Allopurinol for three weeks for hyperuricemia.

The clinical examination revealed an eruption consisting of erythematous irregular macules which coalesced forming large patches and developed flaccid blisters on the surface whose breaking determined extensive sheet-like epidermal detachment, especially on the face and pressure points. The lesions were distributed on the face, trunk, proximal extremities and thighs in a symmetrical fashion. The patient also presented extensive erosions of the lips, tongue and oral mucosa, conjunctival erosions and hyperemia and genital erosions (Fig. 1,2,3).

Laboratory findings revealed mild neutropenia and eosinophilia, electrolyte imbalances and mild hyperglycemia. During hospitalization the patient developed episodes of fever (39.2˚C) and tachycardia (120bpm).

The symptomatic treatment included fluid replacement and nutritional support. The environmental temperature was raised to 28˚C. The patient was treated with high doses of systemic corticosteroids, topical corticosteroids, antihistamines and systemic antibiotics. He also received eye drops with neomycin and dexamethasone as well as artificial tears and antifungal solutions for the mouth lesions. The genital lesions were treated with topical corticosteroids to prevent synechiae formation. The evolution was favorable, with complete remission after 4 weeks of treatment (Fig.4).

Figure 1. Erosions covered by haemorrhagic crusts and epidermal detachment, as well as meliceric crusts on the eyelids. The lesions are distributed in a symmetrical fashion

Figure 2. Hyperaemia, extensive sheet-like epidermal detachment and genital erosions

Figure 3. Erosions of the lips covered by haemorrhagic crusts and erosions of the tongue

Figure 4. Clinical appearance after four weeks of treatment

DISCUSSIONS

Toxic Epidermal Necrolysis (TEN) is a severe cutaneous reaction most often occurring after drug administration. It belongs to a spectrum of cutaneous reactions which also includes Stevens - Johnson syndrome (SJS) and SJS/TEN overlap syndrome. Although it was initially believed that SJS and TEN are separate entities with different pathogenesis, it is now known that they represent different severity degrees of the same mucocutaneous reaction only differentiated by the extent of the body surface area (BSA) affected by the epidermal detachment. Therefore, the term SJS is used when the extent of mucosal involvement is less than 10% (BSA<10%) and TEN when it is greater than 30% (BSA>30%). When the disease involves 10-30% of the BSA, the patients are said to have SJS/TEN overlap. (8,9,10)

The disorder was first described in 1956 by Alan Lyell, a Scottish dermatologist who recognised a new disease in four patients presenting with an eruption resembling scalding of the skin. He named the disorder toxic epidermal necrolysis thus introducing the neologism "necrolysis" into the dermatologic world. (10, 11)

Drugs are the most important etiologic factors in TEN. The use of medications is reported in over 95% of patients with this affliction and a strong association between a drug and TEN is observed in more than 80% of the cases. (4) Even though more than 100 medications have been implicated in the etiology of the disorder, only a few of them account for the vast majority of cases. (Table 1) The risk is higher during the first three weeks of treatment and is usually confined to the first two months of drug intake. Drugs with long half-lives cause drug reactions more frequently than drugs with short half-lives. (4, 5)

Table 1. Medications associated with TEN (1,12)- after Mockenhaupt et. al modified

High-risk	Significant but lower risk
Trimethoprim-sulfamethoxazole	Macrolides
Sulfapyridine	Aminopenicillins
Sulfadiazine	Cyclins
Sulfadoxine	Cephalosporins
Thiacetazone	Quinolones
Allopurinol	Diclofenac
Phenobarbital	Tramadol
Phenytoin	Sertraline
Carbamazepine	
Lamotrigine	
NSAIDs (phenylbutazone, oxyphenbutazone, isoxicam, piroxicam, cyclo-oxygenase-2 inhibitors)	
Sulfasalazine	
Nevirapine	

Although medications are the main etiologic factors for TEN, a small number of cases have been associated with other conditions. Infectious bacterial diseases such as *Mycoplasma pneumoniae*, *Klebsiella pneumoniae* or *Yersinia enterocolitica*, viral diseases such as herpes simplex virus, immunizations (measles-mumps-rubella, varicella, hepatitis B, influenza), stem cell transplantation, allogenic bone-marrow, systemic lupus erythematosus and oncological disease have been incriminated as potential risk factors for this affliction. (1,5) Radiotherapy in patients receiving antiepileptic drugs can trigger TEN lesions localized at the site of radiation. (1)

In the case we are presenting the patient had more possible precipitating factors for TEN. Therefore, he had self-administered Clarithromycin one day before the onset of the cutaneous lesions. He had also taken Acyclovir one day before presentation, a drug which had been prescribed by the general practitioner for cold sores and he was on chronic treatment with allopurinol for three weeks after he had been diagnosed with hyperuricemia. Allopurinol is recognized as one of the most frequently involved drugs in the etiology of TEN while Clarithromycin is associated with a moderate risk for this affliction. Rare cases of Acyclovir as a possible etiologic factor for TEN have also been reported. Herpes simplex virus infection is a possible risk factor for this disease, but generally during childhood.

The pathogenesis of TEN is not completely understood. However, the immunologic pattern of early lesions

suggests an immune mediated cytotoxic destruction of keratinocytes that express foreign antigens leading to massive apoptosis. (1,3) Even though the presence of natural-killer-T cells (NKT), drug specific CD^{8+}T lymphocytes, macrophages and granulocytes was demonstrated in lesions, the discrepancy between the paucity of the infiltration of immune cells and the massive epidermal destruction lead to the search of other incriminating factors. It is therefore believed that soluble mediators may contribute to keratinocyte death. (7,13) Though it was previously believed that soluble Fas-ligand (sFasL), granzyme B and perforin were the main triggers implicated in the pathogenesis of the affliction, more recent studies showed that secretory granulysin (a cationic cytolytic protein secreted by cytotoxic T lymphocytes, NK cells and NKT cells) was present in the blister fluid and it was the only one in high enough concentrations to kill human keratinocytes *in vitro*. Studies also showed a significant correlation of granulysin levels in the blister fluid with the severity of the disease. Therefore, a possible sequence of events is that cytotoxic T-cells directed against the culprit drug develop and kill keratinocytes directly and indirectly- through the recruitment of other cells which release soluble mediators, mainly granulysin, and the strong expression of the cytolytic molecule FasL on keratinocytes. (1,4,13)

Several studies were performed to prove a genetic susceptibility of certain individuals to high risk medications. A strong association was found between HLA-B*5801 allele and allopurinol-induced SJS/TEN in both Asian and non-Asian population, the strength of the association being higher in the Han Chinese from Taiwan, where 100% of the patients with a severe adverse drug reaction to allopurinol were positive. (1,14) Another remarkable association was found between HLA-B*1502 allele and carbamazepine induced SJS/TEN in several Asian countries, with the exception of Japan and Korea where there was an association with HLA-B*1511. This link was not found in European patients (1,15,16,17) Severe cutaneous reactions in HLA-B1502 individuals were also associated with phenytoin and lamotrigine, but to a lesser extent. (7,9)

The mucocutaneous reaction usually occurs within 4 to 30 days after the drug exposure. The prodrome is non-specific and depends on the triggering factor, but usually consists in malaise fever, headache, rhinitis, conjunctivitis which occur 1 to 3 days before the eruption.(1,18)

The eruption has a sudden onset and usually starts on the trunk, proximal extremities and face, with lesions initially distributed in a symmetrical fashion but rapidly extending to the rest of the body. The lesions consist in erythematous, irregularly shaped maculae which coalesce and progress towards widespread erythema. Nikolsky sign is positive. Flaccid blisters occur on the surface, especially in pressure points and break easily leading to extensive denuded areas as a result of full thickness epidermal necrosis. (1,4,18)

Mucosal lesions can either precede or follow the cutaneous lesions and occur in over 90% of the patients. The typical lesions consist in erythema and painful erosions. The oral mucosa is most commonly involved. Hemorrhagic erosions, pseudomembranes and crusts of the lips are almost invariably present. Ocular lesions are usually mild and consist in conjunctival hyperemia, erosions, chemosis, photophobia or eyelid edema but sometimes the eye involvement is severe and results in symblepharon, non-healing corneal defects, visual loss, conjunctival fornix foreshortening. Genital and anal mucosal erosions also occur. Less commonly, the epithelium of the

respiratory and gastrointestinal tract are also affected. (4,9,19,20)

In the case we are presenting the patient had a typical eruption consisting of erythematous irregular macules which coalesced forming large patches and developed flaccid blisters on the surface whose breaking determined extensive sheet-like epidermal detachment. The lesions were symmetrically distributed on the face, trunk, proximal extremities and thighs. He also presented extensive erosions of the lips covered by hemorrhagic crusts, erosions of the tongue and oral mucosa, conjunctival erosions and hyperemia as well as genital erosions. The BSA affected was higher than 30%. The eruption was preceded by an influenza-like prodrome consisting of malaise, fever, headache, cough and rhinitis. The first lesions occurred in the oral cavity and on the lips and were diagnosed by the general practitioner as cold sores. However, these lesions might have been the first manifestation of the affliction.

The diagnosis of TEN is usually a clinical one but a histopathologic examination can be used to rule out other differential diagnoses. Early lesions present sparse apoptotic keratinocytes in the basal and suprabasal layers of the epidermis. At later stages lesions show diffuse full thickness epidermal necrosis and sub-epidermal detachment. In the papillary dermis there is a sparse perivascular infiltrate composed of lymphocytes and macrophages.

The main differential diagnoses are acute generalized exanthematous pustulosis (AGEP), generalized bullous fixed drug eruption (GBFDE) and staphylococcal scaled skin syndrome (SSSS), as well as autoimmune blistering diseases (linear IgA dermatosis, paraneoplastic pemphigus, pemphigus vulgaris, bullous pemphigoid). DRESS syndrome (drug rash with eosinophilia and systemic symptoms), Graft versus host disease (GVHD) in some circumstances and TEN-like vesiculobullous lesions sometimes seen in patients with acute and subacute lupus erythematosus should also be ruled out.(1,7)

AGEP is an uncommon cutaneous eruption produced by drugs, Enterovirus infections or mercury poisoning, characterized by large areas of erythema with multiple small pustules on the surface. The histopathologic examination is quite typical and shows massive inflammatory infiltrate composed predominantly of neutrophils and intraepidermal and subcorneal pustules.(4,5)

GBFDE is characterized by large, blue-red to brown patches with flaccid blisters on the surface. It has a similar drug-related mechanism but the lesions occur more rapidly after drug ingestion than in TEN. It has a significantly better prognosis. (1,12)

SSSS is produced by epidermolysin, a staphylococcal exotoxine that targets desmoglein 1, and is characterized by widespread erythema, bullae and superficial erosions, located especially in the intertriginous and periorificial areas. The mucosal involvement is rare and discrete. Children are more frequently affected. Histopathologic examination shows intraepidermal cleavage in the granular layer. (4,21)

As regard to the clinical course of the disease, the epidermal detachment continues for 5 to 7 days and then enters a plateau phase corresponding to progressive re-epithelialization which can last from a few days to several weeks. The course of disease can be complicated during this time by serious complications such as sepsis and systemic organ failure. Skin lesions heal without scarring but hypo or hyperpigmentation may last for months or even years. Mucosal lesions heal slower and adhesions may occur. (1,12)

The prognosis of the disease can be calculated using the Severity of

Illness Score for Toxic Epidermal Necrolysis (SCORTEN). The aim of Bastuji-Garin et al., the developers of the SCORTEN, was *to build a simple prognostic scoring system, applicable on the whole spectrum of TEN patients, based on variables readily available on admission*. (22) It includes seven independent risk factors (age, heart rate, history of malignancies, BSA>10%, serum urea nitrogen level, serum bicarbonate level and serum glucose) and can be used to predict mortality risk. (Table 2) It must be calculated at admission and three days later. (6,12).

Table 2. SCORTEN after Batuji-Gari, modified (20,22)

Prognostic factors	Points
Age > 40 years	1
Heart rate > 120 bpm	1
Malignancy	1
BSA>10%	1
Serum urea nitrogen level (>10 mmol/l)	1
Serum bicarbonate level (<20 mmol/l)	1
Serum glucose level (>14 mmol/l or >250 mg/dl)	1
SCORTEN	Mortality rate (%)
0-1 points	3.2
2 points	12.1
3 points	35.8
4 points	58.3
≥ 5 points	90

In the case we are presenting laboratory findings revealed mild neutropenia and eosinophilia, electrolyte imbalances and mild hyperglycemia. The epidermal detachment continued for 6 days after admittance. During hospitalization the patient developed episodes of fever (39.2˚C) and tachycardia (120bpm). Our patient was young, had no history of malignancies, had only mild hyperglycemia, the serum urea and serum bicarbonate levels were within normal range, he was tachycardic and the BSA was over 30%. Therefore the SCORTEN was 2 points, indicating a mortality risk rate of 12.1 %.

The treatment of the disorder is complex and includes drug withdrawal, supportive treatment, local and systemic treatment.

Identifying the culprit drug can often be difficult because many patients have multiple medical problems and take several medications. When TEN is suspected, all potential causative medications should be discontinued, as should drugs who share chemical similarities to the suspected drug, when possible. In practice the most likely inciting agent is one that has been administered within the last 4 weeks. One should keep in mind that the most recently administered medication is not always the responsible agent. Several tests have been proposed to identify the responsible drug, such as patch testing, prick pin, intradermal injection or lymphocyte transformation test, but they all lack sensitivity and have not been validated as reliable tools. Medication rechallenge is a reliable method to identify the incitating agent. Its use however is limited due to ethical considerations. (5,20,23,24)

Patients should be treated in an optimal environment, with a temperature raised to 28˚C to 30 ˚C. Severely affected patients should be managed in intensive care units or in burn centres. Fluid replacement, protein and electrolyte balance adjustment are of paramount importance. Nutritional support should be provided to patients who are not able to feed themselves and a nasogastric tube is preferred. Regular

surveillance and sepsis screening are essential, but prophylactic antibiotics are not indicated. Wound care should be performed once daily. (1,4,23)

Topical treatment includes antiseptic solutions like chlorhexidine, polihexanide or octenisept for the skin erosions. Special care should be given to mucosal lesions as adhesions, strictures or synechiae may occur. Ophthalmologic consultations are crucial and patients should be prescribed antiinflammatory eye drops several times a day. (12)

Corticosteroids have been the mainstay in the treatment of TEN for many years but in our days their use is subject to controversy. Therefore, while some studies showed that corticosteroids could prevent the extensions of the disease when administered in the early stage, other studies showed that the treatment is non-beneficial and is associated with increased mortality. (1,25)

The use of intravenous immunoglobulin is also controversial. While previous studies showed therapeutic benefit, other studies failed to prove that they might slow progression or speed re-epithelisation. It should not be administered to patients with impaired renal function, as it is nephrotoxic. (12,25)

A few studies showed that cyclophosphamide might be a good treatment option in TEN. It determines rapid cessation of bullae formation; it is a cheap and safe drug. (20,25) Cyclosporine A has also been shown to be beneficial in a few uncontrolled studies. Further studies are needed to support their use. (1,5)

Thalidomide and tumor necrosis factor alpha (TNF-α)-inhibitors have been proposed for the treatment of TEN. A trial using thalidomide had to be stopped after the death rate in the group treated with this drug was significantly higher than the one in the control arm. There have been cases of TEN treated with anti- TNF-α antibodies (Infliximab and Etanercept) which showed positive response, but further controlled studies are needed to confirm their efficacy. (5,20)

Plasmapheresis and haemodialysis have been used to remove the drug excess, its metabolites and the cytotoxic mediators from circulation, with some positive outcomes but further studies are needed to confirm the efficacy. (1,5,20)

In the case we are presenting all the drugs the patient was taking before presentation were withdrawn. The symptomatic treatment included fluid replacement and nutritional support. The environmental temperature was raised to 28˚C. The patient was treated with high doses of systemic corticosteroids, topical corticosteroids, antihistamines and systemic antibiotics. He also received eye drops with neomycin and dexamethasone as well as artificial tears and antifungal solutions for the mouth lesions. The genital lesions were treated with topical corticosteroids to prevent synechiae formation. The evolution was favorable, with complete remission after 4 weeks of treatment.

CONCLUSIONS

TEN is a rare, potentially fatal condition, usually occurring as a severe adverse reaction to drugs. Its pathogenesis is not completely understood, the methods of identifying the causal agent lack sensitivity and the treatment options are limited.

Clarithromycin, Acyclovir and Allopurinol, as well as herpes simplex virus infection, have all been reported as potential precipitating factors for Lyell syndrome. The simultaneous presence of multiple risk factors raises difficulties in defining the etiologic diagnosis in this particular case.

Acknowledgement

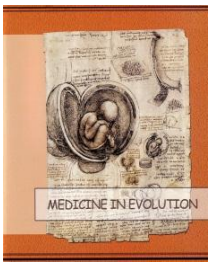
This paper is partly supported by the Sectorial Operational Programme Human Resources Development (SOPHRD), financed by the European Social Fund and the Romanian Government under the contract number POSDRU 141531

REFERENCES

1. Klaus Wolff, Lowell A. Goldsmith, Stephen I. Katz, Barbara A. Gilchrest, Amy S. Paller, David J. Leffell. Fitzpatrick's Dermatology in General Medicine. Mc. Graw-Hill Professional; Seventh edition. 2007. pag. 349-355. ISBN-10: 0071466908
2. Blanca R Del Pozzo-Magana, Alejandro Lazo-Langner, Bruce Carleton, Lucila I Castro-Pastrana, Michael J Rieder. A Systematic Review of treatment of drug-induced Stevens Johnson syndrome and toxic epidermal necrolysis in children. J Popul Ther Clin Pharmacol Vol 18(1):e121-e133; March 21, 2011
3. Dina Khalaf, Bassem Toema, Nidal Dabbour, Fathi Jehani. Toxic epidermal necrolysis associated with severe cytomegalovirus infection in a patient on regular hemodialysis. Mediterr J Hematol Infect Dis 2011; 3; Open Journal System. ISSN 2035-3006 DOI 10.4084/MJHID.2011.004
4. Bolognia Jean L, Joseph L. Jorizzo and Schaffer Julie V. Dermatology. ISBN: 978-0-7234-3571-6 Elsevier, 3Ed, 2012
5. Paquet P; Piérard GE New insights in toxic epidermal necrolysis (Lyell's syndrome): clinical considerations, pathobiology and targeted treatments revisited. Drug Safety: An International Journal Of Medical Toxicology And Drug Experience [Drug Saf] 2010 Mar 1; Vol. 33 (3), pp. 189-212.
6. Kim HI, Kim SW, Park GY, Kwon EG, Kim HH, Jeong JY, Chang HH, Lee JM, Kim NS. Causes and treatment outcomes of Stevens-Johnson syndrome and toxic epidermal necrolysis in 82 adult patients. Korean J Intern Med. 2012 Jun;27(2):203-10. doi: 10.3904/kjim.2012.27.2.203. Epub 2012 May 31.
7. Thomas Harr, Lars E French. Toxic epidermal necrolysis and Stevens-Johnson syndrome. Harr and FrenchOrphanet Journal of Rare Diseases2010,5:39
8. Mittmann N, Knowles SR, Koo M, Shear NH, Rachlis A, Rourke SB.Incidence of toxic epidermal necrolysis and Stevens-Johnson Syndrome in an HIV cohort: an observational, retrospective case series study. Am J Clin Dermatol. 2012 Feb 1;13(1):49-54. doi: 10.2165/11593240-000000000-00000.
9. Thong BY. Stevens-Johnson syndrome / toxic epidermal necrolysis: an Asia-Pacific perspective. Asia Pac Allergy. 2013 Oct;3(4):215-23. doi: 10.5415/apallergy.2013.3.4.215. Epub 2013 Oct 31.
10. I. O. Fadeyibi, S. A. Ademiluyi, F. O. Ajose, P. I. Jewo, O. I. Akinola Severe idiosyncratic drug reactions with epidermal necrolysis: A 5-year study Indian J Plast Surg. 2011 Sep-Dec; 44(3): 467–473. doi: 10.4103/0970-0358.90824
11. Revuz J. Alan Lyell and Lyell's syndrome. J Eur Acad Dermatol Venereol. 2008 Aug;22(8):1001-2. doi: 10.1111/j.1468-3083.2008.02718.x. Epub 2008 Apr 1.
12. O. Braun-Falco, G. Plewig, H. H. Wolff, M. Landthaler. Braun-Falco's Dermatology. third edition. Springer, pag. 473-479 ISBN 978-3-540-29312-5.
13. Chung WH, Hung SI, Yang JY, Su SC, Huang SP, Wei CY, Chin SW, Chiou CC, Chu SC, Ho HC, Yang CH, Lu CF, Wu JY, Liao YD, Chen YT. Granulysin is a key mediator for disseminated keratinocyte death in Stevens-Johnson syndrome and toxic epidermal necrolysis. Nat Med. 2008 Dec;14(12):1343-50. doi: 10.1038/nm.1884. Epub 2008 Nov 23.
14. Ratchadaporn Somkrua, Elizabeth E Eickman, Surasak Saokaew, Manupat Lohitnavy, Nathorn Chaiyakunapruk Association of HLA-B*5801 allele and allopurinol-induced stevens johnson syndrome and toxic epidermal

necrolysis: a systematic review and meta-analysis BMC Med Genet. 2011; 12: 118.
15. Kheng Seang Lim, Patrick Kwan, Chong Tin. Association of HLA-B*1502 allele and carbamazepine-induced severe adverse cutaneous drug reaction among Asians, a review. Tan Neurology Asia 2008; 13 : 15 – 21
16. Zhang Y, Wang J, Zhao LM, Peng W, Shen GQ, Xue L, Zheng XX, He XJ, Gong CY, Miao LY. Strong association between HLA-B*1502 and carbamazepine-induced Stevens-Johnson syndrome and toxic epidermal necrolysis in mainland Han Chinese patients. Eur J Clin Pharmacol. 2011 Sep;67(9):885-7. doi: 10.1007/s00228-011-1009-4. Epub 2011 Mar 19.
17. Chang CC, Too CL, Murad S, Hussein SH. Association of HLA-B*1502 allele with carbamazepine-induced toxic epidermal necrolysis and Stevens-Johnson syndrome in the multi-ethnic Malaysian population. Int J Dermatol. 2011 Feb;50(2):221-4. doi: 10.1111/j.1365-4632.2010.04745.x.
18. W. Sterry, R. Paus, W. Burgdorf. Dermatology. Thieme. 2008. 10-ISBN: 3-13-135911-0 (GTV), pag. 184-186, 13-ISBN: 978-3-13-135911-7 (GTV)
19. Mukasa Y, N Craven Management of toxic epidermal necrolysis and related syndromes. Postgrad Med J. 2008 Feb;84(988):60-5. doi: 10.1136/pgmj.2007.061465.
20. Worswick S, Cotliar J. Stevens-Johnson syndrome and toxic epidermal necrolysis: a review of treatment options. Dermatol Ther. 2011 Mar-Apr;24(2):207-18. doi: 10.1111/j.1529-8019.2011.01396.x.
21. James Treat. Stevens-Johnson Syndrome and Toxic Epidermal Necrolysis. Pediatric Annals October 2010 - Volume 39 · Issue 10: 667-674 DOI: 10.3928/00904481-20100922-11
22. Bastuji-Garin S, Fouchard N, Bertocchi M, Roujeau JC, Revuz J, Wolkenstein P. SCORTEN: a severity-of-illness score for toxic epidermal necrolysis. J Invest Dermatol. 2000 Aug;115(2):149-53.
23. Mukasa Y, Craven N. Management of toxic epidermal necrolysis and related syndromes. Postgrad Med J. 2008 Feb;84(988):60-5. doi: 10.1136/pgmj.2007.061465.
24. Antonino Romano, Marinella Viola, Francesco Gaeta, Gabriele Rumi, Michela Maggioletti Patch Testing in Non-Immediate Drug Eruptions Allergy Asthma Clin Immunol. 2008; 4(2): 66–74. Published online Jun 15, 2008. doi: 10.1186/1710-1492-4-2-66
25. Michael R Ardern-Jones and Peter S Friedmann Skin manifestations of drug allergy. Br J Clin Pharmacol. May 2011; 71(5): 672–683.

EXCIMER LASER FOR THE TREATMENT OF NAIL PSORIASIS



ALEXANDRA MARIA LIMBAU[1,2], MIRCEA TAMPA[2], CLARA MATEI[2], MARIA ISABELA SARBU[3], ADRIAN DUMITRU[4], LUMINITA ELENA MITRACHE[4], VASILE BENEA[3], SIMONA ROXANA GEORGESCU[2]

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ABSTRACT

Psoriasis is a chronic inflammatory skin disorder characterized by erythematous papules and plaques and can involve the skin, joints, and nails, either alone or in combination. Psoriasis of the nails can involve both the nail bed and nail matrix and can cause aesthetic and functional impairment. Up to two third of patients with psoriasis develop nail changes and without the use of systemic medication, nail psoriasis remains one of the most difficult to treat. The penetration of topical medications through the nail plate, in many cases, is challenging. Most topical treatments are only partially effective and systemic treatments can have serious side effects. Excimer laser has been approved for the treatment of psoriasis since 2000. Light therapy, due to its mechanism of action without affecting normal skin, would be a welcome option in the treatment of any nail change. The present article aims to present the main applications of laser Excimer in psoriasic nails.

Key words: *excimer laser, nail psoriasis; Nail Psoriasis Severity Index*

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INTRODUCTION

As noted in the medical literature, nail psoriasis occurs in approximately 50% of patients with psoriasis, more common in patients with moderate or severe forms and 80% of patients with psoriatic arthritis. Occasionally, less than 5% of patients may develop nail psoriasis, even in the absence of psoriatic lesions of the skin, may be the first manifestation of the disease or the disease can be limited to the nails[1]

Nails are part of the skin, epidermal attachments, and are frequently affected in patients with skin disease such as psoriasis. The clinical characteristics of nail psoriasis are extremely variable and depend upon the site affected. Nail psoriasis affects the fingernails more commonly than the toenails.

The Impact of Nail Psoriasis on Quality of Life is physical and psychological and they are uncomfortable with the aesthetic impact of their condition resulting in a significant negative impacts quality of life. A study published in 2011 aimed to assess the Nail Psoriasis Quality of Life Scale-NPQ10 correlated well with the Dermatology Life Quality Index. A questionnaire was answered by 1309 patients and showed that 86% patients considered nail psoriasis as bothersome, 87% as unsightly, and 59% as painful[2].

CLINICAL MANIFESTATION AND ASSESSMENT OF NAIL PSORIASIS: NAIL PSORIASIS SEVERITY INDEX

The nail psoriasis changes start usually after the onset of cutaneous lesions. Two types of nail disorders have been shown to be caused by psoriasis, damage to the nail matrix and nail bed. The nail is divided into six specific parts consists of the root of the nail, the nail bed, the nail matrix, eponychium (cuticle), hyponychium and perionychium. Two types of nail disorders have been shown to be caused by psoriasis, the damage of the nail matrix and the nail bed[3]. Characteristic nail matrix changes include pitting (cupuliform depressions, measuring less than 1 mm in diameter), leukonychia, red spots in the lunula and crumbling. The abnormalities of nail bed psoriasis include oil spot or salmon patch (resembles a drop of oil under the nail plate), onycholysis (detachment of the nail plate from the nail bed; secondary infection may occur), Splinter hemorrhages, dyschromias and and nail bed hyperkeratosis. Cupuliform depression and subungual hyperkeratosis are the most common changes[4].

Although it has its limitations, the index NAPSI (Nail Psoriasis Severity Index) is the only validated method to diagnose nail disorders and is the most commonly used tool in this regard. NAPSI index is a numeric, reproducible, objective, simple tool for evaluation of nail psoriasis useful both in assessing nail damage, but also to test the effectiveness of treatment. NAPSI is used to assign a score dividing nail in four imaginary quadrants. To each quadrants of nail bed and nail matrix psoriasis, are investigated the presence of any feature of nail matrix including (pitting, leukonichia, red spots in the lunula and crumbling) or in the nail bed (red-yellow spots, onycholysis, hyperkeratosis and splinter hemorrhage). If these changes are present in all four quadrants, the patient receives a score of 4 while the complete absence of such symptoms result in a score of 0. Each nail has a

matrix score (0-4) and a nail bed score (0-4), and the total nail score is the sum of those 2 individual scores (0-8). The sum of the total score of all involved fingernails is the total NAPSI score, ranging from 0-80 or 0-160, if all nails are included. NAPSI does not quantify injuries, it can not have the sensitivity to detect small changes, and it is important to note that the score does not assess the impact of nail psoriasis on quality of life[5].

EXCIMER LASER - MECHANISM OF ACTION AND THERAPEUTIC PROTOCOL

The treatment of nail psoriasis is a big challenge for a dermatologist and depending upon the the nature and duration of the insult in few or many nails. Traditional treatments for nail psoriasis can be time consuming, painful, or limited by significant toxicities. The physical barrier of the nail plate and nail bed hyperkeratosis make very difficult the delivery of drug to the affected site and a longer duration of treatment required due to the slow growth rate of the nail plate.[6] There is relatively little evidence about the therapeutic modality and the goal is to improve the function and appearance of the nails. Ultraviolet (UV) irradiation and laser therapy have been shown to be effective in the control and treatment of psoriasis vulgaris, but the information for their effectiveness in nails is limited. In 1997, was first described the use of excimer laser for the treatment of psoriasis. The excimer laser, a form of targeted ultraviolet light, was compared with full body treatments of ultraviolet UVB. Higher intensity UVB light may be an explanation for the superior efficacy of excimer laser[7]. Has been approved for treatment of psoriasis since 2000 and has now become a well-known way to treat moderate to mild forms of psoriasis localized; the laser with a 308 nm high energy allows treatment of only involved skin. Mechanism of action: the excimer laser induces apoptosis of T cells characterized by changes in the conformation of the DNA and inhibit cytokine secretion[8].

After evaluate the severity of nail psoriasis in each hand using an objective score, called Nail Psoriasis Severity Index (NAPSI) the treatment in patients with clinically significant changes in nail begins after calculating the minimal erythema dose (MED) on unaffected skin. After dose calculation, treatment begins at twice the MED for a maximum of 12 weeks (24 treatments) with the maximum frequency of 5,000 mJ/cm2, fluence increasing by 200 at each session[9]. A study published in 2014 aimed to assess Laser Excimer versus Pulsed Dye Laser efficacy on a group of 42 patients with a a total of 304 nail changes, for total 12 weeks and followed up after a further 12 weeks. In the study, patients were enrolled based on the following criteria: at least 16 years old and psoriatic nail disease refractory to other topical with nail pits, discoloration, thickening, onycholysis, longitudinal ridging, subungual hyperkeratosis, splinter hemorrhages, oil drop, and salmon patchand systemic therapy. Severity of nail disease was scored at baseline by NAPSI and then weeks 4, 8, and 12 and week 24. The authors reported there was no statistically significant difference in NAPSI scores at baseline, but after 3 months treatment period, there were statistically significant difference between the results of excimer laser treatment and PDL by mean NAPSI reduction. The excimer laser were 29.8 at baseline, reduced to 11.8 at the third month, and 16.3 at the end. The study also proved that the the most significant improvement was noticed in subungual hyperkeratosis and onycholysis while the least responsive nail change was nail pitting, moderate response is recorded in oil drops and splinter hemorrhages[10].

According the results of the study, the PDL was shown to be more effective and less time consuming in the treatment of nail psoriasis than the excimer laser. Other studies on a few patients show some efficacy of excimer laser treatment, it found to be effective and could be used as a safe, locally administered treatment for recalcitrant nail psoriasis[11].

CONCLUSIONS

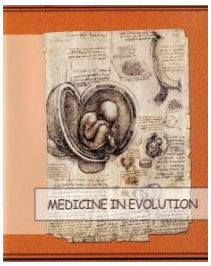
Although nail psoriasis is common in patients with psoriasis , in the literature so far are few studies, poor and time consuming, regarding excimer laser treatment. There is no cure for nail psoriasis but it may improve by itself and may even return to a normal appearance. In a patient with psoriasis, the presence of nail changes may indicate a severe form of the disease and the treatment option should depend on this. In recent years, excimer laser has demonstrated noticeable effects for the treatment localized plaque psoriasis, but few results in nail psoriasis. Minimal adverse reactions and a favorable improvement in nail changes may be arguments for using excimer laser in psoriasis nail.

Acknowledgement: This paper is partly supported by the Sectorial Operational Programme Human Resources Development (SOPHRD), financed by the European Social Fund and the Romanian Government under the contract number POSDRU 141531.

REFERENCES

1. Karen Regina Rosso Schons, Cristiane Faccin Knob, et all. Nail psoriasis: a review of the literature. An Bras Dermatol. 2014; 89(2): 312–317.
2. Alka Dogra, Amanjot Kaur Arora. Nail Psoriasis: The Journey So Far. Indian J Dermatol. 2014; 59(4): 319–333.
3. De Berker D. Management of psoriatic nail disease. Semin Cutan Med Surg. 2009;28:39–43.
4. Jiaravuthisan MM, Sasseville D, Vender RB, Murphy F, Muhn CY. Psoriasis of the nail: Anatomy, pathology, clinical presentation, and a review of the literature on therapy. J Am Acad Dermatol. 2007;57:1–27
5. Rich P, Scher RK. Nail psoriasis severity index: A useful tool for evaluation of nail psoriasis. J Am Acad Dermatol. 2003;49:206–12.
6. Fleckman P. Structure and function of the nail unit. In: Scher RK, Daniel CR, editors. Nails: Diagnosis, therapy, surgery. 3rd ed. Philadelphia: Elsevier Saunders; 2005; 13–26.
7. Sánchez-Regaña M, Sola-Ortigosa J, Alsina-Gibert M, et all.. Nail psoriasis: A retrospective study on the effectiveness of systemic treatments (classical and biological therapy) J Eur Acad Dermatol Venereol. 2011;25:579–86.
8. Lee E, Koo J, Berger T. UVB phototherapy and skin cancer risk: a review of the literature. Int J Dermatol. 2005;44(5):355–60
9. Bonis B, Kemeny L, Dobozy A, et all. 308 nm UVB Excimer laser for psoriasis. Lancet. 1997;350:1522.
10. Nawaf Al-Mutairi, Tarek Noor, Ahmed Al-Haddad. Single Blinded Left-to-Right Comparison Study of Excimer Laser Versus Pulsed Dye Laser for the Treatment of Nail Psoriasis. 2014; Dermatol Ther.
11. Asawanonda P, Anderson RR, Chang Y, Taylor CR. 308-nm Excimer laser for the treatment of psoriasis: a dose–response study. Arch Dermatol. 2000;136:619–24.

CONSONANTIST PSYCHOLOGY – A PSYCHO-SOMATO-PSYCHOLOGICAL APPROACH



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ABSTRACT

The work of Stefan Odobleja ,, Consonantist psychology", was presented to the international medical community on two occasions. Once by the author himself, in 1937 at the International Congress of Military Medicine, attended by Odobleja who announced the publication and the second time in 2014 at the European Conference of Psychosomatic Medicine, in Sibiu, where the authors of the present paper exhibited a poster suggestively entitled "Consonantist Psychosomatics" which demonstrates that "Consonantist Psychology" helps us to better understand the psycho-somatopsychological circuit at psycho-physiological and clinical levels, equally.

Key words: *Psychosomatic Medicine, Consonantist Psychology, Consonantist Psychosomatics*

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INTRODUCTION

Between 25-28 June 2014 Sibiu hosted the annual meeting of the European Association of Psychosomatic Medicine "Care and Cure – an integrated approach to psychosomatic medicine", accredited by the European Accreditation Council for Continuous Medical Education.

EAPM-2014 (fig.1) was a great success:

- 270 participants from 39 countries on 5 continents;
- Over 210 presented paper abstracts from 35 countries;
- 19 symposia included in the programme;
- 6 plennary sessions;
- over 80 poster presentations in 2 plennary sessions.

During the first plennary session I presented a poster (fig. 2- Univ. Prof. DHC Liviu Sofonea, President of the Romanian Committee for History of Philosophy, Science and Technology of the Romanian Academy, left and Dr. Nicolae Popescu, right) in which I highlighted the medical applications of the works of St. Odobleja and the contribution to the concept of psychosomatics. For a synthetic approach of the ideas, thesis and concepts demonstrating that "Consonantist Psychology" is in fact a psycho-somatopsychological approach usable in medicine, we introduced the syntagm of "Consonantist Psychosomatics".

Figure 1. EAPM-2014

Figure 2. Univ. Prof. DHC Liviu Sofonea, President of the Romanian Committee for History of Philosophy, Science and Technology of the Romanian Academy, left and Dr. Nicolae Popescu, right

METHODS

Analytical study investigating the relations and inter-relations between psychosomatics and consonantist psychosomatics. Academy Member Ştefan Odobleja, army physician, internationally acknowledged as the parent of generalised cybernetics and creator of psychocybernetics, deserves a special place in the history of both cybernetics and psychosomatics. The

work P*sychologie consonantiste* (880 pp), published in French in Lugoj, in two volumes, between 1938-1939, was distributed through ,,Librairie Maloine" in Paris. In 1978 at the International Congress of Cybernetics and Systems in Amsterdam, 30 years of cybernetics were celebrated and the ,,Norbert Wiener" medal was inaugurated. Upon this occasion Ştefan Odobleja's world priority on the idea of generalised cybernetics was acknowledged, 10 years prior to N.Wiener, whose cybernetics is in fact a technical application of general cybernetics.

,,THE PSYCHOLOGICAL (the soul, the spirit, the interior universe)...

THE PSYCHOLOGICAL IS A BIOLOGICAL FUNCTION LOCATED IN THE BRAIN.

...any physiology is ultimately reduced to physical and chemical. Does the psychological belong to the physical or chemical? *And, if the former is true,* does it belong to the *mechanical* – as taught by all psychology manuals – or is it *energetical,* of a more subtle and superior nature than a vulgar act of fibre contact?...

The true elements of psychological phenomena are invisible – as are the elements or material substrate of physical energies – and analogue, if not identical, with the latter. The psychological process is no longer such a vulgar phenomenon as the supposed mechanical approaching and coming apart movements of neuronal fibres – but an extremely fine tuned process, an energetic process.

Psychology really is the physiology of nervous centres, but it is only the most refined, intimate, subtle part of this physiology: the rest is neurology. *Psychology is a physiology without anatomy,* as its true anatomy, the veritable psychological anatomy i.e. energetic microscopy has not yet been inaugurated. Until new developments, we can only mentally represent it, by imitating chemists and physicists who do the same for valences, atoms, quanta, ions and their electrons. Maybe man will never be able to see and directly observe by his senses – including devices which enhance them – the true material-anatomic substrate of his psychology." (Odobleja Şt. - premier volume 1938-, Psychologie consonantiste, premier et deuxieme volume, Libraire Maloine, Paris,p.p. 51-64).

,,THE PHYSICAL(the nature, the outside world)

DEFINITIONS

The physical body is the source of the psychological and its ultimate expression, cause and, often, effect, the material the psychological is made of. It is one of the first categories, opposed to the psychological. From a logical perspective, the physical body is one of the two halves of the Universe, the other being the psychological: quantitatively it is by far the largest part of the Universe…

DIVISIONS OF THE PHYSICAL

Psychologically, we must make the distinction between:

- the transformable physical, the pre-psychological, the excitants;
- the transformed physical, the post-psychological, the reactions and acts.

From the perspective of change:

- the static physical: the matter, the substance, the chemical, the structure, the anatomy;
- the dynamic physical: the energy, the force, the actual physical, the phenomena, the function, the physiological.

From a biological perspective:

- the inanimate nature: lifeless bodies, the actual physical;
- the living nature: the beings, the biological.

The study of the physical belongs to natural sciences:

- for inanimate nature: cosmological sciences
- static: chemistry, geography, mineralogy, astronomy, etc.

- dynamic: physics, mechanics, sky mechanics, etc.
- for living nature: biological sciences:
  - static: anatomy, histology
  - dynamic: physiology, evolution."

(Odobleja Şt. -premier volume 1938-, Psychologie consonantiste, premier et deuxieme volume, Libraire Maloine, Paris, p.p.47-48).

,,PSYCHOLOGY (general notions)

DEFINITION

Psychology is the science of the soul, of the conscience, of conscience phenomena; the science of non-mediated facts, of interior experience, of psychological facts or phenomena, a science derived from introspection (genetic, empirical, sensualist, and subjective definition). It is the science of sciences, the key and fundament of all the other sciences and of philosophy (noological definition by its effects). It is the physiology of the brain; central and fine tuned physiology of the relation apparatus (objective, biological, anatomo-physiological definition). It is the science of *reciprocal actions* exerted by stimulation, adaptation, or adjustment and response between an organism and the environment (H. Spencer and behaviour psychology). It is *brain physics: the science of internally perceived physical phenomena (propagations, balances and unbalances, consonances and dissonances, actions and reactions, loads and unloads, etc*. physical concept, supported in the present paper)...

Psychophysics

According to the old, limited and restricted concept, psychophysics is the science of reports between sensations and their exciting triggers. More widely defined, psychophysics is a synthesis between psychological and physical, the definition of the psychological with the aid of the physical, the physicist concept on the physical, the knowledge of the psychological unknown through the known physical, the unification of psychological sciences and physical or natural sciences, the equivalence of physical and psychological sciences with the consequent application of methods and devices from physics in the field of the psychological, and the use of experimental method. Our psychology is ultimately psychophysics in a wider sense: it is psychological physics."(Odobleja Şt. - premier volume 1938-, Psychologie consonantiste, premier et deuxieme volume, Libraire Maloine, Paris, p.p.39,46).

,,PSYCHO-NEUROLOGY

Neurology is sometimes understood as a subordinate of psychology; it would be the study of anatomy, physiology, pathology, etc. of the nervous system (including the study of the brain and of psychology). It may also be understood as a subordinate of physiology: in this case neurology would be the study of transmissions, the science of connections between soul and body, between centre and periphery, between psychological and physical...

The influences of the psychological upon the physiological (psycho-somatic effects) are:

Reversible (functional) – psychosomatic disfunctions n.a. – or irreversible (organic) – psychosomatic diseases n.a. - Normal (physiological) or abnormal (pathological). Durable (evolutive, permanent, anatomic, organised: physiognomy, voice, conformation, gaining or losing weight etc.) or short lasting (transitory, functional: mimic, gestures, expressions, attitudes, manners, hand writing etc.). Intense or weak. Mediated or immediate. Direct or indirect. Local or diffuse. Excitant (dynamogenic, stimulating, stenic) or depressing (calming, astenic, inhibitory). Motor or secretor. Induced by sensations or by representations – cognitive or affective.

The influences of the physiological upon the psychological (somato-psychological effects n.a.) are:

Reversible or irreversible; normal or pathologic; durable or transient; strong or weak; local or diffuse, excitant or depressing etc. There are effects on receptivity and effects on reaction; effects on the intelligence and effects on affectivity.

...Does the physical determine the psychological or is it the other way around? In reality, between centre and periphery there is reciprocity of action, there are reciprocal interactions, balancing oscillations in alternative current. Between physical and psychological, between body and soul there is a reciprocal influence: each is, in its turn, cause and effect.

Is this influence vague or precise? We must replace the vague notion of reciprocal influence of physical and moral, by the more precise notion of reciprocal influences between each body part and each psychological component." (Odobleja Şt. -premier volume 1938-, Psychologie consonantiste, premier et deuxieme volume, Libraire Maloine, Paris,p.p. 407,426,427).

,,PSYCHO-SOMATIC INTERACTIONS

Definition. Psycho-physiology is the study of reciprocal repercussions (interactions) between centre and periphery, between physical and psychological, between moral and body, between brain and the other viscera, between general and local, between the whole and its components. It is the study of psycho-somatic reflexes; the science of psycho-somatic interactions (fig3).

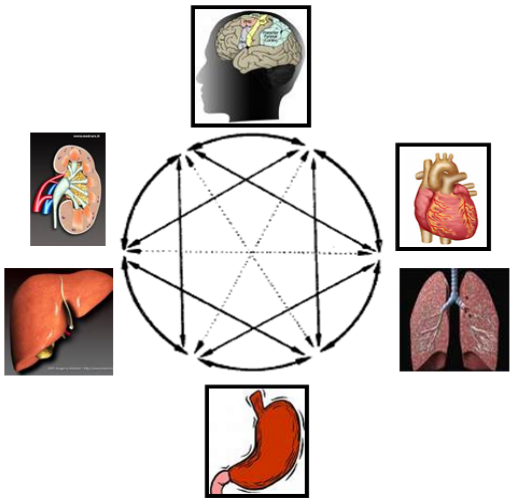


Figure 3. Psycho-somatic interactions. Source: adapted after Şt.Odobleja (1939): Psychologie consonantiste, deuxiéme volume, Libraire Maloine, 27, rue de L'école-de-médecine 27, Paris ,1939

There are interorganic actions achieved by nervous centres (brain, heart, lungs, stomach, intestines, liver, kidneys, sexual organs). There are also direct interorganic actions. Each organ has relations with every other organ, including the brain. The brain is, undoubtedly, a privileged organ, but it does not hold exclusivity on interorganic communication. (Odobleja Şt.-premier volume 1938-, Psychologie consonantiste, premier et deuxieme volume, Libraire Maloine, Paris,p.535).

RESULTS

Throughout its vast content, the work ,,Psihologia consonantistă" (Consonantist psychology), uses nine universal laws i.e. those of equivalence, equilibrium, compensation, reaction, oscillation, reversibility, inertia, consonance, transformation, all based upon the resonance phenomenon. He

was the first attempting to apply the feedback law (law of reversibility) in nature and society, in as many scientific fields as possible: philosophy, biology, psychology, sociology, political economics, mathematics and even medicine (psychoneurology, psychophysiology, psychopathology, interpsychology), enabling an easier understanding of the interrelations betwen biological, psychological and social factors, of the psycho-somatic connexions in the practice of psychosomatic medicine.

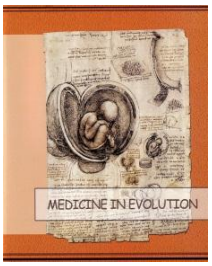
CONCLUSIONS

The syntagm of consonantist psychosomatics facilitates a better understanding of the psychosomatic circuit, psychophysiologically and clinically expressed in the work of Stefan Odobleja.

REFERENCES

1. ODOBLEJA ST.(1938): *Psyhologie Consonantiste*, premiere et deuxieme volume, Libraire Maloine, 27, rue de L' ecole de medicine, Paris.
2. DUMITRASCU D.L., SOELLNER W.,(2014), proceedings of EAPM 2014, *Care and cure- an integrated approach to psychosomatic medicine,* Annual meeting of the European Association of Psychosomatic Medicine, MEDIMOND-Monduzzi Editore International Proceedings Division.
3. POPESCU N., POPESCU G.A.(2013), *Consonantist Psychosomatics-contribution of doctor Stefan Odobleja to the psychosomatics concept,* Medicine in evolution, nr.2,2013,Timisoara;
4. POPESCU N., POPESCU G.A.(2013), *Vision of Stefan Odobleja on psycho-physiological mechanisms induced by stress factors/stress agents,* Medicine in evolution, nr. 4,2013, Timisoara.

NEUROENDOCRINE CELLS OF THE HUMAN EPIGLOTTIC VALECULLA



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ABSTRACT

The diffuse neuroendocrine system comprises neuroendocrine cells (NECs) dispersed in the mucosa of the respiratory tract. Neuroendocrine tumors are rare and involve verious organs, including the larynx. As in basic science information regarding the intramural neural and neuroendocrine cells of the larynx is elusive we aimed at determining the presence of NECs in the mucosa of the epiglottic valeculla. Immunohistochemistry for calretinin (CR) and neuron-specific enolase (NSE) was performed on human postautopsic samples dissected out from three cadavers. CR+/NSE+ adendritic cells were found in the lamina propria of mucosa, closely related to the subepithelial microvessels and were identified as NECs. The presence of NECs within normal tissues, such as the mucosa of the epiglottic valeculla, should be clearly included in basic descriptions of structural anatomy. Beyond the educational role for further understanding of the neuroendocrine tumoral pathology, the NECs in cervical viscera could represent anatomical targets of autonomic neural fibers.

Key words: *human larynx; neuron-specific enolase; calretinin; immunohistochemistry; epiglottis; APUD system*

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INTRODUCTION

The neuroendocrine system comprises elements sharing co-production of amine, and peptide hormones or transmitters and specific neural markers; the diffuse neuroendocrine or APUD system contribute to the neuroendocrine system (Toni, 2004).

The diffuse neuroendocrine system of the respiratory tract comprises solitary or clustered endocrine cells together with an autonomic nerve supply (Wharton et al., 1981). Most of neuroendocrine cells (NECs) are dispersed in the mucosa of the gastric and respiratory tracts (Hubalewska-Dydejczyk et al., 2010). These cells lack axons and dendrites (Hubalewska-Dydejczyk et al., 2010). The NECs of the oral mucosa are understudied; they form diverse subpopulations and were assigned elusive biologic roles in the oral cavity (Mahomed, 2010).

Neuroendocrine carcinomas are rare tumors which have been described in the nasal cavity, paranasal sinuses, tongue, salivary glands, larynx and trachea (Capelli et al., 2007). Although neuroendocrine neoplasms of the larynx are rare they are the most common nonsquamous laryngeal tumors (Ferlito et al., 2009).

For identification of NECs various specific antibodies are used, such as those against calcitonin, somatostatin, neuron-specific enolase or calretinin (Kasacka and Sawicki, 2004, Selaru et al., 2014).

The NECs seem overlooked in normal anatomy and histology despite their structural importance in malignant transformations. Therefore we aimed at investigating their presence in normal mucosa of human epiglottic valeculle.

MATERIAL AND METHODS

We used three postautopsic visceral cervical blocks consisting of tongue, larynx, trachea and hypopharynx. The study was conducted in accordance with the relevant national Law (104/2003) regarding the manipulation of human cadavers and its methodological norms.

The epiglottic valecullas were evidenced and mucosa was dissected out, formalin (10%)-fixed, and paraffin-embedded. The samples were sectioned at 3 µm, and stained with hematoxylin eosin in order to appreciate the general histology of tissues.

There were used primary antibodies against neuron specific enolase (NSE, clone BBS/NC/VI-H14, Dako, Glostrup, Denmark, 1:200, code M 0873) and calretinin (CR, clone 5A5, Novocastra-Leica, Leica Biosystems Newcastle Ltd, Newcastle Upon Tyne, U.K., 1:100, code NCL-CALRETININ).

Sections were deparaffinized, rehydrated and rinsed in PBS buffer solution at pH 7.4. Retrieval by incubation in 0.01 M citrate retrieval solution, pH 6, was completed. The standard ABC technique used a DAB protocol. Appropriate endogenous blocking peroxidase was completed before immunolabeling (0.1% BSA in PBS). Sections incubated with non-immune serum served as negative controls. Immunolabeled sections were counterstained with Hematoxylin.

Microscopic slides were analyzed and micrographs were taken and scaled using a Zeiss working station which is described elsewhere (Selaru et al., 2014).

RESULTS

On CR-labeled slides positively stained cells were found intermingled with the subepithelial microvessels of the mucosa (fig.1). NSE-positive cells also found in that location (fig.2). Histologically, these cells had a round-oval shape, eccentric encromatic nuclei, and were devoided of prolongations. Considering their morphology and the antibodies specificities the subepithelial calretinin+/NSE+ cells were diagnosed as NECs.

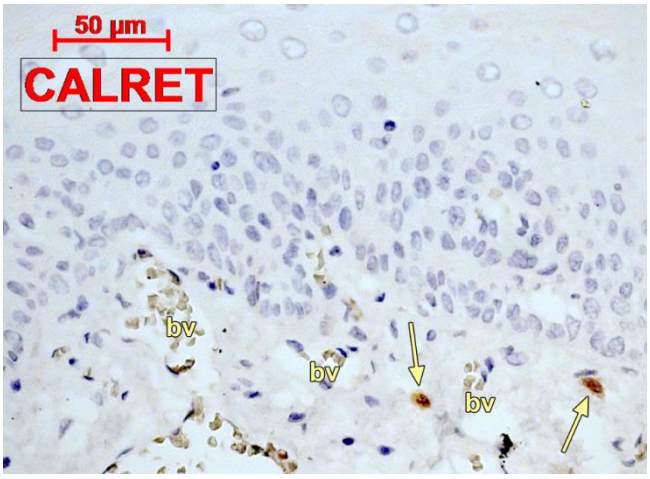


Figure 1. Calretinin-positive cells (arrows) within the lamina propria of the human epiglottic valecula. bv: blood vessel

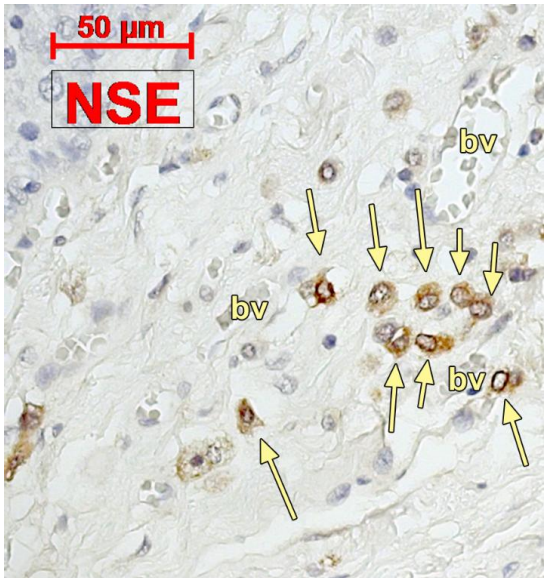


Figure 2. Neuron specific enolase-positive cells (arrows) within the lamina propria of the human epiglottic valecula. bv: blood vessel

DISCUSSIONS

Recognition of NECs in normal histological structures, such as the epiglottic mucosa, has both educational and clinical importance if one takes into account that within the larynx the neuroendocrine tumors occur more often in the epiglottis and in the supraglottic region (Capelli et al., 2007).However, laryngeal neoplasms with neuroendocrine differentiation are uncommon (Porto et al., 1987). Such a rare case of neuroendocrine carcinoma, widely metastasized, was reported as arosen in the epiglottis and was responsible for death of that patient; immunohistochemistry revealed the NSE-positive of tumor cells, among other different specific markers (Porto et al., 1987).

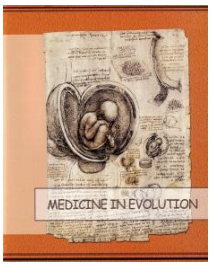
In usual anatomical textbooks the information on the autonomic exact distribution and relays in the pharynx and larynx is quite elusive. In this regard the NECs of larynx should be viewed as possible sites on which preganglionic parasympathetic nerve fibers project upon. It is not however a simple task as sympathetic-parasympathetic anastomoses usually occur in neck. The epiglottis is supplied anatomically with vagal fibers, via the internal branch of the superior laryngeal nerve. The internal branch of the superior laryngeal nerve further sends off a superior branch which runs to the lingual part of the epiglottis and sends small fibers through the epiglottic foramina to the laryngeal surface(Olthoff et al., 2007). Both vagus and superior laryngeal nerves are known to anastomose with the sympathetic trunk(Furlan, 2002).

CONCLUSIONS

The presence of NECs within normal tissues, such as the mucosa of the epiglottic valeculla, should be clearly included in basic descriptions of structural anatomy. Beyond the educational role for further understanding of the neuroendocrine tumoral pathology, the NECs in cervical viscera could represent anatomical targets of autonomic neural fibers.

