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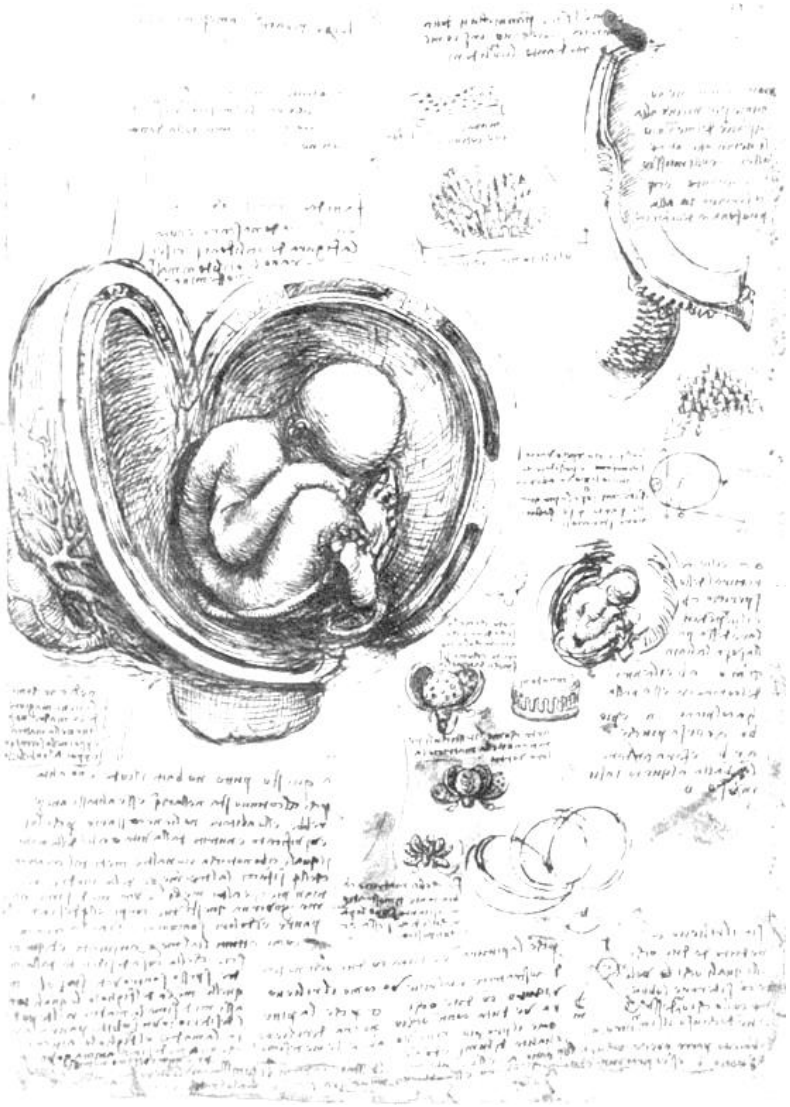

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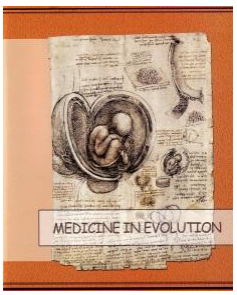

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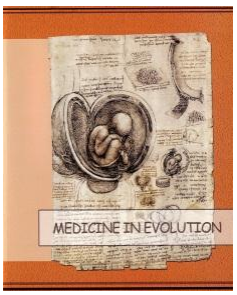
Imagery diagnostic difficulties: toxoplasmosis, primary lymphoma, progressive multifocal leukoencephalopathy. Case report and review of literature.



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Abstract

The role of the article is to present the problems which have arisen in the diagnosis of the disease especially from the perspective of imaging. Such injuries appear in the phase of AIDS at immunocompromised patients. Each of pathologies are presented in the list of differential diagnoses of other hence resulting in importance of diagnostic problem. Thus, with the support of modern imaging methods one can argue for or against a diagnosis offering the clinician a concurrent argument in managing the patient.

We present a mini-series of three cases: (1) primary lymphoma in 28 years old female, a HIV registered patient, with diplopia, headache and fatigue, diagnosis suggested by MRI examination that noticed the presence of a multilocular expansive formation T2 hyperintense with T1 hypointense areas in left hemisphere surrounding the IVth ventricle that involved the thalamus; (2) cerebral toxoplasmosis in a 31 years old male unconfirmed for HIV infection, in which MRI revealed a 9mm fluid signal in right lenticular area, hyperintense T2 and FLAIR lesions in periventricular white matter extending to left corona radiata; (3) progressive multifocal leukoencephalopathy in a 27 years old, HIV registered patient, with visual impairment, in which MRI revealed bilaterally,supratentorial, asymmetric T2 / FLAIR hyperintense areas with T1 hyposignal, without diffusion restriction, involving the U fibers, predominantly fronto-temporo-parietal. Later the case was confirmed being John Cunningham virus positive subsequent to a lumbar puncture.

Keywords: magnetic resonance, primary lymphoma, toxoplasmosis, brain, progressive multifocal leukoencephalopathy.

INTRODUCTION'

Toxoplasmosis revealed in imagery tests becomes a difficult diagnosis especially in differentials with primary lymphoma, when localized in brain. Both can demonstrate ring enhancement pattern and multicentricity, and alternative imaging techniques may help towards a faster diagnosis. The initial diagnosis may be toxoplasmosis while, eventually, the differential diagnosis can include primary brain lymphoma, neurosyphilis, and nevertheless, progressive multifocal leukoencephalopathy.

Primary lymphoma

Primary lymphoma of the central nervous system (CNS) is actually a non-Hodgkin lymphoma localized in the central nervous system. Epidemiologically, it has an increasing incidence even in immunocompetent patients. The etiology remains unknown, allegedly involving Herpes Virus 6 and 8, Epstein-Barr but also associated with observing abnormalities of chromosomes 1,6,7,14. Epstein Barr virus would infect B lymphocytes, with subsequent hijacking of the immunological protection (1,2). Symptoms occur only a few days or weeks prior to the first medical visit accompanied either by cognitive disorders or personality disorders through frontal lobes, corpus callosum and periventricular structures affliction. Nonetheless, neurologic signs may occur, Jacksonian crisis episodes, ocular damage in more than 15% of the cases and leptomeningeal dissemination in about 45% of the cases (3-6). HIV patients who have intracranial lesions suitable for cerebrospinal fluid analysis in despite of any biopsy benefit from herniation risk reduction. Positive cytology or detection of DNA of Epp-Barr virus can establish the diagnosis thus, excluding any biopsy necessity. A recent study has shown that 3 out of 13 immunocompromised patient had positive cytology versus 79 of 255 among immunocompetent (7). In the United States alone the incidence of the disease is 51 to 10 million cases per year among immunocompetent persons, while, in HIV patients 6 to 20 percent may develop a primary lymphoma (8). Magnetic resonance examination with contrast injection is preferred for highlighting supratentorial and periventricular lesions or afflicted areas of the corpus callosum and basal ganglia that appears with prior contrast in hypo-hyperintense T1 sequences, revealing a dense and homogeneous charge following contrast administration associated with peritumoral edema in a mass effect at a lower level. Bleeding may occur, while calcifications or cysts are rarely observed (9-13).

Progressive multifocal leukoencephalopathy (PML)

Progressive multifocal leukoencephalopathy is produced by the John Cunningham (JCV) DNA virus reactivation. It is a demyelinating disease of the CNS in severely immunosuppressed patients and is characterized by radiological and histopathological important changes (14,15). Progressive multifocal leukoencephalopathy is a disease indicator and it has a prevalence of up to eight percent and remained unchanged after the introduction of HAART therapy (16,17). Motor deficits predominates in the clinical picture (16,17,18,19). Progressive multifocal leukoencephalopathy occurs in approximately 1-10% of patients diagnosed with AIDS (20, 21) having a prevalence of 0.7-8 percent of the AIDS diseases indicator (22-25) while in the pre-HAART therapy was first in 25-57% of cases of AIDS indicator disease (26-29). In terms of clinical manifestations stands motor deficit present in 50-80% of diagnosed patients (30,31). Cognitive changes are present in 25% of patients with progressive multifocal leukoencephalopathy. The most important are the behavioral and personality changes but also memory impairment, dyslexia, dyscalculia, foreign hand syndrome or neglect of a body part should be at least as indicative (32). Ophthalmic problems occur in 30-45% of patients (33,34) and the most common symptom is homonymous hemianopsia or quadranopsia due to optical radiation injury (34). The certainty diagnosis requires biopsy, but because of reserved prognosis and a rapid evolution it becomes hard to achieve any early confirmation in the absence of presuming signs. Favorable results in the diagnosis of this pathology was observed by highlighting the association of JCV in CSF by

PCR with MRI imaging (35). The diagnostic value of CSF analysis appeared with the use of PCR detection of JCV virus, having a sensitivity of 43-92% and a specificity of 92-100% (32,36-38). The predictive value of PCR for JCV CSF approaches 90%, but with a lower sensitivity (32). Through the nuclear magnetic resonance imaging examinations, one may observe multifocal brain involvement, consisting in asymmetrical periventricular and subcortical lesions. It has no mass effect and no enhancement, although the subcortical U fibers are involved mainly in parietal-occipital region. It can also exist in certain cases involving the corpus callosum (39-55). Involved regions revealed on the T1 sequence are usually hypointense and hyperintense on T2 the sequence. Lesion enhancement in some patients reveals a favorable evolution in time, showing peripheral diffusion restriction (39-55). The MRI spectroscopy notes low levels for N acetyl aspartate and lactates, followed by a lipid and choline high levels, thus, supporting the diagnosis of progressive multifocal leukoencephalopathy (39-55).

Toxoplasmosis

It is one of the main causes in case of the diseases focused at the level of the central nervous system in context of AIDS. This is a late complication of the AIDS disease and the decision of treatment is in large part of the cases empirical with reserved prognosis (56). The infection is caused by reactivation of the parasite "Toxoplasma gondii" and occurs mainly in immunosuppressed patients which shows below 200 $CD4^+$ cells (56). Diagnosis of Toxoplasma gondii is achieved either through serological tests like PCR, either by histologic examination of the parasite (57). Other methods that are rarely used in diagnosing this infection, consisti in revealing parasite serum antigens and quantification of antigenemia, skin tests like multipuncture skin test with excretory-secretory antigen for parasites or antigen specific lymphocyte transformation test (LTT). The LTT measures the proliferation of T cells in vitro – from which one concludes to using an in vivo reaction due to a previous sensitization (57, 58). In many cases, the diagnosis is done on therapeutic grounds using samples following imaging investigations. Therefore, in the case of suspected toxoplasmosis lesion, an antiparasitic treatment is required. Thus, during subsequent follow-up, if imagery investigation techniques reveal lesion reduction or disappearance, the treatment may continue (57). Serological and epidemiological studies have revealed that Toxoplasma infection may coexist in 15-68% of HIV infected patients. It is estimated that 10-25% of patients with manifest AIDS (25% in Europe), may develop Toxoplasma encephalitis, sometimes being the first manifestation of HIV infection (56). In such patients, the conclusive paraclinical investigations are tomography and magnetic resonance imaging with or without contrast. Magnetic resonance examination specifically describes a target like sign on T2 sequences - showing alternating concentric areas either in hypo or hyperintensity (59). Spectro-IRM may reveal an increased lactate and lipids with concomitant reducing of choline and N-acetyl-aspartate levels. Nonetheless, increased lipids-lactate curve is a hallmark for this pathology (60).

CASE REPORT

Primary lymphoma - Case Report no 1

A 28 years old female patient known with HIV infection is admitted in the department of infectious diseases accusing nausea, diplopia, headache and fatigue. Family and attendants argue that during few days prior to presentation, the patient presented personality disorders towards violent, strange, behavior, different from his day-to-day psychological status. Laboratory examinations revealed significant changes: anemia (Hemoglobin = 9g/dl) associated with a decreased number of lymphocytes CD4+ (CD4+ = 150/mm3), leukopenia (Leu=3900mm3), thrombocytosis, hyperalbuminemia, but also a significant increase in β-2 microglobulin (Table 1). In this case it was decided to dose CXCL13 chemokines, which are predictive factor for lymphoma, the last ones appearing in the serum (61).

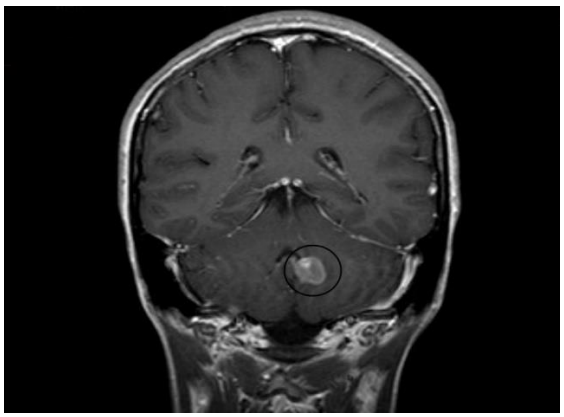


Figure 1. Coronal section in the FLAIR sequence which reveals the lesion at the fourth ventricle

Table 1. Laboratory values found in our cases (Leu – leucocyte count, Hgb – hemoglobin, CD4+ - CD4+ lymphocytes)

	Case no. 1	Case no. 2	Case no. 3
Leu (/mm³)	3900	3976	3890
Hgb (g/dl)	9	8	9,3
CD4+ (/mm³)	150	170	167

The patient was febrile with body temperature fluctuations, focal paralysis in the limbs. She lost weight about 7 kg during the last 3 months according to the family statements. Physical examination of the patient proved aphasia, apraxia and diplopia. Cerebral MRI exam noticed the presence of a multilocular expansive formation with higher intensity on T2 and FLAIR sequences, low intensity on T1 sequences in the left cerebral hemisphere surrounding the ventricle IV of 19/14/14 mm dimensions in largest extent with intense and inhomogeneous enhancement. Another similar lesion was surrounding the lateral 3rd ventricle with left extension to the thalamus and anterior and superior frontal horn of the lateral ventricle with 21/18/26 mm in largest extent – suggestive-looking for primary brain lymphoma patient.

Toxoplasmosis - Case report no 2

A 31 years old male is presented to the emergency room claiming a prior HIV diagnosis, treated for complications like headaches, weakness and confusion. Laboratory examinations revealed significant changes: anemia associated with a decreased number of lymphocytes $CD4^+$ and leukopenia. Thus, regarding a scant conclusive personal history, it was decided to perform a brain MRI.

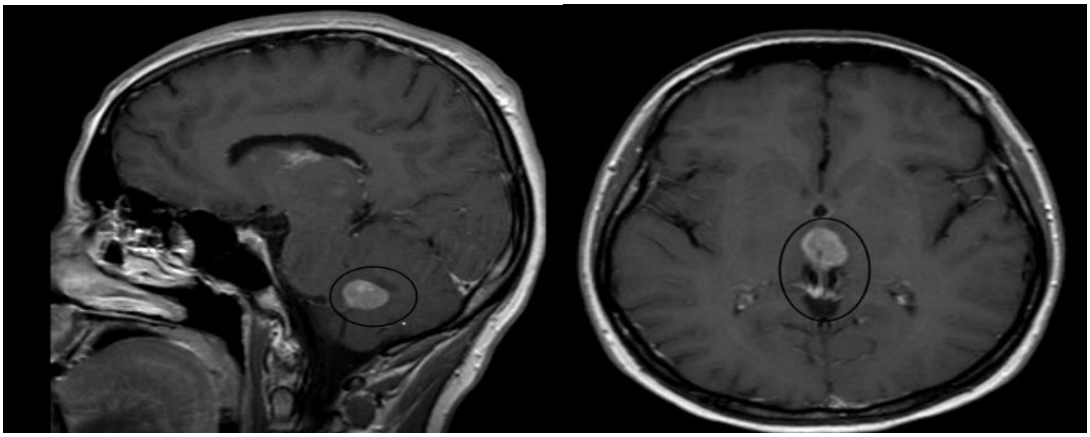


Figure 2. The sagittal (left) and axial sections (right) in T1 contrast sequence: enhancement of the lesions in the 3rd and 4th ventricles is visible

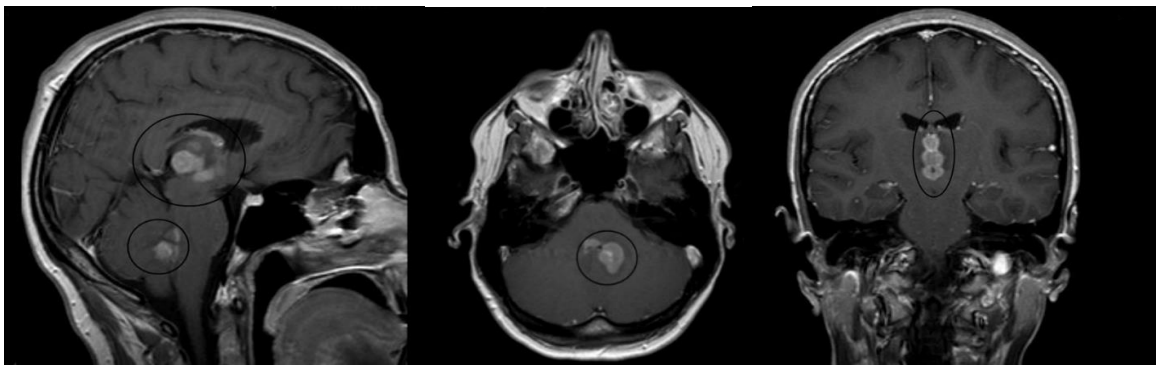


Figure 3. The coronal, sagittal and axial sections in contrast T1 sequence : noticeable contrast enhancement of the lesions in the 3rd and 4th ventricles

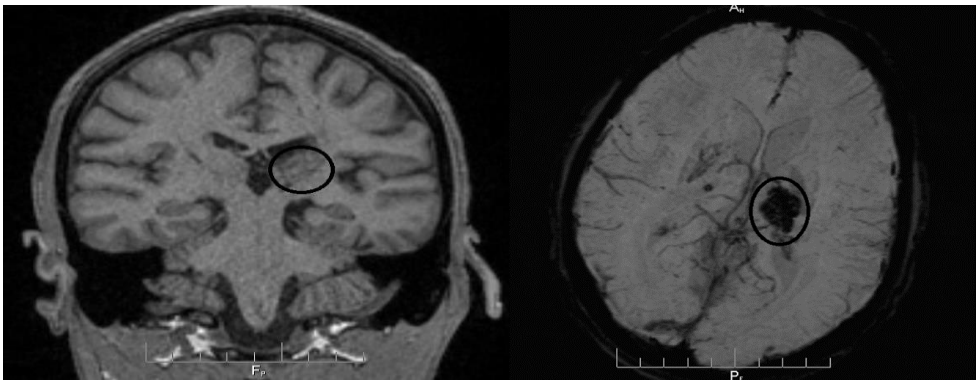


Figure 4. At thalamic lenticular and capsular left, in posterior aspect, a heterogeneous hyperintense nodular lesion is highlighted, visible in all sequences (20/17/11 mm) hypointense in the diffusion sequence.

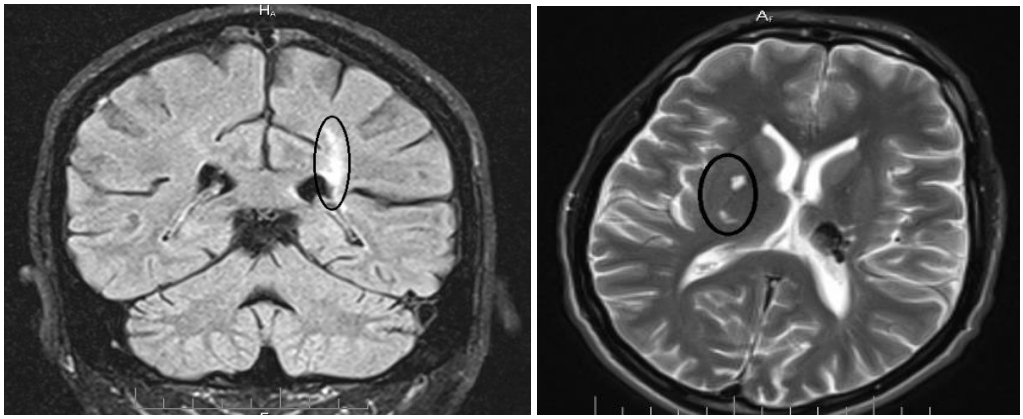


Figure 5. MRI excludes supratentorial polymorphic lesions, looking suggestive for a sequel with fluid type signal in axial and coronal slices. Other injuries occur hiperintense on T2 and FLAIR sequences

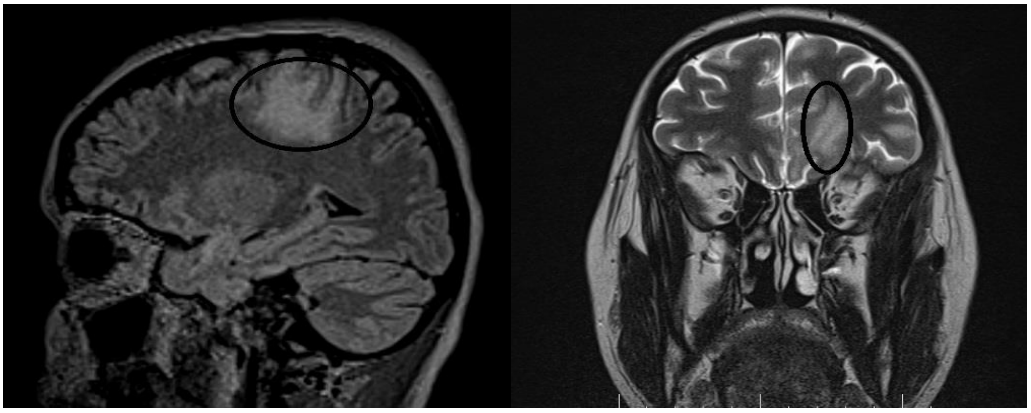


Figure 6. MRI exam distinguish T2 and FLAIR hypersignal areas. Lesions are localized supratentorial, bilaterally, asymmetric – sagittal and coronal slices

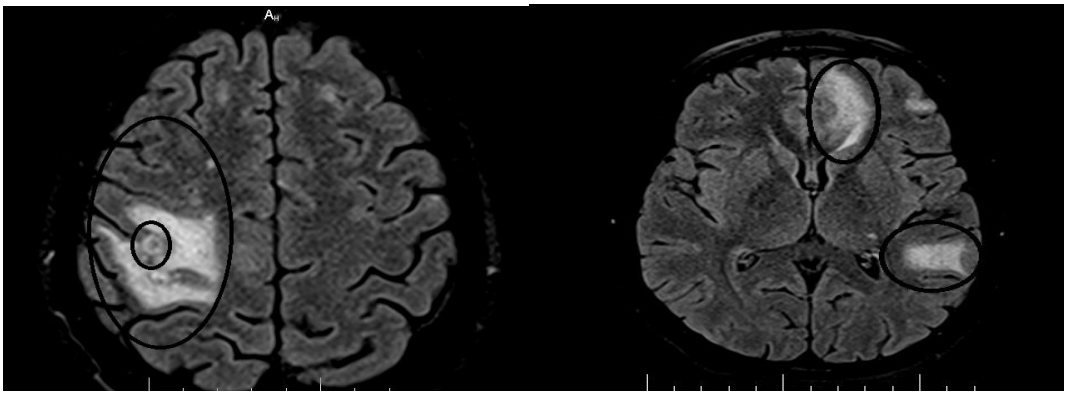


Figure 7. Images in axial slices describe several nodular images with central FLAIR isosignal and hypersignal peripheral ring with isosignal T1, without restriction diffusion nor contrast outlet

The patient stated that he, during last days, suffered headaches and seizures. The MRI excluded supratentorial polymorphic lesions, looking suggestive for a sequel with fluid type signal. Furthermore, fluid type signal developed at right capsule, lenticular level – maximum 6 mm – and cortico-subcortical frontal bilateral – maximum 9 mm – on the right side circumscribed by slight gliosis. Other injuries were hyperintense on T2 and FLAIR sequences, with a discrete T1 hyperintensity. They were located bilaterally in the periventricular white matter with extension in the left corona radiata – maximum 8 mm. The above described injuries do not show conspicuous enhancement. In the left posterior aspect, at thalamic lenticular capsular level a heterogeneous hyperintense nodular lesion is visible in all sequences within the dimensions of 20/17/11 mm, that becomes hypointense in the diffusion sequence. Lesions have an easily retractable effect on left lateral ventricle, thus being partly non-delineated with an inhomogeneous enhancement. Therefore, the appearance suggests a mixed structural substrate, predominantly calcified, associated with coexistent enhancement. No further contrasts were detectable in the brain. Such injuries suggest a substrate sequela after toxoplasmosis in the HIV infection context. Eventually, serology for Toxoplasma gondii revealed increased IgG antibodies, thus, confirming the diagnosis of an old, previously treated, infection.

Progressive multifocal leukoencephalopathy - Case report no 3:

A 27 years old patient, already registered as a HIV carrier presents to hospital with visual impairment, diffuse muscular weakness and dizziness. Laboratory examinations revealed anemia with hemoglobin levels of 9,3g/dl, leukopenia (3890 / mm3), CD4+ lymphocytes count of 167/mm3 and decreased hematocrit (30%). The clinical picture proved to be nonspecific, the patient having only behavioral and personality changes, memory impairment, dyslexia, as well as a foreign hand syndrome. MRI exam distinguish T2 and FLAIR hypersignal areas, T1 hyposignal, hypersignal during diffusion and ADC, without detectable contrast outlets. Lesions are subcortical, bilaterally localized, supratentorial and asymmetric, involving U fibers. These are predominantly fronto-temporo-biparietal, with no mass effect, thus, suggesting the appearance of progressive multifocal leukoencephalopathy. Amid the described images, other several nodular images are distinguished with central FLAIR isosignal and hypersignal peripheral ring, iso-signal T1, without restriction diffusion nor contrast outlet. Some nodular areas in right supratentorial subcortical white matter with T2 and FLAIR hypersignal were detected, with no contrast outlet nor any diffusion restriction. As these injuries are very small, one may suggest the existence of glial nodules in the setting of the underlying disease or microangiopathic demyelinating lesions. Other lesions in the left caudate head, left thalamic, rear arm of left internal capsule and right hypothalamus were observed, showing T2/FLAIR hypersignal, without diffusion restriction and wanting contrast outlet. In conclusion subcortical changes at supratentorial level with bilaterally, asymmetric localized areas, without mass effect is strongly indicative for

progressive multifocal leukoencephalopathy with long evolution. Lesions from the caudate head are susceptible to brain abscess but shows no outlet contrast feature. In order to have a definite diagnosis the patient was referred to PCR examining from cerebrospinal fluid, in which, later on, JCV was positive.

DISCUSSIONS

Diagnostic problem in relation to modern literature is the resemblance of these pathologies and difficulties encountered during the diagnosis and treatment. Thus, neurological complications are common in immunocompromised patients. They, usually, present to the hospital with either de nuovo neurological symptoms or, due to a routine imaging examination, multifocal brain lesions are revealed which, frequently, show peripheral charging (62). Without modern imaging methods or without correlating clinical and laboratory data it would be virtually impossible to differentiate, while biopsy is often dangerous and delays diagnosis. Sometimes, in order to elucidate, both magnetic resonance and computer tomography sometimes in DWI are used. However, computer tomography has the disadvantage of the weaker localization of lesions and radiation. In spite of the arisen difficulties, there are some favorite locations of these pathologies that can only help us in guiding diagnosis with the possibility of empiric treatment prescription. Thus, primary lymphoma affects deep parenchyma, particularly, the basal ganglia as mentioned earlier (63). Medical literature describes a high index of multiple injuries among immunocompromised patients, with a compliance similar to the case presented in this article (64). Therefore, in the case of primary lymphoma, CT examination revealed hypodense lesions associated with necrosis creating a situation in which MRI is rather preferred with this pathology. Cerebral toxoplasmosis, as an opportunistic infection, occurs mostly in patients with CD4+ count below 200/mm3. In these cases, subsequent to antiretroviral therapy onset, the incidence decreases (65). Patients usually present with fever, headache and sometimes nausea, hemiparesis and aphasia, while in a late stage diagnosis dementia may occur followed by confusion, lethargy or even coma (66). Diagnosis is based on imaging methods such as computed tomography and magnetic resonance imaging which reveals multiple lesions with contrast intake, but it may become difficult to differentiate from other pathologies in this area. Thus, one can request further biological examinations such as IgG antibodies quantification which is positive in 97 percent of patients with cerebral toxoplasmosis (67), or other methods, like empirical therapy or spectro-MRI examinations. The last ones serve to differentiate toxoplasmosis of primary lymphoma, tuberculosis or fungal/ bacterial abscess. Progressive multifocal leukoencephalopathy is a progressive demyelinating subacute disease, which occurs in immunocompromised patients especially in AIDS-related cases. From the histopathological point of view, progressive multifocal leukoencephalopathy is characterized by: demyelination, conspicuously enlarged oligodendrocyte nuclei and bizarre astrocytes (68). On the other hand, regarding prognosis patients who have lesions with contrast outlet and a reasonable number of CD4+ cells may undergo a favorable evolution, through a good immune status (69). Magnetic resonance imaging remains the preferred diagnostic method in this pathology which, along with other laboratory investigations, help us succeed early diagnosis. Differential diagnosis may become difficult because it shows a pattern of multifocal injuries without contrast outlet or without mass effect.

CONCLUSIONS

In conclusion the brain lesions occurred in immunocompromised patients may have a similar pattern and the differential diagnosis becomes difficult and delay treatment. The biopsy is often dangerous and lingers diagnosis. Thus, modern imaging by spectro-IRM and biological samples can guide the diagnostic and thus the patient can receive appropriate

treatment to cure or halt disease progression. Modern neuroimaging can help us to presume a diagnosis, in an early stage pathology, thus preventing any further central nervous system damage. Radiologists and infectious disease physicians must be familiar with these techniques that assist in managing immunocompromised patients.

Aknowledgements

Special thanks goes to medical staff of infectious diseases and radiology departments in our hospital.

Ethical issues

We have received the ethical board consent within our institution for clinical data acquisition, clinical study publication of and this article.

Conflict of interests

The authors declare no conflict of interest of any kind.

REFERENCES

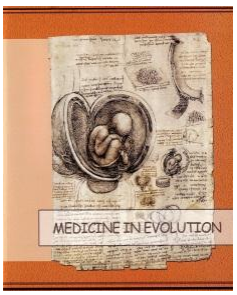
1. Corboy JR, Garl PJ, Kleinschmidt-DeMasters BK. Human herpesvirus 8 DNA in CNS lymphomas from patients with and without AIDS. Neurology. 1998 Feb. 50(2):335-40.
2. Gomez-Brouchet A, Delisle MB, Vital A, Brousset P. Immunohistochemical assessment of human herpesvirus 8 infection in primary central nervous system large B cell lymphomas. J Clin Pathol. 2001 Aug. 54(8):617-8.
3. Balmaceda C, Gaynor JJ, Sun M, Gluck JT, DeAngelis LM: Leptomeningeal tumor in primary central nervous system lymphoma: recognition, significance, and implications. Ann Neurol 38: 202-209, 1995
4. Bataille B, Delwail V, Menet E, Vandermarcq P, Ingrand P, Wager M, et al: Primary intracerebral malignant lymphoma: report of 248 cases. J Neurosurg 92: 261-266, 2000
5. Fine HA, Loeffler JS: Primary central nervous system lymphoma, in Canellos GP, Lister TA, Sklar JL (eds): The Lymphomas. Philadelphia: W.B. Saunders, 1998, pp 481-494
6. Herrlinger U, Schabet M, Bitzer M, Petersen D, Krauseneck P: Primary central nervous system lymphoma: from clinical presentation to diagnosis. J Neurooncol 43: 219-226, 1999
7. Fine HA, Mayer RJ: Primary central nervous system lymphoma. Ann Intern Med 119: 1093-1104, 1993
8. Increasing incidence of primary brain lymphoma in the US Authors Nancy L. Eby PHD,Seymour Grufferman MD, DRPH,Christina M. Flannelly MD,S. Clifford Schold Jr MD,F. Stephen Vogel MD,Peter C. Burger MD Laboratory Diagnosis of Toxoplasma gondii Infection and Toxoplasmosis, Jose G. Montoya
9. Jahnke K, Schilling A, Heidenreich J. Radiologic morphology of low-grade primary central nervous system lymphoma in immunocompetent patients. AJNR Am J Neuroradiol. 26 (10): 2446-54;
10. Zacharia TT, Law M, Naidich TP. Central nervous system lymphoma characterization by diffusion-weighted imaging and MR spectroscopy. J Neuroimaging. 2008;18 (4): 411-7.
11. Haldorsen IS, Kråkenes J, Krossnes BK et-al. CT and MR imaging features of primary central nervous system lymphoma in Norway, 1989-2003. AJNR Am J Neuroradiol. 2009;30 (4): 744-51.
12. Johnson BA, Fram EK, Johnson PC. The variable MR appearance of primary lymphoma of the central nervous system: comparison with histopathologic features. AJNR Am J Neuroradiol. 1997;18 (3): 563-72.
13. Huang WY, Wen JB, Wu G. Diffusion-Weighted Imaging for Predicting and Monitoring Primary Central Nervous System Lymphoma Treatment Response. AJNR Am J Neuroradiol. 2016 Nov;37(11):2010-2018
14. Berger JR, Major EO. Progressive multifocal leukoencephalopathy. Semin Neurol 1999; 19:193-200,

15. Henson JW, Louis DN. Edward Peirson Richardson Jr (1918-1998) and the discovery of PML. J Neurovirol 1999; 5:325-326)
16. Astrom KE, Mancall EL, Richardson EP Jr. Progressive multifocal leukoencephalopathy. Brain 1958; 81:93-127
17. Berger JR, Pall L, Lanska D et al. – Progressive multifocal leukoencephalopathy în patients with HIV infection. J Neurovirol 1998; 4:59-68
18. Miller JR, Barrett RE, Britton CB. Progressive multifocal leukoencephalopathy în a male homosexual with T-cell immune deficiency. N Engl J Med 1982; 307:1436-1438
19. Dr. Dan Duiculescu, Dr. Luminița Ene. Leucoencefalita multifocala progresiva (PML). Rom J Infect Dis.; 2006; 9(1):40-50;
20. Berger JR, Major EO. Progressive multifocal leukoencephalopathy. Semin Neurol 1999; 19:193-200
21. Welch K, Morse A, and the Adult Spectrum of Disease Project în New Orleans. The clinical profile of end-stage AIDS în the era of highly active antiretroviral therapy. AIDS Patient Care and STDs 2002; 16:75-81
22. Chowdhury M, Kundu M, Khalili K. GA/GC-rich sequence confers Tat responsiveness to human neurotropic virus promoter, JCVL, în cells derived from central nervous system. Oncogene 1993; 8 (4): 887-92
23. Holman RC, Janssen RS, Buehler JW. Epidemiology of progressive multifocal leukoencephalopathy în the United States: analysis of national mortality and AIDS surveillance data. Neurology 1991; 41 (11): 1733-6
24. Berger JR, Kaszovitz B, Post JD. Progressive multifocal leukoencephalopathy associated with human immunodeficiency virus infection: a review of the literature with a report of sixteen cases. Ann Intern Med 1987; 107 (1): 78-87
25. Dworkin MS, Wan PC, Hanson DL. Progressive multifocal leukoencephalopathy: improved survival of human immunodeficiency virus-infected patients in the protease inhibitor era. J Infect Dis 1999 Sep; 180 (3): 621-5
26. Albrecht H, Hoffmann C, Degen O. Highly active antiretroviral therapy significantly improves the prognosis of patients with HIV-associated progressive multifocal leukoencephalopathy. AIDS 1998; 9:1149-1154
27. Fong IW, Toma E. – The natural history of progressive multifocal leukoencephalopathy în patients with AIDS. Clin Infect Dis 1995 ; 20: 1305-10
28. Whiteman MLH, Post MJD, Berger JR. Progressive multifocal leukoencephalopathy în 47 HIV-seropositive patients: neuroimaging with clinical and pathologic correlation. Radiology 1993 Apr; 187 (1): 233-40
29. Tassie JM, Gasnault J, Bentata M. Survival improvement of AIDS-related progressive multifocal leukoencephalopathy în the era of protease inhibitors. AIDS 1999; 13 (14): 1881-7
30. Brooks BR, Walker DL. Progressive multifocal leukoencephalopathy. Neurol Clin 1984; 2:299-313
31. Dr. Dan Duiculescu, Dr. Luminița Ene. Leucoencefalita multifocala progresiva (PML). Rom J Infect Dis.; 2006; 9(1):40-50;
32. Berger JR, Major EO. Progressive multifocal leukoencephalopathy. Semin Neurol 1999; 19:193-200
33. Astrom KE, Mancall EL, Richardson EP Jr. Progressive multifocal leukoencephalopathy. Brain 1958; 81:93-127
34. Omerud LD, Rhodes RH, Gross SA. Opthalmologic manifestations of acquired immune deficiency syndrome-associated progressive multifocal leukoencephalopathy. Ophthalmology 1996; 103:899-906
35. Major EO, Curfman BL. Viral-induced demyelination leading to progressive multifocal leukoencephalopathy: The involvement of both immune and nervous system target cells. In: Remington J, Peterson PK, eds. Defense of the brain. Cambridge, MA: Blackwell Science, 1997:305-321
36. Weber T, Turner RW, Frye S, et al. – Progressive multifocal leukoencephalopathy diagnosed by amplification of JC virus-specific DNA from cerebrospinal fluid. AIDS 1994; 8:49-57
37. Fong IW, Britton CV, Luinstra KK, et al. – Diagnostic value of detecting JC virus DNA în cerebrospinal fluid of patients with progressive multifocal leukoencephalopathy. J Clin Microbiol 1995; 33:484-486

38. McGuire D, Barhite S, Hollander H. JC virus DNA în cerebrospinal fluid of human immunodeficiency virus-infected patients: Predictive value for progressive multifocal leukoencephalopathy. Ann Neurol 1995;37:395-399
39. Grossman RI, Yousem DM. Neuroradiology, the requisites. Mosby Inc. (2003) ISBN:032300508X.
40. Smith AB, Smirniotopoulos JG, Rushing EJ. From the archives of the AFIP: central nervous system infections associated with human immunodeficiency virus infection: radiologic-pathologic correlation. Radiographics. 28 (7): 2033-58.
41. Berger JR, Levy RM, Flomenhoft D et-al. Predictive factors for prolonged survival in acquired immunodeficiency syndrome-associated progressive multifocal leukoencephalopathy. Ann. Neurol. 1998;44 (3): 341-9.
42. Brant WE, Helms CA. Fundamentals of diagnostic radiology. Lippincott Williams & Wilkins. (2007) ISBN:0781761352.
43. Selewski DT, Shah GV, Segal BM. Natalizumab (Tysabri). AJNR Am J Neuroradiol. 2010;31 (9): 1588-90.
44. Mark AS, Atlas SW. Progressive multifocal leukoencephalopathy in patients with AIDS: appearance on MR images. Radiology. 1989;173 (2): 517-20.
45. Bag AK, Curé JK, Chapman PR. JC virus infection of the brain. AJNR Am J Neuroradiol. 2010; 31 (9): 1564-76.
46. Iranzo A, Moreno A, Pujol J. Proton magnetic resonance spectroscopy pattern of progressive multifocal leukoencephalopathy in AIDS. J. Neurol. Neurosurg. Psychiatr. 1999;66 (4): 520-3.
47. Post MJ, Yiannoutsos C, Simpson D. Progressive multifocal leukoencephalopathy in AIDS: are there any MR findings useful to patient management and predictive of patient survival? AIDS Clinical Trials Group, 243 Team. AJNR Am J Neuroradiol. 20 (10): 1896-906.
48. Garrels K, Kucharczyk W, Wortzman G. Progressive multifocal leukoencephalopathy: clinical and MR response to treatment. AJNR Am J Neuroradiol. 1996;17 (3): 597-600.
49. Whiteman ML, Post MJ, Berger JR. Progressive multifocal leukoencephalopathy in 47 HIV-seropositive patients: neuroimaging with clinical and pathologic correlation. Radiology. 1993;187 (1): 233-40.
50. Thurnher MM, Post MJ, Rieger A. Initial and follow-up MR imaging findings in AIDS-related progressive multifocal leukoencephalopathy treated with highly active antiretroviral therapy. AJNR Am J Neuroradiol. 2001;22 (5): 977-84.
51. Vendrely A, Bienvenu B, Gasnault J. Fulminant inflammatory leukoencephalopathy associated with HAART-induced immune restoration in AIDS-related progressive multifocal leukoencephalopathy. Acta Neuropathol. 2005;109 (4): 449-55.
52. Buckle C, Castillo M. Use of diffusion-weighted imaging to evaluate the initial response of progressive multifocal leukoencephalopathy to highly active antiretroviral therapy: early experience. AJNR Am J Neuroradiol. 2010;31 (6): 1031-5.
53. Gonçalves FG, Lamb L, Del Carpio-O'Donovan R. Progressive multifocal leukoencephalopathy restricted to the posterior fossa in a patient with systemic lupus erythematosus. Braz J Infect Dis. 2012;15 (6): 609-12.
54. Tan K, Roda R, Ostrow L. PML-IRIS in patients with HIV infection: clinical manifestations and treatment with steroids. Neurology. 2009;72 (17): 1458-64.
55. Sarbu N, Shih RY, Jones RV. White Matter Diseases with Radiologic-Pathologic Correlation. Radiographics. 2016;36 (5): 1426-47.
56. Gulshan Uppal. CNS Toxoplasmosis in HIV Department of Neurology. University of Missouri-Columbia School of Medicine. 2018.
57. Kaplan JE, Benson C, Holmes KH, Brooks JT, Pau A, Masur H. Guidelines for prevention and treatment of opportunistic infections in HIV-infected adults and adolescents: recommendations from CDC, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America. MMWR Recomm Rep. 2009 Apr 10. 58:1-207;
58. Alfonso Y, Fraga J, Fonseca C, et al. Molecular diagnosis of Toxoplasma gondii infection in cerebrospinal fluid from AIDS patients. Cerebrospinal Fluid Res. 2009 ; 6:2.
59. Mahadevan A, Ramalingaiah AH, Parthasarathy S, Nath A, Ranga U, Krishna SS. Neuropathological correlate of the "concentric target sign" in MRI of HIV-associated cerebral toxoplasmosis. J Magn Reson Imaging. 2013; 18:1-20.
60. Gupta RK, Lufkin RB. MR imaging and spectroscopy of central nervous system infection. Springer Us.2001. ISBN:0306465515

61. Hussain SK, Zhu W, Chang SC, Breen EC, Vendrame E, Magpantay L, et al. Serum Levels of the Chemokine CXCL13, Genetic Variation in CXCL13 and Its Receptor CXCR5, and HIV-Associated Non-Hodgkin B-Cell Lymphoma Risk. Cancer Epidemiol Biomarkers Prev. 2013; 22(2):295-307.
62. Herbert B.Newton,H.Wayne Slone,Eric.C Bourekas.Prymary Central Nervous System Lymphoma. In Handbook of Neuro-Oncology NeuroImaging. Elsevier. 2008; p. 364-374.
63. Halliday T,baxter G. Lymphoma:pictoral review. I.Eur Radiol.2003;13:1145-64.
64. Corti M, Villafane F,Trione N,Schtirbu R.,Yampolsky C, Narbaitz M.Primary central nervous system lynphoma in AIDS. Enferm Infecc Microbiol Clin. 2004; 22(6):332-6.
65. Naqi R,Azeemuddin M,Ashan H. Cerebral toxoplasmosis in a patient with aquired immunodeficiency syndrome .J Pak Med Assoc 2010,60:316-8.
66. Kloska SP, Husstedt IW, Schlegel PM, Anneken K, Evers S,Fischbach R. Magnetic resonance imaging findings of the brain in adult HIV and AIDS patients. Rofo 2008; 180: 21-9.
67. Garg RK, Sinha MK. Multiple ring-enhancing lesions of the brain. J Postgrad Med 2010; 56(4): 307-16.
68. Hua-Chuan Z, Lei Y, Lei C, Yi-Fu G, Yasuo T. Mapping the history and current situation of research on John Cunningham virus- a bibliometric analysis. BMC Infect Dis. 2009 Mar 11.
69. Manohar Aribandi, MBBS, MD Senior Consultant Radiologist, Teleradiology SolutionsAnil Kumar Aribandi, MBBS, MD, MRCP Specialist Registrar, Department of Hematology, Manchester Royal Infirmary, UK Imaging in Progressive Multifocal Leukodystrophy. 2018. Accesed 25th Oct 2019 at: https://emedicine.medscape.com/article/343475-overview.

