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# MEDICINE IN EVOLUTION

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# CONTENTS

## CURRICULUM VITAE

**PAGES 5 -6**

## CURRICULUM VITAE

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1994-1997 – Residency in cardiology (Cardiovascular Prevention and Rehabilitation Clinic, Timisoara)

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since 2003 – Associate Professor in Victor Babes University of Medicine and Pharmacy, Timisoara

since 2008 - Professor in Victor Babes University of Medicine and Pharmacy, Timisoara

***Main titles***

since 2007 - National coordinator for cardiovascular prevention.

since 2006 – Member of European Society of Cardiology Education and Accreditation Committee

since 2005 – President of Cardiovascular Prevention and Rehabilitation Working Group from Romanian Society of Cardiology

since 2005 – Coordinator of European Association for Cardiovascular Prevention and Rehabilitation Education and Accreditation Committee.

Since 2004 - Scientific & Research Vice Rector of Victor Babes University of Medicine and Pharmacy

**Fields of Interest:**

- exercise testing
- exercise training in special groups: PTCA, CABG, valve prostheses, heart failure, elderly

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**Scientific work:**

- PhD at Victor Babes University of Medicine and Pharmacy, Timisoara: "Cardiac Rehabilitation in Chronic Heart Failure" (2000)
- director of 5 national and international research projects
- author / co-author of 10 books and book chapters in cardiovascular rehabilitation
- author / co-author of 54 full papers in journals of cardiology
- author / co-author of 292 abstracts in conferences and congresses

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- since 1991 – member of Romanian Society of Cardiology and of Working Group of Cardiovascular Prevention and Rehabilitation (secretary 1994-1996 and since 2000)
- since 1994 – member of European Society of Cardiology and of Working Group of Exercise Physiology and Cardiac Rehabilitation
- since 1995 – member of Heart Friends Around the World
- 1995-1999 – member of European Association on Cardiovascular Rehabilitation (1999 – member in Board of Directors)
- since 2003 – member of International Editorial Board of European Journal of Cardiovascular Prevention & Rehabilitation

PAGES 7 – 13

# CURRICULUM VITAE

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## EDUCATION

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Orthodontics with orthopedics
Date of examination: 26 December 1990

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Date of examination:
17 June 1983

**PHD THESIS:**

"Effect of the antiepilaptic drugs diphenylhydantoin and sodium- valproate on the growth and development of the craniofacial system"
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## UNIVESITY AND EXPERT CAREER

| from - to | Title |
|---|---|
| 3 October 1980 - 10 January 1984 | Assistant aspirant |
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| 1 January 1992 - 30 April 1997 | Docent |
| 1 May 1997 - 31 August 2002 | Assistant Professor |
| 1 September 2002 - to date | Full Professor |

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1 October 1998 - 31 October 2000 Head of Clinic for Jaw Orthopedics

**EXPERT TRAINING:**

**Participation at courses:**

1. "Orthodontic Treatment of an Angle Class II Division 1 Malocclusion with Extraction by means of the Edgewise Fixed Multy Band Appliance"
   Prof. Sheldon W. Rosenstein (Belgrade, 17 – 19 June 1998)

2. "An Evaluation of Alternative Methods of Treatment"
   Prof. William R. Proffit (Athens – Greece, 18. February 2000)

3. "Anterior Dental Aesthetics: The Role of the Orthodontist"
   Prof. Vincent Kokich (Hersonissos – Crete, Greece 2 June 2000)

4. "Esthetics and Finishing in Orthodontic Treatment"
   Prof. Bjorn Udo Zachrisson (Istanbul – Turkey, 13 October 2002)

5. "The Clinical Management of Temporomandibular Disorders – (Part I)"
   Prof. Jeffry P. Okeson (Istanbul – Turkey, 16 October 2002)

6. "Savremeni ortodontski aparati u terapiji malokluzija II klase"
   *(Modern Orthodontic Devices in Treatment of Class II Malocclusions)*
   Prof. Moschos A. Papadopoulos (Belgrade, 2 November 2002)