REFERENCES

1. Capelli, M, Bertino, G, Morbini, P, Villa, C, Zorzi, S, Benazzo, M. Neuroendocrine carcinomas of the upper airways: a small case series with histopathological considerations. Tumori. 2007;93(5):499-503.
2. Ferlito, A, Silver, CE, Bradford, CR, Rinaldo, A. Neuroendocrine neoplasms of the larynx: an overview. Head Neck. 2009;31(12):1634-46.
3. Furlan, JC. Sympathetic fiber origin of the superior laryngeal nerve and its branches: an anatomic study. Clin Anat. 2002;15(4):271-5.
4. Hubalewska-Dydejczyk, A, Trofimiuk, M, Sowa-Staszczak, A, Gilis-Januszewska, A, Baczynska, E, Szybinski, P, et al. Neuroendocrine tumours of rare location. Endokrynol Pol. 2010;61(3):322-7.
5. Kasacka, I, Sawicki, B. Immunohistochemical and electron-microscopical identification of neuroendocrine cells in the respiratory tract of rats with experimental uraemia. Folia Morphol (Warsz). 2004;63(2):233-5.
6. Mahomed, F. Neuroendocrine cells and associated malignancies of the oral mucosa: a review. J Oral Pathol Med. 2010;39(2):121-7.
7. Olthoff, A, Schiel, R, Kruse, E. The supraglottic nerve supply: an anatomic study with clinical implications. Laryngoscope. 2007;117(11):1930-3.
8. Porto, DP, Wick, MR, Ewing, SL, Adams, GL. Neuroendocrine carcinoma of the larynx. Am J Otolaryngol. 1987;8(2):97-104.
9. Selaru, M, Hostiuc, S, Rusu, MC. Intrinsic neuroendocrine cells in the outer wall of the human pyriform recess. Anat Sci Int. 2014;10.1007/s12565-014-0256-8.
10. Toni, R. The neuroendocrine system: organization and homeostatic role. J Endocrinol Invest. 2004;27(6 Suppl):35-47.
11. Wharton, J, Polak, JM, Cole, GA, Marangos, PJ, Pearse, AG. Neuron-specific enolase as an immunocytochemical marker for the diffuse neuroendocrine system in human fetal lung. J Histochem Cytochem. 1981;29(12):1359-64.



THE VALUE OF CLASSICAL SURGICAL TECHNIQUES IN THE MANAGEMENT OF THE COMPLICATIONS OF CHRONIC PANCREATITIS. THE EXPERIENCE OF IIIRD SURGERY CLINIC OF THE COUNTY HOSPITAL OF TIMISOARA

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ABSTRACT

Though not among the most frequent cases in our clinic, complicated chronic pancreatitis is a complex pathological entity, with a variety of aspects, affecting patients with multiple organ dysfunctions, and therefor requiring a well-planned management. The present article shows our clinic's experience on a number of 24 operated cases using the most conservative means possible which intended and managed to treat the complications of chronic pancreatitis and preserve as much of the remnant functional pancreatic tissue as possible. Encouraged by previous successes, we consider these classic treatment techniques to still hold great value.

Key words: *surgical techniques; complications of chronic pancreatitis; conservative approach*

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INTRODUCTION

Chronic pancreatitis (CP) is a benign pathological entity defined by a chronic inflammatory process which leads to a progressive loss of functional pancreatic tissue, which, in turn, in later stages, will lead to pancreatic failure, both exocrine and endocrine[1, 2]. CP had a prevalence of 26.4 cases in every 100.000 population in France 2006[3]; its main etiological factor is chronic alcoholism. Being correlated with a low social and economic level, this is a somewhat frequent problem in our country, which probably means that the true incidence of CP in Romania is higher than that in the EU. All this, together with the precarious biological state of the patient on which the disease is overlapped, and keeping in mind the complications that occur in its development, makes the complicated CP a complex pathological entity that very often represents a challenge of treatment management for both the surgeon and the internal physician.

As stated above, CP is characterized by a chronic inflammatory process which mainly takes place at the head of the pancreas; this, in turn, explains the high frequency of complications involving the compression of the biliary tract, the duodenal frame and even the portal system which will manifest through jaundice, duodenal stenosis and ascitogen portal hypertension respectively. Besides these, acutization episodes on the one hand and the obstruction of the pancreatic ducts on the other hand lead to pancreatic pseudochyst dilatation, which in some cases require surgery in order to prevent severe possible complications[4, 5]. The massive destruction of glandular pancreatic tissue will lead to endocrine and exocrine insufficiency, manifested through steatorrheic stools, malnutrition and insulin-requiring diabetes respectively. In its development CP may present any of these complications, alone or simultaneously. The surgeon has a large variety of surgical techniques for the treatment of such cases, starting from different types of pancreatic resections, bilio-digestive anastomosis, pseudochystic internal or external drainage, to the more modern methods which associates total pancreatectomy to total pancreatic transplant or the transplant of pancreatic isles. Despite the last therapeuit acquisitions, using them is conditioned by financial criteria and practicing such therapeutic methods in Romania is still impossible. This article tries to prove the utility of classic techniques in the management of CP's complications.

MATERIAL AND METHODS

This study included 24 patients which were previously diagnosed with a complicated form of chronic pancreatitis and which, after being admitted in the IIIrd Surgical Clinic of The County Hospital of Timisoara throughout the period 2007-2014, underwent surgical treatment. Only patients with a definite diagnostic of chronic pancreatitis and one or more complication of this disease were included. Also, any patient who did not undergo surgical treatment or where surgery was performed for other reasons than to treat a complication of chronic pancreatitis was excluded from the study.

A repartition of the cases according to a gender shows a clear predominance towards men – 21 Patients which represent 87.5% of the total. Women make up a much lower number of cases, only 3, which constitutes 12.5% of the total. The

average age was that of 60.2 years, with values varying between 38 and 76 years. The maximum incidence was found to be in the 7 decade (9 cases).

At the time of the admission, patients mostly accused: pain (present in 22 cases, meaning 91.66%), jaundice (14 cases, meaning 58.33%), weight loss (11 cases), nausea and vomiting (5 cases), clinical manifested diabetes (7 cases, meaning 29.16%). Out of the total number of 24 cases, 21underwent elective surgery and only 3 cases needed emergency surgery. Regarding the complications of CP we found 14 cases of jaundice that occurred through the compression of billiary ducts (5 of them that associated duodenal stenosis, and 1 with portal hypertension and ascites) and 10 cases with pancreatic pseudochyst (three of them presented abscessed pseudochysts and underwent emergency surgery).

Regarding CP diagnostic this was established considering the past suffering for a prolonged period of time, episodes of acutization, seric amiliase levels, and imagistic explorations. Out of the total of 24 patients, 15 were in evidence at the Gastroenterologic Clinic, being already diagnosed with CP; as for the other 9 of them computer tomography was performed in order to confirm the diagnostic and to evaluate the pancreas'current condition. For similar reasons all patients were subjected to an echography; edndoscopic retrograde cholangio-pancreatogrphy (ERCP) was performed in 7 cases and provided additional useful information for deciding upon the operating tactic.

Surgical interventions were mainly limited to solving the complications of CP, and consisted of:

- 14 bilio-digestive anastomosis
  - 9 latero-lateral coledoco-duodenal anastomosis
  - 5 colecisto-gastro-anastomoze
- 5 transmesocolic posterios gastro-entero-anastomosis
- 7 pseudochysto-gastro-anastomosis
- 1 pseudochysto-jejuno-anastomosis

1 external drainage of the abscessed pseudochyst, with the placement of one tube for lavage purposes

RESULTS

Out of the total of 24 patients which underwent surgery in our clinic for complicated CP, 22 had a good evolution; the other two patients died; one of them had chronic pancreatitis complicated with jaundice and also associated with etanolic cirrhosis with vascular decompensation – In this case, despite the conservative approach during surgery (bilio-digestive anastomosis), The patient had a negative evolution, worsened by the failure of the parenchyma. Later, once the hepato-renal syndrome set in, the patient was transferred to the ICU; in the end death occurred after two months from the initial admittance due to multiple organ failure. The second case involved the patient with a long history of CP who was operated three years prior to the admittance for the internal drainage of a pancreatic pseudochyst. Following a CT scan the patient was diagnosed with an abscess at same level and admitted as an emergency. Surgery revealed that there was a stenosis at the pseudochysto-gastro-anastomosis accompanied by pus inside the chyst's cavity. The content of the cavity was drained, thorough washing was done after which two external drainage tubes were placed. Despite both medical and surgical treatment, postoperatory evolution was not a good one with the set in of multiple organ failure consecutive to septic shock; death occurred 27 days after admittance.

For the rest 22 cases the evolution was slow but good, with the average

time spent in the hospital being 14.7 days. The remission of jaundice along with normal seric values of bilirubin were found in 13 patients (92.85%)out of the ones who were admitted with jaundice, and the 5 patients which suffered from digestive disorders (nausea or vomiting) have once again commenced normal, oral alimentation, with not one case of post-prandial vomiting being noted at the time of discharge. A follow-up involving echography and endoscopy after one month following surgery of patients who were admitted for pancreatic pseudochysts revealed a functional anastomosis and the efficient drainage of pseudochystic collections, with the absence of any liquid accumulation at this level. The pain was softer for 15 patients (62.50%), but all 22 patients required chronic medication for pain control following discharge.

The following postoperatory complications are noted: evisceration (1 case which alse had hypoproteinemia and chronic obstructive bronchopneumopathy), seroma (3 cases) and stitch granuloma (1 case), all treated during hospitalization. Regarding the evaluation of endocrine pancreatic insufficiency, 7 patients (29.16%) had clinical manifest diabetes at the time of the admittance. These patients benefited from a personalized therapeuit scheme of insulin treatment that was developed with the help of the Clinic of Diabetes and which helped maintain a balanced glicemic status throughout the hospitalization period as well as following discharge. Exocrine pancreatic insufficiency was found in 14 patients (58.33%), all of them being treated with enzimatic supplements (Pancreatin) after starting to eat again.

DISCUSSIONS

CP is an incurable disease which steadily deteriorates patients' quality of life. Its diagnostic and management in the early stages is mostly attributed to gastroenterology. But once the complications set in, either by the compression of neighbor organs, the formation of pseudochysts or the suspicion of a malign process being present, it is surgery which holds the treatment[6, 7].

Concerning the preoperatory imagistic investigations that help establish a definite diagnostic and help decide upon the surgical approach, we think that the triad formed by ERCP-CT-Echography is the gold standard, just as most experts in the field have shown[8]. CT with contrast is the investigation that brings very important information on the local status, also having the smallest rate of false-negative results (<5%); this is the reason why it is the preoperatory investigation of choice in helping establish the approach tactic[9].

The available surgical techniques involve either different methods of pain management, drainage or resection. The objectives of any surgical intervention regarding patients with complicated CP should consider the following:

– Treatment of the complication and getting the patient out of the vital-risk zone

– Removing any suspicion of malignancy (were such cases are involved)

– Reducing the rate of postoperatory morbidity and mortality as much as possible

– Saving as much of the functional pancreatic parenchyma as possible

– Improving the patients' quality of life

Our clinic's experience suggest that one should strictly try to treat any complications of CP when dealing with such, followed by helping the patient out of the vital-risk zone and preserving as much of the functional

pancreatic tissue as possible. This is why radical surgery involving pancreatic resection were not recommended for patients who already had a complication of CP. Simple interventions, with a predictable outcome that could also remove the effects of complications were chosen in all cases. As such, when dealing with the compression of the billiary duct, a biliary-digestive anastomosis was chosen (either colecisto-gastro-anastomosis or coledoco-duodeno-anastomosis), decision that was supported by long-term results; by comparison, the endoscopic treatment has a long-term reliability that is overshadowed by numerous complications and often needs reintervention. The therapeutic success of these anastomosis was, in our clinic's experience, 100% and the anastomosis was still functional a long time after the surgery.

On the other hand, when faced with a pancreatic pseudochyst, an internal anastomosis was preferred; the external drainage would be a compromising solution for complicated cases, where the local status demands a prudent approach and at the same time a less-invasive intervention. Our success with whether a pseudochysto-gastro-anastomosis or a pseudochysto-jejuno-anastomosis was 100%, at the same time having good results on the long run. The one case where we preformed external drainage had a severe development due to a very tardy check in and intervention.

As for being able to maintain as much of the functional pancreatic parenchyma, we found that our patients had a balanced and stable glicemic status both pre- and postoperatory; this fits our purpose of not worsening the patients'pancreatic insufficiency by means of an aggressive intervention.

CONCLUSIONS

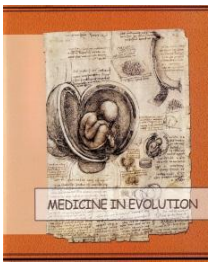
The complications of CP represent life-threatening situations for patients with low biological status that is only worsened by the prolonged evolution of the disease; surgical interventions that offer treatment in such cases should strictly try to get the patient out of the vital-risk zone while saving as much of the pancreatic parenchyma as possible in order to preserve the already deteriorated functional status of the patients.

REFERENCES

1. Buchler MW, Friess H, Muller MW, Wheatley AM, Beger HG. Randomized Trial of Duodenum-Preserving Pancreatic Head Resection Versus Pylorus-Preserving Whipple in Chronic Pancreatitis. Am J Surg. 1995;169(1):65-9.
2. Eddes EH, Masclee AM, Gooszen HG, Frolich M, Lamers CB. Effect of Duodenum-Preserving Resection of the Head of the Pancreas on Endocrine and Exocrine Pancreatic Function in Patients With Chronic Pancreatitis. Am J Surg. 1997;174(4): 387-92.
3. Philippe Lévy, Marc Barthet, Bruno Richard Mollard, Michel Amouretti, Anne-Marie Marion-Audibert, François Dyard. Estimation de la prévalence et de l'incidence de la pancréatite chronique en France: une enquête prospective portant sur les adultes consultant en gastroentérologie en France. Gastroentérologie Clinique et Biologique. 2006; 30 (6-7): 838-44
4. MacLaren IF. Observations and Surgical Management of Chronic Pancreatitis in the British Isles: a Review of the Twentieth Century. World J Surg. 1990;14(1):19-27.
5. Schlosser W, Poch B, Beger HG. Duodenum-Preserving Pancreatic Head Resection Leads to Relief of Common Bile Duct Stenosis. Am J Surg. 2002;183(1):37-41.

6. Saeger HD, Schwall G, Trede M. Standard Whipple in chronic pancreatitis. In: Beger HG, Buechler M, Malfertheimer P. Editors. Standards in pancreatic surgery, I ed. Berlin: Springer; 1993; p. 385-391.
7. Buechler M, Friess H, Isenmann R, Bittner R, Beger HG. Duodenum-preserving resection of the head of the pancreas: the Ulm experience. In: Beger HG, Buechler M, Malfertheimer P, editors. Standards in pancreatic surgery, I ed. Berlin: Springer; 1993; p. 436-449.
8. Swobodnik W, Meyer W, Brecht-Kraus D, Wechsler JG, Geiger S, Malfertheiner P, et al. Ultrasound, computed tomography and endoscopic retrograde cholangiopancreatography in the morphologic diagnosis of pancreatic disease. Klin Wochenschr. 1983; 61(6):291-6.
9. Luetmer PH, Stephens DH, Ward EM. Chronic pancreatitis: reassessement with current CT. Radiology. 1989;171(2):353-7.

DIFFERENT THERAPY OPTIONS IN TREATING PERSISTENT DIABETIC MACULAR EDEMA. A SINGLE CASE REPORT.



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ABSTRACT

We present the different treatment options in a single case report of a male patient with proliferative diabeticretinopathy who develops macular edema. The latest therapy options are used, ranging from grid laser photocoagulation to different intravitrean injections and posterior vitrectomy.

Key words: *diabetic retinopathy, macular edema, treatment*

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INTRODUCTION

The number of diabetic patients in the population of the United States of America in 2002 was of 13,5 million people and in 2011 this number grew up to 25,8 million. From these patients 25% have a form diabetic retinopathy(DR) and of these approximately 4% will evolve to a severe form of disease that can lead to blindness. Macular edema is the main cause of vision loss in patients with DR and is defined by fluid accumulation in the retinal external plexiform layer and the internal nuclear layer. Clinical significant macular edema (CME) is defined as retinal edema with or without hard exudation located within one papillary diameter of the macular area resulting in vision loss.

The standard treatment in macular edema was retinal photocoagulation,especially grid laser photocoagulation for the last 10 years and is used today worldwide. Intravitrean treatments are the new standard care in treating CME being in a constant development.

This single case report presents the different treatment options ranging from macular grid photocoagulation, posterior vitrectomy to different intravitreal injections with a follow up of 5 years[1-4].

We present the case of a male patient, 49 years old who was reffered to our clinic in 2007 and diagnosed in both eyes with Diabetic proliferative retinopathy .

We recommend laser Argon pan photocoagulation for both eyes.Follow up is every 6 months in which period the patient maintains a best corrected visual acuity(BCVA) of 0.7 until a control in 2009.

In april 2012 the patient is diagnosed with macular edema(ME) in both eyes after OCT examination: righth eye(RE) - 534 μ(fig.1) and left eye (LE) 642μ (fig. 2),BCVA RE: 0,3 and LE 4/50

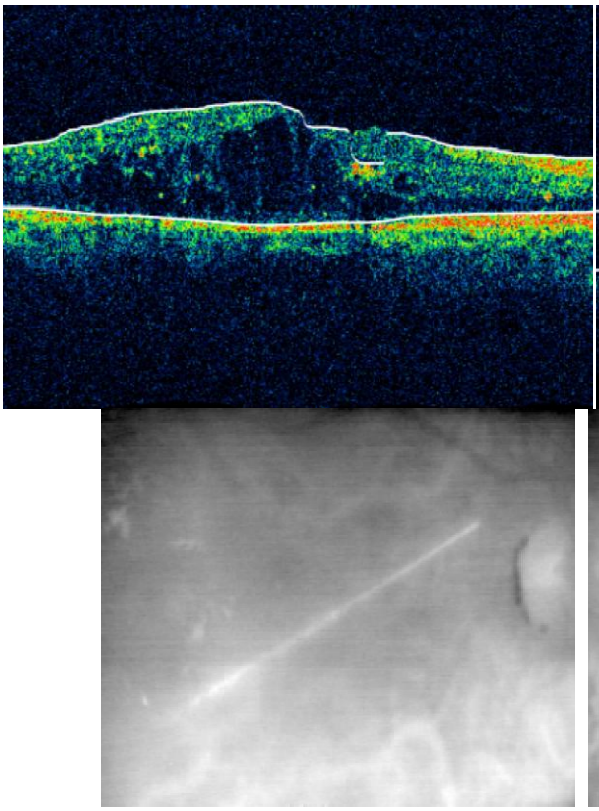


Figure 1.

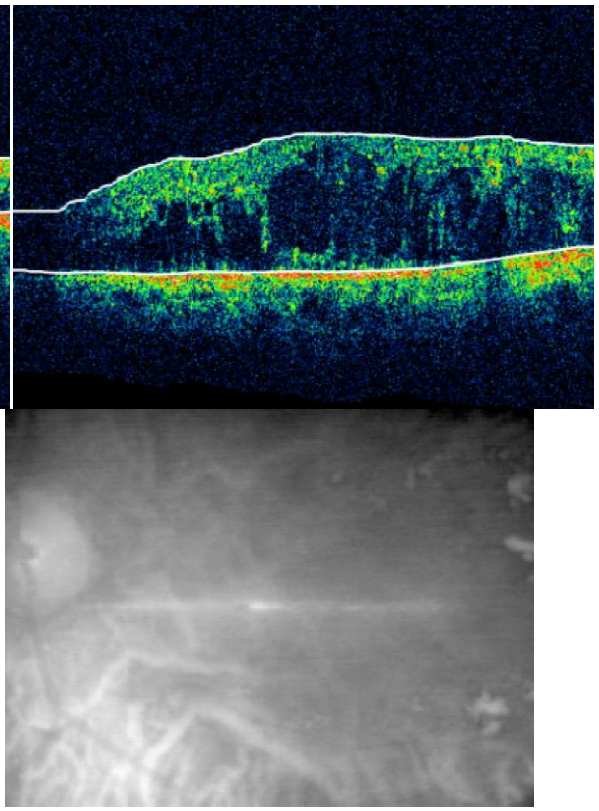


Figure 2.

Angiography(FA): Hiperfluorescence in the macular area with a petaloid pattern (fig. 3 şi 4)

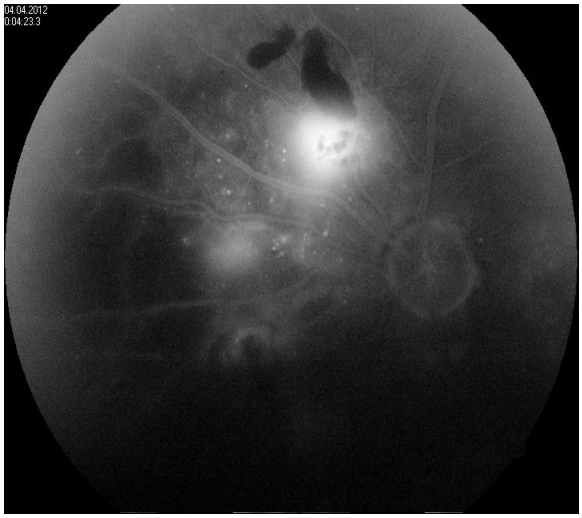


Figure 3.

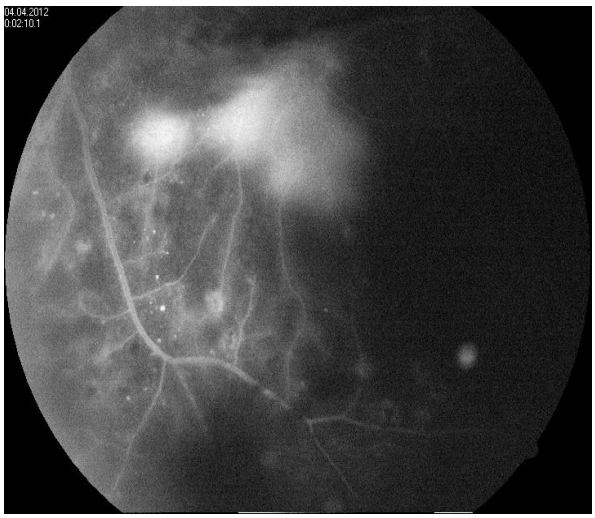


Figure 4.

Macular grid pan photocoagulation is recomended and completing the Argon laser pan photocoagulation (Fig.5) .After laser Argon photocoagulation is completed visual acuity is stationary.

Figure 5.

In august 2012 a reccurence of macular edema(Fig.6) is present and in consequence intravitreean injections with Triamcinolon in the RE is recommended and posterior vitrectomy for the peeling of the internal limiting membrane in the LE.

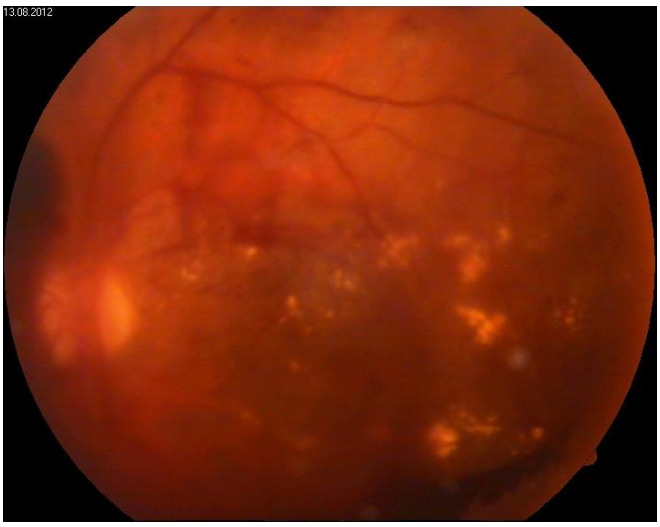


Figure 6.

LE: august 2012 peeling of internal limiting membrane is completed

RE: 2 intravitreal injections with Triamcinolon 0,05 ml in october 2012 and february 2013 are administered. After the intravitrean treatment in both eyes and vitrectomy in LE BCVA is RE:0,7 and LE:0,05.

In february 2013: BCVA is in the RE: 0,7 and LE 4/50 (no reduction of macular edema is present). We recommend the patient another intravitrean injection with Triamcinolon but the ME LE OCT- 541 μ (Fig.7) relapses in spite of the treatment.

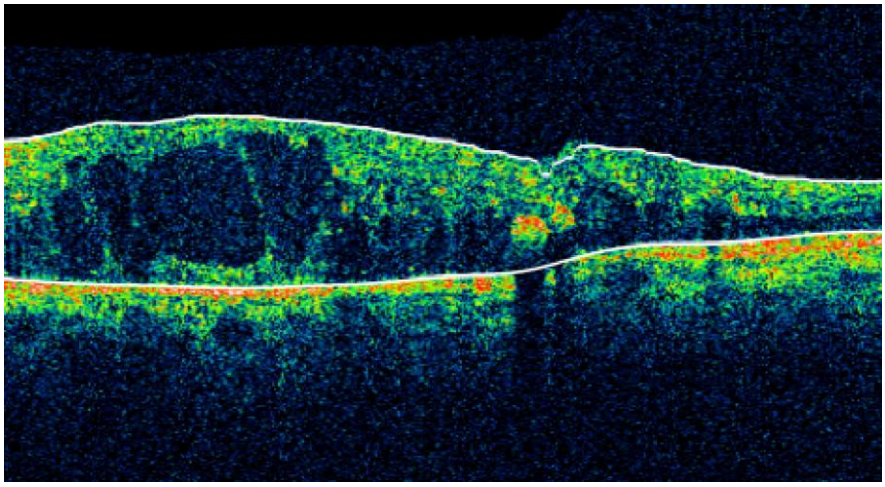


Figure 7.

We recommend intravitreean implant with dexametazone(Ozurdex).

After 4 months since the implant BCVA LE:0,6 without any reccurrence of the ME(fig.8)

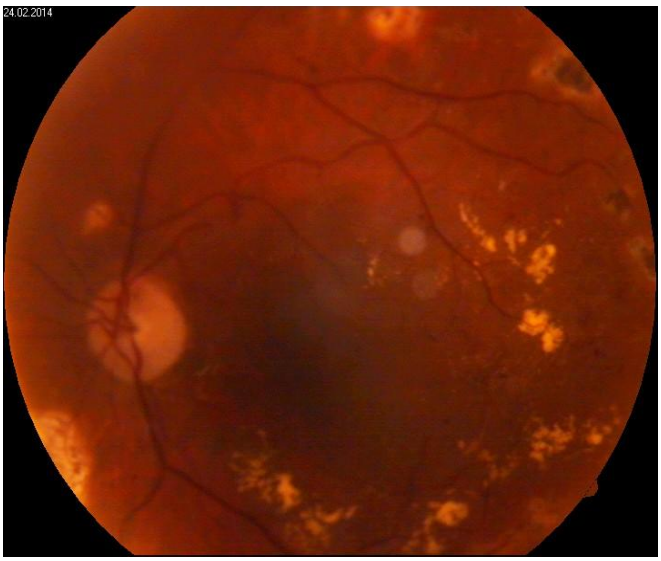


Figure 8.

This single case illustrates the latest modern therapy options in treating diabetic macular persistent edema. We used the standard therapy with Argon laser pan photocoagulation which is the first line treatment of proliferative diabetic retinopathy.

When macular edema was present we used intravitreal injections with Triamcinolon(IVT) which is a powerful antiinflamatory. Several studies confirm the efficiency of IVT in several clinical trials, fact also confirmed in our patient treatment [5]. IVT doesn't have a lasting effect and can lead to high intraocular pressure and cataract. A combined treatment of Argon laser and intravitreean steroids or anti vascular growht factor is very effective in combating diabetic macular edema and posterior vitrectomy if needed [6,7].

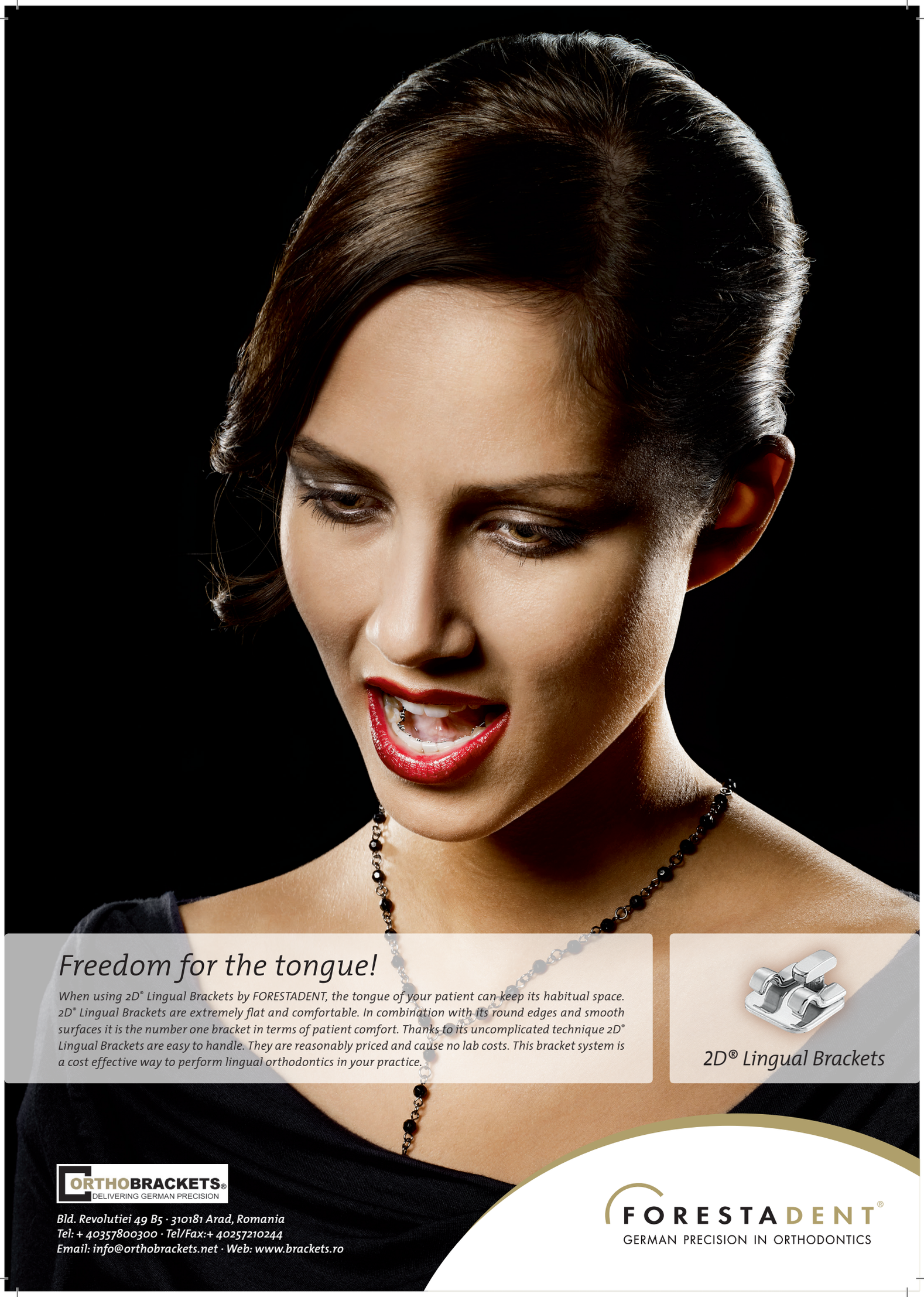
Another recent therapeutic option is Ozurdex,which is an intravitrean implant approved for the treatmentof diabetic macular edema. In our case it proved to be very usefull on the long term,maintaining a good visual acuity[8].

The particularity of our case is the involvement of both eyes with DME, the use of different therapeutical methods, involving laser, posterior vitrectomy and different intravitrean injections and implants. The fact that we obtained a stable visual acuity for 5 years in a diabetic patient confirms the good results of the latest treatments but also,it has to be validated by more clinical trials involving a greater number of patients in the future.

REFERENCES

1. J. H. Kempen, B. J. O'Colmain, M. C. Leske et al.,"The prevalence of diabetic retinopathy among adults in the United States,"Archives of Ophthalmology, vol. 122, no. 4, pp. 552–563,
2. J. Ding and T. Y. Wong,"Current epidemiology of diabetic retinopathy and diabetic macular edema,"Current Diabetes Reports, vol. 12, no. 4, pp. 346–354, 2012.
3. K. M. V. Narayan, J. P. Boyle, L. S. Geiss, J. B. Saaddine, and T.J. Thompson,"Impact of recent increase in incidence on future diabetes burden: U.S., 2005-2050,"Diabetes Care, vol. 29, no. 9 pp. 2114–2116, 2006.
4. J. Ding and T. Y. Wong,"Current epidemiology of diabetic retinopathy and diabetic macular edema,"Current Diabetes Reports, vol. 12, no. 4, pp. 346–354, 2012.
5. Gillies MC, Sutter FK, Simpson JM . Intravitreal triamcinolone for refractory diabetic macular edema: two-year results of a double-masked,

placebo-controlled, randomized clinical
trial. Ophthalmology 2006;113:1533–8.
6. Beck RW, Edwards AR, Aiello LP.Diabetic Retinopathy Clinical Research Network (DRCR.net). Three-year follow-up of a randomized trial comparing focal/grid photocoagulation and intravitreal triamcinolone for diabetic macular edema. Arch Ophthalmol 2009;127:245–51.
7. Figueroa MS, Contresal I, Noval S. Surgical and anatomical outcomes of pars plana vitrectomy for diffuse nontractional diabetic macular edema. Retina 2008;28:420–6.
8. Boyer DS, Faber D, Gupta S, Patel SS, Tabandeh H, Li XY, Liu CC, Lou J, Whitcup SM. Dexamethasone intravitreal implant for treatment of diabetic macular edema in vitrectomized patients. Retina 2011; 31: 915-923 [PMID: 21487341 DOI: 10.1097/IAE.0b013e318206d18c]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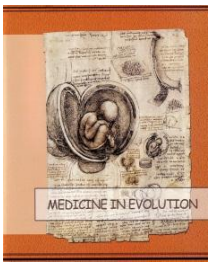
VITAMIN D DEFICIENCY AND ORAL HEALTH



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ABSTRACT

Periodontal disease (PD) is a chronic inflammatory condition leading to the progressive destruction of the periodontal tissues. It constitutes a major cause of teeth loss and a risk factor for a number of other chronic conditions. Due to its importance for public and individual health it is essential to characterise all modifiable risk factors contributing to the development of PD. One of these risk factors is increasingly thought to be represented by vitamin D (VD) deficiency. The current paper will provide a brief overview of the evidence connecting VD deficiency and impaired oral and especially periodontal health.

Key words: *vitamin D deficiency, periodontal disease, oral health*

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INTRODUCTION

The importance of vitamin D (VD) for the skeletal health has long been acknowledged as its main physiological role. However, adequate VD status has been proved to be essential not only for the bone health and mineral homeostasis but also for a wide variety of organ systems. In the last two decades, a wide range of epidemiological and observational studies have showed that VD deficiency increases the risk of a wide range of chronic conditions (inflammatory, cardiovascular, autoimmune and malignant diseases) (Hossein-nezhad, 2013) and overall mortality.(Schottker, 2014) Recent studies suggested that VD might also play a role in oral health, especially in periodontal disease (PD). We aim to provide a brief overview of the evidence linking the VD with PD.

VD deficiency

VD deficiency is a worldwide health problem being highly prevalent in all age groups. (Palacios, 2014) The optimal serum marker for the diagnosis of the VD status of the organism is 25-hydroxy-vitamin D (25OHD) but there is no worldwide consensus regarding the cut-off levels for 25OHD concentrations defining VD deficiency. The definition of the US Endocrine Society is, however, the most widely used: 25OHD serum levels below 50 nmol/l (20 ng/ml) indicate VD deficiency, values between 50 and 75 nmol/l (20-30 ng/ml) define inadequate VD levels, while levels above 75 nmol/l are considered sufficient. (Holick, 2011)

Periodontal disease

Periodontal disease (PD) is a chronic inflammatory condition affecting the gums and periodontal ligaments. PD is a major cause of teeth loss which, on its turn, leads to impaired feeding and speech and diminished quality of life.(Mack., 2005) Recently, epidemiological evidence began to suggest that it might be a risk factor for impaired general health. (Joshipura, 2003) Therefore, careful detection and correction of the risk factors for PD is an essential public health measure. One of the recently characterised putative predisposing factors is VD deficiency. Vitamin D may affect the risk of developing periodontal disease via its effect on bone mineral density or via immunomodulatory effects (Myszka, 2014).

Epidemiological connections between VD and PD

Epidemiological and observational studies provided growing evidence that low serum VD concentrations are associated with increased gingival inflammation and risk of development and/or complications of PD.

An inverse association was reported in the general population between the quintiles of the predicted 25OHD score and the incidence of tooth loss (the highest quintile being associated with a 20% lower incidence of tooth loss). (Jimenez, 2014) Low VD status was inversely associated with the gingival bleeding, alveolar bone loss, clinical attachment level, tooth loss; also the odds ratio for PD in this group is increased by as much as 33%.(Millen, 2013) In one study, the negative correlation between 25OHD serum concentration and attachment loss was significant only in individuals over 50 years-old but not in younger subjects.(Dietrich, 2004) Notably, low VD status has also been associated with maternal periodontal disease during pregnancy (Boggess, 2011)

The possibility that this connection is significantly mediated through effects on bone loss is suggested by the fact that women with osteoporosis have increased prevalence of both VD deficiency and PD compared with control subjects. (Jabbar, 2011) Lumbar spine and femoral neck bone mass density are

negatively correlated with the loss of attachment (as marker of PD) (Takahashi, 2012) Also, patients with active or past PD have significantly lower 25OHD concentrations.(Jabbar, 2011) In other studies the extent of PD was associated with osteoporosis, and the tooth loss with the fracture risk.(Moedano, 2011)

However, this does not appear to be the only link between PD and vitamin D. The vitamin D receptors (VDR) are ubiquitously expressed, including in the periodontal tissue and several VDR polymorphisms were strongly associated with periodontal disease (some offering protection, some increasing the risk).(Inagaki, 2003; de Brito, 2004; Gunes, 2008; Baldini, 2013) Also, VD might play an important role in the inflammation of the periodontal tissue through its regulatory local effects on cytokine production. The local production of proinflammatory agents is significantly inhibited by VD in a dose-dependent manner. (Andrukhov, 2014)

CLINICAL STUDIES

Scientific evidence from clinical studies is still weak but rapidly growing. Vitamin D has anti-inflammatory and immunological properties which act together with the positive effect on bone health toward an overall periodontal benefit. VD administration reduces PD prevalence in elderly men (Garcia, 2014) reduces the manifestations of PD in patients diagnosed with the condition. Daily VD intake of at least 800 IU was associated with lower risk of severe PD and alveolar bone loss compared with lower daily intake (below 400 UI). (Garcia., 2011) Individuals taking VD supplements have fewer bleeding spots, decreased gingival index values and loss of attachment.(Miley, 2009) In addition, ultraviolet exposure reduces risk of dental caries. The presumed mechanism is the production of vitamin D, which triggers the synthesis of cathelicidin and defensins, agents with antimicrobial properties.(Grant, 2011)

All these data suggest that PD, tooth loss and defective overall oral health as preventable conditions could potentially benefit from the widely available, inexpensive and increasingly recommended VD supplementation. Especially geriatric patients should be screened for vitamin D adequacy, whenever possible or supplement with the daily doses recommended (a minimum of 800-1000 UI VD daily).(Resmini, 2013)

CONCLUSIONS

Available studies published in the literature strongly suggest that VD may have a positive effect on periodontal and dental health. There is stringent need for randomised placebo-controlled clinical trials designed to assess the PD measures as primary outcomes in order to provide adequate scientific proof that VD supplementation is indeed an important adjunct to the standard treatment of PD.

Acknowledgments: This paper is supported by the Sectorial Operational Programme Human Resources Development (SOP HRD), financed from the European Social Fund and by the Romanian Government under the contract number POSDRU/159/1.5/S/137390

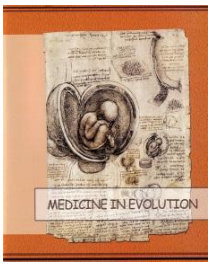
Conflict of interest: none

REFERENCES

1. Andrukhov O, Andrukhova O, Hulan U, Tang Y, Bantleon HP, Rausch-Fan X (2014). Both 25-hydroxyvitamin-D3 and 1,25-dihydroxyvitamin-D3 reduces inflammatory response in human periodontal ligament cells. *PloS one* **9:** e90301.
2. Baldini A, Nota A, Fanti E, Martelli FS, Ottomano C, Lippi G (2013). Association between periodontal disease and Interleukin-1beta +3953 and vitamin D receptor Taq1 genetic polymorphisms in an Italian caucasian population. *Annali di stomatologia* **4:** 191-195.
3. Boggess KA, Espinola JA, Moss K, Beck J, Offenbacher S, Camargo CA, Jr. (2011). Vitamin D status and periodontal disease among pregnant women. *Journal of periodontology* **82:** 195-200.
4. de Brito Junior RB, Scarel-Caminaga RM, Trevilatto PC, de Souza AP, Barros SP (2004). Polymorphisms in the vitamin D receptor gene are associated with periodontal disease. *Journal of periodontology* **75:** 1090-1095.
5. Dietrich T, Joshipura KJ, Dawson-Hughes B, Bischoff-Ferrari HA (2004). Association between serum concentrations of 25-hydroxyvitamin D3 and periodontal disease in the US population. *The American journal of clinical nutrition* **80:** 108-113.
6. Garcia MN (2014). Vitamin D may reduce periodontal disease prevalence in older men. *The journal of evidence-based dental practice* **14:** 39-41.
7. Garcia MN, Hildebolt CF, Miley DD, Dixon DA, Couture RA, Spearie CL, *et al.* (2011). One-year effects of vitamin D and calcium supplementation on chronic periodontitis. *Journal of periodontology* **82:** 25-32.
8. Grant WB (2011). A review of the role of solar ultraviolet-B irradiance and vitamin D in reducing risk of dental caries. *Dermato-endocrinology* **3:** 193-198.
9. Gunes S, Sumer AP, Keles GC, Kara N, Koprulu H, Bagci H, *et al.* (2008). Analysis of vitamin D receptor gene polymorphisms in patients with chronic periodontitis. *The Indian journal of medical research* **127:** 58-64.
10. Holick MF, Binkley NC, Bischoff-Ferrari HA, Gordon CM, Hanley DA, Heaney RP, *et al.* (2011). Evaluation, treatment, and prevention of vitamin D deficiency: an Endocrine Society clinical practice guideline. *The Journal of clinical endocrinology and metabolism* **96:** 1911-1930.
11. Hossein-nezhad A, Holick MF. Vitamin D for health: a global perspective. Mayo Clinic proceedings. 2013;88(7):720-55.
12. Inagaki K, Krall EA, Fleet JC, Garcia RI (2003). Vitamin D receptor alleles, periodontal disease progression, and tooth loss in the VA dental longitudinal study. *Journal of periodontology* **74:** 161-167.
13. Jabbar S, Drury J, Fordham J, Datta HK, Francis RM, Tuck SP (2011). Plasma vitamin D and cytokines in periodontal disease and postmenopausal osteoporosis. *Journal of periodontal research* **46:** 97-104.
14. Jimenez M, Giovannucci E, Krall Kaye E, Joshipura KJ, Dietrich T (2014). Predicted vitamin D status and incidence of tooth loss and periodontitis. *Public health nutrition* **17:** 844-852.
15. Joshipura KJ, Hung HC, Rimm EB, Willett WC, Ascherio A (2003). Periodontal disease, tooth loss, and incidence of ischemic stroke. *Stroke; a journal of cerebral circulation* **34:** 47-52.
16. Mack F, Schwahn C, Feine JS, Mundt T, Bernhardt O, John U, *et al.* (2005). The impact of tooth loss on general health related to quality of life among elderly Pomeranians: results from the study of health in Pomerania (SHIP-O). *The International journal of prosthodontics* **18:** 414-419.
17. Miley DD, Garcia MN, Hildebolt CF, Shannon WD, Couture RA, Anderson Spearie CL, *et al.* (2009). Cross-sectional study of vitamin D and calcium supplementation effects on chronic periodontitis. *Journal of periodontology* **80:** 1433-1439.
18. Millen AE, Hovey KM, LaMonte MJ, Swanson M, Andrews CA, Kluczynski MA, *et al.* (2013). Plasma 25-hydroxyvitamin D concentrations and periodontal disease in postmenopausal women. *Journal of periodontology* **84:** 1243-1256.

19. Moedano DE, Irigoyen ME, Borges-Yanez A, Flores-Sanchez I, Rotter RC (2011). Osteoporosis, the risk of vertebral fracture, and periodontal disease in an elderly group in Mexico City. *Gerodontology* 28**:** 19-27.
20. Myszka M, Klinger M (2014). [The immunomodulatory role of Vitamin D]. *Postepy higieny i medycyny doswiadczalnej* 68**:** 865-878.
21. Palacios C, Gonzalez L (2014). Is vitamin D deficiency a major global public health problem? *The Journal of steroid biochemistry and molecular biology* 144PA**:** 138-145.
22. Resmini G, Tarantino U, Iolascon G (2013). Vitamin D: role and opportunity to prescribe. *Aging clinical and experimental research* 25 Suppl 1**:** S125-127.
23. Schottker B, Jorde R, Peasey A, Thorand B, Jansen EH, Groot L*, et al.* (2014). Vitamin D and mortality: meta-analysis of individual participant data from a large consortium of cohort studies from Europe and the United States. *Bmj* 348**:** g3656.
24. Takahashi O, Yoshihara A, Nakamura K, Miyazaki H (2012). Association between periodontitis and systemic bone mineral density in Japanese community-dwelling postmenopausal women. *Journal of dentistry* 40**:** 304-311.

CONTRIBUTION OF LATERAL CEPHALOMETRIC RADIOGRAPH TO ORTHODONTIC TREATMENT PLANNING DECISIONS



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ABSTRACT

A variety of methods are available for the evaluation of dento-maxillary anomalies. The lateral cephalometric radiographprovides initial information with priority for orthodontic diagnosis; withal the treatment plan could not be performed without comparing a lateral cephalometric radiograph before and after treatment. This article describes the roles and limitations of conventionallateral cephalometric radiographs for orthodontic diagnosis.

Key words: *dento-maxillary anomalies, cephalometric, orthodontic diagnosis*

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INTRODUCTION

The diagnosis of a specific dento-maxillary anomaly can't be limited to clinical examination (4). Guidelines recommend lateral cephalometric radiographs in patients with dento-maxillary anomalies, with the rationale that patients are better managed when the orthodontic diagnosis is known. However, because of marked interindividual variability in the clinical manifestation of dento-maxillary anomalies, it can be argued that lateral cephalometric radiographs gives a more specific representation of pathology than clinical assessment (6).

Cephalometry in dento-maxillary anomalies has undergone revolutionary changes in the past 20 years with the wide availability of an unprecedented array of new techniques (5). In this study we present an overview of the current state of the field and future directions.

CEPHALOMETRIC ANALYSIS IN DENTO-MAXILLARY ANOMALIES

In the initial evaluation of orthodontic patient, the history is the most important component of the initial evaluation; it should be obtained from both the family and the patient. Family history should include questions about relatives who suffer from dento-maxillary anomalies. The aim of examination should be not only the cause detection, but also coexisting abnormalities that may exacerbate the patient's disability. The dental examination should be corrobotated to the lesions detection and signs of dento-maxillar system dysfunctions.

While analysis of study models is a more readily available technique, panoramic radiography is the simplest and least expensive imaging technique (Fig.1). However, cephalometry analysis dominates the orthodontic literature and allows more comprehensive dento-maxillary anomalies assessment (8). Methods of cephalometric measurement can be manual or semiautomated using computer software. From orthodontist's perspective, cephalometric analysis provides a context for assessing current radiological technologies as well as expected advances in diagnosis, prediction and outcome measures in dento-maxillary anomalies treatment (6).

Figure 1. Orthopantomograph

Presently, lateral cephalometric radiographs play a key role in ruling out pathological lesions of the jaws (Fig.2). Although dento-maxillary

anomalies are uncommon, the discovery of such finding dictates the need for a radiological study in the initial evaluation of every orthodontic patient.

Once the presence of a dento-maxillary anomaly has been established, the role of cephalometric radiographs in the diagnosis becomes a function of the clinical diagnosis. The accuracy of the clinical diagnosis of dento-maxillary anomalies is significantly. Even orthodontists with limited experience should have a diagnostic accuracy at this level.

A literature review revealed average values for sensitivity and specificity of clinical diagnosis of dento-maxillary anomalies.

Figure 2. Lateral cephalometric radiograph

So that the cephalometric analysis have a useful contribution to the diagnosis, the sensitivity and specificity of radiographs compared exceeds the clinical standard (3). Very few researches have addressed the accuracy of cephalometry studies as compared with clinical diagnosis. Since clinical diagnosis achieves relatively high levels of accuracy, profile cephalograms, as currently performed, offer only relatively modest incremental benefits for the diagnosis of dento-maxillary anomalies. On the other hand, cephalometric radiography contributes to diagnostic certainty of the skeletal anomalies.

The usual clinical methods to achieve this are sufficient for certain conditions. When these diagnoses are being considered in a particular individual, an orthodontist should have the opportunity to perform profile cephalometric radiographs. It may never be possible to quantify the added value of certainty in dento-maxillary anomalies diagnoses.

In contrast to their accuracy in diagnosing anomalies, current clinical techniques are poor in predicting which patients will develop dento-maxillary anomalies in the future.

Cephalometric analysis holds the promise of making an important contribution to identifying patients at risk for skeletal malocclusions (1). While the practical value of clinical observations is limited by lack of preventive therapies for dento-maxillary anomalies, cephalometric

analysis should play an important role in future efforts for preventing orthodontic pathologies, as more effective preventive strategies emerge. It is important to distinguish the early stages of anomalies but, unfortunately, this isn't always possible. Serial patient examinations at a period of time remain the proper path to achieve this goal.

The differential diagnosis of dento-maxillary anomalies is mostly based on careful clinical assessment, but radiological techniques may provide useful additional information (2).

Newer digital techniques may play a large role, although there is room for improvement in accuracy (9). The clinical availability of these systems is currently limited, but the role in the clinical and research environment remains to be fully established.

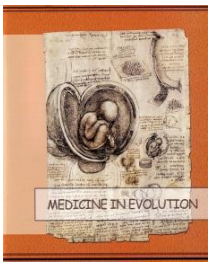
CONCLUSIONS

Diagnosis of dento-maxillary anomalies has improved over the past decades, but thorough assessment still cannot be quickly performed**.** Conventional cephalometry is still the most commonly used imaging technique for patients with a known or suspected diagnosis of malocclusion evaluation**.** Cephalometric analysis may be useful for both the early diagnosis as well as preclinical detection of dento-maxillary anomalies.

REFERENCES

1. Broadbent BH. A new x-ray technique and its application to orthodontics. *The Angle Orthodontist*.1981;51(2):93–114.
2. Jacobson A. Chicago, IL: Quintessence Publishing Co.Inc; Radiographic Cephalometry: From Basic to Video imaging. 2006: 53–61
3. Legan HL, Burstone CJ. Soft tissue cephalometric analysis for orthognathic surgery. *Journal of Oral Surgery*. 1980;38(10):744–751.
4. Moyers RE. Hand Book of Orthodontics. IVth ed. London: Mosby Publishers; 1988.
5. McNamara JA, Jr, Ellis E., 3rd Cephalometric analysis of untreated adults with ideal facial and occlusal relationships. Int J Adult Orthodon Orthognath Surg. 1988;3:221–231
6. Profitt W, Fields HW. Contemporary Orthodontics. 2nd ed. St Louis: Mosby Year Book; 1993.
7. Steiner CC. The use of cephalometrics as an aid to planning and assessing orthodontic treatment. Am J Orthod. 1960;29:8
8. Whaites E. *Essentials of Dental Radiography and Radiology*.Churchill Livingstone; 1996
9. Yu SH, Nahm DS, Baek SH. Reliability of landmark identification on monitor-displayed lateral cephalometric images. Am J Orthod Dentofacial Orthop. 2008;133:790.e1–790.e6

THE SHORTENED DENTAL ARCH – CONSIDERATIONS THROUGH GERIATRIC DENTISTRY



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ABSTRACT

***Objective**: Analysis of opinions and attitudes of a group of private-practice dentists from the urban environment in Romania, related to the concept of shortened dental arch (S.D.A.) based on a directly addressed questionnaire and the comparison of the results with similar study results.*

***Method**: A questionnaire with a series of questions regarding the shortened dental arch was designed for this study and sent to a group of dentists.*

***Results**: The rate of participation rate to the study was 83%. Most of the answers show that the participating dentists have enough experience and knowledge on the shortened dental arch. Mastication, comfort and aesthetics, in the context ofshorteneddental archwere rated asgood–satisfactory by the doctors.Patients' reactiontothe proposedtreatmentincludingshorteneddental archvaries fromfrequentacceptancetodenial.*

***Conclusions**: The participating doctors' attitude is generally positive regarding the concept of S.D.A.; caution was noted in assessing functionality in the S.D.A context.*

***Key words:** shortened dental arch, geriatric patients, functional dentition*

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INTRODUCTION

The "shortened dental arch" concept (S.D.A. / Shortened Dental Arch – S.D.A.) is correlated with the "minimum number of remaining teeth recommended by the World Health Organization (W.H.O. - Technical Report Series No. 826. WHO, Geneva; 1992 as objective in oral health, for a naturally functional dentition". This requires minimum 20 teeth in the oral cavity, including front teeth and premolars, a situation which is, however, less common. Inspecific circumstances related to the individualbio-psycho-social statusspecific to the geriatric persons, the shortened dental archisan interesting option, minimizing the riskof affecting the natural and remaining dental and periodontal structures focusing on maintaining the functionality of the oral cavity, and could be considered a strategy to reduce the complex treatments in the posterior areas of the dental arches for geriatric patients, mostly when systemic diseases or psycho-somatic syndromes are present.

The shortened dental arch was studied under various aspects, including the masticatory efficiency, occlusal stability, the impact on the temporo-mandibular join to rpatients'comfort. However, the specialized literature includes very few data regarding the dentists'attitude on the S.D.A and their recommendations forgeriatricpersons. The goalof our approachis, in thiscontext, to analyze theopinions, knowledge and attitude towardsS.D.A of a group of dentists, in urban areas, in Romania, inorder to shape future suggestions or strategies regarding university and post-graduate programsas well as public health policies.