Cystic echinococcosis in Southeastern European countries, 1998-2017



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Abstract

Introduction: Cystic echinococcosis (CE) is a zoonotic disease with a worldwide distribution caused by the larval stages of cestodes of genus *Echinococcus*. Despite some progress in the control of CE, this disease is still a major public health problem in several countries. In this review we discuss apects of epidemiology of human cystic echinococcosis in Southeast Europe between 1998 and 2017.

Material and methods: We analysed the incidence rates and the number of human cystic echinococcosis cases reported in community-based studies and ECDC. When available, distribution by area of residence, gender and age group, were mentioned.

Results: The results shown a decreasing trend in cystic echinococcosis incidence among the countries from Southeastern Europe. The incidence was higher in residents from rural areas and in adults.

Conclusions: Although the number of cases tend to decrease over the years, cystic echinococcosis remains a public health problem in Southeastern Europe and need more effective control strategies.

Keywords: cystic echinococcosis, epidemiology, Europe, review

INTRODUCTION

Echinococcosis, also called hydatidosis, is a zoonotic disease caused by the larval stages of cestodes of genus *Echinococcus*. Six species and several additional genotypes have been recognized: *Echinococcus granulosus* sensu lato responsible for cystic echinococcosis, *Echinococcus multilocularis* responsible for alveolar echinococcosis, *Echinococcus vogeli* and *Echinococcus oligarthrus* responsible for polycystic echinococcosis, *Echinococcus shiquicus* described in wildlife mammals (Tibetan fox-Vulpes ferrilata, plateau pikas- Ochotona curzoniae, dogs) in the Qinghai- Tibet plateau and *Echinococcus felidis* isolated in African lions (Panthera leo), warthogs and hippopotamus (Hippopotamus amphibious). No infections in humans caused by *E.felidis* and *E. shiquicus* have been described yet [1, 2, 3, 4].

Echinococcus granulosus sensu lato has several genotypes: *E. granulosus sensu stricto* (G1-G3), *E. equines* (G4), *E. ortleppi* (G5), *E. canadensis* (G6–7, G8, G10). The most common genotype is G1 or the sheep strain which is responsible for the majority of human cystic echinococcosis cases around the world (88.44%). It is estimated that from the 2-3 million cases worldwide, human cystic echinococcosis accounts for more than 95% [5].

Cystic echinococcosis (CE) is a parasitic disease with a worldwide distribution. This zoonotic infection represents a serious life-threatening disease and a major public health problem in endemic regions such as Peru, Argentina, Chile, Uruguay, southern Brazil, the Mediterranean region, central Asia, East Africa and western China where the incidence may exceed 50 per 105 people/year [6].

Humans can be infected by accidental ingestion of *E. granulosus* eggs but they do not play a role in the life cycle. Human infection leads to the development of one or more hydatid cysts located most often in the liver and lungs. Less frequently it localizes in the bones, kidneys, spleen, muscles, central nervous system and eyes. The incubation period of the disease is asymptomatic and can last many years until hydatid cysts grow to an extent that triggers clinical signs [7].

Aim and objectives

The aim of the present paper was to review the epidemiology of human cystic echinococcosis in Southeast Europe between 1998 and 2017.

MATERIAL AND METHODS

The online systematic search was conducted in Pubmed database to collect the most recent information regarding human cystic echinococcosis reported cases in Southeast Europe between 1998-2017. The search terms were echinococosis and hydatidosis with the keywords "epidemiology", "review" and each of the Southeastern European countries (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Kosovo, Macedonia, Montenegro, Serbia, Slovenia, Romania and the European part of Turkey). Only reports from these Southeastern European countries were included in the study. We reviewed abstracts and full length articles published only in english and duplicate publications were eliminated. The last online search was performed on 30 march 2019. Data were extracted from the selected papers and were introduced in tables containing study date, source population, incidence, number of cases, predominant gender, area of residence, age group. Gender, area of residence and age were mentioned when available. We analyzed the variations regarding the number of reported cases and incidence rates over the years, comparing past and present situation.

RESULTS

Our search indicated references to 44 articles, however 21 met our study design criteria and were suitable for epidemiological data extraction. This review presents some limitation with regards to missing data: predominantly gender, area of residence and age groups for some countries. No records regarding the number of CE in Montenegro were found.

Data on human cystic echinococcosis were extracted for each of the Southeastern European countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Kosovo, Macedonia, Montenegro, Serbia, Slovenia, Romania and the European part of Turkey.

Error! Reference source not found.Table 1 summarizes the total number of cases reported between 1998-2017, mentioning the predominantly gender, area of residence and age group with the highest incidence, when available. For some countries, epidemiological data were available at regional level. Only Bosnia and Herzegovina, Bulgaria, Serbia and Slovenia provided national-level data.

Females appeared to be more infected than males, except for Bosnia and Herzegovina, Croatia and Greece. The number of CE was higher in patients residing the rural area, except for Bulgaria and Croatia.

The incidence was higher in adults.

Table 1. Number of cases with CE in Southeastern European countries* (1998-2017)

Country	Age group	Study date	Source population	Incidence	Number of cases	Pred. gender	Area of residence	Age group	Author	Ref.
Albania	C+A (1-77)	2005-2011	Regional-Tirana	1.5	333	-	-	6-15 (21.9%)	Pilaca A. *et al.*	[8]
Bosnia and Herzegovina	C (4-18)	2000-2008	Regional-Sarajevo	-	72	M (57%)	-	-	Karavdic K. *et al.*	[9]
		2001-2010	National	0.32-1.06	-	-	-	-	Deplazes P. *et al.*	[10]
		2010-2012	National	-	31	M(64.5%)	-	40-50	Zuko A. *et al.*	[11]
Bulgaria		2003	National	8.14	-	-	-	-	Rainova I. *et al.*	[12]
		2003-2012	National	-	5334	-	-	-	Rainova I. *et al.*	[12]
	C+A (4-84)	2004-2013	Rhodope Region	5.33	334	F(58.4%)	-	-	Muhtarov M. *et al.*	[13]
	C+A (0->65)	2006-2014	Regional-Stara Zagora Region	4.67	140	M	U (64.3%)	>65 (29.6%)	Chakarova B. *et al.*	[14]
		2012	National	4.37	-	-	-	-	Rainova I. *et al.*	[12]
Croatia		2001-2010	National	0.23-0.81	-	-	-	-	Deplazes P. *et al.*	[10]
	C+A	2008-July 2009			21	M(66.6%)	U (61.9%)	35-50 (33.3%)	Tabain I. *et al.*	[15]
Greece		April - May 2009	Regional-Thessaly	-	6	M (66.7%)	R (83.3%)	>65 (83.3%)	Fotiou V. *et al.*	[16]
Kosovo		1999-2001	National	2.7	163	-	R (75%)	-	*Alishani M et al.*	[17]
	A (18- 70)	2009-2013	Regional-Prizren	-	22	F(73%)	R (64%)	26-50 (54.5%)	Avdaj A *et al.*	[18]
Macedonia		2001-2010	National	0.3-1.89	-	-	-	-	Bobic B. *et al.*	[19]
Romania	C+A	2000s	National	7.2	-	-	-		Tamarozzi F. *et al.*	[6]
	C+A	2004-	Regional-	2.4	79	F	-	0-19	Calma C.	[20]

Country	Age group	Study date	Source population	Incidence	Number of cases	Pred. gender	Area of residence	Age group	Author	Ref.
	(5-88)	2010	Arad county					(29.1%)	*et al.*	
	C+A	2004-2010	Regional-Timis county	3.8	182	F(62.1%)	R	50-59 (21.4%)	Calma C. *et al.*	[21]
	C+A (0-88)	2004-2010	Regional-Western Romania	-	451	F(68.8%)	R (63.7%)	50-59 (17.9%)	Vlad DC *et al.*	[22]
		2007-2017	Regional-Timis county	-	228	F(54.4%)	R (59.6%)	50-59 (21.7%)	Lupu MA. *et al.*	[23]
	C(1-18)	2008-2012	Regional-North-Eastern Romania	-	194	M(55%)	R(79%)	11-14 (33%)	Cobzaru RG. *et al.*	[24]
Serbia		1998-2010	National	0.38–0.63	409	F(68%)	R	>60	Bobic B. *et al.*	[19]
	A (19-75)	2000-2006	Belgrade	-	20	F(55%)	R(60%)	-	Ćulafić DM *et al.*	[25]
	C+A (7-67)	april 2014-may 2015	Belgrade	-	38	F(60.5%)	U (65.8%)	-	Calovski C. *et al.*	[26]
Slovenia	A (24-86)	2002-2006	National	1.7	34	F=M	-	-	Logar J. *et al.*	[27]
		2006-2015	National	0.28	-	-	-	-	Šoba B. *et al.*	[28]
Turkey	A+ C (4-91)	2006-2015	Edirne	-	366	F(59.3%)	-	-	Sakru N. *et al.*	[29]

*A: adult; C: children;

*Southeastern countries according to WIKIPEDIA- The free encyclopedia [23]

* Montenegro was excluded because the studies regarding CE didn't provide informations about the incidence rates

According to the data presented in the *ECDC's "Surveillance Atlas of Infectious Diseases"*, between 2007-2017, 4359 cases of human echinococcosis were reported from Bulgaria, Croatia, Greece, Romania and Slovenia (Table 2). Croatia began reporting the CE cases only from 2015. Bulgaria ranked first among them with 79.5% (3468/4359) of the cases, followed by Romania (13.6%, 595/4359), but the number of reported cases tended to decrease in time for both countries. The incidence was higher in females (except for Romania) and tend to increase with age.

Table 2. Distribution of echinococcosis cases in the Southeastern European countries according to ECDC, 2007-2017

		Bulgaria	Croatia	Greece	Romania	Slovenia	Total cases/year
2007	**No. cases**	461	-	10	99	1	**571**
	Pred. gender	-	-	F (60%)	M (63.6%)	F(100%)	
	Pred. age group			65+(55.6%)	-	45-64(100%)	
2008	**No. cases**	386	-	28	119	7	**540**
	Pred. gender	-	-	M (60.7%)	-	F (71.4%)	
	Pred. age group			65+(39.3%)	-	45-64(71.4%)	
2009	**No. cases**	323	-	22	42	9	**396**
	Pred. gender	-	-	M (59.1%)	M (61.9%)	F (66.7%)	
	Pred. age group			45-64(54.6%)	25-44(30.9%)	45-64(66.7%)	
2010	**No. cases**	291	-	11	55	8	**365**
	Pred. gender	-	-	M (54.5%)	F (58.2%)	F=M 50%	
	Pred. age group			65+(40%)	25-44(36.4%)	25-44(37.5%)	
2011	**No. cases**	307	-	17	53	8	**385**
	Pred. gender	-	-	F (52.9%)	M(56.6%)	F=M 50%	
	Pred. age group			25-44(35.3%)	45-64(39.6%)	25-44(50%)	
2012	**No. cases**	320	-	21	96	6	**443**
	Pred. gender	-	-	F (52.4%)	M (58.3%)	F=M 50%	

		Bulgaria	Croatia	Greece	Romania	Slovenia	Total cases/year
	Pred. age interval			45-64(44.4%)	25-44(29.2%) 45-64(29.2%)	25-44(66.7%)	
2013	**No. cases**	278	-	10	55	6	**349**
	Pred. gender	-		M (60%)	M (56.4%)	F (83.3%)	
	Pred. age group	-	-	45-64(44.4%)	45-64(38.2%)	25-44(33.3%) 65+(33.3%)	
2014	**No. cases**	302	20	13	31	5	**371**
	Pred. gender	F (53.3%)	F (65%)	M (61.5%)	F (64.5%)	F (80%)	
	Pred. age group	25-44(32.1%)	45-64(45%)	25-44(50%)	45-64(32.2%) 65+(32.2%)	65+(60%)	
2015	**No. cases**	313	7	13	18	7	**358**
	Pred. gender	F (53%)	F (57,1%)	F (69.2%)	M (55.6%)	M (71.4%)	
	Pred. age group	25-44(31%)	45-64(57.1%)	65+(61.5%)	45-64(33.3%)	25-44(42.9%) 45-64(42.9%)	
2016	**No. cases**	269	9	18	13	3	**312**
	Pred. gender	F (55.8%)	F(55.6%)	M (72.2%)	M (53.8%)	M (66.7%)	
	Pred. age group	25-44(32.7%)	45-64(55.6%)	45-64(33.3%)	15-24(30.8%) 25-44(30.8%) 65+(30.8%)	45-64(66.7%)	
2017	**No. cases**	218	15	15	14	7	**269**
	Pred. gender	M (52.3%)	F (60%)	F (66.7%)	F (71.4%)	F (71.4%)	
	Pred. age group	25-44(32.6%)	45-64(40%)	65+(40%)	45-64(42.9%)	25-44(28.6%) 45-64(28.6%) 65+(28.6%)	
Total cases/ country		**3468**	**51**	**178**	**595**	**67**	**4359**

*No.= number; Pred. = predominant;
*Table adapted according to ECDC's " Surveillance Atlas of Infectious Diseases"

DISCUSSIONS

Most of the community-based studies analysed the epidemiological characteristics at regional-level. Only Bosnia and Herzegovina, Bulgaria, Serbia and Slovenia provided national-level studies[11,12,19,27].

During the period of 2007-2017, 4359 cases of echinococcosis from five Southeastern European countries were reported to ECDC (Bulgaria, Croatia, Greece, Romania and Slovenia). Bulgaria ranked first among them with 79.5% (3468/4359) of the cases, followed by Romania (13.6%, 595/4359). However, a decrease in the number of reported cases was observed during that period in both Bulgaria and Romania. This may be explained by periodic deworming of dogs, improved hygiene and public education campaigns [7,30].

The higher incidence in residents from rural area may be related to many habits. Farming activities are posing a significant risk of infection to humans through direct contact with the contaminated soil. The presence of stray dogs and the soil contaminated with dog faeces are a common occurrance. Furthermore, low level of education, poor medical assistance and poor economic condition can maintain a high infection rate [15,18,27].

Regarding the distribution by gender, females were more affected by CE in almost every country. In Greece and Bosnia and Herzegovina the number of cases in males was higher [9,11,16] A higher frequence in females due to their lifestyle habits was also reported by Rao SS *et al* [31]. Other studies showed a higher seroprevalence in males, explained by their involvement in farming and herding livestock [32].

ECDC reported echinococcosis more frecquently in adults. From 2014 to 2017 in Bulgaria, people between 25-44 years were the most affected. During the same period of time, in Croatia, the most affected age group was 45-64. In the last 7 years, Romania encountered more cases in people over 45 years old. An exception was in 2016 when three age groups

were equally affected (15-24, 25-44 and 65+) [30]. There are contrasting reports, based on the hospital studies, regarding the most affected age interval. While Fomda BA et al. and Hanilou A. et al. reported a higher number of seropositive subjects in younger population, other studies revealed an increased seropositivity in elderly population [32,33,34]. A higher prevalence in children may be associated with the exposure to the contaminated environment, suggesting an ongoing transmission of the disease. On the other hand, increased prevalence in elderly population may signify the reduction in the burden of disease, due to implemented control measures [32].

According to the community-based studies we observed that between 2008 and 2012 the number of cases diagnosed and treated in clinical hospitals (1806 cases) in Bulgaria was higher than the one declared to ECDC (1627 cases) [12, 30].

As stated by Pilaca A. et al., from 2005 to 2011 Albania registered 333 cases of echinococcosis, with an annual incidence of 1.5 cases/ 10^5 inhabitants [8]. According to Bobic B. et al., in 2010 the incidence rate reached 5.27 cases/ 10^5 inhabitants [19].

In Serbia, the Institute of Public Health registered 409 cases of echinococcosis between 1998 and 2010. During the same period, 820 patients with echinococcosis were reported in the clinical studies published [19].

Official reports from the Turkish Ministry of Health reported more than 52,000 patients who underwent CE-related surgery between 1990 and 2005. The incidence rate of CE in Turkey was estimated at 0.8-2.0/10^5 inhabitants. However, no information about the incidence rate in the European part of Turkey was found [29].

From 1998 to 2017 in Southeastern Europe the lowest incidence rate was registered during 2001-2010 in Croatia (0.23/ 10^5 inhabitants) and the highest rate registered was in 2013 in Bulgaria (8.14/10^5 inhabitants). Over the 19 year period Bulgaria, Greece and Slovenia registered a decline in incidence rate. In contrast, the incidence rate of CE in Serbia increased from 0.38–0.63/ 10^5 inhabitants (1989-2010) to 3.2/10^5 inhabitants in 2013 [12,27,28].

Human hydatid disease is difficult to diagnose because it remains asymptomatic long time after the infection. Only when the cyst has large dimensions or when complications occur the patient may become symptomatic [35].

The burden of CE is difficult to be quantified in Southeastern European countries because of the inaccurate official records. Only five out of 12 countries report each year the number of CE cases to European Surveillance Atlas of Infectious Diseases [30].

CONCLUSIONS

Human cystic echinococcosis, a neglected zoonosis, is still present among the population from Southeastern Europe. Even though there are poor official reporting data and insufficient published literature, this paper point out the ongoing transmission of the disease and underline that human cystic echinococcosis continues to be a public health problem. Eforts still need to be done to increase the public awarness about CE and monitor the number of infected poeple. Implementation of effective prevention and control measures and proper education will reduce the burden of CE.

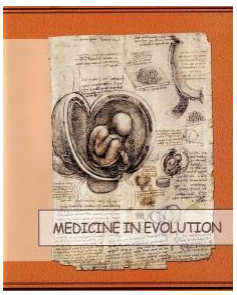
REFERENCES

1. Xiao N, Qiu J, Nakao M, et al. Echinococcus shiquicus n. sp., a taeniid cestode from Tibetan fox and plateau pika in China. Int J Parasitol. 2005; 35:693–701.
2. Boufana B, Qiu J, Chen X, et al. First report of Echinococcus shiquicus in dogs from eastern Qinghai–Tibet plateau region, China. Acta Tropica. 2013; 127: 21-24.

3. Hüttner M, Romig T. Echinococcus species in African wildlife. Parasitology. 2009; 136(10): 1089-1095.
4. Halajian A, Luus-Powell WJ, Roux F,et al. Echinococcus felidis in hippopotamus, South Africa. Veterinary Parasitology, 2017; 243: 24-28.
5. Alvarez Rojas CA, Romig T, Lightowlers MW. Echinococcus granulosus sensu lato genotypes infecting humans--review of current knowledge. International Journal of Parasitology. 2014; 44(1): 9-18.
6. Tamarozzi F., Akhan O., Cretu C.M. et al. Prevalence of abdominal cystic echinococcosis in rural Bulgaria,Romania, and Turkey: a cross-sectional, ultrasound-based, population study from the HERACLES project. Lancet Infect Dis. 2018; 18: 769 - 778.
7. World Health Organization. https://www.who.int/news-room/fact-sheets/detail/echinococcosis. [World Health Organization , Accessed 28 March 2019]
8. Arben Pilaca, Gentian Vyshka, Arben Pepa, et al A Neglected Zoonosis in Albania: why Echinococcosis is Becoming a Surgeon's Exclusivity?. Mediterr J Hematol Infect Dis. 2014; 6(1): e2014013.
9. Karavdic K, Guska S. Surgical treatement of pulmonary hydatid disease in children--a retrospective study. Med Arh. 2011; 65(1):16-19.
10. Deplazes P, Rinaldi L, Alvarez Rojas CA, et al. Global Distribution of Alveolar and Cystic Echinococcosis. Adv Parasitol. 2017; 95: 315-493.
11. Zuko A, Obradović Z. Cystic echinococcosis in Bosnia and Herzegovina – an overview. The ESCCAP Echinococcus 2014.
12. Rainova I, Marinova I, Harizanov R, et al. PARASITIC DISEASES IN BULGARIA IN 2012. Problems of Infectious and Parasitic Diseases. 2014; 42 (1): 29-38.
13. Muhtarov M, Rainova I, Tamarozzi F. Treatment of Hepatic Cystic Echinococcosis in Patients from the Southeastern Rhodope Region of Bulgaria in 2004–2013: Comparison of Current Practices with Expert Recommendations. Am. J. Trop. Med. Hyg., 94(4), 2016, pp. 900–905
14. Chakarova B, Kichukova K, Rasheva G, et al. A Short Overview of the Cystic Echinococcosis among People in Bulgaria and Stara Zagora Region during the Period 2006-2014. Trakia Journal of Sciences. 2015; 13(2): 151-154.
15. Tabain I., Sviben M., Ljubin-Sternak S., Vilibic-Cavlek T., Mlinaric-Galinovic G. Seroprevalence of Echinococcus granulosus infection in Croatian patients with cystic liver disease. Journal of Helminthology (2011) 85, 192–195.
16. Fotiou V, Malissiova E, Minas A, et al. Seroprevalence of IgG Antibodies against Echinococcus granulosus in the Population of the Region of Thessaly, Central Greece. PLoS ONE. 2012; 7(5): e37112.
17. Alishani M., Sherifi K., Rexhepi A. , Hamidi A., Armua-Fernandez M. T., Grimm F. , Hegglin D., Deplazes P. The impact of socio-cultural factors on transmission of Taenia spp. and Echinococcus granulosus in Kosovo. Parasitology. 2017 Nov;144(13):1736-1742.
18. Avdaj A, Namani S. Surgical treatment of hepatic echinococcosis in Prizren (Kosovo). Annals of Medicine and Surgery. 2014; 3(4):130-133.
19. Bobić B, Nikolić A, Radivojević SK, et al. Echinococcosis in Serbia: an issue for the 21st century?. Foodborne Pathog Dis. 2012; 9(11): 967-73.
20. Calma CL, Neghina AM, Moldovan R, et al. Cystic echinococcosis in Arad County, Romania. Vector Borne Zoonotic Dis. 2012; 12(4): 333-5.
21. Calma C.L., Neghina A.M., Vlaicu B., Neghina R. Cystic echinococcosis in the human population of a western Romanian county, 2004–2010. Clinical Microbiology and Infection, November 2011, Volume 17 Number 11,
22. Vlad DC, Neghina AM, Dumitrascu V, et al. Cystic echinococcosis in children and adults: a seven-year comparative study in western Romania. Foodborne Pathog Dis. 2013, Vol. 10(2), pg. 189-95.
23. Lupu MA, Dragomir A, Paduraru AA, et al. Cystic echinococcosis in adult hospitalized patients: A 10-year retrospective study in Western Romania. International Journal of Infectious Diseases. 2018; 73: 299–300.
24. Cobzaru R. et al. Epidemiological aspects of hydatidosis in children, in some areas of northeastern Romania, Rev. Med. Chir. Soc. Med. Nat., Iaşi, 2013, vol. 117, no. 3

25. Ćulafić DM, Kerkez MD, Mijač DD, et al. (2010) Spleen Cystic Echinococcosis: Clinical Manifestations and Treatment, Scandinavian Journal of Gastroenterology, 45:2, 186-190.
26. Calovski CI, Barac A, Golubovic Z. et al. Case-series study of hepatic echinococcal cysts in Serbia: viability of scolices, seropositivity and epidemiological characteristics, J Helminthol. 2018 Mar;92(2):161-167.
27. Logar J, Soba B, Kotar T. Serological evidence for human cystic echinococcosis in Slovenia. BMC Infectious Diseases. 2008; 8:63
28. Šoba B, Gašperšič S, Keše D. Molecular characterisation of Echinococcus granulosus sensu lato causing human cystic echinococcosis in Slovenia. . Madrid 28th ECCMID. 2018.
29. Sakru N, Kuyucuklu G, Eryıldız C. Evaluation of cystic echinococcosis suspected cases in Edirne Turkey between 2006 and 2015. International Journal of Infetious Diseases. 2016; 53: 91
30. European Centre for Disease Prevention and Control. [Interactiv] [Citat: 16 September 2018.] https://ecdc.europa.eu/en/echinococcosis/surveillance-and-disease-data/disease-data-atlas.
31. Rao SS, Mehra B, Narang R. The spectrum of hydatid disease in rural central India: An 11-year experience. Ann Trop Med Public Health, 2012;5:225-30.
32. Fomda BA, Khan A, Thokar MA, et al. (2015) Sero-Epidemiological Survey of Human Cystic Echinococcosis in Kashmir, North India. PLoS ONE 10(4): e0124813.
33. Hanilou A., Badali H., Esmaeilzadeh A.R. Seroepidemiological study of hydatidosis in Zanjan (Islam-Abad 2002), JOURNAL OF ZANJAN UNIVERSITY OF MEDICAL SCIENCES AND HEALTH SERVICES ,2004 , Volume 12 , Number 46; Page(s) 41-46.
34. Fotiou V., Malissiova E., Minas A., et al. Seroprevalence of IgG Antibodies against Echinococcus granulosus in the Population of the Region of Thessaly, Central Greece. PLoS ONE, 2012, 7(5), e37112.
35. Human Echinococcosis: A Neglected Disease? Philip S. Craig, Christine M. Budke, Peter M. Schantz et al., Tropical Medicine and Health, 2007, Vol. 35, pg. 283-292.

Particular Aspects of Synchronous and Metachronous Head and Neck Cancers - a Rapid Review



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Abstract

Introduction: Cancer represents the second most common cause of world-wide mortality after cardiovascular disease. The incidence of both synchronous and metachronous tumors has grown exponentially, although life expectancy and treatment options have improved. Synchronous tumors are defined as those occurring within the first six months or simultaneously with the primary cancer. Metachronous tumors represent those which occur more than six months later, or after completing the treatment for the initial cancer.

A common issue for these tumors arises due to resistance to the subsequent treatment. The reoccurring tumor may be radio-resistant, while the initial tumor may subside after radiotherapy.

Objectives: Through this presentation we wanted to bring to the attention the etiology, methods of diagnosis, evaluation, prevention and treatment in synchrounus and metachronus tumors in patients with cancer of the head and neck.

Material and methods: Based on literature data and specialized studies.

Conclusion: The number of patients with cancer in the ENT area associated with other synchronous or metachronous tumors has been increasing lately. The poor prognosis and the lack of a well-established algorithm in the treatment of these patients is the main reason why they need high quality care and should be given great importance and responsibility for research in this field.

Keywords: synchrounus tumors, metachronus tumors, head and neck neoplasm

INTRODUCTION

Head and neck cancers constitute the sixth most common type of cancer worldwide; the squamous cell carcinoma (SCC) represents the majority [1]

Malignant tumors with double or multiple localization represent the simultaneous coexistence of two or more tumors in the same pacient. They may be found in the same area or on an entirely different organ.[2]

The SEER Program Coding and Stating Manual defines the primary tumor as the index tumor. Synchronous tumors are defined as tumors appearing within the first six months after the initial diagnosis. The metachronous tumors occur later than six months after the primary tumor diagnosis. These tumors are histologically distinct from the index tumor.[3]

Because the incidence of head and neck cancer malignancies is increasing, an effective screening program to detect the synchronous or metachronous tumors is necessary. A study demonstrated that the survival rate was significantly influenced by the localization of the secondary malignancy.[4]

The prevalence of second primary tumors in some panendoscopy studies have shown of synchronous primary tumors range from 1.4% to 17% while the prevalence in cadaver dissection studies ranges between 3.7% and 15.5% [5]

It is well-known that Smoking and drinking alcohol are risk factors for the development of these cancers.[6]

The extended areas of oral and oropharyngeal mucosa are exposed to their carcinogenic effect. Slaugher et al. described the phenomenon of "field cancerization" that explains the possible development of multifocal primary cancers in this case. [7]

Aim and objectives

Through this presentation we wanted to bring to the attention the etiology, methods of diagnosis, evaluation, prevention and treatment in synchrounus and metachronus tumors.

MATERIAL AND METHODS

Material and methods are based on literature data and specialized studies

Epidemiology

According to the World Health Organization, squamocellular carcinoma of the ENT area (oral cavity, oropharynx, rhinopharynx, hypopharynx, larynx, nasal cavity and paranasal sinuses) accounts for 6% of the total number of new cancers occurring annually. [8]

Squamocellular carcinoma is the most common type of cancer in the field of ENT, especially found in adult men with chronic smoking and alcoholism according to the World Health Organization. A study shows that the appearition of the second primary tumor depends on the excessive consumption level of alcohol and smoking more than 20 cigarettes per day.[9] A study in terms of age, it is more common in the sixth and seventh decade , more often in patients that live in urban areas rather than in rural areas. [8] [9]

According to the World Health Organization, the median prevalence for synchronous secondary primary tumor in the upper airway tract is 9%. The annual risk for these tumors is constant and can vary between 1.5% and 5.1% in patients with squamocellular carcinoma in the ENT area. [8]

Etiology

The etiology of squamocellular carcinoma in the ENT area is varied. We encounter the following factors: alcohol consumption and smoking, occupational factors such as exposure to asbestos, polycyclic aromatic hydrocarbons, metal dust or cement, Human papillomavirus

(HPV) infection, especially subtype 16, and environmental factors such as diet: deficiency in proteins and vitamins. Gastroesophageal reflux can act as a promoter in association with alcohol and tobacco consumption. [8] [9]

Several studies have shown both similarities and discrepancies in the genetic profile of the index and secondary primary tumors. Concordant genetic profiles of the primary tumor and adjacent mucosa support the concept of cancerous mucosal field as a phenomenon of clonal expansion in the vicinity of the index tumor. [8]

Primary secondary tumor may occur either by spreading of the premalignant cells in the adjacent mucosa or without genetic linkage. Moreover, there seems to be an individual relationship between the distance from the index tumor to the secondary primary tumor, the time interval from the appearance of the first tumor to the appearance of the second tumor and the genetic clonality. [8]

The probability of development of the primary secondary tumor is influenced by the location of the index tumor. For primary tumors in the ENT area, the most common place for primary secondary tumor development is within the upper airway tract, usually an oral secondary primary tumor is associated with an intraoral index tumor. The risk of developing a primary secondary tumor is higher in patients with supraglottic tumors than in those with glottic tumors. Patients with glotic cancer have a higher risk of developing primary secondary tumor in the respiratory organs such as the lungs, while patients with supraglotic cancer are more likely to develop primary secondary tumors in the upper aerodigestive organs. Environmental factors that have a promotional role must also be taken into account. [8]

Exposure to radiation has a carcinogenic effect, however it could have a protective effect in the development of secondary primary tumors. For patients with index laryngeal tumors, the period until the appearance of the primary secondary tumor in the irradiated area was significantly longer than in the non-irradiated patients, which suggests that radiotherapy may delay the development of the secondary primary tumor. In patients with laryngeal neoplasm (primary tumor) first treated with radiotherapy, the incidence of primary laryngeal secondary tumor was low 4.3%, compared with patients with laryngeal primary index tumor and treated with primary surgical intent, the incidence of primary secondary tumor was 9%. [8]

Diagnostic

Diagnosis of secondary malignancies can often be a challenge for the clinician. It cannot certify the diagnosis of metastasis, relapse or new cancer. The diagnosis of certainty of the synchronous or metachronous tumor will be confirmed or denied only by histopathological examination by comparison with the primary tumor (index). [10]

According to the concept of "field cancerization" multiple, unrelated, precancerous lesions may exist adjacent to the index tumor mass and it can have the potential to develop a second primary tumor. To obtain clear surgical margins at histology, you need to identify the precancerous lesions and to remove with the main tumor mass during the first surgical treatment. It is essential because the presence of dysplasia or carcinoma following resection of head and neck cancers has been shown to be associated with a higher incidence of local recurrence. [11][12]

In a study that looked at the role of panendoscopy in highlighting primary secondary tumors performed at a hospital in Zurich on 358 patients, it revealed that only 16.2% of the total number of patients had a secondary primary tumor. Of these, 6.4% had synchronous tumors, of which only half were diagnosed by panendoscopy.[13]

According to the more recent National Comprehensive Cancer Network (NCCN) guidelines for advanced stages (III and IV) of oral, oropharyngeal, hypopharyngeal, glottic and supraglottic tumors, as well as for nasopharyngeal carcinoma and mucosal melanoma ;

PET/CT imaging is suggested. The essential adjunctive investigation remains the panendoscopy with a biopsy..[14]

NBI(Narrow-band imaging), a new technique, is a very useful tool during the pre-operative evaluation of patients with oral and oropharyngeal scuamocelular cancer. Using NBI enabled us to identify a synchronous lesion in three of the patients examined.[15]

The worst part of it is that the wavelengths of NBI can only help to improve the definition of superficial margins because it can only penetrate the superficial layers of mucosa and submucosa. [1]

A study made by SFORL shows that Patients with an initial tumor location in the ENT area show a cumulative rate of metachronous second head and neck cancer of 56% with in 15 years, on a linear curve not diminishing over time. The oral cavity and oropharynx are the most frequent sites where second locations are.[16][17]

The serum tumor markers have a poor sensitivity when it comes to the diagnosos and follo-up pf head and neck cancer. [17][18]

Treatment

Surgery, radiation and chemotherapy in different combinations are used in HNSCC management, depending on the TNM stage and primary location. Limited or early stage disease (stage I and II) is the stage present in about 40% of patients and is usually treated only with surgery or radiation. For most patients with advanced local disease (stage III and IVA / B), treatable resectable or nonresectable cancer involves platinum-based chemoradiation, with or without induction chemotherapy (IC) as sequential therapy. Metastatic disease is treated with combination chemotherapy for patients with good performance and chemotherapy with a single agent or the best supportive care for patients with poor performance. The treatment of local or regional recurrence depends on the place of recurrence, tumor burden and previous therapy and may range from salvage surgery to radiation or re-irradiation with chemotherapy or chemotherapy alone if the disease cannot be cured with surgery or radiation. All of these treatments are associated with toxicity leading to a certain degree of late organ dysfunction, which can be substantial if a surgical or non-surgical approach is taken. [19]

For the treatment of locally advanced disease, radiotherapy (RT) is used as an adjunct to surgery or concomitantly with chemotherapy. The radiation dose for HNSCC varies from 60 Gy to 70 Gy, depending on the time of treatment and the initial treatment. The radiation oncology group (RTOG) studied radiation regimens with cisplatin concomitantly and found no difference in local or regional control, overall survival and late effects. The risk of long-term radiation toxicity increases with doses exceeding 55 Gy in the salivary glands, pharyngeal and thyroid gland muscles, leading to xerostomia, dysphagia, gastrostome dependence, chronic aspiration and hypothyroidism. Recent advances with intensity-modulated radiotherapy (IMRT) have allowed the application of different doses to the salivary gland. Not affecting the salivary glands is the major benefit of IMRT for improving the quality of life by reducing xerostomia. However, radiation dose control in the pharyngeal constrictor muscles is difficult to achieve in the treatment of oropharyngeal cancers, thus the adverse effects of this level of aspiration, dysphagia, and gastrostome dependence appear. Dose intensification strategies in patients with low recurrence risk are being applied, and IMRT administration systems may be able to reduce these late effects. [19]

In patients in which the above treatments cannot be performed, palliative and supportive therapy is indicated. [20]

CONCLUSIONS

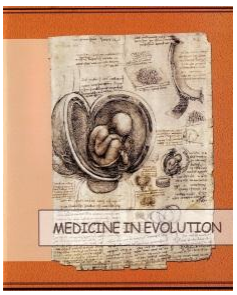
The number of patients with cancer in the ENT area associated with other synchronous or metachronous tumors has been increasing lately. The poor prognosis and the lack of a well-established algorithm in the treatment of these patients is the main reason why they need high quality care and should be given great importance and responsibility for research in this field.