7. **"Etiology, Diagnosis and Management of Face Asymmetries"**
   Prof. Athanasios E. Athanasiou (Belgrade, Serbia and Montenegro, 18 April 2003)

8. "Biomechanics and Its Clinical Applications in Orthodontics"
   Prof. Ram S. Nanda (Belgrade, Serbia and Montenergo, 2 October 2003)

9. "Non-Compliance Orthodontics: new biomechanical applications for avoiding the need of patient's compliance"
   Stefano Velo (Belgrade, Serbia and Montenergo, 5 October 2003)

10. "Estetska pravila i principi u terapiji malokluzija u dece i odraslih"
    *(Esthetic rules and Principles in the Treatment of Malocclusion in Children and Adults)*
    Prof. Bjorn Udo Zachrisson (Belgrade, 2 April 2004)

11. "Contemporary Orthodontic Practice: Biomechanics and Smart Wires"
    Prof. Ravindra Nanda (Thessaloniki, 23 April 2004)

12. "Lingual Orthodontics Course – Basic Pronciples"
    Romano Rafi, Geron Silvia (Orlando, 28-29 April 2004)

13. "The painful bite. Update on occlusion, Orthodontics and TMA pain"
    Peter Svensson, Ambrosina Michelotti, Tine Hjorth, Thomas Klit Pederson, Liselotte Sonnesen, Thor Henikson, Antoon De Laat (Aarhus, 06 June 2004)

14. "Mandibular and Midface Distraction"
    Konrad Wangerin, Barry Grayson, Thomas Klit Pedersen, Alvaro Figuroa, Thomas Kofod, Sven Erik Norholt (Aarhus, 12 June 2004)

15. "The Clinical Management of Temporomandibular Disorders – (Part II) "
    Prof. Jeffry P. Okeson (Belgrade, 18.Jun 2004.)

16. "Interactive Self-Ligation System (ISLS) Using In-Ovation Appliances"
    Prof. Mladen M. Kuftinec (Belgrade, 19 June 2004)

17. "Biological Concepts Supporting the Orthopedic Treatment of Class II and III Patients: Timing (biological age), Therapeutic Methods, Comparasion with Untreated Samples" Tiziano Baccetti, Lorenzo Franchi (Bahia, Brasil, 8 August 2004)

18. "Biological Concepts Supporting Biomechanics in Tooth Movement" Prof. F.G. Sander (Bahia, Brasil, 13 August 2004)

19. "Interdisciplinary Orthodontic – Prosthodontic Treatment" Prof. Bjorn Udo Zachrisson, Dr. Toreskog (Istanbul, 03-04 October 2004)

20. "Mini-screw Implants in Orthodontics" Claude Chabre, Hugo DeClarc (Paris, 12 November 2004)

21. "Orthodonric Treatment of the Impacted Teeth" Prof. Adrian Becker (Belgrade, 12-13 April 2005)

22. "Esthetics in Orthdontics: State of the Art" Prof. Vincent. G. Kokich, Prof. Bjorn Udo Zachrisson (Paris, 10 September 2005)

23. "Biomechanics of the fixed appliances orthodontics: from basics to interactive self-ligation" Prof. Mladen Kuftinec (Belgrade, 24 September 2005)

24. "Orthodontic Finishing: Guidelines for Managing the Interdisciplinary Patient" Prof. Vincent Kokich (Belgrade, 26 September 2005)

25. Roth – Wiliams – The Road to Excellence in Orthodontics – Achieving Functional Goals in Contemporary Orthodontic Treatment" – two-year course (Vienna, 2005/2006)

26. "Simultaneous Orthodontic and Orthopedic Technique to Avoid Extraction or Surgery in Unwilling Patients" Prof. Jose Dahan (Sofia, 19, November 2005)