MATERIAL AND METHODS

This study was run between 2013-2014, initiated and coordinated within "Carol Davila" University of Medicine and Pharmacy, Faculty of Dentistry, Department of Fixed Prosthodontics and Occlusology. We used 13-question questionnaires. The structure of the questionnaire emerged from the analysis and comparison of various articles in the specialized literature approaching this subject [1], [2], [3], [4], [5],[6]. This questionnaire was optimized by the Department of Fixed Prosthodontics and Occlusology and the Department of Orthodontics and Dento-Facial Orthopedics, under the coordination of a University Professor within the Dental Medicine Faculty, Carol Davila" University of Medicine and Pharmacy. The final questionnaire is clear, user friendly and includes relevant questions:

Nr.	Question	Answer 1	Answer 2	Answer 3	Answer 4
1.	How many years of **practice** do you have in dental medicine?	< 5 years	5-10 years	10-20 years	>20 years
2.	How long ago have you heard of the **„shortened dental arch"** concept?	< 5 years	5-10years	>10 years	never heard of it
3.	Which is the „**minimum acceptable number** of remaining teeth" recommended by the World Health Organization as oral health objective for a naturally functional dentition?	20	18	16	I don't know
4.	What **age group** is S.D.A recommendable to as a treatment	Youth	adults	Elderly	I don't know

	option, in general?				
5.	How often upon **initial oral examination** of your patients, have you noticed the S.D.A concept so far?	frequently	sometimes	very seldom	Never
6.	How often have you **included** the „shortened dental arch" concept in your patients' treatment, so far?	frequently	sometimes	very seldom	Never
7.	What was your **patients' reaction** when you proposed this treatment to them?	they always accepted	they often accepted	they seldom accepted	other variants than the above mentioned (did not accept, we did not propose, etc)
8.	Do you think that the „shortened dental arch" provides **masticatory efficiency** to your patients?	very good	good /sufficient	scarcely acceptable	Insufficient
9.	Do you think that in case of shortened dental arch, the **esthetic** is:	very good	good /sufficient	scarcely acceptable	Insufficient
10.	Do you think that the **comfort** of the persons with shortened dental arch is:	very good	good /sufficient	scarcely acceptable	Insufficient
11.	In case of shortened dental arch, do you think that **phonetics** is:	very good	good /sufficient	scarcely acceptable	Insufficient
12.	Shortened dental arch may generate problems in the temporomandibular joint:	frequently	sometimes	very seldom	I don't know

13.For the geriatric patient (over 65 years) the shortened dental arch may bring some benefits; Please order the statements below (1 – the most important advantage, 4 – the least important):

	It can be applied to the patients with counter indications for more complex dental interventions (general diseases, psychological and kinetic dysfunctions)
	It facilitates the enforcement of individual oral hygiene rules
	It enables keeping the naturalteeth longer time
	Patients are less financially challenged

The informed agreement of the participants in this study has been obtained and signed in advance. The initial group of participants consisted of 60 persons and we distribute the due number of questionnaires; only 50 persons accepted to participate in this study and responded to this questionnaire. These 50 persons responded fully and integrally to all questions, we noticed no incomplete questionnaire. The data from the answers to the questionnaire were selected, analyzed and synthesized into tables for each question in the questionnaire.

RESULTS AND DISCUSSIONS

Out of the 60 dentists proposed to participate in this study and offered this questionnaire to, 50 have responded (83,3%). The doctors who did not agree with their participation in this study were excluded from it. The distribution of the respondents' years of practice is shown in **chart no. 1.** Most practitioners (56%) have 5-10 years of practice in dentistry, and 30% have over 20 years. It may be considered that the participants in this

study have an early experience in dental medicine. The concept of shortened dental arch has been **known**, as shown in **chart no. 2**, by 60% of the doctors participating in this study, for 5-10 years, by 24% for less than 5 years and only 10% for more than 10 years; 6% of the participants are not aware of this concept. Consequently, even though the number of years of experience in practical dentistry is very important, the awareness over this concept is relatively recent. **Chart no. 3** shows the distribution of the answers to the question: „Which is the „**minimum acceptable number** of remaining teeth" recommended by the World Health Organization as oral health objective for a naturally functional dentition?" It is obvious that the correct answer (20 teeth) prevailed (92%) of the answers, but still it is interesting that 8% of the questioned doctors do not know the correct answer.

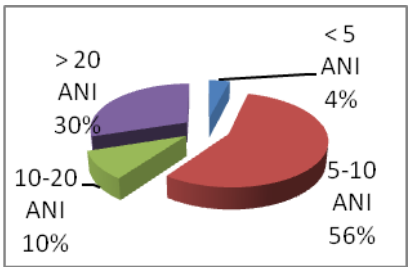


Chart 1. Years of practice

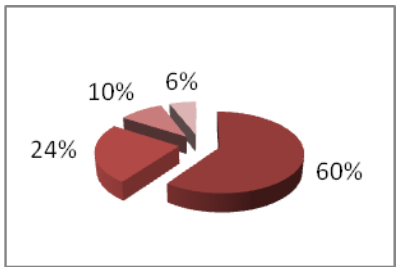


Chart 2. Awareness over S.D.A. concept

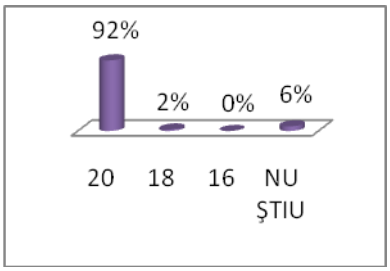


Chart 3 Minimum acceptable number of teeth

Regarding the age range that the respondents believe the shortened dental arch (S.D.A.), **is mainly recommended to**, it may be shown in **chart no. 4** a majority correct answer (94%), the recommendation is - of course – oriented towards the elderly. It is remarkable that no respondent recommended the S.D.A. to young patients. Still there are 4% of the doctors who do not know the answer. During the initial oral examination 56% very seldom noticed the presence of shortened dental arch, 18% never noticed it, 24% sometimes/low frequency and only 2% frequently noticed the **presence** of the shortened dental arch, as shown in **chart no. 5**. This distribution of answers show that this variant of treatment is seldom proposed and/or accepted. The distribution of the answers regarding the introduction of the shortened dental arch concept in the **treatment plan** is presented in **chart no. 6**: percentage of doctors who have never recommended the S.D.A. (30%) and those who very seldom recommend it (44%) are dominating; 12% of the doctors frequently recommend it and 14% - sometimes/ with moderate frequency.

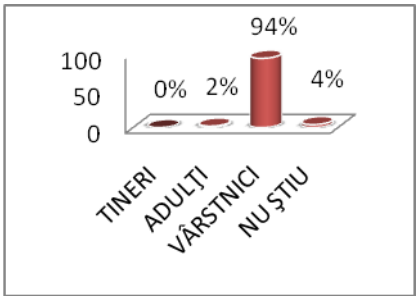


Chart 4. Age range for S.D.A. reccomandation

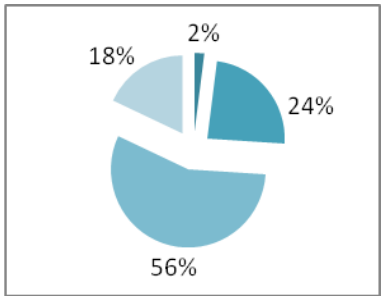


Chart 5. S.D.A. found at initial oral examination

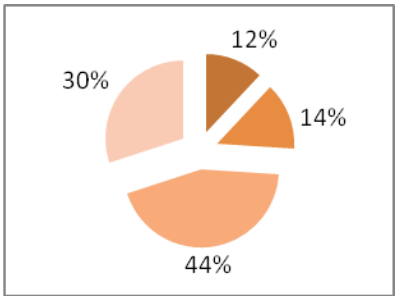


Chart 6. S.D.A. included in the treatment plan

Chart no. **7** shows the **patients' reactions as seen by the doctors,** when they were proposed such a treatment; answers vary from re-comforting answers – "have frequently accepted" (44%) and "have always accepted" (8%) – up to 16% of the patients who seldom accepted, along with a significant 30% which included various situations such as: have not accepted the treatment, or they were not proposed the treatment, etc.

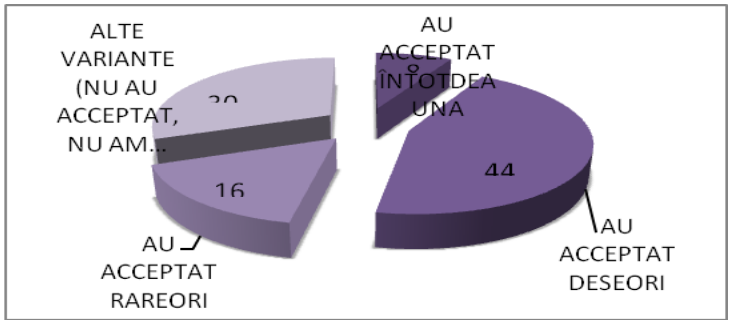


Chart 7. Patients' reactions when the S.D.A treatment was proposed to them

Charts no. 8, 9, 10 and 11 show the distribution of the doctors' answers regarding the efficiency of mastication, the aesthetic aspect, comfort and phonetics in terms of the shortened dental arch (S.D.A.). It may be noticed that most participants considered the mastication, esthetics and comfort as satisfactory as far as the S.D.A is concerned: masticatory efficiency: – 68%; esthetics– 64%; comfort – 52%. It is interesting that no participant considers that the S.D.A. provides very good masticatory efficiency (**Chart no. 8**). Also, according to **charts no. 9 and11**, in 30% of the answers, the esthetics is considered very good as far as the S.D.A. is concerned, and in 58% of the answers, phonetics is considered very good (majority of answers, compared to 40% good and 2% acceptable). **Chart no.10** shows 42% of the answers indicating an acceptable comfort, but with compromises, as far as the S.D.A is concerned, compared to the majority 52% percentages (indicating sufficient comfort), already mentioned.

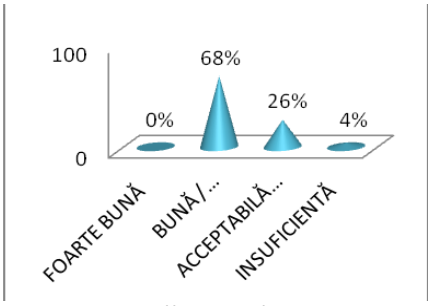


Chart 8. Masticatory efficiency for S.D.A.

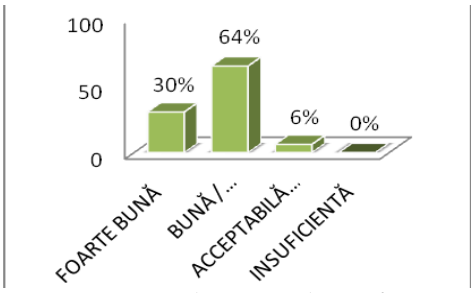


Chart 9. Esthetics for S.D.A.

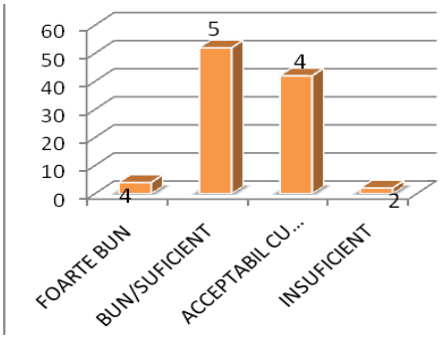


Chart 10. Comfort associated with S.D.A

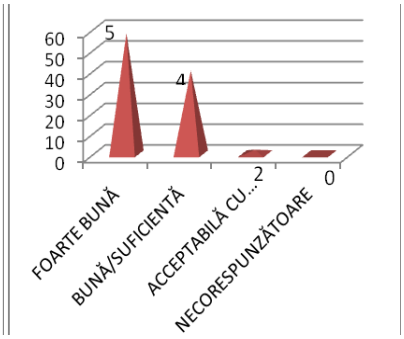


Chart 11. Phonetics associated with *S.D.A*

To the question regarding any possible problems that may be generated by the shortened dental arch at the level of the temporomandibular joint, the participants to the study had a majority answers - 82% - that they may sometimes occur and 12% that they may very seldom occur. The result shows the caution in recommending this treatment. (**Chart no. 12**).

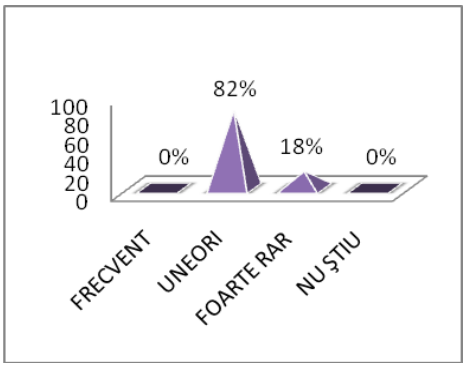


Chart 12. T.M.J. problems

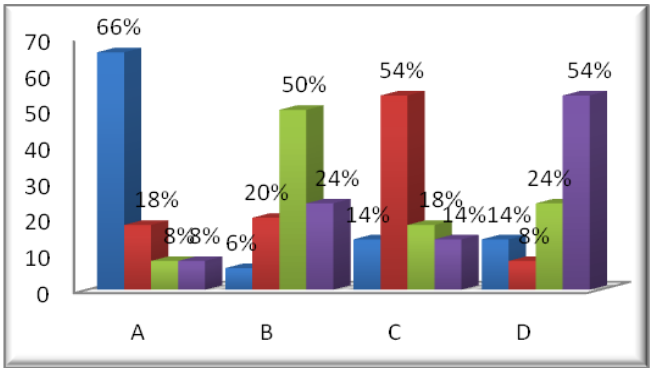


Chart 13. S.D.A. benefits for the geriatric patients

In the last section of this study the patients were invited to order, according to their importance (1 – most important advantage, 4 – least important), certain advantages of the S.D.A regarding the elderly patients. As shown in chart no. 13, the participants in this study considered that the most important advantage of the S.D.A for the elderly is that "it may be applied to the patients with counter-indications for more complex dental interventions (general diseases, psychological and kinetic dysfunctions)" – 66% voted it as the most important one.

The second place in terms of importance was held by the advantage that the S.D.A. "enables keeping the natural teeth on the arch for a longer period of time" - 54%. The third place was held by the advantage that "it facilitates the individual oral hygiene techniques" – 50%, and on the last place: the advantage that "the patients are less financially challenged" – 54%.

Our results are generally similar to other studies' [1], [2], [4], [6]. Still it is to be noticed that although most participants in our study considered mastication, physiognomy and comfort as satisfactory within the S.D.A (masticatory efficiency – 68%; physiognomy – 64%; comfort 52%), other studies showed different values , for example 87%, 80% and 82% [7]. Given these aspects, the results of this study are closer to the results of Kumar et al [5]: mastication is considered satisfactory by 57% of the doctors, the esthetics is considered satisfactory by 77%, and the patient's comfort is assessed as good by 57% of the doctors.

It may also be noticed in this study the difference in the patients' reaction when they were proposed the S.D.A as a variant of treatment (16% of the patients seldom accepted it, and 30% of the patients includes various situations such as – they did not accept the treatment, or they were not proposed this treatment); as a comparison there is the answer form other studies in which, for example, only 7% of the patients refused this treatment [7]. This difference may be justified by the recent progress in oral implants that provides more complex ways of oral rehabilitation.

The limits of this study are connected to the low number of participants; our approach is the argument to continue this research on a larger batch of participants, with high response rate and statistic processing of the data.

CONCLUSIONS

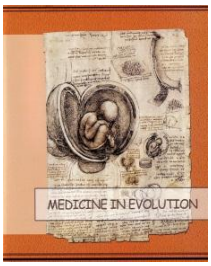
The following conclusions emerged from our analysis: the dentists participating in this study have enough **knowledge** and experience regarding the S.D.A even if the information acquired is rather recent - this last result is connected to the participants' number of years of practice in dental medicine; the shortened dental arch, as a **treatment option**, is still seldom proposed by dentists - this outcome is also justified by the fact that the presence of the shortened dental arch is very seldom noticed upon the initial clinical examination; **the masticatory efficiency, the comfort and the aesthetics** as far as the shortened dental arch is concerned, were assessed as good/satisfactory by the doctors with the comment that the results of this study are different in terms of value form the corresponding results of other studies; **the patients' reaction** to the proposal of a treatment which included the shortened dental arch varies from frequent acceptance to refusal, noticing that the caution reaction or refusal is more important than the reaction revealed by the previous studies; the participants in this study agree that for the elderly the most important advantage brought in by the S.D.A is that "it may apply to the patients with counter-indications for more complex dental interventions (general diseases, psycho-kinetic dysfunctions)".

ACKNOWLEDGEMENT: ***This paper is supported by the Sectoral Operational Programme Human Resources Development (SOP HRD), financed from the European Social Fund and by the Romanian Government under the contract number*** **POSDRU/159/1.5/S/137390/**

REFERENCES

1. Finbarr Allen P, Witter DJ, Wilson NHF. A survey of the attitudes of members of the European Prosthodontic Association towards the shortened dental arch concept. Eur J Prosthodont Restor Dent 1998; 6: 165-169.
2. Finbarr Allen P., Witter DJ, Wilson NH, Kayser AF. Shortened Dental Arch Terapy: Views of consultants în restorative dentistry în the United Kingdom. J Oral Rehab, 1996; 23: 481-485.
3. Kano et al: A review of the shortened dental arch concept focusing on the work by the Käyser/Nijmegen group; Journal of Oral Rehabilitation 2006; 850-862.
4. Korduner EK, Bjorn Soderfeldt, Mats Kornstrom, Krister Nilner: Attitudes toward the shortened dental arch concept among swedish general dental practitioners. The International Journal of Prosthodontics, Vol 19, Nr 2, 2006: 171-6.
5. Kumar PC, George S: An assesment of prosthodontists'attitudes to the shortened dental arch concept. J Interdiscip Dentistry 2012; 2: 104-7.
6. Mayank Singh, Arvind Tripathi, Neerja Raj, D. Singh: Evaluation of masticatory performance în subjects with shortened dental arch: A comparative study. European Journal of General dentistry, Vol 3, Issue 2, may-aug 2014: 46-9.
7. Witter DJ, Allen PF, Witter DJ, Wilson NH, Kayser AF. Dentists' attitudes to the shortened dental arch concept. J Oral Rehab, 1997; 24: 143-147.

MAXILLARY TOOTH TRANSPOSITION: CHARACTERISTICS AND TWO NON-EXTRACTION CLINICAL CASE REPORTS



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ABSTRACT

Transpositionis an eruptive disturbance in which two permanent teeth interchange their position within the same arch quadrant. Tooth transposition is a developmental anomaly that may create problems from both esthetic and functional points of view. Studiesindicate higher prevalence of Mx.C.P1transposition compared to other types of transposition. Furthermore,literature also indicates ahigher prevalence among females. The aim of this article is to present two clinical cases of unilateral Mx.C.P1 transposition in which natural alignement was obtained, describing diagnosis and treatment considerations.

Key words: *transposition, ectopic eruption, fixed appliance*

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INTRODUCTION

The term ectopic eruption is often used in a wide sense to refer to any aberrant and abnormal eruption path taken by a tooth. Tooth transposition is defined a form of ectopic eruption in which apermanent tooth develops and erupts in the position naturally occupied by another permanent tooth.[1]Therefore, the ectopic tooth changes the natural order of the tooth sequence in the dental arch. It is a relatively raredevelopmental dental anomaly.

Tooth transposition often has affectsesthetic and functional aspects. Considering these aspects, it is important to knowthe the etiology and prevalence of this anomaly in order to minimize its longterm effects and establish possible preventive measures.The maxillarypermanent canine is the tooth most frequentlyinvolved. Ethiological factors such ascongenitally missing or peg-shaped maxillary lateralincisors, rotations, malpositions of the adjacentteeth and retention of the deciduous canines, aret often associated with transposition.[1,3,4]

Other factors like developing tooth buds interchanging their position[2,5],trauma, mechanical interferences, bone disease, tumors or cysts[1,2]and early loss of incisors[3] have been associated with tooth transposition.Although there are several theories concerning this subject, the etiology of transposition is still unclear[13,14,15,16,17].

Prevalence

According to the results of Papadopoulos et. al.[3], the average prevalence of tooth transposition was found to be 0.33%. This percentage was lower compared with the corresponding ones found in other published reports in the existing literature among various ethnic groups suggesting that tooth transposition might be considered a rare phenomenon.

Gender incidence of tooth transposition varied according to the type of transposition considered[7]. Occurence of both unilateral and bilateral transposition was recorded[6]. Although the bilateral form may appear, the unilateral occurrence is found more often, with a left side dominance[1].

There is no recorded case of simultaneous occurrence in both dental arches. Tooth transposition in primary dentition was not recorded either.

The maxillarypermanent canine is the tooth most frequentlyinvolved :transpositionbetweenthe canine and first premolar appears in 70% of cases in the maxillary arch, followed by the onebetween canine and lateral incisor in 20% of the cases.[2,9]Mandibular lateral incisor-canine transpositions, were also identified.[6]

Classification

On the basis of anatomic factors. 5 types of maxillary tooth transpositions have been identified and abbreviated according to the teeth involved. Peck and Peck [8] conducted a wide review of case reports (201 cases) of toothtranspositions in the maxillary arch and established the classificationbased on anatomical factors. As a result, transpositions can be systematically classified as follows,in decreasing order of frequency:maxillary canine - first premolar (Mx.C.P1), maxillary canine - lateral incisor (Mx.C to I2), maxillary canine - first molar (Mx.C to M1), maxillary later incisor - central incisor (Mx.I2 to I1), maxillary canine - central incisor (Mx.C to I1).

In the classification, the maxillary canine interchanges its natural position with another permanent tooth in four of the five types, with the exception of lateral incisor-central incisor transposition.

CLINICAL CASE 1

Diagnosis

Pacient B.E. is a 15 year old girl with permanent dentition and good oral and general health. Her chief complaint was her smile esthetics when she presented herself at the practice in October 2012. In order to place a correct diagnosis of the malocclusion, initial facial(Fig. 1) and intra-oral photographs were taken(Fig. 2).

Figure 1. Initial facial photographs: front, front smile, profile

Figure 2. Intra-oral view of malocclusion.In the upper right quadrant the interchange of position between the right upper canine and right upper premolar is clearly visible

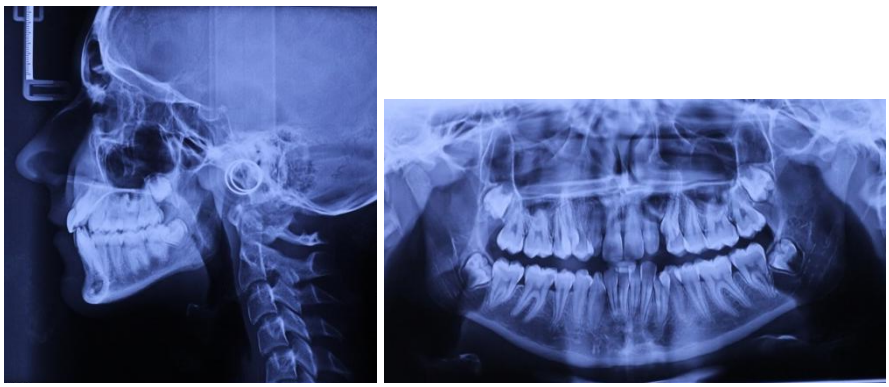


Figure 3A. Radiographic examinations showing complete transposition of right upper canine and right upper premolar

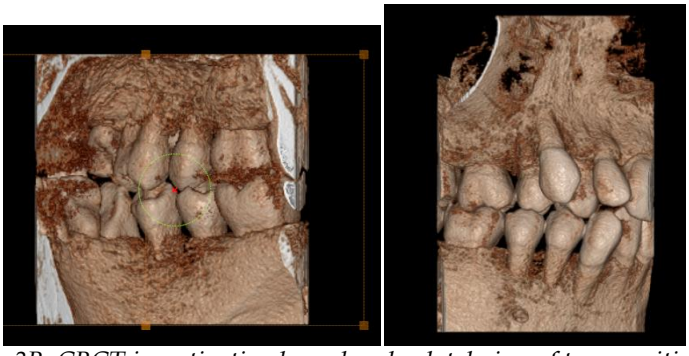


Figure 3B. CBCT investigation buccal and palatal view of transposition site

Further investigations included a plaster model and panoramic and cephalometric radiographs (Fig.3A).In order to assess the bone quantity at the transposition site the pacient was asked to undergo a 3D CBCT investigation. As a result of analyzing the above investigations together with the clinical examination the following observations were made: the patient showed no facial asymmetry with normal soft tissue parameters.The facial profile was convex and showed a slight strain during lip closure. The intra-oral examination revealed a severe malposition in the right upper quadrant, an ectopic canine in the left upper quadrant and crowding in the lower arch. Oral hygiene was satisfactory, and the periodontiumhealth good, with adequately attached gingiva. The plaster model analisys showed that she had a severe arch length deficiency in both upper and lower arches and that she was a molar Cls. II.

Overjet and overbite were within normal values. A 2mm lower midline shift was observed. Radiographic examinationscorroborated the clinical findings and defined the malposition in the upper right quadrant as a complete transposition of the upper right canine and upper right premolar. The canine root was parallel to the root of the second premolar and was positioned between the right first premolar and right second premolar.

The cephalometric radiography data showed a slight posterior rotation of the mandible and a dolichofacial pattern.

Treatment considerations

Given all the information both clinical and paraclinical investigations provided, in this case, a non-extraction approach was chosen. Moreover, in the end a natural alignment of the upper arch was among the final objectives.

Figure 4. Treatment sequence from bonding until final upper arch alignment. Initially, the upper right canine was guided in its natural position. Space was made for the upper first right premolar using Niti open coil

Upper arch was bonded with 022 Roth prescription brackets and molar tubeson the first molars. Later on buccal tubes were bonded to second molars as well. An014 NiTi wire was placed to align the upper arch and the right canine was slowly guided closer to the lateral incisor (Fig.4). Space was obtained for the right upper first premolar through arch alignment and with the aid of NiTi open coils. Four months into the treatment the lower brackets were bonded.

CLINICAL CASE 2

Diagnosis

Pacient C.D. ,15 years old presented herself to the practice in April 2013 and her main complaint was the ectopic eruption of her left upper canine.

All routine investigation were performed including a 3 dimensional CBCT in order to have a better view of the bone around the malpositioned teeth.The ectopic canine had almost no cortical bone coverage.

Facial and intraoral photographs(Fig. 5) were taken and a first clinical examination was undergone. No facial asymmetry was noticed. The facial profile was concave with a protrusive lower lip. Gingival color and texture were normal. Oral health and hygiene were satisfactory Analysis of the plaster models revealed a Cls. III molar relation with 0mm overjet and 0 mm overbite. The lower midline was 2 mm shifted to the left. An ectopic eruption of the upper left canine was recorded. After analysis of the panoramic and cephalometric radiographs (Fig. 6) the malocclusion was classified as a complete MxCP1 transposition.

Figure 5. Intra-oral and facial photographs at beginning of treatment. Smile esthetics are compromised and facial profile is concave. In the upper left quadrant a malposition of the canine and first premolar was observed along with a carious white spot lesion on the buccal side of the upper left canine

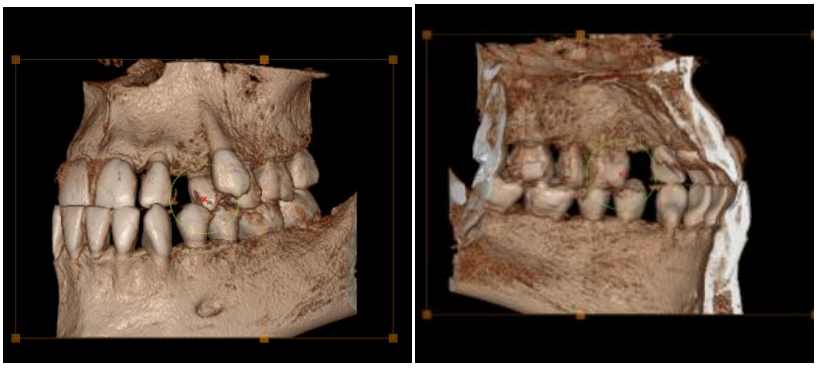


Figure 6. Radiographic investigations corroborating MxCP1 transposition diagnosis

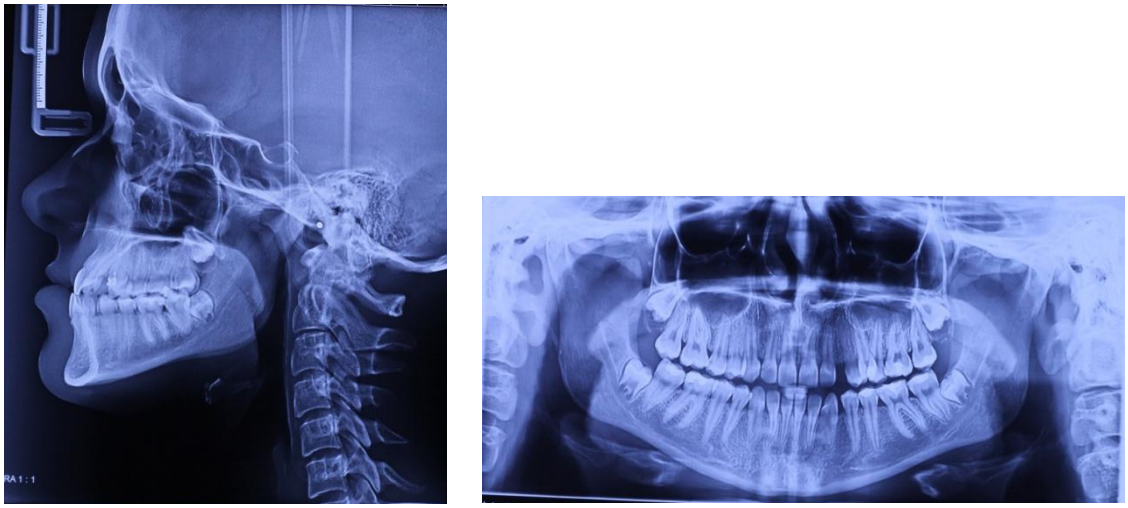


Figure 6. Radiographic investigations corroborating MxCP1 transposition diagnosis

Treatment considerations

Both clinical and paraclinical investigations suggested a non-extraction approach in this case. No arch length deficiency, lack of overjetand overbite, and the cls. III tendency were all in favor of the chosen treatment plan. A natural alignment of the upper arch was among the objectives, with special attention given to the amount of bone in the area of the transposition.

Figure 7. Bonding of fixed orthodontic appliance and arch alignment of transposed upper left canine and first premolar in natural position with visible improvement of smile esthetics

Upper arch was bonded with 022 Roth prescription brackets and molar tubes on the first molars. Later on buccal tubes were supposed to be bonded to second molars as well, but it was delayed given that the patient developped cavities on the buccal side of these teeth. An 012NiTi wire was firstplaced in the upper arch. The upper left canine was guided into its natural position. The first left upper premolar was then aligned. Leveling of the occlusal plane and upper arch alignment led to a minimal overjet and overbite, improving the overall smile even before the end of treatment (Fig. 7).

DISCUSSIONS

Pediatric dentists, using a radiographic examination when the patient is between 6 and 8 years of age can provide a timely detection of variations in theposition of teeth and makes interceptive treatment possible, especially in caseswhere there is retention of the deciduous teeth[1,3,4]. Procedures including extraction of deciduous teeth and placement of eruption guides for the permanent teeth are part of the prevention treatment and offer beneficial influence to case evolution[5], preventing complete development of the anomaly.

Both cases disscused in this case report seeked orthodontic assitance around the age of 15. Early diagnosis of

a developing transposition would have been extremely important and would have had a great influence on prognosis. When transposition is detected at a later stage, after full development of the anomaly, there is a greater risk of root interference and damage to both the roots and supporting structures[10]. Therefore,the prefered sequencewithin the dental arch is the one that can be obtained with less detrimental effect on both teeth and periodontium.As a general rule, it is not advisable to correct a transposed tooth order because of insufficient buccopalatal width of bone support when two overlapping teeth are moving in different directions.[5, 12] Moreover, gingival recession around the repositioned canines is a possibility given the long journey of the canine through the dense buccal compact bone.[5, 11, 12]

MxCP1 transposition in adult patients allows consideration of several treatment options, with or without extraction of the premolar[9].The problem in restoring the natural tooth order is prolonged orthodontic treatment due to difficulties in root movement.[10,12]

Even so,keeping the unnatural tooth sequence should take into consideration that alterations to the premolar are needed. The differences in the size, shape, and tooth color between canine and premolar sometimes cause anterior esthetic problems, and the palata cusp of the premolar often causesfunctional interference.

The gingival contour of the premolar is lower relative to the canine, requiring a gingival recontouring procedure.[5, 11]

In nonextraction treatment, generally the position of transposed teeth is maintained,but in some cases, as shown in the present case report, natural tooth order can be achieved.Treatment with premolar extraction is considered analternative,and is preferred when there is a severe arch length deficiency.

CONCLUSIONS

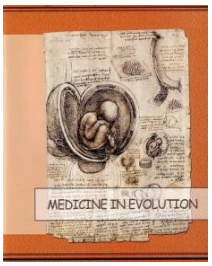
Tooth transposition is rare and has recorded occurance in various populations, affecting both genders in a similar manner. Esthetics, occlusion, treatment period, patient comfort, patient cooperation, periodontal support are factors that affect the treatment results and should be considered when treating transpositions, in order to achieve optimal results. The complexity of the orthodontic treatment needed to correct tooth transpositions can be reduced through prevention or interception.

REFERENCES

1. Shapira Y, Kuftinec MM.: Maxillary tooth transpositions: characteristic features and accompanying dental anomalies. Am J Orthod Dentofacial Orthop. 2001;119:127–134.
2. Peck L, Peck S, Attia Y.: Maxillary canine-first premolar transposition, associated dental anomalies and genetic basis. Angle Orthod. 1993;63:99–110.
3. Papadopoulos MA, Chatzoudi M, Kaklamanos EG: Prevalence of tooth transposition. A meta-analysisAngle Orthod. 2010 Mar;80(2):275-85. doi: 10.2319/052109-284.1.
4. Allen WA. Bilateral transposition of teeth in two brothers: Br Dent J. 1967;123:439–440.
5. Chattopadhyay A, Srinivas K.: Transposition of teeth and genetic etiology. Angle Orthod. 1996;66:147–152.
6. Weeks EC, Power SM.: The presentations and management of transposed teeth. Br Dent J.

1996;181:421–424.
7. Shapira Y, Kuftinec MM:. Tooth transpositions—a review of the literature and treatment considerations. Angle Orthod. 1989;59:271–276.
8. Peck S, Peck L.: Classification of maxillary tooth transpositions. Am J Orthod Dentofacial Orthop. 1995;107:505–517..
9. Shapira Y, Kuftinec MM.: Orthodontic management of mandibular canine-incisor transposition. Am J Orthod. 1983;83:271–276.
10. Laptook T, Silling G.: Canine transposition – approaches totreatment. J Am Dent Assoc. 1983; 107: 746-8.
11. Kurodaa S, Kurodab Y.: Nonextraction Treatment of Upper Canine–Premolar Transposition in an Adult Patient. Angle Orthod 2005; 75:472–477.
12. Babacana H, Kilic B, Bicakci A.: Maxillary Canine-First Premolar Transposition in the Permanent Dentition. Angle Orthod. 2008.78(5): 954 – 960.
13. Singh, Sharma, Tandor, Nagar, Singh: Maxillary Canine-First Premolar Transposition. A Case Report. J Indian OrthodSoc 2006; 39; 14-19.
14. Beatriz Silva CâmaraMattos&colab.: Tooth transposition – A literature review and a clinical case. Braz J Oral Sci. January-March 2006 - Vol. 5 - Number 16.
15. Kavitha P.R., Vivek P. ,BharatiLambha: Tooth Transposition – A Review. Indian Journal of Dental Sciences.www.ijds.in.
16. Negi K.S.,: Maxillary Canine Transposition to Incisor Site: A Case report. The Orthodontic CYBERjournal, March 2010.
17. Francisco Ajalmar Maia: Orthodontic Correction of a Transposed Maxillary Canine and Lateral Incisor. Angle Orthodontist, Vol. 70, No. 4, 2000.

TRISMUS – A COMMON COMPLICATION IN DENTAL AND MAXILLO-FACIAL PRACTICE



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ABSTRACT

Trismusis defined astemporary spasms of the mastication muscles resulting in the inability or limitation of mandibular movements and in opening the oral cavity to the maximum amplitude. The word trismus comes from the Greek"trismos", translate as lattice,barrier.

Key words: *trismus, mouth opening,spontaneous remissions*

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INTRODUCTION

The normal range of mouth opening varies from patient to patient, between 40-60 mm, although some authors consider normal opening at 35-60 mm. The normal lateral movement of the mandible is 8–12 mm.There are several factors that influencemouth opening: age, sex (men open the mouthwiderthan women), ascending ramus height, gonion angle opening.

In the medical literature, uniform criteriafor define the trismusmissing, and there are several much different opinions: mouth openingless than 20mm, mouth openingless than 40mm. The severity scale of trismus can be: average (30-40 mm), moderate (15-30mm), severe (less than 15mm). Most authors consider that the mouth opening less then 35-40 mm require functional supervision.

Inpractice, the opening can be appreciated by placing fingersin the mouth, between the front teeth. The width of the fingers at the nail bed is around 17 and 20 mm. Thus, two fingers breadth (35-40 mm) up to three fingers breadth (50–60 mm) is the usual width of opening.[1, 2, 3].

Figure 1. Three fingers breadth opening the mouth

MATERIAL AND METHODS

The purpose of this study was to make an updated presentation of the disease (conditions in which trismus occurs, its duration and characteristics), to present an overview of the management protocol for trismus in Timişoara Oral and maxillo-facial departement, and to analyze the response to initiated treatment.

Table I. Patients studiedstructure

Pacient	Age	Sex	Trismus age	Etiology
1	27	M	1 day	Infection
2	34	M	1 day	Infection
3	22	F	2 days	Infection
4	47	F	3 days	Infection
5	53	F	1 day	Infection
6	36	F	1 day	Infection
7	32	M	1 day	Trauma
8	56	M	15 days	Malignant tumor
9	53	M	12 days	Malignant tumor
10	33	M	3 days	Chronic oral ulcer

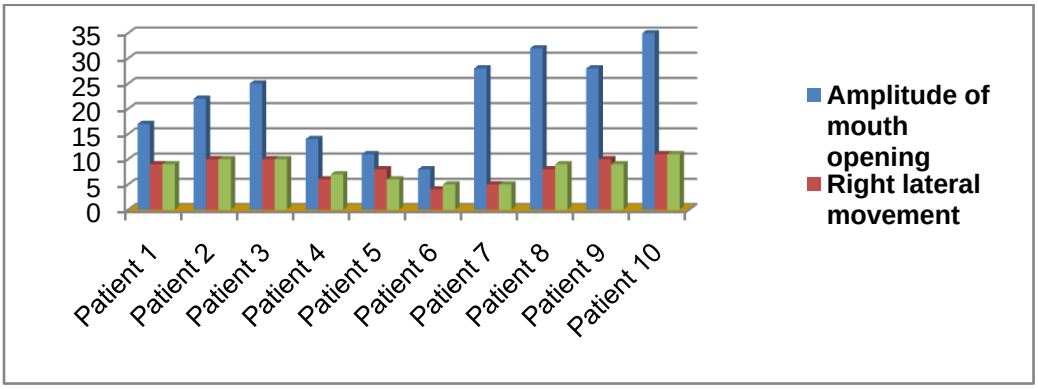


Table 2. Amplitude of mouth opening, right and left lateral movement in studied patients

ETIOLOGY OF TRISMUS

The etiology of trismus may be classified as follows:

- Oral, facial and cervical infection:
- Odontogen infection (pulpitis, periodontitis, perimaxillary abscess)
- Nonodontogen infection (faringo-amigdalitis);
- Oral, facial and cervical trauma (contusions, wounds, fractures);
- Oral, facial and cervical tumours (maxillary, mandibular, temporal, masseteric, oral tumours);
- Dental treatment (posterior teeth endodontics or extraction, troncular anesthesia, etc.);
- Temporomandibular joint disorders;
- General infectious disease (meningitis, encefalitis, tetanous);
- CNS disorders (multiple sclerosis, Parkinson disease, epilepsy, brain tumors);
- Miscellaneous disorders (hysteria, lupus erythematosus)
- Drugs (neuroleptics, phenothiazines, halothane).

Figure 2. Three cases of trismus, caused by: oral infection, facial trauma, oral tumour

Some dental treatments that can cause trismus are:

- Anesthesia (followed by hematoma and infection)
- Anesthesia (followed by nerve damage)
- Anesthesia (followed by muscle damage)
- Endodontic treatment and extraction, especially in the posterior mandible and maxillary teeth.[4,5,6,7]

CLINICAL MANIFESTATION

The most obvious effect of trismus is difficulty in opening the mouth, installed so slowly that the patient may not notice it,till can only open the mouth to 20 mm or less. Trismus frequently results from:

- inflammatory infiltration of tissues (muscles);
- muscle, nerve and vessels damage in trauma;
- central nervous system dysfunction;
- a combination of this factors.

The limitation in mouthopening is sometimes accompanied by difficulties in speech and swallowing, xerostomia, mucositis, headache, ear ache, jaw pain, deafness.

Problems caused by trismus

Eating issues

The inability to open the mouth to receive a small amount of food makes eating quite difficult and results in reduced nutrition. Weight loss in a short period of time of more than 10% of initial body weight is considered significant, and indicates nutritional problems.

Figure 3. Cachexiain a patient with severe oral trismus caused by an oral malign tumour

Oral hygiene issues

Limited mouth opening can result in compromised oral hygiene, that will cause: dental caries, periodontal diseases, oral mucosa diseases.

Speech issues

Patients with limited mouth opening also present speechdificulties. This happen whenorgans involved in the speech mechanism are unable to create normal sounds.

Joint issues

The inability to open the mouth will cause degenerative changes within the joint (which may mimic arthritic changes). If trismus is longer lasting, the initial degenerative process may become permanent.

Muscle degenerative changes

Masticatory muscles atrophy, manifested by reduction in muscle mass, as well as shortening of muscle fibers is observed within days of immobilization. [1,2,3].

DIAGNOSIS

For a proper trismus diagnosis, the dentist must be able to obtain a history and a thorough clinical and radiograph examination. Acompletedifferential diagnosis is important too.

Clinical examination includes history, inspection, palpation. We are interested in the trismus history, history of dental and periodontal diseases, any difficulties with speech and swallowing, medication taken, recently tetanus vaccination.

Head and neck examination will follow:

- facial symmetry
- swelling
- maxillary fractures

- adenopathy

Oral cavity examination will follow:

- oral swelling
- condition of teeth
- condition of tonsils, soft palate, oropharynx

Imaging examination will follow:

- dental and panoramic radiographs
- CT scan and MRI

Stegenga (1993) imagine a questionnaire of functional disturbance in trismus:

- Work and/or current activities
- Biting a bulky food
- Chewing hard, resistant food
- Speaking
- Drinking
- Laughing
- Kissing
- Yawning [7,8,9,10]

Differential diagnosis

It is important for the dentist to be familiar with the differential diagnosis of limited jaw opening:

- *Mandibular constriction*, defined asprogressive, but ***permanent*** limited jawmovements.

There are somemechanismsthat inducemandibular constriction:

•constriction caused by periarticular condition (suppurations, articular trauma, periarticular surgery), with a scar transformation of joint capsule and ligaments.

•constriction caused by muscular condition (sclerosisorhypertonia), following muscle in juries, intramuscular foreign body, vicious consolidated mandible fractures, long suppurations, radionecrosisof the mandibular ramus

•constriction caused by cutaneous and mucous condition (scars), after trauma with loss substance, burns of the face, long suppurations, oras sequelae of multimodal treatmentof facial malignancy (post surgical, postradiation)

- *TMJankylosis*, which presentvery smallamplitudeor nomovements in opening the mouth, laterality and protrusion, caused by fibrousorbone TMJ transformation. Radiography specify the diagnosis

- *Simulation*[11].

TREATMENT

Some small difficulties in opening the jaw on the day following an anesthesia of superior alveolar or inferior alveolar nerves is frequently encountered. For this category ofpatients, the practitioner should prescribe the following:

- heat therapy (hot towels on the affected area for 15–20 minutes every hour)
- analgesics (aspirin, diclofenac, ibuprofen)
- muscle relaxants to manage the muscle spasm
- antibiotics (for 7 days)
- soft diet

However, if the examination reveals the presence of limited mouth opening (trismus), treatment should begin as soon as possible. If treatment is delayed, reopening the mouthtonormal sizewill be moredifficult.

During this periodof the disease, the most important treatment is the mechanotherapy (opening-closing the mouth, andlateral movements of the mandible).For this purpose,can be usedsimplemechanical devices(mechanical mouth opener, Heister mouth opener), or speciallymanufactureddevices (Facial Flex device, DynasplintTrismus System, Therabite System, Therapacer System, etc.).

Figure 4. Mechanical mouth opener and Heister mouth opener

Some benefits of the mechanotherapy are:

- improving local circulation
- reducing inflammation
- elongation of muscle fibers
- joint mobilization.

Others physical methods commonly used are: ice/heat applications, facial massage, ultrasound. Not at least, the removal ofan identified causeoftrismus must beperformed.

Therapy should be continued until thepatient is free of symptoms. Further dental treatments in the involved region should be avoided until symptoms resolve and the patient is more comfortable.

In Timişoara Oral and maxillo-facial departement, we apply a regimen of 4-5 sessions/day, consisting in:

- Ice applications 10 minutes
- Mechanotherapy 10 minutes
- Facial massage 10 minutes
- Heat applications 10 minutes
- Facial massage 10 minutes

Our therapy results are seen in table 3:

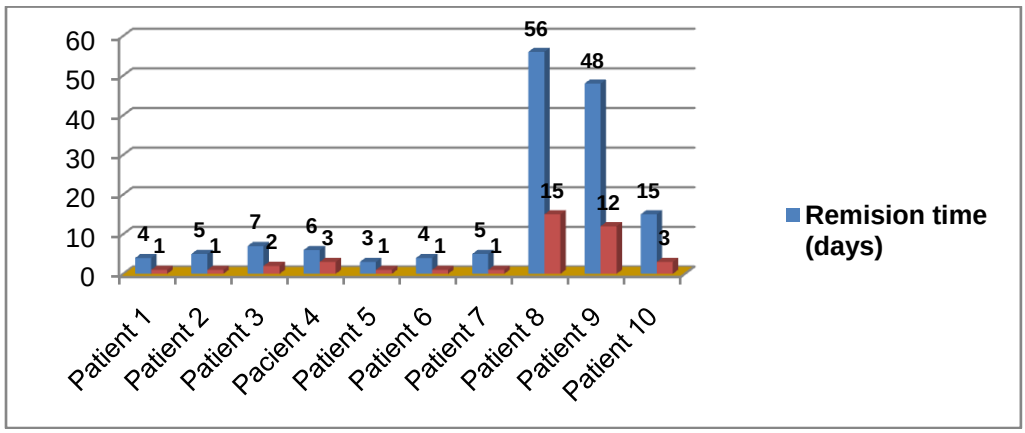


Table 3. Remision time depending on time from debut in studied patients

The results in opening the mouth often leave expected. A typical patient will gain from 1-2 mm of opening in the first session. However, most if not all of this gain will be lost within the next 2-3 hours. Only by continuing to stretch and mobilize for many sessions per day, will result in a real benefit. However, mostif not allof this gain will be lost within the night.

There are controversies regarding the daily rate of progressin terms of mouth opening. This can vary between2-4mm formild cases, with recent installation, and 1-1.5mm forsevere cases and longer evolution. Mathematically speaking, recovery cantake between 4-7 days formild casesand6-10weeksforsevere cases.

For severe cases, who tendrelapsing, most patients will continue to mobilize and stretch at least once per day for the rest of their lives. [1, 2, 12, 13]

CONCLUSION

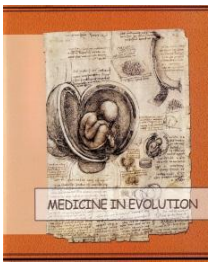
Trismus is a common complication in dental and maxillo-facial practice. Severity of its symptoms vary from mild tosevere. In many cases, trismus require assisted therapy, hospitalization, and do social activities impossible. It is there fore important for clinicians to know the etiology, symptoms, and treatment of trismus. Without taking effective measures, trismus severity will increase from day to day. The possibility of spontaneous remissionsis rare and uncertain.

Trismus can sometimes be considered malpractice, and not excludedthe possibility of legal action by the patient, dissatisfied with the critical statereached.

REFERENCES

1. Marien M. Trismus: causes, differential diagnosis and treatment. *Gen Dent* 1997; 45(4): 350–355.
2. Leonard M. Trismus: What is it, what causes it and how to treat it? *Dentistry Today* 1999; June: 74–77.
3. Mezitis M, Rallis G, Zacharides N. The normal range of mouth opening. *J Oral Maxillofac Surg* 1984; 47: 1028–1029.
4. Berge TI, Boe OE. Predictor evaluation of postoperative morbidity after surgical removal of mandibular third molars. *Acta Odontol Scand* 1994;52: 162–169.
5. Stacy GC, Hajjar G. Barbed needle and inexplicable paresthesias and trismus after dental regional anesthesia. *Oral Surg Oral Med Oral Pathol* 1994;77: 585–586.
6. Masbach JJ. Hysterical trismus. A study of six cases. *NY State Dent J* 1996; 32: 413–416.
7. Ichimura K, Tanaka T. Trismus in patients with malignant tumors in the head and neck. *J Laryngol Otol* 1993; 107: 1017–1020.
8. Trumpy IG, Lyberg T. Temporomandibular joint dysfunction and facial pain caused by neoplasms. *Oral Surg Oral Med Oral Pathol* 1993; 76: 149–152.
9. Dijkstra P.U., , Huisman P.M., &, Roodenburg J. (2006). Criteria for trismus in , head and neck oncology. *International Journal of Oral & Maxillofacial Surgery*, 35, 337-7-342.
10. Paterson A.W., Ryan, W., & Rao Mudigonda V. (2006). Trismus: or is it,tetanus? A report of a case. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics, 101*, 437--441.
11. Bucur A.- Compendiu de chirurgie oro-maxilo-faciala**,** Editura Quintessence, 2009, ISBN 978-973-88553-7-3
12. Nguyen AMH. Dental management of patients who receive chemo and radiation therapy. *Gen Dent* 1992; 40: 305–311.
13. Lund TW, Cohen JI. Trismus appliances and indications for their use. *Quint Int* 1993; 24: 275– 279.

INCIDENCE AND PATTERNS OF CYSTIC LESIONS OF THE JAWS – RETROSPECTIVE STUDY



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ABSTRACT

Aim and objectives: *To determine the frequency and patterns of cysts in jaw bones with an emphasis on the location and histological type of the lesions.*

Materials and methods: *We performed a descriptive, retrospective study on 1390 patients with radiolucent lesions of the jaws admitted into the Oral and Maxillofacial Surgery Clinic of Timisoara between 2010 and 2013. The data of the study were correlated with the histopathological findingsfor cystic lesions of the jaws.*

Results: *Out of 1390 patients286 presented histopathologically confirmed cystic lesions of the jaws.Out of these 286 patients (mean age 41.41± 16.821) with cystic lesion, 149 were males (mean age 42.92±16.457) and 137 female patients (mean age 39.77±17.119).Regarding the location, 55.9% of the cystic lesions were found in the maxilla. The histopathlogicalfindings revealed that the types of cysts of the jaw were: 193 radicular cyst (67.5%) 38 dentigerous cyst (13.3%) 20keratocyst (7%)18 residual cyst (6.3%) and 17 non odontogenică cysts (5.9*

Conclusions*: In our study, the cystic lesions represent a quarter of all radiolucent lesions off the jaws. The radicular cyst is the most common cyst of the jaws while the dentigerous cyst has the second highest incidence. The prevalence of the cystic lesions of the jaws is higher in males, but at an older age than in females, while the upper jaw is more frequent affected than the mandible.*

Key words: *descriptive study, cysts, jaw bones*

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INTRODUCTION

The radiological examination of the jaws by conventional radiography (e.g. orthopantomographies) or through more modern technologies, such as cone beam computed tomography (CBCT), may reveal a variety of radiolucent lesions in the jaws. Radiolucent lesions seen on panoramic radiographs develop from both odontogenic and non-odontogenicstructures which can be challenging in the interpretation, either because the clinical presentation may be non-specific, or because the lesion may be detected incidentally.[1]

The cystic lesions, especially epithelial cysts, are more commonly seen in jaw bones than in other parts of the body because of numerous epithelial rests that develop in intimate relationship with bone growth.[4]

Although the knowledge of the particularities of radiolucent lesions of the jaws narrows the differential diagnosis and is crucial for the identification of those lesions [1], the biopsy and histopathologycal examination will determine the final diagnostic.

We have carried out our study on patients with radiolucent lesions of the jaws that were revealed on the radiological examination. They were treated in The Clinic of Oral and Maxillofacial Surgery of Timişoara. The aim of this study was to determine the frequency and pattern of cystic lesions, with an emphasis on the site and histological type of these lesions.

MATERIAL AND METHODS

We performed a descriptive, retrospective cross-sectional study on patients with radiolucent lesions of the jaws seen on conventional radiography admitted into the Oral and Maxillofacial Surgery Clinic of Timisoara between 2010 and 2013. The study included a total of 1390 patients, with the age between 3 and 91 years, males and females, from rural and urban areas. Data from the patients' medical records and histopathological findingshas been analyzed in our study. Data on all patients registered between January 2010 and December 2013 with radiological radiolucent lesions of the jaws has been extracted from the hospital database.These data has been correlated with the histopathological findings for odontogenic and non-odontogenic cystic lesions.The report for each patient included the following parameters: gender, age, cyst location, histopathological diagnosis.

The cystic lesions were surgically removed and the diagnosis was confirmed by the histological exam of the specimens in the Laboratory of Pathology - Municipal Hospital of Timisoara. A statistical data analysis using SPSS 20 software package has been performed.