REFERENCES

1. Tirelli Giancarlo, Piovesana Marco, Gatto Annalisa, Torelli Lucio, Di Lenarda Roberto, Nata Francesca Boscolo, NBI utility in the preoperative and intra-operative assessment of oral cavity and oropharyngeal carcinoma, American Journal of Otolaryngology–Head and Neck Medicine and Surgery (2016), doi: 10.1016/j.amjoto.2016.09.020
2. Las Heras Alonso M M, Gelabert A. Independent multiple primary tumors and second primary neoplasm. Relationship between smoking. Actas Urol Esp. 2010, 34(6):516-521
3. Spizziri A, Coccetta M, Cirochi R et al. Syncronous colorectal neoplasis: our experience about laparoscopic team combined treatment. World Journal of Surgical Oncology. 2010, 8:105
4. Schwartz LH, Ozsahin M, Zhang GN et al, Synchronous and metachronous head and neck carcinomas, Cancer. 1994 Oct 1;74(7):1933-8.
5. Strobel K, Haerle SK, Stoeckli SJ, Schrank M, Soyka JD, Veit-Haibach P, et al. Head and neck squamous cell carcinoma (HNSCC) - detection of synchronous primaries with (18)F-FDG-PET/CT. Eur J Nucl Med Mol Imaging 2009;36(6):919-27.
6. McCullough MJ, Prasad G, Farah CS. Oral mucosal malignancy and potentially malignant lesions: an update on the epidemiology, risk factors, diagnosis and management. Aust Dent J 2010;55 Suppl 1:61-5
7. Slaughter DP, Southwick HW, Smejkal W. Field cancerization in oral stratified squamous epithelium: clinical implications of multicentric origin. Cancer 1953;6:963-8.
8. Barnes L. Evenson J. W. Reichart P. Sidransky D. WHO Classification of Tumours, Vol 9, 2005
9. Choy ATK, van Hasselt CA, Chisholm EM, et al. Multiple primary cancers in Hong Kong Chinese patients with squamous cell cancer of the head or neck. Cancer 1992;70:815-20
10. Johnson C.H. SEER Program Coding and Staging manual 2004, Revision 1. National Cancer Institute, NHI Publication number 04-5581, Bethesda, MD 2004
11. Slaughter DP, Southwick HW, Smejkal W. Field cancerization in oral stratified squamous epithelium: clinical implications of multicentric origin. Cancer 1953;6:963-8
12. Weijers M, Snow GB, Bezemer PD, van der Wal JE, van der Waal I. The clinical relevance of epithelial dysplasia in the surgical margins of tongue and floor of mouth squamous cell carcinoma. J Oral Path Med 2002;31(1):11-5.
13. Atkins Jr JP, Keane WM, Young KA, et al. Value of panendoscopy in determination of second primary cancer. A study of 451 cases of head and neck cancer. Arch Otolaryngol 1984;110:533–4
14. Mani M, George MM, Nash L, Anwar B, Homer JJ. Role of 18-Fludeoxyglucose positron emission tomography-computed tomography and subsequent panendoscopy in head and neck squamous cell carcinoma of unknown primary. Laryngoscope 2015 Dec 16. doi: 10.1002/lary.25783
15. Stoeckli SJ, Zimmermann R, Schmid S. Role of routine panendoscopy in cancer of the upper aerodigestive tract. Otolaryngol Head Neck Surg 2001;124:208-12, 33 Rodriguez-Bruno K, Ali J, Wang SJ. Role of panendoscopy to identify synchronous second primary malignancies in patients with oral cavity and oropharyngeal squamous cell carcinoma. Head Neck 2011;33(7):949-53
16. Di Martino E, et al. Survival in second primary malignancies of patients with head and neck cancer. J Laryngol Otol 2002;116(10):831–8
17. C. Halimi, B. Barrya, D. De Raucourt et al, Guidelines of the French Society of Otorhinolaryngology (SFORL), short version. Diagnosis of local recurrence and metachronous locations in head and neck oncology, European Annals of Otorhinolaryngology, Head and Neck diseases 132 (2015) 287–290

18. Abgral R, et al. Does 18F-FDG PET/CT improve the detection of posttreatment recurrence of head and neck squamous cell carcinoma in patients negative for disease on clinical follow-up? J Nucl Med 2009;50(1):24–9
19. Shanthi Marur, Arlene A. Forastiere, Head and Neck Squamous Cell Carcinoma: Update on Epidemiology, Diagnosis, and Treatment, Mayo Clin Proc. 2016;91(3):386-396
20. Primo_z Strojan, MD, PhD, June Corry, MD, Avraham Eisbruch, MD, Recurrent and second primary, Clinical review, 2014

Factors influencing placebo reactivity



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Abstract

This article provides a synthesis of current knowledge on Placebo factors and try to identify his role in therapeutic intervention. This article will acquaint the general practitioner with factors influencing placebo reactivity. We emphasize the importance of understanding Placebo effect because this is capable of relieving pain.

In the last years there has been growing interest in ascertaining factors associated with and potentiating placebo effects in pharmacological research and scientific investigation has accelerated in the past decade, with particular attention to its neurobiological mechanisms. Regarding the effects of placebos in management of orofacial pain and Myofascial Pain Syndrome (MPD) syndrome have been demonstrated.

The purpose of this paper is to discuss how doctors and other health professionals may benefit from placebo effects and why it is important to use the placebo effect to improve patient care.

Keywords: Placebo, mechanism, expectation.

INTRODUCTION

The Placebo effect has been a phenomenon of significant interest and debate in medicine.

Historically, in 1955, the Journal of the American Medical Association published a famous article, signed by Dr.Henry Beecher, titled "The Powerful Placebo." Dr. Beecher told him that if you administer drugs to people, many of them feel better, but if you administer salt water or another inert ingredient, about a third of them heals themselves, not just in their minds, but even physiologically, in a manner that can be clinically proved [1]. Beecher was the first scientist to quantify the placebo effect. He claimed that in 15 trials with different diseases, 35% of 1082 patients were satisfactorily relieved by a placebo alone.

Definition

Any therapy (or component of therapy) deliberately used for nonspecific psychological or psychophysiological effect and without specific activity for the condition being treated. [2]

In general, placebos are thought to be interventions which do not contain components that will improve the condition being treated. Inert interventions such as 'sugar pills' or saline injections are often designated "pure" placebos, whereas therapies that contain active components, but are considered ineffective for the condition being treated, are called "impure" placebos (for example, antibiotics in viral infections).[3]

So, in the narrowest sense, a placebo is a biomedically inert substance given by a healthcare practitioner to please a patient.[4,5]

The way in which patients perceive environmental factors contributes to the magnitude, duration and quality of the placebo response.

Factors influencing placebo reactivity

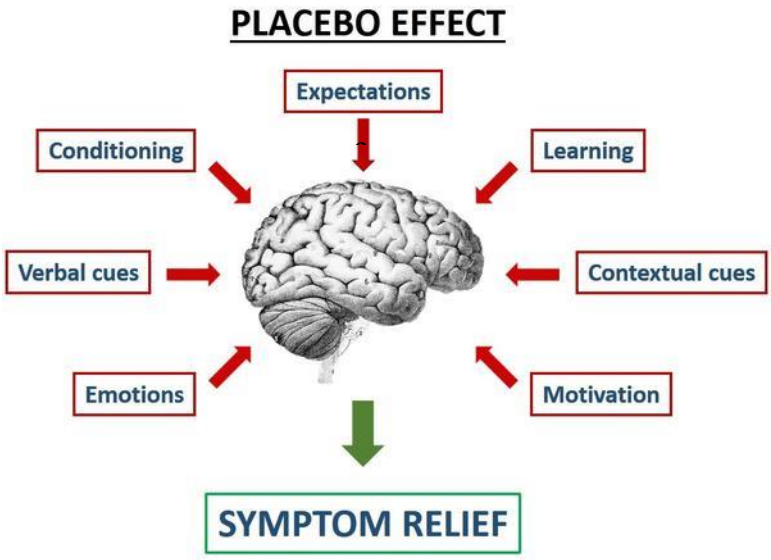


Figure 1. Placebo Effect

The placebo effect is a multi-determined phenomenon. We emphasize only some of them:

I.The actual or assumed power of treatment

II. Factors related to the physician

III. Social support

I. The actual or assumed power of treatment

The actual or assumed power of the treatment is closely interdependent with the patient's expectations. It is well known that psychological phenomena like expectancy and classical conditioning can have physiological effects.

Although expectancy seems to be an important psychological mediator of placebo effects, it doesn't operate alone. Desire, which is the experiential dimension of wanting something to happen or wanting to avoid something happening, is also likely to be involved in placebo effect.[6]

Verne et al. (2003) and Vase et al. (2003) conducted two similar studies. Patients with irritable bowel syndrome (IBS) were exposed to rectal distention by means of a barostat ballon, a type of visceral stimulation that simulates their clinical pain, and tested under the conditions of untreated natural history (baseline), rectal placebo, and rectal lidocaine. Pain was rated immediately after each stimulus within each condition. The first study was conducted as a double-blind crossover clinical trial in which patients were given an informed consent form that stated they "*may receive an active pain reducing medication or an inert placebo agent*" (Verne et al. 2003). In this study, there was a significant pain-relieving effect of rectal lidocaine as compared with rectal placebo ($p < 0.001$), and there was a significant pain-relieving effect of rectal placebo (pain in placebo < natural history). In a second similarly designed study, patients were told, "***The agent you have just been given is known to significantly reduce pain in some patients***" at the onset of each treatment condition (rectal placebo, rectal lidocaine).[7]

A much larger placebo analgesic effect (Cohen's $d = 2.0$) was found in the second study, and it did not significantly differ from that of rectal lidocaine. These two studies show that adding an overt suggestion for pain relief can increase placebo analgesia to a magnitude that matches that of an active agent.[8]

In another study, Benedetti et al looked at the influence of expectation in 6 patients with severe Parkinson's disease who had been implanted with stimulating electrodes. When the electrodes were turned on, these patients underwent a dramatic improvement in their ability to move. When the electrodes were turned off, they once again froze up. But after several weeks of stimulator treatment, simply the thought that the stimulator was on or off had almost as much impact on movement as the stimulation itself. When the patients were told that the stimulator had been turned off, their motor velocity decreased even though, in fact, the stimulator had remained on. When patients with asthma inhaled an innocuous substance that they were told was an allergen, their airways constricted; when they inhaled an innocuous substance that they were told was a bronchodilator, they began to breathe more easily. [9]

II. Factors related to the patient/physician

A continuum of placebos has been suggested, ranging from tangible items such as pills, injections, white coats and procedures, to intangible features of healthcare delivery like touch, gesture, ambience and support.[10,11]

There are several factors which we can put together:

1. patient characteristics
2. physician characteristics
3. patient– physician interaction
4. treatment and treatment setting

1. Patient characteristics

Patients are likely to perceive environmental factors in different ways, and these differences are likely to contribute to the magnitude, duration, type of placebo responses.

Empirical studies which have sought to explain observed placebo effects entirely on the basis of patient characteristics have generally failed. Almost all people can react to placebo under certain conditions, which also applies to physicians and scientists. people.

If at the begining, the researchers have postulated that people who react more easily to placebo have less intelligence or are more "neurotic", nowadays there are a lot of studies that suggest that **people with higher IQ are more likely to react to placebo.**

The patient's expectancy created in a particular treatment situation reflects her/his pre-existing beliefs. For example, the memory of previous experiences is likely to influence the experience of pain.

The prescribing framework, the ritual of the prescription that signifies the end of the consultation and the beginning of the care, certainly enhances the effect of the drugs.

2. Physician characteristics

Figure 2. Magic or beliefs

A practitioner who adopts a concerned, warm, supportive, caring and empathetic, attitude to her/his patients may inspire trust, confidence and rapport in the relationship.[14] So, a confident practitioner, displaying strong beliefs in the diagnosis and treatment, can enhance positive expectancy in the patient.

For example, K.B.Thomas randomly assigned 200 patients with symptoms of minor illness – most had cold symptoms or muscle pains – to receive either a "**positive consultation**" with or without treatment or a "**negative consultation**" with or without treatment. In the positive consultation, the patient was given a diagnosis and told that he would be better in a few days. If no prescription was given the patient was told that none was required; if a prescription was given the patient was told that the treatment would certainly make him feel better. In the negative consultation the doctor said: "*I cannot be certain what is the matter with you*." If the doctor gave no prescription, he added: "And therefore I will give you no treatment." If he gave the patient a prescription, he said: "*I am not sure that the treatment I am going to give you will have an effect*." The negative consultation concluded with the doctor telling the patient to return if he or she were not feeling better in a few days. The treatment in both consultations was a prescription for thiamine hydrochloride tablets used as a placebo. Two weeks after the consultation, a card was sent to each patient asking if he or she had gotten better; 64% of the patients who received a positive consultation reported that they were better, compared to only 39% of those who received a negative consultation.[15]

The majority of studies show that when the physician conveys optimism about the treatment patients perceive the treatment to be more helpful. At this point we have to understand why it is so important that healthcare professionals receive training in how to communicate positive expectations effectively.

Anxiety reduction as a placebo mechanism may be a consequence of positive expectancy. Classical conditioning has been proposed as a mechanism for placebo effects. Repeated association of medical care with symptom relief results in a classically conditioned response of symptom relief after receiving care even when the therapy is nonactive. [16]

4. Treatment and treatment setting

Several analgesia studies have used the open-hidden paradigm, demonstrating that open administration of a drug is significantly more effective than hidden administration. [17]

The way in which a medication is delivered may affect its perceived action. Injections have been perceived as more effective than pills, and capsules as more effective than pills. [18] Even the colour of pharmaceuticals can affect peoples' perceptions of their action and their effectiveness. [19,20].

Interestingly, when a treatment is prescribed by a famous head of the department, whose waiting list is several months long and which represents the last hope, the therapeutic effect of the prescriptions can be amplified compared to of a modest physician to which the patient may have access at any time. Describes the selection of observations or subjects for the experiment (including controls). Identify methods, equipment (with the name and address of the manufacturer in brackets) and give sufficient details on procedures. Give references for the selected methods, including statistical methods; offer details and brief descriptions for previously published methods which are not well known; describe new or substantially modified methods, justify their use and assess their limitations. Precisely identify all used drugs and chemicals, including generic names, dosage and administration ways. Describe statistical methods with sufficient details for reported results to be verified. Whenever possible, quantify discovered aspects and present them with appropriate measurement indicators for the uncertainty or error of measurement (such as confidence intervals). [Book Antiqua, 11 point, normal, justified alignment].

CONCLUSIONS

This paper shows that Placebo provides an indispensable tool for study the component of suffering. I believe that the words of the dr Larry Dossey reflect the best the true about Placebo effect: "*Eventually it became clear that our emotions, attitudes, and thoughts profoundly affect our bodies, sometimes to the degree of life or death. Soon mind-body effects were recognized to have positive as well as negative impacts on the body. This realization came largely from research on the placebo effect – the beneficial results of suggestion, expectation, and positive thinking.*"

It is important to emphasize the role of physicians, because they might enhance the benefit of all kind of treatments by promoting patient's positive expectation. In fact, all caregivers can enhance patients' experiences by anticipating or even being able to use a placebo response, because always a positive attitude may help to strengthen the body's resilience.

If in the past, Placebo have typically been identified as inert agent aimed to please the patient rather than exerts a specific effect, nowadays our understanding of this effect has changed. We can consider that Placebo has a real therapeutic intervention, having different physical and psychological effects and influencing the course of a disease.

The existence of placebo effects suggests that we must broaden our conception of the limits of our brain and our consciousness and to not forget that the mind and the brain are linked to the body. Lastly, we assert that research on the placebo effect has the potential to revitalize the art of medicine.

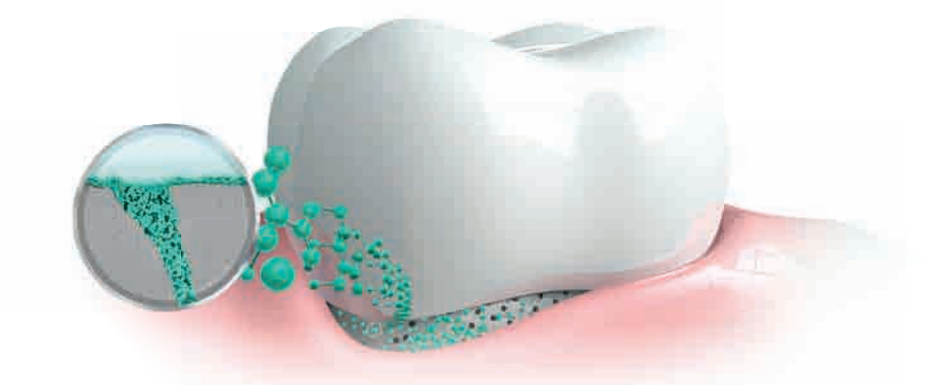
REFERENCES

1. Beecher HK. 1955. The powerful placebo. JAMA 159:1602–6
2. Shapiro AK. Attitudes toward the use of placebos in treatment. J Nerv Ment Dis 1960;130:200–11
3. Shapiro AK, Morris LA: The placebo effect in medical and psychological therapies. Handbook of Psychotherapy and Behaviour Change New York: WileyGarfield SJ, Bergin AE , 2 1978, 369-410.
4. Byerly H. Explaining and exploiting placebo effects. Perspect Biol Med 1976;19:423–36.

5. Wolf S. The pharmacology of placebos. Pharmacol Rev 1959;22:689–704.
6. Price DD, Barrell JJ. 2000. Mechanisms of analgesia produced by hypnosis and placebo suggestions. Prog. Brain Res. 122:255–71
7. Verne GN, Robinson ME, Vase L, Price DD. 2003. Reversal of visceral and cutaneous hyperalgesia by local rectal anesthesia in irritable bowl syndrome (IBS) patients. Pain 105:223–30
8. Vase L, Robinson ME, Verne GN, Price DD. 2003. The contributions of suggestion, expectancy and desire to placebo effect in irritable bowl syndrome patients. Pain 105:17–25
9. Luparello TJ, Leist N, Lourie CH, Sweet P. The interaction of psychologic stimuli and pharmacologic agents on airway reactivity in asthmatic subjects. Psychosomatic Medicine. 1970; 32: 509–513)
10. Chaput de Saintonge M, Herxheimer A. Harnessing placebo effects in healthcare. Lancet 1994;344:995–8.
11. Ernst E, Herxheimer A. The power of placebo. BMJ 1996;313:1569–70.
12. Peck C, Coleman G. Implications of placebo theory for clinical research and practice in pain management. Theor Med 1991;12:247–70.
13. Voudouris NJ, Peck CL, Coleman G. Conditioned response models of placebo phenomena: further support. Pain 1989;38:109–16.
14. Letvak R. Putting the placebo effect into practice. Patient Care 1995;29:93–102.
15. Thomas KB. General practice consultations: Is there any point in being positive? BMJ. 1987; 294: 1200–1202. Voudouris NJ, Peck CL, Coleman G. The role of conditioning and verbal expectancy in the placebo response. Pain 1990;43:121–8
16. Kirsch, I. The placebo effect as a conditioned response: failures of the 'litmus test'. Behav Brain Sci 1991;14:200–4.
17. Amanzio M, Pollo A, Maggi G, Benedetti F. 2001. Response variability to analgesics: a role for non-specific activation of endogenous opioids. Pain 90:205–15
18. Buckalew LW, Coffield KE. An investigation of drug expectancy as a function of capsule color and size and preparation form. J Clin Psychopharmacol 1982;2:245–8.
19. Buckalew LW, Coffield KE. An investigation of drug expectancy as a function of capsule color and size and preparation form. J Clin Psychopharmacol 1982;2:245–8.
20. De Craen AJM, Roos PJ, de Vries AL, Kleijnen J. Effect of colour of drugs: systematic review of perceived effect of drugs and of their effectiveness. BMJ 1996;313:1624–6.

Noul elmex®SENSITIVE PROFESSIONAL cu tehnologia PRO-ARGIN

Calmarea **imediată* și de durată** a durerii din sensibilitatea dentară[1,2]



- În contact cu saliva, se formează un strat bogat în calciu, care obturează instant[1,*] tubulii dentinari deschiși
- Stratul rămâne intact în timp, chiar după expunerea la acizi, asigurând calmarea de durată a durerii din sensibilitatea dentară[2,3]

93% dintre pacienți confirmă calmarea durerii din sensibilitatea dentară[4]

93% dintre pacienți — confirmă reducerea hipersensibilității dentinare[4]

91% dintre pacienți — apreciază recomandarea medicului stomatolog[4]

Calmarea imediată* a durerii din sensibilitatea dentară[1]

Calmarea imediată* și de durată începe cu recomandarea dumneavoastră**

*Pentru calmare imediată, aplicați direct cu degetul pe dintele sensibil și masați ușor pentru 1 minut;
**Doar în legătură cu pasta de dinți

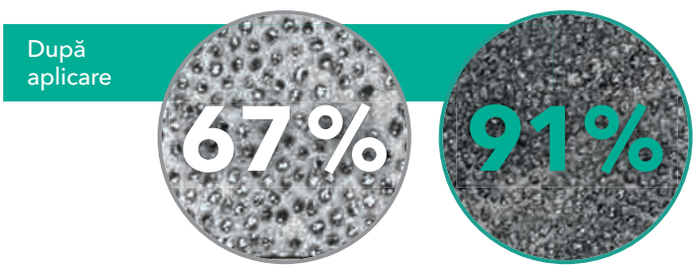
Referințe: 1. Nathoo S, et al. J Clin Dent. 2009;20(Spec Iss):123 –130; 2. Docimo R, et al. J Clin Dent. 2009;20(Spec Iss): 17– 22.; 3. Report Deon Hines-0003, 2016; 4. Studiu Ipsos cu privire la utilizarea produsului elmex® SENSITIVE PROFESSIONAL Repair & Prevent, efectuat în Polonia, rezultate după 2 săptămâni de utilizare, cu 325 de participanți (2017).

elmex® SENSITIVE PROFESSIONAL realizează obturarea superioară a tubulilor dentinari în comparație cu tehnologiile concurente[1,2,*]

Studiul 1[1,*]

Tehnologia cu fluorură de staniu/ fluorură de sodiu

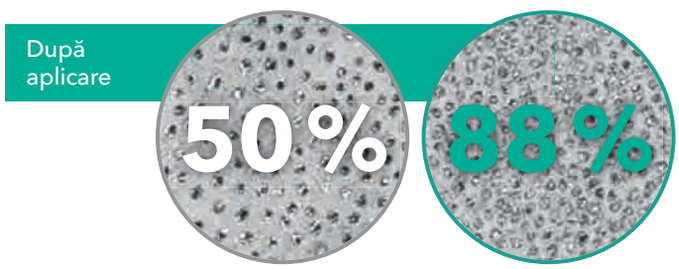
Tehnologia PRO-ARGIN



Studiul 2[2,*]

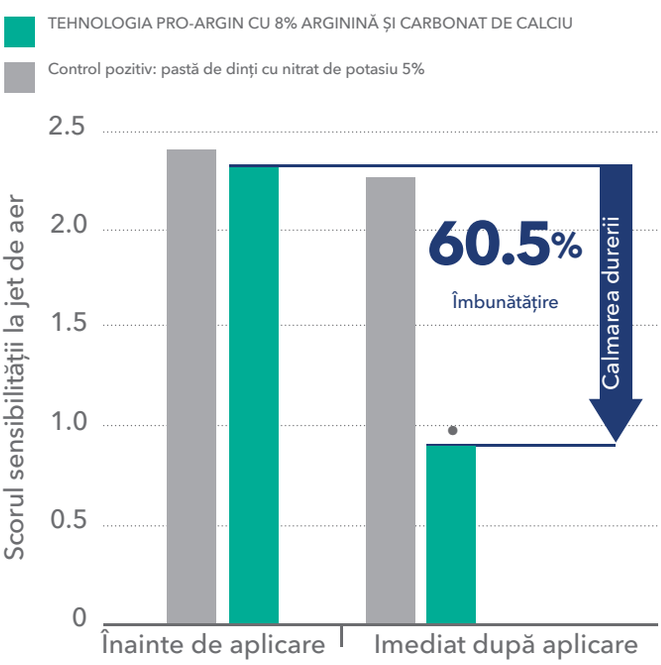
Tehnologia Novamin/ fluorură de sodiu

Tehnologia PRO-ARGIN



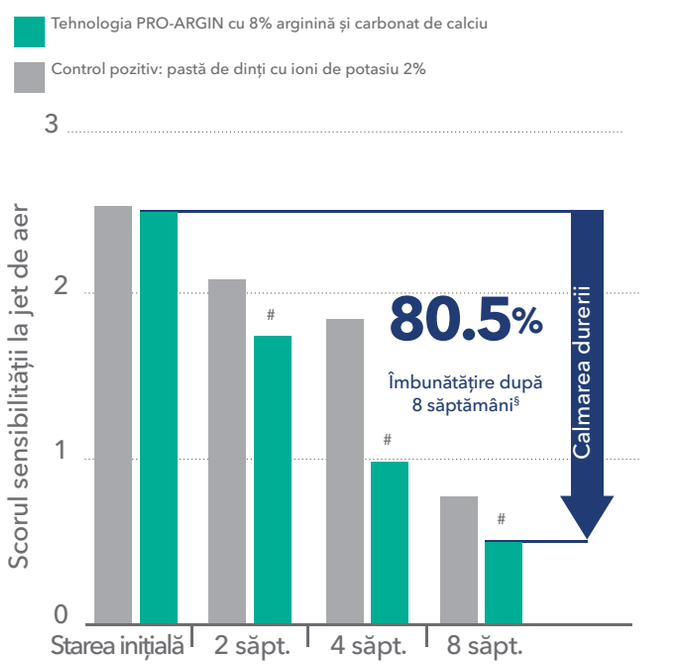
elmex® SENSITIVE PROFESSIONAL oferă calmare semnificativă imediată** și de durată a durerii din sensibilitatea dentară[3,4]

Calmarea semnificativă a durerii din sensibilitatea dentară instant[3,‡,**]



‡ În comparație cu starea inițială (sunt prezentate doar datele relevante)
• Semnificativ statistic (p<0,001)

Calmarea semnificativă de lungă durată a durerii din sensibilitatea dentară după 2, 4, și 8 săptămâni de utilizare[4,§,&]



§ În comparație cu starea inițială
& În comparație cu o pastă de dinți comercială desensibilizantă, ce conține 2% ioni de potasiu și 1450 ppm de fluor (NaF)
# Semnificativ statistic (p<0,05)

*Studiu in vitro, imagini reale de microscopie confocală după 5 aplicări (p<0,05%);
**Pentru calmarea imediată aplicați direct pe suprafața sensibilă și masați ușor cu vârful degetului timp de 1 minut.

Referințe: 1. Hines D, et al. Poster acceptat, July 2018 IADR. Colgate- Palmolive Company 2018.; 2. Hines D, et al. Poster #0742, March 2018 AADR. Colgate-Palmolive Company 2018.; 3. Nathoo S, et al. J Clin Dent. 2009;20(Spec Iss):123 –130; 4. Docimo R, et al. J Clin Dent. 2009; 20(Spec Iss): 17– 22.

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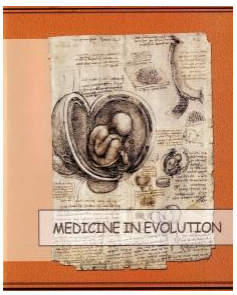
Comparative technical aspects of different ceramic systems used for the aesthetic rehabilitation of the upper incisors



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Abstract

The aim of the present study was to compare the technical steps of two different techniques, glass-infiltrated alumina-based ceramics and the pressable ceramic technique, and subsequently to highlight the advantages and improved properties of the pressed ceramics, in order to sustain the reason for which the latter technique become widely used, compared to the glass infiltrated technique.

Differences regarding both ceramic system technology and technique particularities were assessed, using two distinct cases: the four upper incisors restored by the means of four infiltrated glass ceramic copings, layered with Vita VM7 (case 1), and four heat-pressed copings, followed by veneering, also involving the four upper incisors (case2).

Keywords: pressed ceramics, glass-infiltrated alumina, aesthetics.

INTRODUCTION

Ceramic systems have improved through the recent decades in terms of aesthetics, marginal fit and user-accessible techniques. Different additive techniques have been used throughout the evolution of full ceramics systems: sintered ceramic onto refractory dies or platinum foil, glass-infiltrated alumina-based porcelain (the slip cast technique) or pressable ceramics. Various new systems have evolved improving the features of ceramic reconstructions.

However, there are some disadvantages which cannot be neglected, like brittleness and low tensile strength. These weak points of ceramic materials influence the clinical success of all-ceramic restorations, mainly in the premolar-molar area [1-4].

Aim and objectives

Initially, feldspar ceramics sintered onto refractory dies or onto platinum foil were the only technologies available for obtaining single, all ceramic restorations. Glass infiltrated alumina represented the system that provided improved strength and was used for short span restorations, also maintaining the aesthetic appearance. Until a few years ago, only reduced fixed partial dentures (FPDs) manufactured out of glass-infiltrated alumina porcelain were recommended for the frontal area. Available data from clinical studies on all-ceramic anterior FPDs indicate a success rate of 93% to 100% after 3 years [5-7]. Longitudinal Optical Coherence Tomography and En-Face Optical Coherence Tomography are investigation methods that

highlight the properties of ceramic materials, such as marginal fit, providing a scientific evidence for the superior clinical results of certain ceramic materials [8, 9].

The aesthetics and biocompatibility of ceramic restorations are confirmed as superior compared to traditional porcelain fused to metal restorations. In terms of mechanical properties, fixed restorations, which contain a metallic core have better results than full ceramic reconstructions [10]. However, clinical studies have shown that the longevity and fracture resistance of In-Ceram Alumina crowns improved over time and raising their resistance at a similar level to that of the porcelain fused to metal crowns [10-14].

Aluminum oxide and zirconium oxide ceramics are the most common materials used for copings, fixed FDP frameworks, and implant abutments [15-20]. Aluminum oxide is the election material in aesthetically demanding areas because of its optical properties, such as the presence of different factors of light refraction (1.8 for alumina versus 2.2 for zirconia) compared to natural tooth structures (1.6) and different light transmission of oxide framework materials (72% for alumina versus 48% for zirconia) [21].

New systems such as the pressable ceramics, using either glass leucite or lithium dislilicate, have improved different parameters such as marginal fit, the aesthetic outcome and indication for longer span bridges.

The aim of the present study was to compare the technical steps of two different techniques: glass infiltrated alumina and the heat-press technique and to highlight the advantages and improved properties of the pressed ceramics, so as to sustain the reason for which the latter technique become widely used versus the glass infiltrated technique.

Differences regarding both ceramic system technology and technique particularities were assessed, using two distinct cases: four infiltrated glass ceramic copings layered with Vita VM7 on the upper incisors, (case 1) and four heat-pressed copings, followed by veneering also on four upper incisors (case2).

For standardizing the comparation methods between different ceramic systems, we decided to take case 2 as a reference case, as it was compared in a previous study of ours with another pressing technique, using Willi Geller pressed ceramics [22].

MATERIAL AND METHOD

Vitapan Classical shade guides were used for both patients in order to perform the dental shade selection. For case 2, the shade matching was accomplished as well for the prepared teeth, in order to obtain composite dies with similar colour as the prepared teeth. For both cases, arch impressions, including the prepared teeth, were recorded, using two consistency silicones. Alginate has been used for the antagonist arch in both cases. Heavy bodied silicone was used for bite registration (Figures 1-3).

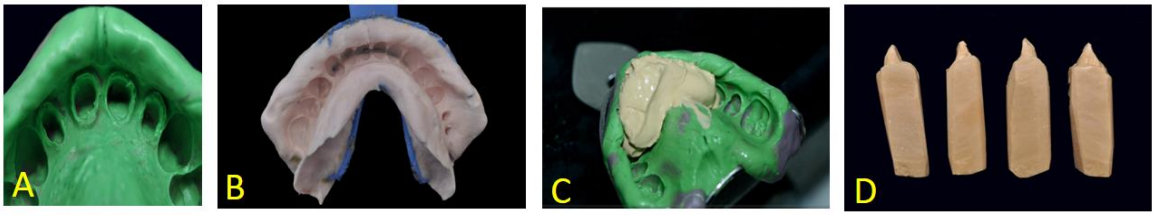

Figure 1. A. Working arch impression – case 1 ; B. Antagonist arch impression – case 1; C. Pouring the plaster for removable dies; D. Removable dies

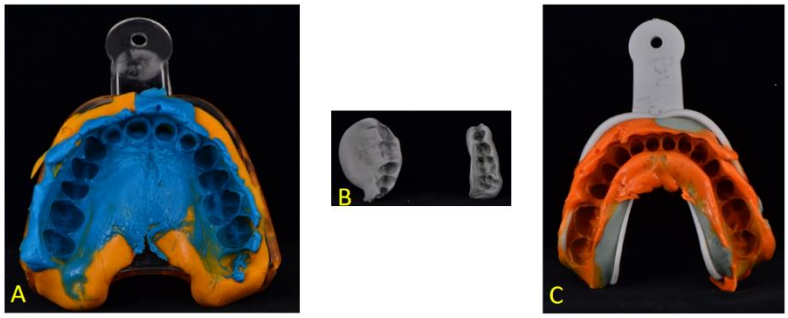

Figure 2. A. Working arch impression – case 2; B. Bite registration – case 2; C. Antagonist arch impression – case 2

Figure 3. A, B. Case 2 – shade selection of the dies; C. Case 2 – dental shade selection

For case 1, we used the Willi Geller technique in order to prepare the model, by first obtaining the master cast, duplicating the cast, using a silicone conformer, and preparing the radicular removable dies (Figure 4). The radicular parts of the dies were prepared as nonretentive towards the apex and round, except for the buccal side, that was prepared flat, in order to prevent rotation of the dies. Insulation of the removable dies insured their future detaching out of the base of the cast, which was obtained with help of the silicone conformer.

For case 2, the Pindex technique was used for obtaining the working cast with removable dies, for all four incisors (Figure 4). Die spacer (Yeti Dental) has been applied up to 1 mm from the preparation limit, in order to ensure a proper marginal sealing and insulation.

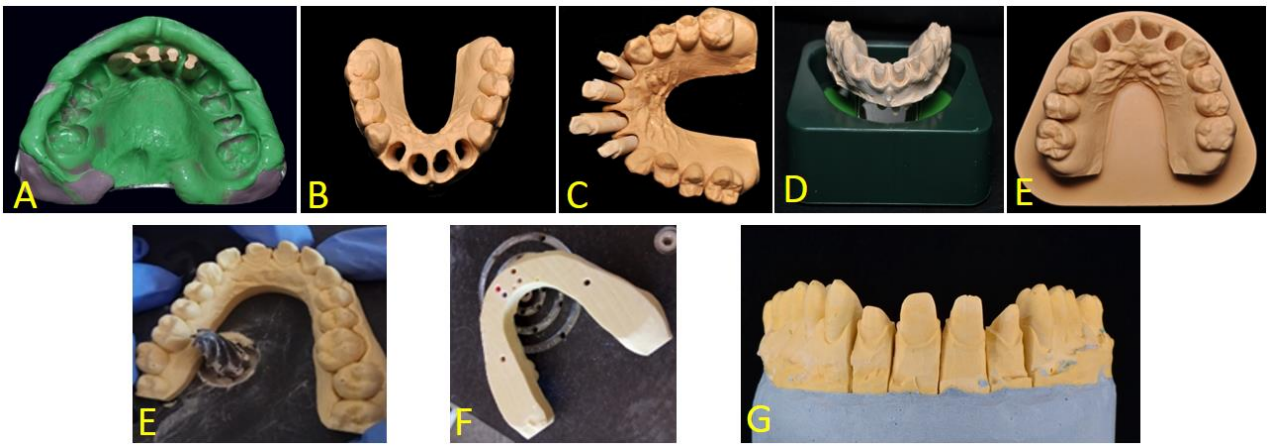

Figure 4. A-E. Fabrication of the Willi-Geller model – case 1; E. Fabrication of the master cast – Pindex technique – case 2

Mounting was performed using a non-adjustable articulator for case 1, respectively a semi-adjustable Artex TK articulator for case 2 (Figure 5).

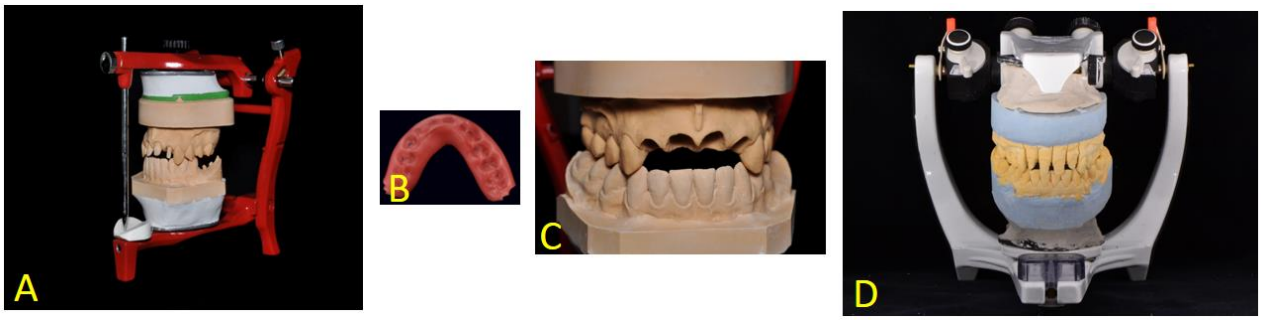

Figure 5. A, C. Casts mounted in the articulator – case 1; B. Bite registration – case 1; D. Casts mounted in the articulator – case 2

For case 1, before the duplication, the retentive areas of dies were identified and removed by the use of blocking wax, to ensure easy insertion and detachment of the wax pattern. Duplication was achieved using Optosil (heavy bodied) and Xantopren material (fluid) (Figure 6 3), the latter being applied with a dispenser onto the abutment, for a more accurate recording of the preparation limit.

For the pressed IPS e.max Press system restorations, wax copings (without anatomical contour) were obtained using organic wax, allowing thus a residuum-free burn-out. Previous to investing, the internal part of the investment ring base was lubricated (Vaseline), for a better detaching of the mold, subsequent to the setting of the investment material. Investing was performed using a silicone 200g ring and Press Speed West material. The casting sprue has been mounted on the crucible former at a 55° angle, accordingly to the flowing direction of the pressed ceramic. The height of the wax patterns and the casting sprues respected the value of 16 mm; the distance between the margins of the wax patterns and the walls of the casting ring was over 10 mm (Figure 7).

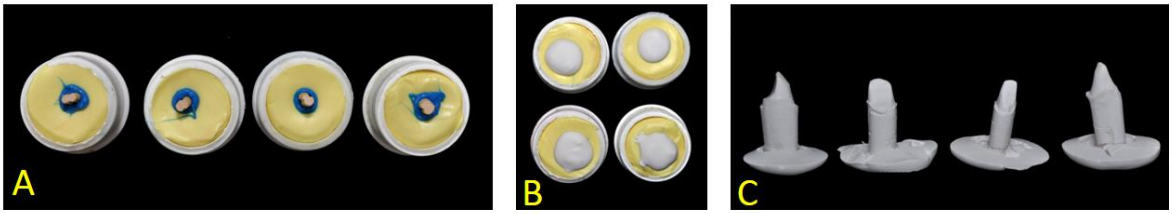

Figure 6. A, B. Duplication of the removable dies – case 1; C. Duplicated dies – case 1

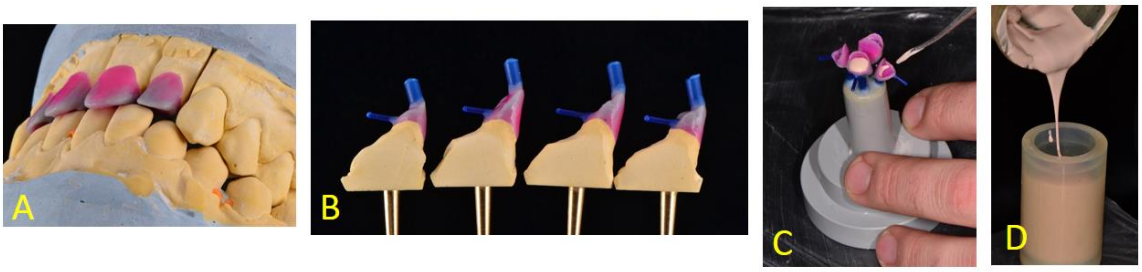

Figure 7. A, B. Wax patterns with reduced morphology – case 2; C. Preparation for investing – case 2; D. Investment – case 2

For case 1, the technological flow implies coating the dies with zirconium oxide paste. The paste is obtained by mixing the alumina powder with the specific liquid, at first on the vibrating table and afterwards in an open ultrasonic mixer (Vitasonic). The paste is thus becoming fluid and can be brushed onto the duplicated dies. The consistency of the paste is sensitive to dehydration and while modeling, dehydration is mandatory to be avoided. The obtained copings are fragile and brittle, thus they are to be handled with care. The copings were sintered at 1120 °C, using a Multimat Mach 3 (Dentsplay) furnace. The prorgam started with drying for 6 minutes, followed by a 50 minutes-long burnout, achieved by increasing temperature at a rate of 26 °C per minute. After completion, the copings were grinded subsequent to the cooling, by using diamond burs at low speed, in order to reach a 0.5mm thickness of the axial walls. The copings were set on the dies, insertion and marginal fit being checked. Infiltration of the copings was achieved by placing of a platinum foil inside the copings and brushing a lanthanum aluminosilicate glass suspension upon the external surface. The suspension penetrates the coping due to capillarity and enters into the space between the aluminum oxide particles. The suspension was brushed, starting from the incisal edges, avoiding leaking, to the inside of the copings. Thereby, their strength is improved and the enhancement of mechanical resistance is ensured (Figure 8). Sintering of the glass-infiltrated coping took place at a temperature of 1120 ^{0} C for 4.5 hours.