**EXPERT VISITS:**

1. Clinic for Jaw Orthopedics, University in Zagreb, Croatia *(Prof. Vladimir Lapter)*

2. Department of Orthodontics School of Dentistry, Aristotle University of Thessaloniki Greece *(Prof. Athanasios E. Athanasiou)*

3. Clinic for Jaw Orthopedics, Faculty of Stomatology, Sofia, Bulgaria *(Prof. Valentin Moutafchiev)*

4. Department of Orthodontics of the Hebrew University-Hadassah School of Dental Medicine, Jerusalem Israel *(Prof. Adrian Becker)*

5. Department of Orthopedics and Orthodontics, Charité, Humboldt-University, Berlin, Germany *(Prof. Rainer Reginald Miethke)*

6. School of Stomatology, Bejing Medical University, Peking China

7. Department of Orthodontics, Marmara University Faculty of Dentistry Istanbul –Turkey *(Prof. Nejat Erverdi)*

8. Orthodontic Department, Mainz University Dental School, Mainz Germany *(Prof. Hans G. Sergl)*

9. Department of Orthodontics, New York University College of Dentistry, USA
   *(Prof. Mladen Kuftinec)*

10. Orthodontic Department, University of Padua, Padua, Italy
    *(Prof. Francesca Ada Miotti)*

11. Department of Orthodontics, University Clinic of Dentistry, Medical University of Vienna – Austria
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12. Department of Orthodontics, Royal Dental College, Aarhus – Denmark
    *(Prof. Birte Melsen)*

13. Orthodontic Institute Dr. Wilhelm – Brenner, Vienna, Austria
    *(Dr Maija Eltz)*

## PARTICIPATION IN SCIENTIFIC PROJECTS

from - to

Project name and source of financing

1986

1990

Health Status of the Oral Cavity of the Yugoslav Population
*(Ministary of Science of the Republic of Serbia)*

1989
1992

Orthodontic and Prosthetic Rehabilitation in Patientas Suffering from Parodontal Disease
*(Republic Administration for Science for the Region of Sumadija and Pomoravlje)*

1990
1994

Investigation of the Temporomandibular Joint in Children with Irregular Bite
*(Ministary of Science of the Republic of Serbia)*

1994
1998

Investigation of Physiological Age Children with Normal occlusion and Dentofacial Anomalies
*(Ministary of Science of the Republic of Serbia)*

2005
2010

Multidisciplinary Approach to Resolving the Problem of Cleft Lip and Palate
*("Smile Train" Clinic, USA)*

## MEMBERSHIP IN EXPERT ASSOCIATIONS

- World Federation of Orthodontics;
- European Orthodontic Society;
-
- Member of the Board of Mediterranean Orthodontic Society;

- Expert Team for Deformities of the Orofacial Region of the Military Medical Academy, Belgrade;
- President of the Orthodontic Section of the Serbian Medical Society, 1998 – 2000;
- President of the Orthodontic Society of Serbia – 2000 – to date;
- Secretary General of Europeanf Federation of Orthodontics;
- Member of the Balkan Dental Society;
- Member of the Yugoslav Antropologic Society.

**FOREIGN LANGUAGES:**

English

Franch

**MENTOR ACTIVITY**

| No. | Student papers |
|---|---|
| 8 | |
| MSc theses | |
| 4 | |
| PhD theses | |
| 2 | |

**PARTICIPATION IN DOMESTIC SCIENTIFIC AND EXPERT ORGANIZATIONS**

**JOURNAL EDITORIAL BOARDS**

1. Stomatološki glasnik
2. Deputy Editor in Chief, Orthodontic Journal of Serbia and Montenergo

**REVIEWER**

1. Progress in Ortodontics;
2. Orthodontics;
3. Revista de Ortodontie si Ortopedie Dento-Faciala;
4. Facta Universitatis;
5. Orthodontic Journal of Serbia and Montenergo.