RESULTS

Over a period of 4 years, 1390 patients with radiolucent lesions of the jaws were admitted in our clinic, 553 patients in 2010, 328 in 2011, 251 in 2012 and 258 patients in 2013(Table 1),with the age ranging between 3 and 91 years, and a mean age of 41.57 ± 17.74, the mode in the third decade.(**Table 1, Chart 1**)

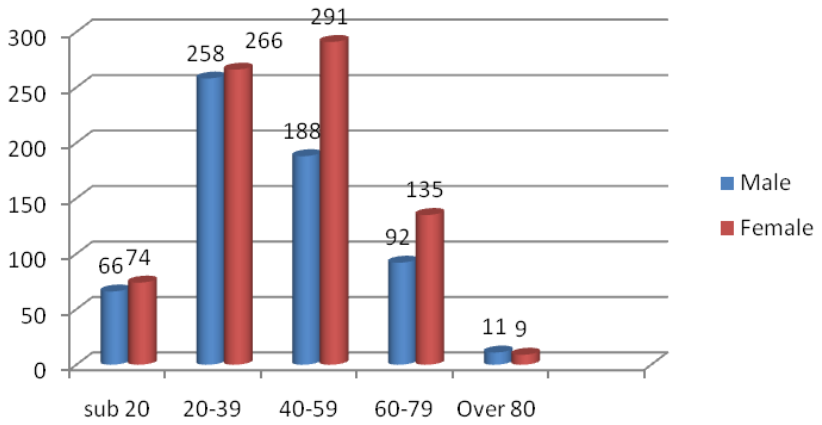


Chart 1. Patients with radiolucent lesions of the jaws: distribution on gender and age group

Table 1. Patients with radiolucent lesions of the jaws: distribution on gender and age group

	Age group (years)					
	under 20	20-39	40-59	60-79	over 80	Total
Male	66	258	188	92	11	615
Female	74	266	291	135	9	775
Total	**140**	**524**	**479**	**227**	**20**	**1390**

There were 775 female patients (55.8%) and 615 male patients (44.2%). The mean age of the males (40.41±17.76) was found to be slightly lower than that of females (42.49±17.685), the peak age incidence being in the 20-59 years group with 1003 patients representing 72.16% of the study subjects. The distribution of patients with radiolucent lesions of the jaws according to gender, year of presentation in the clinic, mean age and percentage, is presented in **table 2.**

Table 2. Distribution of patients: sex, year of presentation, mean age, percent

		2010	2011	2012	2013	**Total**	Mean	Std. Devi.	Percent
Sex	Female	334	171	123	147	**775**	42.49	17.685	55.8%
	Male	219	157	128	111	**615**	40.41	17.759	44.2%
Total		**553**	**328**	**251**	**258**	**1390**	**41.57**	**17.742**	**100%**

Table 3. Location of lesions and mean age for each gender

	Male		Female		Total		p^{sign}
Maxillary	356	40.64±17.368	471	42.23±17.226	827	41.54±17.295	0.191^{ns}
Mandibular	217	40.06±17.901	247	41.49±18.212	464	40.83±18.062	0.396^{ns}
Bimaxillary	42	40.21±20.550	57	48.98±18.088	99	45.26±19.56	0.027^{ns}

The distribution of patients with radiolucent jaws lesions on location revealed 827 patients (59.5%) with intraosseous lesions in the maxillary, demonstrating the highest incidence. Of the rest, 464 patients (33.4%) developed lesions in the mandible, and 99 patients (7.1%) developedbimaxillary lesions.(Ta**ble 3, Table 4, Chart 2**)

Table 4. Location, gender and mean age

	Freq.	Percent	Mean	Std. Devi.
Mandible	464	33.4%	40.83	18.062
Maxillary	827	59.5%	41.54	17.295
Bimaxilar	99	7.1%	45.26	19.560
Total	1390	100%	41.57	17.742

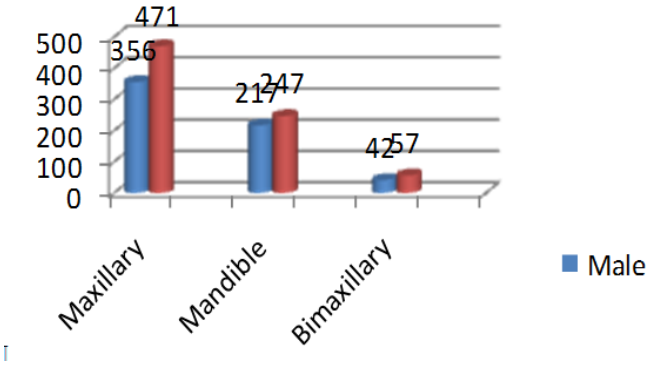


Chart 2. Location and N - radiolucent lesions

The histological examination of the lesions after surgery revealed that out of 1390, 286 where cysts of the jaw and the rest granulomas.

Regarding the gender, there were 149 male patients (mean age 42.92±16.457) and 137 female patients (mean age 39.77±17.119) with histologically confirmed cystic lesions of the jaws. (**Chart 3, Chart 4, Table 5**)

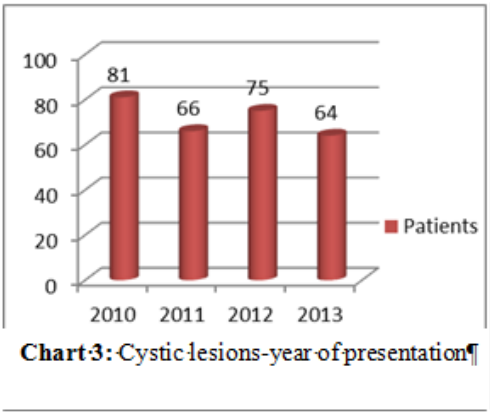


Chart 3. Cystic lesions-year of presentation

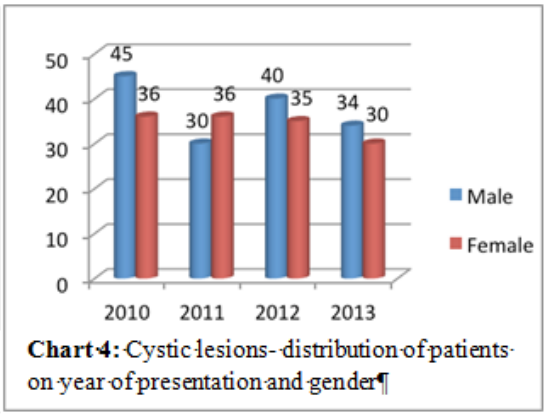


Chart 4. Cystic lesions- distribution of patients on year of presentation and gender

Table 5. Cystic lesions – distribution on gender, year of presentation, mean age

	Year	2010	2011	2012	2013	**Total**	Mean	Std. Deviation
Sex	Male	45	30	40	34	**149**	42.92	16.457
	Female	36	36	35	30	**137**	39.77	17.119
Total		**81**	**66**	**75**	**64**	**286**	**41.41**	**16.821**

At the time of assessment, the distribution of patients with histopathologically confirmed cystic lesions localized in the jaws revealed 160 patients (55.9%) with maxillary cysts demonstrating the highest incidence, while of the rest, 121 patients (42.3%) developed mandibular cysts and 5 (1.7%), bimaxillary radicular cysts.(**Table 6**).

Table 6. Distribution of patients with cystic lesions of the jaws and mean age

		Frequency	Percent	Mean	Std. Deviation
Valid	Mandibular	121	42.3%	40.74	16.768
	Maxillary	160	55.9%	42.15	16.898
	Bimaxillar	5	1.7%	34.00	16.477
	Total	286	100.0	41.41	16.821

In our study, the histological types of cysts in the jaws were: 193 patients (67.5%) with radicular cyst (mean age 42.32 ±17.1), 38 patients (13.3%) with dentigerous cyst (mean age 38.76 ±16.444), 20 keratocyst (7%) (mean age 43.85 ±16.806), 18 residual cyst (6.3%) (mean age 40.00± 17.334) and 17 non-odontogenică cysts (5.9%) (mean age 35.71± 13.429). (**Table 7**)

Table 7. Histological types of cysts, percent and mean age

Histological type	N	Percent	Mean age
Radicular	193	67.5%	42.32 ±17.1
Dentigerous	38	13.3%	38.76 ±16.444
Keratocyst	20	7%	43.85 ±16.806
Residual cyst	18	6.3%	40.00± 17.334
Non odontogenic cyst	17	5.9%	35.71± 13.429
Total	**286**	**100%**	**41.41± 16.821**

DISCUSSIONS

Cystic lesions of the jaws can be either odontogenic or non-odontogenic, developmental or inflammatory in origin.[2][3] A cyst is defined as a pathological cavity with a fluid or semi-fluid content, which is not created by the accumulation of pus.[4]

The cysts of the oral and maxillofacial region that are lined by epithelium are known as true cysts, for example, thedentigerous cyst; while those not lined by epithelium are generally referred to as pseudo-cysts, for example, the mucous extravasation cyst of the salivary glands, the aneurysmal bone cyst and the solitary bone cyst.[4]

In our retrospective 4-year study we found a number of 286 cystic lesions of the jaw, representing 20.58% of radiolucent lesions of the jaws. In the permanent dentition the frequency of periapical granulomas is higher than that of periapical cysts.[5] Our percentage of cysts compared to the periapical granulomas, a quarter of the lesions, is lower than one third of those reported in the literature. [5]

Our analysis revealed that the most common cyst of the jaw is the radicular cyst (in 67.5% of the patients), followed by the dentigerous cyst (in 13.3% of all cases). Other studies that analyzed separately the cystic lesions in adults and in pediatric patients concluded that there is a significant difference in prevalence of developmental and inflammatory cysts in these two groups.[2][5]

Caries are the most common etiologic factor for radicular cysts [5]. The incidence of radicular cyst in males in our study was higher than in female patients. These findings are in consent with the literature. [1][2] Manor et all consider that the greater frequency in adult males may be due to the fact that they are more likely to neglect their teeth, or they are more likely to sustain trauma to their teeth, compared to females, who may be the etiology for cyst formation [2].

Mannor considers that the difference in distribution of inflammatory cysts may be due to the fact that radicular cysts arising from primary dentition are considered very rare,[2] comprising only 0.5-3,3% of the total number of radicular cysts in both the primary and permanent dentitions.[5]

In our study the prevalence of radicular cyst was higher in the maxilla 58%. Our data is comparable with other studies showing that, while mandibular primary teeth are affected more frequently than the maxillary teeth, in the permanent dentition the maxillary is more affected. [5][1]

The dentigerous cysts is the most common type of developmental

odontogenic cyst, defined as an odontogenic cyst derived from reduced enamel epithelium surrounding the crown of an unerupted tooth.[6] In our study, the dentigerous cyst has the second highest prevalence, affecting 13.3% of patients with a mean age of 38.76 ±16.444, 76.3% in the mandible. The male to female ratio in our study was 2:1. Other authors report that thedentigerous cyst makes up about 20% of the epithelium-lined cysts in the jaw, and that it is commonly associated with the unerupted mandibular or maxillary third molars or maxillary cuspids with a peak incidence in patients from the 10-30 year-old age group.[6]

Wang et all. consider that dentigerous cyst can lead to several complications, such as the tendency of displacing the related tooth, the invasion of the maxillary sinus and the uptake of a considerable portion of the maxillary sinus, thus causing ophthalmologic and nasal symptoms. Some untreated dentigerous cysts may have the potential to develop into an odontogenic tumor such as ameloblastoma, or a malignant one e.g. oral squamous cell carcinoma or mucoepidermoid carcinoma.[6]

CONCLUSIONS

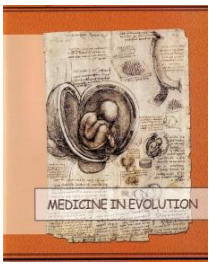
In our study, the cystic lesions represent a quarter of all radiolucent lesions of the jaws. The radicular cyst is the most common cyst of the jaws while the dentigerous cyst has the second highest incidence. The prevalence of the cystic lesions of the jaws is higher in males, but at an older age than in females, while the upper jaw is more frequent affected than the mandible.

Acknowledgement: The authors would like to thank Dr. LilanaVasile, Department of Histopathology and Cytology, University of Medicine and Pharmacy "Victor Babeş" Timişoara, Romania.

REFERENCES

1. Avril L, Lombardi T, Ailianou A, et al. Radiolucent lesions of the mandible: a pattern-based approach to diagnosis. Insights Imaging.2014;5:85–101. doi: 10.1007/s13244-013-0298-9.
2. Manor E, Kachko L, Puterman BM, Szabo G, Bodner L. Cystic lesions of the jaws - a clinicopathological study of 322 cases and review of the literature. Int J Med Sci. 2012;9(1):20-26
3. 3 Subramaniam P, Kumar K, Ramakrishna T, Bhadranna A. Bone regeneration with plasma-rich-protein following enucleation of traumatic bone cyst.Eur J Dent. 2013;7:377–81
4. 4 Lawal AO, Adisa AO, SigbekuOF. Cysts of the oro-facial region: A Nigerian experience. J Oral MaxillofacPathol 2012;16:167-71
5. Mass E, Kalpan F, Hishberg K. A clinical and histopathological study of radicular cysts associated with primary molars. J Oral Pathol Med 1995;24:458-61
6. Cho JY, Nam KY. Expansile dentigerous cyst invading the entire maxillary sinus: a case report. J Korean Assoc Oral MaxillofacSurg 2012;38:245–248.

FIBRIN-RICH PLASMA IN DENTISTRY: FIRST EVIDENCES



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ABSTRACT

A variety of methods are commercially available for obtaining autologous growth factors, a product of blood centifugation. The platelet and growth factor content in fibrin-rich plasma (PRF) vary with individual blood samples and depends on the PRF preparation method. The goal of this study was to compare the histologic differences between using blood clot and PRF prepared according to Choukroun, knowing that PRF is becoming more clinically accepted among dentists.

Key words: *platelets, growing factors, fibrin-rich plasma*

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INTRODUCTION

Although fibrin-rich plasma (PRF) has been used for a couple of years in other medical specialties, it has only recently become popular in dentistry. However, to date, there is inconclusive evidence since there are just case reports and lower level studies.

Recent advances in methods for PRF preparation and use have made it possible for dentists to use the concentrated form of growth factors and cytokines, cells naturally present in blood clots (3). All these factors are already within our bodies during the natural healing response.

The goal of this study was to compare the histologic differences between using blood clot and PRF and blood clot.

MATERIAL AND METHODS

A group of eight patients with required single tooth extraction was studied retrospectively. The extraction was carried out as atraumatic as possible. Interseptal bone was trimmed to allow bucco-lingual compression of the alveolus to achieve primary

closure.

Immediately after venous stasis was induced, blood was collected using butterfly needles and Vacutainer tubes. For PRF preparation, the blood samples were immediately centrifuged at 1300 rpm acceleration for 14 minutes - Choukroun method (4). The resulting PRF preparations were picked up with forceps, and the fraction of red blood cells was eliminated with scissors along the border between this fraction and the PRF clot.

The alveolar blood clot was prepared with a histological routine. Samples of PRF masses were fixed in 10% buffered formalin and routinely processed using Thermo Scientific STP 420D Tissue Processor. After embedding the tissue fragments, the resulting paraffin blocks were cut into 3 µm thick sections with a semi-automated Rotary Microtome Leica RM2245. The slides were routinely stained with Hematoxylin–Eosin (HE); deparaffinized sections were probed with monoclonal anti-CD31 antibody (Novocastra-Leica Biosystems, Newcastle Upon Tyne, U.K., 1:100, clone 1A10). As detection system, we used Novolink Polymer (Leica/Novocastra). Immunoreactive proteins were visualized by a DAB substrate solution. Slides were counter-stained with Mayer's Hematoxylin, rehydrated and mounted with glycerol gelatin. Immunohistochemical stains were analyzed using a microscope Nikon 80i.

RESULTS

It was observed that platelets (CD31positive) are present in the periphery of the blood clot (Fig.1) and diffusely distributed in PRF (Fig. 2). Numerous platelets are aggregated on the PRF membrane surface and some lymphocytes and/or other white blood cells were observed. The number of platelets in PRF decreased with increasing distance from the red thrombus. In the blood clot, fibrin fibers could be observed. The fibrin meshwork was clearly observed in PRF.

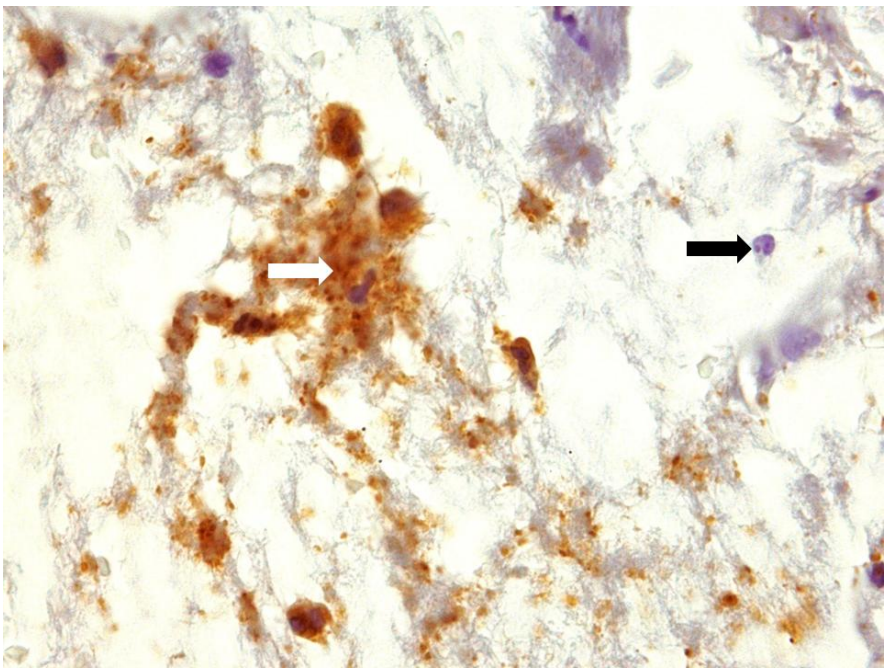


Figure 1. Blood clot - aggregated platelets (CD31positive) (white arrow) and white blood cell (black arrow). CD31 immunostaining, ×1000. Image courtesy of Prof.dr.Alexandru Bucur

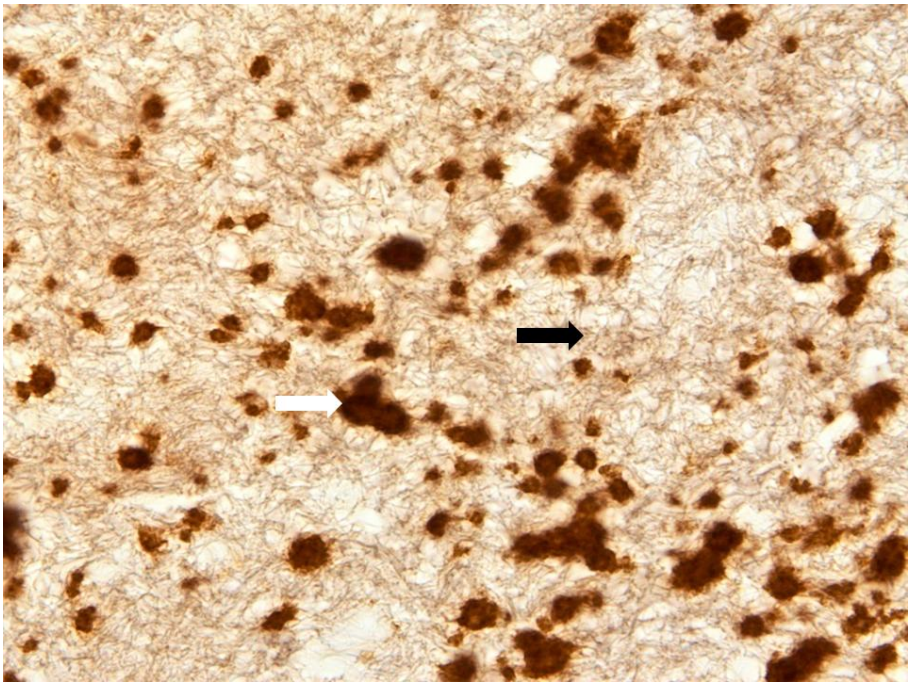


Figure 2. PRF - aggregated platelets (CD31positive) (white arrow) and the fibrin network (black arrow). CD31 immunostaining, ×1000. Image courtesy of Prof.dr.Alexandru Bucur

DISCUSSIONS

PRF is most simply defined as a volume of plasma that has a platelet count above the blood. Several different forms of PRF products have been used in medicine (6); however, PRF preparation methods can vary in the amount of blood used and the efficacy of platelet recovery (8), the presence of white cells (2) and the amount of fibrin (1). Moreover, platelet concentrations can vary from day to day in PRF produced from a single individual, depending on factors such as general health and medications (eg. coagulants) (9).

It is impossible to count and adjust the number of platelets in PRF preparations prior to clinical use.

Therefore, the most clinically efficient way to control the quality of the results is to utilize the platelet-rich region of the PRF preparation (7,5). Based on our results, it is likely that platelets would accumulate most in PRF than in the blood clot.

CONCLUSIONS

Available data suggests that PRF may be valuable in enhancing wound healing. Continued research is needed to optimize the preparation and use of PRF during surgery and to determine the ways to use it to improve healing.

Author contribution

All authors have equally contributed to this study.

Acknowledgement

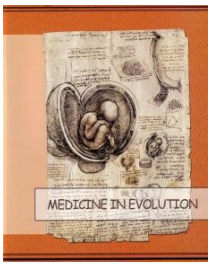
Lecturer Dr. Sabina Zurac kindly contributed with this knowledge and performed careful histopathological examinations. Appreciation is also extended to Prof. Dr. Florica Stăniceanu for scientific consultation.

The authors declare no competing financial interests related to this study.

REFERENCES

1. Clark RAF. Fibrin is a many splendored thing. J Invest Dermatol 2003;121:XXI-XXII
2. Dijkstra-Tiekstra MJ, Van der Schoot CE, Pietersz R N, Reesink HW. White blood cell fragments in platelet concentrates prepared by the platelet-rich plasma or buffy-coat methods. Vox Sang. 2005;88:275–277
3. Dincă O, Zurac S, Stăniceanu F, Bucur MB, Bodnar DC, Vlădan C, Bucur A. Clinical and histopathological studies using fibrin-rich plasma in the treatment of bisphosphonate-related osteonecrosis of the jaw. Rom J Morphol Embryol 2014, 55(3):3–6 (in print)
4. Dohan DM, Choukroun J, Diss A, Dohan SL, Dohan AJ, Mouhyi J, et al. Platelet rich fibrin (PRF): a second-generation platelet concentrate. Part I: technological concepts and evolution. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2006;101:e37e44.
5. Dohan DM, Choukroun J, Diss A, Dohan SL, Dohan AJ, Mouhyi J, et al. Platelet rich fibrin (PRF): a second-generation platelet concentrate. Part II: platelet related biologic features. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2006;101:e45e50
6. Marx RE. Platelet-rich plasma (PRP): what is PRP and what is not PRP? Implant Dent. 2001;10(4):225-228
7. Marx RE. Platelet-Rich Plasma: evidence to support its use. J Oral Maxillofac Surg. 2004;62:489–496
8. Su CY, Kuo YP, Tseng YH, Su CH, Burnouf T. In vitro release of growth factors from platelet-rich fibrin (PRF): a proposal to optimize the clinical applications of PRF. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2009;108:56e61
9. Weibrich G, Kleis WKG, Hafner G, Hitzler WE. Growth factor levels in plateletrich plasma and correlations with donor age, sex, and platelet count. J CranioMaxillo Surg 2002;30:97e102

HISTOLOGIC COMPARISON BETWEEN INTRA-ALVEOLAR CLOT AND PLATELET CONCENTRATE



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ABSTRACT

In recent years, platelet concentrates (PRP) had become increasingly important and have been used in numerous clinical studies. Although a few previous studies which compared different types of commercial PRP kits were reported, this is the first comparative investigation to address platelet concentrate and intra-alveolar clot at the same time.

Key words: *platelets, plasma concentrate, clot*

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INTRODUCTION

In the last years, the interest for the use of platelet concentrate increased in dentistry (4,5). The introduction of a PRP technique has sparked a debate in the literature over the superiority of platelet concentrate versus the intra-alveolar clot for achieving wound healing (2). Although outcomes may be the primary consideration, it is still important to consider factors findings that can determine the feasibility of each procedure.

It is known that platelets are a source of several growth factors; this fact stimulated the development of a platelet concentrate with the intention of increasing the levels of local growth factors delivery, which, theoretically, if present at a damaged site, could improve the healing process (1). However, little attention has been directed to the morphology of intra-alveolar clot and platelet concentrate. The present study was undertaken to examine the morphology of platelet-rich plasma and to compare it to intra-alveolar clot.

MATERIAL AND METHODS

The blood was collected from a healthy male patient, 46 years old, who required dental extractions and who was not under medication. Blood samples were collected with the appropriate ratio of anticoagulant according to the manufacturer's instructions, and were simultaneously processed using GLO PRP kit (Glofinn Oy, Salo, Finland).

The preparation process was semi-closed. Centrifugation was performed two times, following to GLO protocol - the first centrifugation at 1800 rpm acceleration for 3 minutes and the second at 1900 rpm for 6 minutes. PRP sample was collected and activated according to manufacturer's protocol. A 1:1 mixture of 0.5 M $CaCl_2$ and thrombin was prepared in advance as an activator. A 10:1 (v/v) mixture of PRP and the activator was incubated for 5 min at room temperature (7).

Dental extraction was performed with standard surgical techniques. Intra-alveolar clot was obtained from alveolar socket 20 minutes after dental extraction, with minimal manipulation of the specimen. The blood clot removal was performed without fragmentation and several smears were obtained from PRP material. The samples were stained with hematoxylin and eosin.

RESULTS

With the hematoxylin and eosin staining, the red clot appeared with distinctive pattern: large areas of erythrocytes, trapped in a weak fibrin network; rare platelets and clusters of white bllod cells (Fig.1).

A different pattern with a large number of platelets, mostly of them arranged in aggregates and trapped in a weak fibrin network, were observed in the periferic portion of the clot (Fig.2). The other cellular components were roughly distinguishable by fibrin (Fig.2).

PRP consisted of platelet bands interspersed with rare white blood cells and erythrocyte-rich accumulations (Fig.3).

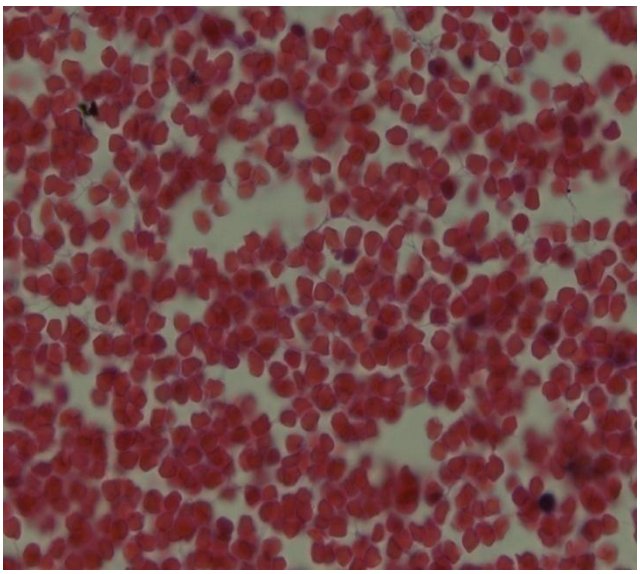


Figure 1. The red clot. HE stain (H&E stain, ×10). Image courtesy of Prof.dr.Alexandru Bucur

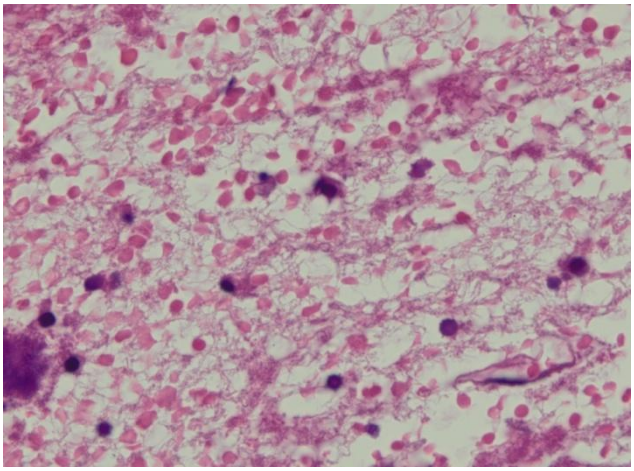


Figure 2. The red clot. HE stain (H&E stain, ×100). Image courtesy of Prof.dr.Alexandru Bucur

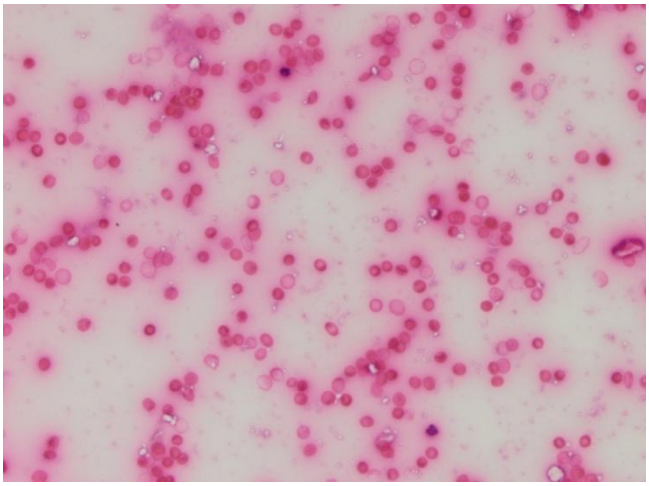


Figure 3. PRP. (H&E stain, ×100). Image courtesy of Prof.dr.Alexandru Bucur

DISCUSSIONS

The histological examination clearly demonstrated the presence of platelets within PRP, suggesting that platelet concentrate may contribute in the complex process that ultimately leads to wound healing. Although prior observations suggested that fibrin may be an important determinant of

wound healing (3,6), our study provides for the first time direct evidence that fibrin was present both in the intra-alveolar clot and in the PRP. These observation confirmed that the basic histological structure of PRP is quite similar to periferic portion of the clot.

Our findings may have important clinical implications suggesting that PRP may be an effective therapeutic strategy in dental medicine. However, there were some important study limitation. Thus, the samples were sectioned and only small proportions were examined, and it may well be that features were missed. This work should be followed by imunohistochemical analysis that would certainly better differentiate blood clot and platelet concentrates.

CONCLUSIONS

This study defines PRP as an autogenous platelet-rich product, but further in vitro studies are required to reveal its exact significance. Since evidence does not point to either the intra-alveolar clot or platelet concentrate the clear superior procedure, dentist preference and circumstantial influences will probably continue to dictate the method employed in postextractional healing.

Authors Contribution

All authors contributed to the conception, design, and preparation of the manuscript, as well as read and approved the final manuscript.

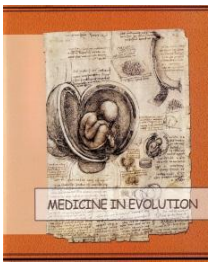
Acknowledgments

We would like to thank Lect.dr. Sabina Zurac for her thorough review of this manuscript and thoughtful suggestions, and Prof. dr. Florica Stăniceanu for kindly histological examination. Any potential conflict of interests is disclosed.

REFERENCES

1. Anitua E, Andia I, Ardanza B, et al. Autologous platelets as a source of proteins for healing and tissue regeneration. Thromb Haemost. 2004. 91:4-15
2. Freymiller EG, Aghaloo TL. Platelet-rich plasma: ready or not? J Oral Maxillofac Surg. 2004;62:484-488
3. Marx RE. Platelet-rich plasma: evidence to support its use. J Oral Maxillofac Surg. 2004;62:489-496
4. Oyama T, Nishimoto S, Tsugawa T, Shimizu F. Efficacy of platelet-rich plasma in alveolar bone grafting. J Oral Maxillofac Surg. 2004;62:555-558
5. Sammartino G, Tia M, Marenzi G, di Lauro AE, D'Agostino E, Claudio PP. Use of autologous platelet-rich plasma (PRP) in periodontal defect treatment after extraction of impacted mandibular third molars. J Oral Maxillofac Surg. 2005;63:766-770
6. Whitman DH, Berry RL, Green DM. Platelet gel: an autologous alternative to fibrin glue with applications in oral and maxillofacial surgery. J Oral Maxillofac Surg. 1997;55:1294-129
7. http://alsmeditek.com/pdf/golfin/Glofin-Presentation.pdf

MINIMAL INVASIVE TREATMENT OF ORAL BISPHOSPHONATE RELATED OSTEONECROSIS OF THE LOWER JAW: A CASE REPORT



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ABSTRACT

The optimal surgical technique to treat bisphosphonate related osteonecrosis of the jaw is uncertain. The aim of this paper is to report an unpublished case of oral bisphosphonate related osteonecrosis of the lower jaw caused by an ill fitting prothesis. The applied treatment consisted of oral rinses with chlorhexidine, antibiotics, and removal of devitalized portion of the bone separated from the adjacent tissue. Complete healing of the lesion was achieved.

Key words: *osteonecrosis of the jaw, bisphosphonates*

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INTRODUCTION

Bisphosphonate related osteonecrosis of the jaw (BRONJ) refers to necrotic jawbone due to the use of oral bisphosphonates, usually prescribed to prevent bone resorption in osteoporosis. Although, invasive oral local procedures are often present in clinical history of patients suffering from BRONJ, a significant number of cases are apparentely spontaneous. We report a case of a female patient with a wide bone sequestration of the anterior mandibular body onset after a prosthetic trauma.

CASE REPORT

The patient is a 67 year old female with a history of long term use of oral bisphosphonate. The interdisciplinary consultation with the patient's rheumatologist revealed that he was diagnosed with osteoporosis in early 2011 and had received 70 mg alendronic acid treatment, on a weekly basis, until February 2014. The patient complained about spontaneous mild pain in the anterior mandibular right side after a prosthesis replacement performed one month earlier. Rheumatologist's recommendation for alendronic acid treatment interruption did not improved the patient's condition. He was then referred to our Department in early March 2014.

At presentation, clinical examination revealed a 2 cm x 0.3 cm size lesion on the anterior mandibular right side, surrounded by inflamed soft tissue without evidence of purulent discharge. Review of an ortopantomograph (OPG) showed a superficial osteolysis area, associated with a slight increase in the density of the surrounding bone. The patient had no history of radiotherapy, infectious process in the maxillo-facial region, but did had a history of smoking. Given these observations, a diagnosis of bisphosphonate related osteonecrosis of the lower jaw (BRONJ) could be established. Patient was instructed to rinse alternatively with Chlorhexidine mouthwater five times a day. It was opted the removal of the mobile prostheses.

Initial response was good and the patient stated that he felt no pain. The single complaint was the presence of unclosed wound. Two weeks later, patient complained of painful symptoms on the anterior mandibular area. At examination we observed exposed bone with pus expression on slight pressure. We recommended treatment with clyndamicine 450 mg daily and mouth-rinsing with chlorhexidine 0.12%. Patient underwent 10 days antibiotics_courses, with relief of the symptoms. In late May 2014, because of the lack of symptoms and stability of the lession, we adopted a „wait-and-see" attitude, since the surgical exploration of the lession could trigger another area of necrosis.

In September 2014 a sequestrectomy was done with conservative debridement without primary closure (Fig.1).

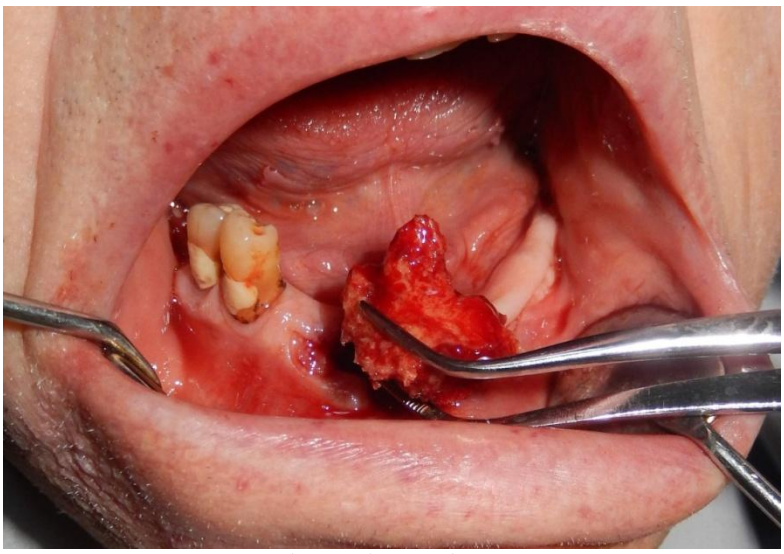


Figure 1. Oral view during the sequestrectomy

Seven days later, clinical evaluation disclosed the previously exposed necrotic bone on mandibular anterior region covered by a normal mucosa, with no signs of inflammation or infection and no painful symptoms (Fig.2). The patient was kept under regular follow up.

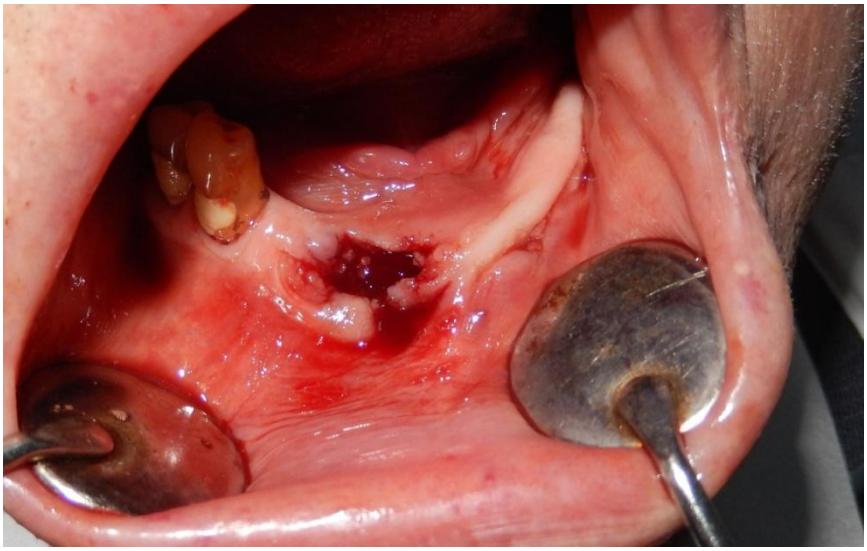


Figure 2. Healing after seven days postoperative follow-up

DISCUSSIONS

Bisphosphonates have played a key role in the standard treatment for osteoporosis. The most often condition is that it is often preceded by an invasive dental procedure, such as an extraction. Only a few reported cases have shown that occlusal overload of the prostheses might be related to BRONJ, as it was in our case.

No global accepted management of patients with BRONJ exists. Some authors reported that therapy discontinuation for a couple of month can be beneficial in stabilizing sites of BRONJ or can improve the healing after surgical procedures (10). *Marx* claimed that surgical procedures are not effective on patients with BRONJ and that these procedures lead to further exposed bone (2). However, other authors showed positive outcomes (). The goal of surgery should be to eliminate necrotic bone which acts as a non-self material ().

In our work, sequestrectomy without exposure of additional bone

was chosen, since patient's health was poor. Eventually, the surgical outcome was favorable.

We acknowledge that a limitation of the present paper is only one case exposure. More studies should be developed to support scientific bases for this work hypothesis we managed to achieve.

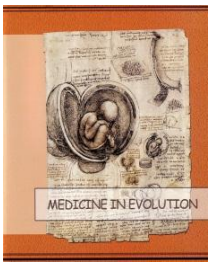
CONCLUSIONS

This case demonstrates that medical treatment is often sufficient to lead to the healing of BRONJ lesions by spontaneous loss of the sequestrum. This attitude should be considered as a suitable therapy in properly selected cases.

REFERENCES

1. Gallego L, Junquera L. Consequence of therapy discontinuation in bisphosphonate-associated osteonecrosis of the jaws. The British Journal of Oral and Maxillofacial Surgery. 2009;47(1):67–68.
2. Marx RE, Sawatari Y, Fortin M, Broumand V. Bisphosphonate-induced exposed bone (osteonecrosis/osteopetrosis) of the jaws: risk factors, recognition, prevention, and treatment. Journal of Oral and Maxillofacial Surgery. 2005;63(11):1567–1575
3. Migliorati CA, Schubert MM, Peterson DE, Seneda LM. Bisphosphonate-associated osteonecrosis of mandibular and maxillary bone: an emerging oral complication of supportive cancer therapy. Cancer. 2005;104(1):83–93
4. Montebugnoli L, Felicetti L, Gissi DB, Pizzigallo A, Pelliccioni GA, Marchetti C. Biphosphonate-associated osteonecrosis can be controlled by nonsurgical management. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontology. 2007;104(4):473–477
5. Pérez SB, Barreo MV, Hernàndez MS, Knezevic M, Navarro JM, Millares JR. Bisphosphonate-associated osteonecrosis of the jaw. A proposal for conservative treatment. Medicina Oral Patologia Oral y Cirugia Bucal. 2008;13(12):E770–E773
6. Ruggiero SL, Fantasia J, Carlson E. Bisphosphonate-related osteonecrosis of the jaw: background and guidelines for diagnosis, staging and management. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontology. 2006;102(4):433–441
7. Vescovi P, Merigo E, Meleti M, Manfredi M. Early surgical approach preferable to medical therapy for bisphosphonate-related osteonecrosis of the jaws. Journal of Oral and Maxillofacial Surgery. 2008;66(4):831–832
8. Vlădan C, Dincă O, Bucur MB, Niță T, Bucur A. Bisphosphonate - related osteonecrosis of the jaws –a case series. Medicine in Evolution, 2012, XVIII (1): 60-64
9. Wilde F, Heufelder M, Winter K, et al. The role of surgical therapy in the management of intravenous bisphosphonates-related osteonecrosis of the jaw. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontology. 2011;111(2):153–163
10. Wutzl A, Pohl S, Sulzbacher I, et al. Factors influencing surgical treatment of bisphosphonate-related osteonecrosis of the jaws. Head and Neck. 2012;34(2):194–200

VARIANTS CHOSEN FOR BRACKET DETACHMENT OCCURED DURING FIXED ORTHODONTIC TREATMENT INTRODUCTION



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ABSTRACT

During fixed orthodontic treatment, detachment of one or more brackets often occurs. For these reasons, orthodontists try to minimise the detachment rate as much as possible; and in cases of accidental debonding, they try to adopt the best variant in order to continue the orthodontic treatment.

***Material and method**: We monitored 203 patients aged between 12 and 32 years who received fixed orthodontic treatment between 2008 and 2014, of which 165 in both maxillaries while the rest in one of the maxillaries, totalising 368 dental arches. Of these, only 294 complete arches were selected.All patients were treated with the same kind of metal brackets: Roth Omni 22 and they were bonded with the same composit: Ortho-Loc.From all 2940 teeth included throughout the treatment, a total of 463 brackets became detached which represents 15.74%.Of the total number of detached brackets, 155 were replaced with new brackets and the rest were reconditioned as follows: 154 were cleaned by aluminium oxide sandblasting for 4 seconds from a distance of 3 mm and than rebonded; and in the remaining 154 the resin residues were removed by drilling and after that they were rebounded.*

***Results:**Until the end of the treatment, the results were as follows: in group 1, where detached brackets were replaced with new ones, 10 more (6.45%) became detached; in group 2 where brackets were cleaned by aluminium oxide sandblasting for 4 seconds from a distance of 3 mm, 11 (7.14%) more brackets became detached; in group 3 where brackets were cleaned by drilling, 27 (17.53%) more brackets became detached*

***Conclusion:**There were no significant differences regarding bracket detachment between group 1 where new brackets were used and group 2 where sandblasted brackets were used. Nevertheless, brackets in group 1 became detached in a lower percent supporting the replacement with new ones whenever possible*

***Key words:** debonding, brackets, recondition*

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INTRODUCTION

During fixed orthodontic treatment, detachment of one or more brackets often occurs(1, 2, 3). The causes of debonding may vary from those induced by the dentist or by the patient. In spite of the dentist's expertise, the improper bonding of one or more brackets may occur; but most often, the accidental bracket detachment is caused by the patient who does not entirely adhere to recommendations (i.e. to avoid hard foods which may induce bracket detachment, to avoid chewing gum and sticky foods, etc.)(4, 5, 6). Sometimes the mere enamel structure influences the quality of bracket-tooth bonding. For these reasons, orthodontists try to minimise the detachment rate as much as possible; and in cases of accidental debonding, they try to adopt the best variant in order to continue the orthodontic treatment (7).

There are numerous studies on the adhesion strength of various materials used in orthodontics, and also on their resistance to pressure, traction, shear forces on the same type of bracket but also comparing different types. There are mixed opinions but the unanimous conclusion is that all commercially available adhesion materials used for brackets are suitable to successfully meet all the requirements provided all recommendations are followed (8, 9, 10).

MATERIAL AND METHODS

In the present study we monitored 203 patients aged between 12 and 32 years who received fixed orthodontic treatment between 2008 and 2014, of which 165 in both maxillaries while the rest in one of the maxillaries, totalising 368 dental arches. Of these, only 294 complete arches were selected: 2 central incisors, 2 lateral incisors, 2 canines and 4 premolars – on which brackets were applied, and 6 years molars on which orthodontic bands were cemented. All patients were treated with the same kind of metal brackets: Roth Omni 22 and they were bonded with the same composit: Ortho-Loc. Throughout the orthodontic treatment the exact number of detached brackets was recorded for each patient together with the potential reasons (cases where the same bracket became repeatedly detached were also included). The arch distribution of the number of detached brackets may be observed in the following figure: 114 patients in whom no bracket was detached, 51 patients in whom a single bracket detached, 47 patients with 2 detached brackets, 32 patients with 3 detached brackets, 30 patients with 4 detached brackets, 18 patients with 5 detached brackets and 2 patients with 6 detached brackets.

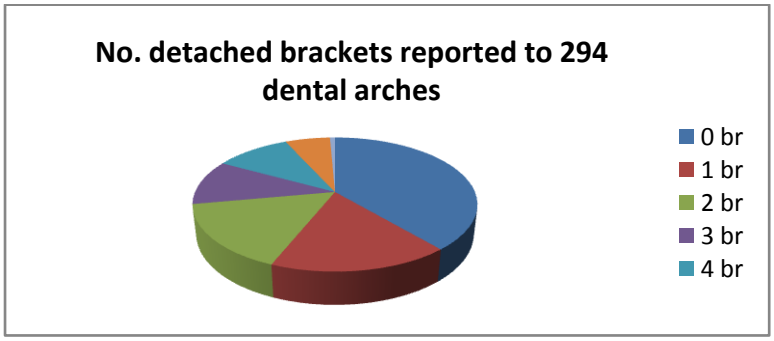


Figure 1. Number of detached brackets on dental arches

Adding up these figures we concluded that out of the 2940 teeth included throughout the treatment a total of 463 brackets became detached which represents 15.74%. This proportion may cause concerns but considering the average duration of a fixed orthodontic treatment being 2 and a half years, as well as the age of the patients (mostly children and adolescents), this figure is justified. Bracket detachment represents a minor accident and does not necessarily constitute a medical emergency except for cases when severe irritation and bleeding are caused to the lips, tongue or cheeks. An appointment to the orthodontist is recommended for the detachment to be repaired without any pressure.

All patients with one or more detached brackets were re-instructed regarding hygiene and feeding during the orthodontic treatment but also on adherence to certain rules during practicing sports. Then the subject of replacing the detached brackets was discussed. Of the total number of detached brackets, 155 were replaced with new brackets and the rest were reconditioned as follows: 154 were cleaned by aluminium oxide sandblasting for 4 seconds from a distance of 3 mm and in the remaining 154 the resin residues were removed by drilling. The latter variant, considered to be a compromise, was tested because new brackets are not always available and sometimes there is not enough time to perform sandblasting of brackets. Composite material residues were also removed from the dental surfaces with special drills and the initial cementing protocol was repeated. The evolution of these brackets was attentively monitored in order to determine the best working protocol to be adopted in case of accidental bracket detachment.

RESULTS

The evolution of the 463 detached brackets was closely monitored and these were divided into the 3 groups. Throughout the entire treatment the same cementing / re-cementing material was used to ensure that the results are strictly influenced by the accuracy of bracket basis. Until the end of the treatment, the results were as follows: in group 1, where detached brackets were replaced with new ones, 10 more (6.45%) became detached; in group 2 where brackets were cleaned by aluminium oxide sandblasting for 4 seconds from a distance of 3 mm, 11 (7.14%) more brackets became detached; in group 3 where brackets were cleaned by drilling, 27 (17.53%) more brackets became detached (Fig. 2)

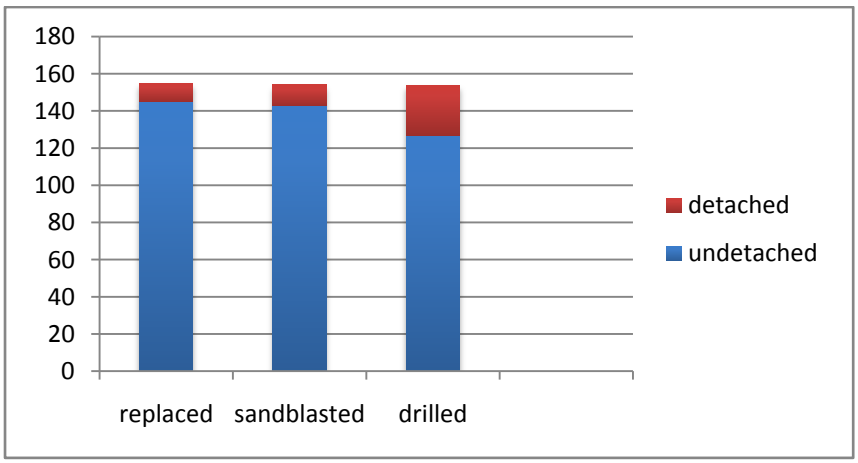


Figure 2. Proportion of detached brackets

CONCLUSIONS

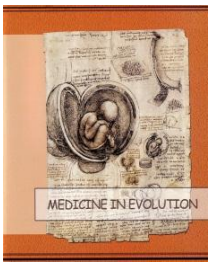
After interpreting the results of this study we came to the following conclusions:

- Of the total of 2940 teeth, throughout the average treatment period of 2 and a half years 463 brackets became detached, representing 15.74%.
- There were no significant differences regarding bracket detachment between group 1 where new brackets were used and group 2 where sandblasted brackets were used. Nevertheless, brackets in group 1 became detached in a lower percent supporting the replacement with new ones whenever possible;
- The removal of composite residues from brackets by aluminium oxide sandblasting for 4 seconds from a distance of 3 mm is an effective reconditioning method;
- Reconditioning brackets in the dental practice by removing composite residues by drilling must only be used in exceptional cases when the other two variants cannot be performed.

REFERENCES

1. Thiyagarajah S., Spary D.J., Rock W.P. A clinical comparison of bracket bond failures in association with direct and indirect bonding.Journal of Orthodontics September 2006 vol. 33 no. 3 198-204
2. Nicky A Mandall, Joy Hickman, Tatiana V Macfarlane, Rye CR Mattick, Declan T Millett, Helen V Worthington. Adhesives for fixed orthodontic brackets.Editorial Group: Cochrane Oral Health Group, published Online: 22 APR 2003
3. FábioLourenço Romano, Rodrigo AlexandreValéRio, Jaciara Miranda Gomes-Silva, José TarcíSio Lima Ferreira, Gisele Faria, Maria Cristina Borsatto. Clinical Evaluation of the Failure Rate of Metallic Brackets Bonded with Orthodontic Composites. Braz Dent J (2012) 23(4): 399-402.
4. R. Valletta, D. Prisco, R. De Santis, L. Ambrosio, R. Martina. Evaluation of the debonding strength of orthodontic brackets using three different bonding systems.European Journal of Orthodontics, Volume 29, Issue 6, Pp. 571-577
5. Grabouski J.K.,Staley R.N., Jakobsen J.R. The effect of microetching on the bond strength of metal brackets when bonded to previously bonded teeth: an in vitro study.Am J OrthodDentofacialOrthop. 1998 Oct;114(4):452-60.
6. Bishara S.E, Laffoon J.F.,Vonwald L, Warren J.J. The effect of repeated bonding on the shear bond strength of different orthodontic adhesives.Am J OrthodDentofacialOrthop. 2002 May;121(5):521-5.
7. Lilian Maria BrisquePignatta, Sillas Duarte Júnior, Eduardo César Almada Santos. Evaluation of enamel surface after bracketdebonding and polishing. J.Orthod. vol.17 no.4 Maringá July/Aug. 2012
8. Harari D.,Gillis I., Redlich M. Shear bond strength of a new dental adhesive used to bond brackets to unetched enamel.Eur J Orthod. 2002 Oct;24(5):519-23.
9. Nagayassu M.P.,Shintome LK, Arana-Chavez VE, Fava M. Micro-shear bond strength of different adhesives to human dental enamel. J ClinPediatr Dent. 2011 Spring;35(3):301-4.
10. ShaminaBawa, Mithra N. Hedge. Comparative evaluation of the Shear Bond Strenght of a Total Etch Adhesive with a Self-etching Primer on Endodontically Treated Teeth. 10.5005/jp-journals – 10015-1165

PATIENT'S EXPECTATIONS AND PERCEPTION OF THE PRIVATE DENTAL PRACTICE



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ABSTRACT

Introduction.*Patient's expectation and perception of the private dental practiceshould be acknowledged in order to ensure a good dentist-patient relation and provide a more comfortable environment, which may have a positive impact on the treatment. This study aimed identifying patient'sperception of the private dental practice, as self-rated importance of aspects related to dental practitioner and the dental office.*

Materials and methods.*A cross sectional study was implemented on a convenience sample of patients attending dental private practice offices, placed in urban areas in Romania.*

Results. *Study sample included 67 patients, of which 42 were women, with a mean age of 43 years. Considering patient's perception on oral health related problems, the most important aspects from patient's point of view were the health problems (caries and periodontitis), these being statistically significant more important compared to functional and aesthetic outcome. Patient's assessment of the dental practitioner identified the professional recognition of the dentist, behavior and ability to provide painless treatments as the most relevant aspects for their perception. Most patients value a communicatively (n=44; 66%), friendly (n=39; 58%), respectful (n=29; 43%) attitude of the dentist. The most important aspect of the dental office was the cleanliness of the dental office, seconded by time related factors, as the flexibility of scheduling and decrease waiting time.*

Conclusion. *Patient's expectations and perception of the private dental practice are linked to aspects related to the dental practitioner and the dental office. Their knowledge may be helpful for obtaining a good dentist-patient relation.*

Key words: *dentist, patient satisfaction, dental office, dentist-patient relation*

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INTRODUCTION

In the dental field, as in any other medical field, ensuring treatments with an outcome in accordance with the current standard of care, is the main priority. In order to do that, a very important aspect is patient's compliance, which is usually related to the degree of his satisfaction on the dental services. Therefore, patient's expectation and perception should be acknowledged, in order to provide, if possible and considered appropriate, a more comfortable environment that may help them overcome barriers to dental treatment, as fear. This is even more important in the private dental practice, where marketing policies should include addressing patient's need.

This study aimed identifying patients expectations of perception of the private dental practice, as self-rated importance of some aspects related to dental practitioner and dental office.

MATERIAL AND METHODS

A cross sectional study was designed and implemented on a convenience sample of patients attending dental private practice offices, all placed in urban areas in Romania (Bucharest, Buftea, Constanta). Patients were included in January-May 2012, on a voluntary basis. There were included patients that were present in the dental office scheduled for a medical intervention, who agreed upon filling the questionnaire and study inclusion. There were excluded patients who worked in dental or medical field, those who were first time users of the dental services and those with age below 18 years.

Patient expectations and perception on the private dental practice was evaluated using a questionnaire that mainly focused on importance of oral health problems, the dentist and the dentaloffice. Most of the questions were formulated as requiring to rate the perceived importance of one particular aspect, on a numerical scale from 1 (very unimportant) to 7 (very important). Other open and closed questions were used for providing other information. The questionnaire was pretested on 5 persons, with jobs that were not related to the dental fields, in order to correct language ambiguities. The questionnaire was administrated in the dental office, after a brief information on the purpose of fulfilling the questionnaire and study aim, followed by signing of an informed consent.

Statistical analysis was performed according to variable type and, for the qualitative one, to the normality of their distribution. In order to assess difference between multiple paired observations, Friedman test was used. In order to assess difference between two-paired observations, Wilcoxon ranked test was used. The statistically significance level was set as $p<0,005$.

RESULTS

Study sample included 67 patients, of which 42 (63%) were women, with a mean age of 43 years (ranging from 18 years to 76 years). All were urban inhabitants and more than half (n=37; 55%) had higher education level.

Considering patient's perception on oral health related problems, there was found using Friedman Test a statistical significant difference between the aspect analyzed ($p<0,001$). The most important aspects from patient's point of view were the health

problems (caries and periodontitis), rated with the highest score, being statistically significant more important compared to functional and aesthetic outcome (Table I). Wilcoxon ranked test was used to assess difference between two paired groups.