For the pressed reconstructions (case 2), the investment material was prepared, accordingly to the manufacturers indications, in the vacuum mixer; consecutively, the casting ring was filled with 200g of investment material. After the setting of the investing material, the silicone ring was removed and the casting channel was inspected for debris and for a perfectly

levelled base. The mould was obtained through the burnout of the wax, after heating the mold (850°C). Following the complete elimination of the wax, the pressed ceramic was introduced into the mould, without previous preheating of the ingot or plunger.

Ceramic pressing was performed using the Ivoclar Programat EP 5010 furnace. Transferring the mould from the preheating furnace to the pressing furnace was achieved in less than 30 seconds, in order to avoid an excessive cooling of the mould. Afterwards, the pressing process was started, at a temperature of 700 °C, which was raised gradually to reach the final 1050 °C pressing temperature (Figure 9).

After the cooling of the mould, the height of the plunger was marked, the mould was cut with a disc, and the plunger was removed (Figure 9). Sandblasting at a pressure of 4 bar/2 bar was employed in order to remove the investment material from the pressed ceramic crown and after the sprues were identified, a 2 bar pressure was used for further divesting. The mechanical finishing implied the cutting of the ceramic pressing sprue, using a disc. The pressed copings were fitted on the model, by finishing both casting sprue placement area and margins.

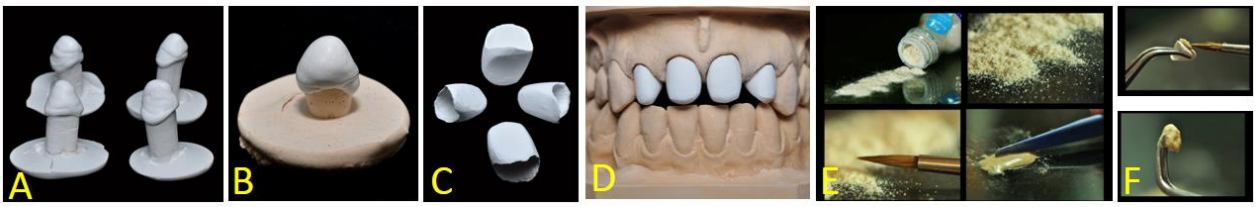

Figure 8. A, B. Zirconium oxide copings before sintering; C. Sintered copings; D. Sintered copings fitted on the dies; E, F. Infiltration with lanthanum glass alumina

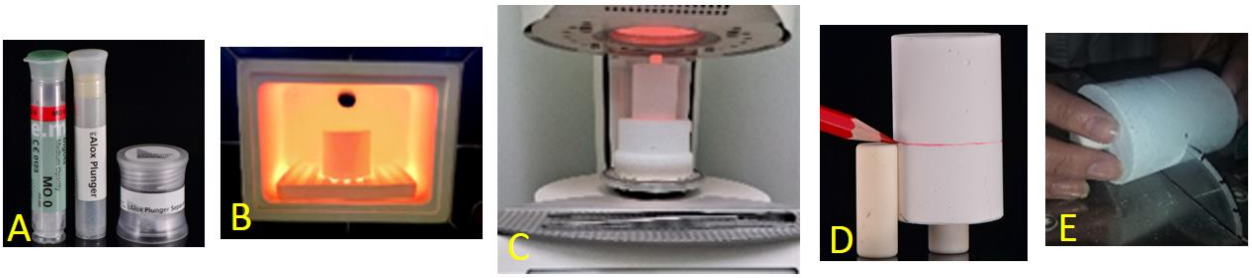

Figure 9. A. Ingots – IPS e.max Press – case 2; B. Preaheating oven – case 2; C. Ceramic furnace – case 2; D, E. Sectioning the mold – divesting procedure – case 2

For the first case, the next step involved the removing of excessive glass with diamond burs and the blasting with Al_2O_3 of 30-35 μ at 3-6 bar. After the second sintering, fracture-resistant cores were obtained due to the infiltrated lanthanum aluminosilicate glass. Thus, the fit of the copings could be checked on the cast (Figure 10).

For the second case, after the try in (Figure 11), the restorations were degreased, in order to avoid any surface debris or surface impurities. The next stage implied the layering of dentin, incisal effects and finishing with glaze. Wash firing was performed to provide the bond between the pressed and layered ceramics using IPS e.max Ceram Shade and Essence. The layering started with the application of the Cervical Transpa Orange-Pink mixture in a ratio of 1: 1 in the cervical third of Power Dentin A1 and Cervical Transpa. Powder Dentin ceramics provides the brightness of the restorations, being applied over the previous layers with increased opacity, and Cervical Transpa was used for obtaining a depth effect in the cervical third (Figure 10).

For case 1, a liner, which was sintered at 940° C, was used to cover the opaque copings (Figure 12). For the second sintering, we used base dentin which already brought the color of the restorations closer to the one of the adjacent teeth. The contour and shape of the restorations was defined by leaving minimal space in the incisal area, to add the enamel. Base dentine was sintered at 910°C. Transpa dentine was added in the incisal third. Followed by the third sintering which provided the appearance of translucency, with predilection in the incisal area of the restoration (Figure 12).

Figure 10. A, B. Glass-infiltrated copings before grinding – case 1; C. Glass-infiltrated copings after grinding – case 1

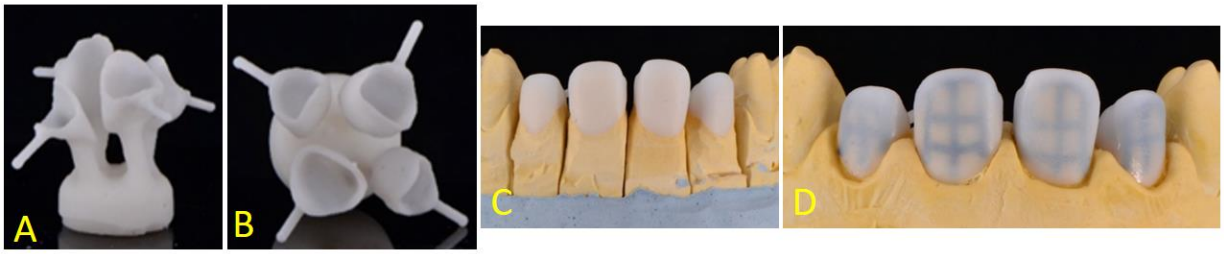

Figure 11. A, B. Pressed copings – case 2; C. The copings adapted on the dies – case 2; D. The reduced copings – case 2

For case 2, the primary shape of the restoration was achieved using a Dentin A1 and Transpa Neutral blend, providing transparency regardless of the substrate and replicating the enamel of natural teeth. Using the cut back technique, incisal space for Opal Effect 1 was obtained, in order to provide translucency, opalescence and increased brightness. After removing the shiny, glaze-like aspect through grinding, layering was carried out by completing the cervical third with Dentin A1, followed by individualization with Mamelon Light (medial and distal) and Mamelon Salmon (middle third). These powders were mixed with Visual Eyes liquid that offers visualization of the chromatic result before the ceramic sintering (Figure 13).

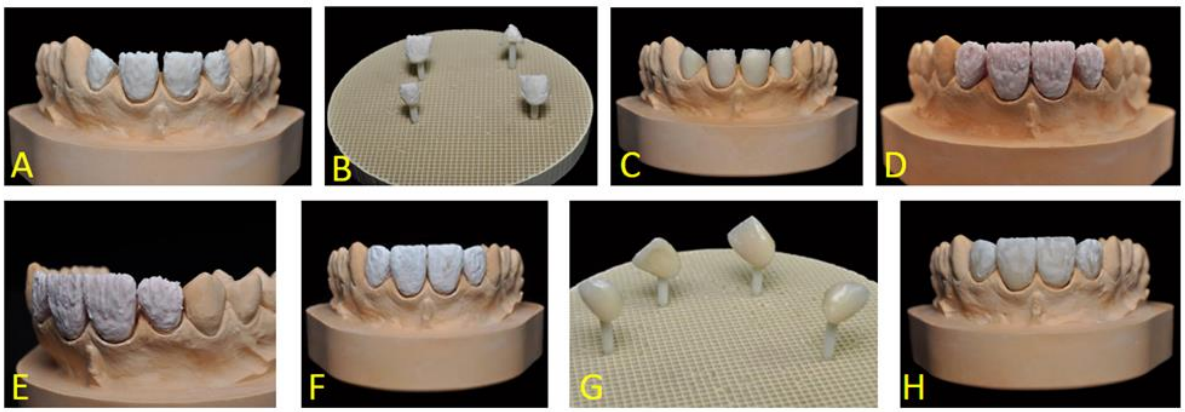

Figure 12. A. Effect liner Vita VM7 on the cast – case 1; B. Effect liner before sintering – case 2; C. Aspect of the copings after the first firing case – case 2; D. Base dentin layering before sintering – case 2; F. Transpa dentine before sintering – case 2; G. Transpa dentine after sintering – case 2

For case 2, after the second sintering, the finishing was accomplished, aiming to obtain the proper surface texture. The surface of the restoration was colored with the use of articulating paper, highlighting thus the surface texture. The surface of the restorations was prepared for glazing (Figure 14).

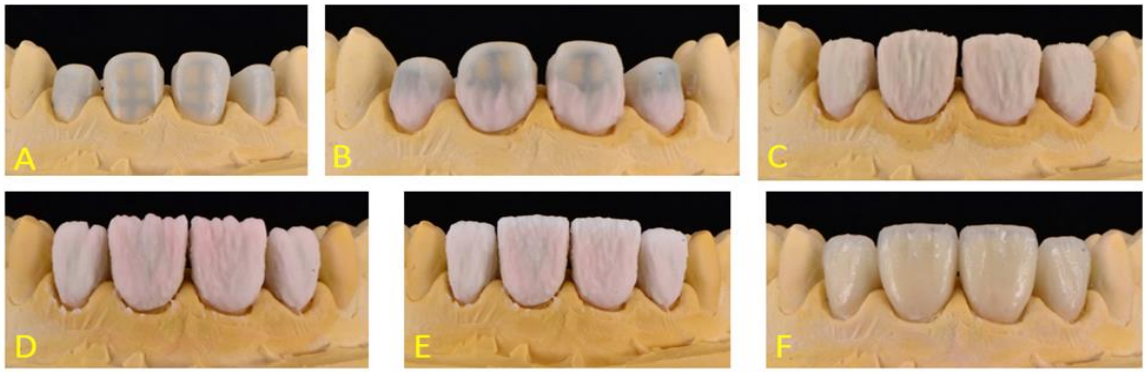

Figure 13. A. Copings after wash foundation firing – case 2; B. Powder Dentin A1 – cervical third and Cervical Transpa orange-pink – case 2; C. Power Dentin – case 2; D. Layering of Transpa Neutral – case 2; E. Opal Effect 1 before sintering – case 2; F. Opal Effect 1 after sintering

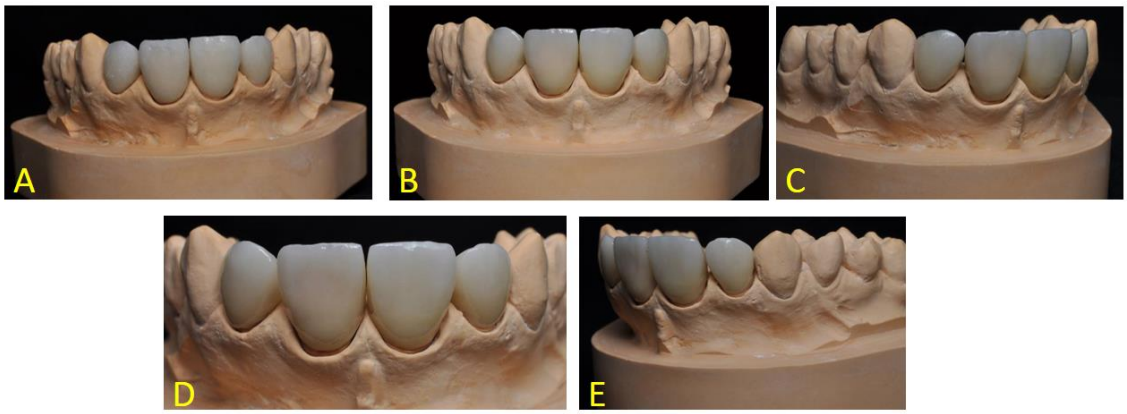

Figure 14. A. Enamel layer after sintering – case 1; B-E. Final aspect of the restorations – case 1

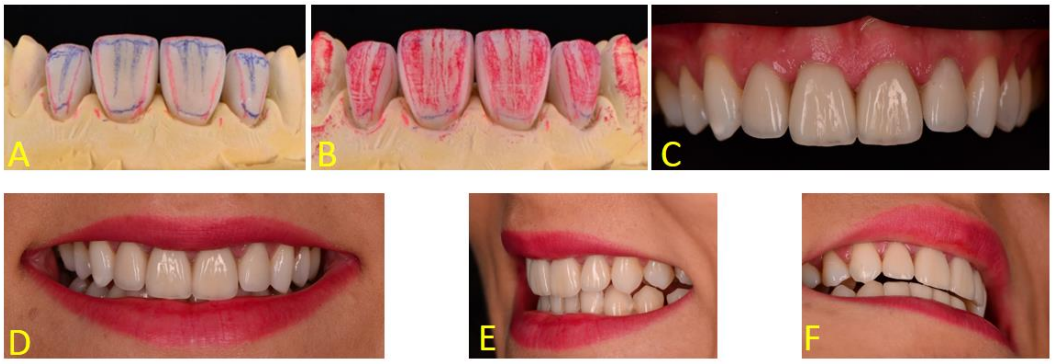

Figure 15. A. Highlighting the morphology using colors and by drawing – case 2; B. Highlighting surface texture by colors and drawing; C. Aspect after IPS e.max Ceram Glaze Powder FLUO, IPS e.max Ceram Glaze and Stain Liquid longlife; D-F. Final intraoral aspect of the restorations

CONCLUSIONS

The studied technologies allow manufacturing of full ceramic restorations, replacing the metallic framework existent in metal-ceramic restorations and providing better aesthetic results [23]. In contrast to the sintering and infiltration technique suitable especially for manufacturing of inlays, onlays, venners, single-unit crowns and short spam fixed partial dentures [24, 25], the heat-press technique ensures the widening of clinical indications also to more extensive edentulous spaces, the succes of the restoration depending however on the used pressing material [26].

More modern ceramic systems and materials, including the heat-press technique have emulated, aiming to improve the aesthetic appearence [25] and prolonging lifetime of aesthetic restorations [27, 28]. The heat-press technique, in addition to the above mentioned characteristics (superior aesthetics, due to the individual colour effects provided by the Stain and Build-UP techniques) requires easier technical steps, ensures a perfect coordination between the thermal expansion coefficients of the pressed structure and of the layering materials, high versatility and a very good dimensional stability and marginal fit.

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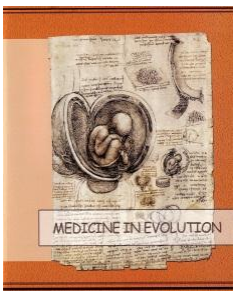
All 4 authors contributed to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript, therefore their contribution is equal. The authors would like to thank Stanescu Maria, CDT and Bianca Palage, CDT (Alb Studio Cluj Napoca) for their involvement.

REFERENCES

1. 1. Sorensen JA, Kang S-K, Torres TJ, Knode H. In-Ceram fixed partial dentures: Three-year clinical trial results. J Calif Dent Assoc. 1998; 26:207–214.
2. Pröbster L. Metallfreie Keramikbrücken—Eine Standortbestimmung. Phillip J. 1993; 6:271–278.
3. Setz J, Simonis A, Diehl J. Klinische und zahntechnische Erfahrungen mit vollkeramischen Brücken. Dent Lab. 1989; 37:1425–1427.
4. Campbell SD, Sozio RB. Evaluation of the fit and strength of an all-ceramic fixed partial denture. J Prosthet Dent. 1988; 59:301–306.
5. Hüls A. All-Ceramic Restorations with the In-Ceram System: Six Years of Clinical Experience. Vita In-Ceram Alumina Product Report. Bad Säckingen, Germany: Vita; 1995. p. 20–25.
6. Pröbster L. Survival rate of In-Ceram restorations. Int J Prosthodont. 1993; 6:259–263.
7. Pang SE. A report of anterior In-Ceram restorations. Ann Acad Med Singapore. 1995; 24:33–37.
8. Sinescu C, Negrutiu ML; Colojoara Todea C, Balabuc C, Filip LM, Rominu R, BraduA, Hughes M, Podoleanu A. Quality assessment of dental treatments using en-face optical coherence tomography. J Biomed Opt. 2008; 13(5):1-8.
9. Canjau S, Todea C, Negrutiu ML, Sinescu C, Topala FI, Marcauteanu C, Manescu A, Duma VF, Bradu A, Podoleanu AG. Optical Coherence Tomography For Non-Invasive Ex Vivo Investigations In Dental Medicine — A Joint Group Experience (Review). Sovremennye Tehnologii v Medicine. 2015; (7)1;97-114.
10. Pröbster L. Four-year clinical study of glass-infiltrated, sintered alumina crowns. J Oral Rehabil. 1996; 23:147–151.
11. McLaren EA, White SN. Survival of In-Ceram crowns in a private practice: A prospective clinical trial. J Prosthet Dent. 2000; 83:216–222.
12. Scotti R, Catapano S, D'Elia A. A clinical evaluation of In-Ceram crowns. Int J Prosthodont 1995; 8: 320–323. 6. Coornaert J, Adriaens P, De Boever J. Long-term study of porcelain-fused-to-gold restorations. J Prosthet Dent. 1984; 51:338–342.
13. Haselton DR, Diaz-Arnold AM, Hillis SL. Clinical assessment of high-strength all-ceramic crowns. J Prosthet Dent. 2000; 83:396–401.
14. Andersson M, Razzoog ME, Odén A, Hegenbarth EA, Lang BR. Procera: A new way to achieve an all-ceramic crown. Quintessence Int. 1998; 29:285–296.
15. Byrne D, Houston F, Cleary R, Claffey N. The fit of cast and premachined implant abutments. J Prosthet Dent. 1998; 80:184–192.
16. Cho HW, Dong JK, Jin TH, Oh SC, Lee HH, Lee JW. A study on the fracture strength of implant-supported restorations using milled ceramic abutments and all-ceramic crowns. Int J Prosthodont. 2002; 15:9–13.
17. Yildirim M, Fischer H, Marx R, Edelhoff D. In vivo fracture resistance of implant-supported all-ceramic restorations. J Prosthet Dent. 2003; 90:325–331.
18. Potiket N, Chiche G, Finger IM. In vitro fracture strength of teeth restored with different allceramic crown systems. J Prosthet Dent. 2004; 92:491–495.
19. Fradeani M. Esthetic Rehabilitation in Fixed Prosthodontics – Volume 1. Esthetic Analysis: A Systematic Approach to Prosthetic Treatment. Chicago: Quintessence; 2005.
20. Sadan A, Blatz MB, Lang B. Clinical considerations for densely sintered Alumina and Zirconia Restorations—Part 1. Int J Periodontics Restorative Dent. 2005; 25:213–219.
21. McLaren EA. All-ceramic alternatives to conventional metal-ceramic restorations. Compend Contin Educ Dent. 1998; 19(3):307-8, 310, 312.
22. Manole M., Stănescu M., Mutoiu A.S., Grecu A., Burde A.V., Baciu S. Technical aspects in the restoration of arches in the front area by layering of pressed structures. Medicine In Evolution. 2018; 14(4):401-407.
23. Kugel G, Perry RD, Aboushala A.Restoring anterior maxillary dentition using alumina- and zirconia-based CAD/CAM restorations Compend Contin Educ Dent. 2003; 24(8):569-72, 574, 576.
24. Hegenbarth EA, Holst S Esthetic alumina and zirconia rehabilitation: a team approach to treatment planning and material selection. Eur J Esthet Dent. 2007; 2(4):370-88.
25. Tinschert J, Natt G, Mautsch W, Augthun M, Spiekermann H Fracture resistance of lithium disilicate-, alumina-, and zirconia-based three-unit fixed partial dentures: a laboratory study. Int J Prosthodont. 2001; 14(3):231-8.

26. Chang YY.Maximizing esthetic results on zirconia-based restorations. Gen Dent. 2011; 59(6):440-5;
27. Kaiser M, Wasserman A, Strub JR.Long-term clinical results of VITA In-Ceram Classic: a systematic review Schweiz Monatsschr Zahnmed. 2006; 116(2):120-8.
28. Giordano R. Zirconia: a proven, durable ceramic for esthetic restorations. Compend Contin Educ Dent. 2012; 33(1):46-9.

Periodontal risk factors among a group of teenagers in Romania



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Abstract

Aim: Assessment of the level of exposure to periodontal risk factors among teenagers

Material and methods: The cross-sectional study was developed in 2019 on a sample of 100 schoolchildren from a high-school from Ploieşti, with a mean age of 15,32 years (SD=0,56), 42% boys. The assessment was performed using a self-administered questionnaire with 20 questions regarding the behavioral and general periodontal risk factors as well as the presence of symptoms and self-evaluation of periodontal health.

Results: Regarding the behavioral risk factors, 83% of the subjects brush twice daily and 50% use only toothpaste and toothbrush for daily oral hygiene, 53% never used the dental floss and only 25% use it at least once a day; only 58% of the teenagers went to the dental office in the last year and 52% never had a professional dental cleaning; 31% of the subjects are smokers, 11% wear orthodontic devices; regarding the general risk factors, 3,4% of the girls use contraceptive pills, 2% have diabetes mellitus, 14% declare that their parents have periodontal disease; 77% of the adolescents declare they have gingival bleeding but only 11% consider they have gingival affection.

Conclusion: The main periodontal risk factors to which the adolescents assessed are exposed on high proportion are the behavioral factors: improper daily oral hygiene, lack of dental check-ups and preventive professional cleanings as well as smoking

Keywords: periodontal risk factors, adolescents, gingivitis.

INTRODUCTION

Inflammation of gingival tissue is a common disease, affecting a large proportion of population [1,2]. Since this disease is highly preventable [3], it is necessary to identify and control common risk factors and also specific risk factors for different group population [4]. Adolescents represent a vulnerable group because of specific additional risk factors such as transitory modification of hormonal levels, improper oral hygiene and local factors that favor dental plaques such as orthodontic devices [4]. Among WHO goals for 2020, the one related to prevention of periodontal disease and adolescents is that 80% of young adults (18-25 years old) to have enough information about the risk factors, be aware of the symptoms of inflammation and to be interested in early diagnosis of oral disease [3, 5]. Even though adolescents are affected by superficial form of periodontal inflammation – gingivitis, community dentistry activists, as part of their programs of oral health promotion, should identify the risk factors specific for teenagers and offer proper education to control those predominant risk factors in order to stop the evolution toward deep forms of inflammation.

Aim

The aim of the study was to identify the periodontal risk factors to which adolescents are most frequently exposed, in order to adapt the periodontal health promotion activities to the specific needs of this age group.

MATERIAL AND METHODS

The cross-sectional study took place in 2019, on a sample represented by 100 teenagers between 14 and 16 years (with a mean age of 15,32 years, SD 0,56), 42% boys, enrolled in a high school in Ploiești, România. The study was conducted under the informed consent of the school representatives and parents of the participants. The subjects enrolled completed a self-administered questionnaire with 20 items (7 open and 13 closed ended questions) that aimed to assess periodontal risk factors – local, general and most important - behavioral. In addition, there were included questions related to perceived clinical signs of gingival inflammation and also self-reported status of oral health, in general, and gingival health, in particular. The data collected was analyzed using IBM SPSS Statistics v19 software (Armonk, NY:IBM Corp) and the results were reported as frequencies.

RESULTS

1. Behavior risk factors

1.1. Oral hygiene

Results showed that while a high percent of the subjects (83%, N=83) brush their teeth twice daily, as recommended, they neglect the use of secondary oral hygiene products. Thus, when it comes to interdental cleaning, dental floss is used regularly by only half of the subjects (47%, N=47) and moreover, only one quarter use it every day (25%, N=25). Mouth rinse is more popular among the teenagers assessed, two thirds use it regularly (65%, N=65) and 40% (N=40) rinse every day with a mouthwash (table 1).

1.2. Smoking behavior

In the age group assessed, one third of the subjects declared they smoked (31%, N=31). Most of them smoke either occasionally (13%, N=13) or daily but less than 10 cigarettes per day (12%, N=12) (table 1).

1.3. Dental services utilization

When it comes to visits to the dental office, results showed a very unsatisfactory behavior due to the fact that one third of the subject declare they had not visited the dentist in

the last year (35%, N=35). Furthermore, only half of the teenagers (53%, N=53) go to dental office for regular check-ups, while one quarter (27%, N=27) ask for dental services only when they are disturbed by the symptoms or, moreover, 1 in 10 only in advance phases of the disease – for emergencies (12%, N=12) (table 1).

Table 1. Behavioral risk factors among adolescents

Oral hygiene behavior			
Toothbrushing frequency	%(N)	**Dental floss**	%(N)
Twice a day	83% (83)	Regular users	47% (47)
Once a day	13% (13)	Daily users	25% (25)
Few time per week	3% (3)		
Few time per month	1% (1)	**Mouthrinse**	
		Regular users	65% (65)
		Daily users	40% (40)
Smoking behavior			
Smoking status	%(N)	**Frequency of smoking (for smokers)**	%(N)
Non-smoker	69% (69)	Occasionally	13% (13)
Smoker	31% (31)	1-10 cigarettes / day	12% (12)
		11-20 cigarettes / day	5% (5)
		> 20 cigarettes / day	1% (1)
Dental visits behavior			
Reason for dental visits	%(N)	**Number of visits during la last year**	%(N)
Regular check-up	53% (53)	Once a year	23% (23)
Treatment (symptoms are present)	27% (27)	Twice a year	12% (12)
		> twice a year	30% (30)
Emergency	12% (12)	None	35% (35)
Unknown	8% (8)		

2. Local risk factors

2.1. Orthodontic devices

Taking into consideration the factors that favor dental plaque accumulation and that orthodontic devices impede a proper oral hygiene, the study assessed the frequency of subjects under orthodontic treatment and the results showed that only 11% (N=11) were wearing fixed appliances at the moment of study and 13% (N=13) of them were former wearer (table 2).

2.2. Professional dental cleaning

Additional to daily oral hygiene at home, regular professional dental cleanings are mandatory for removal of debris and calculus and the results showed that half of the subjects enrolled never had this prophylactic treatment (52%, N=52) while the most of those who benefited from it, had it either 1 time per year (14%, N=13) or more seldom than that (18%, N=18) (table 2).

Table 2. Local risk factors among studied population

Orthodontic treatment		*Professional dental cleaning*	
	% (N)		% (N)
Fixed appliances	11% (11)	Never	52% (52)
Former orthodontic patient	13% (13)	Only when teeth are discolored / significant deposits	4% (4)
Never wore orthodontic devices	76% (76)	Occasionally	
		1 time per year	18% (18)
		2 times per year	14% (14)
		3-4 times per year	8% (8)
			4% (4)

3. General risk factors

The participants at the study were exposed to the general risk factors in reduced proportion, as expected for this age range. Thus, only 2% (N=2) had Diabetes Mellitus and only 3,4% (N=2) of the girls declared they were using oral contraceptives (Table 3). Regarding the genetic predisposition, 15% (N=15) of the teenagers declared family history of periodontal disease (table 3).

Table 3. General risk factors for teenagers

General risk factors	% (N)
Systemic disease (Diabetes Mellitus)	2% (2)
Medicines Oral contraceptives / steroids	3,4% (2) of girls
Genetics (Family history of periodontal disease)	15% (15)

4. Self-reported symptoms of gingivitis and status of oral and gingival health

Asked to report the perceived gingival bleedings (as clinical sign of gingivitis), 77% (N=77) of the subjects declared they noticed this symptom, most of them either occasionally (43%, N=43) or inconstantly during the tooth brushing (30%, N=30) (Table 4). Yet, only 11% (N=11) of the teenagers consider the gingival bleedings that they have are a gingival health issue that should be addressed to the dentist. Moreover, half of the subjects perceive their overall oral health as either excellent (10, N=10) of very good (41%, N=41) (table 4).

Table 4. Perceived oral and gingival health problems

Gingival bleeding		*Perceived gingival health*		*Perceived oral health*	
	%(N)		%(N)		%(N)
Every time at toothbrushing	2% (2)	Affected	11% (11)	Poor	2% (2)
		Not affected	53% (53)	Fair	10% (10)
Sometimes at toothbrushing	30% (30)	Don't know	36% (376)	Good	37% (37)
				Very good	41% (41)
At dental floss use	1% (1)			Excellent	10% (10)
At gentle touch of the gingiva	1% (1)				
Occasionally	43% (43)				
Never	23% (23)				

DISCUSSIONS

Reported to the WHO objectives regarding the awareness among young adults about gingival health, results in the present study show unsatisfactory level among the group assessed. For an accurate assessment of the gingival status among this sample, there remains the necessity to continue the research with a clinical study to report the objective gingival status of the subjects besides the self-reported signs and self-assessed gingival and oral health. With respect to the relevance of this research for the gingival health promotion activities, the results show that the predominant risk factors are related to adolescents' behavior, which fortunately could be changed by proper intervention, experiential learning being efficient for this age group, as shown by previous research [6].

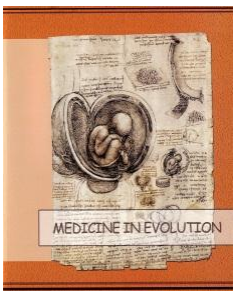
CONCLUSIONS

Teenagers assessed are mostly exposed to behavioral periodontal risk factors. There is a lack in using the interdental cleaning products, smoking is already a frequently met habit and, in addition, dental visits are neglected among the teenagers assessed. Although gingival bleedings are common, most of the adolescents underestimate the importance of this symptom and tend to overestimate their overall oral health status.

REFERENCES

1. Petersen PE, Ogawa H. The global burden of periodontal disease: towards integration with chronic disease prevention and control. Periodontology 2000. 2012; 60 (1): 15–39.
2. World Health Organization. WHO Global Oral Health Data. 2005. [Last accessed on 2014 Nov 07]. Available from: http://www.who.int/oral_health/databases/niigata/en .
3. Tonetti MS, Eickholz P, Loos BG, Papapanou P, van der Velden U, Armitage G, Bouchard P, Deinzer R, Dietrich T, Hughes F, Kocher T, Lang NP, Lopez R, Needleman I, Newton T, Nibali L, Pretzl B, Ramseier C, Sanz-Sanchez I, Schlagenhauf U, Suvan JE, Fabrikant E, Fundak A. Principles in prevention of periodontal diseases–Consensus report of group 1 of the 11th European workshop on periodontology on effective prevention of periodontal and peri-implant diseases. J Clin Periodontol. 2015; 42 (Suppl. 16): S5–S11.
4. Lang NP, Suvan JE, Tonetti MS. Risk factor assessment tools for the prevention of periodontitis progression a systematic review. J Clin Periodontol. 2015; 42 (Suppl. 16): S59–S70.
5. Petersen PE. World Health Organization global policy for improvement of oral health – World Health Assembly 2007. Int Dent J. 2008; 58(3): 115-121.
6. Sfeatcu R, Dumitrache MA, Cărămidă M, Johannsen A, Perlea P. A pilot study on the effectiveness of a 2-year school-based oral health educational programme using experiential learning among adolescents. Int J Dent Hyg. 2019; 17(3): 221-228.

Comparative stduy – manufacturing of full-ceramic crowns using two different ceramic heat-press techniques



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Abstract

Lithium disilicate is a ceramic material that is recommended for the fabrication of dental restorations including single crowns and fixed dentures. This technique meets the requirements of both biocompatibility and aesthetics, prevents hypersensitivity, ensures a very good marginal fit and implies more simple technical steps, compared to other techniques. There are different ceramic pressing systems on the market, nowadays, the most used being IPS e.max Press and Vita PM9. The aim of our study was to compare the technical steps between these two techniques. Differences regarding particularities of both the ceramic techniques were assessed, using two distinct cases: case 1 – the mandibular incisors were rehabilitated using heat-pressed Vita PM9 full contour crowns, followed by external staining and glazing; case 2 – a patient presenting dyschromic maxillary incisors, for which the chosen solution represented medium-opaque lithium-disilicate cores, layered with fluorapatite ceramics.

Keywords: heat-press technique, e-max, Vita PM9

INTRODUCTION

The modern prosthodontic therapy follows three main criteria, namely: biocompatibility, aesthetics and avoiding hypersensitivity, usually encountered in restorations using metallic substructures. Although porcelain fused to metal restorations have higher mechanical strength than full ceramic restorations, they tend to be replaced in practice by the latter. This is mostly due to patients developing possible allergies, or due to the chipping of the ceramic layers, that are prone to fracture, even if only minor fissures, which are not detected by simple eye inspection, are present [1]. Zirconia restorations represent an alternative to PFM restorations for the posterior area, but can also be used for frontal restorations. However, zirconia crowns may also be affected by fissures of the ceramic veneering material that leads to chipping, therefore requiring a second burning of the zirconia–ceramic interface. Such an additional procedure may affect the mechanical resistance of the ceramic and the bond between the zirconia core and the ceramic layer [2].

Also, other ceramic materials, like vitreous ceramics can be processed using different laboratory techniques, such as layering, heat pressing and CAD CAM methods with considerable success rates [3]. One of the ceramic techniques which meets these needs and also ensures a very good marginal fit, has simpler technical steps compared to other techniques, as well as less air trapped into the ceramic material, resulting in improved mechanical strength, is the heat-pressing technique [4-6]. There are different pressable ceramic systems on the market nowadays, the most used being the IPS e.max Pand Vita PM9.

Aim and objectives

The aim of our study was to compare the technical steps particularities between two pressing techniques. For standardizing the comparation methods between different ceramic systems, we decided to take case 1 as a reference case, as it was compared in a previous study of ours with another pressing technique, using Willi Geller pressed ceramics [7]. Differences regarding both ceramic techniques details were assessed, following two distinct cases: case 1 – the mandibular incisors were restored, using heat-pressed Vita PM9 full contour crowns, followed by external staining and glazing; case 2 – a patient presenting dyschromic upper incisor, for which the chosen solution was represented by medium-opaque (MO) lithium-disilicate cores, layered with fluorapatite ceramics.

Lithium disilicate is a ceramic material that is recommended for the fabrication of dental restorations including single crowns and fixed dentures [8]. It can be used in the fabrication of restorations using the lost-wax (pressed ceramic) technique, as well as through the milling technique [9]. For the pressed ceramics technique, ingots of lithium disilicate are heat-pressed into a mould within the ceramic furnace, in order to obtain the desired shape after the wax burn-out [10, 11], without heating the ingot or plunger. According to Ivoclar's 2011 scientific report, the strength of the pressed lithium disilicate material is 11% higher compared to the CAD/CAM version of lithium disilicate.

Similarly, Vita PM9 functions on the principle of preheating and melting of a ceramic ingot and pressing it into a mold. It uses 3 degrees of translucency, with 10 different shades, resulting in very good aesthetics.

For both materials, the principle is based on the obtaining of either a full contour or a coping wax pattern, spruing, investing and pressing.

The lost-wax technique has numerous advantages: it is already known to technicians, needs inexpensive laboratory equipment, and enhances various types of prosthetic reconstructions.

Ivoclar has developed over the years the pressed ceramics system, as well as the concept: while Empress 1 used leucite reinforced ceramic and provided monochrome full contour restorations which required to be stained, Empress 2 insures obtaining of 0.8 mm

thickness copings made out of glass ceramic reinforced with lithium disilicate, layered with fluor-apatite ceramics. The latest system, IPS e.max Press allows the technician to obtain reduced or long-span restorations out of lithium disilicate glass ceramic (lithium disilicate blocks/high strength zirconium oxide (emax ZirCAD zirconia blocks) [12].

In regards to the wax patterns, the technicians have the possibility to choose, depending on the case, between several options: copings, associated with layering; full contour reconstructions which are cut back in the incisal/occlusal or buccal area, followed by micro-layering; full contour restorations associated with external staining and pigmentation [13].

The pressing system also allows the over-pressing on milled zirconia structures or metallic frameworks.

Indications of IPS e.max Press are: table tops, veneers, inlays, onlays, partial crowns, crowns in the front / lateral area, short span bridges of 3 elements in the anterior area, short span bridges of 3 elements in the bicuspid area up to the second premolar.

The prosthetic treatment of the case 2 used an IPS e.max Press lithium disilicate MO ingot, presenting a flexural strength of 400MPa, in order to obtain a framework, subsequently layered with fluor-apatite ceramics.

VITA PM 9 is an "all-in-one" press ceramic that uses the fine-structure veneering ceramic VITA VM 9 and covers a wide range of indications (inlays/onlays, veneer and crowns). It is suitable for the substructure-free staining and layering technique and for over-pressing on zirconium oxide substructures. The wide indication range (substructure-free staining and layering technique, as well as over-pressing technique) of VITA PM 9 allows for an economic and reliable fabrication of various restorations using an identical press program. The highly translucent VITA PM 9 HT ingots have a chameleon effect to ensure a completely natural shade effect. The natural tooth characteristics of the VITA PM 9 ceramic include homogeneous surfaces, high resistance to plaque and enamel-like material behavior [14].

MATERIAL AND METHODS

Two cases were considered. One of the cases was presented The shade selection of the teeth to be restored and of the adjacent teeth was operated using shade guides and taking into account individual features for each case. The shade of the prepared abutment was selected using the IPS Natural Die Material color key for case 2, allowing the manufacturing composite resin dies with similar color as the patient's prepared teeth.

The HT Vita pellets were selected for case 1. MO Ivoclar ingots were used for case 2.

Two consistency silicones were used to register the impressions of the prepared arches (lower arch – case 1 and upper arch – case 2), alginate for the opposing arches. For the bite registration silicone (high consistency) was used as well. All impressions were disinfected (Figures 1-3).

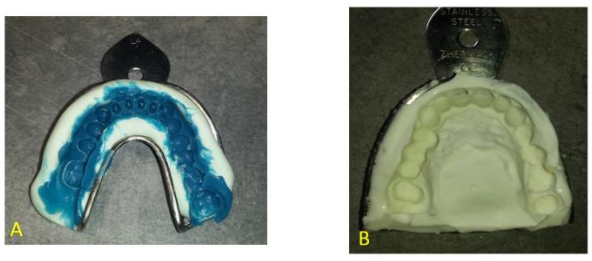

Figure 1. A. Working arch impression – case 1; B. Antagonist arch impression – case 1

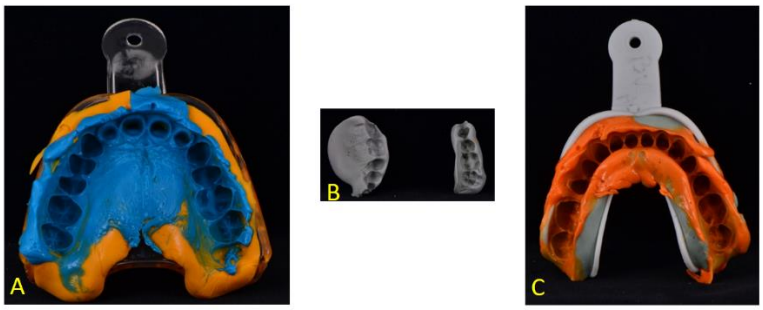

Figure 2. A. Working arch impression – case 2; B. Bite registration – case 2; C. Antagonist arch impression – case 2

Figure 3. A, B. Case 2 – die shade selection, using the Natural Die Shade Guide; C. Case 2 – dental shade selection using the Vitapan Classical shade guide

Casts with removable dies were obtained out of GC Fujirock Class IV gypsum. The die spacer (2 coated) was applied and then the cases were mounted into articulators (Figure 4). Mounting of the casts in the articulator, based on the bite registration, followed (Figure 5).