**MEMBERSHIP IN ORGANIZATIONAL AND SCIENTIFIC BOARDS AT CONGRESSES**

President

- Organizational Board, 1st International Orthodontic Congress of Serbia and Montenergo (October 2003);

– Organizational Board, 2nd International Orthodontic Congress of Serbia and Montenergo (September 2005);

Member

– Organizational Board, 73rd Annual World Dental Congress of the Federation Dentaire Internationale Belgrade (1985)

– Organizational Board, 1st Congress of Stomatologists of SR Yugoslavia (Belgrade, 1993)

**CHAIRING OF SCIENTIFIC SESSIONS AT INTERNATIONAL CONGRESSES:**

1. Symposium on Growth and Development (Istanbul, 2002);
2. 79th European Orthodontic Congress (Prague, 2003);
3. 6th World Orthodontic Congress (Paris, 2005);

## BIBLIOGRAPHY

**TEXTBOOKS:**

1. "Program preventivne stomatološke zaštite stanovnika Srbije" *(Program for Dental (Prevention for the Serbian Population)* – Prof. Marko Vulovic
   (coauthor)
   *Publisher: Zavod za udžbenikei nastavna sredstva, Belgrade, 1996*

2. "Preventivna stomatologija u odraslih" *(Preventive Stomatology for Adults)*
   Editors: Ljiljana Jankovic, Dragoslav Stamenkovic – Permanent university textbook
   (coauthor)
   *Publisher: Izdavačka kuća Draganić, 1995; 1998*

3. "Zglobna veza mandibule sa kranijumom – normalna funkcija i poremećaji" *(Connecting Mandibulo–Cranial Joint – Normal Function and Disorders)*
   Prof.Dr. Darinka Stanisic Sinobad – Textbook for graduate and postgraduate studies
   (coauthor)

4. Chapters:

– Growth and development of the temporomandibular joint;

– Role of malocclusions in etiology of craniomandibular disorders.
*Publisher: Beogradsko mašinsko-grafičko preduzeće, 2001*

**REVIEWS**

1. "Ortopedija vilica za IV razred medicinske škole" *(Jaw Orthopedics for 4th grade Medical School)* – Prof. Vjera Gvozdenović-Simović (1992)

2. "Dečja i preventivna stomatologija" *(Children's and Preventive Stomatology)* – Textbook for graduate studies – Gruup of authors (2000)

**FIELDS OF SCIENTIFIC – HELATH RESERCH:**

– prevention and interception of malocclusions;

– treatment with functional orthodontic devices;

– orthodontic treatment of temporomandibular dysfunction;

– orthodontic – surgical treatment of malocclusions;

- orthodontic treatment of cheilognathopalatoshises;
- orthodontic treatment of adults.

**PAPERS**

| | No. |
|---|---|
| Papers in foreign journals (cited in CC and ISI) | 2 |
| Papers in other foreign journals with reviewers | 3 |
| Papers in leding national journals | 14 |
| Invited lecturer abroad | 6 |
| Invited lecturer in the country | 21 |
| Papers presented at international meetings | 78 |
| Papers presented at domestic meetings | 40 |

PAGES 15 – 15

## CURRICULM VITAE

# VASILE VICTOR VALEA (VALIN)

Prof. Dr. Valin graduated the Faculty of Dentistry in Timisoara in 1971,

in 1982 he became a specialist in BMF surgery.

Between 1982 – 1984 he functioned as Chief of the BMF Compartment of the Arad County Hospital.

Between 1984 – 1986 he practiced BMF surgery in "Rambam Hospital" Haifa – Israel.

Between 1986 – 1992 he practiced oral surgery and implantology in a private practice. Between 1993 – 1997 he practiced at the Oral Surgery Clinic in Ludwigshafen, Germania, and then, starting with August 1997 he practiced implantology, oral surgery, periodontology and oral rehabilitation in a private practice in Köln.