Patient's assessment of the dental practitioner identified a different importance of the items analyzed, as the results of Friedman test indicated a statistically significant difference ($p<0,001$). The most important aspects, as declared by patients are the professional recognition of the dentist, his behavior and ability to provide painless treatments, his appearance not being perceived as an important factor (Table II) Treatment quality wasn't analyzed considering patients didn't have expertise in the dental field. Additionally, regarding dentist's behavior, most patients value a communicatively (n=44; 66%), friendly (n=39; 58%), respectful attitude (n=29; 43%).

The most important aspect of the dental office, as patients' self-rated, was the cleanliness of the dental office, with statistically significant different scored compared to the other items taken into account (Table III). Additionally, time-factors, as the flexibility of scheduling and decrease waiting time in the dental office, are also perceived as important aspects.

Table I. Self-rated importance of oral health aspects

Self-rated importance of		**mean**	**p-value**			
			2	**3**	**4**	**5**
Healthy teeth, without caries	1	6,82	nss	0,032	0,001	<0,001
Healthy gums, without bleeding	2	6,78		nss	0,001	<0,001
Good masticatory performance	3	6,64			0,081	<0,001
Pleasant aesthetic appearance	4	6,40				0,001
Straight teeth	5	5,75				
nss – not statistically significant						

Table II. Aspects related to patient's assessment of the dental practitioner

Self-rated importance of		**Mean**	**p-value**		
			2	**3**	**4**
Professional recognition of the dentist	1	6,56	nss	0,004	<0,001
Dentist's behavior	2	6,40		nss	<0,001
Dentist's ability to provide painless treatments	3	6,00			<0,001
Dentist's appearance	4	4,70			
nss – not statistically significant					

Table III. Aspects related to patient's assessment of the dental office

Self-rated importance of		**mean**	**p-value**					
			2	**3**	**4**	**5**	**6**	**7**
Cleanliness of the dental office	1	6,61	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001
Flexibility of the scheduling	2	5,77		nss	nss	<0,001	<0,001	<0,001
Decrease waiting time	3	5,69			nss	0,001	<0,001	<0,001
Dental office's equipment	4	5,52				0,002	<0,001	<0,001
Location of the dental office	5	4,63					nss	nss
Comfort of the waiting room	6	4,60						nss
Dental office design	7	4,58						
nss – not statistically significant								

DISCUSSIONS

Patient's expectations and perception of the dental practice include aspects that are important to be acknowledged by the dentist, in order

to ensure treatments that fulfill patient's need. According to the results of this study, patients are most interested in resolving their specific oral health problems (as caries and periodontitis), mastication and aesthetic problems coming closely, but secondly to these ones.Professional recognition of the dentist is the most important aspect that contribute to forming their opinion on the health care provider, and cleanliness and time related factors are relevant assessment factors of the dental office.

Regarding the manner used by patients to form an opinion about the dental practitioner, considering the specifics of dental health services, it is mostly natural that patients seek well trained practitioners, with good clinical abilities. This is also understandable when considering the characteristics of dental services in Romanian urban area, where there are available numerous private practices from which to choose.

Health care provider's behavior may influence patient's satisfaction and compliance to the treatment. In this regard, a good doctor-patient relation is very important, as a mean to prevent difficult situations with possible negative repercussions as when concerns of litigation arise [1]. Other studies highlight the importance of a good doctor-patient communication, this being usually a very important aspect for the patient. Hamasaki et al. observed that when patients perceive more positive the dentist-patient communication, compared to the dentists, there is more likely to have a positive outcome (improvement of health, managing fear, satisfaction with care)[2]. Schouten et al., in a study on 90 patientsfrom 13 different offices, also concluded that patient's satisfaction is mainly influenced by communicative behavior of the dentist [3].Orenuga etal. identifies the dentist-patient relation as being the first parameter linked to patient's satisfaction, two directions being emphases, namely respect and ability to listen [4]. Also, dentists should pay attention to the patient's personal communication style, in order to establish if either an affective or control style is more appropriate [4]. Empathy of the dental health care provider is another aspect that has been linked positively to patient's satisfaction [5].

A dental practice characterized by a good organization, with visibility regarding the adherence to health care services regulation, considering also the application of the general ergonomic principle, may increase patient's satisfaction. Whenassessing the quality of the dental health care, one of the top priorities, as patient perception, is related to the adherence to the rules of antisepsis and sterilization [6].This fact is confirmed by the results of this study, in which the cleanliness of the dental office was perceived as major criteria of the patient's evaluation. Cleanliness and comfort of the dental facility are rated also sometimes as the main aspects related to patient's satisfaction [8]. Responsiveness to patient's needs, as the one of finding an appropriate time for scheduling the dental appointment, has been previously identified as a factor in evaluating the quality of the dental care services [5]. Lack of timeliness of services, that is related to prolong waiting times are factor linked to patient's dissatisfaction [9].

CONCLUSIONS

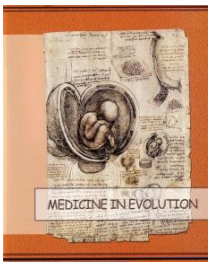
Patient's expectations and perception of the private dental practice are linked to aspects related to the dental practitioner and the dental office. The professional recognition and behavior are the most important aspects that influencepatient's perception upon the dentist. Cleanliness and organization of time schedule are the most relevant aspects

used by the patient in assessment of the dental office. Their knowledge of what patient desire may help the dental practitioner to organize his dental practice and maintain a good dentist-patient relation.

REFERENCES

1. Maitland R.Professional responsibility and patient retention: alerts for the new dentist.N Y State Dent J. 2014;80(1):15-21.
2. Hamasaki T, Soh I, Takehara T, Hagihara A.Applicability of both dentist and patient perceptions of dentists' explanations to the evaluation of dentist-patient communication.Community Dent Health. 2011;28(4):274-9.
3. Schouten BC, Eijkman MA, Hoogstraten J. Dentists' and patients' communicative behaviour and their satisfaction with the dental encounter.Community Dent Health. 2003;20(1):11-5.
4. Orenuga OO, Sofola OO, Uti OO.Patient satisfaction: a survey of dental outpatients at the Lagos University Teaching Hospital, Nigeria.Nig Q J Hosp Med. 2009;19(1):47-52.
5. Veldhuis B, Schouten BC. The relationship between communication styles of dentists and the satisfaction of their patients. Ned Tijdschr Tandheelkd. 2003;110(10):387-90.
6. John J, Yatim FM, Mani SA. Measuring service quality of public dental health care facilities in Kelantan, Malaysia. Asia Pac J Public Health. 2011;23(5):742-53.
7. Karydis A, Komboli-Kodovazeniti M, Hatzigeorgiou D, Panis V. Expectations and perceptions of Greek patients regarding the quality of dental health care. Int J Qual Health Care. 2001;13(5):409-16.
8. Adeniyi AA, Adegbite KO, Braimoh MO, Ogunbanjo BO.Factors affecting patient satisfaction at the Lagos State University Teaching Hospital Dental Clinic.Afr J Med Med Sci. 2013;42(1):25-31.
9. Campbell PC, Olufunlayo TF, Onyenwenyi AO.An assessment of client satisfaction with services at a model primary health care centre in Ogun State, Nigeria.Nig Q J Hosp Med. 2010;20(1):13-8.

DOES APPLIED ERGONOMY INFLUENCE PATIENT'S ANXIETY?



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ABSTRACT

***Aim**:The study analyzes anxiety fluctuation related to dental treatment (Dental anxiety). There are no studies related to patient confort durring dental treatment in ergonomic work position (horizontal position).*

***Material and method**:The actual tendency along with health care of the medical team, is the concern toward patient comfort. 42 patients of a private dental practice in Bucharest were applied a questionaire regarding anxiety level durring dental treatment.*

***Results and conclusion**:The anxiety levels result varied insignificantly. However it was greater in men than in women,not age related, correlated to the procedure and not related to the operative dentist.*

***Key words:** anxiety, patient ergonomy*

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INTRODUCTION

Fear is one of the oldest natural defence mechanisms. Fear center is located in the amigdala in all mamels, the nervous tracts beeing linked to different cerebral areas, the main represented by the hipotalamus.

The main factors causing fear in dental treatment can be cathegorised in:

- Causal factors-previous and present experiences (VAKOG formula)
- Contributing factors related to:
  - Surroundings-dental office, waitting room,
  - Personel attitude
  - Waitting time before entrance, the patient
    - Acumulates stress
    - Has more time to process pain awaiting

In all studies performed in the literature various themes acre approached:

- Doctor's comfort/assistent (team)durring work
- Patient appreciation regarding medical team proffesionalism
- Patient's satisfaction toward the result

However there is no available data regarding patient's comfort durring dental treatment, especially in the ergonomic working position. The main aspect that we are interested in as profesionals is keeping our state of health, because we spent more time working than the patient on the dental unit.

We proposed a study on the influence of ergonomic horrizontal working position over patient anxiety durring dental treatment. It was investigated the anxiety toward the dentist and toward therapeutical manouvers.

MATERIAL AND METHODS

The study comprised 2 years time span, between 2010 and 2012 in a dental office in Bucharest.

42 patients were selected who were not treated in ergonomic fashion. The lot is composed from 17men and 25 women ages between 42-84years old, in need of prosthetic treatment.

A questionaire regarding the working position was applied. Questions were posed by the dentist who explained and recorded the answers. The questions were:

A. Anxiety corelated to the dentist

B. Anxiety corelatd to the performed procedures/horrizontal position perceived as better/as worse

A. Anxiety corelated to the dentist

The answers received different scores:

- 3+very good-absent anxiety
- 2+good-mild anxiety
- 1+ acceptable-medium anxiety
- 0 high anxiety

Answers with subjective note were recorded as well:

- X dentist dependent
- Y procedure dependent
- U necesity dependend
- V device depended

B. Anxiety related to performed therapies,

Subjectiv perceived by the patient related to the working position, horrizontal/sitting position of the dental unit. The answers were valued:

- 3+ very well-absent anxiety
- 2+good-mild anxiety
- 1+ acceptable-medim anxiety
- 0 high anxiety present
- X dentist dependend

- Y performed procedure dependend
- U upon necesitites
- V device dependend

RESULTS

Table 1.

age	comfort	anx /dentist	anx /performed procedures	sex
42	3	0	0	1
44	2	1	0	1
44	2	0	2	1
44	3	0	3	1
45	0	0	0	1
45	2	0	1	1
46	3	0	3	1
46	3	1	Y	1
46	3	0	3	1
47	2	X	0	1
49	3	0	A	1
50	3	2	0	1
54	2	0	3	1
55	2	0	3	1
57	3	0	3	1
59	3	0	2	1
60	3	0	3	2
61	0	3	3	2
62	2	0	2	2
62	2	0	3	2
63	2	X	1	2
65	3	0	2	2
65	0	Y	0	2
65	3	0	1	2
69	3	0	0	2
70	3	0	1	2
71	1	0	3	2
71	3	0	2	2
71	3	0	3	2
72	3	0	1	2
72	3	0	3	2
72	2	0	1	2
73	0	0	0	2
75	3	0	0	2
75	1	0	3	2
75	2	0	1	2
75	1	0	3	2
77	3	0	3	2
83	3	0	3	2
84	1	0	3	2
87	0	0	0	2

In percentage the results were as follows:

Table 2.

Value	3	2	1	0	X	Y	U	V	A	B
Anxietytoward the dentist	2,4	2,4	4,8	83,3	4,8			2,4		
Anxiety toward performed procedure	23,8	11,9	33,3	26,2					4,8	

X=DENTIST
DEPENDENT
Y=PROCEDURE
DEPENDEND

U=UPON NECESITIES
V=DEVICE
DEPENDEND

A=INDIFERENT
B=DON'T KNOW

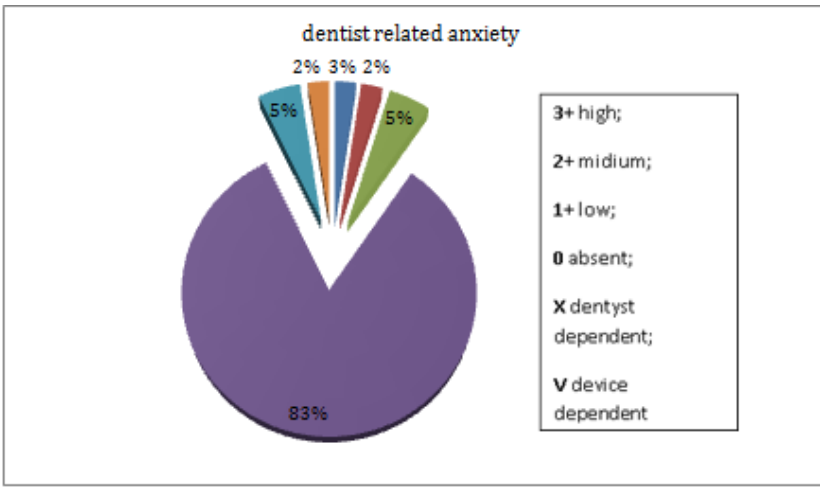
NUMBERS REPRESENT PERCENTAGE

Explaining the answers in table 1

X=DENTIST
DEPENDENT
Y=PROCEDURE
DEPENDENT

U=UPON NECESITIES
V=DEVICE
DEPENDENT

A=INDIFERENT
B=NU STIU



Graphic 1.

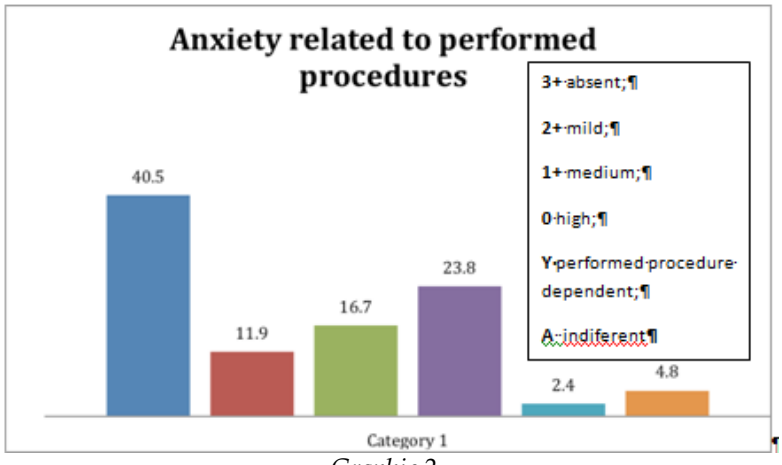
It is remarkable to notice that 83% of the participants do not present anxiety toward the dentist durring dental treatment in horrizontal working position.

Anxiety related to performed procedures,

Perceived subjective by the patient, according to the horrizontal working position/siting position of the dental unit.

The answers were evaluated:

- 3+ very well-absent anxiety
- 2+good-mild anxiety
- 1+ acceptable-medim anxiety
- 0 high anxiety present
- X dentist dependend
- Y performed procedure dependend
- U upon necesitites
- V device dependend



Graphic 2.

DISCUSSIONS

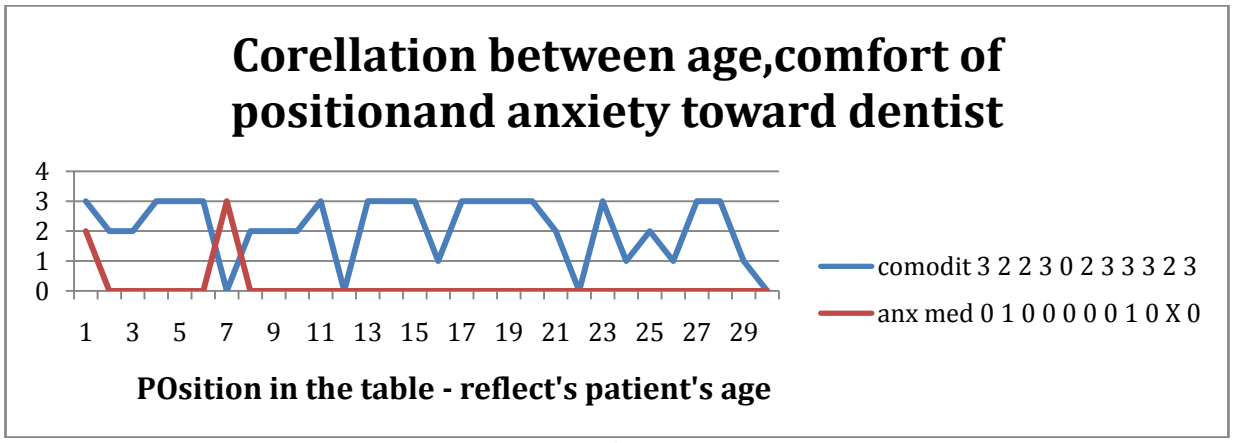
The answers showed that patients don't manifest a higher anxiety toward dentist in horrizontal working position. We did not obtain the same result toward performed procedures where 59,5% patients presented different degrees of anxiety.

Correlations between patients answers:

Comfort-age-anxiety toward dentist or performed procedures

Correlations can be made between patient's acceptance toward horrizontal working position, age, degree of patient's anxiety.

Anxiety was measured in ergonomic working position, toward the dentist and performed procedures obtaining the following results:



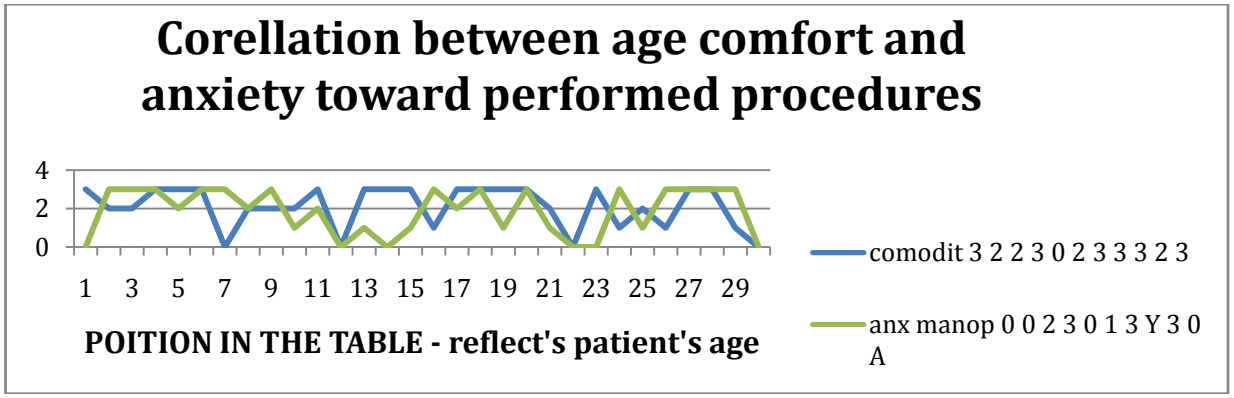
Graphic 3.

As it can be observed, there is no correlation between acceptance of ergonomic working position and anxiety toward dentist. We have to mention, that all the patients in the study are used to be treated for years to the same dentist. Correlation coeficient between age and anxiety toward dentist is -0,18901

In the case of female patients, the correlation coeficient between age and anxiety toward dentist is-0,16697

Correlation coeficient between age and anxiety toward dentist in male patients is-0,45797.

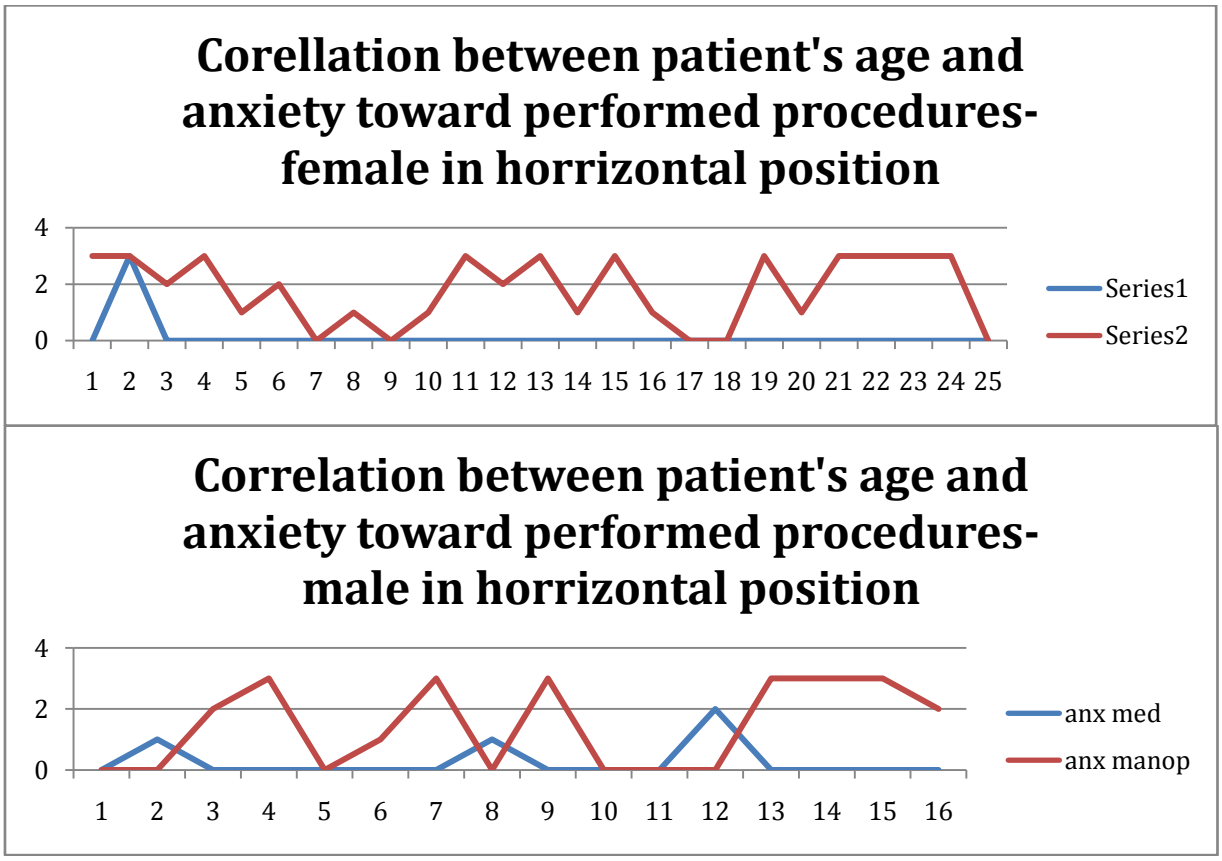
It is obvious a lack of correlation in both cases.



Graphic 4.

Between acceptance of horrizontal working position and

anxiety fluctuation toward performed procedures there is a positive correlation as it can be observed above.

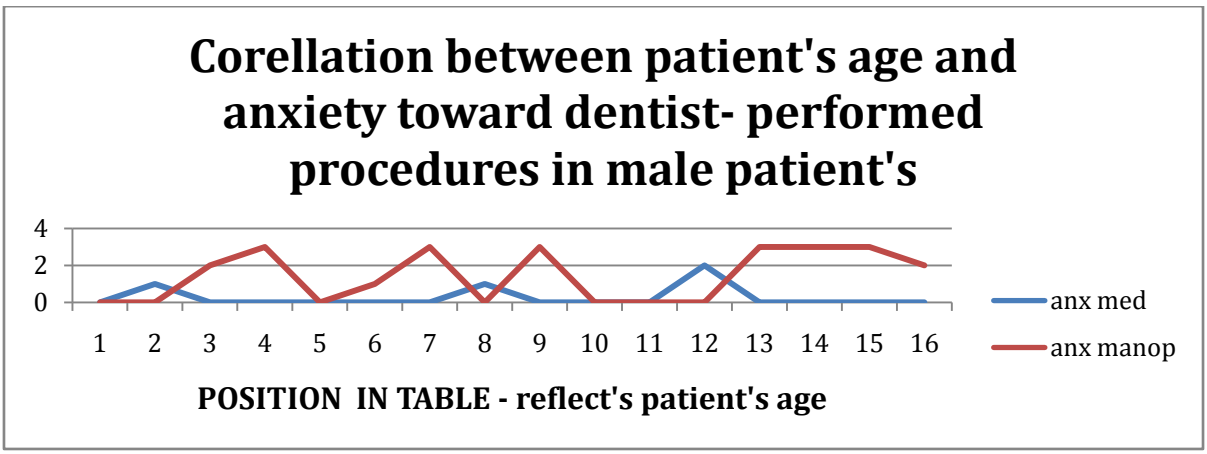


Correlation coeficient between age, anxiety toward performed procedures is 0,394821 in male cases, and in female cases is -0,04112, obviously a lack of correlation

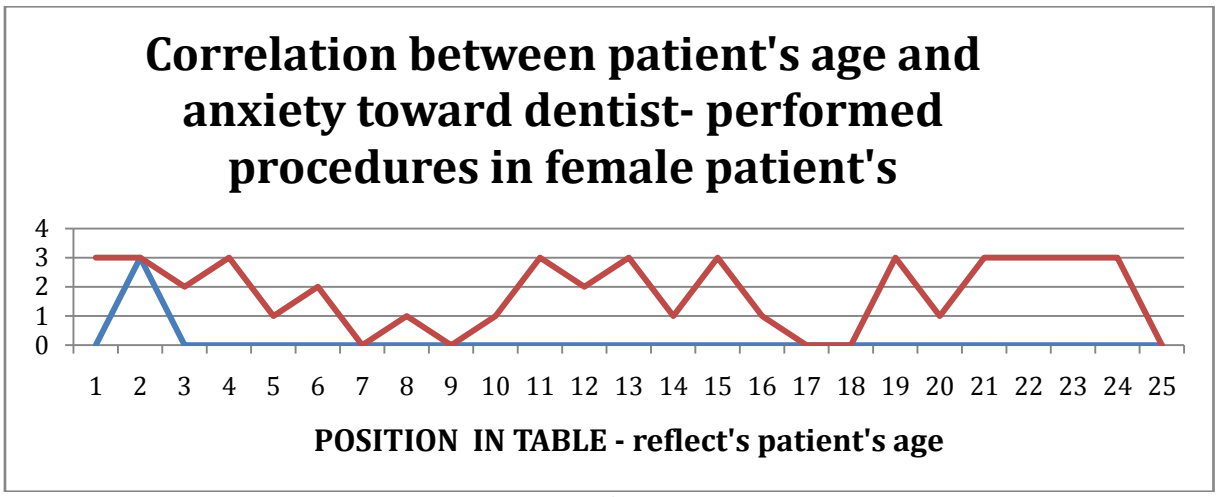
Patient gennder and anxiety:

Correlation coeficient between patient's gender and anxiety toward dentist in male patient's is -0,52549,being a negative medium correlation.

Correlation coeficient between patient's gender in female patient's and anxiety toward dentist is 0,00458. Obviously a lack of correlation. It can be observed there is a higher anxiety in male than female regarding performed procedures to be executed in ergonomic working position.



Graphic 5.



Graphic 6.

CONCLUSIONS

a. Patient's anxiety toward dentist in ergonomic horrizontal working position does not modify in time oposed to the performed procedures where the anxiety levels are high

b. there is no correlation between acceptance of the ergonomic horrizontal working position and anxiety toward dentist.

c. between acceptance of the horrizontal working position and the lack of anxiety linked to the performed procedures there is an obvious positive correlation

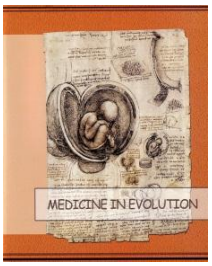
d. anxiety is higher in male than female regarding the performed procedures to be executed in ergonomic working position

e. patient's anxiety toward performed procedures or to the dentist is not age related

REFERENCES

1. Stouthard M, Hoogstraten J.Prevalence of dental anxiety in The Netherlands. Community Dent OralEpidemiol 1990; 18: 139-42.
2. Thomson WM, Stewart JF, Carter KD, Spencer AJ. Dental anxiety among Australians. Int Dent J 1996; 46: 320-4.
3. Armfield JM, Spencer AJ, Stewart JF. Dental fear in Australia: who's afraid of the dentist? Aust Dent J 2006; 51: 78-85.
4. Ter Horst G, De Wit CA. Review of behavioural research in dentistry 1987–1992: Dental anxiety, dentistpatient relationship, compliance and attendance. Int Dent J 1993; 43: 265-78.
5. Eli I, Uziel N, Blumensohn R, Baht R. Modulation of dental anxiety - the role of past experiences, psychopathologic traits and individual attachment patterns. Br Dent J 2004; 196: 689-94.
6. Locker D, Liddell A. Correlates of dental anxiety among older adults. J Dent Res 1991; 70: 198-203.
7. Neverlien PO. Normative data for Corah's Dental Anxiety Scale (DAS) for the Norwegian adult population. Commun Dent Oral Epidemiol 1990; 18: 162.
8. Hagglin C, Berggren U, Hakeberg M, Hallstrom T, Bengtsson C. Variations in dental anxiety among middleaged and elderly women in Sweden: a longitudinal study between 1968 and 1996. J Dent Res 1999; 78: 1655-61.
9. Doerr PA, Lang WP, Nyquist LV, Ronis DL. Factors associated with dental anxiety. J Am Dent Assoc 1998; 129: 1111-9.
10. Moore R, Birn H, Kirkegaard E, Brødsgaard I, Scheutz F. Prevalence and characteristics of dental anxiety in Danish adults. Commun Dent Oral Epidemiol 1993; 21: 292-6.
11. http://medicineinevolution.umft.ro/forauthors.htm

DEFINING SALIVARY BIOMARKERS IN ORAL CANCER - A MINI REVIEW



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ABSTRACT

Oral cancer is one of most frequent human cancers with a high mortality rate. Traditional detection methods consist of clinical and histological exams. Early detection leads to a better prognosis for long term survival. Several serum parameters show a great potential for cancer detection such as uric acid, total antioxidant capacity, Foxp3, interleukin-6, matrix metallo proteinase-9, tissue inhibitor of metallo proteinase, Ki-67 and squamous cell carcinoma antigen (SCCAg). Saliva is an alternative to serum testing for several diseases and has certain advantages to serum. This review is focusing on saliva as a diagnostic fluid and the most importants salivary biomarkers used in oral cancer detection.

Key words: *Oral cancer; Serum; Saliva; Uricacid; TAC; FOXP3; IL-6; MMP-9; TIMP2; Ki-67; Squamouscell carcinoma antigen*

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ORAL CANCER - GENERALITIES

Cancer is the leading cause of mortality worldwide. The most common cancers are lung, prostate and breast cancers with head and neck cancers being the 6th most common cancers worldwide (Jemal et al., 2011). Most of the cancers in this area are squamous cell carcinomas, located in more than 85% of the cases in the oral cavity. The incidence is closely and directly related to socio-economic conditions, gender, age and the existence of risk factors such as smoking or alcohol. In terms of socio-economic status, oral malignancies are more common in developing countries and in rural areas (Warnakulasuriya, 2010). They are also more common in men and in patients over 55 years (Jemal et al., 2011). Risk factors most commonly involved are smoking, chronic alcohol consumption and infection with papillomavirus. Any form of cancer treatment involves several stages: a diagnosing step (ideally as soon as possible) and a treatment step in which surgical methods are associated with chemotherapy or radiotherapy, the success being measured as five-year survival rate. Unfortunately, at least for oral cancers, diagnosis occurs in late stages when treatment options are limited to a negative impact on quality of life and survival (Brocklehurst et al., 2013). To date, together with the advent of new immuno-histo-chemistry techniques and multiplicity of biomarkers, screening for many diseases may be done more easily and with high precision using serum as a diagnostic fluid. Disadvantages in serum diagnosis are related to the stress induced when sampling the patients together with the need of specialized personnel.

SALIVA: GENERAL CHARACTERISTICS AND ROLES

Total saliva is a complex fluid from several points of view: origin, composition and function (Greabu et al., 2009). Most important salivary roles include protection and whenever needed repair of oral tissues; other roles focus on taste, digestive process, antiviral antibacterial and antifungal activity that can shelter the oral environment from exo- or endo-genous microorganisms. Physical and chemical properties are also essential for protecting the periodontontium and the teeth. A thin saliva film is always covering the tooth surface preventing demineralization, promoting remineralization and inhibiting bacterial adherence and growth.

Saliva contains water, inorganic and organic substances. The most common organic substances are represented by salivary proteins and polypeptides – so far there are reports of more than 2300 proteins. Of these the most representative include: α-amylase, albumin, mucins, lactoferrin, lysosome, proline-rich proteins, statherins. Out of the total amount of 2300 organic substances found in saliva approximately 100 are potential markers of oral cancer as they are found in significantly higher concentrations in oral cancer patients when compared to controls. A list of potential markers for oral cancer is shown in the Table 1.

SALIVA AS A DIAGNOSTIC FLUID

As an alternative to other body fluids saliva has become an important diagnostic fluid due to many advantages: being serum derived, the vast majority of the compounds found in blood can also be determined in

saliva. The downside is that salivary levels of these compounds are lower in saliva than in blood and require more equipment with a lower detection threshold. Saliva collection is also non-invasive and does not imply unnecessary stress from the patient; it can potentially be done anywhere and requires relatively inexpensive equipment (Pfaffe et al., 2011). One major disadvantage when using saliva as a diagnosing fluid is the possibility of contamination due to the high microbial load of the oral environment. Saliva is also important due to permanent and continuous contact with various oral lesions such as lichen planus, oral cancer or periodontal disease which insures the existence of biomarkers that can give important indicators on the diagnosis and development of these diseases. The methods most frequently used in analyzing these markers depend greatly on their chemical nature (Kawas et al., 2012). Thus proteins are usually determined using ELISA method, high performance liquid chromatography, radioimmunoassay techniques, two-dimensional gel electrophoresis. For biomarkers such as DNA, mRNA and microRNA methods such as polymerase chain reaction polymerase (PCR), or quantitative PCR are usually employed (Al-Tarawneh et al., 2011, Kawas et al., 2012, Löfgren et al., 2012). Marker analysis is usually done on unstimulated saliva followed by centrifugation to separate the solid content such as desquamated epithelial cells, red blood cells, bacteria and food debris.

Table 1. Most common salivary biomarkers used for oral cancer diagnosis

CATEGORY	BIOMARKERS
Anorganic compounds	-Na,Ca, Mg, F
Peptides	-Defensin-1
Proteins	-p53
	-α-amilase
	-IL-8
	-TNF-α
	-IL-1
	-IL-6
	-Fibroblast growth factor
	-Statherins
	-Cyfra 21.1
	-Tissueplasminogenactivator (TPA)
	-Cancer antigen 125 (CA125)
	-Endotelyn-1
	-IL-1β
	-CD44
	-Total salivary proteins
	-Insulin Growth factor (IGF-1)
	-MMP-2
	-MMP-9
	-CD-59
	-Catalaza
	-Profilin
	-S100A9/MRP14
	-M2BP
	- CEA
	- CA-50
	-Cyclin D-1
	-8-OH-guanyn
	-Ki-67

	-SCCA
	- LDH
	-Transferin
	-Hemopexin
	- Haptoglobyn
	- alfa1-antitrypsin
Markeri ADN	-TP53
	- Mitochondrial DNA
	- TIMP1, TIMP2,TIMP31, p16, MGMT
ARNm Markers	
	-IL-1β
	- DUSP1
	- Histones - H3F3A
	- OAZ-1
	- Protein S100 (S100P)
microARN Markers	-miR-200a
	-miR-31
	-miR-125a
Oxidative stress	- NO, NO_2, NO_3
	-Peroxidase
	-Gluthation transferase (GST)
	-Super oxid dismutase (SOD)
	-8-OHdG
	-Glutathione (GSH)
	-Malondialdehyde (MDA)
	-Uric acid
	-Cortisol
	- Total antioxidant capacity (TAC)
Metabolic products	-Acidul lactic

KEY SALIVARY MARKERS FOR ORAL CANCER DIAGNOSIS

There are currently more than a dozen discovered interleukins each of them with distinct roles in the inflammation process. Out of them, IL-6 has been linked with cellular growth and differentiation. Several reports show that IL-6 can be a good indicator of cell differentiation and dysplasia usually paired with increased concentrations of IL-1 andTNF-α. There is also a direct link between high salivary levels of IL-6 and oral cancer aggresivity which makes the marker a usefull indicator of inflammation development in oral cancer (Brailo et al., 2012).

Another class of proteins involved in oral cancer are tissue inhibitors of metallo proteinases or TIMP (Singh et al., 2010). The continuous interaction between TIMP and matrix metallo proteinases maintains normal tissue architecture and regulates cell growth and differentiation as well as control of local invasivity and metastasis. MMPs or matrix metalloproteinases are known to play paramount roles in tissue destruction. Out of all of them, MMP-9 is mainly involved in cell migration, wound healing or alveolar bone development as well as in pathological processes such as malignancy (Yu et al., 2011). Ki-67 is another important indicator of aggressive cancer behavior in various cancers including oral cancer. World Health Organization recognizes Ki-67 labeling index as a reliable cancer prognostic tool (Freudlsperger et al.,

2011). Malignancy is also traditionally associated with increased levels of oxidative stress and reactive oxygen species. In this respect total antioxidant capacity has an important significance in clinical setting as it is highly relevant for the antioxidant status in many pathological conditions including oral cancer.

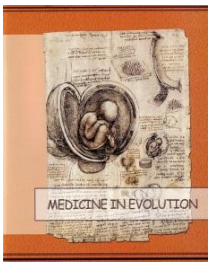
CONCLUSIONS

Taken together, saliva holds the promise for a trully reliable and non-invasive diagnostic fluid. Several concerns when using saliva as a diagnostic fluid are related to the lack of standardization, procurement and processing of saliva samples, and variability of results as well as the need for validation results. The potentially high variability of final results are connected to age, sex and nutritional physiology differences between patients as well as any underlying conditions, oral or systemic, inflammatory or neoplastic that may influence the analysis.

REFERENCES

1. Al-Tarawneh, SK, Border, MB, Dibble, CF, Bencharit, S. Defining salivary biomarkers using mass spectrometry-based proteomics: a systematic review. Omics: a journal of integrative biology. 2011;15(6):353-61.
2. Brailo, V, Vucicevic-Boras, V, Lukac, J, Biocina-Lukenda, D, Zilic-Alajbeg, I, Milenovic, A, et al. Salivary and serum interleukin 1 beta, interleukin 6 and tumor necrosis factor alpha in patients with leukoplakia and oral cancer. Medicina oral, patología oral y cirugía bucal. 2012;17(1):e10.
3. Brocklehurst, P, Kujan, O, Glenny, A, Oliver, R, Sloan, P, Ogden, G, et al. Screening programmes for the early detection and prevention of oral cancer. Cochrane Database Syst Rev. 2013;11.
4. Freudlsperger, C, Rohleder, SE, Reinert, S, Hoffmann, J. Predictive value of high Ki- 67 expression in stage I oral squamous cell carcinoma specimens after primary surgery. Head & neck. 2011;33(5):668-72.
5. Greabu, M, Battino, M, Mohora, M, Totan, A, Didilescu, A, Spinu, T, et al. Saliva-a diagnostic window to the body, both in health and in disease. J Med Life. 2009;2(2):124-32.
6. Jemal, A, Bray, F, Center, MM, Ferlay, J, Ward, E, Forman, D. Global cancer statistics. CA: a cancer journal for clinicians. 2011;61(2):69-90.
7. Kawas, SA, Rahim, ZH, Ferguson, DB. Potential uses of human salivary protein and peptide analysis in the diagnosis of disease. Archives of oral biology. 2012;57(1):1-9.
8. Löfgren, CD, Wickström, C, Sonesson, M, Lagunas, PT, Christersson, C. A systematic review of methods to diagnose oral dryness and salivary gland function. BMC oral health. 2012;12(1):29.
9. Pfaffe, T, Cooper-White, J, Beyerlein, P, Kostner, K, Punyadeera, C. Diagnostic potential of saliva: current state and future applications. Clinical chemistry. 2011;57(5):675-87.
10. Singh, RD, Haridas, N, Patel, JB, Shah, FD, Shukla, SN, Shah, PM, et al. Matrix metalloproteinases and their inhibitors: correlation with invasion and metastasis in oral cancer. Indian Journal of Clinical Biochemistry. 2010;25(3):250-9.
11. Warnakulasuriya, S. Living with oral cancer: epidemiology with particular reference to prevalence and life-style changes that influence survival. Oral oncology. 2010;46(6):407-10.
12. Yu, T, Wu, Y, Helman, JI, Wen, Y, Wang, C, Li, L. CXCR4 promotes oral squamous cell carcinoma migration and invasion through inducing expression of MMP-9 and MMP-13 via the ERK signaling pathway. Molecular Cancer Research. 2011;9(2):161-72.

THE ESTHETIC RECONSTRUCTION OF THE CENTRAL SUPERIOR INCISERS WITH FULL CERAMIC CROWNS - CASE REPORT



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ABSTRACT

In order to be considered a success, a fixed central superior restoration must be very well integrated in the morphological, phonetical and esthetical context of the patient.The present article presents a clinical case of frontal superior incisors retreatment and restoration with very good esthetic results. The phiziognomic result will be influenced by the soft tissue management, as well as by the shape of de dental units made by the tehnician in accordance with the adiacent teeth, with the age and ,of course, the personality of the patient.

Key words: *cavity, esthetic, fixed restoration, endodontic retreatment*

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INTRODUCTION

The four superior incisors participate in phyziognomy, phonation, food-sectioning, anterior guidance and soft parts sustainance.[1]Because the face and the mouth are the most exposed parts of the body, dental treatment has an important role in improving or totally restoring the esthetic aspect of a person.

In context of the homeostasis of the organism, configuring a facial and functional harmony becomes a biological and behavioral requirment of a special importance, especially with the help of the frontal teeth.No matter how good a prosthetic restoration is, functionally speaking, if we don't inegrate it with the physiognomy and also the personality of the patient, it could be considered a failure.

Morpho-functional restoration of the dental units submined by the caries, can be restored extremely esthetic,and also functional, in the frontal area with the help of the full ceramic restorations.

CASE REPORT

The patientE.R., student, 20 years, from Bucharest,came into the dental office with a 3 years old fixed metallo-ceramic restorationon teeth 11 and 21, being very unsatisfied with it.

After clinical and radiological examination (Fig.1) the poor esthetic integration of the restoration could be observed as well as the incorrect endodontic treatments with a big apical reaction on tooth 11 as well as a guttapercha cone over the apex on tooth 21.

Figure 1. Initial radiological aspect

Also on tooth 12 a big mesial restoration with a secondary cavity could be identified and on tooth 22 an apparently good endodontic treatment, with no crown.

After the removal of the prosthetic restoration the endodontist retreated the teeth 11 and 21.The old filling was kept as a temporary restoration during the endodontic treatments. The root canal filling on tooth 22 appeared scratchy, so also these tooth was endodontically retreated. All rootcanal treatments were rotary prepared and filled with warm guttapercha (vertical condensation) and Ah plus (Dentsply, Meileffer). After the endodontic treatmentall teeth were fiberpost restored. (White Post Dc from FGM and Build-It A2 from Pentron Clinical were used). Because tooth 12 presented a secondary cavity, as well as for a more esthetic result, this tooth was devitalized followed by warm guttapercha and Ah plus filling and a

fiber post restoration (White Post Dc no 3 from FGM and Build It A2 from PentronClinical).Figure no 2 represents the retroalveolar X Ray after the root canal fillings on teeth 12,11,21,22

Figure 2. RetroalveolarX Ray, teeth 12,11,21,22

The fiber post restorations (Fig. 3.) were followed by the prosthtodontic preparationand the impression for temporary crowns (Fig. 4). Teeth bleaching with Opalescence Whitening 15% (Ultradent)for 10 days was recommended followed by a 10 days of pause for tooth shade to stabilize.

For a superior esthetic result (Fig 5-6) as well as for a better retention of the future prosthetic restoration, also a gingivectomy on these four teeth was performed.

Figure 3. The aspect of the prepared teeth

Figure 4. Temporary crowns used for the social integration of the patient and for the abutments' and soft-tissue protection

Figure 5. The aspect of the cemented full ceramic prosthetic restoration. The very good esthetic integrationin the dento-maxillary system can be observed

Figure 6. Aspect while smiling

DISCUSSIONS

In the last years, the esthetic of the teeth became a major concern and an important reason for why patients ask for a dental treatment.[3,4]

The lost of the frontal teeth, specially in young age, will negatively influence the physiognomic aspect due to the direct exposure while talking or smiling of the edentulous space, and also by affecting the normal contour of the lips.[5]

Different studies (De Witt, Lucker, Shaw quoted by[6]) demonstrated the salutary effect of the attractivnessin human relations which is being asociated in most cases with the face.

Often, the most important reason for the request of the dental treatment is the esthetic motivation.The size and the shape of the maxillary anterior teeth are important not only for the esthetic of the mouth, but also for the esthetic of the face. [7].The progress made by the new dental biomaterials and by applying new and modern therapeutical procedures, increases the posibilities of offering more esthetic treatments. [4]

Espeland and colab.[8]observed the fact that the majorityof young people are more preoccupied of the esthetic aspect of the frontal teeth than by the occlusal ratio at this level. The therapeutical succes depends on the reasons for which the patient comes into the office, on the personality, expectations and on the patient-doctor cooperation.

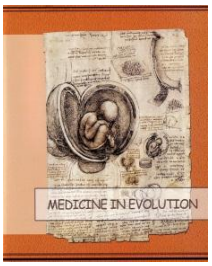
CONCLUSIONS

The morpho-functional restoration of the central incisors affected by the caries or lost as a result of the carious activity is a complex procedure and consits in establishing the harmony between the functional and esthetic.

Any restored teeth, but especially the superior central incisors must have an accentuated individuality in order to be perceived as individual entities and avoiding the artificial associated to an identical string of teeth.

REFERENCES

1. Ghergic D.L., Comăneanu R.M., Morfologia aparatului dento-maxilar, Bucureşti, Printech, 2009.
2. Cavalcante LMA, Pimenta LA. Princípiosestéticospara um sorrisoharmônico. Rev ABO Nac. 13: 81-5, 2005.
3. Soares GP, Valentino TA, Lima DANL, et al. Esthetic analysis of the smile, Braz J Oral Sci. 6(21):1313-1319, 2007.
4. Comăneanu R.M., Coman C., Ghergic D.L., et al, Esteticădento-facială, Bucureşti, Printech,2013.
5. Ghergic D.L., Comăneanu R.M., Andreescu C.F., et al, Restaurarea edentaţiei parţiale prin protezare fixă, Bucureşti, Printech, 2013.
6. Mahshid M, Khoshvaghti A, Varshosaz M, et al. Evaluation Of "Golden Proportion" In Individuals With Esthetic Smile. J EsthetRestor Dent 2004; 16: 185-192.
7. Hasanreisoglu U, Berksun S, Aras K, et al. An analysis of masillary anterior teeth: Facial and dental proportions. J Prosthet Dent. 94: 530-8, 2005.
8. Espeland LV, Stenvik A. Perception of personal dental appearance in young adults: relationship between occlusion, awareness, and satisfaction. Am J OrthodDentofacialOrthop. 100: 234-41, 1991.
9. Golumbeanu N., Hutu E. Particularitésmorphologiques des dents dans le cadre des arcades naturelleset le facteurdento-parodontal, RevistaRomână de Stomatologie, vol LVIII, nr. 2, pag. 123-127, 2012.



ANATOMICAL COMMENT: THE LATERAL LINGUAL CANALS OF THE INTERFORAMINAL MANDIBLE MAKE POSSIBLE THE DISTRIBUTION OF THE MYLOHYOID NERVE TO TEETH

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ABSTRACT

Basic anatomical educations should go beyond the classical data. In this regard the mylohyoid nerve should be treated not only as a motor one, but also as an accessory nerve innervating teeth. This is of utmost importance in dental schools worldwide. Lingual canals (LCs) through the lingual cortical plate of the mandible were described a long time ago. However, different methods of study lead to a heterogeneous pool of evidence. According to these studies, there are median and lateral LCs. These can use for the passage of blood vessels but also for entrance of mylohyoid nerve branches. The later can pass equally thourgh median and lateral LCs, the later appearing as recurrent canals which leave the incisive canal of the mandible. The mandible LCs ensure so a dental distribution of the mylohyoid nerve.

Key words: *mandible; incisive nerve; tooth*

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Openings in the lingual cortical plate of the human mandible are common findings, all individuals demonstrating at least one such canal (Rosano et al. , 2009). Such orifices correspond to the lingual canals (LCs) of the mandible, which were evaluated by dissection (Rosano, 2009), on dry bones (reviewed in (Kaufman et al. , 2000)), by imagistic methods, such as computed tomography (CT) or Cone Beam CT (CBCT) (Cova et al. , 2003, Gahleitner et al. , 2001, Gultekin et al. , 2003), or by combinations of methods (Liang et al. , 2007). The LCs can be classified as lateral and median; the median LCs openings are either superior or inferior spinal genial foramina (Liang, 2007).

The LCs are described as being vascular (Cova, 2003, Gahleitner, 2001, Gultekin, 2003) (although CT studies cannot accurately discriminate the contents of a bony canal as being vascular or neural), other authors indicating a neural and/or vascular content (Liang, 2007). A study aimed at clarifying the inconsistencies regarding the LCs contents, and concluded that the superior spinal genial foramina contents can be represented by branches of the lingual vessels and nerves while the inferior spinal genial foramina contents are branches of the mylohyoid nerve and of submental and/or sublingual arteries (Liang, 2007).

A recent study performed on dry mandibles attempted to classify the lingual foramina of the mandible; the authors preferred to relate the lateral ones with the genial tubercle (mental spine), failing to observe that those openings are located below the anterior end of the mylohyoid line (Przystanska and Bruska, 2012). That study was followed by a scientific debate (Suhaimi and Das, 2012); it was discussed that "It would be better to interpret the concerned neurovascular structures according to the position of the accessory foramen".

The contents of the LCs are usually discussed in relation with different surgical procedures (Kaufman, 2000, Liang, 2007). However, the available literature has failed to integrate the existing data into the basic anatomical education, in order to support the need of thinking beyond the vesalian anatomy (Bergman, 2011).

Here is documented in CBCT the mandible of an adult patient which demonstrates bilateral LCs (fig.1), with inner diameters of 0.79 mm. (right side) and of 1.03 mm. (left hemimandible). In a lot of 21 patients, 2 had such unilateral canals and 7, including this case, had bilateral LCs (33%). The three-dimensional volume renderization (fig.2) identified the openings of the recurrent branches of the incisive canals below the anterior ends of the mylohyoid lines, such as were demonstrated previously in dry mandibles (Przystanska and Bruska, 2012).

The study of the inferior alveolar nerve morphology performed in 1971 by Carter and Keen (Carter and Keen, 1971) is largely cited by various publications. We carefully observed the anatomical descriptions of these two authors which present "thick downturning branches, from both the dental branches and from the incisor plexus" which lead to foramina within the lingual cortical of the mandible opposite to the premolar teeth. Topographically, there is a perfect match of their findings and the CBCT evidence we documented. According to Carter and Keen (Carter and Keen, 1971), the respective foramina were described in 1954 by Shiller and Wiswell (it seems that the first description of the lingual foramina of the mandible belongs to these authors) and are traversed by the anastomosis of the mylohyoid nerve with either the dental plexus, or the inferior alveolar nerve branches (Carter and Keen, 1971).

In such anatomical situations in which the mylohyoid nerve sends fibers within the interforaminal mandible it is absolutely correct to state that the incisor teeth receive innervation from both the intramandibular inferior alveolar inerve and the extramandibular mylohyoid nerve. This information, which is rarely found (Schroeder, 1991, Stein et al. , 2007), but not completely absent in publications, deserves a better focus in basic anatomical teaching, mainly in dental medical faculties. However, caution should be taken when considering the mandible entry point of the mylohyoid nerve dental twigs: this can be a median LC, as presented in much too few different papers (Liang, 2007, Rodella et al. , 2012, Stein, 2007), but it can also be a lateral recurrent LC, as documented here, as well as previously by Carter and Keen (Carter and Keen, 1971).

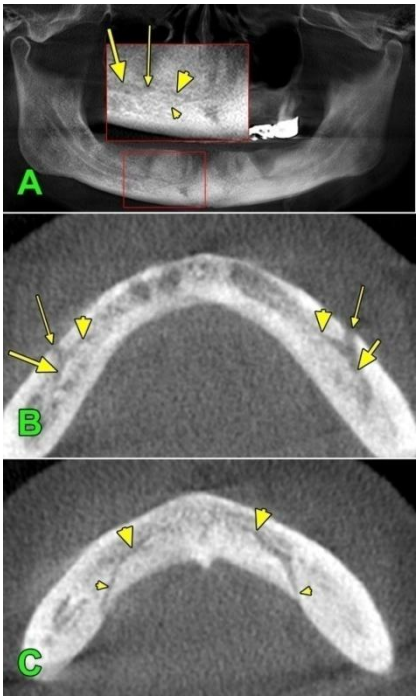


Figure 1. CB CT evaluation of a 59 years old edentulous female patient. The reconstructed panoramic radiograph is presented in (A); (B) and (C) present successive oblique/axial MPRs through the mandibular body. Inset in (A) presents details of the right hemimandible canals. There are indicated: the mandibular canal (thick arrow), the mental foramen (thin arrow), the incisive canal (thick arrowhead) and bilateral canals (thin arrowheads) leaving the incisive canals and downturning to open through the lingual cortical plates of the mandible

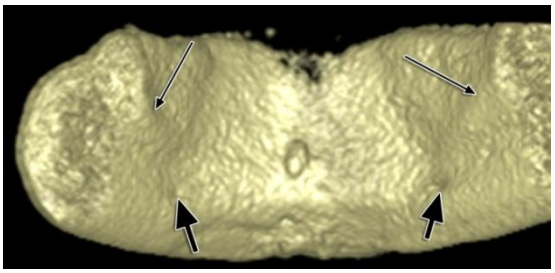


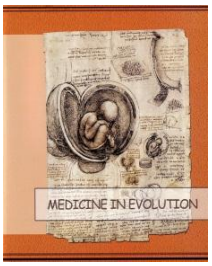
Figure 2. Three-dimensional volume renderization. The openings of the lateral lingual canals (thick arrows) are located beneath the anterior ends of the mylohyoid lines (thin arrows)

REFERENCES

1. Bergman, RA. Thoughts on human variations. Clinical Anatomy. 2011;24(8):938-40.
2. Carter, RB, Keen, EN. The intramandibular course of the inferior alveolar nerve. J Anat. 1971;108(Pt 3):433-40.