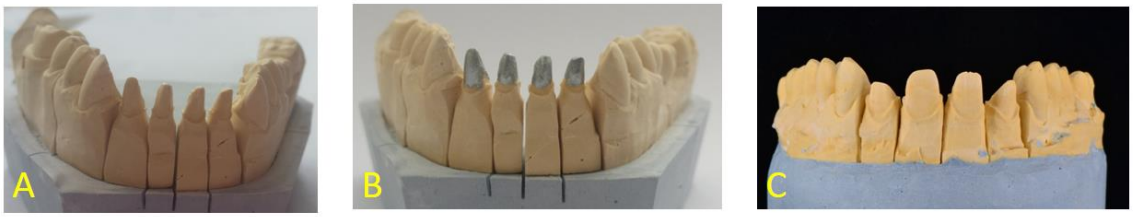

Figure 4. A, B. Case 1 – master cast with the prepared dies; C. Case 2 – master cast

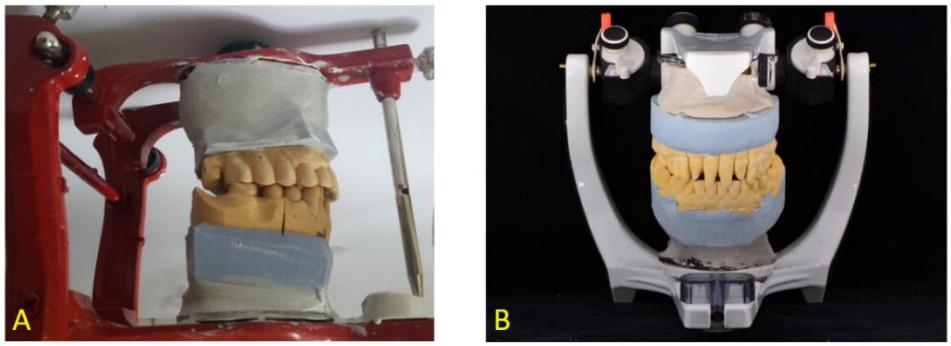

Figure 5. A. Case 1 – casts mounted in the articulator; B. Case 2 – casts mounted in the articulator

The wax patterns used organic wax in both cases. For case 1 copings were obtained by dipping the dies into molten wax, and the anatomic contour was concluded using casting wax. Maximum intercuspation, contacts during anterior and lateral movements were, as well, checked (Figure 6).

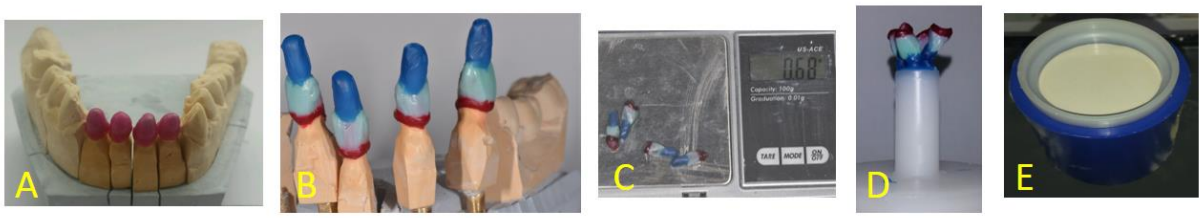

Figure 6. A. Wax patterns – buccal view – case 1; B, C. Spruing and weighting the wax patterns – case 1; D. Preparing for investing; E. Invested wax patterns

For case 2, copings were obtained taking into account the available space, the design being set to follow the morphology associated with the grinding stereotype and to support the cusps, ensuring a uniform thickness of the ceramic layer [11]. Excess of wax below the shoulder preparations was removed and wax was applied (respecting the minimum thickness for each area) as follows: 1 mm indicated at the margins of the preparation, 1.2 mm in the midd le third and 1.5 mm at the incisal edges (Figure 7).

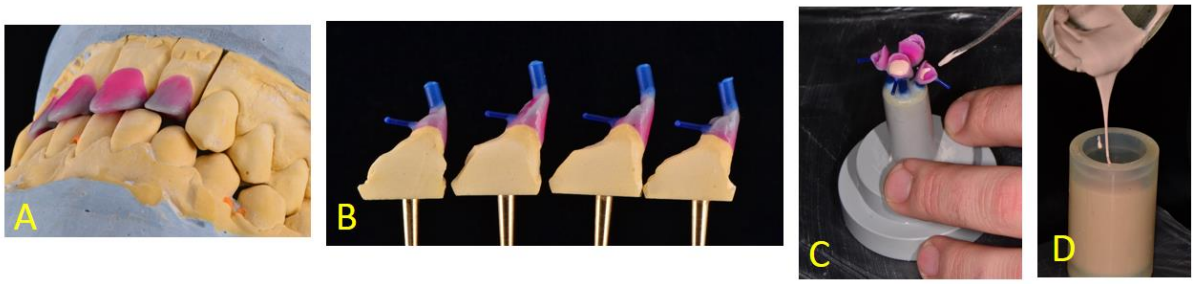

Figure 7. A. Wax patterns – buccal view – case 2; B. Sprued wax patterns – case 2; C. Preparing for investing; D. Investingwax patterns

For spruing, 3 mm diameter/4 mm length wax rods at 55˚ (case 1) respectively 3mm diameter/5mm length at a 60˚ angle were attached to the sprue former of the investment ring bases (case2). For VitaPM9 pressing system, the weight of the wax patterns had to be under 1.2 g for the use of 2 ingots (Figures 6, 7).

For case 1, 200gr of PM9 investment material, 34 ml liquid diluted with 10 ml distilled water was used, manually mixed followed by mechanical mixing for 60 seconds. After the setting time, for obtaining the mold, the investing material was introduced into the heating furnace (850° C) for 75 min. VITA HT ingots and the plunger were positioned on the investment mold in the VITA VACUMAT 6000 MP pressing furnace. Pressing was accomplished in 29 minutes, at 1000° C.

IPS PressVest Premium investing material was used with a ratio of 100 g powder/16 ml liquid and 11 ml distilled water, for case 2. The investment material was mechanically homogenized and was poured into the silicone ring while under constant vibration. Preheating was accomplished for 45 minutes at 850 ° C. Ivoclar Programmed EP 5010 pressing furnace along with a preset temperature, vacuum and preset time were used. The plunger was prepared and immersed in the Plunger Separator while maintaining the furnace at 700 ° C, prior to inserting the MO ingot. After pressing and gradual cooling of the investment and the pressed crowns, the tracing of length of the plunger was accomplished (Figures 8, 9)

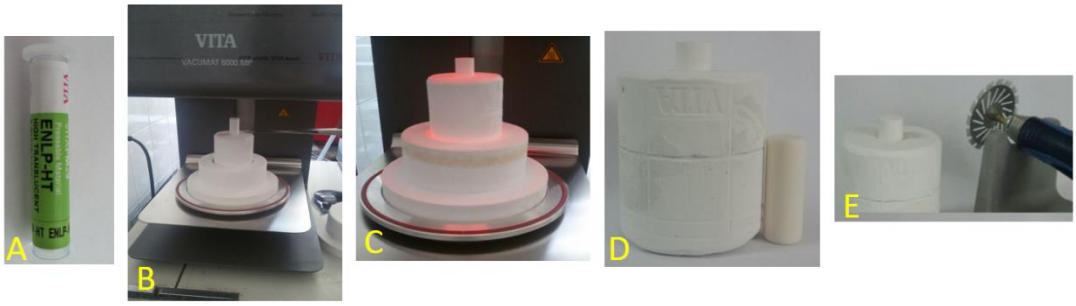

Figure 8. A. Vita PM9 ingot – case 1; B, C. Pressing stage within the ceramic furnace – case 1; D. Marking the length of the plunger for divesting – case 1; E. Diamond disc for sectioning de investment material – case 1

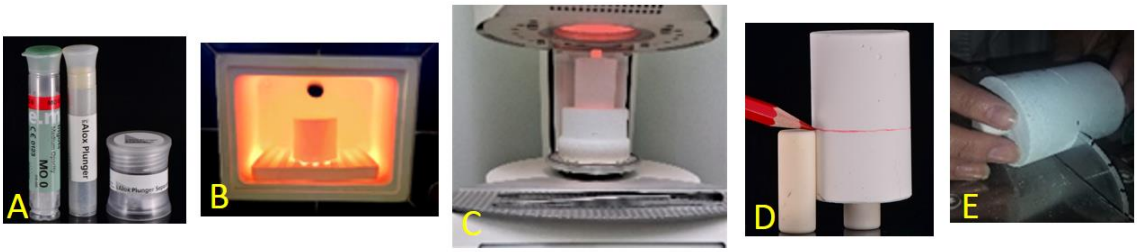

Figure 9. A. IPS e.max Press ingots – case 2; B. Preaheating oven – case 2; C. Ceramic furnace – case 2; D, E. Marking the length of the plunger and sectioning the investment material for divesting – case 2

For both cases, prior to unpacking, sandblasting (4bar/2 bar) was performed, and for case 2, removing the reaction layer was obtained with help of Invex Liquid (flourhidric acid) (Figures 8, 9).

For case 1, a diamond disc was used to separate the crowns from the pressing rods along with diamond burs at low speed for the axial walls (Figure 8).

For case 2, in order to reduce a uniform thickness of the copings, guide lines were drawn on the dies prior to grinding with diamond burs and abrasive stones for pressed ceramics (Figures 10-12).

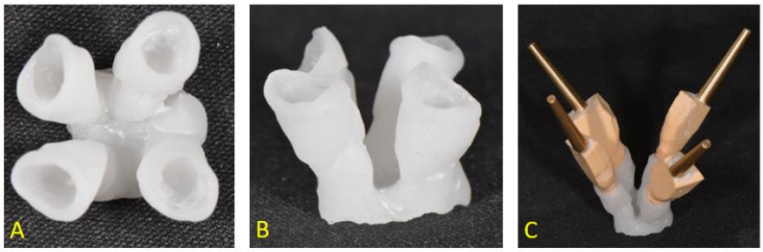

Figure 10. A, B. Pressed copings – case 1; C. Pressed copings adapted on the dies – case 1

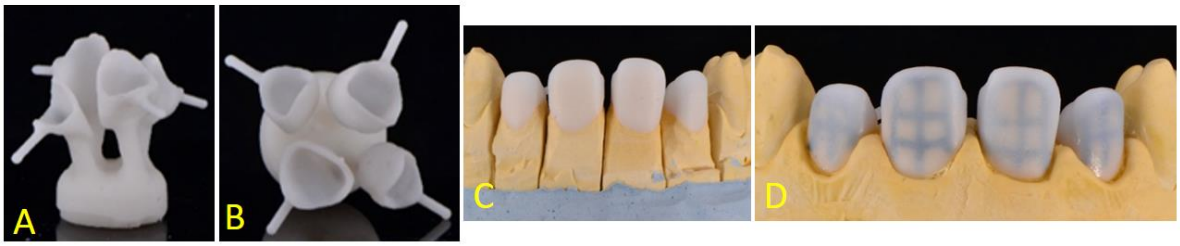

Figure 11. A, B – pressed copings – case 2; C. Pressed copings adapted on the dies – case 2; D. Reduced copings – case 2

For case 1, after the try-in, external stain (vita Stain) and glaze (Vita Akkzent Glaze 780˚C, 1 minute) was carried out for individualization (Figure 12).

For case 2, wash firing was performed to provide the bond between the pressed and layered ceramics using IPS e.max Ceram Shade and Essence. Layering was then carried out with dentin, incisal, effects and finishing with glaze (Figure 13).

Figure 12. Finishing stage – case 1; B, C. Grinding stages before external glaze

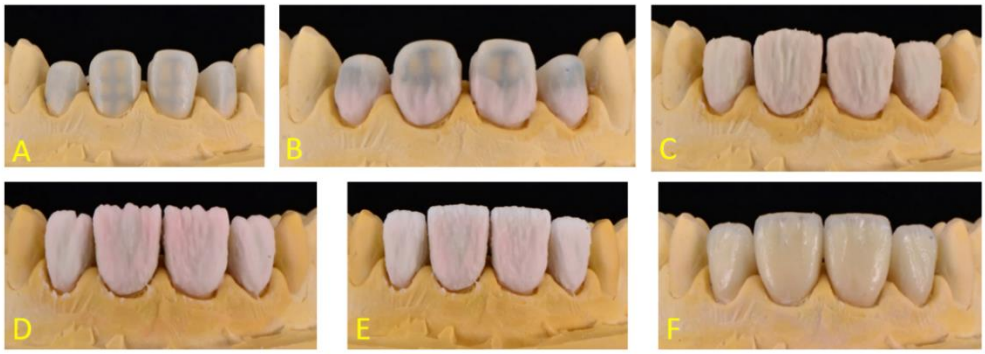

Figure 13. A. Copings after wash foundation firing – case 2; B. Powder Dentin A1 in the cervical third and Cervical Transpa orange-pink – case 2; C. Power Dentin – case 2; D. Layering of Transpa Neutral – case 2; E. Enamel – case 2; F. Mamelon Light, Mamelon Salmon and Visual Eyes – case 2

Layering began with the application of the Cervical Transpa Orange-Pink mixture in a ratio of 1:1 in the cervical third of Power Dentin A1 and Cervical Transpa. Power Dentin ceramics provides the brightness of the restorations, being applied over the previous layers with increased opacity, and Cervical Transpa was used for obtaining a depth effect in the third cervical. The primary shape of the restoration was achieved using a Dentin A1 and Transpa Neutral blend, redfenring transparency regardless of the substrate and replicating the enamel of natural teeth.

Using the cut back technique, incisal space for Opal Effect 1 was obtained in order to provide translucency, opalescence and increased brightness. After removing the shiny, glaze like aspect by grinding, layering was carried out by completing the cervical third with Dentin A1 and individualization with Mamelon Light (medial and distal) and Mamelon Salmon (middle third). These powders were mixed with Visual Eyes liquid that offers visualization of the chromatic result before the ceramic sintering. Following the second sintering, finishing was accomplished, aiming to obtain the surface texture. The surface of the restoration was colored with the use of articulating paper highlighting thus the surface texture. The surface of the restorations analyzed and prepared for glazing (Figures 14, 15).

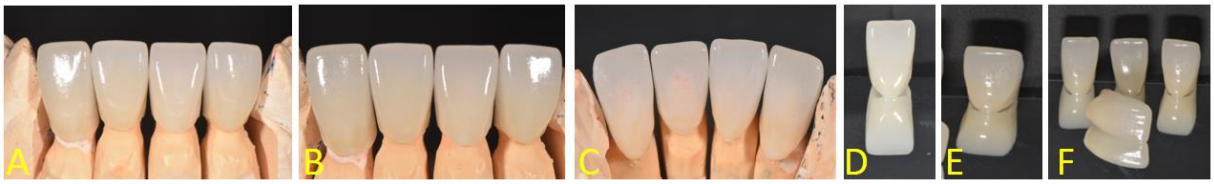

Figure 14. A-C. Glazed restorations – case 1; D-F. Finished restorations – details – case 1

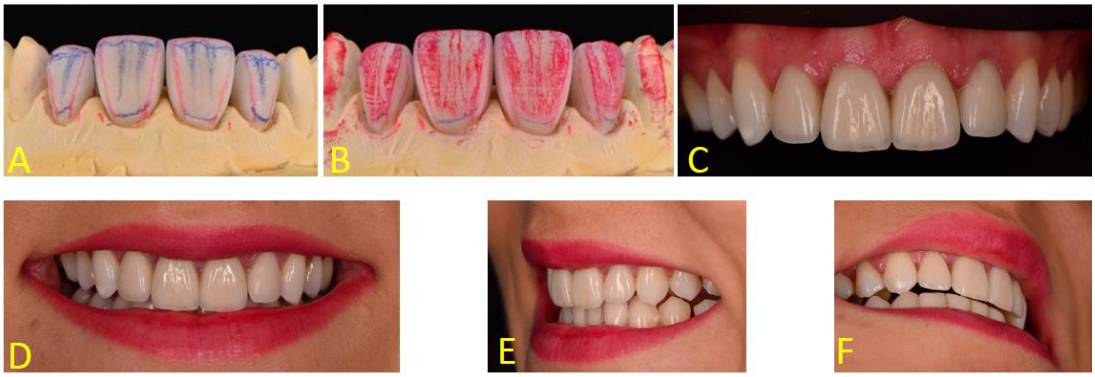

Figure 15. A, B. Highlighting morphology and surface texture through color and drawing – case 2; C-F. Finished restorations – case 2

CONCLUSIONS

Pressed reconstructions represent, in modern treatments, a high percentage of the prosthetic reconstructions, replacing especially in the front area the metal-ceramic reconstructions, but due to the strength of the used pressing materials [14], the lack of abrasion of antagonists [16] and the precise marginal fit [17-21], they are widely used also in the premolar-molar area. Chromatic stability, low thermal conductivity, integrity maintenance of marginal periodontal tissues through positioning of the preparation limit, good surface density and the glossy appearance of glazed ceramics which lead to an excellent biocompatibility are also features which make the pressing techniques very popular among dentists and technicians.

Both clinical cases resulted in very good marginal adaptation, highly esthetic results and perfect functional integration.

Acknowledgement

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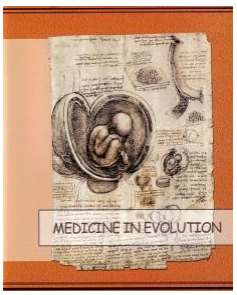
REFERENCES

1. Craciunescu E, Sinescu C, Negrutiu ML, Pop DM, Lauer HC, Rominu M, Hutiu G, Bunoiu M, Duma VF, Antoniac I. Shear bond strength tests of zirconia veneering ceramics after chipping repair. Journal of Adhesion Science and Technology. 2016; 30(60):666-676.
2. Petrescu EL, Negrutiu ML, Pop DM, Rominu RO, Topala FI, Fabricky M, Rusu LC, Ardelean L, Rominu M, Podoleanu AG, Sinescu C. Comparative and non-invasive study of two different ceramic materials. Rev Chim. 63(2); 2012:179-181.
3. Conrad HJ, Seon WJ- current ceramic materials and systems with clinical recommandations: a systematic review; J Prosth Dent. 2007; 98; 389-404
4. Ansong R, Flinn B, Chung KH, Mancl L, Ishibe M, Raigrodski AJ.Fracture toughness of heat-pressed and layered ceramics.J Prosthet Dent. 2013; 109(4):234-40.
5. Christgau M, Friedl KH, Schmalz G, Resch U. Marginal adaptation of heat-pressed glass-ceramic veneers to dentin in vitro.Oper Dent. 1999; 24 (3):137-46.
6. Guess PC, Vagkopoulou T, Zhang Y, Wolkewitz M, Strub JR.Marginal and internal fit of heat pressed versus CAD/CAM fabricated all-ceramic onlays after exposure to thermo-mechanical fatigue. J Dent. 2014; 42(2):199-209.
7. Manole M., Stănescu M., Mutoiu A.S., Grecu A., Burde A.V., Baciu S. Technical aspects in the restoration of arches in the front area by layering of pressed structures. Medicine In Evolution. 2018; 14(4):401-407.

8. Hamza TA, Ezzat HA, El-Hossary MM, Katamish HA, Shokry TE, Rosenstiel SF. Accuracy of ceramic restorations made with two CAD/CAM systems. J Prosthet Dent. 2013; 109(2):83-7.
9. Azar B, Eckert S, Kunkela J, Ingr T, Mounajjed R The marginal fit of lithium disilicate crowns: Press vs. CAD/CAM. Braz Oral Res. 2018;32: e001..
10. Schaefer O, Watts DC, Sigusch BW, Kuepper H, Guentsch A. Marginal and internal fit of pressed lithium disilicate partial crowns in vitro: a three-dimensional analysis of accuracy and reproducibility. Dent Mater. 2012; 28(3):320-6.
11. Subasi G, Ozturk N, Inan O, Bozogullari N. Evaluation of marginal fit of two all-ceramic copings with two finish lines. Eur J Dent. 2012; 6(2):163-8.
12. Ivoclar Vivadent technical, IPS E.max Press Monolithic Solution; 2014.
13. Ivoclar Vivadent technical, IPS E.max Ceram; 2009.
14. https://www.vita-zahnfabrik.com/en/L20-83159,27568,pm9.html
15. Guazzato M, Albakry M, Ringer SP, Swain MV. Strength, fracture toughness and microstructure of a selection of all-ceramic materials. Part I. Pressable and alumina glass-infiltrated ceramics. Dent Mater. 2004;20:441-448.
16. Berge HX, Sorensen JA, Edelhoff D. Split energy factor theory in fracture analysis of dental ceramics. J Dent Res. 2001;80:57.
17. Homsy F, Bottin M, Özcan M, Majzoub Z.Fit Accuracy of Pressed and Milled Lithium Disilicate Inlays Fabricated From Conventional Impressions or a Laboratory-Based Digital Workflow.Eur J Prosthodont Restor Dent. 2019; 22;27(1):18-25.
18. Homsy FR, Özcan M, Khoury M, Majzoub ZAK.Comparison of fit accuracy of pressed lithium disilicate inlays fabricated from wax or resin patterns with conventional and CAD-CAM technologies. J Prosthet Dent. 2018; 120(4):530-536
19. Mounajjed R et al. Dent Mater J. The marginal fit of E.max Press and E.max CAD lithium disilicate restorations: A critical review. Dent Mater J. 2016; 35(6):835-844.
20. Shamseddine L et al Marginal and internal fit of pressed ceramic crowns made from conventional and computer-aided design and computer-aided manufacturing wax patterns: An in vitro comparison.. J Prosthet Dent. 2016; 116(2):242-8
21. Homsy FR et al. Marginal and internal fit of pressed lithium disilicate inlays fabricated with milling, 3D printing, and conventional technologies. J Prosthet Dent. 2018; 119(5):783-790.

Clinical crown reshaping in bilateral isolated microdontia – a case report



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Abstract

The microdontia frequently appears at the level of the last teeth of each dental group, the most targeted being the upper lateral incisors, the lower premolars or the lower molars. Using the composite material in a transparent celluloid crown as a conformer, adapted to the coletal line (in case of restoration of the entire dental morphology) or of a half crown adapted to the coletal line and proximal to the prepared surface (if only a portion of the dental morphology is being restored) applied to the tooth that is intended to be restored can lead to favorable and rapid solutions.

Keywords: bilateral microdontia, interdisciplinary treatment, enameloplasty, upper lateral incisors.

INTRODUCTION

As in the case of unilateral isolated microdontia, the bilateral variant occurs more frequently in the last teeth of each dental group, the most targeted being the upper lateral incisors, the lower premolars or the lower molars. From a clinical point of view, in the situation of symmetrical anomaly, the discrepancies between the counterparts are no longer, but only in comparison with the neighboring teeth. Boboc [1], and Ionescu [2, 3] also consider in this anomaly the implication of a phenomenon of phylogenetic reduction of the number of teeth.

Regarding therapy methods, there are the composite materials (direct restorations) or the veneers (direct or indirect restorations).

For the preparation for adhesion techniques, in the literature it is proposed [5-10] the following algorithm: a quantity of composite is applied on the tooth surface with an oral spatula dampened in adhesive, after which the coronary matrix is filled with composite material and placed on the tooth in the correct position and with finger pressure. It will be light cured for a longer time (60 s) buccal and oral, and the excess will be removed. Surface finishing is done with tapered diamond burs, and marginal finishing with flexible discs. The restoration should be checked in the centric position, in propulsion and laterality.

A particularization of the techniques of applying direct composite materials by layering or coating is the veneer.

CASE REPORT

In the case of the patient S.O. we tried to treat a bilateral isolated microdontia (upper lateral incisors) by in office enameloplasty.

I. Anamnesis and clinical examination data

The reason for presenting of the patient S.O., female, 24 years old, was determined by the existence of small superior lateral incisors, with modified shape and with altered esthetics.

The clinical examination revealed the presence of: two lateral small upper incisors; of post-extractional single-tooth edentulous breaches in the all four quadrants (lack of 2.6, 3.6, 4.6 and 1.5), mesio-inclination towards edentulous space of the limiting teeth (especially the remaining molars); at the level of the right upper hemiarch with almost completely space closure by 2.7, half-cusp distalized ratio on the left canine level.

The crown fillings are present, partially physiognomic in the molar or premolar groups. At the level of the upper left central incisor and there is also a color change (Figure 1).

Figure 1. Patient S.O., 24 years old, female, with dento-alveolar disharmony with spacing and bilateral microdontia of the upper lateral incisors (a-d - intraoral aspects) (personal case)

II. Paraclinical investigations

The OPT shows an endodontic treatment at the level of 2.1; all four wisdom molars are in aligned position on the arch. The over 60° mesioinclination of 2.7 caused the resorption of the alveolar bone in the distal area of 2.5 to the apical third, and the mesioinclination of 3.7 and 4.7 at an angle of approx. 45°, next to that of 2.7 (Figure 2 arrows) and the distal inclination of 1.4 determined a significant reduction of the space of edentulous breaches.

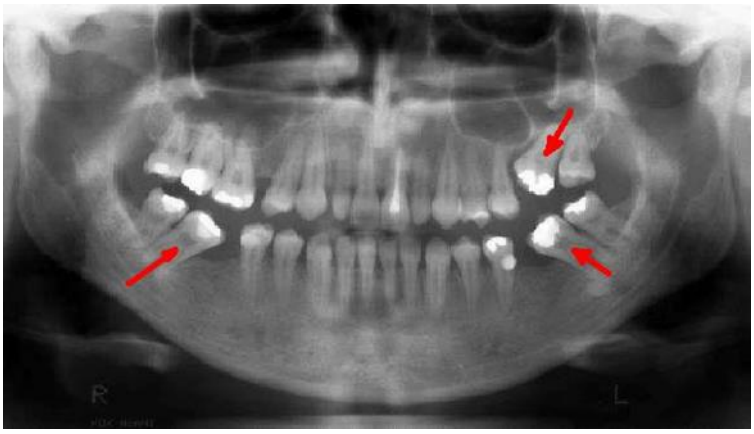


Figure 2. The S.O. patient, 24 years, female, OPT with bilateral microdontia of the upper lateral incisors (personal case)

III. Diagnosis

The diagnosis was of bilateral microdontia of the upper lateral incisors (dwarfism) with the existence of simple and complicated dental lesions, partially treated correctly and of an unbalanced occlusion determined by the presence of single-tooth lateral non-treated edentations in each four quadrants.

IV. Treatment and evolution

Correction of the aesthetic appearance of the two upper lateral incisors, due to their pointed shape and the small volume compared to the other teeth, we performed by enameloplasty on the entire coronary surface (coronoplasty).

For an easy manipulation of the light-curing composite material (A2, Charisma®, Heraeus-Kulzer, Germany) during the 1.2 and 2.2 enameloplasty we used celluloid crowns (Frasaco, Italy) perforated at the incisal level to eliminate excess material and adapted cervical to the clinical situation.

In the clinical phase of ameloplasty we have followed the steps:

- isolation of the upper lateral incisors,
- the enamel was only demineralized with 34% ortho-phosphoric acid (UltraEtch, Ultradent, UK), for 20 s, following the washing of the area and its drying
- applying the glue (Gluma® Comfort, Heraeus-Kulzer) according to the manufacturer's instructions
- inserting the composite into the celluloid crown with a buccal spatula and then additionally pressed at the incisal angle to remove any air bubbles. We placed the cap on the tooth, checking its orientation and position, and the excess composite was removed with a probe. After light curing polymerization, 20 s on the vestibular face and 20 s on the palatal face, the celluloid crown was removed with a probe.

Finally, mimicking of natural dental appearance (Figure 3), the patient declared herself satisfied [11, 12]. Due to the use of the celluloid crown, resulted a glossy surface, not needing finishing, but only occlusal and gingival marginal adaptation.

Figure 3. Enameloplasty of the upper lateral incisors using the celluloid crowns during orthodontic treatment in the SO patient, 24 years, female (personal case)

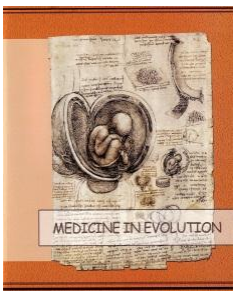
DISCUSSIONS

Even though the patient is still under orthodontic treatment for closing the edentulous gaps by moving the limiting teeth, redistributing the spaces and harmonizing the intermaxillary relationships (the ameloplasty beeing performed during the orthodontic treatment) we believe that this type of hybrid composite with ultrafine filler particles (Charisma ultrafine®, Kulzer, Germany) represented an efficient solution for the crown restoration of the upper lateral incisors in the context of harmonization of the two arches.

REFERENCES

1. Boboc G – Anomaliile dento-maxilare, Ed. Med., Bucureşti, 1971
2. Ionescu E – Anomaliile dentare de număr, Ed. Cerma, Bucureşti, 2000
3. Ionescu, E – Anomaliile dentare, Ed. Cartea Universitară, Bucureşti, 2005
4. Matei R., Todor L., Porumb A., Ciavoi G., Todor B., Dalai C., Tofan S.A., Teodorescu E., Composite layering enameloplasty in unilateral upper incisor anodontia – a case report, Medicine in Evolution, 2017, 23(2), 212-216
5. Horwat, A.P., Capp, N.J., Barrett, N.V.J., Colour atlas of occlusion and malocclusion, Wolfe Publishing Ltd, Aylesburg, 1991, 129-137, 147-148
6. Miyawaki, S., Shiai, Y., Takada, K., Changes in the masticatory jaw movement following orthodontic traction of an impacted and transposed upper canine and occlusal adjustment, Clin Orthod and Research, 2001, 4(1), 43-49
7. Buzatu R., Boloş C.O., Câlniceanu H., Scrobota I., Ciavoi G., Vâlceanu S.A., Onisei D., Changes of aesthetic characteristics in patients undergoing orthodontic treatment, Medicine in Evolution, 2017, 23(2), 165-167
8. Blackwood, JA, Dilley, DC, Roberts, MW, Swift jr., EJ, Evaluation of pumice, fissure enameloplasty and air abrasion on sealant microleakage, Ped Dent, 2002, 24, 199-203
9. Popa, M.B., Estetica în odontoterapia restauratoare, Ed. Univ. Carol Davila, Bucureşti, 2005
10. Cocârlă, E., Ortodonție, Tip. UMF „ Iuliu Haţieganu” , Cluj-Napoca, 1995
11. Berk, NW, Dukich Bush, H, Cavalier, J, Kapur, R, Studen-Pavlovich, D, Sciote, J, Weyant, RJ, Perception of orthodontic treatment need: opinion comparissons of orthodontists, pediatric dentists and general practitioners, J Orthod, 2001, 29, 287-291
12. Levai M.C., Rusu L.C., Podariu A.C., Tofan S.A., Anculia R.C., Popovici R.A., Communication barriers in the doctor's office or medical organizations, Medicine in Evolution, 2016, Vol. XXII, Nr. 4, p. 585-594, ISSN: 2065- 376X

Current knowledge and practices of dental technicians based in Romania regarding additive manufacturing



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Abstract

Objective: The purpose of this study was to evaluate the degree knowledge, acceptance and usage of additive manufacturing systems among dental technicians based in Romania and to identify the factors which contribute/ inhibit the usage of this technology.

Materials and methods: For this purposes, a web-based survey containing 20 questions was distributed by means of an online social platform to dental technicians practicing in Romania. The questionnaire focused on topics related to the level of usage and common practices regarding additive manufacturing, demographics and perception of impact.

Results: The majority of the respondents affirmed that they have theoretical knowledge about this technology (90.4%), while only 18 dental technicians (27.2%) reported that they currently use some form of additive manufacturing technology in their laboratories. The majority of dental technicians (78.7%) consider the introduction of additive manufacturing systems had no negative impact on their profession.

Conclusions: Currently, a moderate number of dental technicians in Romania are using additive manufacturing in their clinical practice, mainly due to the large initial investment required for purchasing such a system.

Keywords: additive manufacturing, survey, 3D printing, dental technician

INTRODUCTION

In regard to the field of contemporary dental technology we can, without a doubt, report rapid changes that take place worldwide and are mainly due to several important factors, such as: increased patient demand for highly aesthetic and functional prosthesis, new types of dental materials, labor availability and the introduction of new digital technologies.[1]

Digital technologies currently represent a common set of tools that are used during patient examination, planning and treatment in all the fields of dentistry, having a strong impact on them in daily practice [2]. Through the introduction of these digital technologies arises the possibility of using new types of materials and of increasing quality control of the produced restorations [3] while also substantially the work volume of dental technicians.[4]

In this field of dental technology, there are endless possibilities to exploit the means of digitization, starting with the incorporation of digital patient charts [5], digital color maps [6], digital smile design [7], and finally, the production of personalized dental restorations through the use of computer assisted manufacturing, in the form of subtractive or additive manufacturing [8,9]. While these technologies have been implemented and available in the commercial and dental field for more than 30 years [8, 10], there are only a limited number of studies that focus on the actual degree of use of this technology by dental technicians[11]. Taking these facts into account, we consider that it is beneficial to analyze the effects of additive manufacturing technology in the dental field, because both digital and classical methods have reached a level of performance that allows a comparative analysis[12]. Beyond any prejudices and premature choice of a drastic position in this relationship, critical thinking is needed on the basis of concrete data. Through this analysis, we aim to understand the benefits and disadvantages of using additive manufacturing, to what extent this technology is incorporated into the daily practice of dental technology laboratories in Romania, which are the problems that need to be improved before the new technology becomes a standard.

Aim and objectives

The current study aims to evaluate the degree of interest and use of additive manufacturing technology among dental technicians. As a global assessment of this population is impossible, due to the very large number of subjects and language barriers, this study was conducted on the population of active subjects in Romania.

As secondary objectives, the study aims to determine:

- The level of familiarity with the additive manufacturing technology
- The level and mode of use and exploitation of the additive manufacturing technology
- The perceived advantages and disadvantages of the additive manufacturing systems
- The perceived impact of this technology on the technicians.

MATERIALS AND METHODS

In order to carry out this study we used an original survey comprised 20 original and invalided items, built on the considerations provided by the specialized literature [11,13-14] and our previous studies [15]. For an improved quantification of the results, all the questions asked in the questionnaire, except for one item, were closed, with multiple choice answers. The questionnaires were distributed via two online methods: by e-mail and by using a socialization platform (Facebook) on several group dedicated to dental technicians based in Romania. The questionnaire was designed using an online hosting platform (Google Forms).

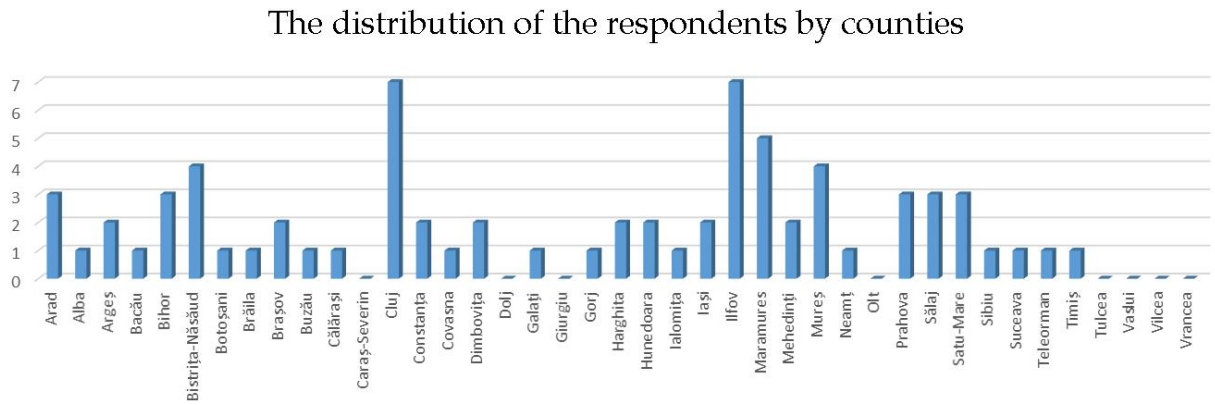
In order to improve the quality of the original items and to optimize and validate the survey, a pilot test was carried out with the purpose of pretesting the designed questionnaire. A number of three dental technicians were asked to complete the questionnaire online and to

provide feedback on the clarity of the questions, the accessibility of the answers provided and the time required to complete the entire questionnaire. Some questions have been modified or reformulated to give a better understanding of the meaning and to eliminate errors in the formulation of the questions or answers. After testing the online platform, a link was sent to the target population through the two virtual environments, inviting them to participate in this study. In this link, the virtual address of the online hosting platform was entered, and the researcher explained in detail the purpose of the study, the procedures that will be used to collect the data and a confidentiality clause for the participants. The participants were informed about their rights to voluntarily accept or refuse participation and the possibility to withdraw from the study at any time, without constraints.

The questionnaire consisted of 3 sections that evaluate the following aspects: a) the degree of familiarity and the way of acquiring information about the additive manufacturing technology; b) the degree of current use and the foreshadowed degree of future use of this technology; and c) the perception of the impact of this technology. Given that the current study focuses only on active dental technicians in Romania, the sample was established after identifying the total number of subjects in the target population. Thus, to estimate the total number of dental technicians registered in Romania, we used the statistics provided publically by the Order of Dental Technicians in Romania. According to this source, in Romania, in December 2018, there were approximately 3700 registered technicians, in the 41 counties on the territory of the country. Thus, we determined that in order for the results of this questionnaire to be representative for the entire target population (in our case 3700 subjects), based on a 90% confidence interval and the 10% margin error, a number of 67 subjects is sufficient. The resulting was analyzed by descriptive statistics, being illustrated as graphs and percentages using Excel (Microsoft Office) software.

RESULTS

In regards to the response rate of the target population, out of the 3700 dental technicians in Romania, a number of 73 valid questionnaires were obtained, thus obtaining a response rate of 1.97%. The distribution of respondents by counties is shown in Figure 1. The vast majority of respondents (73.9%) are situated in the 20-40 age bracket, while 17 technicians (23.2%) fall into the 40-60 age bracket, and only 2 technicians (2.73%) were over the age of 60.



Graphic 1. Total number of responses by county

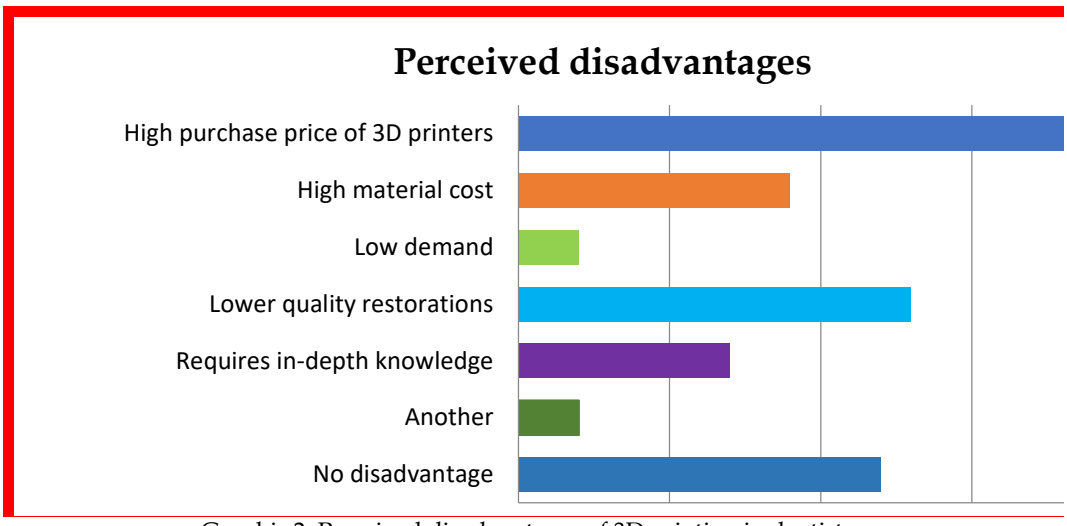
Out of the 73 respondents, the majority of 66 subjects (90.4%) stated that they are familiar with the additive manufacturing technology, while a number of 7 subjects (9.5%) stated that they do not any have information related to this technology. The subjects who reported having no knowledge of additive manufacturing systems were redirected to a special section of the survey, which was addressed to both those who were familiar with this technology and also who did not poses any knowledge about this subject.