Among Dr. Valin's qualifications, between 1986 – 1992 there are multiple courses of

updating in implantology in Germany, France, Italy, Israel, between October 1991 – September 1992 Postgraduate Course – Oral Implantology „University of Pittsburgh"/USA.

Since 1994 he is a Doctor in medical science – implantology, since October 2001 he holds the title of „DIPLOMATE" – I.C.O.I, International Congress of Oral Implantologists, since 2002 he is medical consultant of M.I.S „Medical Implant Systems".

In 2003 he received the title of Honorific Professor Doctor Honoris Causa of the „Aurel Vlaicu" University Arad.

He is a Specialist in Implantology – German Society of Dental Implantology, since 2003, and starting with 2005 he is an Expert in Implantology – German Society of Oral Implantology.

He is an active member of the „American Academy of Implant Prosthodontics", active Member of DGZI „Deutsche Gesellschaft für zahnärztliche Implantologie", Fellow of the „American Academy of Implant Prosthodontics".

Since 2001 he leads the „Studiengruppe Valin" / Köln, sponsored by M.I.S. Company.

PAGES 17 -22

# EVALUATION OF PATIENT ORAL HEALTH FROM THE PERSPECTIVE OF LIFE QUALITY

**ATENA GĂLUŞCAN, ANGELA PODARIU, DANIELA JUMANCA, CARMEN IFTIME*, ROXANA OANCEA, RAMONA POPOVICI, ANITA ROŞU, RUXANDRA SAVA ROŞIANU**

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## ABSTRACT

***Oral Health is a constitutive component of a healthy life,*** *having an important contribution to an attractive appearance, a high self esteem and a good life quality in general. Missing or carious teeth, as well as inesthetic or improper treatments lead in time to the loss of self esteem and social isolation. The most frequent oral diseases, dental caries and periodontal disease, are accompanied by pain and inflammation. This discomfort leads to sleepless nights, absenteeism, decreased performance. For these reasons we monitored two age-matched groups of children in two different schools located in different locations in town and with children coming from various socio-economical backgrounds. Children were evaluated regarding the CAF and plaque indexes and these were correlated to information (obtained by questionnaires) regarding child's level of information and the degree of family involvement in maintaining their health status. We observed significant differences between the level of hygiene of children (CAF index – plaque index ratio) and we observed that these indicators are directly linked to the educational level of children and to the degree of family involvement in the maintainance of their oral health.*

### Introduction

The concept of oral health-linked life quality brings a new perspective both in the filed of clinical medicine and medical research because it changes the dentist's single focusing onto the oral cavity and leads to an approach of the patient as a whole. This way, the oral health – life quality association may bring a special contribution to the clinical practice of dental medicine, research and health education.

In present medical practice a great difference may be observed between the health level of patients and their socio-economic status. This points out to the way life quality may influence oral health and, reversely, how general health may influence the life quality of patients. Following this topic we discovered a number of clinical studies revealing the relation between oral health and life quality, many authors being preoccupied by this idea.

Oral Health refers to preserving a low level of caries (CAF/CAF) and bleeding (GI, CPITN) indexes, knowing and reducing oral-dental disease risk factors (smoking, carbohydrates intake, bacterial plaque, dental-maxillary abnormalities, etc.) and this indicator may be achieved by educational models made accessible to all categories of patients and, also, by access of all categories of patients to hygiene means and also to medical and prophylactic medical services, regardless of education and socio-economic background.

Population life quality reports to morbidity and mortality indexes, to education and information level of the

population regarding risk factors, to healthy habits practiced within a community and a population, to the level of professional performance and efficiency of the individual which is strongly connected to his or her state of health.

**Life quality** depends on the quality, quantity and equity of population health protection services. Access to these services is a determinant factor. Disadvantaged social groups have the highest health problems and the lowest access to preventive and curative measures. The present health promotion concept states that any individual, regardless of age, gender, race or ethnic group, income, education, disability or geographical position must have access to services of health maintaining and improvement.