3. Cova, M, Ukmar, M, Bole, T, Morra, A, Lubin, E, Pozzi Mucelli, R. Evaluation of lingual vascular canals of the mandible with Computed Tomography. Radiol Med. 2003;106(4):391-8.
4. Gahleitner, A, Hofschneider, U, Tepper, G, Pretterklieber, M, Schick, S, Zauza, K, et al. Lingual vascular canals of the mandible: evaluation with dental CT. Radiology. 2001;220(1):186-9.
5. Gultekin, S, Arac, M, Celik, H, Karaosmaoglu, AD, Isik, S. [Assessment of mandibular vascular canals by dental CT]. Tani Girisim Radyol. 2003;9(2):188-91.
6. Kaufman, E, Serman, NJ, Wang, PD. Bilateral mandibular accessory foramina and canals: a case report and review of the literature. Dentomaxillofac Radiol. 2000;29(3):170-5.
7. Liang, X, Jacobs, R, Lambrichts, I, Vandewalle, G. Lingual foramina on the mandibular midline revisited: a macroanatomical study. Clin Anat. 2007;20(3):246-51.
8. Przystanska, A, Bruska, M. Anatomical classification of accessory foramina in human mandibles of adults, infants, and fetuses. Anat Sci Int. 2012;87(3):141-9.
9. Rodella, LF, Buffoli, B, Labanca, M, Rezzani, R. A review of the mandibular and maxillary nerve supplies and their clinical relevance. Arch Oral Biol. 2012;57(4):323-34.
10. Rosano, G, Taschieri, S, Gaudy, JF, Testori, T, Del Fabbro, M. Anatomic assessment of the anterior mandible and relative hemorrhage risk in implant dentistry: a cadaveric study. Clin Oral Implants Res. 2009;20(8):791-5.
11. Schroeder, HE. Oral Structure Biology: Embryology, Structure, and Function of Normal Hard and Soft Tissues of the Oral Cavity and Temporomandibular Joints: G. Thieme Verlag; 1991.
12. Stein, P, Brueckner, J, Milliner, M. Sensory innervation of mandibular teeth by the nerve to the mylohyoid: implications in local anesthesia. Clin Anat. 2007;20(6):591-5.
13. Suhaimi, FH, Das, S. Accessory foramen in the human mandible: anatomical and clinical considerations. Anat Sci Int. 2012;87(3):179.

THE EVALUATION OF DIRECT AMALGAM AND COMPOSITE RESTORATIONS – COMPARATIVE CLINICAL STUDY



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ABSTRACT

The use of composite resins is more and more extended to the posterior teeth too, but there are also a lot of direct coronary amalgam restorations in proximal-occlusal carious lesions.

***The purpose** of this study was to make a parallel between the behavior in time of the two restorative materials.*

***Material and methods** In the study were included 100 direct proximal-occlusalrestorations of conventional amalgam (50) and of hybrid composite resin (50), 4-6 years old, on the molars and premolars. The evaluation of the state of the restorations was made by these parameters: marginal adaptation, marginal discoloration, at the preparation/restoration wall limit, secondary marginal caries, cracks in the restoration, coronary adjacent fractures.*

***Results and discussions** The number of composite restorations that have clinically presented an ideal marginal adaptation was lower that the number of amalgam restorations. Marginal discoloration at the restoration/preparation limit, for the composite direct restorations apeeres because of the marginal inadequacy after the polimeryzation contraction and the degradation of the adhesion quality with the permission of infiltations.*

***Conclusions** The choise of amalgam restorations ramains an option in posterior reconstructions because of their great reliability and sustainability.*

***Key words:** coronary restorations, amalgam, composite resin, marginal adaptation*

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INTRODUCTION

The use of composite resins is more and more extended to the posterior teeth too, but there are also a lot of direct coronary amalgam restorations in proximal-occlusal carious lesions. That is way the comparative studies about the longevity of amalgam and composite direct restorations, correlated with a series of clinical factors, has a great practical importance.Even if for the majority of patients the esthetic part is the most important, the restorative material has to be chosen in a way for it to allow a maximum longevity of the restoration, an optimal marginal adaptation and to prevent the appearance of secondary caries.

The purpose of this study was to make a parallel between the behavior in time of the two restorative materials.

MATERIAL AND METHODS

The study was made on a number of 50 patients with ages between 18 and 50 years, of both sexes, selected among the patients that came to the Department of Odontology of the University of Dental Medicine, UMF Tg.Mures.

The criteria chosen to include patient in this study were:

- every patient has to present at least one direct proximal-occlusalamalgam restorations and one of hybrid composite resin
- the direct proximal-occlusalamalgam or hybrid composite resin restorations have to be similar on the location on the tooth (molars and premolars) and the degree of surface extent, for every patient

In the study were included 100 direct proximal-occlusalrestorations of conventional amalgam (50) and of hybrid composite resin (50), 4-6 years old, on the molars and premolars.

The evaluation of the state of the restorations was made by these parameters:

- marginal adaptation
- marginal discoloration, at the preparation/restoration wall limit
- secondary marginal caries
- cracks in the restoration
- coronary adjacent fractures

In relation to the used material we followed:

- the modification of the external contour of the restoration in relation to the anatomy of the region or the rough surface of the silver amalgam
- discolorations of the composite or the adjacent enamel

For the mentioned clinical evaluation we used the Ryge modified criteria of the United Sates Public Health Department, in which the parameters are classified into 3 categories:

- Alfa score (A) – clinically ideal
- Bravo score (B) – clinically acceptable
- Charlie score (C) - clinically unacceptable (table I)

Table I. USPHS modified criteria

Category	Scores	Criteria
Retention	A	No loss of restorative material
	C	Any loss of restorative material
Color match	A	Matches tooth
	B	Acceptable mismatch
	C	Unacceptable mismatch
Marginal discoloration	A	No discoloration
	B	Discoloration without axial penetration

Category	Scores	Criteria
	C	Discoloration with axial penetration
Secondary caries	A	No caries present
	C	Caries present
Anatomic form	A	Continuos
	B	Slight discontinuity, clinically acceptable
	C	Discontinuity, failure
Marginal adaptaion	A	Closely adapted, no detectable margin
	B	Detectable margin, clinically acceptable
	C	Marginal cervice, failure
Surface texture	A	Enamel-like surface
	B	Surface rougher than enamel, clinically acceptable
	C	Surface unacceptable rough

RESULTS

The clinical results concerning the marginal adaptation on the direct proximal-occlusal amalgam and composite restorations are contained by table II and graphicly represented in diagram 1.

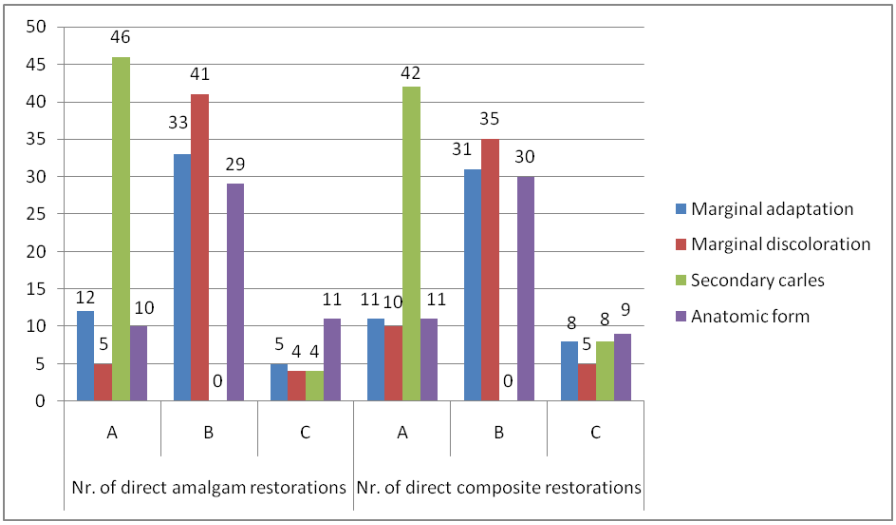
At the limit between the preparation and the retoration, marginal descoloration has apeared as shown in the results contained by table II and graphicly represented in diagram 1.

Secondary caries were detected in 4 of the 50 direct proximal-occlusal amalgam restorations and in 8 of the composite restorations. (table II, diagram 1)

The scores concerning the amatomic form of the occlusal surface for the direct proximal-occlusal amalgam and composite restorations are contained by table II and graphicly represented in diagram number 1.

Table II. The Scores concerning the chracteristics of the the direct proximal-occlusal amalgam and composite restorations

Categories	Nr. of direct amalgam restorations			Nr. of direct composite restorations		
	A	B	C	A	B	C
Marginal adaptation	**12**	**33**	**5**	**11**	**31**	**8**
Marginal discoloration	**5**	**41**	**4**	**10**	**35**	**5**
Secondary caries	**46**	**-**	**4**	**42**	**-**	**8**
Anatomic form	**10**	**29**	**11**	**11**	**30**	**9**



Diagrame 1. The scores concerning direct proximal-occlusal amalgam and composite restorations

The observations linked to the cracks in the restorations and the coronary adjacent fractures are contained by table III.

Table III. The scores concerning cracks in the restorations and coronary adjacent fractures

	Nr. of direct amalgam restorations	Nr. of direct composite restorations
Cracks in the restoration	**3**	**4**
Coronar fractures	**2**	**5**

DISCUSSIONS

In our study the number of composite restorations that have clinically presented an ideal marginal adaptation was lower that the number of amalgam restorations, the same for the ones that were clinically acceptable. 8 for the 50 composite direct restorations presented a poor marginal adaptation which imposes thier repair or replacement. If the marginal defect isn't extended it is preferably to repair it then to replace the intire restoration because a new intervention on the tooth would meen sacrifice of more rough dental materia. The repair tratament is more eficient and has biological benefits for the patient. [1,2,3]

The bigger incidence of marginal defects in composite restorations then in amlagam restorations has been observed by other autors too. [4]

Marginal discoloration at the restoration/preparation limit, for the composite direct restorations apeeres because of the marginal inadequacy after the polimeryzation contraction and the degradation of the adhesion quality with the permission of infiltations. The majority of dicolorations appered in devital teeth and in patients who somke, drink coffe, black tea or consume extremly hot food and bevreges.

Marginal discoloration in direct proximal-occlusal amalgam restorations appears as a follow to an incorect marginal condensation of the material with spaces between the cavity and the restoration. Plus, with the silver amalgam, due to it's composition enamel dicolorations can apeer by silver impregations.

In our study the number of composite restorations that have received ideal score for no marginal discoloration was bigger than the number of amalgam restorations. Among the restorations that have presented marginal discoloration, the number of amalgam ones was bigger than the number of composite ones, but the axial penetration of the discoloration was observed in more composite restorations then in amalgam ones.

The appearance of secondary caries is the result of the incomplete demineralized or discolored enamel removal or it is secondary to coronary or direct restoration fractures with the appearance of micro spaces at the restoration/preparation limit.

Among the 50 amalgam restorations, 4 have presented secondary caries, and for the composite restorations the number was bigger, 8 of them receiving C score. This fact is explainable because at the composite/preparation limit, in the posterior area of the dental arcade fractures with micro spaces that can develop secondary caries appear more frequently. The presence of caries represents the most frequent motive of restoration replacement [5], but there aren't enough proofs to sustain the fact that the risk of failure and of secondary caries appearance is higher in composite restorations then in amalgam restorations.

The fracture of adjacent cusps is a problem that confronts the dentist very often. In our study we observed cracks in 3 of the amalgam direct restorations and in 4 of the composite ones; and coronary adjacent fractures in 2 of the amalgam restorations and 5 of the composite ones. Wahl and collab. [7] observed a lower prevalence of cusp fractures in young patients then in elderly ones, on teeth with 1 remaining surface then in teeth with more the 1 remaining surfaces.

The decision to choose amalgam or composite for posterior restorations can be influenced by a series of factors. A study that analyzed the use of amalgam or composite in posterior restorations depending on the doctor shows that the dentists with longer experience (over 15 years) have chosen the amalgam more often, while young dentists (≤30 years) choose it more rarely.

A very controversial subject nowadays is the toxicity of dental amalgam. In 2008 Scandinavian countries prohibited the use of amalgam restorations for the safe of the environment and the patients. There are a series of contradicting clinical studies [9, 10, 11, 12, 13, 14, 15]. In Sweden clinical studies show that the removal of amalgam restorations from patients with neurological problems can improve their health. [16,17] In the USA official studies fun by the FDA and the NIH have established that there aren't enough data to sustain a correlation between the level of mercury elimination for amalgam and the numerous shortcomings of this restoration material. There are statistical evidences that prove that the mercury vapors emitted by the amalgam are not the direct cause in some conditions, being just related to them.

In 2009 the FDA imposed a new regulation concerning the use of dental amalgam of second class cavities (moderate risk) and first class cavities (low risk), respecting some special recommendations about the amalgam use. The current position of the ADA and the FDA is that the dental amalgam is a safe material and any dentist that recommends removing it for health reasons, related to the mercury vapors is considered unethical.

CONCLUSIONS

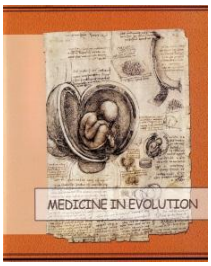
1. The choise of amalgam restorations ramains an option in posterior reconstructions because of their great reliability and sustainability.
2. The risk of failure and appearence of secondary caries is bigger in composite restorations than in amalgam restorations, if there not made in absolute isolation.
3. The toxicity of the dental amalgam is a very controversial subject nowadays, but the current position of the ADA and the FDA is that the amalgam is a safe material.
4. Given that, form many points of wiew, the amalgam is a material that satisfies clinical requierments of a direct posterior restoration and that the data concerning it's toxicity are controversial, we consider that this material can be futher used.

REFERENCES

1. Moncada GC, Martin J, Fernandez E, Vildosola PG, Caamano C, Caro MJ, Mjor IA, Gordan VV. Alternative treatments for resin-based composite and amalgam restorations with marginal defects: a 12-month clinical trial.Gen Dent. 2006 Sep-Oct;54(5):314-8
2. Martin J, Fernandez E, Estay J, Gordan VV, Mjör IA, Moncada G. Management

of Class I and Class II Amalgam Restorations with Localized Defects: Five-Year Results.Int J Dent. 2013;2013:450260. doi: 10.1155/2013/450260. Epub 2013 Jan 28.

3. Sharif MO, Fedorowicz Z, Tickle M, Brunton PA. Repair or replacement of restorations: do we accept built in obsolescence or do we improve the evidence?Br Dent J. 2010 Aug 28;209(4):171-4.
4. Rasines Alcaraz MG, Veitz-Keenan A, Sahrmann P, Schmidlin PR, Davis D, Iheozor-Ejiofor Z. Direct composite resin fillings versus amalgam fillings for permanent or adult posterior teeth.Cochrane Database Syst Rev. 2014 Mar 31;3:
5. Mjör IA, Qvist V. Marginal failures of amalgam and composite restorations.J Dent. 1997 Jan;25(1):25-30.
6. Hurst D. Amalgam or composite fillings - which material lasts longer?Evid Based Dent. 2014 Jun;15(2):50-1
7. Wahl MJ, Schmitt MM, Overton DA, Gordon MK. Prevalence of cusp fractures in teeth restored with amalgam and with resin-based composite.Am Dent Assoc. 2004 Aug;135(8):1127-32;
8. Khalaf ME, Alomari QD, Omar R. Factors relating to usage patterns of amalgam and resin composite for posterior restorations--a prospective analysis.J Dent. 2014 Jul;42(7):785-92. Clarkson TW, Magos L, Myers GJ. The toxicology of mercury–current exposures and clinical manifestations. N Engl J Med. 2003;8(18):1731–1737
9. Richardson GM. Mercury Exposure and Risks from Dental Amalgam in Canada: The Canadian Health Measures Survey 2007–2009. Hum Ecol Risk Assess. 2012. 2013/05.
10. Abraham JE, Svare CW, Frank CW. The effect of dental amalgam restorations on blood mercury levels. J Dent Res. 1984;8(1):71–73.
11. Olstad ML, Holland RI, Wandel N, Pettersen AH. Correlation between amalgam restorations and mercury concentrations in urine. J Dent Res. 1987;8(6):1179–1182.
12. Snapp KR, Boyer DB, Peterson LC, Svare CW. The contribution of dental amalgam to mercury in blood. J Dent Res. 1989;8(5):780–785.
13. Yip HK, Li DK, Yau DC. Dental amalgam and human health. Int Dent J. 2003 Dec;53(6):464-8.
14. Dodes JE.The amalgam controversy. An evidence-based analysis. J Am Dent Assoc. 2001 Mar;132(3):348
15. Bates MN. Mercury amalgam dental fillings: an epidemiologic assessment. Int J Hyg Environ Health. 2006 Jul;209(4):309-16.
16. Ekstrand J, Björkman L, Edlund C, Sandborgh-Englund G.Toxicological aspects on the release and systemic uptake of mercury from dental amalgam.Eur J Oral Sci. 1998 Apr;106(2 Pt 2):678-86.
17. Sandborgh-Englund G, Elinder CG, Langworth S, Schütz A, Ekstrand J. Mercury in biological fluids after amalgam removal. J Dent Res. 1998 Apr;77(4):615-24.



RETROSPECTIVE STUDY REGARDING THE INCIDENCE OF SUPERIOR MOLAR IMPLICATION IN MAXILLARY SINUSITIS

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ABSTRACT

Maxillary sinusitis is an inflammatory and infectious process, caused by odontogenic, fungal or viral diseases. The odontogenic pathology may be isolated or associated with other processes, affecting one or more facial sinuses, and results after pathologic interactions between dento-parodontal structures and the adjacent maxillary sinus. The frequency of maxillary sinusitis of dental origin is under estimated. The sinusal muccosa is vulnerable to various diseases, such as infectious, allergic or tumoral. Because the odontogenic maxillary sinusitis is the most frequent maxillary sinus disease and because the molars are the teeth with the biggest incidence in sinus pathology, this paper aims to evaluate the implicaion of superior molars in maxillary sinusitis. The incidence of superior molars implication in maxillary sinusitis was sudied on a group of 308 pacients diagnosed with odontogenic sinusitis. The results shows that superior molars are the main cause of maxillary odntogenic sinusitis, the most affected age group was 30-50 years of age and both maxillary sinuses was equally affected by odontogenic inflammmatory pathology.

Key words: *maxillary sinus, odontogenic maxillary sinusitis, superior first molar*

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INTRODUCTION

The maxillary sinus is the biggest of all paranasal sinuses [1] and its development begins in the 10th week of intrauterin life, when the first pneumatisation of the maxillary bud, situated in the middle nasal meatus, towards the ethmoidal cartilage, takes place; it takes part in breathing, by heating, humidyfying and filtering the inspired air, and also regulates the intranasal pressure. The maxillary sinus also has an important role in the nonspecific immune response, by producing nitric oxide (NO), by this being considered an inflammatory mediator for the upper airway. Also, in the growing period, through its penumatisation, the maxilarry sinus participates in the formation and development of the face; through its volume and anatomical configuration, the maxillary sinus also plays a role in fonation and also absorbes the traumatic forces to the face. In adults, the maxillary sinus occupies almost the entire maxilla, with a medium volume of approximately 15cm^3 [2]. The sinusal muccosa is vulnerable to various diseases, such as infectious, allergic or tumoral.

Maxillary sinusitis is an inflammatory and infectious process, caused by odontogenic, fungal or viral diseases. The odontogenic pathology may be isolated or associated with other processes, affecting one or more facial sinuses, and results after pathologic interactions between dento-parodontal structures and the adjacent maxillary sinus.The frequency of maxillary sinusitis of dental origin is under estimated [3].

The anatomy of some temporary and permanent teeth, mostly the molars, contributes to the correlation between an important part of sinusal pathology and the periapical or periodontal lesions of these teeth; also, dental conservative or surgical tretament applied to these teeth may be added as cause to sinus pathology[4].

The implantation of the second superior molar is weaker than that of the first superior molar. Less frequent as the first superior molar, the roots of the second superior molar are in tight connection with the maxilarry sinus[5].

By their report with the maxillary sinus, the following teeth are the most frequent cause of sinus pathology:first molar, second molar, second premolar, third molar, first premolar and last the canine, but in a rare incidence [5].

MATERIAL AND METHODS

Because the odontogenic maxillary sinusitis is the most frequent maxillary sinus disease and because the molars are the teeth with the biggest incidence in sinus pathology, this paper aims to evaluate the implicaion of superior molars in maxillary sinusitis.

The incidence of superior molars implication in maxillary sinusitis was sudied on a group of 308 pacients diagnosed with odontogenic sinusitis. The patient were of both sexes, with ages between 10 and 90, and were selected of a total of 5349 patients admitted in the Oral and Maxillo-Facial Surgery Clinic ofThe Emergency County Hospital of Targu Mures, were our group represented 5.75%, during 2004-2013.

In our study, we included patients with odontogenic sinusitis and nonodontogenic maxillary sinusitis, wich were admitted in our clinic. The cases were evaluated by different variables: age group, gender, environment (urban/rural), localisation (right/left/bilateral), implicated tooth, determining factors, presence/absence of oro-sinusal

communication, presence/absence of a root rest.

We used a retrospective clinical and statistical method, based on a mixed analytical and descriptive research, represented by a biostatistical and mathematical examination of the variables reported to the studied disease.

Data workup was realised using Microsoft Excel®,associated with XLSTAT®.The investigated pramaters from our patients were stored in Excel files. The secondary workup of the data, the calculation of fundamental statistical parameters and their graphical representation were realised with Excel, using Pivot Tables, Functions-Statistical, Chart şi Data Analysis. For advanced statistical tests we used XLSTAT®.

RESULTS

Analyzing the clinical and statistical rezults based on gender, we found that 50.32% of the patients (155) were male and 49.68% (153) were female. Regarding the environment, 182 patients (59.09%) came from an urban environment and 126 patients (40.91%) came from an rural environment. In order to make data analysis easier, we split the patients in age decades; 22 cases (7.14%) were in the 10-20 years of age group, 9 cases (2.92%) were in the 21-30 years of age group, 76 patients (24.68%) were in the 31-40 years of age group, 78 patients(25.32%)were in the 41-50 years of age group, 51 cases(16.56%)were in the 51-60 years of age group, 37 patients(12.01%)were in the 61-70 years of age group, 21patients(6.82%)were in the 71-80 years of age group and14 patients(4.55%)were in the81-90 years of age group. (Figure 1)

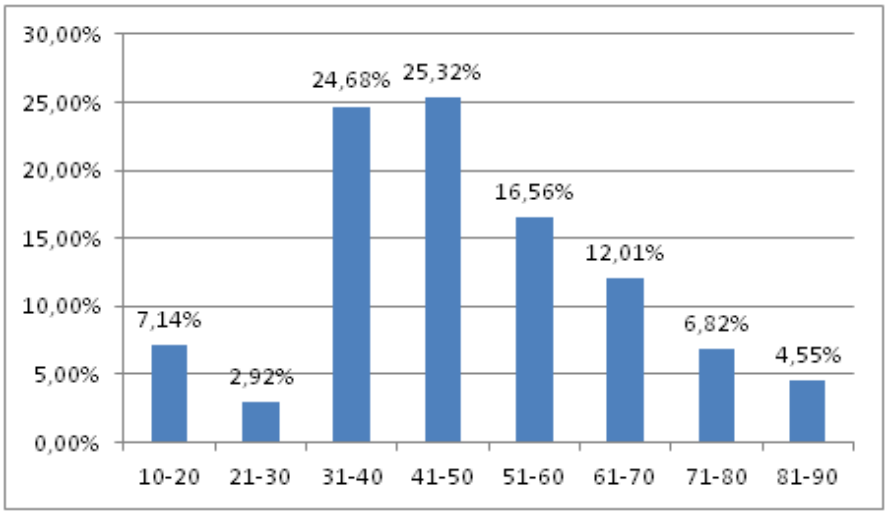


Figure 1. Repartition of patients with odontogenic maxillary sinusitis based on age group

Patients who were admitted in the Oral and Maxillo-facial Surgery Clinic with odontogenic sinus pathology, were divided in 4 subgroups:there were patients presenting one of the three forms of odontogenic sinusitis: acute sinusitis, chronic sinusitis, exacerbation of chronic sinusitis, and the fourth subgroup were the patients with odontogenic inflammatory cysts from sinusal teeth, with an endosinusal evolution. The statistical analysis established that 200 patients(64.94%) had chronic sinusitis,41 patients (13.31%)hate acute sinusitis, 21 patients (6.82%) had exacerbation of chronic sinusitis and46 cases (14.94%) presented with intrasinusal cyst(Figure 2).

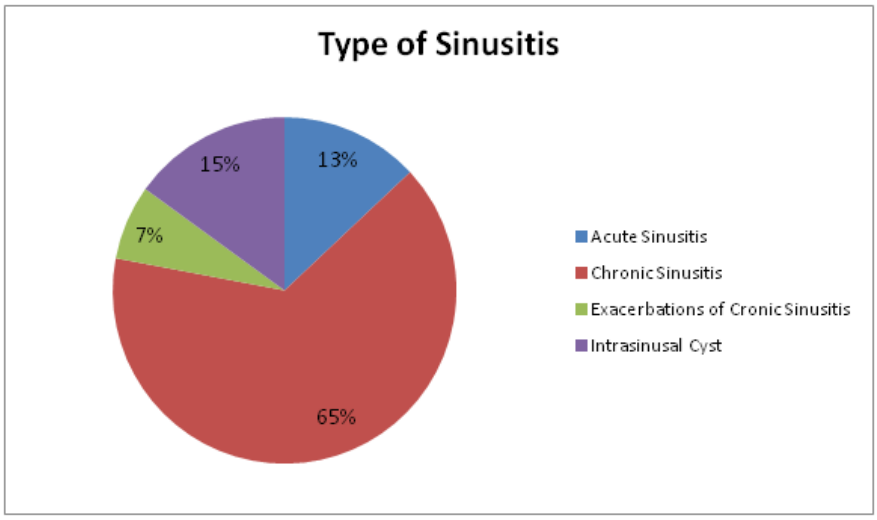


Figure 2. Repartition of patients with odontogenic maxillary sinusitis based on clinical form

Analysing the clinical and statistical data regarding the side of the sinusitis, the incidence of maxillary sinusitis was: 151 patients (49.026%) had right maxillary sinusitis, 151 patients had left maxillary sinusitis (49.026%); only a small number of patients (6 cases, 1.948%) had bilateral maxillary sinusitis.

The data of the clinical and statistical study regarding the incidence of superior molar implication in maxillary sinusitis in our study group, showed that in 120 cases(38.96%)**the first molar** was the causal tooth, **the second molar** in 52cases (16.88%), **the second premolar** was responsible for 36 cases (11.69%), **the first premolar** in 24 patients (7.79%),**thecanine** – 23 patients (7.47%),**the thirdmolar** – for 9 patients (1.92%), **the lateralincisor**– for 4 cases (1.30%) şi **the centralincisor** for 3 patients (0.97%) but in these cases it was not a singular causal tooth, but associated with one of the other lateral teeth. (Figure3).

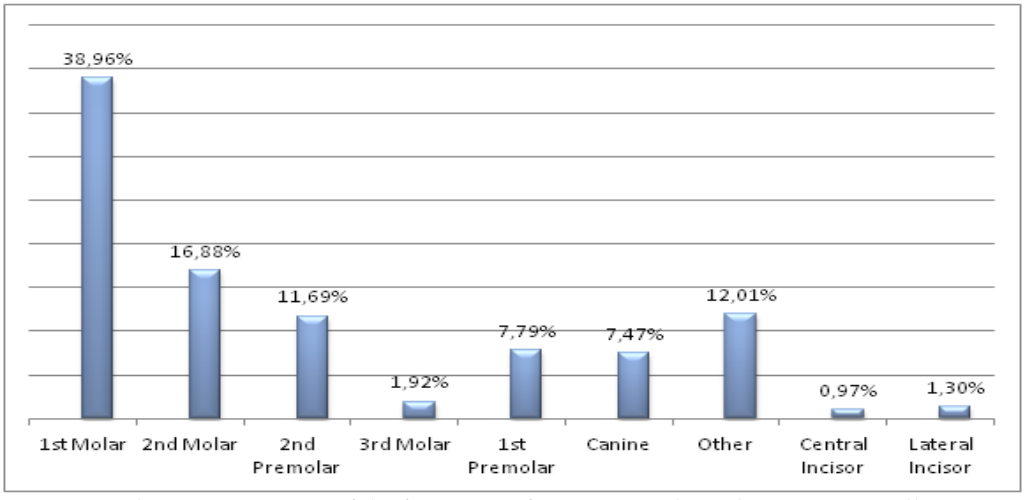


Figure 3. Graphic representation of the frequency of superior tooth implication in maxillary sinusitis

The etiology of maxillary sinusitis is wide. It includes, as our study showed, dental and periodontal diseases in 123 cases (39.94%), failure of endodontic treatment in 9 patients(2.92%) and complicationts due to dental extraction in 134 patients (43.51%). In our study group, there were no cases with maxillary sinusitis due to implantological failure (Figure4).

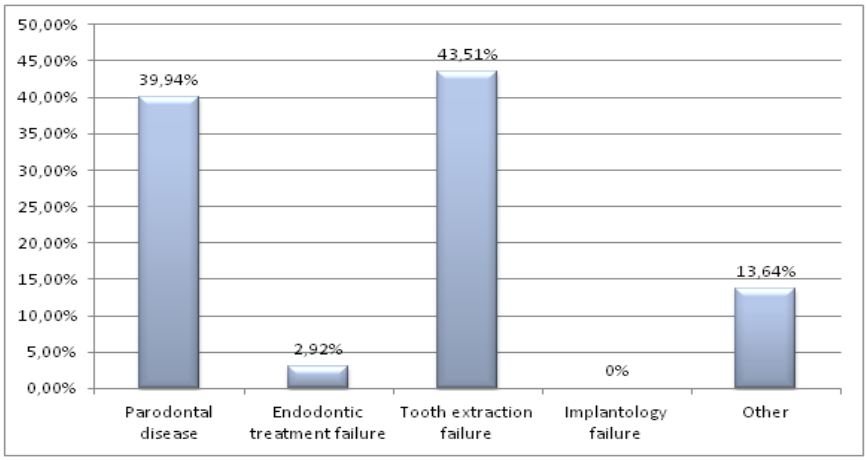


Figure 4. Frequency of determining factors in maxillary sinusitis

Oro-antral link is an accident during dental extraction. From the total of our study group with inflammatory maxillary sinusitis, 137 of the patients (44.48%) presented oro-antral fistula, while the rest of the cases, 171 patients (55.52%) had no oro-antral fistula.

Postextractional root remains play an important role in inflammatory maxillary sinusitis. 74 of the patients (24.03%) included in our study presented superior root remains which were the main cause of sinusitis; in the rest of the 234 cases (75.97%), there were no root remains involved.In some of our patients (47 cases, 15.26%), root remains were pushed instrasinusally as an accident of dental extraction, thus being diagnosed with oro-antral fistula associated with intasinusal root.

DISCUSSIONS

Our clinical and statistical study performed on patients with ages from 13 to 81 years, in a 9 year period, showed that men (50.32%) and women (49.68%) are approximately equally affected with maxillary odontogenic sinusitis, with a slight male predominance (0.64% more men than women). In another study, performed during 2004-2008on 1752 patients diagnosed with maxillary sinusitis, there were 43,80% females and 56,20% males. From the total number of patients the dental cause of maxillary sinusitis was 55,50%[6].Other studies show 57.7% females and 42,3% males [7]. Although the percentage varies, most studies show that women are more inclined to develop this kind of pathology[6-8].

As for the environment, the patiens came from all types of backgrounds, urban as well as rural. We must consider the fact that dental diseases as well as sinusal diseases are present in the rural environment due to poor hygene, and in the urban environment due to pollution, stress and lifestyle. In our study, patients from urban environment are present in higher percentage than those from the rural environment (59.1% vs 40.9%). In conclusion, we may say that the enviroment plays a minimal influence on inflammatory maxillar sinusitis, and that patients from both environments are roughly equally represented.

The highest incidence is for patients between 41 and 50 years of age (78 cases, 25.32%), followed by those with ages between 31 and 40 (76 cases, 24.68%); the smallest number of patients are in the 21-30 group of age (9 patients, 2.92%).Analysing the results of other studies the highest number of patients was for those with ages between 31 and 40 [6,7,8], while in other studies it was between 41 and 50

years of age[7,9]; thus, we can establish that the highest number of patients with inflammatory odontogenic maxillary sinus disease is between 30 and 50 years of age. In this age group are 50% of all patients with odontogenic sinusitis, so it results that during these 20 years the molars are most affected by caries, followed by pulpitis and then by maxillary odontogenic sinusitis due to accidents during dental extractions, root remains or bacterial infection from periodontal tissues [6].

Our study reveals the higher prevalence of chronic sinusitis, 65% of cases, due to poor hygene and skipping medical consult when the first symptoms of acute sinusitis appear, thus allowing the disease to become chronic. Clinically, chronic sinusitis is irreversible and its treatment implies radical cure of sinus muccosa. Only a small percent of patients (13%) come to medical consult from the first symptoms of acute sinusitis or when the oro-antral fistula appears.Our study confirms the high frequence of chronic sinusitis, a fact also indicated by other studies where the incidence is as high as80.87% [9].

Regarding the unilateral or bilateral presence of maxillary sinusitis, our study shows bilateral sinusitis in only 6 cases, while left or rigt sinusitis was present in equal number of cases. Comparing our results with those of other studies, we observe that other authors also obtained equal percentages for left and right maxillary sinusitis [9].

Odontogenic maxillary sinusitis appears as a combined interaction of dento-periodontal structures and the adjacent sinus muccosa and represent one of the most frequent inflammatory diseases of the maxillary sinus. Anatomically, the maxillary sinus in in close correlation withe the maxillar alveolar process and the lateral superior teeth. These close reposrts between the dento-alvolar structures and the maxillary sinus are depending on the size of the sinusal cavity and the length of the dental roots.Often, the sinus is intricated between the dental rootof the lateral superior teeth.

The frequence of dental implication in the maxillar sinus pathology is: first molar, second molar, second premolar, third molar, first premolar, canine (1.5.). Our study demonstrated the previously stated, the highest incidence being discovered in patients where the first molar was the causing tooth (38.96%) and the second molar close to it (16.88%), together realising the main cause of maxillary sinusitis in 55.84% fo patients. For the rest of the patients, the second premolar was cause of maxillar sinusitis in 36 cases (11.69%), first premolar in 24 cases (7.79%), canine for 23 patients (7.46.5), third molar for 9 cases (1.92%), lateral incisor for 4 patients (1.30%) and central incisor for 3 cases (.97%) but mostly not the only tooth involved. Similarly to our research, a study realised by Lung et al. observed that the first molar was the causal tooth in 34.67% of cases, the second molar in 26.00% of cases, second premolar in 13.33% of cases, canine – 10.57%,first premolarul – 10.00%, third molarul - 5.33%.Our study sustains other studies [7,9,10,11] that observed that the superior molars are the main cause for more than a half of the cases of odontogenic maxillary sinusitis. As a final result, we can safely affirm that the superior molars have the highest incidence as cause of odontogenic maxillary sinusitis.

The time between the the first symtoms and the first medical consult varies from one day to fewvyears, the inferior limit corresponding to the cases when the maxillary sinusitis was caused by a dental extraction with a consequent oro-antral fistula or witrh a root remain pushed intrasinusally, and the superior limit being represented by cases of chronicsinusitis, with long asymptomatic evolution, which became symptomatic after a long time or were diagnosed late.Causes for

maxillary sinusitis varied widely. In most cases, the observed starting point was represented by accidents and complications of dental extractions (oro-antral fistula and/or root remains intrasinusally) in 43.51% of cases, followed by dento-periodontal diseases in 39.94% of cases. 2.92%of cases were caused by failure of endodontic treatmentby overflowing of the root apex with filling materials or incomplete root fillings [3,6]. In 13.64%of cases the maxillary sinusitis was caused by a tumour in the maxillary sinus (endosinusal mucocele) or by an included tooth. Comparison of our study with dates in medical literature [7,9] we observe the same distribution of causes for maxillary sinusitis.

Oro-antral fistula is an accident of intempestive dental extraction that results in a communicsation between the sinus and the mouth. According to our study, 44,48% of patients with odontogenic maxillary sinusitis presented an oro-antral fistula, the rest of 55.52% of sinusitis being caused by dento-periodontal diseases or endodontic treatment failures. Our study demonstrates that most cases of accidents during extractions of teeth in close contact with the maxillary sinus are representwed by oro-antral fistulas, sometimes associated with intrasinusal root.

Of the 308 patients included in our study, 24.03%(74)presented root remains in the superior dental arch, which were the causing factor for the maxillary sinusitis. The implication of root remains in the patophysiology of the maxillary sinusitis is realised by pushing the root remains endosinusally as a result of incorrect extraction technique of sinusal teeth, or by complicated caries which cause an extended inflammatory and infectious process, which is easily transmitted to the maxillary sinus, causing odontogenic sinusitis[3,5,6]. According to the results of this statistical study, in 15,26% of the cases in the Oral and Maxillo-Facial Surgery Clinic, the presence of oro-antral fistula and of endosinusal root remains was observed.

CONCLUSIONS

1. Women are more predisposed in developing inflammatory sinus diseases, although our study did not confirm this aspect.
2. Environment does not have any influence on health issues in patients with maxillary odontogenic sinusitis, as they approximately came in equal percentage from urban as well as from rural areas.
3. The most affected age group is 30-50 years of age.
4. Most patients were diagnosed with chronic maxillary sinusitis.
5. Both maxillary sinuses are equally affected by odontogenic inflammmatory pathology.
6. Superior molars are the main cause of maxillary odntogenic sinusitis.

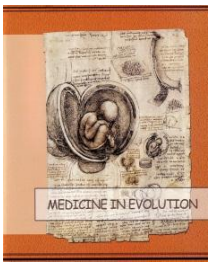
REFERENCES

1. Lechien JR, Mahillon V, Boutremans E.: Chronic maxillary rhinosinusitis of dental origin: report of 2 cases.*Rev Med Brux.* 2011;32(2):98-101

2. Vishniakov VV, Makarova NV, Pashovkina OV.: Changes in the mucous membrane of the patients with chronic maxillary sinusitis.*Vestn Otorinolaringol*. 2014;(1):12-14

3. Chemli H,Mnejja M,Dhouib M,Karray F,Ghorbel A,Abdelmoula M.: Maxillary sinusitis of odontogenic origin: surgical

treatment.*Rev Stomatol Chir Maxillofac*.2012 Apr;113(2):87-90
4. Vallo J, Suominen-Taipale L, Huumonen S.: Prevalence of Mucosal Abnormalities of the Maxillary Sinus and Their Relationship to Dental Disease in Panoramic Radiography: Results from the Health 2000 Health Examination Survey,*Oral Surgery*, *Oral Medicine*, *Oral Pathology*, *Oral Radiology*, *and Endodontics*, 2010;109(3):80-87.
5. Simuntis R, Kubilius R, Vaitkus S.: Odontogenic maxillary sinusitis: a review. *Stomatologija*. 2014;16(2):39-43.
6. Yehouessi-Vignikin B, Vodouhe SJ.: Maxillary sinusitis: 1752 cases at the ear-nose-throat department of a teaching hospital in Cotonou, Benin. *Eur Ann Otorhinolaryngol Head Neck Dis*. 2013;130(4):183-7.
7. Arias-Irimia O, Barona-Dorado C, Santos-Marino JA, Martínez-Rodriguez N, Martínez-González JM.: Meta-Analysis of the Etiology of Odontogenic Maxillary Sinusitis,*Medicina Oral Patologia Oral y Cirugia Bucal*, 2010;15(1): 70-73.
8. Ugincius P, Kubilius R, Gervickas A Vaitkus S.:Chronic odontogenic maxillary sinusitis, *Stomatologija, Baltic Dental and Maxillofacial Journal,*2006;8(6):44-8.
9. Lung T, Onișor Gligor F, Junear M.:Afecțiunile inflamatorii ale sinusului maxilar – studiu statistic pe o perioadă de 5 ani (2003-2008), *Revista Româna de stomatologie*, 2009; LV(4): 276-280.
10. Cantín López MG, Coronado Gallardo C, Suazo Galdames IC.: Maxillary Sinusitis of Dental Origin. A Case Report and Literature Review, *Int. J. Odontostomat.,* 2009;3(1):5-9.
11. Lechien JR, Filleul O,Costa de Araujo P, Hsieh JW, Chantrain G, Saussez S.:Chronic Maxillary Rhinosinusitis of Dental Origin, *Int. J Otolaryngolog*, 2014, 2014:465173. doi: 10.1155/2014/465173. Epub 2014 Apr 8.



IS THERE A REAL QUALITY OF LIFE IMPROVEMENT AFTER ORTHODONTIC TREATMENT? A LITERATURE REVIEW.

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ABSTRACT

The seek for orthodontic treatment has surmounted the classical indications for this type of therapy, that is why it is important to evaluate the true benefits gained from this form of treatment in relation with quality of life aspects. Oral symptoms – temporomandibular disorder associated with pain, periodontal disease, malocclusion, dental trauma are thought to be improved through orthodontic treatment, but this has only been proven so far for dental trauma and for periodontal disease. Seeking improvement of the oral functions through orthodontic treatment seems useful in reduced masticatory ability, but in relation to the phonation function there seems to be no real connection between tooth positioning and the ability to articulate. The relation between social well-being and the need for orthodontic treatment is confirmed by numerous studies, still there are few identifying no significant relation between the two. Increased self esteem and self confidence seem to be related to facial esthetics content and dental appearance, but these have not been supported by controlled studies.

Key words: *malocclusion, oral symptoms, socialwell-being, emotional well-being*

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INTRODUCTION

In today's world, where aesthetics seems to pay an increasing role in determining one's quality of life, and where requests for orthodontic treatment have moved from children and adults in need to adults seeking improved aesthetics, it seems necessary to understand weather orthodontic treatment brings real improvement to social and emotional well being, or it is just another good dentist marketing strategy. So far the literature available is still deficient in data regarding adults and long term effects of orthodontic treatment on their quality of life, thus this literature analysis is focused on the analysis of children's quality of life evolution with or without orthodontic treatment.

The relationship between malocclusion and the quality of life has been thoroughly analyzed through numerous studies, but only a few of these studies have compared the relationship between the quality of life of the orthodontic treated children and the quality of life of the non-treated children.

OH-QOL (ORAL HEALTH RELATED QUALITY OF LIFE) AND ORTHODONTICS

Most of the studies conducted so far have emphasized the importance of the social and emotional aspects of OH-QOL in children when evaluating the results of orthodontic treatment, but because of the study design used-transversal most of the times-we would rather talk about the association of the elements rather than their cause-effect relationship. The results obtained must be confirmed by further studies that would better define the conclusions.

In order to examine the four big domains that define OH-QOL (oral symptoms, function limitation, social and emotional well-being) we have analyzed the existing literature trying to establish the relationship between orthodontic treatment and oral symptoms improvement, between orthodontic treatment and social life, between orthodontic treatment and the oral function and between the emotional and psychological well-being and orthodontic treatment.

A recent study conducted in Brazil in 2008 by Oliveira and Sheiham has evaluated the impact of the orthodontic treatment on the quality of life of Brazilian adolescents [1]. The results of this study have shown that among the participants those who had finalized the orthodontic treatment had 1,85 times lower chances to have their life quality influenced than those currently in treatment and 1,43 times smaller chances than those who did not undergo any treatment at all. The scores were also matched with the ones of a similar case control study of a similar population [2].

ORAL SYMPTOMS IMPROVEMENT IN RELATION TO THE ORTHODONTIC TREATMENT

The association between malocclusion and dental trauma is contradictory according to the existing literature. The relationship between the size of the overjet and dental trauma suggests the fact that for an overjet bigger than 3mm the risk of the children's dental trauma is twice as big than the one in a child with an overjet smaller than 3mm[3]. But, there are studies that indicate no significant relationship between overjet and dental trauma[4,5].

Pain is one of the symptoms that can affect the quality of life [6]. Malocclusion itself does not generate

pain, but it can intensify pain through the initiation of temporomandibular disorders, through dental trauma and gingival trauma[7-11]. The studies conducted so far do not confirm the direct relationship between malocclusion and temporomandibular suffering [12-14]. There is also no confirmation, to the present date, of the fact that orthodontic treatment could determine or treat temporomadibular disorders [9,12,13,15].

An increased prevalence of the periodontal disease is also associated with a large overjet, with a big overbite and with severe class II/2 anomalies[7]. Still, the connection between malocclusion and gingival trauma is controversial [16]. Today, a consensus is accepted- malocclusion is a cofactor that can accelerate periodontal disease but does not initiate it[17,18]. Early correction of protrusive incisors could have an impact on both dental trauma and periodontal trauma, especially if the treatment starts in the mixed dentition period.

ORAL FUNCTION IMPROVEMENT THROUGH ORTHODONTIC TREATMENT

In many situations orthodontic treatment is aimed at speech improvement and increased masticator abilities. The evidence analyzed so far have not confirmed the relationship between the three. According to a number of studies [19,20]a significant difference has been identified between patients with malocclusion and those with correct bite and masticator efficiency. According to a study[21] there is a correlation between nutritional status, nutritional choices and the severity of malocclusion. Despite these data, most of the studies have found weak or no correlation between the masticator function and malocclusion[22,23].

From the pronunciation ability point of view of the patients with malocclusion, numerous studies[24,25] have found little association between the two. The pronunciation of the sibilants s, j, z can be difficult for patients with deep bite and those with overbite [26,27]. Despite of these facts, because when pronouncing words more elements are involved then tooth positioning and occlusion, a direct cause and effect relationship cannot be established between the two[28]. The fact that pronunciation is a highly adaptive process is suggested by the fact that despite severe malocclusion, patients manage to compensate this function and speak correctly[24,29-31].

ORTHODONTIC TREATMENTAND ITS SOCIAL IMPACT

The relationship between social adequacy and a person's aspect is a marker for one's social popularity [32-34], for its social behavior and for its personality appreciation. Physiognomy is highly influenced by the aspect of the teeth [25,32,33]. According to a study, the academic potential and the intelligence of a student are evaluated by a teacher from a dental-facial point of view also. There are studies which prove that the presence of the diastema or frontal teeth crowding can automatically place the student in a inferior social class [32] or can label him as being less intelligent or less attractive. But, there are studies that suggest the fact that there is no correlation between the facial appearance and children's attractiveness in school [35].

Malocclusion is also frequently related to bullying. Bullying victims are frequently socially isolated and suffer from psychological problems including anxiety and depression[36]. There are numerous proves relating bullying in early childhood to adult life psychological issues [37]. To the date, there are insufficient data to confirm

the relationship between orthodontic treatment for these children and the improvement of their social life[38]. Recent studies confirm the fact that OH-QOL determinations in these children in order to determine the social and psychological components of oral health on the quality of life of these children, is an important instrument[1,2].

EMOTIONALSTATE IMPROVEMENT THROUGH ORTHODONTIC TREATMENT

A series of studies [39] confirm the effect of orthodontic therapy on self esteem, mostly regarding adult patients and orthognatic surgery needing patients [40,41]. The data available for adolescents and small children are on the other hand, a lot less convincing.

The connection between self esteem and orthodontic treatment has been analyzed in studies such as that of Centofante, Brittin [42]. Shame, inferiority and uselessness feelings are frequently related to severe malocclusions[43]. Increased self esteem and self confidence seem to be related to facial esthetics content and dental appearance. Generally, patients who are satisfied with their appearance score better in self esteem and self confidence. Most of the studies confirming this are transversal ones[42] or without a control group, whereas control group evaluations fail to establish a cause-effect relationship between a higher self esteem and orthodontic treatment. A prospective study conducted in Norway on 224 children aged between 11-15 years old has proven no cause-effect connection between self esteem and orthodontic treatment [44]. Experimental controlled studies conducted in USA and Great Britain [45]analyzing the psycho-social implications of the early orthodontic treatment have had similar results to the study conducted in Norway. These studies confirm in fact that although a few specific dental evaluations can be influenced by the orthodontic treatment this has little or no effect on those patients self esteem [46].

According to a longitudinal prospective study conducted in Cardiff, orthodontic treatment, or better said, lack of it when recommend, did not determine psychological implication in those children's self esteem[47,48]. The increased self esteem of the participants in the 20 years follow up is not related to orthodontic treatment nor was it associated with the orthodontic treatment need identified at the beginning of the follow up period.

CONCLUSION

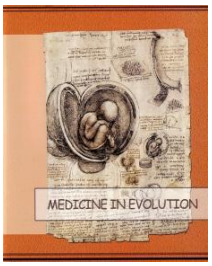
The results of this analysis of up to date literature show the fact that, although psychological aspects are more important in determining orthodontic treatment requests[49], it does not have a decisive effect in increasing self esteem or in increasing social well being. These results will not change the dentists' popular belief that orthodontic treatment will bring benefits on the patients self esteem, but it might make us reevaluate the way the benefits of orthodontic treatment have been appreciated so far.

REFERENCES

1. de Oliveira CM, Sheiham A. Orthodontic treatment and its impact on oral health related quality of life in Brazilian adolescents. J. Orthod. 2004 Mar 31 (1):20-7;discussion 15.
2. Bernabe E, SheihamA,Tsakos G, Messia de Oliveira C. The impact of

orthodontic treatment on the quality of life in adolescents: a case control study. Eur. J. Orthod. 2008 Oct;30(5):515-520.
3. Nguyen QV, Bezemer PD, Habets L, Prahl-Andersen B. A systematic review of the relationship between overjet size and traumatic dental injuries. Eur. J. Orthod. 1999;21(5):503-515.
4. Marcenes W, Alessi ON, Trabert J. Causes and prevalence of traumatic injuries to the permanent incisors of school children aged 12 years old in Jaragua do Sul, Brazil. Int. Dent. J. 2000;50(2):87-92.
5. Brin I, Ben-Bassat Y, HelingI, Brezniak N. Profile of an orthodontic patient at risk of dental trauma. Dental traumatology 200;16(3):111-115.
6. Mauro G, Tagliafero G, Montini M, Zanolla L. Diffusion Model of Pain Language and Quality of Life in Orofacial Pain Patients. J. Orofacial Pain 2001;15(1):36-46.
7. Geiger AM. Malocclusion as an ethiological factor in periodontal disease: a retrospective essay. Am. J Orthod.andDentofac. Orthop.: official publication of of the American Association of Orthodontists, its constituent societies, and the American Board of Orthodontics 2001; 120(2):112-115.
8. Celenk S, Sezgin B, Ayna B, Atakul F. Causes of dental fractures in the early permanent dentition: a retrospective study. J. ofEndodontics 2002;28(3):208-210.
9. Henrikson T, Nilner M. Temporomandibular disorders, occlusion and orthodontic treatment. J. Orthod. 2003 Jun 30(2):129-137;discussion 127.
10. Koroluk LD, Tulloch JF, Philips C. Incisor trauma and early treatment for class II/1 malocclusion. Am. J. Orthod. Dentofac. Orthop. 2003 Feb; 123(2):117-125; discussion 125-6.
11. Shulman JD, Peterson J. The Association between incisor trauma and occlusal characteristics in individuals 8-50 years of age. Dental Traumatology 2004; 20 (2):67-74.
12. McNamaraJr JA orthodontic treatment and temporomandibular disorders. Oral surgery, Oral Medicine, Oral Pathology, Oral Radiology, and endodontics 1997;83(1):107-117.
13. McNamara JA, Turp JC. Orthodontic treatment and temporomandibulardisorders:Is there a relationship?- Part 1: Clinical Studies. Journal of Orofacial Orthopedics 1997;58(2):74-89.
14. Kim M, Graber TN, Viana MA. Orthodontics and temporomandibular disorder. A meta-analysis. Am. J. of Orthod. and Dentofac. Orthop. 2002; 121(5):438-446.
15. Egermark I, Magnusson T, Carlsson GE. A 20-year follow up of signs and symptoms of temporomandibular disorders and malocclusions in subjects with and without orthodontic treatment in childhood. Angle Orthodontist 2003:73(2): 109-115.
16. Blair FM, Thomason JM, Smith DG. R=The traumatic anterior overbite. Dental update 1997;24(4):144-152.
17. Burgett FG. Trauma from occlusion. Periodontal concerns. Dental Clinics of North America;39: 301-311.
18. Davies SJ. Occlusal considerations in periodontics. British Dental Journal 2001; 191(11):597-604.
19. English JD, Buschang PH, Throckmorton GS. Does malocclusion affect masticatory performance? Angle Orthodontist 2002;72(1: 21-27).
20. Owens S, Buschang PH, Throckmorton GS, Palmer L, English J Masticatory Performance and areas of occlusal contact and near contact in subjects with normal occlusion and malocclusion.AM. J. ofOrthod. and Dentofac. Orthoped. 2002;121(6)602-609.
21. Hollister MC, Weintraub JA. The association of oral status with systemic health, quality of life, and economic productivity. J. of dental education 1993;57(12):901-912.
22. Mohlin B, Kurol J. To what extent deviations from an ideal occlusion constitute a health risk? Swed.Dent.J 2003;27(1):1-10.
23. Onyeasco CO, Aderinokun GA. The relationship between dental aesthetic index (DAI) and perceptions of aesthetics, function and speech amongst secondary school children in Ibadan, Nigeria.Int.J. Paediatr. Dent. 2003 Sep;13(5):336-341.
24. Vallino LD, Tompson B, Warren DW. Perceptual characteristics of consonant errors associated with malocclusion. J.

of Oral and Maxilofac Surg. 1993;51(8):850,857.
25. Suzuki N, Sakuma T, Michi K, Ueno T. The articulatory characteristics of the tongue in anterior open bite: Observation by use of dynamic palatography. Int J Oral Surg 1981;10(suppl 1): 299-303.
26. Hu W, Zhou Y, Fu M. Effect of Skeletal class II malocclusion on speech articulation. Chinese J. of Stomat. 1997;32(6):344-346.
27. Johnson NCL, Sandy JR. Tooth position and speech- Is there a relationship? Angle Orthodontist 1999; 69(4):306-310.
28. Whitehill TL, Sammam N, Wong LLN, Ormiston I. Speech errors associated with dentofacial abnormalities in Cantonese speakers. J. of Medical Speech Language Pathology 2001;9(3): 177-190.
29. Ruscello DM, Tekieli ME, Van Sickels JE. Speech production before and after orthognatic surgery. A review. Oral Surgery Oral Medicine and Oral Pathology !985;59(1):10-14.
30. Kerosuo H,,Hausen H, Laine T, Shaw WC. The influence of incisal malocclusion on the social attractiveness of young adults in Finland. Eur. J. Orthod 1995 Dec;17(6):505-512.
31. Grzywacz I. The value of the aesthetic component of th IOTN in the assessment of subjective orthodontic treatment need. Eur.J. ofOrthod 2003;25(1):57-63.
32. Eli I, Bar Tal Y, Kostovetzki I. At first glance: Social meanings of dental appearance. J. Public Dent. Health. 2001 Summer;61(3):150-154.
33. Shaw WC, Humphreys S. Influence of children's dentofacial appearance on teachers expectations. Community dent. Oral Epidemiol. 1982 Dec;10(6):313-319.
34. Hawker DSJ, Boulton MJ. Twenty years' research on peer victimization and psychosocial maladjustment: A meta-analytic review of cross sectional studies. J. of Child Psychology and Psychiatri and Allied Disciplines 2000;41(4):441-455.
35. Zhou Yh, Hagg U, Rabie AB. Concerns and motivations of skeletall class III patients receiving orthodontic-surgical correction. The Int. J. of Orthod. andOrthogn. Surg 2001; 16(1):7-17.
36. DiBiase AT, Sandler PJ. Malocclusion, orthodontics and bullying. Dent. Update 2001 Nov;28(9):464-466.
37. Helm S, Petersen PE, Kreiborg S, Solow B. effect of separate malocclusion traits on concern for dental appearance. Community Dent. Oral Epidemiol. 1986 Aug;14(4):217-220.
38. Hunt OT, Johnston CD, Hepper PG, Burden DJ. The psychosocial impact of orthognaticsugery: A systematic review. Am. J. Orthod. Dentofac.Orthop. 2001 Nov:120(5):490-497.
39. Zhou Y, Urban H, Bakr MR. Severity of dentofacial deformity, the motivations and the outcome of surgery in skeletal class III patients. Chinese medical J. 2002;115(7):1031-1034.
40. Birkeland K, Boe OE, Wisth PJ. Relationship between occlusion and satisfaction with dental appearance in orthodontically treated and untreated groups. A longitudinal study. Eur. J. Orthod. 2000 Oct; 22(5):509-518.
41. O'Brien K, Northcroft Memorial lecture 2004. Consumer centered research…what do they think? J. Orthod. 2005 Sep;32(3):187-190.
42. Shaw WC, Richmond S, Kenealy PM, Worthington H. A 20-year cohort study of health gain from orthodontiv treatment: psychological outcome. Am.J.Orthod.DentofacialOrthop. 2007 Aug;132(2):146-157.
43. Kenealy PM, Kingdon A, Richmond S, Shaw WC. The Cardiff dental study:a 20 year critical evaluation of the psychological health gain from orthodontic treatment. Br. J. Health Psychol. 2007 Feb;12(Pt 1):17-49.
44. Plunkett DJ. The provision of orthodontic treatment: some ethical considerations. N.Z Dent J. 1997 Mar; 93 (411):17-20.