In regards to the 66 technicians that declared that they are familiar with additive manufacturing, 48 subjects (72.7%) declared that they do not use this technology in the clinical practice, while only a number of 18 technicians (27.2%) use additive manufacturing technology in their laboratory. Regarding the sources of information on this topic, a number of 8 technicians (12.1%) acquired their information during their studies, 34 subjects representing the majority with a rate of 51.5%, obtained their information from congresses or conferences that they attended, a single person (1.5%) reported self-documentation from scientific literature, 12 subjects (18, 1%) obtained information on 3D printing through self-documentation on the Internet, and 11 technicians (16.1%) discovered this technology with the help of mass-media.

Out of the total number of 66 dental technicians who have knowledge about additive manufacturing, 27 subjects (40.9%) know more than one process of additive manufacturing, a number of 16 people (24.2%) know only a single process, and a number of 23 technicians (34.8%) did not know what to answer or refused to answer this question. Regarding the materials that can be processed through this technology, a number of 31 subjects (46.9%), consider that plastics, polymeric resins and metallic alloys are among the materials used in additive manufacturing, while a number of 11 technicians (16.6%), consider that these materials cannot be used in this technology, and a number of 24 subjects (36.5%), do not know if these materials can be used in 3D printing or refused to answer.

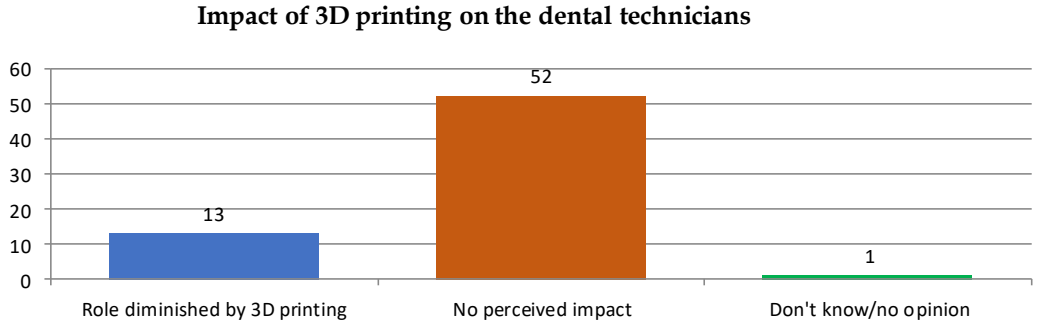
Regarding the perceived accuracy of the objects obtained by 3D printing, the vast majority of the respondents represented by a number of 53 subjects (80.3%), considers that, by using this technology, precise objects can be made, while only a number of 13 technicians (19.6%) believe that objects obtained through additive manufacturing are inaccurate. When the subjects were asked, if this technology is currently used in dental technology, 48 technicians (72.7%) gave an affirmative answer, a number of only 4 subjects (6.06%) considered that additive manufacturing is not used in field, while a number of 14 subjects (21.2%) do not known or refused to answer this question. In regards to the manufacturing time of the printed parts, a considerable number of 31 subjects (46.9%) consider that the use of these systems, shortens the processing time by comparison to the conventional methods, while a number of 10 subjects (15.5%), consider that the use of these systems does not have a beneficial effect on the processing time of different types of restorations. The rest of 25 participants (37.8%), do not have sufficient information about the processing time of 3D printed restorations or have decided not to answer.

Among the main disadvantages perceived, by the dental technicians, in the use of additive manufacturing systems are, the high initial investment which was mentioned by a number of 21 subjects (28.7%), 9 technicians (13.6%) consider that the materials used in this technology have a high purchase cost, 2 subjects (3.03%) considered that the demand is low for such services, a number of 13 technicians (19.6%) claim that the restorations obtained by these methods have a lower quality, while another 7 technicians (10.6%) consider that in order to use this type of systems it is necessary to possess in-depth knowledge about this technology. A number of 2 subjects (3.03%) have other reasons why they consider that these systems cannot be used in the dental field, while 12 technicians (18.1%) consider that this technology has no main disadvantage, as can be seen in Graphic 2.



Graphic 2. Perceived disadvantages of 3D printing in dentistry

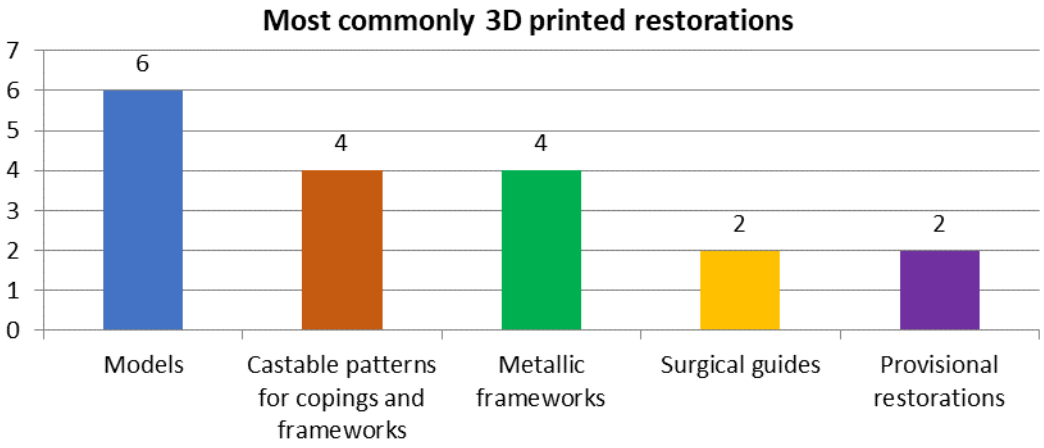
In regards to the impact of 3D printing on the profession of dental technician, the majority of 52 (78.7%) considered that the use of additive manufacturing systems does not diminish the dental technician's role in performing prosthetic restorations, while a number of 13 subjects (19.6%), claim that the use of this technology, decreases the role of the dental technician in the manufacturing process of prosthetic restoration, as can been seen in Graphic 3.



Graphic 3. The perceived impact of 3D printing on the dental technicians` profession

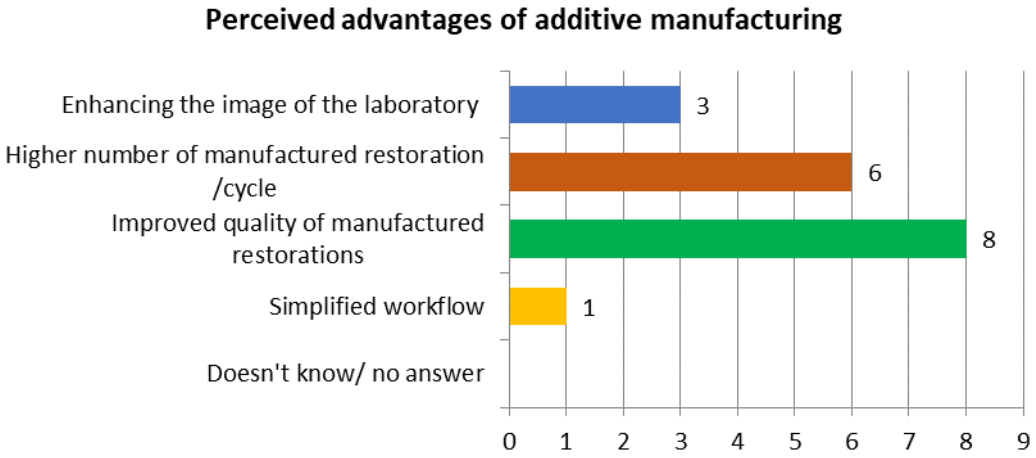
Out of the total number of respondents who reported that they are familiar with additive manufacturing, only 18 technicians (27.2%) use this technology in their clinical practice. For this purpose we created a survey section that was dedicated to users only, as we wanted to determine the current level and mode of exploitation of additive manufacturing technology. Out of this 18 subjects, 14 practitioners (77.7%) reported using resin-based printers (Stereolithography or Direct Light Projection) and 4 users of metal-alloy printers (Selective Laser Melting or Selective Laser Sintering).

The users were asked to name the most common type of restoration that they manufacture through 3D printing. A number of 6 users (33.4%) reported 3D printing dental models through this technology, 4 technicians (22.1%) create copings and frameworks out of castable resin, 4 subjects (22.1%) create metallic frameworks, 2 users (11.2%) 3D print surgical guides and another 2 technicians (11.2%) manufacture provisional prosthetic works, as can be seen in Grapic 4.



Graphic 4. The most commonly manufactured restoration reported in the user group

According to the respondents, among the main advantages of this technology are, the quality of the restorations that is considered to be superior compared to the manual manufacturing according to the 8 technicians who chose this answer, the second advantage, 6 technicians mentioned the ability to produce a large number of restorations in a single cycle which leads to shortened working time, 3 respondents mentioned the capacity of additive manufacturing systems in improving the image of the laboratory and thus attracting more collaborators, and also, one technician mentioned the simplified workflow of additive manufacturing by comparison with conventional manufacturing, as can be seen in Graphic 5.



Graphic 5. The perceived advantages of additive manufacturing according to the users group

Regarding the main disadvantages of additive manufacturing systems, more than half of the respondents (66.6%) mentioned that the main disadvantage is the initial purchase price of these systems, followed by the high cost of materials used by these systems (27.7%). Another answer to this question which was mentioned by two technicians (5.7%) was the low level of aesthetics of printed restorations by comparison with conventional restorations.

DISCUSSIONS

The questionnaire used in the present study was designed with the purpose of assessing the impact of additive manufacturing technology on oral health service providers, as well as determining the level of familiarization and use of this technology.

According to the results depicted in Graphic 1, Cluj and Ilfov counties have achieved a high number of responses, due to the social and cultural development of these counties, but also because of the high number of technicians which are active in this area. However, we cannot state that this survey represents an accurate depiction of the whole country of Romania because we did not receive any valid answers from some counties (Vrancea, Vaslui, Tulcea, Olt, Giurgiu, Dolj, Caras-Severin).

Out of the total number of technicians who participated in this study, an impressive number of 66 respondents are familiar with computing techniques and additive manufacturing, acquiring their information mainly from participating in diverse congresses or symposiums. However, out of these 66 respondents who have some degree of knowledge about additive manufacturing, only 27.2% (18 technicians) use this technology in clinical practice.

Even though the surveyed dental technicians believe that the use of 3D printers could shorten the manufacturing time of dental restorations and the quality of the obtained parts would be superior to conventional techniques, the main impediment in using 3D printers is the high initial investment, followed by the low degree of aesthetics of the resulting restorations.

CONCLUSIONS

Currently, a relatively small number of dental technicians based in Romania use additive manufacturing systems in their clinical practice, but most are aware of this technology and do not consider that this technology will diminish their role in the production of dental restorations. Although the participants have reported that these systems have multiple advantages over conventional techniques for manufacturing prosthetic restorations, the initial purchase price is a deterrent to large-scale implementation of this technology.

Acknowledgement

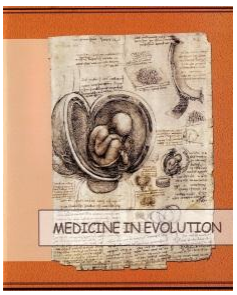
All four authors have had the same contribution to this study and to the writing of this article and therefore should be considered main authors.

REFERENCES

1. Olin P, Clay D, Look J. Current prosthodontic practice: a dental laboratory survey. J Prosthet Dent. 1989;61(6):742–5.
2. Miyazaki T, Hotta Y. CAD/CAM systems available for the fabrication of crown and bridge restorations. Aust Dent J. 2011;56(1):97–106.
3. Trost L, Stines S, Burt L. Making informed decisions about incorporating a CAD/CAM system into dental practice. J Am Dent Assoc. 2006;137(Suppl:32S-36S.).
4. Boynton P, Greenhalgh T. Selecting designing, and developing your questionnaire. BMJ. 2004;328(7451):1312–5.
5. Cooper BR. Patient education software: technology in the dental office. Dent Assist. 1994;76(3):16–7.
6. Chu SJ, Thrushkowsky RD, Paravina RD. Dental color matching instruments and systems. Review of clinical and research aspects. J Dent. 2010;38 Suppl 2:e2-16.
7. McLaren EA, Goldstein RE. The Photoshop Smile Design Technique. Compend Contin Educ Dent. 2018 May;39(5):e17-e20.
8. Bruno M, Soizick N. En première mondiale aux entretiens de Garancière: Démonstration de l'empreinte Optique. Tonus Dentaire. 1983;11–4.
9. Cotrut MC, Ciuca S, Miculescu F, Antoniac VI, Târcolea M, Vrânceanu MD. The Influence of Classical and Modern Manufacturing Technologies on the Properties of Metal Dental Bridges. Key Eng Mater. 2014;583:163-8.

10. [Madhav VN V, Daule R. Rapid Prototyping and its Application in Dentistry. 2013;2(2):57–61.
11. Shopova D, Mihaylova A, Petleshkova P, Bakova D. Study of dental specialists' awareness of additive manufacturing in dental practice. Biomed Res. 2019; 30(3):410-12.
12. Zaharia C, Gabor A, Gavrilovici A, Stan A, Idorasi L, Sinescu C, Negruțiu M. Digital Dentistry – 3D Printing Applications. J Interdiscip Med.2017; 2(1): 50-53.
13. Boynton P, Greenhalgh T. Selecting designing, and developing your questionnaire. BMJ. 2004;328(7451):1312–5.
14. Millenium Research Group. More dental labs outsourcing custom crown and bridge production. NewsRX LLC. 2008; Available from: http://www.prnewswire.com/news-releases/more-dental-labs-outsourcing-custom-crown-and-bridge-production-56862242.htm
15. Burde AV, Baciu S, Popa D, Constantiniuc M, Manole M, Kallay E, Câmpian RS. Highlighting knowledge, attitude and practices regarding CAD/CAM technology among oral healthcare providers in Cluj-Napoca. International Journal of Medical Dentistry. 2016; 6(4); 293-300.

Modification of salivary Ph in the bearers of fixed orthodontic appliances



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Abstract

In patients with fixed orthodontic appliances, the application of measures in their oral-dental hygiene become even more complicated due to the presence of brackets, wire arches, rings, ligatures, elastics, and others. It is therefore essential to raise awareness in patients about the need to apply rigorously the oral-dental hygiene measures in order to prevent demineralization, and in more severe caries even the periodontal diseases. The study aims to demonstrate that patients wearing fixed orthodontic appliances develop a lower salivary, acidic pH. Demonstrating a decrease in pH in these patients, we also want to educate them on a proper oral hygiene. The study was conducted over a period of two months and included 27 patients, followed by changes in salivary pH, before and after 2 months after fixing the fixed orthodontic appliance. The results of the measurements showed that in only 2 months from the application of the fixed orthodontic appliance, slight decreases of salivary pH begin, which in the longer term could lead to much more serious situations, if patients do not pay particular attention to oral hygiene.

Keywords: salivary pH, fix orthodontic appliances, oral hygiene.

INTRODUCTION

The abbreviation pH comes from the Latin word "hydrogen potency", which translates as "hydrogen ion concentration". [1] The pH scale of acidity ranges from 0 to 14, 0 representing the highest acidity and 14 the highest basic value. The neutral pH value is 7.

PH is the measurement of the degree of acid or basic reaction of an aqueous solution. The concentration of hydrogen ions contained in this solution is measured by pH. Because the human body is made up of 70% water and all metabolic reactions thus occur in an aqueous environment, the pH of these fluids, especially those fluids that are excreted, such as saliva and urine, can be measured.

At rest, the average salivary pH is about 6.7 (5.2-7.6), showing variations within wide limits (5.6-8). The pH is sensitive to changes in the salivary flow. After stimulation of the glands the pH increases to 8 due to the growth of bicarbonate. The pH is increased in children, in hyperpnea, alkalosis. PH decreases in intense exercise, in diabetes.

Salivary pH depends on: blood carbon dioxide concentration; nutrition; salivary buffer systems; the presence of carbonic anhydrase; the salivary flow rate, and others.

In addition to its digestive role, saliva is an essential element in maintaining the normal trophicity of the tissues in the oral cavity and by this, in maintaining the structure and stability of the teeth in the alveolus.

The roles of saliva are multiple: digestive, protective, excretory, endocrine, in the hydro-electrolytic station, in thermoregulation, in speech.

The direct antibacterial function is achieved by a complex mechanism in which the following participate: salivary proteins (lysozyme with bacteriolytic effect), lactoferin with a role of iron fixation, inhibits the proliferation of ferodependent bacteria and the peroxidase system that determines the oxidation of salivary thiocyanate and the formation of hypotiocyanate, a strong oxidizing agent.

Antifungal function is made of histatines, cationic proteins rich in histidine.

The following occur in *antiviral* defence: lactoferin, lysozyme, peroxidase system, gA, mucin, and virus secretion.

Maintaining the local acid-base balance and the neutralization of the chemicals accidentally entering the buccal cavity (acids, alkalis), is ensured by the salivary buffer systems of bicarbonates (which neutralize acids), of phosphates, (which neutralize the bases), of mucin.

*Maintaining tooth integrity***.** During the posterruptive, maturation period of the teeth, saliva becomes a saturated solution of calcium, phosphorus, magnesium salts, which prevents the solubilization of hydroxyapatite in the enamel. Fluoride present in saliva participates in the formation of fluorapatite, which increases the enamel resistance. The salivary flow washes away food residues and prevents the stagnation, adhesion and decomposition of food.

Demineralization implies the loss of the initial smoothness of the enamel, i.e. beginning of a caries. Due to the acidity that comes from a diet rich in sugars and carbohydrates, the tooth gets on its surface an extremely unsightly pigmentation that cannot be removed by brushing.[2]

Poor hygiene, faulty brushing techniques, as well as some profound changes in the body, but also a less balanced nutrition can lead to the deterioration of the tooth by changing the acidity in the oral cavity.

Acids demineralize the teeth by dissolving calcium, phosphorus, etc. This erosion of tooth enamel leads to caries formation. The demineralized surface becomes porous and much more adherent, being a suitable place for bacteria that cause dental caries.

In addition, the teeth become extremely sensitive to various stimuli: hot, cold, touch; brushing can become a painful activity, and the patient may be tempted to brush superficially, which is usually fatal for the teeth.

When the demineralized and hypersensitized teeth do not have a rigorous hygiene, severe caries occur that affect all the teeth, and the treatment becomes problematic. The patient must understand that these conditions occur due to an infection that can easily get out of control if oral hygiene is neglected.

The prevalence of dental caries significantly decreased in the last few years, including in our country, but still this disease continues to represent a major problem affecting all age groups, including children and teenagers, being the most prevalent disease worldwide [3].

The health of the oral cavity is not due only to balanced nutrition but also to a correctly performed oral hygiene. Cleaning the teeth must begin before the first temporary teeth, each age requiring certain dental care features, in order to support the structural and functional evolution of the teeth [4].

Although dental enamel is the hardest tissue in the human body, its high mineral content makes it susceptible for the demineralization process [5].

The emergence of fixed orthodontics with the subsequent development of treatment techniques represented a great step forward in the treatment of dental- maxillary disorders [6].

In patients with fixed orthodontic appliances, the application of measures in their oral-dental hygiene become even more complicated due to the presence of brackets, wire arches, rings, ligatures, elastics, and others. It is therefore essential to raise awareness in patients about the need to apply rigorously the oral-dental hygiene measures in order to prevent demineralization, and in more severe caries even the periodontal diseases [7].

In order to maintain the balance of the oral ecosystem, together with food hygiene and hygiene measures, the use of natural products protecting the hard dental tissues and preventing soft tissue inflammation is highly recommended. As the main cause of periodontal inflammatory diseases are the excessive accumulation of microorganisms in the shape of soft and mineralised dental deposits, the safest and most effective prophylactic and therapeutic method for inflammation is the removal of these deposits by mechanical methods [8].

Aim and objectives

The study aims to demonstrate that patients wearing fixed orthodontic appliances develop a lower salivary, acidic pH. This is due to the fact that they do not attach particular importance to oral hygiene when wearing fixed orthodontic appliances. Demonstrating a decrease in pH in these patients, we also want to educate them on a proper oral hygiene.

MATERIALS AND METHODS

The study was conducted over a period of two months and included 27 patients, followed by changes in salivary pH, before and after 2 months after fixing the fixed orthodontic appliance.

Patients, with their consent, were examined in dental practices.

The selection of patients was made using age as a criterion, aged between 15 and 32 years. For all randomly selected patients, fixed orthodontic appliances are to be applied. Both male and female patients participated in this study, this criterion not being used for patient selection. All patients were given two measurements of salivary pH, an initial one, before fixing the fixed orthodontic appliance and a final one, 2 months after application.

Currently, there are several methods for measuring a solution: pH - electronic meter with numeric display; pH indicator strips by changing the colour; determination with the chemical method in the laboratory. For this study, the working method included the measurement of salivary pH with strips of indicator litmus paper.

Litmus is a water-soluble chemical mixture. It contains dyes extracted from lichens, mainly from Roccella tinctoria. The mixture is often absorbed on filter paper, becoming one of

the oldest known pH indicators. The property of litmus to indicate the acidic or basic character of another substance is due to the chromophore 7-hydroxypHenoxazone it contains.

The main use is to determine the acidic or basic / alkaline character of a solution.

The pH value expresses the acidity or basicity of a solution.

The pH value of a solution can be determined using an indicator, which is a substance that causes a colour change depending on the pH value. The value can be determined from the respective colour reaction.

The determination of salivary pH with indicator strips is done in this way:

- soaking the sample paper strip in saliva;
- waiting for 1 second for the colour of the paper to change;
- within 15 seconds, the colour obtained is compared with the colour from the control table.

Interpretation according to the number corresponding to the colour:

- between 1 and 6, indicates an acidic substance;
- 7 indicates a neutral substance;
- between 8 and 14, indicates an alkaline substance.

RESULTS

From the initial measurements, we could observe that the patients had a neutral salivary pH value, which indicates that they have an adequate oral hygiene.

Two months after the application of fixed orthodontic appliances, the pH of the patients was reassessed to observe the changes. For the measurement of pH we used the same method, with sample paper strips, the results being interpreted from the colorimetric scale in the control table. Most subjects (18 out of 27) had lower pH values, the remaining 2, remaining at neutral pH.

According to the control table, from a neutral pH, the subjects reached an acidic pH, which indicates that oral hygiene was inadequate.

In the graphs below, we can see the changes of the pH after two months. During this period, there was a slight decrease in pH, which became neutral, slightly acidic.

It is well known that patients wearing fixed orthodontic appliances should pay particular attention to oral hygiene, which certainly implies a responsibility and extra effort from the patient.

Maintaining a proper hygiene is absolutely necessary to achieve an excellent result at the end of the treatment. Due to the structure of the fixed orthodontic apparatus, with elements such as brackets, rings, springs, castings (glued) on the teeth, it represents retention areas for the bacterial plate, being considered as additional obstacles for proper hygiene.

Most of the time, around the glued elements, such as the brackets, visible traces can be seen on the teeth due to the bacterial plaque, which forms a thick film and has negative effects on the oral health in general. In this way, areas of demineralization with a white-brown or brown appearance may appear around the brackets, i.e. the initial cavities.

Other consequences of poor hygiene are decreased salivary pH, which leads to gingival disease, as well as the appearance of tartar deposits, of bad breath.

With gingival disease, gingival bleeding also occurs during brushing, chewing or even spontaneously and, it seems, gingival inflammation influences the reactivity of the tissues at orthodontic movements, which can increase the wear time of the appliance.

At the moment, just to make it easier for patients to maintain oral hygiene while wearing fixed orthodontic appliances, a multitude of products have appeared on the market to help them in this regard.

Regardless of the type of dental appliance chosen, the orthodontic treatment involves observing some basic rules for the maintenance of the appliance and the dental hygiene.

Although the daily care ritual becomes more complex, the patient should not worry about these changes, because in a short time, everything will become routine.

CONCLUSIONS

According to the two measurements of salivary pH, an initial one, before the patients were applied fixed orthodontic appliances, and two months after wearing it, we could see a decrease in salivary pH. This decrease is due to the deposit of the bacterial plate on the surface of the teeth, due to an inadequate oral hygiene.

The results of the measurements showed that in only 2 months from the application of the fixed orthodontic appliance, slight decreases of salivary pH begin, which in the longer term could lead to much more serious situations, if patients do not pay particular attention to oral hygiene.

As dental practitioners, before applying fixed orthodontic appliances, we should pay greater attention to educating patients on proper hygiene. Just as important as educating them, is also informing them about the serious consequences of neglecting oral hygiene.

As an assistive method, for both doctors and patients, we can suggest the printing of leaflets with oral hygiene methods and instruments for while wearing fixed orthodontic appliances.

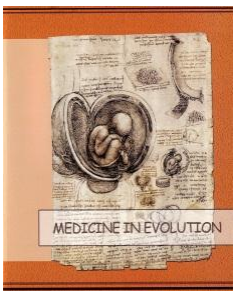
As we have shown earlier, at present there are a large number of appliances and instruments on the market precisely to facilitate and promote the maintenance of proper oral hygiene, instruments designed precisely for this period, of wearing fixed orthodontic appliances.

And last but not least, we can suggest specific periodic checks, even with salivary pH measurements, in order to prevent and control its values, and to take measures before there are serious consequences on the gums, teeth.

REFERENCES

1. Ph-ul salivar, link: https://www.zentrum-der-gesundheit.de/ph-wert.html
2. https://dentfix.ro/2011/10/demineralizarea/
3. Jumanca D., Galuscan A., Popescu L.A., Ghiorghe A., Andrian S., Sinescu C.: Comparative Study On Available Sealing Materials. Revista de chimie (Bucharest), vol. 67, nr.2/2016. Pag 241-244
4. Jumanca D., Matrichescu A., Galuscan A.: An Experimental Method of Producing Hydroxyapatite. Revista de chimie (Bucharest), vol. 69, nr.6/2018. Pag 1506-1508
5. Jumanca D., Galuscan A., Podariu A.C.: Protection of Demineralized Enamel Surfaces in Temporary Teeth Using Fluorinated Varnishes. Revista de chimie (Bucharest), vol. 67, nr.4/2016. Pag 757-759
6. Jumanca D., Galuscan A., Podariu A.C., Motoc M. Comparative Study on the Adhesive Capacity of Four Adhesives Habitually used in Fixed Orthodontics. Revista de materiale plastice, vol. 48, nr.4/2011, pag 322-325
7. Jumanca D., Galuscan A., Podariu A.C., Ardelean L., Rusu L.C.: Infiltration Therapy - an Alternative to Fluoride Varnish Application for Treatment of White Spot Lesion After Fixed Orthodontic Treatment. Revista de chimie (Bucharest), vol. 63, nr.8/2012. Pag 783-786
8. Jumanca D., Galuscan A., Podariu A.C., Borcan F., Erar K.: Anti-inflammatory Action of Toothpastes Containing Betulin Nanocapsules. Revista de chimie (Bucharest), vol. 65, nr.12/2014. Pag 1473-1476

Ergonomic posture in dentistry students



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Abstract

Objective: It has been very well observed that the dental activity in an ergonomically incorrect position implies an overloaded musculature. We intended to focus on a very important aspect (implemented from the beginning until the end of dental practice career), namely the position in the chair or at dental unit.

Material and method: We used as material four young bodies (four dental medicine students) that reacted very well to muscle relax exercises, only through the implementation of stretching exercises. We observed them through a non-invasive method (thermographic vision).

Results and discussions: The extended and uncomfortable prolonged postures caused the increasing temperature of working muscular groups. Even correct positions were adopted, there was a muscular tension and this tension sometimes led to muscular ischemia. The stretching exercises, performed at various times, were able to restore the work efficiency parameters.

Conclusions: The incorrect working positions not only led to decreased efficiency, but also preceded the poor physical conditions of the dental professionals. In conclusion we believe that these exercises could be performed individually, by every dental doctor, normally in a pause between two patients, with certain somatic benefits.

Keywords: ergonomics, chair position, musculoskeletal injuries, stretching exercises.

INTRODUCTION

The occurrence of musculoskeletal injuries, as a professional disease, is very common among the dentists [1-3]. Through ergonomics we believe that these disorders could be prevented. The ergonomic principles together with the advanced technology give us all the possibilities to execute a whole-life work, without pain.

Ergonomics aims to achieve maximum efficiency with minimal effort, trying to eliminate possible accidents of the persons who carry out their activity [4-6]. The goals of this study include some ergonomic principles that help reduce or eliminate risks, while increasing the efficiency of dental professional activity [7].

There is an ISO 11226/2000 [8] that stipulates the following working positions in dentistry: symmetrical position of the body; parallelism of horizontal axes; the legs apart at an angle of 30-45°; the position of the legs perpendicular to the floor; the upper part of the body located perpendicular to the seat; the angle between the legs and thighs 105-115°; the soles completely on the floor; the head inclined at 20-25°; and forearms almost horizontal, high up to 25°.

The purpose of this study was to demonstrate how important was the correct working posture and what exactly the incorrect posture could produce. The treatment of the musculoskeletal injuries or post-treatment recovery was not the objective of this work.

MATERIALS AND METHODS

We performed a comparative study between different positions, some correct (according to ISO 11226/2000), others incorrect, thus leading to muscular overload.

The study was conducted in the Dental Medicine Clinic of the Faculty of Medicine and Pharmacy, University of Oradea. The present paper was developed with the help of four dental students from the Faculty of Medicine and Pharmacy, Oradea.

We used a Fluke Thermographic Camera - Visual IR Thermometer (Fluke Europe B.V., The Netherlands) designed for construction/building purposes (Figure 1).

Figure 1. The Fluke Thermographic Camera

A direct method of fatigue investigation is thermography [9]. The thermography is a method of recording temperature changes in the body. The thermography is based on the principle that any condition changes body temperature. With the help of this device, was made a comparison between the temperatures of a damaged tissue, respectively of a healthy-whole tissue. The thermograph is described as an infrared scanning device, through which is obtained the thermal information. It requires a data software which is provided by the producer. The interpretation is done according to the registered grades, each color being associated with a temperature (Figure 2).

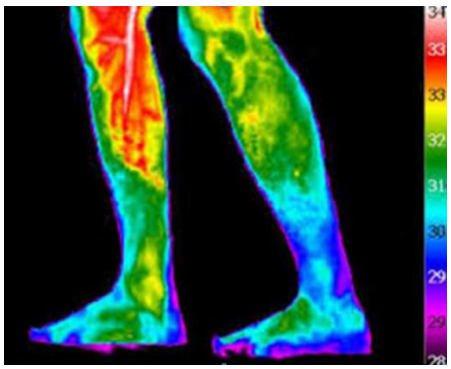


Figure 2. The Fluke Thermographic Camera color code for body temperatures

We used a thermograph that notes the dispersion and heat loss in the muscles from the upper part of the trunk, during the preparation of a tooth (Figure 3).

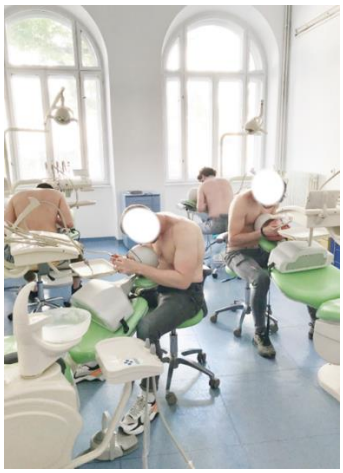


Figure 3. The four dental students during experiment

For the elaboration of the study, 4 students from the Faculty of Medicine and Pharmacy, Oradea, aged between 23 and 26 years, were involved. For a greater accuracy of the results, the subjects were asked to perform this experiment without wearing clothing on the upper body, any clothing impeding direct contact between the skin and laser and thus altering the results.

The protocol consisted of thermal recording at certain hour intervals. The first recording was made at the initial moment, then the next after 15 minutes of work, then 30 minutes after and after stretching. After this first exercise, everything was repeated, so we continued the measuring at 15 minutes of work, then at 30 minutes and finally after the second stretching.

At the end of the experiment, the results of all subjects were compared.

The study was conducted in two stages:

1. The first stage lasted 30 minutes, in which the students prepared one tooth from the simulating arches. After 15 minutes of work, the subjects were examined with the help of the thermograph and after another 30 minutes they were examined again. The next step was *stretching* (5 minutes of relaxing exercises for the overworked muscles), after which the students were re-examined with the thermographic device.

2. The second stage meant the repetition of the first stage.

The first subject (Figure 4) worked in the "12 o'clock" position, complying with ISO 11226/2000 standards and having a regular posture. The posture of this subject is a symmetrical one, with parallel axes; the legs apart (30-45°) and perpendicular to the floor; the

soles completely placed on the floor; with the lumbar support; the head slightly bent (20-25°); and the forearms almost horizontal, slightly raised.

Figure 4. Subject #1 - Right posture, working position "12 o'clock" for the lower frontal group

Can be seen the appearance of the spine, which has a physiological position: it is straight. The subject prepared a tooth from the mandibular frontal group, on buccal face with direct visibility and on oral surface with indirect visibility, while maintaining a correct posture.

The subject #2 (Figure 5), worked in the position at "9 o'clock" and prepared a tooth from dental left upper arch.

Figure 5. Subject #2 - Wrong posture with working position "9 o'clock" for dental left upper arch

The characteristics of ISO 11226/2000 are not respected, because:

- the head is tilted too far to the right; the position of the head and shoulders is asymmetrical;
- the spine is not straight;
- there is no lumbar support;
- the angle between the head and the neck is greater than 20°;
- the distance between the eyes of the subject and the patient is less than 20 cm;
- the forearms are too high, more than 25°;
- the angle between the thighs is greater than 45°;
- the sole of the foot is not on the floor;
- the angle between the thigh and the leg is less than 115°;
- the forearm is not parallel to the floor.

The subject #3 (Figure 6) prepared a tooth from dental left lower arch, also in the working position from "9 o'clock". The student had an asymmetrical position, the head inclined to the left (too bent), and the spine curved.

Figure 6. Subject #3 - Wrong posture with working position "9 o'clock" for dental left lower arch

The posture is incorrect because:

- the patient's position is not correct (semi-sitting);
- the spine is curved in thoracic segment and lumbar flattened;
- there is no lumbar support;
- the head is bent more than 20 °;
- the head and shoulders are asymmetrical;
- the arm is positioned at a distance from the body and too high.

The subject #4 (Figure 7) was positioned at "12 o'clock" and has prepared a tooth from the upper frontal group. He has adopted a correct working position.

Figure 7. Subject #4 – Right working position "12 o'clock" for dental upper frontal group

The subjects prepared two teeth in these two stages, a 30-minute interval followed by a 5-minute stretching period. All students repeated the same set of exercises (Figure 8) after the first and second stage.

Stretching consisted of the following exercises:

- lateral bending of the head and circular movements;
- shoulder lifts;
- forward and reverse shoulder rolls;
- hands behind in extension;

back supported bending.

Figure 8. Stretching exercises

RESULTS

Using the Fluke Thermovisiograph data software we obtained the following results:
Subject #1 (Figure 9):

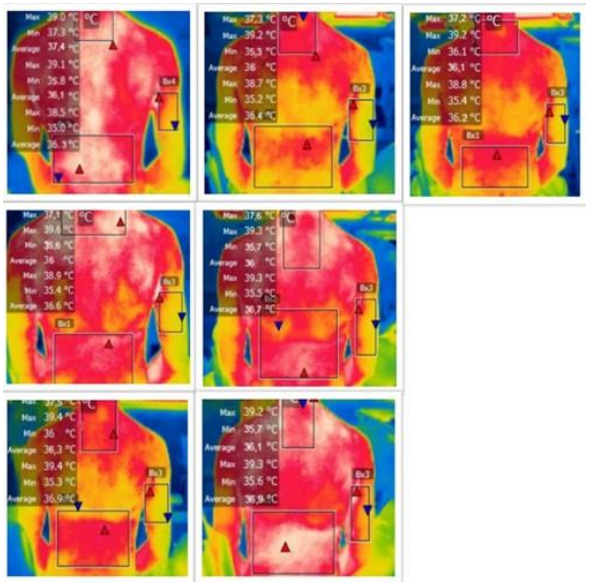


Figure 9. Subject #1 - a) Before starting the activity; b) At 15 minutes of activity; c) At 30 minutes; d) After stretching; e) 15 minutes after stretching; f) At 30 minutes; g) After the second stretching

Subject #2 (Figure 10):

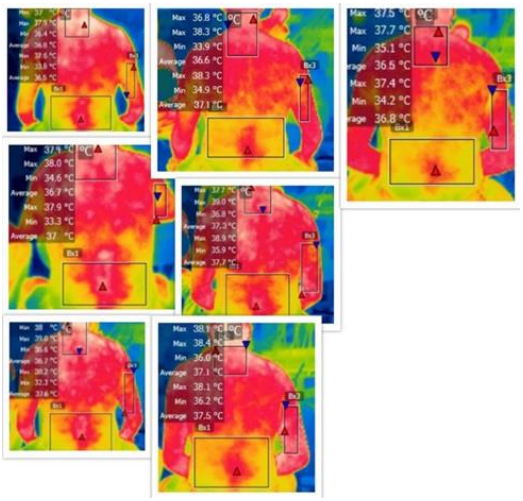


Figure 10. Subject #2 - a) Before starting the activity; b) At 15 minutes of activity; c) At 30 minutes; d) After stretching; e) 15 minutes after stretching; f) At 30 minutes; g) After the second stretching

Subject #3 (figure 11):

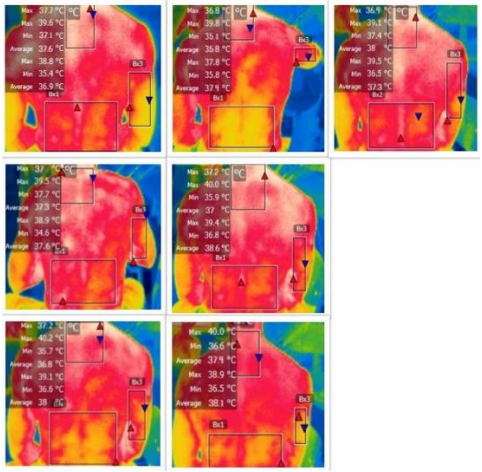


Figure 11. Subject #3 - a) Before starting the activity; b) At 15 minutes of activity; c) At 30 minutes; d) After stretching; e) 15 minutes after stretching; f) At 30 minutes; g) After the second stretching

Subject #4 (Figure 12):

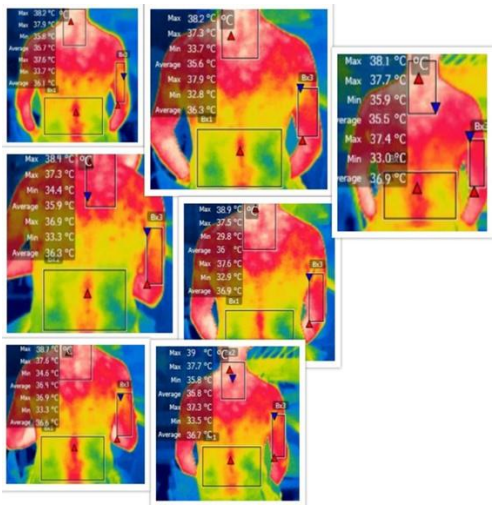


Figure 12. Subject #4 - a) Before starting the activity; b) At 15 minutes of activity; c) At 30 minutes; d) After stretching; e) 15 minutes after stretching; f) At 30 minutes; g) After the second stretching

The obtained data were centralized in the following table (Table #1):

Table #1. Cervical, lumbar and arm temperatures in subjects

POSTURE	Subject #1: Correct posture „12 o'clock"	Subject #2: Incorrect posture „9 o'clock"	Subject #3: Incorrect posture „9 o'clock"	Subject #4: Correct posture „12 o'clock"
T 0 (Initial time)	Cervical: 37,4°C Lumbar: 36,1°C Arm: 36,3°C	Cervical: 37°C Lumbar: 36,8°C Arm: 36,5°C	Cervical: 37,7°C Lumbar: 37,6°C Arm: 36,9°C	Cervical: 38,2°C Lumbar: 35,7°C Arm: 36,1°C
T 15 (after 15' working)	Cervical: 37,5°C Lumbar: 36°C Arm: 36,7°C	Cervical: 37,4°C Lumbar: 36,7°C Arm: 37°C	Cervical: 37°C Lumbar: 37,3°C Arm: 37,6°C	Cervical: 38,4°C Lumbar: 35,9°C Arm: 36,3°C
T 30 (after 30' working)	Cervical: 37,5°C Lumbar:36,3°C Arm: 36,9°C	Cervical: 38°C Lumbar: 36,7°C Arm: 37,6°C	Cervical: 37,2°C Lumbar: 36,8°C Arm: 38°C	Cervical: 38,7°C Lumbar: 36,4°C Arm: 36,6°C
A.S 1 (after stretching #1)	Cervical: 37,3°C Lumbar: 36°C Arm: 36,4°C	Cervical: 36,8°C Lumbar: 36,6°C Arm: 37,1°C	Cervical: 36,8°C Lumbar: 35,8°C Arm: 37,4°C	Cervical: 38,2°C Lumbar: 35,6°C Arm: 36,3°C
T 15 (15' working after stretching #1)	Cervical: 37,5°C Lumbar: 36°C Arm: 36,7°C	Cervical: 37,7°C Lumbar: 37,3°C Arm: 37,7°C	Cervical: 37,2°C Lumbar: 37°C Arm: 38,6°C	Cervical: 38,9°C Lumbar: 36°C Arm: 36,8°C
T 30 (30' working after stretching #1)	Cervical: 37,7°C Lumbar: 36,1°C Arm: 36, 9°C	Cervical: 38,1°C Lumbar: 37,1°C Arm: 37,5°C	Cervical: 37,3°C Lumbar: 37,4°C Arm: 38,1°C	Cervical: 39°C Lumbar: 35,8°C Arm: 36,7°C
A.S 2 (after stretching #2)	Cervical: 37,2°C Lumbar: 36,1°C Arm: 36,2°C	Cervical: 37,5°C Lumbar: 36,5°C Arm: 36,8°C	Cervical: 36,4°C Lumbar: 38°C Arm: 37,3°C	Cervical: 38,1°C Lumbar: 35,5°C Arm: 36,9°C

DISCUSSIONS

Unfortunately, there is a lack of awareness among dentists about these health problems. Some studies show that dentists could have problems developed by their own wrong posture, and that posture could lead to a shortening or interruption of the working hours [10, 11]. In a dental office the factors that develop these musculoskeletal injuries are: repeated movements, prolonged static postures, static loading of muscles over a long period (hours). These incorrect positions result in muscle imbalances with serious repercussions over time.