Whitehead (1990), considers the following health determinants: age, gender, hereditary factors, lifestyle, social and community influences, living and work conditions, socio-economic and cultural conditions, environmental factors.

Despite the significant improvement of the population oral-dental health in most European countries, dental caries and periodontal disease still affect millions of people. In Europe, the prevalence of these diseases is high in EU countries, especially in challenged groups: immigrants, refugees, members of ethnic groups and persons living in geographic areas with difficulties.

The World Health Organization (WHO) defined health as "… complete state of physical, mental and social wellness and not simply the absence of disease or disability". Later this definition was expanded, presenting health as a "resource of daily life and not the objective of existence; it is a positive concept which stresses upon personal and social resources as well as on physical and mental capacities.

Lalonde proposes four basic factors which may influence health: the biological factor, the environment, the lifestyle and the organization of health services.

**Life quality** is absolutely related to **lifestyle –** which has a special effect on the health status. Diet, alcohol and tobacco consumption, harmful habits are only some of the factors reflecting the individual's responsibility for his or her own health. Permanent information on healthy habits and adopting these habits may correct lifestyles, implementing prophylactic means, and in case of early detection of diseases a minimal invasive therapy may be attempted.

**Oral health is a constitutive part of healthy living,** highly contributing to an attractive appearance, a high self esteem and a good life quality in general. Missing or carious teeth, as well as inesthetic or improper treatments gradually cause the loss of self esteem and social isolation. The most frequent oral diseases, caries and periodontal disease, are accompanied by pain and inflammation. This discomfort leads to sleepless nights, absenteeism, decreased performance. Dental treatments are very expensive for the individual and society in general. For instance, in Great Britain, during the period 2003-2004, an approximate of £3.8 billion were spent including private dental treatment [36]. Indirect costs such as those due to absenteeism for dental treatment are also a financial burden.

**Life quality** reflects the individual general feeling of happiness and satisfaction, including all life aspects: health, leisure, culture, rights, system of values, beliefs and aspirations, as well as the conditions granting support for these elements.

**The association between oral health – life quality** is a relatively new concept but in a constant and rapid dynamics. Studies performed up to date based upon questionnaires revealed the existence of some clear correlations between the low life quality and a defective oral status, most frequently associated to reduced access to dental services.

**Material and Method:**

Starting from these observations, revealed in the entire body of studied references for documenting this paper, we included two groups of children from different socio-economic backgrounds and

we performed their evaluation on oral health and on the way this is reflected upon their quality of life.

For this paper we monitored and evaluated two age-matched groups of children in two different schools in different locations in town and with children coming from various socio-economical backgrounds. Thus, the two groups include IV-th grade children from two schools in Timişoara, IV-th grade children (age group 10-12 years) from a school located in the central area of the town (most of them have a good socio-economic status, reflected by a high life quality) and IV-th grade children in a school from the suburban area of Timişoara (most of them with a lower socio-economic status). All children included in the study were aged between 10-12 years and, according to their somatic and dental age, have permanent teeth, developmentally situated during the pre-puberty period. In the central school, there is also a dental practice where children address with emergencies and where educational and preventive actions are performed.

Dental files were filled in for children and they were monitored in the school dental practice or in the classroom where they responded to a series of questionnaires with the following topics:

- Dental Hygiene is achieved by the following means: tooth brush, paste, mouse rinse, dental floss.
- Do you have access to at least two of the above mentioned means? (Yes/No) Please specify which ones.
- What brushing technique do you use? (horizontal, vertical, circular brushing);
- What is the frequency of brushing? (1/day, 2/day, 3/day, sometimes);
- What is the source of your knowledge and information about individual hygiene? (parents, school, TV, dental medicine practice)
- Do you regularly visit a dental medicine practice? (no. Of visits during the previous year) ;
- Do you have a personal dentist to whom you address for treatment? (Yes/No)
- Do you visit the dentist only in case of an emergency? (Yes/No)
- Did you benefit from emergency dental treatment more than once? (once, twice, more often)
- Did you miss school during the previous year due to dental pain? (once, twice, never, more often)
- Do parents check your individual hygiene? (daily, periodically, not at all)
- Are you aware of the importance of oral health? (Yes/No)
- Can you enumerate at least 3 risk factors for oral health? (.....)
- Do you wish to have healthy teeth? (Yes/No)
- Enumerate at least one reason for wishing to have healthy teeth ……