TREATMENT PLAN SELECTION IN CASE OF LOW-BUDGET AND SHORT–TERM TREATMENT AVAILABILITY: A CLICAL CASE REPORT

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ABSTRACT

The esthetic rehabilitation of patients with disharmonic smile demands, in most cases, a multi-disciplinary approach.

This clinical report describes a treatment plan for a patient with an unaesthetic appearance derived from dento-facial disharmonies that have been caused by missing teeth, malposition, and a large diastema. The lack of both financial and time resources of the patient makes collaboration with an orthodontist difficultand both face the challenge of choosing alternatives that rely only on restorative and prosthetic treatment.

Initially, diagnostic wax-up,mock-up and provisional restorations were performed. Assessment of the aesthetic proportion as well asthe shape of the teeth was obtained exclusively with porcelain fused to metal-fixed partial dentures.The framework of fixed partial denture was fabricated from dental alloys using selective laser sintering/ selective laser melting (SLS/ SLM)technique. The shape, contour and color of fixedpartialdenture recreate a natural looking smile integrated with the facialaspect of the patient.

Key words: *space management,diastema,porcelain fused to metal fixed partial-denture, selective laser sintering, selective laser melting, smile design*

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INTRODUCTION

Harmony between one's smile and face are fundamental in facial esthetics which increase self-esteem and well-being of the individual.[1]

Esthetics of smile is based on a proper position of the lips, gingival tissue condition, color, size, shape, and position of teeth.[2-5]Criteria that constitute the global esthetic parameters are the smile line, the midline, the incisal edge position, the incisal plane and the buccal corridor. An integrated assessment of each component should be performed when prosthetic rehabilitation becomes necessary.[3,4]

Congenitally missing lateral incisors cases can use interdisciplinary modalities for treatment. Diastema closure can use various rehabilitation options: orthodonticallyand/ or with restorative treatment. Orthodontic treatment can improve patient's esthetics but needs time and is not sufficient alone. The literature has demonstrated that direct composite resin restorations, porcelain laminate veneers and crowns are good treatment for correcting anterior diastema.[5]

Rehabilitation of the smile design requires professional comprehension of the natural dentition aspects and a careful treatment plan. This plan includes a clinical and radiographic examination, study models with diagnostic wax-upand provisional restorations served with aesthetic rehabilitation.[6]

CASE REPORT

The case report presents a53-year-old male, who came to the Faculty of Dentistry Timisoara,departmentof Prosthodontics, requestingthe replacement of the old maxillary fixed partial dentures and esthetic rehabilitation. He gave us the inform consent regarding the full face photography.(Fig.1)

The clinical examination included a comprehensive exo- and endo-bucal examination, photographic examination,panoramic radiograph and study cast examination.The endo-bucalexamination included more detailed research regarding biological aspects (presence of decays, probing depths, bleeding on probing, missing teeth) and esthetic parameters (shape, color of existing teeth and fixed partial dentures).

The patient presented the following (Fig. 2):

- a large diastema,
- congenitally missing of both superior lateral incisors (1.2,2.2),
- an oldmetallicacrylic fixed partial denturebetween teeth 1.3 and 1.6, causing an unpleasant esthetic effect,
- spaces between teeth 2.4and 2.5,
- absence of 1.7, 2.6 and 2.7,
- prosthodontic diagnosis for maxillary arch is Kennedy class I with 2 modifications, because of the congenitally missing lateral incisors;
- prosthodonticdiagnosis for mandibular arch is KennedyclassII.class II.

Position anomaly is presented in the maxillary arch because of the absence of the molar group. In addition the second premolar migrated distally and took place and function of molars. Since the second premolars are the last teeth on both maxillary quadrants the principle of the shorteneddental arch was considered in treatment plan decision.

The initial treatment plan was to orthodontically close the diastema between the upper central incisors and to re-establish occlusion in order to create the necessary space for implant placement.

Unfortunately, the patient wasn't prepared to pursue an orthodontic and surgical treatment because of alack of both time and financial resources.

The second treatment plan was to create a space management treatment by using only a prosthodontics technique in order get esthetic and functional outcome.

The treatment plan was guided by the patient's written consent and approval to take digital photographs before and during the treatment.(Fig.3)

Following a clinical examination, an impression was taken for study cast(Fig. 4).

An evaluation of the existing teeth positions opened up the possibility of restoring the patient's dentition with a fixed dental prosthesis design in order to improve the esthetic appearance and functionality.

After a wax–up was performed in the dental laboratory(Fig.5),the first interim-fixed restoration was fabricated in order to analyze the position and alignment of the teeth, and to satisfy biological, mechanical and esthetic requirements. (Fig.6). The patient couldn't adapt to new phonetic quality and perceptive changes in pronunciation with the interim restoration ,and requested to preserve a smaller diastema in the new fixed dental prosthesis.

In addition, to meet esthetic expectations and improve the patient's appearance, a new re-evaluation of space management and modifications in teeth preparation was performed to provide a natural diastema through the restorativetreatment plan.

This aspect gave us the opportunity to be more conservative in crown preparation for the porcelain-fused to metal-fixed dental prosthesis.(Fig.7). The framework was obtained from dental alloys using selective laser sintering/ selective laser melting (SLS/ SLM) technique.

After try-in and adaptation of the two maxillary fixed partial dentures, the patient was satisfied with the new shape and color and the cementation was performed.(Fig. 8 &9).

The final restorations were cemented only after the patient was satisfied with his new smile design and consent. This step was important, especially when making compromises for economic reasons.

Figure 1. Full face

Figure 2. Initial smile view

Figure 3. Retracted view after removal of an old fixed dental prosthesis

Figure 4. Diagnostic cast

Figure 5. Diagnostic wax-up

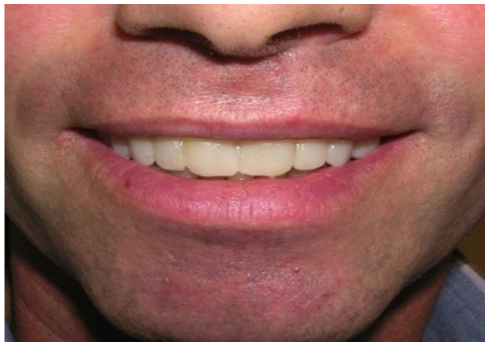


Figure 6. The patient smile with the provisional restoration

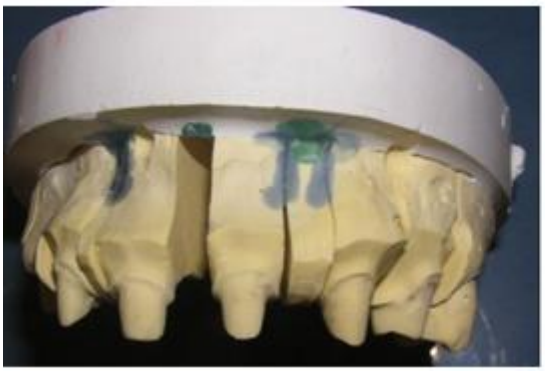


Figure 7. Teeth preparation cast

Figure 8. Retracted post-treatment maxillary view. Maxillary occlusal view of fixed partial denture

Figure 9. Post-treatment full smile

Figure 10. Full face post-treatment smile design

DISCUSSIONS

Laterally incisors are the most common congenitally missing teeth, which are usually diagnosed relevant clinical examination and a panoramic radiograph.[7] Since they present an important part of anterior esthetics, patients will come to a dental team demanding to improve their appearance.

The presence of the space or diastema doesn't always need correction by the dental team.

Good communication between the patient and the dental team is essential andpresents basic guidancefor treatment planning and understanding the patient's vision of esthetics.

Some patients are confortable with a diastema and are unable to adapt to major changes in their smile design.By having intermediaryrestoration cemented, the patientgets the chance to modify the final smile result by expressing his point of view and to adapt to his new look.

When approaching a multi-disciplinary treatment in a dento-facial disharmony, the two key factors are time and budget.At times, patients are lacking one orboth factors and their cases becomea challenge for the dental team.

In this presented case,the treatment plan included an alternative method in order to meet the patient's functional and esthetic needs.Despite the need for orthodontics and implantsurgerythe goal of smile design enhancement was attained only with restorative dentistry.

The decision, if a prosthodontics approach by itself was possible,would be taken only after a good treatment plan with a facial analysis, dento-facial analysis, dental analysis,diagnostically cast wax up, mock up and functional occlusal tests are made.In addition, for anterior teeth a phonetic analysis plays an important role.[8]In this case, good space management made possible a more conservative prosthetic preparation and preserved more teeth structure, avoiding a possible endodontic treatment.[9]

The selection of adequate materials and techniques that make optimal esthetic results possible should be carried out in order to get restoration as close to the natural dentition as possible. Advances in restorative dentistry and development of ceramic systems with biomechanical properties, combined with mimetic requirement, allow the fabrication of restorations with aesthetic and long-lasting results.[10]

When beginning a high esthetic restorative case, focusing on diagnosis, respecting the risk management, establishing a clear vision smile design factors (age, oral conditions, sex, personality) are guiding tools to a successful outcome.

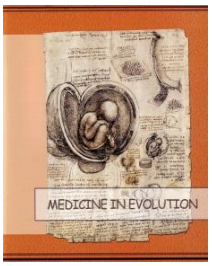
CONCLUSIONS

Rehabilitation of the smile design require in most cases a multidisciplinary approach. Sometimes the lack of time and financial support, like in this presented case, lead to an alternative treatment plan,where the smile design enhancement was attained only with prosthetic and restorative dentistry.

REFERENCES

1. Tole N, Lajnert V, KovacevicPavicic D, Spalj S. Gender, age, and psychosocial context of the perception of facial esthetics. J EsthetRestor Dent 2014; Volume 26:119-30.
2. Musskopf ML, Rocha JM, Rösing CK. Perception of smile esthetics varies between patients and dental professionals when recession defects are present. Braz Dent J 2013; Volume 24(4):385-90.
3. Censi R, Vavassori V, Borgonovo AE, Re D. Esthetic rehabilitation of a severely compromised anterior area: Combined periodontal and restorative approach. Case Rep Dent 2014; Volume 2014:658790.
4. Pithon MM, Santos AM, Viana de Andrade AC, Santos EM, Couto FS, da Silva Coqueiro R. Perception of the esthetic impact of gingival smile on laypersons, dental professionals, and dental students. Oral Surg Oral Med Oral Pathol Oral Radiol 2013; Volume 115(4):448-54.
5. Chang K-J, Chang T-W, Feng S-W, An interdisciplinary approach for diastema closure in anterior maxilla: a clinical report. Journal of prosthodontics and Implantology 2013;Volume 23: 0965-7452
6. Sharma PK, Sharma P. Dental smile esthetics: The assessment and creation of the ideal smile. SeminOrthod 2012; Volume 18:193-201.
7. .Park JH, Kim A, Tai K, Congenitally missing lateral incisors: treatment, Dent Today. 2011; Volume 30(5):81-86
8. Rosenstiel SF, Land MF, Fujimoto J. Contemporary fixed prosthodontics, 2006;10:0-323-2874-5
9. Kuljic B. , Space management: A technique for esthetic, conservative treatment of congenitally missing teeth, Compendium of continuing education, June 2013; Volume 34, Number 6 : 1548:8578.
10. Dundar M, Gungor MA, Cal E. Multidisciplinary approach to restoring anterior maxillary partial edentulous area using an IPS Empress 2 fixed partial denture: A clinical report. J ProsthetDent , April 2003; Volume 89, Issue 4 :327-30

SELECTIVE LASER SINTERING – SELECTIVE LASER MELTING – A CLOSE UP ON DENTAL APPLICATIONS



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ABSTRACT

The aim of this study is to present alternative technologies in making frameworks from dental alloys using selective laser sintering/ selective laser melting (SLS/ SLM) and to investigate the marginal adaptation of the fixed dental prostheses using the en faceoptical coherence tomography.25 metal frameworks were considered for this study, and the selective laser technology (Phenix PXS Dental laser sintering machine)was employed for generate the metal infrastructures.The evaluation of the marginal adaptation of the fixed dental prostheses was done using the en face optical coherence tomography.

The results of this in vitro study show that metal frameworks produced with laser sintering/ laser melting technology exhibit a marginal and internal accuracy that is comparable to conventional production procedures.

Key words: *fixed partial denture, selective laser sintering, selective laser melting, optical coherence tomography.*

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INTRODUCTION

Metal ceramics are still the most widely used material for fabricating complete coverage crowns and fixed partial dentures [1]. The traditional technique for fabricating the metal substructure is the lost-wax technique and using various metal alloys for casting.

Frameworks for fixed partial denture made out of dental alloys thought classic techniques currently involve many errors like marginal and internal gaps.[2]

Selective Laser Sintering (SLS) is a well-known technique for rapid prototyping, rapid manufacturing and rapid tooling and is fast gaining acceptance in various areas of applications such as aerospace, molding and biomedical[3]. The process has become a leading technique for rapid manufacturing and can process more types of materials than any other rapid prototyping/manufacturing techniques.

With the introduction of powerful high quality lasers, the partial melting of SLS

has been taken over by complete melting giving rise a new development of Selective Laser Melting (SLM),with an aim to achieve complete melting of powders.[4]

The marginal fitofmetal-ceramic crowns has been the focus of various investigations. A good marginal fit seems to be one of the most important technical factors for the long-term success of metal-ceramic crowns [5].

The aim of this study is to present alternative technologies in making frameworks from dental alloys using selective laser sintering/ selective laser melting (SLS/ SLM) and to investigate the marginal adaptation of the fixed dental prostheses using the en face optical coherence tomography(OCT).

MATERIAL AND METHODS

25 metal frameworks were considered for this study. The dental mould was made from epoxy resin (Crystal, Bredent) (Fig.1). The selective laser technology was employed for generate the metal infrastructures. All the samples were produced using Phenix PXS Dental laser sintering machine from Phenix Systems (France) and the dental plastic cast was scanned with D700 scanner from 3Shape Dental (Denmark). The laser sintering machine is using a laser Class I withP=50W and λ =1070 nm. The frameworks were made exclusively from Chrome-Chobalt powder alloy without Nickel (Fig. 2).

The interested area were obtained by sectioning the model corresponding to the bridge zone (Fig.3). After that, the evaluation of the marginal adaptation of the fixed dental prostheses was done using the en face optical coherence tomography. The system was working at 1300 nm, 18 degree scanning, with 260 slices per sample investigation (Fig. 4). The optical coherence tomography was working in Time Domain (TD) mode. The slices were used to obtain three dimensional reconstructions of the interested areas.

Two en-face OCT systems have been used. Both use similar pigtailed super-luminescent diodes (SLD) emitting at 1300 nm and having spectral bandwidths of 65 nm which determine an OCT longitudinal resolution of around 17.3 microns in tissue. The first OCT system performs OCT only, in both C-scan and B-scan regimes, with low NA, allowing 1 cm lateral image size. The second system, equipped with a confocal channel at 970 nm, uses a high NA interface optics allowing 1 mm image size. The

configuration of the second system, as shown in Fig. 2, uses two single mode directional couplers. Light from the SLD source is injected into the system via the directional coupler DC1 which splits the light towards the two arms of the interferometer, the probing and the reference arm respectively. The probing beam is reflected by the dichroic beam-splitter BS1 and then sent via the galvanometer scanners SX and SY to the sample. Two telescopes incorporated between these elements conveniently alter the diameter of the beam in order to match the aperture of different elements in the probing path and convey a probing beam of around 8 mm in diameter through the microscope objective MO's pupil plane. Hence, a lateral resolution of around 2 μm in the confocal channel could be achieved. A transversal resolution better than 5 microns is obtained in the OCT channel. Light back-scattered by the sample passes a second time through the object arm and is guided towards the single mode directional coupler DC2 via DC1 where it interferes with that coming from the reference arm. Both output fibers from DC2 are connected to two pin photo-detectors in a balanced photo-detection unit. A computer driven translation stage (TS) is used to construct B-scan images by stopping the frame scanner and moving TS along the optical axis of the reference beam. The scanning procedure is similar to that used in any confocal microscope, where the fast scanning is en-face (line rate) and the depth scanning is much slower (at the frame rate). The en-face scans provide an instant comparison to the familiar sight provided by direct view or by a conventional microscope. Features seen with the naked eye can easily be compared with features hidden in depth. Sequential and rapid switching between the en-face regime and the cross-section regime, specific for the en-face OCT systems, represents a significant advantage in the non-invasive imaging as images with different orientations can be obtained using the same system. As shown in Fig. 2, in the en-face regime, the frame grabber is controlled by signals from the generators driving the X-scanner and the Y-scanner. One galvo-scanner is driven with a ramp at 500 Hz and the other galvo-scanner with a ramp at 2 Hz. In this way, an en-face image, in the plane (x, y) is generated at constant depth. The next en-face image at a new depth is then generated by moving the translation stage in the reference arm of the interferometer and repeating the (x, y) scan. Ideally, the depth interval between successive frames should be much smaller than the system resolution in depth and the depth change applied only after the entire en-face image has been collected. However, in practice, to speed up the acquisition, the translation stage was moved continuously. Alternatively, a scanning delay line could be used, which can achieve faster depth scanning rates. In the images presented below, no other phase modulation was employed apart from that introduced by the X-galvanometer scanner. We demonstrated in a previous study the role played by the image size in balancing the effects of an external phase modulator and of the modulation produced by the transversal scanner. If the image is sufficient large, then the distortions introduced by not using a phase modulator are insignificant. The other system contains an OCT channel only, and the X and Y scanners are grouped spatially. Only one lens L of focal length 4 cm is used between the XY scanner head, allowing a larger lateral size image and a coarser transversal resolution in comparison with the second system, of only 15 microns. The X and Y scanners are similar and driven at the same line rate (500 Hz) and frame rate (2 Hz) as in the previous system. In the cross-section regime, the frame grabber is controlled by signals from the generator driving the X-scanner (or the Y-scanner) with a

ramp at 500 Hz and the translation stage moving over the depth range required in 0.5 s. In this case, an OCT cross-section image is produced either in the plane (x, z) or (y, z) (Fig. 5.a.).

The calibration of the system was performed by the 1951 USAF resolution test chart (Edmond Optics) (Fig.5.b.). The1951 USAF resolution test chartis a test pattern conforming to MIL-STD-150A standard. The pattern consists of groups of three bars (smallRonchi rulings) with dimensions from big to small.The common format consists of six "groups" in three layers of patterns. The largest groups, forming the first layer, are located on the outer sides. The smaller layers repeat the same pattern but are progressively smaller toward the center. Each group consists of six elements, numbered from 1 to 6. Within the same layer, the odd-numbered groups appear contiguously from 1 through 6 from the upper right corner. The first element of the even-numbered groups is at the lower right of the layer, with the remaining 2 through 6, at the left.

Figure 1. The dental models were made from epoxy resin (Crystal, Bredent)

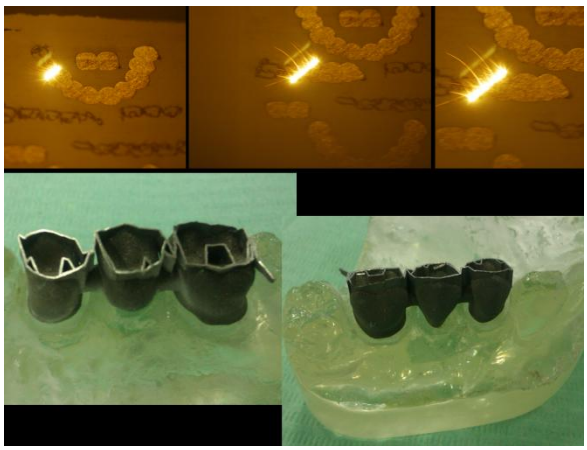
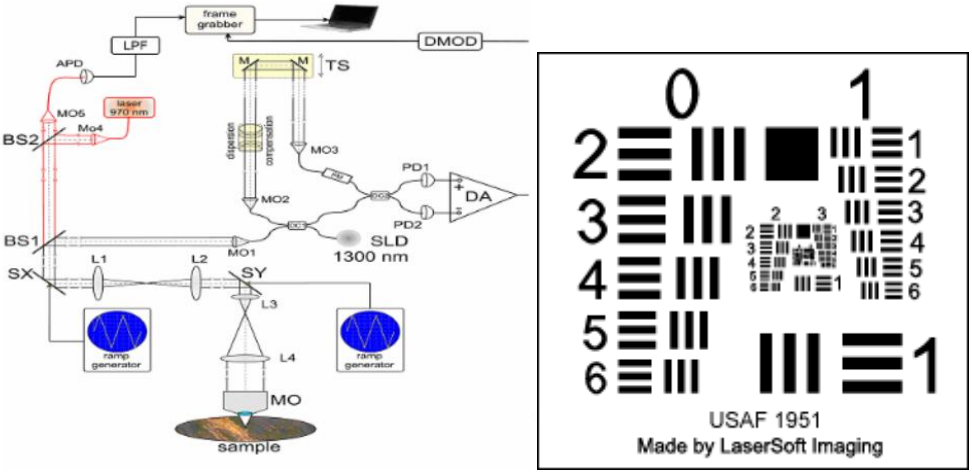


Figure 2. The metal infrastructures were produced using Phenix PXS Dental laser sintering machine from Phenix Systems (France)

Figure 3. The models were sectioned related to the bridge area

Figure 4. The general aspect of the Time Domain Optical Coherence Tomography system used in this study



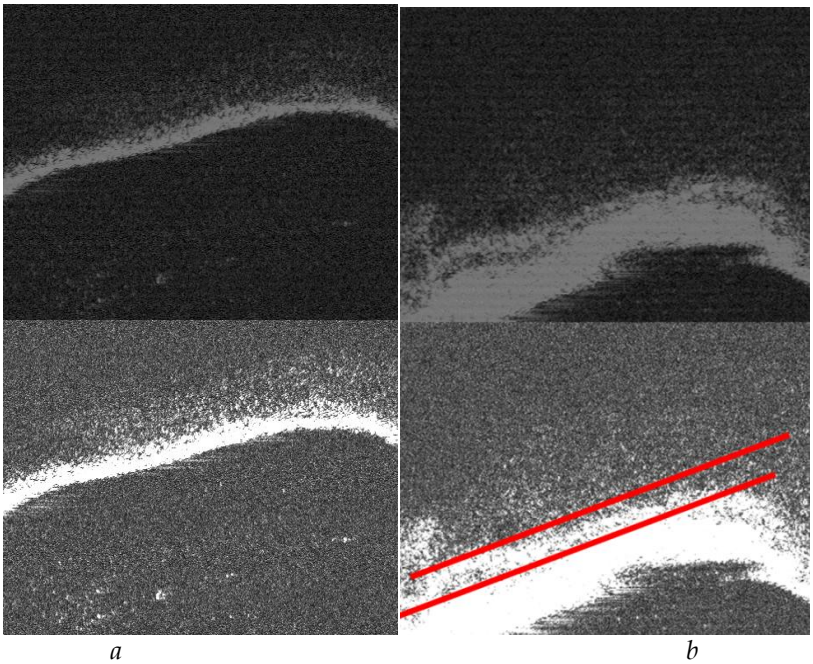
a *b*

Figure 5. a. En-face OCT at 1300 nm/confocal at 970 nm system. SLD = superluminescent diode, SX, SY: X and Y scanners; IMG = index matching gel; APD: avalanche photodiode; L1, L2, L3, L4: lenses: MO1-5: microscope objectives; PD1, 2: pin photo-detectors; BS1,2: beam-splitters; LPF: low pass filter; PM:polarization; b. The USAF test chart

RESULTS

Al the samples were scanned with the Time Domain OCT and 2D slices resulted. The dual channel allows us to evaluate different aspects simultaneously on the same slice. In 20 samples a good marginal fitting was observed (fig. 6, a), while in the rest of 5, some distance between the marginal preparation and the cervical margin of the crown could be spotted (Fig. 6 a,b). The values obtained from the measurements were presented in the table nr. 1.

Nevertheless, the 3D reconstruction permit an even better image for the entire marginal fitting of each considered sample (Fig. 7).



a *b*

Figure 6. 2D TD OCT slices obtain after the noninvasive marginal adaptation scanning procedure: a. aspect of a good fitting crown on the dental model; b. poor marginal adaptation of a crown onto the dental model (red lines)

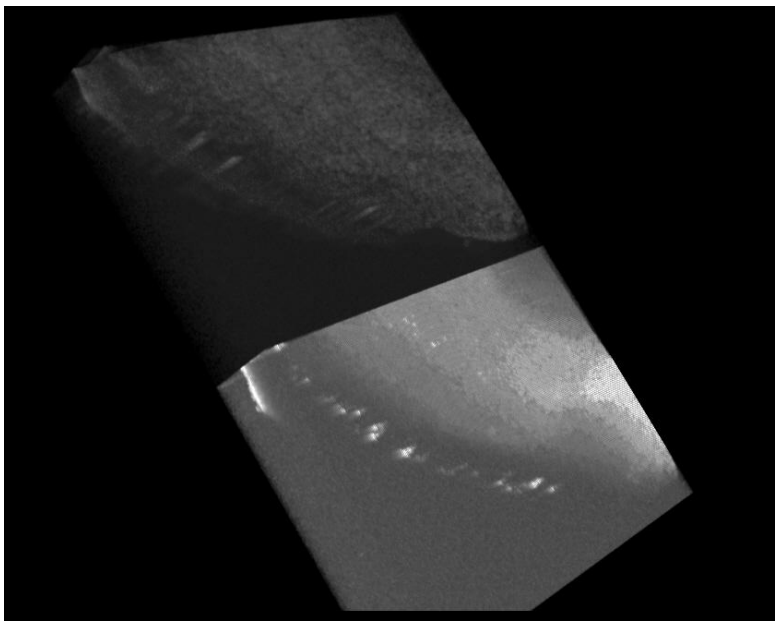


Figure 7. 3D reconstruction of a sample with a good marginal fitting. The dual channel allows to observe different views simultaneously

Table 1. The marginal fit gaps of the 5 samples detected with the TDOCT system

Nr	Sample Number	Mean value for the Vestibular Area (μm)	Mean value for the Oral Area (μm)	Mean value for the Mesial Area (μm)	Mean value for the Distal Area (μm)
1.	Sample nr. 8	50	40	40	150
2.	Sample nr. 15	40	160	120	40
3.	Sample nr. 17	90	180	110	60
4.	Sample nr. 21	220	80	120	40
5.	Sample nr. 25	70	40	40	80

DISCUSSIONS

The marginal fit of dental restorations is one of the most important criteria when evaluating the clinical acceptability of crowns [5]. Although clinical evaluations of marginal discrepancies have their limitations and inherent errors, it seemed to be important to investigate newly developed fabrication technologies. Previous studies concerning different materials and techniques resulted in a wide range of reported values of marginal and internal fit [6-8]. The final gap size between the framework and the abutment marginal preparation gaps should not exceed 40 microns in order to avoid failures of the prosthetic treatments. Therefore, the accuracy of the metal frameworks is analyzed by studying the gap size accumulation of the different steps of the procedure[8-10]. The impression of the dental arch, needed to generate the work model, lead to a small deviation of the position of the abutments. Another error is caused by the geometry capturing system, including the precision and mounting of the registration elements and the accuracy and resolution of the measurement equipment. [11,12]

The production of the metal infrastructure by SLS generates the most important errors. The stair effect is inherent to the layer –wise manufacturing but can be reduced by tilting the framework in the build volume. The SLS process accuracy, limited by deformations due to thermal stress and dimensional errors, can be increased by using optimal parameters.[13,14]. The infiltration process, needed for Liquid Phase Sintering, is responsible for a last

deformation error because the complex frameworks are difficult to support during the furnace cycle.

Akova et al [15] recently compared shear bond strengths of cast Ni-Cr and Co-Cr alloys and a laser-sintered Co-Cr alloy to dental porcelain. The authors reported that the bond strengths were not significantly different and that the laser-sintering technique for the Co-Cr alloy appeared promising for dental applications.

Ukar et al [16]compare the internal fit of laser-sintered Co-Cr alloy crowns with base metal restorations prepared from another Co-Cr alloy and a Ni-Cr alloy using conventional casting techniques. The results of their study reveal no significant difference among the 3 alloy groups evaluated for the internal gap width of sectioned crown specimens.

SLS/SLM technology provides a fast and efficient method to manufacture metal frameworks for fixed partial prosthesis. This technology leads to good and complex metal infrastructure without lengthy manual pre or post- processing. Optimal process parameters guarantee an accurate fit between the framework and the dental models, necessary in order to avoid mechanical or biological failures of the prosthetic treatment. The analysis of the fitting gaps in our study study demonstrates a clinically acceptable accuracy.

CONCLUSIONS

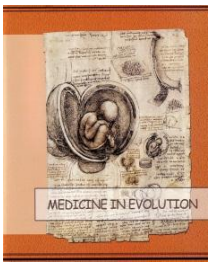
This *in vitro* study shows that metal frameworks produced with laser sintering/ laser melting technology exhibit a marginal and internal accuracy that is comparable to conventional production procedures. The optical coherence tomography, working in Time Domain noninvasive mode, proofs itself as a useful in vivo and in vitro method to analyzethe marginal adaptation of different prosthetic restorations.

REFERENCES

1. White SN, Sorensen JA, Kang SK, Caputo AA. Microleakage of a new crown and fixed partial denture luting agent. J Prosthet Dent 1992; 67:156–61.
2. S. Kumar. Selective laser sintering: a qualitative and objective approach. JOM, vol 55, No 10, pp. 43-47, 2003.
3. C. Santos, M. Shiomia, K. Osakadaa, andT. Laoui. Rapid manufacturing of metal components by laser forming. Int. Journal of Machine Tools & Manufacture, vol 46, issue 12-13, pp 1459-1468, 2006.
4. K.H.Choi, H.C.Kim, Y.H. Doh,and D.S. Kim. Novel scan path generation method based on area division for SFFS. Journal of Mechanical Science and Technology, vol. 23, Issue 4 pp. 1102-1111, 2009
5. Hunter AJ, Hunter AR. Gingival margins for crowns: a review and discussion. Part 2. Discrepancies and configurations. J Prosthet Dent 1990;64:636–42.
6. BelserUC,MacEnteeMI,Richter WA. Fit of three porcelain-fused-to-metal marginal designs in vivo. A scanning electron microscopy study. J Prosthet Dent 1985;53:24–9.
7. AlWazzanKA,Al-NazzawiAA.Marginal and internal adoption of commercially pure titanium and titanium–aluminium–vanadium alloy cast restorations. J Contemp Dent Pract 2007;8:19–26.
8. WitkowskiS, KomineF, GerdsT. Marginal accuracy of titanium copings fabricated by casting and CAD/CAM techniques. J Prosthet Dent 2006;96:47–52.
9. Jesus Suarez M, Lozano JF, Paz Salodo M,Martinez F. Marginal fit of titanium metal-ceramic crowns. Int J Prosthodont 2005;18:390–1.

10. Valderrama S, Van Roekel N, Andersson M, Goodacre CJ, Munoz CA. A comparison of the marginal and internal adaptation of titanium and gold-platinum-palladium metal ceramic crowns. Int J Prosthodont 1995;8:29–
11. G.D.Kimand, Y.T.Oh.Abench- mark study on rapid prototyping processes and machines: quantitative comparison of mechanical properties, accuracy, roughness, speed and material cost. Proceedings of the Institution of Mechanical Engineers Part B- Journal of Engineering Manufacture, vol 222, No. 2, pp. 201-215, 2008.
12. Yu and G. B. Schaffer. Microstructural evolution during pressureless infiltration of aluminium alloy parts fabricated by selective laser sintering. Acta Materialia, Vol 57, pp. 163-170, 2009
13. A. Simchi. Direct laser sintering of metal powders: mechanism, kinetics and microstructural features. Materials Science and Engineering;, vol. 428, Issue 1-2, pp. 148-158, 2006.
14. . Kumar. Manufacturing of WC-Co moulds using SLS Machine. Journal of Materials Processing Technology, 209, pp. 3840-3848, 2009
15. Akova T, Ucar Y, Balkaya MC, Brantley WA. Comparison of the bond strength of laser- sintered and cast base metal dental alloys to porcelain. Dent Mater 2008;24:1400-4.
16. Y. Ucar, T. Akova, M.S. Akyil, and W. A. Brantley. Internal fit evaluation of crowns prepared using a new dental crown fabrication technique: laser-sintered Co-Cr crowns. The Journal of Prosthetic Dentistry, Vol. 102, Issue 4, pp. 253-259, 2009.

MANDIBULAR CANALAR VARIATION: THE RETROMOLAR CANAL



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ABSTRACT

The retromolar foramen (RMF) of the mandible is a normal variation which impedes with dental procedures. As the retromolar canal is neglected in anatomical textbooks and is rarely documented in scientific publications.

In this study, was performed a CBCT scan of the mandible and maxilla in a male patient (37 years old). On the digital orthopantomogram the mandibular canals (MCs) were adequately identified. On the right side was identified an accessory canal within the mandible ramus, diagnosed asretromolar canal (RMC). It left the right MC and described a loop distally to the edentulous third molar area, to further adopt a recurrent course through the mandible branch towards the base of the coronoid process.

CBCT appears as the most suitable tool to adequately investigate anatomically the RMCs.

Key words: *retromolar foramen, retromolar canal, CBCT, mandibular canal*

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INTRODUCTION

Within the human mandible the occurence of accessory canals is greater than their absence (Aps, 2014).

The retromolar foramen (RMF) of the mandible is a normal variation which impedes with dental procedures, such as the extraction of an impacted third mandibular molar (Ossenberg, 1987). It was initially located in the retromolar fossa, one-third to midway between the tip of the coronoid process and the molar occlusal plane (Ossenberg, 1987). As in any other canalar variation of the mandible, a neural content of a variant canal can escape anesthetization if the respective canal is not identified prior to anesthesia. Moreover, a distally placed osteointegratedimplant, as well as endodontic treatments and sagittal split osteotomy surgeries can damage the content of a retromolar canal (RMC), if present (Kumar Potu et al., 2013). Such variant canals of the mandible can give passage either to blood vessels, or to nerves, or both. Nerve fibers coursing through the retromolar canal opened into the retromolar foramen of the mandible, between the temporal crest and the anterior border of the ramus, can distribute to the tendon of the temporalis muscle, buccinator muscle, the posterior region of the mandible alveolar process, as well as to the third mandibular molar. The presence of the retromolar foramen is not dependent on the lateral teeth of mandible (Bilecenoglu and Tuncer, 2006).Variations in position of the RMF have been described (Ossenberg, 1987).

As the retromolar canal is neglected in anatomical textbooks and is rarely documented in scientific publications(von Arx et al., 2011), although its first descriptions were published byOssenberg in the 80's (Patil et al., 2013), we present here the Cone Beam Computed Tomography (CB CT) anatomy of the mandible in a case with an unilaterally present RMC.

CASE REPORT

In a male patient (37 years old) a CBCT scan of the mandibleand maxilla was performed, prior to surgical implant placement procedures, with a CBCT machine – iCat (Imaging Sciences International), the data being analyzed with the iCatVision software, as previously described (Rusu et al., 2013).

On the digital orthopantomogram the mandibular canals (MCs) were adequately identified. On the right side was identified an accessory canal within the mandible ramus (**fig.1**). This was diagnosed as RMC. It left the right MC and described a loop distally to the edentulous third molar area, to further adopt a recurrent course through the mandible branch towards the base of the coronoid process.

The RMC was identified at its best by oblique multiplanar reconstructions (MPRs) (**fig.2**), although it was also recognized on sagittal (**fig.2**), coronal (**fig.3**) and axial (**fig.3**) MPRs. However, although its course through the compact border of the ramus was assessed, the exact location of the RMF was elusive. Therefore, a 3D study was performed, by use of the 3DVR v5.0.0.3 software associated with the iCatVIsion software. It was so clearly assessed the location of the RMF within the retromolar foramen, at its inferior end (**fig.4**).

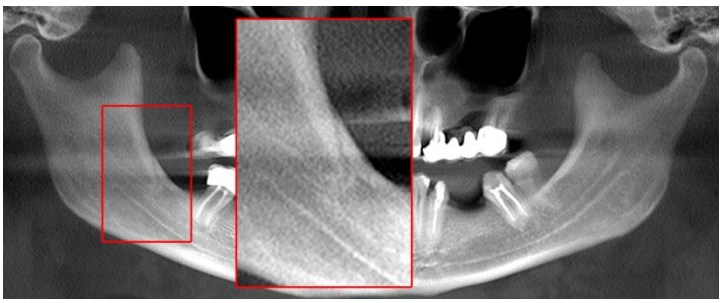


Figure 1. Digital orthopantomogram of the patient, identifying the within the right ramus of the mandible a recurrent accessory canal directed to the base of the coronoid process (inset, zoomed-in and with digitally contrast-enhanced)

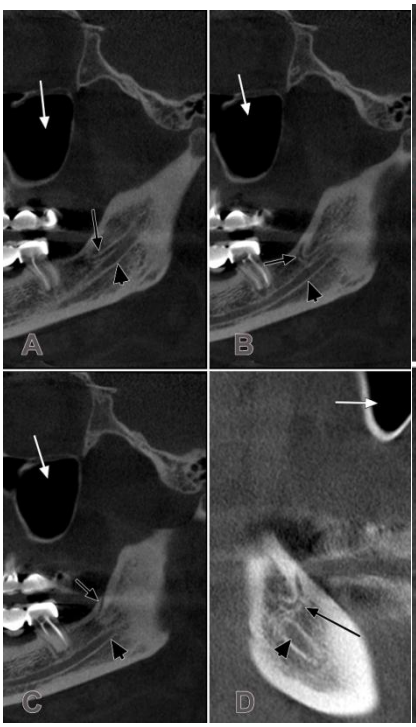


Figure 2. Sequential oblique (A-C) and sagittal (D) multiplanar reconstructions of the right ramus of the mandible, at the level of a retromolar canal (black arrow), leaving the mandibular canal (arrowhead) distally to the third molar area. The maxillary sinus is indicated (white arrow)

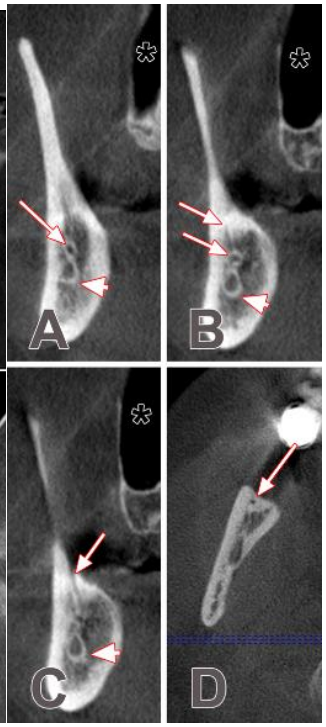


Figure 3. Sequential coronal (A-C) and axial (D) multiplanar reconstructions of the right ramus of the mandible, at the level of a retromolar canal (arrow). The mandibular canal is indicated (arrowhead), as well as the maxillary sinus (*)

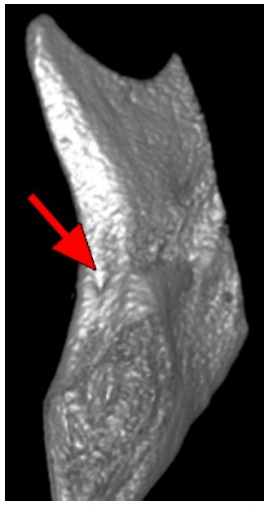


Figure 4. Three-dimensional volume renderization demonstrating the exact anatomical location of the retromolar foramen

DISCUSSIONS

The classical description of the RMC is that of a canal branching off the MC distally to the third mandibular molar and curving to open into, generally into the lingual half of the retromolar fossa (Patil et al., 2013); the opening of the RMC in the retromolartrigone was also noted (Potu et al., 2014). As we also noticed, the three-dimensional volume renderizations of CBCT data are particularly effective for confirming the presence of such canals (Han et al., 2014), and for assessing their exact opening in the mandible ramus. The frequency of the RMC has been variably reported in different studies (Ossenberg, 1987), ranging in an interval between 3.2% and 72%. (Potu et al., 2014).

Three types of RMC were initially described, two of these branching off the MC and being opened, respectively, in the superior and the inferior parts of the retromolar fossa. The third type, defined as the temporal crest canal, has the two ends posterior and, respectively, anterior to the temporal crest of mandible (Han et al., 2014, Kawai et al., 2014, Ossenberg, 1986). Recently, the RMC classification was updated on a CBCT study basis to three different types of RMC different to the temporal crest canal (Patil et al., 2013). These were defined as types A-C(Patil et al., 2013): the first one referrs to a RMC branched off from the MC distally to the third molar, the second type defines a RMC coursing betwen the retromolar fossa and the roots of the third mandibular molar and the last type characterizes a RMC originating from the MC in the mandibular foramen and descending towards the retromolar fossa. In our judgement types A and B are quite similar, except the straight course of the RMC in type A, different to the curved and recurent course of the RMC in type B. In the case reported here a correpondence was established with the type B of this systematization.

CONCLUSIONS

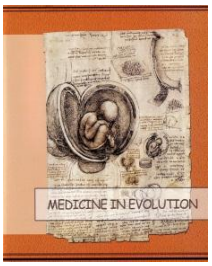
CBCT appears as the most suitable tool to adequately investigate anatomically the RMCs. A sound knowledge of the anatomical possibilities of the mandible canalar structure allows an accurate CBCT diagnosis of variant canals of mandible, if present.

REFERENCES

1. Aps, JK. Number of accessory or nutrient canals in the human mandible. Clin Oral Investig. 2014;18(2):671-6.
2. Bilecenoglu, B, Tuncer, N. Clinical and anatomical study of retromolar foramen and canal. J Oral Maxillofac Surg. 2006;64(10):1493-7.
3. Han, SS, Hwang, JJ, Park, CS. The anomalous canal between two accessory foramina on the mandibular ramus: the temporal crest canal. Dentomaxillofac Radiol. 2014;43(7):20140115.
4. Kawai, T, Asaumi, R, Kumazawa, Y, Sato, I, Yosue, T. Observation of the temporal crest canal in the mandibular ramus by cone beam computed tomography and macroscopic study. Int J Comput Assist Radiol Surg. 2014;9(2):295-9.
5. Kumar Potu, B, Jagadeesan, S, Bhat, KM, Rao Sirasanagandla, S. Retromolar foramen and canal: a comprehensive review on its anatomy and clinical applications. Morphologie. 2013;97(317):31-7.

6. Ossenberg, NS. Retromolar foramen of the human mandible. Am J Phys Anthropol. 1987;73(1):119-28.
7. Ossenberg, NS. Temporal crest canal: case report and statistics on a rare mandibular variant. Oral Surg Oral Med Oral Pathol. 1986;62(1):10-2.
8. Patil, S, Matsuda, Y, Nakajima, K, Araki, K, Okano, T. Retromolar canals as observed on cone-beam computed tomography: their incidence, course, and characteristics. Oral Surg Oral Med Oral Pathol Oral Radiol. 2013;115(5):692-9.
9. Potu, BK, Kumar, V, Salem, A-H, Abu-Hijleh, M. Occurrence of the retromolar foramen in dry mandibles of South-Eastern part of India: a morphological study with review of the literature. Anatomy Research International. 2014;2014.
10. Rusu, MC, Didilescu, AC, Jianu, AM, Paduraru, D. 3D CBCT anatomy of the pterygopalatine fossa. Surg Radiol Anat. 2013;35(2):143-59.
11. von Arx, T, Bornstein, MM, Werder, P, Bosshardt, D. [The retromolar canal (foramen retromolare). Overview and case report]. Schweiz Monatsschr Zahnmed. 2011;121(9):821-34.

FINITE ELEMENT ANALYSIS TO DETERMINE IMPLANT-BONE STRESS DISTRIBUTION



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ABSTRACT

Analysis of a stress caused by masticatory force is essential to establish an appropriate design of the implant suportedprostheses in terms of biomechanics. Finite element analysis (FEA) has been recognized as a useful method which predicts the effect of stress on structures. This research work investigated the methods for the generation of finite element models of implants and bone structures, that can be used for determine a biomechanically behavior of the implant and alveolar bone.

Key words: *finite element analysis, bone graft, implant*

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INTRODUCTION

Experimental stress analysis of implants and alveolar bone has been a topic of interest during the last decade. The object of such research was the determination of stress distribution and improvement of the mechanical strength of these structures.

A major method of stress analysis is the finite element method. The use of finite element analysis in dentistryhas beensignificantly refined during the last years.In finite element analysis,a large structure is divided into a number of small simple-shaped elements, for which individual deformation can be easily calculated. Because the implants and alveolar bone cannot be assimilated to a simplifiedgeometricrepresentationbuth avea layered structure, the method have been developed to refine geometry acquisition.

The aim of our workwas to propose a simple procedure to evaluate through finite element analysis the displacement and stress distribution of an implant and alveolar bone.

MATERIAL AND METHODS

An individual three -dimensional geometry model was built usingcomputer tomography data of the subject´s maxilla. The used spiral CT recorded grayscale images of layers through the maxilla at a distance of 1 mm. The geometry of an 13-mmlength implant was also used.The implant was inserted in anatomical position and oriented to replace the first premolar in the right maxilla.

Using SolidWorkssoftware a 3D model in STL format was generated and meshing of this model was done.

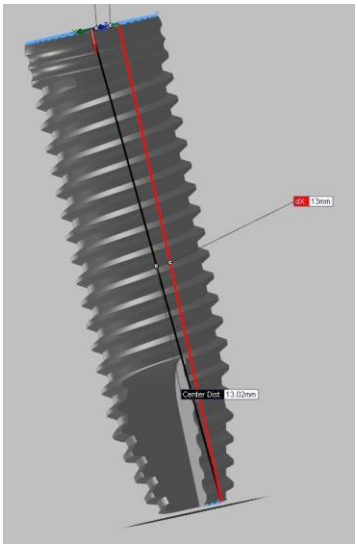


Figure 1. The mesh of the implant

The surface was imported into ANSYS, where the geometry model generation and the computer simulation took place. The software consists of SOLID186 volume elements.Surface contours of the implant and alveolar bone were fitted based on pixel densityusing the interactive image control system. Boolean operations were used to assure the interfacial meshcongruence between the implant and the alveolar bone.

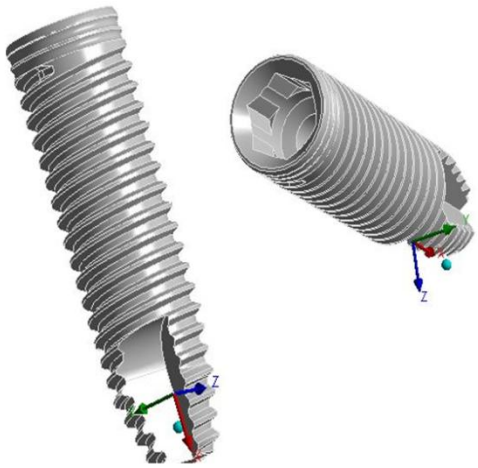


Figure 2. 3D model of the implant

The implant and the bone were meshed by solid elements having three degrees of freedom at each node.The keypoints belonging to each tissue were connected by splines within the layers as well as splines between keypoints from adjacent layers. Between the splines volumes were generated.

The thickness of the implant and the alveolar bone was chosen in order to save elements and therefore computation time. This simplification can be justified by the elastic modulus of materials.

Also for the purpose of simplification, the implant was replaced by a simple cylinder.The model was presumed to represent ideal osseointegration, with complete union between the implant and the alveolar bone. Due to the high stiffness of the implant and the bone, those were modeled as homogenious and linear isotropic materials.

Fixed zero-displacement in the three spatial dimensions wasassigned. Masticatory forces in the OX (laterotrusion), OY (protrusion) and OZ axial (axial force) formed the basis for the simulation of loads.

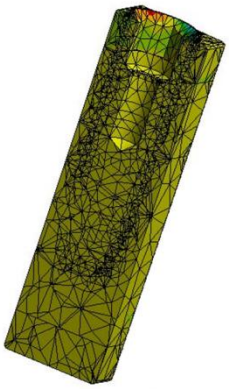


Figure 3. Distribution of von Mises stresses

DISCUSSIONS

The method used in the study suggests thatmaximum detailswas obtained by surface/interface-based meshing. Elements do not overlap,resultingin a controlled representation of interfaces like the implant-bone one.

Another advantageswhen using the efinite element analysis are the possibilities offered by the Boolean

operations with predefined CAD objects.

The user-friendly graphic interface allowsmodifications of the different parts and instantly exportation of volumetricallymeshed in the Ansys Software.

As a limitation of this finite element study, it was assumed that 100% osseointegration of the implant had been achieved. In practice, the complex mechanical behavior of implant and alveolar bone may be affected differently.

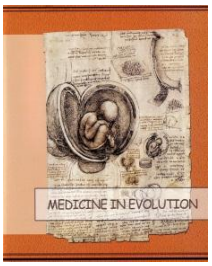
CONCLUSIONS

This work describes a simple method for the generationof finite element models of implants and alveolar bone.This method is rapid and can readily be used for other applications to create specific models usingCT data.

REFERENCES

1. BrunskiJB. Biomaterials and biomechanics in dental implant design. Int J Oral Maxillofac Implants 1988;3:85-97.
2. Detolla DH, Andreana S, Patra A, Buhite R, Comella B. Role of the Finite Element Model in Dental Implants. J Oral Implantol.2000;26(2):77–81
3. GengJP,TanKB,LiuGR.Applicationoffiniteelementanalysisin implant dentistry: A review of the literature. JProsthet Dent 2001;85:585-598
4. Jian-Ping Geng, Keson BC Tan, Gui-Rong Liu.Application of finite element analysis in implant dentistry: A review of the literature. J Prosthet Dent. 2001;85:585–598
5. KongL, HuK, LiD, SongY, YangJ, WuZ etal. Evaluation of the cylinderimplantthread heightandwidth:A3-dimensionalfiniteelement analysis. Int J Oral Maxillofac Implants 2008;23:65-74
6. Korioth TW, Versluis A. Modeling the mechanical behavior of the jaws and their related structures by finite element (FE) analysis. Crit Rev Oral Biol Med 1997;8:90–10
7. Meijer HJA, Kuiper JH, Starmans M, Bosman F. Stress distribution around dental implants: Influence of superstructure, length of implants, and height of mandible. J Prosthet Dent. 1992;68:96–102
8. Pierrisnard L, Barquins M. Daniel chappard Two dental implants designed for immediate loading: A finite element analysis. Int J Oral Maxillofac.2002;17:353–362
9. QuaresmaSE,CuryPR,SendykWR,SendykC.Afiniteelementanalysisoftwodifferentdentalimplants:Stressdistributionintheprosthesis, abutment, implant, and supporting bone. J Oral Implantol2008;34:1-6
10. Rigsby DF, Bidez MW, Misch CE. Bone response to mechanical loads. In: Misch CE, editor. Contemporary implant dentistry. 2nd ed. St Louis: Mosby; 1998;317–328

MIXED DENTITION ANALYSIS USING DIGITAL ORTHOPANTOMOGRAPHY



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ABSTRACT

An ideal mixed dentition prediction method is one that can accurately predict the space for permanent canines and premolars without over or underestimation. The aim of this study was to evaluate prediction method equation for estimating the mixed dentition mandibular arch length analysis by digital orthopantomography.

Key words: *mixed dentition analysis, orthodontic, digital orthopantomography*

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INTRODUCTION

Most orthodontic problems begin during the period of time when the development of the entire masticatory apparatus, including the dental arch and occlusion, proceeds from the primary to the permanent dentition. The transition from this stage to a well aligned arch form in the permanent dentition is dependent upon the space required, and that which is available (4). Space management represents one of the most critical aspects of orthodontic treatment in mixed dentition. The 2-6 length is the difference between the combined mesio-distal widths of the primary cuspid and molars and their permanent successors (5). The most common used procedure to estimate the mesiodistal widths of unerupted permanent canines and premolars in the mixed dentition is the radiographic method (6).

The aim of our study was to estimate by digital orthopantomography (OPG) the total widths of the mandibular permanent canines and premolars using 2-6 distance. This may assist in orthodontic treatment planning.

MATERIAL AND METHODS

A cross-sectional comparative study was carried out on 473 consecutive patients, with an age range of 7-23 years. Data were collected using pretreatment records and plaster casts of orthodontic patients.

Inclusion criteria for sample selection were patients with all permanent teeth in each

arch at least up to first permanent molar, no loss of dental material mesiodistally as a result of caries or trauma and no missing or supernumerary teeth. Patients with a previous history of orthodontic treatment and coronal restorations were excluded.

Digital orthopantomographies (OPGs) were used to measure the distance between distal aspect of the distal aspect of lateral incisor and mesial aspect of the first permanent molar (the 2-6 distance). The mesiodistal widths of the canines and premolars measured were summed. To assess measurement error, the distance between lateral incisor and first molar and the mesiodistal widths of the permanent canine and premolars measured on the study models were remeasured and totaled.

Data analysis was carried out using the Statistical Package for Social Science version 16.0 for Windows (SPSS Inc., Chicago, Illinois, USA). Age and gender were used as independent variables. Pearson's correlation coefficient was used to assess the correlation between the 2-6 distance and widths of the complementary teeth. Multiple linear regression equation was used to predict the 2-6 distance using the widths of the permanent canine and premolars as independent variable. A value of $P < 0.05$ was considered significant.

RESULTS

A total of 178 patients with mixed dentition of 473 fulfilled the eligibility criteria.

A number of 82 (36.8 per cent) males and 96 (63.2 per cent) females with age between 7 and 10 years. The sample showed a greater female composition.

Measurements discrepancy was observed in this study with the 2-6 distance measured on the study models showing significantly ($P < 0.05$)

greater values. A moderate correlation was found between the mesiodistal widths of the permanent canine and premolars for the total sample.

A negative correlation was found between the 2-6 distance and age; another correlation between gender and the 2-6 distance was found (Fig.1). This can be attributed to the fact that mesiodistal widths of the complementary permanent teeth does not change with age.

Simple linear regression, predicting 2-6 distance using gender as independent variable, showed that males had a higher measured value. With multiple linear regressions, when predicting 2-6 distance using widths of the permanent canine and premolars and gender as independent variables, males had a higher 2-6 distance when compared with females (Fig.2).