In this paper we compared four positions, two correct and two incorrect. We reached the following conclusions:

- in subject #1, at 15 minutes of activity, with correct working posture, there was an increase of 0.3°C in the right arm;
- in subject #2, working from „9 o'clock" position, but with incorrect posture, there were registered increases of 0,4°C cervical and 0,5°C in the right arm;
- at subject #3, „9 o'clock" working position, but incorrect posture, a greater muscular demand was noticed at the level of the right arm of 0.7°C;
- at the last subject, which adopts a correct posture („12 o'clock"), we observed an increase of 0.2°C at all levels (lumbar, cervical and arm).

In subject #4, because he adopted a correct position, we saw a uniform distribution of muscle effort and a relatively small increase in temperature. In the two subjects who worked from the posture according to ISO 11226/2000, even if the muscles are overloaded (which is normal), the temperature increase was small, 0.2-0.3°C, compared to the temperature increases in the subjects with an incorrect posture (0.4-0.7°C).

After the periods of muscular relaxation we have registered the following changes compared to the moment of the end of the activity:

- in the subject #1 (S1) we observed a muscle relaxation of 0.2°C at the cervical level, 0.3°C in lumbar level and 0.5°C at the arm level;

- in the subject #2 (S2), we noticed a muscle relaxation of 1.2°C in cervical section, 0.1°C in lumbar section and 0.5°C in the arm;

- in subject #3 (S3), we noticed a decrease in temperature at the cervical level of 0.4°C, at the lumbar level of 0.5°C, and at the arm of 0.6°C;

- at the last subject (subject #4/S4), the data showed a decrease of 0,5°C in cervical level, 0,8°C in lumbar level and at arm of 0,3°C.

Obviously the stretching exercises helped to relax the muscles regardless of the posture adopted by the subjects. These stretching methods are methods of preventing musculoskeletal injuries and other problems, that can be installed due to the static position maintained for hours [12, 13].

In most dental doctors' lives, the sport or any kind of movements did not make their presence. In this paper we tried to show how important the physic exercises are, even they are barely performed, after a period of working in a static posture.

Unfortunately, 93% [13] of the dental practitioners are prone to these musculoskeletal injuries. The major risk factors would be the repetitive movements and uncomfortable position adopted over longer periods of time. Another important factor would be poor knowledge in this area. In the late years appeared online studies on postural awareness, regular rest periods and relaxation exercises. There are mentioned the muscles that relax, but not the description of the movements that are performed [13].

The relaxation exercises presented and performed by the students in this study were more complex and required more muscles. Regarding these, we present and recommend some light and fast exercises, which could be performed by dental doctors even between patients. These exercises have the same effect of muscle relaxation.

CONCLUSIONS

The working position of ISO 11226/2000 has been considered since 1958 as the optimal working position. The consequence of incorrect postures are musculoskeletal injuries, and the correct posture decreases the risk of installing the lesions.

In the two subjects who adopted a correct position („12 o'clock") we see a uniform distribution of muscle tension and a lower tension value, compared to those with an incorrect posture („9 o'clock").

Stretching exercises focus on relaxation of the muscles overloaded by extended dental positions. These are simple exercises that can be performed individually, normally in a pause between two patients. Our proposal consists of the following exercises:

- lateral bending of the head and circular movements;
- shoulder lifts;
- front and back shoulder rolls;
- hands behind in extension;
- back bending.

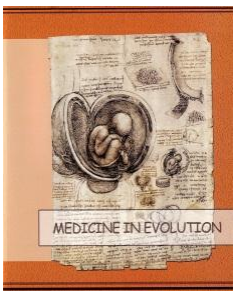
The way of lifestyle or working-style improvement is also a professional advancement, because the practitioner's attention will be focused on the patient's problems. As long the painful conditions caused by the dental activity are greatly diminished or even no longer exist, there will be a real satisfaction (both for doctor and patient).

REFERENCES

1. Valachi B, Valachi K. Mechanisms leading to muculoskeletal disorders in dentistry, Jada, 2003, https://www.ncbi.nlm.nih.gov/pubmed/14620013
2. Hayes M, Cockrell D. A systematic review of musculoskeletal disorders among dental professionals, Int J Dent Hyg, 2009, https://www.ncbi.nlm.nih.gov./pubmed/19659711

3. La Rochelle NR. Work-related musculoskeletal disorders among dentists and orthodontists, Master of Science in Dentistry Degree Thesis, Virginia Commonwealth University, 2017, https://scholarscompass.vcu.edu/etd/4765
4. Morărașu C. Ergonomie stomatologică, Ed. Apollonia, 1997, Iași
5. Anghel M. Diagnostic oral, Ed. Orizonturi Universitare, Timişoara, 2001
6. Monea A, Sitaru A, Monea M. Diagnostic oro-dentar, Ed. University Press, Tîrgu-Mureş, 2012
7. ***. http://practicadentara.ro/wp-content/uploads/2014/11/Principii-ergonomice-ce-trebuie-respectate-in-cabinet.pdf
8. ***. ISO 11226/2000. Ergonomics - Evaluation of static working postures, https://www.iso.org/standard/25573.html
9. ***. https://thermology.com/medical_thermal_imaging_research.html#DENTISTRY
10. ***. https://www.dentistrymypassion.com/pozitii-de-lucru-stomatologie-postura-echilibrata
11. ***. https://osha.europa.eu/ro/themes/musculoskeletal-disorders
12. Miyasaki-Ching C. Elemente clinice de stomatologie, Ed. All Educational, 2001, București
13. Valachi B. www.posturedontics.com

Therapeutic management of ectodermal dysplasia in pediatric dentistry



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Abstract

Ectodermal dysplasia comprises a group of genetic diseases, with X-linked recessive inheritance, which manifest through abnormal development of ectodermal structures and characterised by the triad: anhidrosis, hypotrichosis, oligodontia. The gender ratio favors men. Oligodontia is a dental anomaly of number that is frequently associated with genetic syndromes and characterised by the absence of more than six dental germs. It can affect both the temporary and the permanent dentition. The clinical manifestations of ectodermal dysplasia can lead to major psychosocial issues, sometimes even depression, as a result of the impaired physical appearance. In this paper we presented an interdisciplinary therapeutic approach, using interim prosthodontic restorations, in the case of a seven-year-old male patient diagnosed with ectodermal dysplasia, with oligodontia in both temporary and permanent dentition.

Keywords: prosthodontic treatment, ectodermal dysplasia, oligodontia.

INTRODUCTION

Ectodermal dysplasia comprises a group of genetic diseases, that are most often inherited in an X-linked pattern, which manifest through abnormal development of ectodermal structures such as teeth, hair, nails and sweat glands. It has a rate of occurrence of 1:100000, men being more affected than women. More than 150 types of ectodermal dysplasia are known [1,2]. The ectodermal dysplasia manifests in two main forms, depending on the extent of the affected sweat glands: hidrotic and anhidrotic (hypohidrotic), which is the most representative type [3]. It has been associated with mutations in at least three genes (PAX9, MSX1 and AXIN2) that are involved in the activation of NF-κB pathway [4], which regulates the expression of genes controlling the immune response, cellular adhesion, inflammatory reactions and protection against cellular apoptosis: EDA receptor (EDAR), ectodysplasin (EDA1) and EDAR-associated death domain (EDARADD) [1]. Patients with anhidrotic ectodermal dysplasia have several characteristic clinical features: a round skull, pointy ears, thin hair, sunken cheeks, a small nose with a flattened base, hypoplastic nasal wings, a small chin, total or partial anodontia, complete or partial absence of sweat glands. In the case of affected female patients, the anomaly is usually discovered during their child's diagnosis, because clinical signs can be minimal [1].

Anodontia is a dental anomaly of number, characterized by the total or partial congenital absence of teeth (hypodontia or oligodontia), that can occur both in temporary and permanent dentition. In the present paper, we used the term oligodontia to designate the absence of more than six dental germs. Oligodontia can occur as an isolated phenomenon, but it is most often part of a genetic syndrome [5]. Most of the time, oligodontia is discovered during childhood and poses many challenges, because the clinician has to adapt the treatment to keep up with the changes that occur during growth [6].

These patients have reduced masticatory efficiency, impaired phonation and impaired esthetic appearance, aspects that have a negative impact on their self-esteem, especially during childhood. The purpose of these restorations is to stimulate the growth of the dento-maxillary system, to restore the morphological and functional integrity of the dental arches, to prevent the onset of bad oral habits and to improve the esthetic facial appearance, which promotes a good psychosocial and emotional development. These measures will create the premises for a favorable clinical outcome for long-term fixed or implant-supported prosthodontic restorations.

The treatment complexity in patients with ectodermal dysplasia demands an interdisciplinary approach between pediatrics, genetics, pedodontics, orthodontics, prosthodontics and psychology.

Aim and objectives

The aim of this paper was to present an interdisciplinary therapeutic approach, using interim prosthodontic restorations, in the case of a young growing patient diagnosed with ectodermal dysplasia, with oligodontia in both temporary and permanent dentition.

CASE REPORT

I. Anamnesis

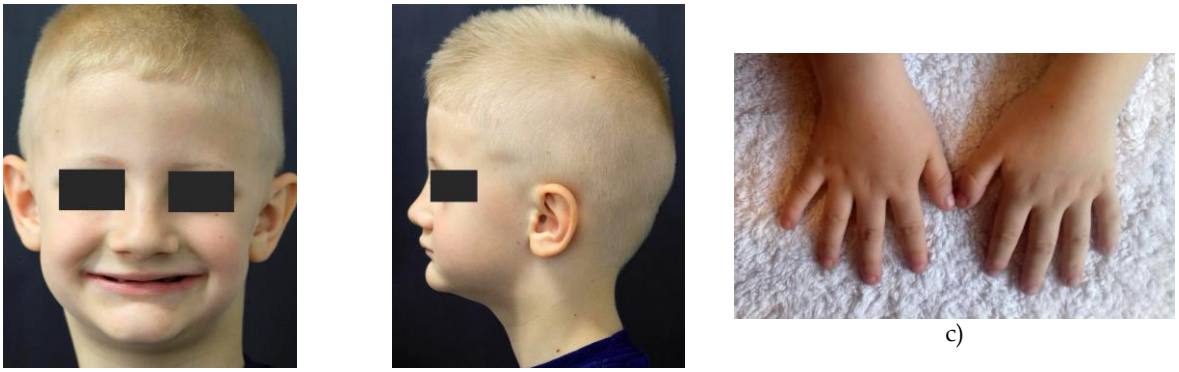
A seven-year-old male patient was brought by his parents in the Pedodontics Department of the Faculty of Dental Medicine, "Victor Babeş" University of Medicine and Pharmacy of Timişoara, accusing the absence of several temporary teeth.

The medical history of the patient revealed that he was the first-born child, born full term, by natural birth, receiving the Apgar score of 9, with a body weight of 3000 g. He was breastfed in the first months of life and had a normal development, with no obvious clinical

signs of ectodermal dysplasia in his early childhood. Referring to the mother's medical history, she was monitored during pregnancy, having a favorable perinatal evolution. The mother was also diagnosed with hypodontia, having congenitally missing second premolars.

II. Clinical examination data

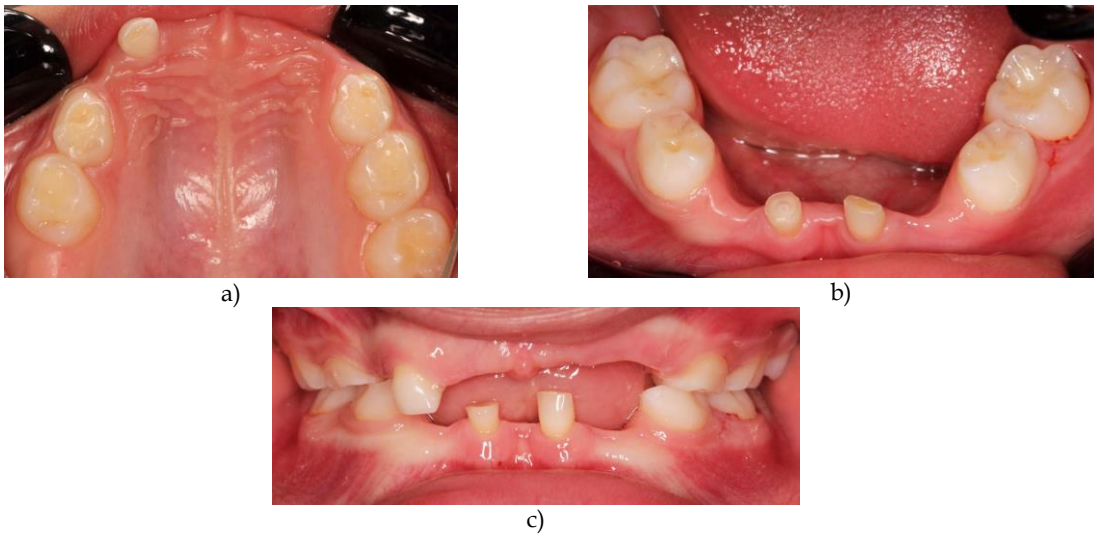
The extraoral clinical examination revealed: pale skin, mild hypertelorism, decreased lower facial height and a deep mentolabial fold which gave the patient an older appearance (Figure 1. a, b). The general clinical examination also revealed the presence of short and divergent fingers, with thin nails (Figure 1. c).



a) b) c)

Figure 1. The patient's general appearance before treatment: a) extraoral clinical exam – frontal view; b) extraoral clinical exam – lateral view; c) short fingers, with thin nails

The intraoral clinical exam (Figure 2) revealed the absence of 5.3, 5.1, 6.1, 6.2, 6.3, in the upper arch and the absence of 7.3, 7.1, 8.1 and 8.3 in the lower arch. Assessing the relationship between the temporary second molars a flush terminal plane was found on the left side and a mesial step, on the right side. In the anterior region, we observed the supraocclusion of 5.2, as well as the persistence of the infantile swallowing pattern and the presence of anterior tongue interposition. We also noticed the absence of dental lesions, the absence of any type of dental or prosthetic restoration and the lack of dental mobility. The temporary incisors showed advanced wear facets.



a) b) c)

Figure 2. Intraoral clinical exam: a) upper arch; b) lower arch; c) frontal view of occlusion

III. Paraclinical investigations

The radiological exam (Figure 3) supported our initial diagnosis of oligodontia and in addition to the clinical findings, we also noticed the absence of 1.8, 1.7, 1.5, 1.3, 1.2, 2.2, 2.3, 2.5, 2.8 in the maxilla and 3.8, 3.7, 3.5, 3.3, 3.2, 3.1, 4.1, 4.2, 4.3, 4.5, 4.7, 4.8 in the mandible. The permanent upper central incisors had a tapered, screwdriver-shaped crown, with a possible associated rotation in 2.1.

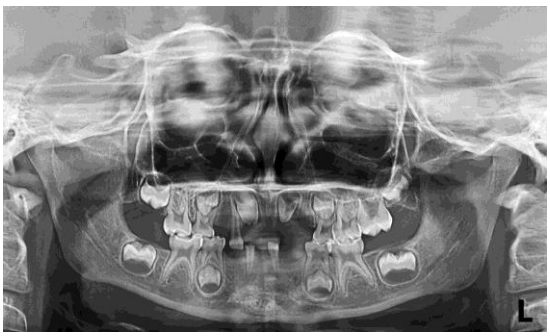


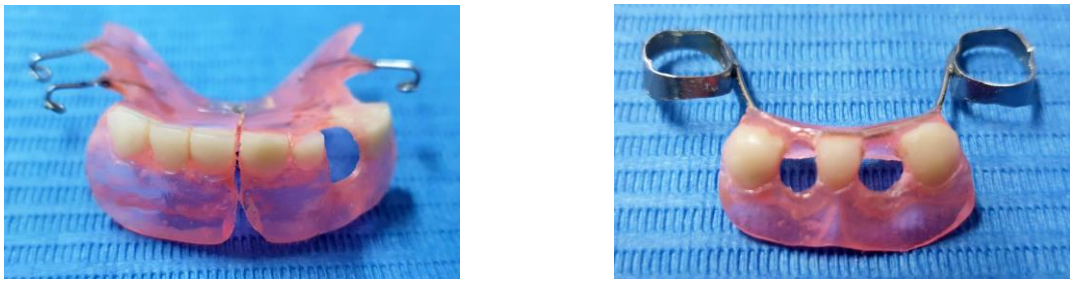
Figure 3. Initial orthopantomography

IV. Diagnosis

Based on the general clinical signs and the complementary exams that confirmed the associated oligodontia in both the temporary and the permanent dentition, the patient was diagnosed with ectodermal dysplasia and he was referred for further genetic investigations.

V. Treatment and evolution

To restore the masticatory, phonetic and esthetic function, we adopted an age-appropriate, early treatment plan and two interim prosthodontic restorations were made (Figure 4). For the upper arch we chose a palatal plate with a midline split, an expansion screw and three Stahl clasps. The acrylic plate was fitted with artificial acrylic teeth in the anterior region, to improve esthetics and to correct the bad oral habits. For the lower arch, we recommended an acrylic saddle with artificial acrylic teeth in the anterior region, fixed on a lingual arch welded to orthodontic molar bands. The molar bands were cemented on the secondary temporary molars 7.5 and 8.5 with resin-modified glass ionomer cement (Figure 5).



a) b)

Figure 4. Prosthodontic restorations: a) palatal plate with midline split and expansion screw; b) prosthodontic restoration for the lower arch

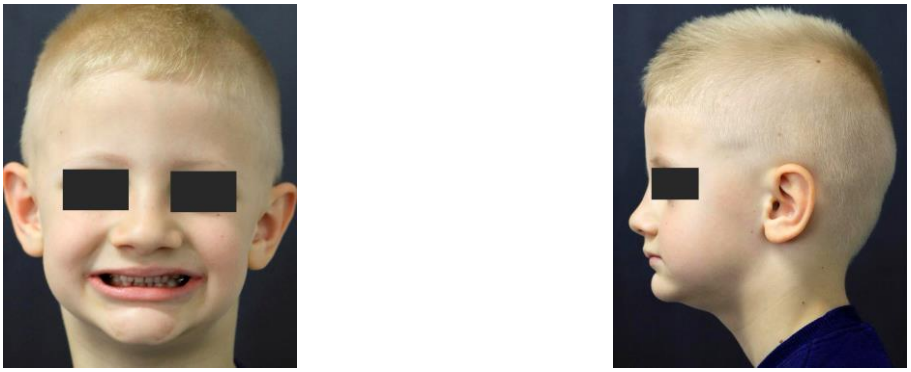
These prosthodontic restorations had the role of restoring the integrity of the dental arches, evenly distributing the loading forces, maintaining the alveolar support and preventing its atrophy. The facial esthetics was also improved, compensating the reduced lower anterior facial height by increasing the vertical dimension of occlusion (Figure 6). The masticatory function and the phonation were also improved. All of these aspects created the premises for a harmonious psychological development.

The patient has to be monitored and periodically re-examined, because the prosthodontic restorations require adjustments, relining or even replacements every 6 months, in order not to interfere with the growth of the dento-maxillary system or the eruption of the permanent teeth. The molar bands have to be removed periodically and a topical fluoride gel should be applied to prevent demineralization and the onset of dental caries.

a) b)

c)

Figure 5. Prosthodontic restorations inserted in the oral cavity: a) palatal plate; b) prosthodontic restoration for the lower arch; c) frontal view of occlusion



a) b)

Figure 6. Improved facial esthetics, after applying the prosthodontic restorations: a) frontal view; b) lateral view

DISCUSSIONS

In patients with a family history of hypohidrotic ectodermal dysplasia, it is advisable to perform genetic tests to detect the occurrence of mutations in the EDA or EDA1 gene in order to be able to diagnose this disease early, even in the prenatal stage. Other investigations such as sonography and fetal skin biopsy are adequate diagnostic tests in the second trimester of pregnancy [7].

Infants and young children with hypohidrotic ectodermal dysplasia should be given additional medical care by the attending physician in order to reduce the mortality rate, as numerous complications, such as pulmonary infections and hyperthermia, may occur in these patients [8].

Patients affected by ectodermal dysplasia suffer from poor psychological and physiological development because of the impaired esthetics and the abnormal functions of the dento-maxillary system. Although there is no specific treatment for the disease, affected individuals should undergo early monitoring and treatment, including the prosthodontic rehabilitation needed to improve both the sagittal and vertical skeletal relationship during craniofacial growth and development, as well as to provide esthetic and speech improvement, as well as masticatory efficiency [9].

Rehabilitation through removable prosthodontic restorations is the most common treatment choice, but in these cases, dental implants can also be considered. The literature recommends implant overdentures only in adolescents older than 12 years of age. When the implant therapy is chosen, the main concern is the alveolar bone deficiency, which requires

bone augmentation. Compared to the more conservative prosthodontic treatment, the surgical approach poses a higher risk of failure and complications and a significant psychological impact, especially in younger children, therefore caution is advised when an implant supported restoration is recommended [10].

CONCLUSIONS

Clinical manifestations of ectodermal dysplasia usually cause significant problems of social integration, thus the early initiation of prosthodontic treatment in patients with oligodontia brings significant benefits regarding the masticatory, phonetic and esthetic function, which in turn promote a good psychosocial and emotional development.

Because oligodontia is associated with alveolar bone deficiency, the removable prosthodontic restorations should include active elements that will ensure a harmonious growth of the dento-maxillary system.

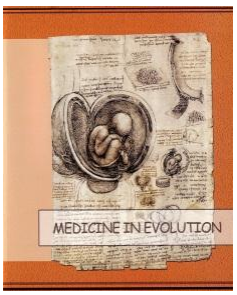
Declaration of patient consent

The authors certify that they have obtained all the patient's consent forms. The patient, through his legal representative, consented for his images and other clinical information to be reported under anonymity for medical and scientific research purposes.

REFERENCES

1. Matei D, Gherghina I, Covăcescu M, Kozma A, Iordan-Dumitru DA. Anhidrotic ectodermal dysplasia – a rare cause of anodontia in children. Medic.ro. 2019;127(1):17–9.
2. Chappidi V, Voulligonda D, Bhogavaram B, Reddy Pk. Ectodermal dysplasia: Report of two cases in a family and literature review. J Fam Med Prim Care. 2019;8(3):1263–5.
3. Freire-Maia N, Pinheiro M. Ectodermal dysplasias - Some recollections and a classification. Birth Defects Orig Artic Ser. 1988;24(2):3–14.
4. Burger K, Schneider AT, Wohlfart S, Kiesewetter F, Huttner K, Johnson R, Schneider H. Genotype-phenotype correlation in boys with X-linked hypohidrotic ectodermal dysplasia. Am J Med Genet Part A. 2014;164(10):2424–32.
5. Tangade P, Batra M. Non Syndromic Oligodontia: Case Report. Ethiop J Heal Sci. 2012;22(3):219–21.
6. Behr M, Proff P, Leitzmann M, Pretzel M, Handel G, Schmalz G, Driemel O, Reichert TE, Koller M. Survey of congenitally missing teeth in orthodontic patients in Eastern Bavaria. Eur J Orthod. 2011;33(1):32–6.
7. Wünsche S, Jüngert J, Faschingbauer F, Mommsen H, Goecke T, Schwanitz K, Stepan H, Schneider H. Noninvasive Prenatal Diagnosis of Hypohidrotic Ectodermal Dysplasia by Tooth Germ Sonography. Ultraschall der Medizin. 2015;36(4):381–5.
8. Blüschke G, Nüsken KD, Schneider H. Prevalence and prevention of severe complications of hypohidrotic ectodermal dysplasia in infancy. Early Hum Dev. 2010;86(7):397–9.
9. Tarjan I, Gabris K, Rozsa N. Early prosthetic treatment of patients with ectodermal dysplasia: A clinical report. J Prosthet Dent. 2005;93(5):419–24.
10. Imirzalioglu P, Uckan S, Haydar SG. Surgical and prosthodontic treatment alternatives for children and adolescents with ectodermal dysplasia: A clinical report. J Prosthet Dent. 2002;88(6):569–72.

Aspects of oral health literacy in adults



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Abstract

The concept of health literacy means the ability to properly understand and use the medical information. The study aims to evaluate the level of oral health literacy in a group of patients in Bucharest. The Rapid Estimation of Adult Literacy in Dentistry test (REALD-30) was used. 52% of the subjects are male and have a mean age of 37.7 years (SD=15.26). Results: The mean score of the REALD-30 test is 25.76 (SD=2.76). Most patients have an increased level (53.3%), and 40% moderate level of oral health literacy, due to the high level of education of the subjects included in the study. Conclusion: there is a need to increase the level of literacy in dentistry among patients in the dental practice, since the way they understand medical and dental issues is greatly influenced by their level of oral health literacy.

Keywords: Literacy in dentistry, adult patients, oral health education.

INTRODUCTION

Starting from the general notion of literacy, which essentially represents an individual's reading and writing ability, the concept of health literacy means the individual's ability to perceive, understand and use medical information. Equally, it also refers to the possibility of the individuals to have basic knowledge on disease prevention, chronic disease approach and participation in the medical decision regarding his own health [1]. Obtaining oral health information, understanding dental concepts and choosing appropriate prevention and treatment in dentistry, requires a development of skills named oral health literacy. The low level of oral health literacy is manifested by a precarious health status of the oral cavity. Acquiring and maintaining health requires the individual to be able to access, understand and act on any type of health data. Patients with low levels of literacy in oral health have a low level of dental knowledge, poor oral health and a higher predisposition to unhealthy behaviours [2, 3]. In practice, for assessing literacy in medicine and dentistry are used specific instruments in order obtain important information for healthcare professionals involved in clinical, prevention, health promotion and public health [1, 4]. This information refers to: activities of determining skills for word recognition, reading and understanding through tests and interviews, population studies or direct assessment of an individual's / patient's ability to access, understand and use medical knowledge [1]. In this regard, healthcare providers need to adapt medical information depending on the level of understanding of each patient.

Aim and objectives

The present study aims to evaluate the level of oral health literacy in adults and to add some aspects in relation to different variables: socio-demographic (gender, age, socio-economic status, level of education), self-perception of oral health, reasons for dental office visits and dental information sources.

MATERIAL AND METHODS

A descriptive cross-sectional study was performed on a group of 90 adult patients from Bucharest. To assess the level of oral health literacy, the Rapid Estimate of Adult Literacy in Dentistry-30 (REALD-30) was used [5]. It was developed as an instrument based on word recognition and was designed to be read aloud by the subjects, the words being listed in increasing order of difficulty [1, 5]. The final score is between 0 and 30 points, with one point being awarded for each word read correctly [5]. A self-administered questionnaire was also applied for the collection of socio-demographic data, the assessment of the dental visits behaviour and the self-perception on oral health.

RESULTS

The studied group has a relatively equal distribution by gender (52% male patients) and the age between 18 and 67 years, the mean is 37.7 years (SD=15.26). Most subjects have more than 12 years of education (71.1%) and only 2 patients have reported secondary education (2.2%). In terms of self-assessed socioeconomic status, the level is good for 46.7%, medium for half of the patients, only 3.3% perceived it as being low. The perception of the subjects about their own oral health status shows that it is good for 41.1%, very good (33.3%), satisfactory (13.3%), excellent (11.1%) and poor for one subject. Most patients report to visit the dentist in case of pain or problems in the oral cavity, only one third is presented at 6 months, and 2.2% have never been to a dental office. Thus, the main reason for meeting the dentist was the emergency, less patients addressed for dental check-ups. Regarding the

sources of oral health information, most subjects choose the dentist (65.6%), media (22.2%), both variants (7.8%) and friends (only 11.1%). The mean score for the REALD-30 test is 25.76 (SD=2.76). Most patients have an increased level of oral health literacy (53.3%), and the least a low level (6.7%) (Table I), due to the increased level of education of the subjects included in the study. Below are presented some aspects of oral health literacy levels depending on the variables studied: socio-demographic factors, self-assessment of oral health status, addressability behaviour to the dentist and type of sources of information on oral health.

Table I. Assessment of health literacy in dental medicine level for the study group

Level of health literacy in dentistry		**N (%)**
Low	0 - 21 points	6 (6.7)
Moderate	22 – 25 points	36 (40)
High	26 – 30 points	48 (53.3)

Table II. The level of oral health literacy by gender and age groups of the subjects

Level of health literacy in dentistry	**Gender**		**Age groups**	
	Masculine	**Feminine**	**18-59 ys**	**≥ 60 ys**
Low	5 (83.3%)	1 (16.7%)	5	1
Moderate	14 (38.9%)	22 (61.1%)	29	7
High	27 (56.2%)	21 (43.8%)	41	7

The high level of oral health literacy is not influenced by gender. At the low level, male subjects predominate, and at the moderate level there are more women (Table II).

Table III. The level of oral health literacy according to the self-assessed socio-economic status of the respondents

Level of health literacy in dentistry	**Socio-economic status (SES)**		
	Low	**Medium**	**Good**
Low	0	6 (100%)	0
Moderate	1 (2.8%)	21 (58.3%)	14 (38.9%)
High	2 (4.2%)	18 (37.5%)	28 (58.3%)

The highest level of literacy in oral health is for respondents with good self-assessed socio-economic status (Table III).

Table IV. The level of oral health literacy according to the years of education

Level of health literacy in dentistry	**Education level of the subjects**		
	Less than 8	8-12	>12
Low	1 (16.7%)	2 (33.3%)	3 (50%)
Moderate	1 (2.8%)	13 (36.1%)	22 (61.1%)
High	0	9 (18.8%)	39 (81.2%)

Subjects with higher education have an increased level of literacy in dentistry. Most respondents with less years of education have low literacy level (Table IV).

Table V. Assessment of the level health literacy in dentistry in relation to the self-assessed oral health status of the respondents

Level of health literacy in dentistry	**Self-perceived oral health**				
	Exccelent	**Very good**	**Good**	**Satisfying**	**Poor**
Low	0	0	3 (50%)	3 (50%)	0
Moderate	4 (11.1%)	9 (25%)	16 (44.4%)	6 (16.7%)	1 (2.8%)
High	6 (12.5%)	21 (43.8)	18 (37.5%)	3 (6.2%)	0

Respondents with oral health status felt to be good and very good have a high level of literacy in dental medicine. Patients with satisfactory oral health status have a low level of literacy (Table V).

Table VI. The level of oral health literacy according to the addressability behaviour of subjects to the dentist

Level of health literacy in dentistry	Reason for visiting the dentist		Frequency of visits to the dental office		
	Emergency	Check-up	6 months	Pain	Never
Low	5 (83.3%)	1 (16.7%)	0	5 (83.3%)	1 (16.7%)
Moderate	15 (42.9%)	20 (57.1%)	9 (25%)	26 (72.2%)	1 (2.8%)
High	18 (38.3%)	29 (61.7%)	21 (43.8%)	26 (54.2%)	0

Subjects with a moderate level of literacy visit the dental office more frequently and less in case of emergency; those with a medium level are addressing in many cases in pain, and a quarter see a dentist at every 6 months (Table VI).

Table VII. The level of oral health literacy in relation to dental information sources

Level of health literacy in dentistry	Sources of information			
	Dentist	Media	Both	Friends
Low	3 (50%)	3 (50%)	0	0
Moderate	25 (69.4%)	10 (27.8%)	0	2 (5.6%)
High	31 (64.6%)	7 (14.6%)	7 (14.6%)	8 (16.7%)

Mainly subjects with high level of literacy have as their main source of information the dentist, and those with moderate degree also get dental information from the media (Table VII).

DISCUSSIONS

Most respondents with high levels of oral health literacy visit the dentist for control. The highest level of literacy in dental medicine is among the 18-59 age group. Respondents with self-rated socio-economic status as good and those with higher education have an increased level of oral health literacy. Most subjects with high levels of literacy in dental medicine perceive their own oral health status as good and very good and have regular dental visits. The results presented confirm the data from the s literature, namely that the level of health literacy correlates with the patient's education level, with the socio-economic status, the addressability behaviour to the dentist and the self-perception of the oral health status [2, 3, 6].

CONCLUSIONS

The assessment of the level of oral health literacy requires the need to increase the literacy degree of patients in the dental office, especially since the dentist is the main source of dental information. Oral health education should be adequately conducted, depending on the level of understanding of the medical information by the patients. The way individuals access dental services, interact with the dentist, obtain and understand medical information is largely influenced by their level of literacy in oral health.

Acknowledgments

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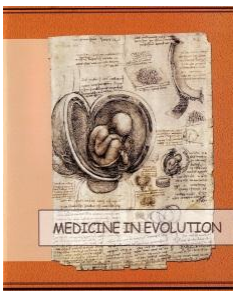
REFERENCES

1. Sfeatcu IR, Dumitrache MA, Ranga RC et al. Oral health literacy concept. Curtea Veche Publishing House, Bucharest, 2016
2. Jones M, Lee JY, Rozier RG. Oral health literacy among adult patients seeking dental care. The Journal of the American Dental Association 2007a; 138(9):1199
3. Jones M, Lee JY, Rozier RG. Oral health literacy among adult patients seeking dental care. Journal of American Dental Association 2007 b;138:1199-1208
4. Oral Health Literacy. Institute of Medicine of the National Academies, Washington DC, 2013
5. Lee JY, Rozier RG, Lee SY, Bender D, Ruiz RE. Development of a word recognition instrument to test health literacy in dentistry: the REALD-30 – a brief communication. J Public Health Dent 2007; 67(2):94-98
6. Sfeatcu R, Cărămidă M, Funieru C, Dumitrache MA, Ionescu E. The relationship between teenagers' oral health literacy, dental use behavior and dental health knowledge. Medicine in evolution 2016; XXII(2):262-267

Attutudes and behaviour of dental practiontioners towards oral health care provision in marginalised communities



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Abstract

The evolving dental public health inequalities among marginalised communities are hardly mentioned. However, the acceptance of the services by the communities and the willingness to provide by the service providers (dentists) is a complex way of reducing disparities in social intervention. Introducing the mobile dental unit is one of the affordable initiatives to bring oral health access to these communities. The qualitative research method was conducted in Timisoara, Romania, to find the scope of introducing mobile dental unit in marginalised communities. The service providers (dentists) participated in the pilot study. The results indicated that young dentists are positive for more engagement in volunteering, although they had no previous experience with mobile unit. Although the positive outcomes, the challenges are four-dimensional: dentists, licencing body legal requirements, funding agents, local authorities. The entrenching influences by these dimensions' and their proportionate engagement infer to this initiative's success and develop the community oral health.

Keywords: oral health, dental practitioner, marginalised communities, inequalities.

INTRODUCTION

Oral public health is one of the fields of studies in the broader spectrum of public health. Every dental professional (dentists, hygienists, dental therapists, dental assistants, dental technicians) must fulfil and serve the criteria or parameter of public health about oral health. The parameters can be: prevent epidemics and spread of diseases, protect the public from environmental hazards, promote and encourage a healthy lifestyle, ensuring that all members of the community have access to the oral health services [1].

In a modern world, the diversified and complex oral health issues persistently inundate the evidence of a disparity in society. Quantifying the disparity and their promising solutions in reflection are debated, discussed and researched for decades as this is now a global issue. The frequency of the oral health assessment was very sporadic as priorities were in other health sectors or other social aspects such as poverty alleviations, housing, social workforce development and infrastructure. Community-level approaches were one size or type of measure for all was unsuitable for many. Especially for marginalised communities, oral health issues were least prioritised or not even exercised. Thus the service options became very restrictive for them. Marginalised communities are predominantly economically deprived minority, their history, own traditions and numerous conditions gradually resulting in a large amount of gap in between mainstream societies through high unemployment rates, low level of education and overall high social exclusion for hundreds of years [2]. The marginalised communities have an enormous lack of access to oral health; not only for limited options but also for lack of social awareness programs, high illiteracy and intricate social exclusion status.

The oral health disparities reveal a disproportionate burden or risk of oral health-related death risks, (oral cancer, severe orofacial infections), disability on any particular community [3]. The actual figures of high-risk incidents are highly unlikely to find from unconvincing oral health statistics in Romania. However, many interventions were introduced in Romania to improve oral health care for overall communities for the last three decades. However, the academic settings are the well-referred intervention projects rather than non-academic specific community-oriented problem solving affiliated programs. Addressing the multiple factors are incumbent for achieving effective oral health; which involve prevention, corrective interventions and recovery. The factors comprise of the diverse challenges such as: establishing and maintaining healthy nutrition and oral hygiene, quality preventive and restorative dental treatment, complex oral rehabilitation treatment, congenital and genetic disorders, psychosocial issues associated with a reduction of tobacco usage and problematic alcohol usage and many others [4].

The scope is broader than the term dental as in typical public eyes dental is much more limited only in teeth and gingival areas. Gluck G. M. et al. described in 2002 that community dental health or community oral health is interchangeable in terminology. However, the "oral health" term is more meaningful to the community as it covers the topics of the hard and soft palate, the lining of the mouth, the throat, tongue and lips, the salivary glands, masticatory muscles, the lower and upper jaws and temporomandibular joints [5].

Aim and objectives

The scope of this study was to assess the willingness of dentists to provide dental treatment in marginalised communities in Timisoara in order to improve the overall community oral health status.

MATERIALS AND METHODS

The qualitative data collection was done through structured questionnaire. In the pilot study that was taking place in December 2018 in Timisora were included 32 dentists with different age and professional experience. Informed consent of all the participants included in the study was obtained. Every question was designed to provide relevant data related to the hypotheses established during the research design. The questionnaires content had two parts. The first part was the identification of the gender, professional status and opinion on the types of oral health services and willingness to work as a volunteer and the second part was mostly related to types of treatment that should be provided free in this community service. Initially, the questionnaires were used for the survey on the pilot basis both the questionnaires were changed according to the feedback from the respondents. A limited number of respondents participated in the pre-test, who are broadly representative of the type of respondent in the initial survey. The questionnaires had been subjected to a thorough pilot test to achieve the final form of the questions through a mechanical process of setting up the questionnaire in the final form.

RESULTS

There were 32 respondents: last year dental students, 1 to 15 years experienced dentists and more than 15 years experienced senior dentists. The sample was equally distributed to the male and female respondents (17 females and 15 males). The lowest age of the respondents was 23 and highest 54 years old (mean age 34.3) (fig.1).