For clinical intraoral evaluation we chose a method easily applicable in the classroom, namely the assessment of the CAF index (caries, absent, filling) and for evaluation of the bacterial plaque we chose plaque staining with plaque revealer and an easily measurable index, namely Quigley-Hein index modified by Turesky (QH-T). Children received plaque revealer tablets (Oral-B) which they suckled in order to later (after rinsing) assess the QH-T plaque index.

After assessing the children regarding the QH-T plaque index, CAF index and questionnaires on life level, educational level and interest in hygiene and oral health, children entered an educational programme with demonstrative lessons on oral health, with information regarding oral health risk factors and the direct connections of all the above to general health.

**Results and Discussions**

Following clinical examination and after the assessment of questionnaires we observed that:

- CAF index is lower (bz 32%) in children with a better socio-economic status as compared to those from suburban areas;
- plaque index has a lower score in children from the central school of the city PI = 1.4 – 1.9 as compared to children from the other school PI = 2.8 – 3.7

- all children included in the programme know brushing techniques and personal hygiene methods and have access to them,
- around 33% of the suburban school children do not apply these knowledge as compared to 12% in the central school;
- most children (94%) have knowledge of hygiene from TV but 80% of the children in the central school have also discussed these information with their parents and are systematically checked regarding the way these methods are applied, whereas only in 12% of the children from the suburban area parents check the way hygiene means are applied;
- In the Central School, all children have a dentist where they go for periodical check ups and treatments and they even have a school practice, whereas only 34% of the children in the other school have a regular dentist, the rest only visiting the dental practice in case of emergency.
- Only 14% of the children in the central school only received emergency treatment once, and 42% of the children of the other school received emergency treatment once or more often.
- 2% of the children in the central school missed school once due to dental pain and this was the case for 19% of the children in the other school
- all children included in the study declared they know the importance of oral health but only 65% were able to enumerate 3 oral health risk factors (nutrition, carbonated juices, bacterial plaque, smoking, lack of hygiene, lack of fluoride in dental hygiene products) and 43% of these were from the central school;
- 80% of children gave the ”beautiful smile” as the reason for a good oral health and only 5% correlated oral and general health;

We may state that most children obtain knowledge on dental hygiene from TV and from their parents, all children have access to the necessary means for hygiene but not all are checked upon and stimulated to maintain their dental hygiene. Very few children are aware of the connection between oral and general health and they do not consider health risk factors. Also children have the tendency to miss from school due to dental pain, especially in cases when they are not surveyed by parents.

## Conclusions

1. Oral health belongs to general health and is essential for increasing life quality.
2. Action on health determinants plays a fundamental role in oral health promotion.
3. There is a clear correlation between low quality of life and a deficient oral status, most frequently associated to reduced access to dental services.
4. Oral-dental status of children is closely related to their quality of life.
5. Reducing oral health inequalities in various population groups represents one of the challenges of the XXIst century regarding oral health
6. The types of dental caries prevention are pre-primary prevention, primary prevention and traditional prevention. In primary and traditional prevention of the dental caries the aim is to identify the early carious lesion and to assess the carious risk of the child, whereas in pre-primary prevention the goal is to reduce the possible risk of lesion development.
7. Health education is important for the patient and it is an ethical duty of professionals.
8. Human behaviour models may guide the development and improvement of efforts towards health promotion and education in general and oral health in particular.
9. The aim of oral health interventions must be social, economic and environmental determinants of oral health.