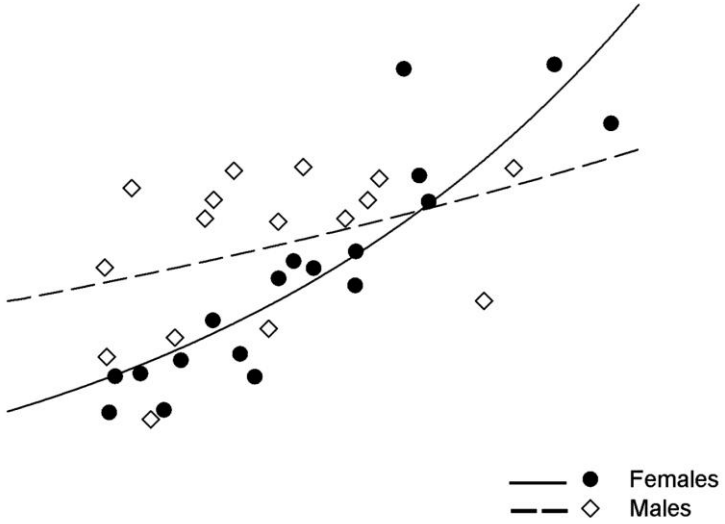


Figure 1. Correlation between the 2-6 distance and age and gendre

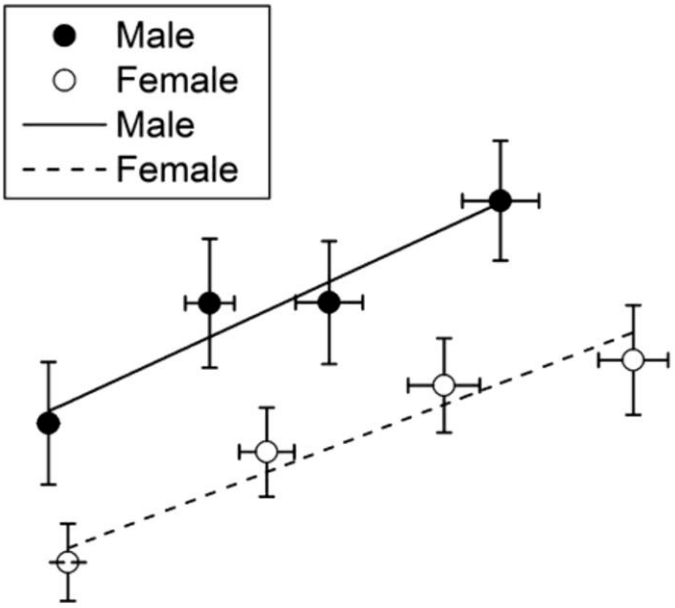


Figure 2. Correlation between the 2-6 distance and widths of the permanent canine and premolars

DISCUSSIONS

Prediction of the mesiodistal dimensions of unerupted permanent canines and premolars is of importance in orthodontic treatment planning. The

better assessment of the size of the canines and premolars allows improved treatment to deal with arch length discrepancies.

Among the different mixed dentition analysis methods reported in the literature, the 2-6 distance measurement is commonly used to predict the widths of unerupted canine and premolars.

The results of the present study were based on the mean widths of the canine complementary teeth as no difference was found between them. A review of the orthodontic literature did not revealed significant difference between the tooth widths of males and females, even males have larger teeth.

A moderate correlation was found in the present study between the 2-6 distance and the widths of the permanent canine and premolars. Some authors claimed that the combined widths of the four incisors was the best predictor for estimating the mesiodistal dimensions of unerupted permanent canines and premolars (3,7,2).

However, another opinion was that the sum of the four permanent incisors is not a good predictor of the mesiodistal widths of the unerupted mandibular canines and premolars (1).

In our study, we used OPG and study models for predicting the sizes of unerupted canines and premolars and we found a high correlation in the mixed dentition period. A linear correlation was found between the 2-6 distance and the widths of the permanent canine and premolars.

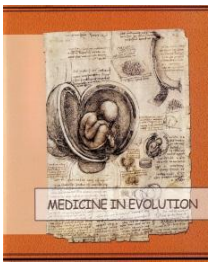
CONCLUSIONS

The use of radiograph for 2-6 distance measurement it is a good prediction method to determine the widths of the lower permanent canines and premolars. Although radiographic method is more precise for mixed dentition analysis, the drawback is that requires sophisticated equipment and experience.

REFERENCES

1. Bernabé E, Flores-Mir C. Are the lower incisors the best predictors for the unerupted canine and premolars sum? An analysis of a Peruvian sample. Angle Orthodontist 2005;75:202-207.
2. Melgaço CA, de Sousa Araújo MT, de Oliveira Ruellas AC. Mandibular permanent first molar and incisor width as predictor of mandibular canine and premolar width. American Journal of Orthodontics and Dentofacial Orthopedics 2007;132:369-372
3. Moyers RE. Handbook of orthodontics. 4th edn. Chicago: Year Book Medical Publishers; 1958.
4. Proffit WR, Fields HW, editors. Contemporary orthodontics. 3rd ed. St Louis: Mosby; 2000.
5. Schwarz AM, Gratzinger M. Removable orthodontic appliances. WB Saunder, Philapelphia; 1966;61-83.
6. Schwarz A M 1961 Roentgenostatics. A practical evaluation of the X-ray headplate. American Journal of Orthodontics 47: 561–585.
7. Van der Merwe SW, Rossouw P, Van Wyk Kotze TJ, Trutero H. An adaptation of the Moyers mixed dentition space analysis for a Western Cape Caucasian population. Journal of the South African Dental Association 1991;46:475-479

THE EFFECT OF BLEACHING AGENTS ON THE MICROHARDNESS OF DENTAL ENAMEL AND COMPOSITE RESINS



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ABSTRACT

Aim: The aim of the experimental study was to evaluate the effect of two different whitening agents on the microhardness of dental enamel and composite resins.

Methods: 6 extracted teeth and 6 disc-shaped specimens of a composite restorative material were used. For the bleaching treatment four applications were performed with a professional whitening gel (Opalescence Boost PF 40%) and a home-use product (Opalescence PF 20%). The surface hardness of the samples was assessed using a Vickers tester before and after each bleaching cycle.

Results: After each whitening cycle the microhardness of enamel and composite surfaces dropped in comparison to the initial values. The mean surface hardness decreased to 56.8% in enamel and to 65.3% in composite samples at the end of the professional bleaching and the reduction was to 71.47% for the enamel and to 81.37% for the resin composite specimens after completing the 4 cycles of at-home bleaching.

Conclusions: Both whitening agents reduced the microhardness of dental enamel and composite resin specimens but the changes were more dramatic in the samples treated with the concentrated agent.

Key words: *microhardness, dental whitening, enamel, composite resins*

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INTRODUCTION

The desire to have brighter and whiter teeth and thus a more pleasant smile has become a very important esthetic demand of today's dental patient. There are many methods and approaches described in the literature for the bleaching of teeth. However, three major whitening approaches are currently available: in-office or professional bleaching, dentist-prescribed and monitored home-use teeth whitening and mass market bleaching agents [1].

Current tooth bleaching materials are based on either carbamide peroxide or hydrogen peroxide. The influence of whitening agents on dental structures and on different tooth-colored restoration materials has been the subject of many investigations. Both peroxides may change the inherent optical properties of the teeth, but they have different considerations for long-term safety and efficacy [2 It has been demonstrated that most professional and at-home bleaching techniques are effective, although results may vary depending on several factors as type of discoloration, concentration of the active ingredient, treatment time and frequency and age of patient [3]. According to several in vitro studies bleaching may exert some negative effects also on the existing composite resin restorations, such as increased surface roughness, marginal breakdown, decreased bond strength or diminished microhardness [4]. While plenty of published studies tend to demonstrate that dental whitening is a relatively safe procedure, investigators continue to describe important side effects of hard tissues, soft tissues, and different restorative materials [5,6]. Thus, concerns and controversy remain regarding the safety of unsupervised long-term and/or repeated application of dental whitening agents.

The aim of the present study was to evaluate the effects of two different bleaching agents on the surface roughness of dental enamel and resin composites.

MATERIAL AND METHODS

In the study six extracted human teeth and six composite resin specimens were used.

The teeth were selected according to the following inclusion criteria: maxillary central or lateral incisors with intact enamel structure (no existing restorations, carious or other lesions), no bleaching treatment in the past 12 months.

For the composite resin samples a universal nanohybrid dental composite (Herculite Ultra, Kerr, USA, with A3 shading) was used. Six disc-shaped restorative material samples were prepared in plastic ring molds with a 6 mm diameter and a 2 mm high (Figure 1). The molds were placed on a glass slab then filled to up with resin. The material surface was covered with a polyester strip and a glass slide, compressed with a device (500 g) for 10 seconds to compact the resin, to extrude excess material and to obtain a flat surface [7]. The composite discs were photoactivated for 20 seconds. After that all specimens were smoothed with fine (20 μm) and extra-fine (10 μm) polishing discs at 10000 rpm.

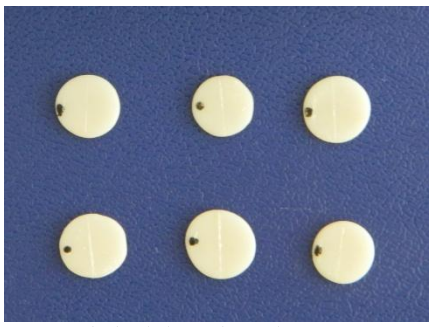


Figure 1. Unpolished disc-shaped composite specimens

The teeth and composite discs were randomly assigned to two groups according to the type of bleaching procedure, as described below:

- Group 1 (Opalescence Boost PF 40% professional bleaching): consisted of 3 teeth and 3 composite specimens (each exposed to 1, 2, 3 and 4 consecutive bleaching cycles)
- Group 2 (Opalescence PF 20% at-home bleaching): comprised of 3 teeth and 3 composite discs (each exposed to 1, 2, 3 and 4 consecutive bleaching cycles)

All teeth and composite specimens were kept in artificial saliva for 24 hours before the first bleaching and between the whitening cycles. Storage of teeth and composite specimens in artificial saliva between bleaching treatments was done to simulate the clinical situation [8].

The appropriate whitening treatments were performed on the buccal surfaces of teeth and on the polished top surface of the composite specimens. Bleaching agents were applied according to the manufacturer's instructions, as follows: the Opalescence Boost PF 40% gel was applied in a 0.5-1 mm thick layer and left on the dental and composite surfaces for 20 minutes, while the home-use Opalescence PF 20% was applied in a 1 mm thick layer and left on the specimens for 4 hours. The whitening cycles were performed at 24-hours intervals on 4 consecutive days. Remnants of whitening gel were removed with a soft toothbrush under running tap water for 1 minute after each whitening cycle.

Surface hardness (HV) of the samples was measured with a CV-AAT 400 Vickers microhardness tester, using a 100 g low-load and a 20s dwell time at room temperature, never close to any edge of the specimen. In the Vickers hardness test a 136° pyramid-shaped diamond is forced into the material with an established load application [9]. Five microhardness measurements were obtained on each dental and composite sample before bleaching and after every cycle. All specimens were positioned on the stage of the tester and stabilized perpendicular to the axis of the Vickers square based diamond pyramid. Then area to indent was selected by focusing with a 10x objective lens. The indents were visualized and measured using the optical microscope (40x magnification) of the mentioned tester device (Figure 2).

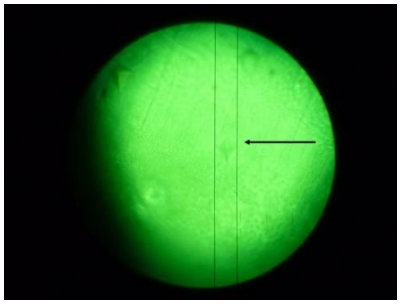


Figure 2. The image of a Vickers indentation left in the surface of a composite disc

Based on the five microhardness absolute values of each sample registered before whitening and after every single bleaching procedure, arithmetic mean values and standard deviations were calculated. Changes in surface microhardness were determined as percentage change in HV from the baseline (%HV) and compared before and after treatments.

RESULTS

The average Vickers microhardness values of the enamel surfaces ranged from 354.1 to 381.2 in group 1 and between 345.9 and 371.6 in group 2. During the two bleaching treatments the microhardness of enamel decreased as shown in Table I and Table II.

Table I. Vickers microhardness values of enamel surfaces during the bleaching with 40% HP

Treatment phase	**HV microhardness [kgf/mm²] ±SD and the percentage change of HV**		
	Tooth 1	**Tooth 2**	**Tooth 3**
Before bleaching	381.2±12.1	354.1±9.6	361.0±7.9
After 1 bleaching cycle with 40% HP	271.0±7.3 (71.09%)	258.3±7.9 (72.84%)	259.6±8.1 (71.91)
After 2 x bleaching cycles with 40% HP	202.3±8.9 (53.06%)	191.8±4.2 (54.16%)	187.6±3.4 (51.96%)
After 3 x bleaching cycles with 40% HP	178.4±7.1 (46.79%)	164.5±5.1 (46.45%)	160.4±6.1 (44.43%)
After 4 x bleaching cycles with 40% HP	169.8±6.7 (44.54%)	148.0±3.4 (41.79%)	155.8±5.5 (43.15%)

Table II. Vickers microhardness values of enamel surfaces during the bleaching with 20% CP

Treatment phase	**HV microhardness [kgf/mm²] ±SD and the percentage change of HV**		
	Tooth 4	**Tooth 5**	**Tooth 6**
Before bleaching	358.1±11.2	371.6±14.2	345.9±13.2
After 1 x bleaching cycle with 20% CP	319.6±10.1 (89.24%)	331.0±12.7 (89.08%)	327.8±15.0 (94.76%)
After 2 x bleaching cycles with 20% CP	287.4±7.2 (80.25%)	299.8±10.7 (80.67%)	291.3±11.2 (84.21%)
After 3 x bleaching cycles with 20% CP	264.7±4.4 (73.91%)	276.4±6.8 (74.38%)	277.4±7.8 (80.19%)
After 4 x bleaching cycles with 20% CP	251.5±6.8 (70.23%)	269.3±8.9 (72.47%)	248.2±8.4 (71.75%)

Figure 3 shows the dramatic decreasing of Vickers microhardness of the enamel during the bleaching treatment with the professional whitening product (containing 40% HP). The strongest microhardness reductions of the enamel were noted after the first bleaching (mean residual microhardness of 71.94% and a mean reduction of 28.06%) and the second whitening cycle with the use of concentrated agent (an average residual microhardness of 53.06% and a mean reduction of 46.94%). During the last two professional bleaching procedures the mechanical properties of the enamel presented a milder diminution. However, after completing the four bleaching cycles the enamel surfaces presented a mean Vickers microhardness value of 157.86 (a dramatic reduction of 56.8%).

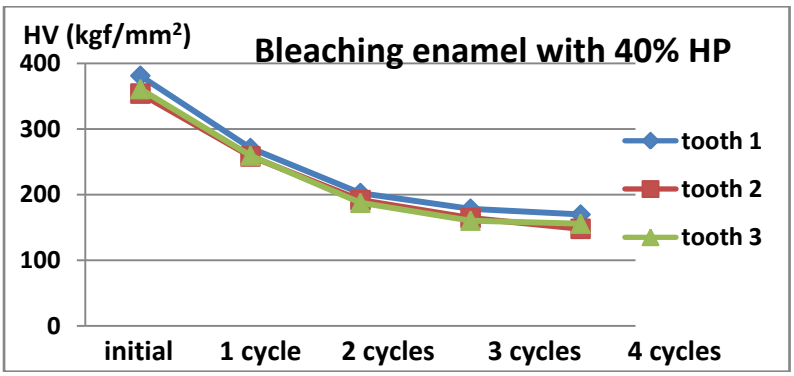


Figure 3. The evolution of enamel microhardness during the professional whitening treatment

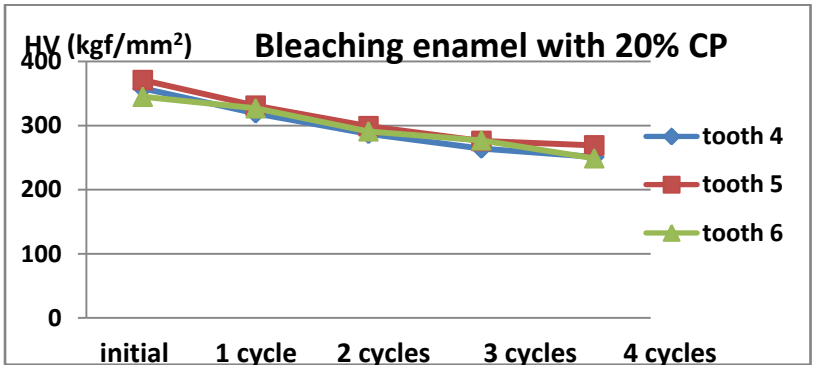


Figure 4. The evolution of enamel microhardness during the at-home whitening treatment

In the dental group treated with 20% carbamide peroxide the microhardness of enamel decreased but in a more linear and continuous perspective. After the first whitening the microhardness of the enamel remained at a mean percentage of 91.02% of the initial value. After the second bleaching cycle the mean HV value decresed to 81.71%. Compared to the first group of teeth treated with the concentrated HP gel, the reduction of enamel surface hardness in the second group was significantly lower. During the third and the fourth bleaching cycles with 20% CP the HV values decreased nearly in the same manner as in the first two cycles, to 76.16% and 71.47%, respectively.

The mean Vickers microhardness values of the composite surfaces varied between 46.4 and 49.7 in group 1 and between 46.9 and 51.2 in group 2. Throughout the sequential bleaching treatments with the concentrated and the milder whitening agent the surface hardness decreased in all composite samples. The mean HV values of the composite specimens during the two whitening regimens are presented in Table III and Table IV.

Table III. Microhardness values of composite samples during the bleaching with 40% HP

Treatment phase	**HV microhardness [kgf/mm²] ±SD and the percentage change of HV**		
	Composite disc 1	**Composite disc 2**	**Composite disc 3**
Before bleaching	48.5±1.1	49.7±1.8	46.4±1.9
After 1 bleaching cycle with 40% HP	35.2±0.8 (72.57%)	40.1±1.9 (80.68%)	38.1±1.4 (82.11%)
After 2 x bleaching cycles with 40% HP	32.2±1.4 (66.39%)	35.1±0.9 (70.62%)	35.6±0.9 (76.72%)
After 3 x bleaching cycles with 40% HP	31.7±0.8 (65.36%)	33.7±0.8 (67.80%)	33.8±1.2 (72.84)
After 4 x bleaching cycles with 40% HP	31.0±0.5 (63.91%)	32.3±1.1 (64.98%)	31.1±1.4 (67.02%)

Table IV. Microhardness values of composite samples during the whitening with 20% CP

Treatment phase	HV microhardness [kgf/mm²] ±SD and the percentage change of HV		
	Composite disc 4	Composite disc 5	Composite disc 6
Before bleaching	47.3±1.9	46.9±1.2	51.2±2.2
After 1 x bleaching cycle with 20% CP	43.8±1.2 (92.60%)	42.6±0.6 (90.83%)	45.8±1.9 (88.86%)
After 2 x bleaching cycles with 20% CP	41.7±0.6 (88.16%)	40.1±1.8 (85.50%)	42.2±0.9 (82.42%)
After 3 x bleaching cycles with 20% CP	40.1±1.8 (84.77%)	38.4±0.6 (81.87%)	40.5±0.7 (79.10%)
After 4 x bleaching cycles with 20% CP	39.9±1.4 (84.35%)	38.2±1.1 (81.44%)	40.1±1.8 (78.32%)

Figure 5 depicts the great drop in Vickers surface microhardness after the first bleaching cycle performed in the first group of composite discs with the 40% HP containing gel. The mean reduction of HV values was of 21.55% after the first treatment phase (mean residual microhardness of 78.45%). The subsequent whitening cycles produsedless surface hardness reductions compared to the first bleaching phase. At the end of the entire bleaching treatment the mean microhardness of the composite discs remained 65.30%.

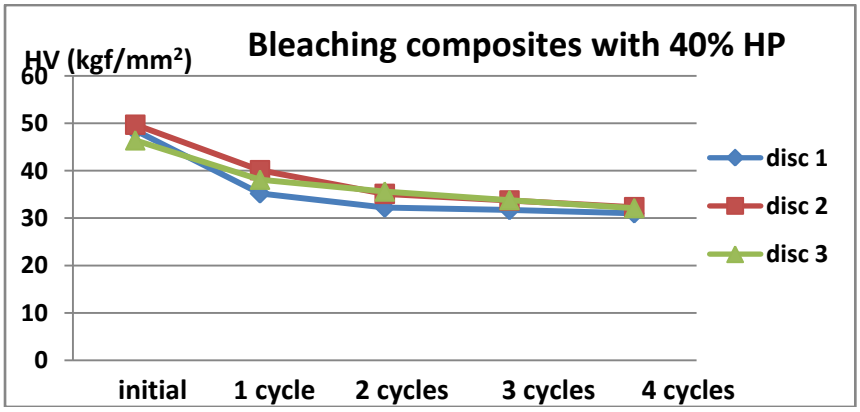


Figure 5. The microhardness reduction of composite surfaces during bleaching with 40% HP

In the group of composites samples whitened with the 20% CP gel the surface microhardness showed a less significant reduction throughout the whole bleaching therapy (consisting of 4 cycles). After completing the entire whitening treatment the mean mcrohardness value of the resin composite discs remained 81.37%.

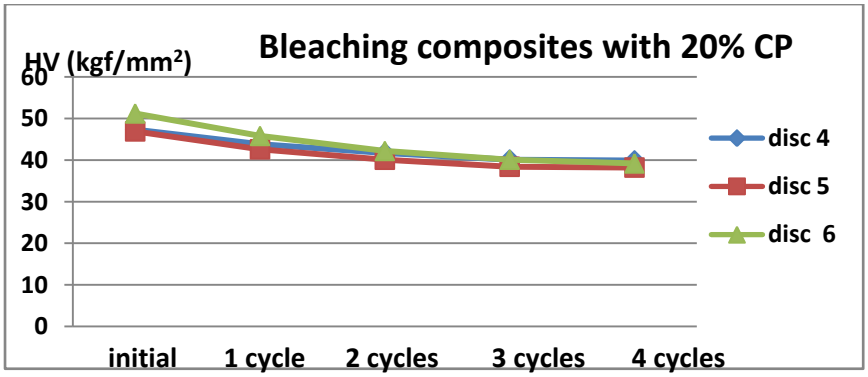


Figure 6. Evolution of resin composite surface hardness during whitening with 20% CP

DISCUSSIONS

Although the use of whitening agents is widespread, the literature has shown contradictory results for the effect of bleaching treatments on the microhardness of dental enamel [10, 11, 12] and on restorative materials, including various types of composite resins [13]. Some studies reported a decrease [14, 15], an increase [16, 17] or no change [18, 19, 20] in surface microhardness of resin composites after application of whitening agents.

Based on the findings of the current study the average value of Vickers enamel surface hardness was 361.98, which is in accordance with the finding of other previous studies [11, 21, 22]. Enamel hardness depends on different factors such as degree of enamel mineralisation, presence or absence of any structural defects in the enamel, type of teeth, the orientation of enamel prisms and the preparing procedures to perform the hardness test [23]. In the present study random sampling was used, thus these factors din not have any negative influence on our findings.

Keeping the samples in artificial saliva may promoted a partial remineralisation after each bleaching cycle, and a consequently increase of microhardness of the sample surfaces. It can be presumed that using distilled water instead of artificial saliva would generate much greater microhardness reductions in each sample. However, the use of artificial saliva creates a closer approximation to the actual clinical situation.

The strongest impact of bleaching treatment was observed in the first two professional bleaching cycles of enamel surfaces and the first cycle of the resin composite samples.

The milder but more constant microhardness reduction observed in the second group of dental and resin samples may be explained by the extended therapy duration of the whitening performed with the 20% carbamide peroxide gel. Therefore patients may need longer treatment periods when using at-home bleaching systems to achieve similar shades to that obtained by the professional products, though the damage to enamel and reduction of surface microhardness will be expected.

CONCLUSIONS

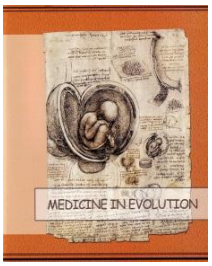
Both bleaching procedures decreased the microhardness of the studied samples, but there was a dramatic reduction in surface microhardness of teeth and composites resins undergoing professional whitening treatment. The in-office bleaching (with 40% HP) reduced enamel hardness to half its original value and resin composite hardness to two-thirds of its initial value after four treatment cycles.

Despite the limitations of this in vitro study the experimental results suggest that the less concentrated dentist-prescribed whitening agents produce less microhardness reduction on the surface of enamel and composite resins, in comparison to the use of professional bleaching products.

REFERENCES

1. Sulieman M. An overview of bleaching techniques. History, chemistry, safety and legal aspects. Dental Update. 2004; 31(10):608–16.
2. Heymann HO. Tooth whitening: facts and fallacies. Br Dent J. 2005; 198(8):514.

3. Joiner A. The bleaching of teeth: a review of the literature. J Dent. 2006; 34(7):412-9.
4. Attin T, Hannig C, Wiegand A, Attin R. Effect of bleaching on restorative materials and restorations—a systematic review. Dent Mater. 2004; 20(9):852-61.
5. Goldberg M, Grootveld M, Lynch E. Undesirable and adverse effects of tooth-whitening products: a review. Clin Oral Invest. 2010; 14(1):1-10.
6. Minoux M, Serfaty R. Vital tooth bleaching: biologic adverse effects – a review. Quintessence Int. 2008; 39(8):645-59.
7. Chung SM, Yap AUJ. Effects of surface finish on indentation modulus and hardness of dental composite restoratives. Dental Materials 2005; 21(11):1008-16
8. Schemehorn B, Gonzalez-Cabezas C, Joiner A. A SEM evaluation of a 6% hydrogen peroxide tooth whitening gel on dental materials in vitro. J Dent. 2004; 32(Suppl 1):35-9.
9. Craig RC, Powers MJ. Restorative Dental Material. St. Louis: Mosby; 2006. pp. 51-96.
10. Hasson H, Ismail AI, Neiva G. Home-based chemically-induced whitening of teeth in adults. Cochrane Database Syst Rev 2006; 18(4): CD006202.
11. Faraoni-Romano JJ, Turssi CP, Serra MC. Concentration-dependent effect of bleaching agents on microhardness and roughness of enamel and dentin. Am J Dent. 2007; 20(1):31-34.
12. Matis BA, Mousa HN, Cochran MA, Eckert GJ. Clinical evaluation of bleaching agents of different concentrations. Quintessence Int. 2000; 31(5):303-310.
13. El-Murr J, Ruel D, St-Georges AJ. Effects of external bleaching on restorative materials: a review. J Can Dent Assoc. 2011;77:b59.
14. Yu H, Li Q, Hussain M, Wang Y. Effects of bleaching gels on the surface microhardness of tooth-colored restorative materials in situ. J Dent 2008; 36(4):261-267.
15. Kwon YH, Shin DH, Yun DI, Heo YJ, Seol HJ, Kim HI. Effect of hydrogen peroxide on microhardness and color change of resin nanocomposites. Am J Dent. 2010; 23(1):19-22.
16. Cooley RL, Burger KM. Effect of carbamide peroxide on composite resins. Quintessence Int 1991; 22(4):817-821.
17. Malkondu O, Yurdaguven H, Say EC, Kazazoglu E, Soyman M. Effect of bleaching on microhardness of esthetic restorative materials. Oper Dent. 2011; 36(2):177-186.
18. Sharafeddin F, Jamalipour G. Effects of 35% carbamide peroxide gel on surface roughness and hardness of composite resins. J Dent. 2010;7(1):6-12.
19. Briso AL1, Tuñas IT, de Almeida LC, Rahal V, Ambrosano GM. Effects of five carbamide peroxide bleaching gels on composite resin microhardness. Acta Odontol Latinoam. 2010; 23(1):27-31.
20. Polydorou O, Hellwig E, Auschill TM. The effect of at-home bleaching on the microhardness of six esthetic restorative materials. J Am Dent Assoc. 2007; 138(7):978-984.
21. Lopes GC, Bonissoni L, Baratieri LN, Vieira LC, Monteiro S Jr. Effect of bleaching agents on the hardness and morphology of enamel. J Esthet Restor Dent. 2002; 14(1): 24-30.
22. Ulukapi H. Effect of different bleaching techniques on enamel surface microhardness. Quintessence Int. 2007; 38(4):201-5.
23. Turker SB, Biskin T. Effect of three bleaching agents on the surface properties of three different esthetic restorative materials. J Prosthet Dent. 2003; 89(5):466-473.



EVALUATING COMPLETE OR REMOVABLE DENTURE WEARERS` SATISFACTION IN RELATION TO A SERIES OF PSYCHO-SOMATIC FACTORS AND PAIN SENSITIVITY

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ABSTRACT

The main purpose of the present study was to evaluate partial or complete dentures wearers` satisfaction in correlation with behavioral psycho-somatic factors and pain sensitivity. Moreover, it outlines, even from the start of the prosthetic therapy, sources of patient unsatisfaction, serving as a guideline for the practitioner. In a group of 150 patients, wearing complete or partial dentures, a questionnaire was used to determine the type of personality and degree of satisfaction regarding the prosthetic. For objective evaluation, modified versions of the Type A Behavior Pattern Test, Oral Health Impact Profile (OHIP-14) and Pain Sensitivity Index (PSI) as part of Symptom Check List (SCL-90-R) were used in providing data for the statistical analysis. From the total of 150 interviewed subjects, 30.66% were type A personality, 25.33% type B personality and 44%, type AB. Dental pain was evaluated by 56,41% of the patients as the highest intensity pain. Subjects with an unsatisfying OHRQoL had their prosthetics for a longer time and had their first prosthetic at a younger age. The number of dentures previously worn influences patient satisfaction and is in correlation with the age that he received his first prosthetic. Pain sensitivity and psycho-somatic factors can predict the lack of cortical integration of the future prosthetic. The study`s clinical applicability resides in helping the practitioner understand patients` complaints and evaluating chances of therapeutic success from the beginning.

Key words: *oral health-related quality of life; oral health impact profile; type A behavior pattern test; type of personality; patient satisfaction; questionnaires*

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INTRODUCTION

Edentulism, as a physiopathological state of the organism, has a deep impact on the quality of life of denture wearers. These influences upon quality of life are of biological, physiological and aesthetic nature, and have a direct impact over the patient`s psychic. Rehabilitation of oral health is a difficult task which and is up to the practitioner; he may obtain a technically perfect prosthodontics, but also has to face a series of psycho-somatic factors which are fully dependent on the patient. Another factor that may influence the prosthetic`s outcome is the fear of pain, during or after the treatment is done. Knowing these factors and their relations, the practitioner can predict a total therapeutic success.

Accepting and integrating the future prosthetic is dependent on the existence of a direct connection between patient expectations and what the dentist-dental technician team can offer. Most frequently, it is compared with natural teeth regarding stability, aesthetics and mastication. Different factors such as age, gender, education, profession, social status and environment, localization of edentulism and the type of personality seem to have an important effect on the patients` expectations. Alteration of the body`s homeostasis has a negative effect on the possibility of denture mental integration and on patient satisfaction regarding the prosthesis.

Data quantification and analysis of their interconnections can lead to a result in therapeutic activity, reducing the risk of failure and alarming the practitioner even from the beginning of their possible appearance.

The most frequent personality test – the Type A Behavior Pattern Test – was introduced by two cardiologists, Rosenman and Friedman, in 1974 [1]. Its main purpose was to correlate types of personality and their susceptibility to stress. Patients were divided in two large categories: type A – very sensitive to stress and type B – not sensitive to stress. Because of the large gap and variations between these two groups, a middle category was introduced, type AB. This idea was widely used in research papers [2, 3, 4].

Slade and Spencer [5] first introduced the Oral Health Impact Profile (OHIP) as a standard and it represented, even from the start, an important instrument in evaluating the effects of denture wearing. Recent studies have used it in the quantification of insatisfaction regarding dentures from the patient`s point of view, proveing that it is a superior quality test regarding validity and sensibility to change [6]. Using a shortened modified version (OHIP-14) is more indicated, because it reduces the source for errors and emphasises the test`s authenticity [7].

Symptom Checklist-90-R (SCL-90-R), introduced by Derogatis et al [8], uses a scale to determine subjective modifications in the model of onset for physical or psychical symptoms. The scale targets modificatations such as somatization, obsesive-compulsive disorder, depression, hostility, fobias, paranoia or psychoticism [4]. The polymorphism of these modifications, next to the evaluation of the impact of a large group of factors by the present study, advised us to use SCL-90-R as a model, modifying the number and some of the questions, adapting it to the situation.

MATERIAL AND METHODS

On a group of 150 patients, 69.33% (104) women and 30.66% (46) men, with ages ranging between 30 and 98, complete and removable denture wearers, a questionnaire was applied. The questions were aimed at finding the type of personality, a short medical history, pain perception and the degree of satisfaction with the prosthetic.

For the evaluation of the answers, modified versions of different indicators were used:

- For type of personality, a modified version of Type A Behavior Pattern Test;
- For discomfort, disability and malfunction In the oral health, a modified version of the Oral Health Impact Profile (OHIP) – the short version OHIP-14;
- For self perception and pain perception, the Pain Sensitivity Index (PSI) and Somatization Scale, a part of the Symptom Check List (SCL-90-R).

The type of personality was determined by direct evaluation of the patient`s choices. The questions regarding pain perception, somatization and satisfaction (regarding aesthetics, mastication, speaking and swallowing) were graded, a positive answer receiving the value 1 and a negative one, the value 2. For the different degrees of perception, the evaluation was subjective, each patient completing the scale with the values taught to be optimal for the given situation. Oral Health Related Quality of Life (OHRQoL) for each individual was evaluated. With this data the previously mentioned factors (OHIP, PSI, SCL-90-R) were evaluated, empowering the relationship and the impact of psycho-somatic factors on patients` satisfaction. Statistical analysis was done using Microsoft® Excel Enterprise 2007 and GraphPad Prism® 5. The analysis consisted of contingency tables, non-Gaussien distribution curves, linear regressions and non-linear regressions (Lowess), linear and non-linear associations, using as variables the data compiled by the questionnaires (age, type of personality, the age when the first denture was made, time of wearing of the present denture, number of dentures worn), thus obtaining data sorted by the quality of the observed effects.

Procedure and statistical analysis

For the determination of OHRQoL, data regarding satisfaction for the prosthetic, general health and social status was used. This variable was then compared with that regarding patient`s personal dental history (patient`s age when the first denture was made, duration of wearing the current denture, number of dentures worn until this date). Using associations between the exposed variables and the results, linear and non-linear associations (Lowess) were developed, obtaining the tendency of the resulting variable (OHRQoL), as a function of the exposed variables (patient history).

Pain Sensity Index (PSI) measures the fear of pain manifested as negative interpretation or catastrophic expectations of the moment of pain onset. Subjects were asked to grade, on a scale from 1 to 10, in comparison, the pain caused by muscle strain, headake, pain caused by trauma and pain of dental origin. Finally, the SCL-90-R model was used to determine the somatization relationships. The values obtained by questionnaires were used to determine 3 indicators for psychic discomfort: Global Severity Index (GSI), the number of discomfort symptoms evaluated by the subject (Positive Symptom Total – PST) and the intensity of the symptoms (Positive Symptom Distress Index – PSDI). To obtain the GSI, the global variable GS was divided by the number of

questions (15): GSI = GS/15. GS equals the value of the sum of all the values on the scale. The same way, a value speciffic for the scale can be calculated $G_{(n)}$ = the sum of the values on a single scale divided by the number of elements (questions) on that scale $S_{(n)}$.

To determine PST, the discomfort tendecy $P_{(n)}$ must be calculated for each scale; it represents the sum of the number of questions with a positive answer (value>1). PST can be calculated by adding all the discomfort tendencies of all the scales: PST = $P_1+P_2+P_3$ or PST= $\sum P_1-P_3$.

The last step necessary to calculate the value of the global index PSDI is the division of GS by the value of PST: PSDI= GS / PST (Table 1).

Table 1. SCL-90-R, the modified version

	Total values	**Nr. Of Questions**	**G**	**P**
1. Oral Health 6a | 6b | 6c | 6d		$4=S_1$	G_1	P_1
2. General Health 10a | 10b | 10c | 10d | 10e | 10f | 10g | 10h | 10i | 10j		$10=S_2$	G_2	P_2
3. Social Status 12		$1=S_3$	G_3	P_3
Global Variables $GS = \sum_{i=1}^{a} S_i$ GSI = GS / 15		15	GSI;	PST
$PST = \sum_{i=1}^{a} P_i$ PSDI = GS / PST				
	GS		PST	PSDI

RESULTS

The distribution of patients by type of personality can be seen in Figure 1. From the total of 150 interviewed subjects, 46 (30.66%) were type A personality, 38 (25.33%) type B personality and 66 (44%), type AB. Gender distribution determined a group of 48 men and 102 women. Age groups, in relation to the median age of 64, outlined a group of 58 persons under 64 years and a group of 92 persons over 64 years.

As for PSI, the pain of dental origin was evaluated by 72 (48%) of the subjects with a lower intesity than the others mentioned. Of those who evaluated it as more powerfull, 34 (43.58%) chose nearby values on the scale, 38 (56.41%) choosing the highest value. Moreover, 70 (46.66%) atributed lower than the median values (median value = 5.53), whereas 80 (53.33%) patients, values over the median. (Figures 1-3).

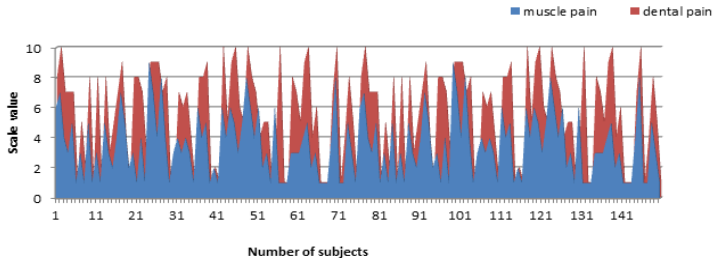

Figure 1. Relationship between dental pain and muscle pain values

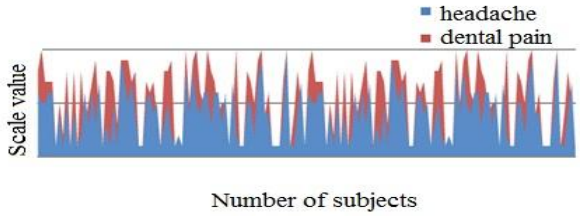

Figure 2. Relationship between dental pain and headake values

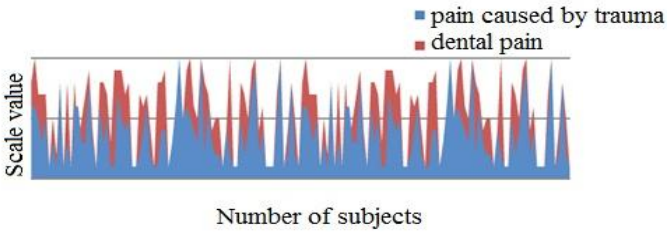

Figure 3. Relationship between dental pain and pain caused by trauma values

Amongst the group of patients, the median age was 64 years, varying between 30 and 98. OHIP scores were between 16 and 26 points, with a median value of 19.38. The median age at which the patients wore their first denture was 54.18 years. They had worn a number of 1.8 dentures prior. The earliest denture was worn at age 20 and the latest, at age 82. 18.66% (28) of the subjects had had their first prosthetic at age 50, 60% (90) of the interviewed patients having had their prosthodontic treatment between 50 and 60 years. 64 (42.66%) of the participants had worn 2 dentures until completing the questionnaire. The current prosthetic had been worn a median of 49.32 months. 16% (24) had been wearing it for 24 months, while equal proportions (9.33%, 14 people) had been using it for 12, 36, 48, 60 and 120 months. The most recent had been made one month prior, the oldest, 240 months prior.

Table 2 represents the patients` distribution by median OHIP values, based on percentages, age and variables that characterize prior denture wearing (age of current dentures, number of prior prosthetics and age at which they got their first prosthetic). Subjects with an unsatisfying OHRQoL (high OHIP) had their prosthetics for a longer time and had their first prosthetic at a younger age. Also, they were significantly less than the oposing group. Diferences regarding patients` age and number of prior prosthetics were unsignificant.

Table 2. The percentage of subjects, age and variables that characterized denture wearing, in 2 groups depending on the median OHIP points

Variable	**Low OHRQoL values (0-19.36 OHIP points)***	**High OHRQoL values (19.36-26 OHIP points)***
Subjects (%)	58.66	41.33

Age (years)	65	66
Age of current dentures (months)	47	52
Number of dentures worn	2	2
Age of first prosthetic (years)	55	53

*Values represent the median of each group

To better detect the possible non-linear associations between age, anamnestic variables and OHRQoL, the following graphics were made, but lacking evidential links (Fig. 4).

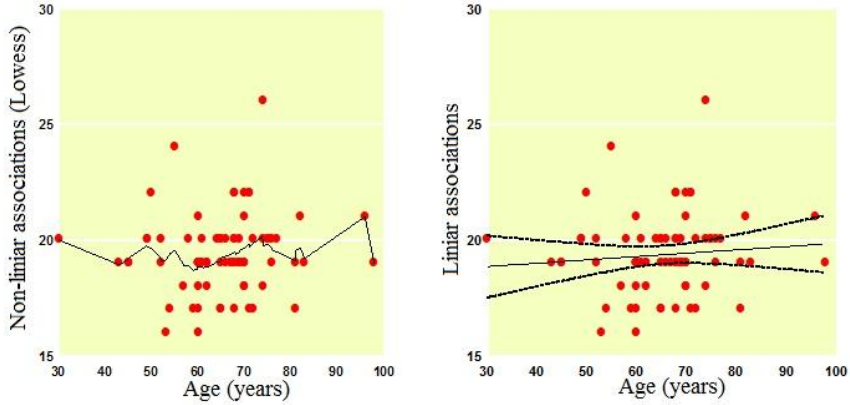

Figure 4. Non-linear (Lowess) and linear associations of the relation between age and OHRQoL

Statistically significant data were gathered from the relation between the number of prosthetics worn and OHRQoL. On the other side, using t test for the 3 anamnestic variables in relation with OHRQoL and the influence of age, all data were statistically significant. Because of the negative confidence intervals in 4 out of 6 cases (table 3), these values may be considered as being false positive, keeping in mind only the influence of the age of the first prosthetic and of the duration of the current prosthetic on OHIP results.

Table 3. Multivariable regression analysis between variables and OHIP results

Variables	**Regression analysis by exposing the variables to OHIP results**			**Regression analysis by exposing the variables to influence of age**		
	95% CI	t	*P*	95% CI	t	*P*
Age of wearing the first prosthetic (years)	30.34 to 37.42	19	<0.0001	-16.98 to -6.85	4.673	<0.0001
Time of wearing current prosthetic (months)	17.26 to 41.67	4.73	<0.0001	-28.74 to -3.92	2.58	0.0108
Number of dentures worn	-19.0 to -15.52	18.96	<0.0001	-65.97 to -60.26	43.33	<0.0001

Finally, SCL-90-R was used to calculate GSI, PST and PSDI. In this case, Mann-Whitney U test was used, using as variables OHRQoL and PSDI). The test was used to compare the median of 2 independent groups that contained scores (in this case). Statistical analysis (Fig. 5) showed a statistically significant relation between the two indexes.

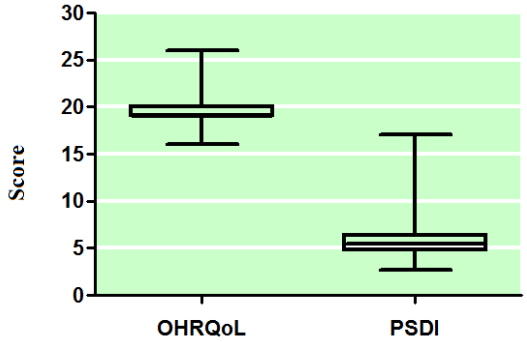

Figure 5. Analysis of the relation between OHRQoL and PSDI (P<.05, U = 15.00)

DISCUSSIONS

The success criteria for prosthodontic treatment are hard to define. Self evaluations of the prosthetics are influenced by psycho-somatic factors and general health. The literature confines well documented cases of dentures that were easily integrated by the patient, although not being of high quality by the practitioner`s point of view. From this we can conclude that the clinical oportunity for using a certain denture does not always concur with the patient`s satisfaction regarding it.

In similar studies, Carlsson et al [9], found a mild corespondence between the denture satisfaction and overall evaluation of oral health. The only notable correspondences have appeared between patient satisfaction and personality type, and also with their social adaptation. Brunello and Mandikos [10] have compared age, gender and medical and psychological status with the number and type of complaints about the dentures, not finding a significant relation between these parameteres. Also, they have stated the fact that age and disease were not factors that would stop patients to succesfully use their prosthetics.

Taking in mind the median age of 64 years, two subject groups were created; the values obtained from them regarding aesthetics, speaking, mastication and swallowing were then related to the type of personality, which concluded once more that type A personality peaked at insatisfaction values, with statistically significant values regarding speaking over the age of 64. Type B remained less satisfied by mastication, for patients over 64 years (table 1). These results confirm prior statements, moreover stating that higher age became a factor in preventing prosthetic therapy failure.

OHIP, PSI and SCL-90-R are interconnected indexes; their analysis was done together. OHRQoL, by OHIP values, was influenced by factors regarding lenght of denture wearing, psychological and psycho-somatic factors regarding somatization and the fear-triggered mechanisms.

Throughout literature, the link between factors related to time of denture wearing and OHRQoL could not be determined, contradicting in a way the hypothesis from which the present study started. Some studies have evoqued positive results in keeping the degree of satisfaction after prosthodontic therapy. For example, Magnusson [11] enunciated that patient satisfaction 5 years after a new denture was still sufficient. In a study by Toolson et al [12], regarding the satisfaction of patients who maintained a recall 5 to 10 years after prosthodontic therapy by overdentures, a great majority were still satisfied, although clinical situations becoming poorer (loss of periodontal support, loss of a number of teeth). This statement may prove the difference between clinical status

(regarding a new denture or a prior prosthetic) and patient expectations, which has a deep impact over satisfaction.

John et al [13] stated that subjects who maintained a recall over a period of 4 years did not present any influence by factors regarding time of wearing the denture upon the degree of satisfaction. This study was used as a model for a part of the present study, though our results turned out contradictory. Certain factors can be enunciated, the most important being the time that patient maintained recalls. In the prior study, subjects maintained a shorter recall period (4 years in comparison with a maximum of 20 years). Another difference may be considered the method of evaluating patients, the instruments used to determine OHRQoL. Moreover, we considered, by means of shortening the number of questions and implying a larger number of indexes, to use as a model the short version, OHIP-14.

For starters, the linear and non-linear (Lowess) associations did not show the existence of a tendency in this function. The variables` statistic analysis demonstrated the possibility of a direct connection between the number of dentures and the degree of unsatisfaction, but also between the age that the patient got their first dentures, the time of wearing for the current one and the degree of satisfaction (Table 2). The data obtained by the present study, in conjunction with the literature review tend to direct, though, the attention to the more important psychic and psycho-somatic influences.

Further study about the relationship between personality traits and patient complaints about dentures have yet to come to a conclusion. Most criticism brought to the authors` attention regarded global evaluation of the discomfort [14] and the use of unspecific tools for the investigation [15]. Klages et al [16] pointed out possible solutions for the criticism; the first problem can be fixed by using OHIP, a secure and comprehensive mean that reaches out to a great variety of oral health problems [5,6,17]. For the second one, the solution came from using the concept of somatization to explain the lack of satisfaction regarding one`s denture. Somatization refers to the disposition to experiment physical symptoms without organic underlying [18,19]. According to the cognitive behavioral theory, the false interpretation of the physical symptoms or of pain and the concentration on proprioceptive signals are defining for the development of amplified perception of somatic dysfunction. Grading by using PSI is one of the best representations of this form of data processing [20,21].

Klages et al [16] have developed a hierarchical model, starting from the sensitivity regarding pain and gradually adding proprioception as a variable. Subsequently, the need to add a somatization scale (SCL-90-R) came up, considering that the two have results regarding the experience of multiple symptoms. In the light of OHIP values, they summarized that the functional limitations and physical pain are affected in a higher percentage (between 38% and 41.5%) by the personality type, in comparison with psychological discomfort (17.3%).

The results of their regression model regarding pain are in agreement of prior noted data. Pain sensitivity, proprioception and somatization predict the onset of psychic symptoms. According to literature data, drawing attention to the physical sensations interferes with the data processing mechanisms that lead to problem solving; and so, denture wearers with high proprioceptive levels may experience these problems, becoming tense, irrational and less able to perform every-day routine tasks. The appearance of these hypotheses raises question marks, leading to uncharted territory for further research.

The present study uses a median between the prior noted information. We joined the prior stated concepts regarding the lack of specificity of the psychological evaluation, but still keeping them as a model, adapted to the present cases. Moreover, it was preferred to elude certain psychological information with the purpose of using more simultaneous evaluation instruments, completing the idea that the conjunct result would be more accurate and significant. The results after PSI evaluation state that 52% of the subjects considered the value attributed to dental pain superior to any other pain. Exaggerated expectations in this case were confirmed by 56.41% of them, who have given dental pain a far superior value (on a scale from 1 to 10). In general, 53.33% of the interviewed patients have noted a value superior to the median value of 5.53. These results sustain a higher impact on the patient, the fear of dental pain being superior to those of organic or traumatic origin. Similar results have been obtained by evaluating SCL-90-R, where PSDI (an indicator of the psychic symptom intensity) appeared in direct correlation with OHRQoL (thru OHIP values), thus confirming the importance of somatization in patient satisfaction and, subsequently, in therapeutic success.

In the light of these data, it was considered that the present study confirmed a part of the noted hypotheses, leaving a path for further study regarding different considerations.

CONCLUSIONS

In conformity with the prior statements, we have reached a set of conclusions:

1. The number of prior worn dentures may have an effect on patient satisfaction, but the subject`s age and the age that he got the first set of dentures have a high signification. Nevertheless, their impact is inferior to those of psychological and psycho-somatic factors.
2. Psycho-somatic factors (pain sensitivity, proprioception and somatization) can predict the onset of psychic and psychological symptoms, drawing attention to modifications in the degree of satisfaction shown by the patient. These data have a clinical application: knowing the interpretation process for the symptoms and proprioception helps the practitioner in understanding patient complaints regarding apparently ideal prosthetics.
3. Patient satisfaction is a subjective concept, the type of personality, the degree of pain perception, proprioception, somatization and data regarding time of denture wearing having a certain influence. Taking these variables in mind, the practitioner can evaluate, even from the beginning of the therapy, the chances for success.

Acknowledgements

This study was partially conducted within the CIGCS-CC 18/11.12.2013 project, supported by the University of Medicine and Pharmacy Tirgu Mures.

REFERENCES

1. Rosenman RH, Friedman M – Neurogenic factors in pathogenesis of coronary heart disease, Med Clin North Am, 1974, 58:269-279.
2. Dumitrescu A - Investigating the relationship between self-reported oral health status, oral health-related behaviors, type A behavior pattern,

perceived stress and emotional intelligence, Rom J Intern Med, 2007, 45(1):67-76.
3. Frei RL, Racicot B, Travagline A – The impact of monochronic and type A behaviour patterns on research productivity and stress, Managerial Psychol, 2002, 14:374-388.
4. Wright L, Newman R – A more bias-proof measure of the type A subcomponent of exaggerated interpersonal control, Educ Psychol Meas, 1994, 54:146-155.
5. Slade GD, Spencer JA – Development and evaluation of the Oral Health Impact Profile, Community Dent Health, 1994, 11:3-11.
6. Allen PF, McMillan AS, Walshaw D et al – A comparison of the validity of generic and disease-specific measures in the assessment of oral health-related quality of life, Community Dent Oral Epidemiol, 1999, 27:344-352.
7. Locker D, Jokovic A, Clarke M - Assessing the responsiveness of measures of oral health-related quality of life, Community Dentistry and Oral Epidemiology, 2004, 32(1):10.
8. Derogatis LR, Savitz KL – The SCL-90-R and Brief Symptom Inventory (BSI) in primary care. Handbook of psychological assessment in primary care settings, Lawrence Erlbaum, New Jersey, 2001, 297-334.
9. Carlsson GE, Otterland A, Wennström A et al – Pacient factors in appreciation of complete dentures, J Prosthedent, 1967, 17-322-328 [5]Awad MA, Locker D, Feine JS et al – Measuring the effect of intra-oral implant rehabilitation on health-related quality of life in a randomized controlled clinical trial, J Dent Res, 2001, 79:1658-1663.
10. Brunello DL, Mandikos MN – Construction faults, age, gender and relative medical health: Factors associated with complaints in complete denture patients, J Prosthet Dent, 1998, 79:545-554.
11. Magnusson T – Clinical judgement and patients` evaluation of complete dentures five years after treatment. A follow-up study, Swed Dent J, 1986, 10:29-35.
12. Toolson LB, Taylor TD - A 10-year report of a longitudinal recall of overdenture patients, J Prosthet Dent, 1989, 62:179-181.
13. John MT, Szentpéteri A, Steele JG – Association between factors related to the time of wearing complete dentures and Oral Health-Related Quality of Life in patients who maintained a recall, Int J Prosthodont, 2007, 20:31-36.
14. Jacob RF – The traditional therapeutic paradigm: complete denture therapy, J Prosthet Dent, 1998, 79(1):6-13.
15. Berg E – Acceptance of full dentures, Int Dent J, 2003, 43:299-308.
16. Klages U, Esch M, Wehrbein H – Oral Health Impact in patients wearing removable protheses: relations to somatization, pain sensitivity, and body consciouness, Int J Prosthodont, 2005, 18:106-111.
17. Locker D – Measuring oral health: a conceptual framework; Community Dent Health, 1988, 5:3-18.
18. Rief W, Auer C – Is somatization a habitual disorder? Physiological reactivity in somatization syndrome, Psychiatr Res, 2001, 101:63-74.
19. Schneider G, Driesch G, Kruse A et al – Subjective body complaints as an indication of somatization in elderly patients, Psychosomatics, 2003, 44:91-99.
20. Gross P – is pain sensitivity associated with dental avoidance?, Behav Res Ther, 2002, 30:7-13.
21. McCracken LM, Faber SD, Janek AS – Pain-related anxiety predicts non-specific physical complaints in persons with chronic pain, Behav Res Ther, 1998, 36:621-630.

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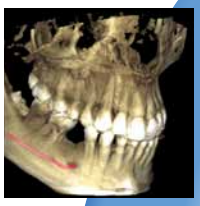

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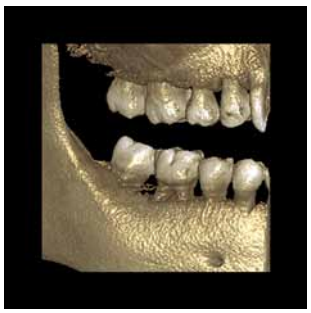

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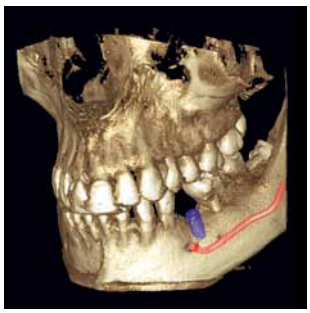

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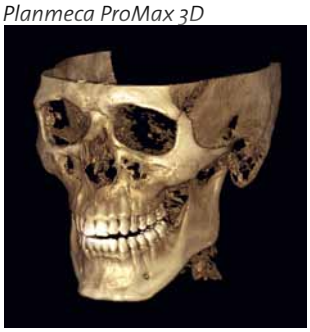

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