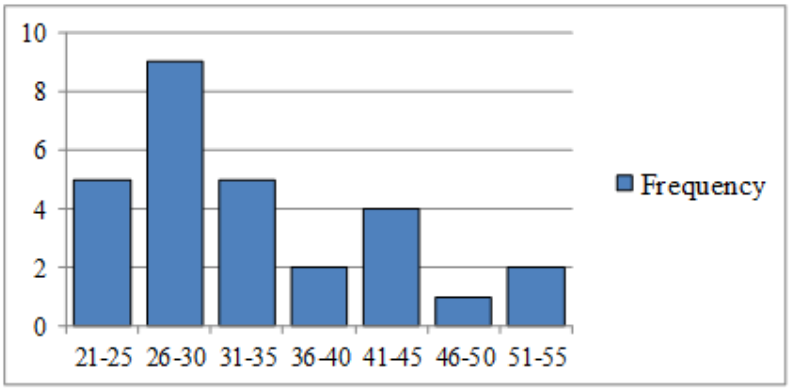


Figure 1. Age range and frequency of respondents (service providers)

Among 32 respondents, 17 respondents were young dentists with 1-15 years of experience, 10 of them had more than 15 years of experience and 5 were final year students. (fig.2).

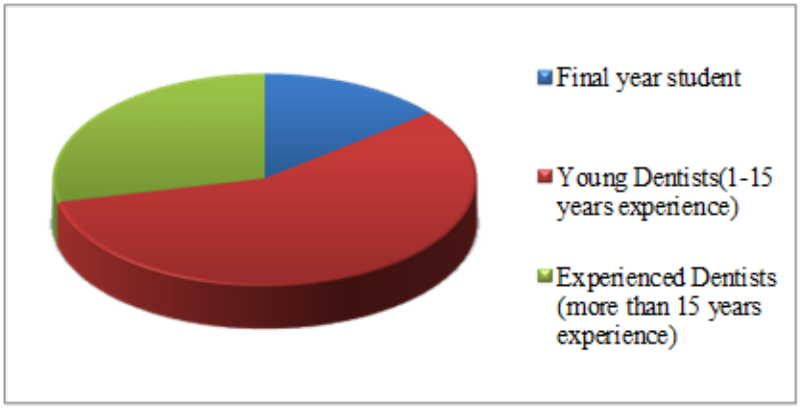


Figure 2. Number of respondents according to professional status

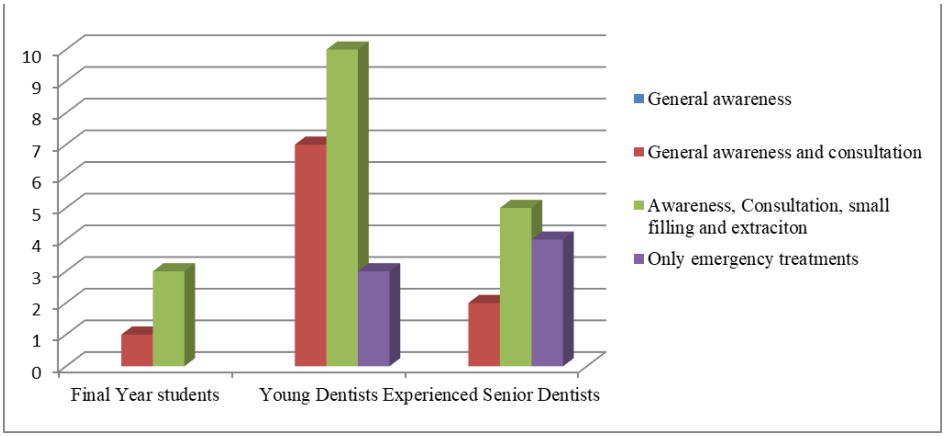


Figure 3. Level of free treatment provision from the different professional experience level groups

The respondents showed their interest to work voluntarily within a community service. The experienced dentists have also expressed that the mobile dental unit could be an alternative for the marginalised community. The level of dental services provided for free varied in their opinions. However, most of the respondents stated that awareness (dental health education lessons), small filling and extraction associated with emergency treatment could be feasible as treatment options for underprivileged communities (fig.3).

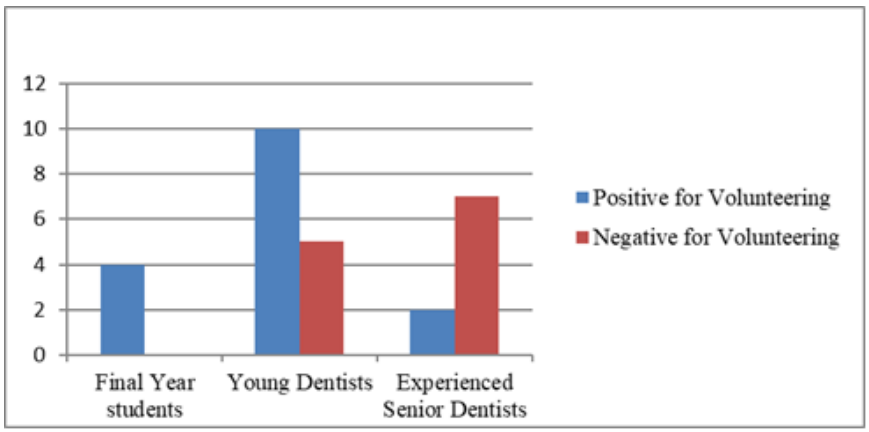


Figure 4. Positive or negative intention for volunteering according to the professional experience level

Since the mobile dental unit is new to the dentists none of them has worked or experienced within this type of clinical environment. Even if they have no previous background their opinion vary quite differently, the youngest dentists being more opened in working in this kind of dental settlement (fig.4).

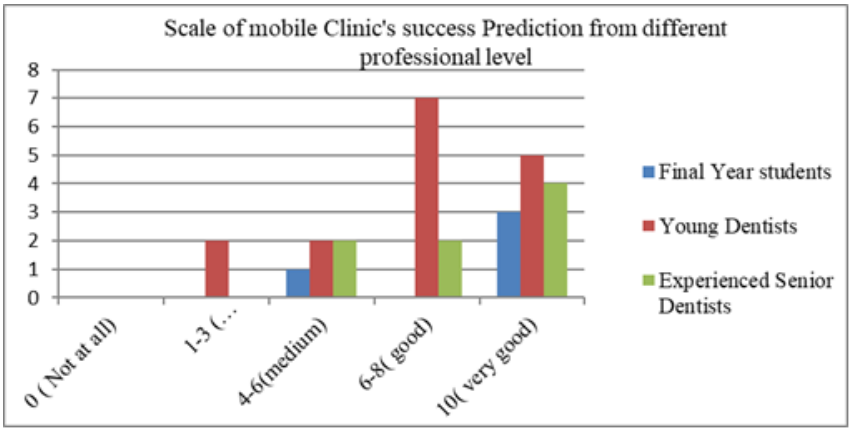


Figure 5. Scale of mobile clinic's success prediction from different professional level

Another question revealed that the expected success after implementing community dental services is very high (fig.5).

DISCUSSIONS

The idea of providing free dental treatment to underprivileged communities is spread across the world, being present in the western countries and also in Canada and United States.

This service provides the following dental treatments for all ages: dental health education programs, regular dental check-ups, scaling and polishing, application of fluoride varnish and sealing for children, extraction and emergency treatments, caries treatment and fillings and full dentures for fully edentulous patients [6,7]. The benefits of a mobile dental unit can impact on overall social oral health status, thus the dental professionals can have a significant influence and make it happen with their small efforts. Bringing the service to the locality is more accessible than the centralised services in the city. The combination of all small efforts can make a more significant impact on society improving better knowledge and practice on oral health. The improved oral health status can encourage dental professionals to introduce advanced dental treatment options, which is irrelevant on many occasions for a deprived community that deficiencies necessary dental treatments. Not only the practising dentists but also the dental students can learn the community, the scope, the grey area or the limitations on practice for their future patients. The congruent tangible and intangible constraints challenge the compatibility on introducing the mobile-unit such as running costs, driving the unit, medical equipment, radiological services, infection control, the safety of the unit. However, the challenges can be dealt with point by point basis by learning from the other cases in Europe or western countries [8]. The local government along with the general medical professionals can form the combined team that can serve a one point service with more experts on site. In the treatment, phases can be similar to the case studies such as Step 1-Awareness (dental health education lessons), Step 2-Preventive therapy, and Step3-Intervention (emergency and immediate need). The success of the project can be consistent services for an extended period of time rather than once in a year or two. The dental awareness cannot be successful alone without the other influencing parameters (e.g. educational development). However, the frequency of the mobile dental unit should be considered depending on the performance and the acceptance to the community. The children will be benefitted as they are dependent on their parents for their treatments which might not happen for lack of knowledge, resources and reluctance by parents. The mobile unit can have an impact on the alleviating the disparity in oral health by all influencing parameters(e.g. dental professionals, local government, funding agencies)[9,10]. Although the constraints are bureaucratic complicacy, the linear outcome from the project implementation can be proportional to their inter-relationship. Tiwari et al. in 2017 mentioned that disparities persist across the full range of oral health issues and challenges when some groups will be more affected than others. Simultaneously, some groups will be abler than others to understand their problems and to respond including the challenges associated with accessing services or other resources to meet their health needs. Clinicians and oral health professionals should optimise the ability to respond to this complex picture. The sensitivity to the oral health disparity issues needs to heighten communities' sensitivity to differences at all levels [11]. In another study on African and Middle Eastern population, the researchers concluded that social determinants of oral diseases have links to family income, educational attainment, employment, housing, the risk of accidents, and physical and mental health. The community and developing community assets, strength of families, competence to self-manage health conditions, family empowerment and equitable health services delivery combined help to reduce the prevalence of oral diseases. However, the primary health care strategy should be in focus for improving the oral health that can advocate in the entire process to influence all

[12]. Dental professionals' main goal is to protect and preserve the oral health of the public and fight against oral diseases that can cause severe harms to public health. To achieve the goal, the professionals need supports from the government, funding agencies and the associated organisations. The necessity of a mobile-unit is obvious and appropriate for the marginalised community in Timisoara.

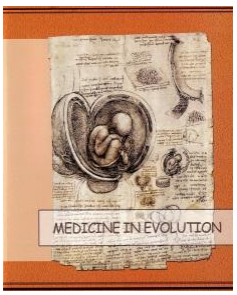
CONCLUSIONS

From the dental professional's point of view, the eagerness to work for the deprived community and their support is encouraging although they never experienced volunteering with a similar type of mobile unit. The access to oral health can be implemented successfully, and in this case, the mobile dental unit can work as a catalyst in the social oral health enhancement alleviating the disparities in the community.

REFERENCES

1. Patrick D. L., Lee R. S.Y., Nucci M., Grembowski D., Jolles C. Z. and Milgrom P. Reducing Oral Health Disparities: A Focus on Social and Cultural Determinants. BMC Oral Health .2006, 6(Suppl 1):S4
2. Simpson, D. Dwayne. A Framework for Implementing Sustainable Oral Health Promotion Interventions. J Public Health Dent. 2011 ; 71(s1): S84–S94.
3. Martino S. Oral Health Behavioral and Social Intervention Research Concepts and Methods. J Public Health Dent. 2011 Winter; 71(0 1): S2–S6.
4. Schulz A, Northridge ME: Social determinants of health: Implications for environmental health promotion. Health EducBehav 2004, 31:455-471.
5. Gluck, G and Morganstein, W.M. Jong's Community Dental Health. (5th ed.). England: Elsevier; 2002.
6. An Assessment of Mobile and Portable Dentistry Programs to Improve Population Oral Health. Center for Health Workforce Studies School of Public Health University at Albany, State University of New York. August 2017. Available online at [http://www.chwsny.org/wp-content/uploads/2017/09/OHWRC_Mobile_and_Portable_Dentistry_Programs_2017.pdf]
7. Dentaid. England. 2019. Available from: [https://www.dentaid.org/news/]
8. Lee , J.Y, Divaris , K. The Ethical Imperative of Addressing Oral Health Disparities: A Unifying Framework. J of Dental Research. [Online] 2014;93(03): 224-230. Available from: https://journals.sagepub.com/doi/abs/10.1177/0022034513511821 [Accessed 15 March 2019].
9. Sabbah, W, Tsakos, G, Sheiham, A, Watt, R.G. The role of health-related behaviors in the socioeconomic disparities in oral health. Social Science & Medicine. [Online] 2009;68(2): 298-303. Available from: https://www.sciencedirect.com/science/article/abs/pii/S0277953608005625 [Accessed 10 Feb 2019].
10. Watt R.G, Sheiham A. 2012. Integrating the common risk factor approach into a social determinants framework. Community Dent Oral Epidemiol.40(4):289–296.
11. Tiwari, T, Baker, S.R, Albino, J. Reducing oral health disparities: what can we learn from social, environmental and cultural factors?. (1st ed.). USA: Frontiers in Public Health ; 2017.
12. Chidzonga, M.M, Carneiro, L.C, Kalyanyama, B.M, Kwamin, F, Oginni, F.O. Determinants of Oral Diseases in the African and Middle East Region. Advances in Dental Research. 2015; 27(1): 26-31.

Dental aesthetics in adolescent patients



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Abstract

Adolescence is known as one of the most controversial periods in the human evolution. Full of changes in all areas, it is a stage of transition from childhood to adult person. In this period adolescent concerns for their looks start to show, sometimes and in the present case we wanted to point out the main concerns of adolescents related to dental aesthetics and the extremes they can reach in certain cases. Based on data from our literature and our research, the present study is a synthesis of the aesthetic demands of adolescents: orthodontic appliances, dental bleaching, aesthetic fillings or even tattoos, piercings, prosthetic bridges of precious metals. Dental aesthetics is a large and controversial field and a teenager at the age of terrible may have claims that contradict our ethics. It is our duty to select, appreciate, and refuse where applicable to these requirements.

Keywords: adolescent, dental aesthetics, patients.

INTRODUCTION

Aesthetic requirements are increasingly common in the dentist's office. Many of these requirements are relevant, but there are cases where ethical and ethical standards are challenged. Not just the requirements are the problem, but sometimes the age of the patient.

Adolescence is known to be a difficult age for both the person concerned and for the parents. It is age changes at all levels, poured rebellious and desire affirmation. Then begin to appear for aesthetic concerns that many of them are completely missing. But sometimes these concerns are exaggerated or the results of the desire to stand out [1].

The most common requirements of adolescents related to cosmetic dentistry are: orthodontic treatment, dental caries in the front teeth, scaling, professional brushing, teeth whitening, injuries, damage to periodontal mainly due to hormonal changes, tattoos and piercings [1-4].

Caries in the frontal area

The carious lesions in the frontal area are due to the vast majority of dental caries. There are significant differences between the damage of the frontal teeth through carious lesions between developed and undeveloped countries, but also between rural and urban areas [2,5]. This can be attributed to prophylactic programs, to the level of parents' culture but also to their material possibilities. The problem of front teeth treatment in adolescence is given by the anatomy of the young permanent tooth, sometimes with the incomplete closed apex and dental larynx, the room large pulp (Figure 1). The treatment solution should be chosen with discernment in view of this and delayed aesthetic treatment if it puts the vitality of the tooth in jeopardy [2,3].

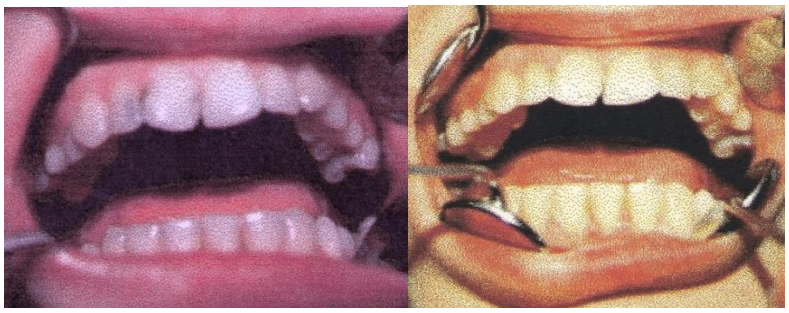


Figure 1. Carious lesions on the front teeth before and after treatment

Dental injuries

Front teeth trauma comes from: aggression, accidents or complications of dental caries (Figure 2). Sometimes they can be prevented by wearing protective gloves in contact sports. Others can be caused by accidents (falls, car accidents, bicycles) or frequent aggressions especially in adolescent boys. Their treatment and prognosis depend on a number of local and general factors, but the refinement of aesthetics must prevail [3].

Figure 2. Accidental trauma by bicycle with tooth fracture before and after treatment

Orthodontic treatments

Malocclusion is one of the most common dental problems. Over the last three decades view there has been a general increase in people's preoccupation with personal aesthetics and their awareness of malocclusion, which has led to a notable increase in the demand for orthodontic [2,3]. Index of orthodontic treatment (IOTN) classify malocclusion according the importance of different occlusal characteristics for the individual's dentition's health and for aesthetic function, with the aim of identifying individuals with the highest probability of receiving orthodontic treatment. When a patient presents a test, a standard procedure is used.

Because the orthodontic treatment needs to be justified on either dental health or aesthetic needs, there are two components to this index:

• The Dental Health Component (DHC)

• The Aesthetic Component (AC) - used only when the patient is evaluated in the DHC group 3 - this splits "group 3" into 10 subcategories.

The Dental Health Component of the IOTN has five categories ranging from 1 (no need for treatment) to 5 (great need) (IOTN)

In the Romanian population the studies conducted by Conega and collaborators on 200 adolescent IOTN (DHC Component) patients: Grade 1. Normal or minor malocclusion. No need treatment 20.7%, grade 2. Minor malocclusion. Little need 32.3% Grade 3. Moderate malocclusion. Borderline need 31.7%, Grade 4. Severe malocclusion. Needs treatment 11.7%, Grade 5. Very severe malocclusion. Definite need; 4.3%. Distribution of the IOTN Dental Health Component (DHC) levels of orthodontic IOTN. No need 75.1%, moderate need. 13.5%. Definite need 11.4 % [2,4].

However, the number of requests for the application of fixed orthodontic appliances is increasing, the device itself being considered by the adolescent as an aesthetic accessory and fashion.

Amelogenesis, dentinogenesis, dental discroms

Imperfect amelogenesis and dentinogenesis have internal causes, changes in the various dental layers during odontogenesis and tooth mineralization. Discroms may have internal or external cause.

Dental bleaching at adolescents

Dental bleaching is one of the most common requirements in the field of dental aesthetics. It can be a treatment solution in case of dental damage or it may be required of the patient who wants more in the aesthetics of his teeth [3].

For many patients, especially adolescents, dental bleaching may be an obsession. Although not all authors agree with this work in childhood and adolescence, many are still of the opinion that it can be done from the age of 10 years. Out of 25 articles on this topic from the literature found on the specialized websites, the results and conclusions reached by practitioners who performed dental bleaching in children and adolescent patients were over 86.5% of cases if the procedures of labor were being followed would be safe [4].

The bleaching procedure was effective, and patients could perceive its result. Also, all investigators have been asked to investigate the effects of bleaching on young teeth [5].

In America at home-whitening with a gel and mouth guard supervised by a dentist is the most widely used way. A protocol for the use of this technique in young people was published in 1994. Conclusions: The bleaching procedure was effective, and patients could perceive its result. No statistically significant difference was found in gingival or tooth sensitivity. However, in Europe, the vast majority of authors believed that the procedure should not be performed under the age of 16, regardless of the method or product of bleaching used [6,7].

The problem is that the adolescent patient (Figure 3), if he is not sufficiently informed, has plenty of ways to take a self-dental procedure (internet, stores, improvised recipes, etc.)

alone, which will result in a much worse outcome than if it had been performed under the supervision of the physician even at an inappropriate age [8].

Figure 3. Dental bleaching at adolescents

Tattoos, piercings

The application of tattoos and piercings in the mouth and teeth area has become a fashion among adolescents. We could only write an article on this subject, but just mention the fact that the major risks of harm to the vitality of the teeth are the inflammation of affected and hormonal periodontitis, injuries dental infection, general infection due to non-compliance with hygiene standards, etc [9, 10]. According to Calderano et al. (PP) ≥ 6 mm and gingival recessions (Rec) were more frequent (n = 14), percentages of sites with bleeding on probing (BoP), attachment loss (AL) Increased in teeth with close proximity to the piercing compared to teeth not affected by the piercing. In patients with a lip piercing (n = 7), the periodontal findings did not differ markedly in teeth close to the piercing compared to teeth not affected by the piercing. Conclusions: Tongue piercings may negatively affect periodontal conditions of teeth with close proximity to the piercing [7,11].

CONCLUSIONS

• Aesthetic requirements are constantly growing in dental practices, some of them being justified, others being just the wishes of the patient

• Teenagers are a special category of patients both because of physical and physiological modifiers and psychological characteristics (rebellion, desire to affirm, need for affiliation, desire to have an attractive aesthetic appearance)

• By celebrating all the above-mentioned aspects we have to make a decision regarding the aesthetic treatment of the adolescent patient that does not harm him or her in the moment or in the future

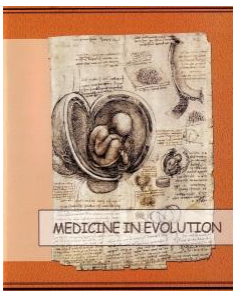
• Teenagers and their families should be advised and patiently explained why they may choose one of the treatment options, otherwise the majority will call another specialist or more severely to a person without knowledge of the subject.

REFERENCES

1. Petersen PE, Danila I, Delean A, Grivu O, Ionita G, Pop M, Samolia A. Oral health status among schoolchildren in Romania, 1992. Community Dent. Oral Epidemiology. 1994; 22:90-93
2. Funieru C, Pandara A, Cuculescu M, Ranga R, Comes C, Panaitescu E, Ivan L. Statistical correlations concerning dental and periodontal status and the level of education in oral health in pupils of Bucharest schools. OHDMBSC. 2006; 5(3):11-17
3. Nalcaci R, Demirer S, Ozturk F, Altan BA, Sokucu O, Bostanci V. The Relationship of Orthodontic Treatment Need with Periodontal Status, Dental Caries, and Sociodemographic Factors. Scientific World Journal. 2012:145-149

4. Corneaga A, Danila I, Balcos C. Assesment of orthodonthic treatment needs of schoolchildren needs (IOTN) and dental aestethetic index (DAI). Romanian Journal of Oral Rehabilitation. 2011, 3(4): 27-32
5. Pinto MM, Goncalves ML, Mota AC, Deana AM, Olivan SR, Bortoletto C, et al. Controlled clinical trial addressing teeth whitening with hydrogen peroxide in adolescents: a 12-month follow-up. Clinics. 2017; 72(3):161-170
6. Donly KJ, Segura A, Henson T, Barker ML, Gerlach RW. Randomized controlled trial of professional athome tooth whitening in teenagers. Gen Dent. 2007; 55(7):69-74.
7. Calderano S, Schmidt J, Weiger R, Walter C. A retrospective study on the association between oral piercings and clinical signs of periodontal inflammation, Conference: Europerio, Amsterdam
8. Pinto MM, Gonçalves ML, Mota AC, et al. Controlled clinical trial addressing teeth whitening with hydrogen peroxide in adolescents: a 12-month follow-up. Clinics. 2017; 72:161–7
9. Nuca C, Amariei C, Badea V, Jipa I. Relationships between Constanta (Romania) 12-year-old children's oral health status and their parents' socioeconomic status, oral health knowledge and attitudes. OHDMBSC. 2009; 7(4): 44-52
10. https://www.chapelroad.co.uk/PDF's/IOTN.pdf
11. Jornet P, Carnacho-Alonso P. Oral and Dental Complications of IntraOral Piercing. Journal of Adolescent Health. 2006; 39(5):767-769

Sinus lift: the method aimed at increasing the amount of bone in oral implantology



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Abstract

Partial uni- or bimaxillary edentulism occurring at younger and younger ages, especially on the upper maxillary, raises several problems when it comes to the oral recovery of the patient. We want to replace one or more teeth without sacrificing the remaining teeth in the area. The only way of not sacrificing other teeth for a dental bridge remains the implant and prosthetic-based oral recovery. Most often bone atrophy and resorption are also encountered, especially on the upper maxillary, next to the maxillary sinuses, which brings up the need to employ surgical methods to provide the necessary amount of bone to be able to insert the dental implants and ensure a successful recovery. *Aim and objectives:* To present one of the surgical methods that ensures the necessary amount of bone, both in height and thickness, on the upper maxillary, in case of an old partial edentulism, as part of implant-based prosthetic oral therapy. *Materials and methods:* Performing a surgical method, sinus lift, to improve the quality and quantity of the bone on the upper maxillary, as a stage within the implant and prosthetic therapy.

Keywords: implant and prosthetic-based oral recovery, partial edentulism, amount of bone, sinus lift, bone addition, bone augmentation

INTRODUCTION

Nowadays we realize that occurrences partial edentulism have increased and ever more of the adult population suffer of toothlessness starting at ages getting younger and younger. Losing teeth has consequently an impact on the main functions of the stomatognathic system: mastication, facial appearance and speech. An increasing number of patients choose a treatment based on prosthetics or dental implants for functional and aesthetic recovery.

Aim and objectives

Losing one's teeth is followed by a series of changes that occur at hard tissue level by means of bone resorption and bone atrophy, as well as with the soft epithelium and connective tissue. Frequently, a year later after the tooth's being pulled out, the amount of bone decreases 25% compared to the initial amount of bone, while after three years, one can notice a resorption rate ranging between 40 and 60 percent, and after five years, the bone has a thickness of less than 3 mm. In most cases, the amount of bone is no longer sufficient for a proper dental implant [2-6]. The paraclinical investigations we perform—the panoramic radiography which provides a general picture, and the computerized tomography which reveals a detailed view on the bone structure and density in the affected area—allow us to produce the appropriate widths and heights of the necessary bone foundation in order to insert the dental implant [1-6]. In this situation, we employ surgical methods to perform bone addition or bone augmentation with the purpose of rebuilding and repairing the bone-related issues in the affected area [1-6].

MATERIAL AND METHODS

Sinus lift and bone augmentation are surgical procedures that allow increasing the amount of bone in the back side of the upper maxillary and consists of raising the membrane coating the jawbone's sinus and inserting additional natural or synthetic bone to increase the width of the bone to allow performing the dental implant in the maxillary area, i.e. lifting the bone in the pneumatized maxillary sinus. [1-6] This additive surgical procedure, that makes use of bone addition or bone augmentation to ensure the necessary amount of bone, is a frequently used method in oral implantology employed to reach a sufficient amount of bone that has the appropriate height and width that allows the proper insertion of a dental implant [1-6]

CASE STUDY

Patient: S. C., male, 57

General clinical status: Ischemic cardiopathy, controlled by means of prescription drugs

Diagnosis: Bimaxillary partial edentulism at 1.5, 1.6 and 2.4, installed five years prior.

Treatment:

We perform sinus lift with augmenting the bone area prior to the implant with BIO-OSS, natural bone substitute, produced by the Geistlich company, having a granulation of 1-2 mm, and with covering it with absorbable membrane. The increase of the amount of bone in height in being done through vertical resizing by adding augmentation material over the sinus floor. The insertion of the implants on 1.5 and 1.6 was done at the same time surgically with sinus elevation. (cf. Figure 1) Postoperatively, a controlling radiography was performed. The patient is still being monitored, and takes part in the later stages agreed upon in the treatment plan for oral recovery on the implants.

Figure 1. Performing the sinus lift procedure on patient S.C., male, 57

CONCLUSIONS

Longtime partial edentulism and its consequent bone atrophy and resorption, ever more frequent among adult patients, raised our interest to study methods that can be employed to increase the amount of bone in order to reestablish oral functionality and aesthetics.

The advantages of bone augmentation by means of the sinus lift procedure allows us to repair oral bone damage, to rebuild and increase the amount of bone, which gives way to performing functionally and aesthetically relevant high standard implant and prosthetic-based therapy afterwards.

In order to achieve on the long run a successful prosthetic restoration using dental implants, it is essential that the physician carefully assesses the preoperative dental and paradontal status in concordance with the general status of the patient and the local and general health issues they are suffering of. [3-6]

The quality and the quantity of the bone have a major importance on whether the insertion of the implants is successful and how long it takes to perform the prosthetics on the implants.

REFERENCES

1. Denissen H.W., Kalk W., Veldhuis H., et al., Anatomic considerations for preventive implantation. Int J Oral Maxillofacial Implants, 1993.
2. http://www.cliniciimplantdentar.ro/
3. Jan Lindhe et al., Clinical Periodontology and Implant Dentistry, 5th Ed., 2008, Blackwell Munksgaard
4. Misch,C.E.: Maxillary sinusAugumentation for aendosteal Implants:Organized Alternative Treatment Plans, Introduction J.Oral Implant.,1987
5. Ganuta, N., Bucur, Al., Ganuta, Al., :Tratat de implantologie orală, Ed. Naţional, 1998
6. Sarbu, I., Stoienescu, M., Tanase, G., Marinescu, A., Gheorghe, S., Carabela, M., et al: Curs practic de implantologie orală, 2004, Ed. Romprint SA, Bucureşti

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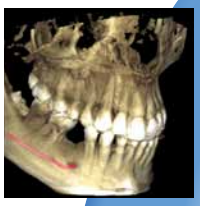

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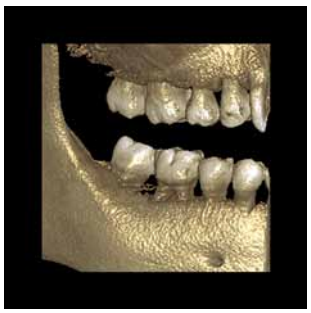

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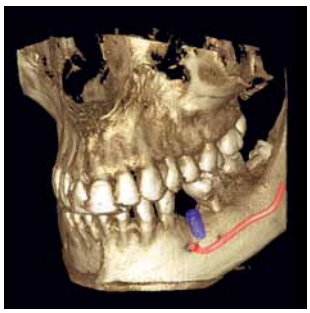
Ø42 x 42 mm–90 x 60 x 130 mm



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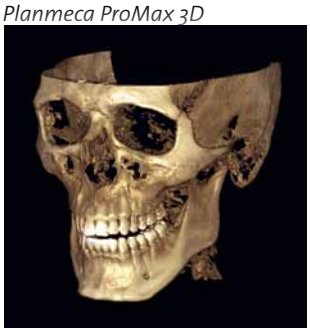

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INSTRUCTIONS FOR AUTHORS

The journal publishes general reviews, studies and clinical, epidemiological, experimental and laboratory research, clinical case presentation, papers from the history of medicine, reviews, scientific and technical state-of-the-art articles, medical informations and opinions. Only papers which have not been published or sent for publishing in other journals are accepted. The authors are responsable for the opinions expressed in the papers. ***The paper must be edited both in Romanian and in English; the English version will be supervised by our collaborator Dana Brehar-Cioflec, MD, PhD; typed on white A_4 paper and on CD, DVD or Memory Stick***.

Manuscripts will not exceed:

- general reviews: 6-8 pages
- studies and researches: 5-7 pages
- case presentations: 2-4 pages
- reviews, scientific and technical state-of-the-art articles, medical informations and opinions: 1-2 pages.

The paper will be edited according to international editing rules for manuscripts. The title will be written in capital characters and it will be followed by the name and surname of the author (authors), followed by their place of work (place where the paper has been elaborated). Studies and researches will be followed by a brief abstract, followed by 3-4 key-words.

The body of the paper will be structured on the following chapters: introduction, aim, objectives, material and method, results and discussions, conclusions. The references will be presented alphabetically and in conformity to the Vancouver Convention, including:

- for articles: name of the authors and surname initials, title of the article in the original language, title of the journal according to the international abreviation system, year of issue, volume, number, pages;
- for books: name of the authors and surname initials, volume, publisher (editors), city of publishing, year of issue.

Citation of references inside the body of the paper will be put between brackets, Harward style (author, year) or Vancouver style (number in square brackets or superscript). Cited reference titles will be selected, maximum 6 for studies and case presentations and 12 for general reviews. Acceptance, rejection or the need of alterations in sent materials, or in inconography, will be comunicated to the authors in due time. For this, the authors will indicate the person and address for corespondence (phone number, e-mail address). Given the less pleasant experience of the editorial board with some articles being rejected because they did not meet publishing criteria, we decided to support those who intend to publish in this journal by detailing the way such a paper should be elaborated, as well as our requirements.

Except some particular aspects concerning this journal, the following details are general requirements asked or imposed by other journals as well. Conditions to be met in order to propose a paper for publishing. The main author has the responsability to make sure the article has been approved by all the other authors. The journal will have copyright

for papers accepted for publishing. The editorial board reservs the right to change the style and dimensions of an article (major changes will be discussed with the main author) and to decide the date of issue.

2. FIRST PUBLICATION

The editorial board will not consider a paper already reported in a published general review or described in a paper proposed to or accepted by another journal. This does not exclude papers which have been rejected by other journals. Also, papers which have been presented at a scientific meeting will be accepted for discussion if they have not been entirely or partially published in a similar publication. „Multiple" publishing of the same study is seldom justified. One of the possible justifications is publishing in a second language but only if the following conditions are met:

- Editors of both journals involved are fully informed;
- Priority of the initial publication will be respected by a minimum publishing interval of two weeks;
- For the second publication, a shortened version will suffice;
- The second version strictly reflects data and interpretations in the first;
- A footnote may state: „This article is based upon a study initially published in [title of the journal]".

3. PATERNITY

Paternity must reflect the common decision of the coauthors. Each author must have participated enough to take public responsability for the content. A paper with collective paternity must have a key person responsable for the article.

4. COPYRIGHT

In order to reproduce materials from other sources, written agreement from the copyright owner must be obtained:

- photographer – for unpublished photographs;
- hospital where the photographer (physician) is employed – for unpublished photographs performed during the employment period;
- initial publisher – for a table, picture or text which have previously been published elsewhere.

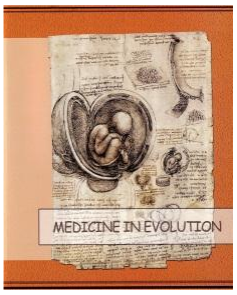
5. ETHICAL ASPECTS

Do not use name of patients, initials or hospital observation charts numbers. If a photograph of a body part which could allow direct or deductive recognition of the patient needs publishing, then the paper must be accompanied by the written consent of the patient and clinician, as well.

6. PRESENTING THE MANUSCRIPT

6.1. CONTENT OF THE PAPER - INDICATIONS FOR ORIGINAL ARTICLES

Paper title [Book Antiqua 20, bold, left alignment]



Surname N.[1], Surname N.[2] [Book Antiqua, 14, bold]

[1] *Author Affiliation (DEPARTMENT, FACULTY, UNIVERSITY, CITY/COMPANY) [10, italic]*
[2] *Author Affiliation (DEPARTMENT, FACULTY, UNIVERSITY, CITY/COMPANY) [10, italic]*

Correspondence to:
Surname Name: [10, italic]
Address: [10, italic]
Phone: +40 [10, italic]
E-mail address: [10, italic]

Abstract [Book Antiqua, 12, bold, justify alignment]

Recommendations for original studies

Original studies must include a structured abstarct of maximum 150 words, containing the following titles and informations: Aim and objectives; Material and methods; Results; Conclusions; Key words: give 3-5 key words; The abstract will be translated into an international circulation language.

Keywords: Innovation, technology, research projects, etc. [Book Antiqua 9].

INTRODUCTION [Book Antiqua, 11, bold, left alignment]

Introduction presentation of general aspects, in the context of the approached theme.

Introduction include **Aim and objectives –** Define the aim of the article. Briefly expose the rationale of the presented study or observation. Make strictly pertinent referals and do not exhaustively review the subject. Do not include data or conclusions from the paper.

There is a limitation of 4/6 pages. All pages size should be A4 (21 x 29,7cm). The top margins should be 2 cm, the bottom, right, margins should be 2cm and left margins should be 2,85 cm. All the text must be in one column and Book Antiqua font, including figures and tables, with single-spaced 10-point interline spacing.

Aim and objectives [Book Antiqua 11, bold italic, left alignment]

The text included in the sections or subsections must begin one line after the section or subsection title. Do not use hard tabs and limit the use of hard returns to one return at the end of a paragraph. Please, do not number manually the sections and subsections; the template will do it automatically.

[Book Antiqua, 11 point, normal, justified alignment].

MATERIAL AND METHODS [Book Antiqua, 11, bold, left alignment]

Describe the selection of observations or subjects for the experiment (including controls). Identify methods, equipments (with the name and address of the manufacturer in brackets) and give sufficient details on procedures. Give references for the selected methods, including statistical methods; offer details and brief descriptions for previously published methods which are not well known; describe new or substantially modified methods, justify their use and assess their limitations. Precisely identify all used drugs and chemicals, including generic names, dosage and administration ways. Describe statistical methods with sufficient details for reported results to be verified. Whenever possible, quantify discovered aspects and present them with appropriate measurement indicators for the uncertainty or error of measurement (such as confidence intervals). [Book Antiqua, 11 point, normal, justified alignment].

RESULTS [Book Antiqua, 11, bold, left alignment]

Present results in a logical succession as text, tables and illustrations. Emphasize or briefly describe only important observations. [Book Antiqua, 11 point, normal, justified alignment].

DISCUSSIONS [Book Antiqua, 11, bold, left alignment]

Underline new, important aspects of the study. Do not repeat in detail data which have been presented in previous sections. Include implications of revealed aspects and their limitations, including implications for future studies. Connect your observations to other relevant studies. Relate the results to the aim proposed for the study. [Book Antiqua, 11 point, normal, justified alignment].

CONCLUSIONS [Book Antiqua, 11, bold, left alignment]

Organize conclusions which emerge from the study. In the end state: a) contributions to be acknowledged but which do not justify paternity right; b) thanks for technical support;

c) thanks for financial or material support. [Book Antiqua, 11 point, normal, justified alignment].

REFERENCES [Book Antiqua, 11, bold, left alignment]

A numbered list of references must be provided at the end of the paper. The list should be arranged in the order of citation in the text of the publication, assignment or essay, not in alphabetical order(according to the Vancouver rules). List only one reference per reference number. It is very important that you use the correct punctuation and that the order of details in the references is also correct.

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[1] _____
[2] _____
[3] _____

6.2. CONTENT OF THE PAPER - INDICATIONS FOR CASE REPORTS

Content of the paper for case report will respect indications for original articles.

Themes may be selected from all medical fields. Manuscripts which offer a special gain for daily activity will have priority. The title must be clearly, precisely stated. It may be completed by a subtitle. It is advisable to include in the key words of the title the main message, the special element which may be observed from the case evolution. The content of a case report must be divided into three parts:

Introduction – It must include a maximum of 15 typed rows (half page). Here, the main medical problem is summarized in order to place the case in a specific domain.

Case report – It contains essential specific information on the case. In order to make a logical, chronological and didactical case report the following 5 chapters are needed:

I. Anamnesis;
II. Clinical examination data;
III. Laboratory data;
IV. Additional paraclinical investigations;
V. Treatment and evolution.

Discussions – The reason for the case report must be stated. The report must be patient-centered. Occasional deviations from typical (characteristic) evolutions, nosologically important facts must be presented in such a manner to expose the clinical picture as completely as possible. The case report must not appear as an appendix of a general review. Dimensions of a case report: maximum 6-8 typed pages, 30 rows of 60 characters/page.

6.3. MEASUREMENT UNITS, SYMBOLS, ABREVIATIONS

All measurements must be expressed in International System (IS) units. Abreviations must be fully explained when first used.

6.4. TABLES

Tables are noted with Roman figures and they will have a brief and concise title, concordant with their content.

6.5. ILLUSTRATIONS

Number all illustrations in Arabic figures in a single succession. Apply a label on the back side of every illustration, containing its number and an arrow indicating the upper side. Coloured illustrations may be accepted but it is the choice of the editors, according to particular technical abilities of each journal issue, or it may involve a fee in special cases.

6.6. EXPLANATIONS FOR DRAWINGS AND GRAPHS

Explanation for drawings and graphs must be clear and in readable dimensions, considering the necessary publishing shrinkage.

6.7. PHOTOGRAPHS

Offer glossy, good quality photographs. Any annotation, inscription, etc. must contrast with the ground. Microphotographs must include a scale marker.

6.8. ILLUSTRATION LEGENDS

Include explanations for each used symbol, etc. Identify the printing method for microphotographs.

7. COPIES FOR PUBLISHING

In order to accelerate publishing, the main author will send a set of printed sheets presenting the final version of the paper, as it will appear in the journal. It is really helpful that texts to be also sent on electronic support, diacritic characters mandatory.

8. REJECTION OF PAPERS

If a paper does not meet publishing conditions, whatever these may be, the editors will notify the first author on this fact, without the obligation of returning the material. Original photographs or the whole material will be returned only if the author comes to the editor and takes them.

Papers submitted for publishing will be addressed to:

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