**Bibliography:**


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PAGES 23 - 29

# EVALUATION OF ORAL HEALTH QUALITY IN A GROUP OF FIRST TERM PREGNANT WOMEN

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## ABSTRACT

*Pregnancy represents a physiological state characterized by multiple, essentially hormonal and metabolic, changes with a transient character, which may, in certain conditions become pathological. All these changes cause the occurence of specific phenomena in the oral cavity.*

*The aim of this study is to evaluate the oral health status of the pregnant woman and the way this is reflected in her quality of life. The main oral health changes occur during the first term of pregnancy and their impact is very important because they may influence the woman's health throughout the whole pregnancy period and they may influence her quality of life. The evaluation of oral health status during pregnancy is important for two reasons: first, it shows the changes occuring during the first term of pregnancy, the way these influence the life of the pregnant woman, and second, they show statistically relevant problems confronting the pregnant woman and the solutions which must be found in order to attenuate the symptoms.*

*Pregnant women's addressability to the dentist is quite low, either due to lack of information or because reticence towards certain procedures performed in the dental practice.*

*Diseases which may occur in first term pregnant women may affect both the evolution of pregnancy and the health of the foetus and, later, of the child.*

*Monitoring the oral health in pregnant women must be performed as early as the first term, in order to prevent the occurence of dental complications, as is the case with the treatment of diseases in optimal conditions and without affecting the further evolution of the pregnancy.*

*The oral-dental status of patients varies a lot with dental and general personal histories.*

*Relevant personal histories of pregnant women include the dental-periodontal status before pregnancy, state of hygiene, nutritional habits, receptivity towards dental treatments.*

*General histories are connected to the age of patients, preexistent diseases, number of previous pregnancies (primiparous, multiparous).*

*Material and Method: for this paper a group of 30 first term pregnant women were included.*

*The evaluation of oral health status of pregnant women followed three parameters:*

- *gingival inflammation index*
- *index of periodontal tissue loss*
- *oral hygiene index*

## INTRODUCTION

Physiological changes during pregnancy cause a series of oral mucosa changes which may be correlated with the increased hormonal activity during this period. Excessively secreted folliculin and progesterone during pregnancy may produce an endocrine or neuroendocrine disbalance having also oral consequences reflected by gingival and periodontal inflammation.

According to the Bucharest school of periodontology, in the etiopathogeny of periodontal diseases a wide cumulative causality is revealed, connections between various causes having to be historically interpreted.

Clinical and experimental research lead various authors to the statement that 3 main factors may be considered in the etiopathogeny of periodontitis:

- local factors causing the inflammation of the periodontal tisssue;
- chronic traumatic factors causing a malfunction of the alveolar-dental supporting apparatus;
- general factors which lower the resistence of the organism and the reaction capacity of the periodontium to various external or internal factors (Firu et al.)(..).

Morpho-functional changes of the maternal organism as well as the characteristic hormonal impregnation may be regarded as true general factors which influence the reactivity of the periodontal tissue.

According to Firu et al., during pregnancy, a fragility of the gingival mucosa is observed and sometimes a hyperaemia by hyperplasia and oedema favouring the occurence of periodontal disease. Oral mucosa cells combine with hydrosoluble glycoproteins which cause the well-known gingival oedema of pregnant women.

Together with the capacity of retaining water which causes gingival oedema, folliculin also produces a fragility of the oral mucosa, while progesterone causes relaxation of the elastic and collagen fibres which also occurs within the periodontal tisssue leading to the widening of the periodontal space, which led to the conclusion that progesterone may play the most important role in the occurence of periodontal diseases during pregnancy.

Apparently, for relaxing of elastic and collagen fibres, an important role is played by a specific hormone – relaxin.

By analogy with the action of relaxin on pelvic joints and ligaments (painful symphisal relaxation), this hormone probably causes the relaxation of elastic and collagen fibres of the periodontal tissue with the widening of the periodontal space, action similar to that of progesterone. Together with the action of hormones, in pathological pregnancies, other general factors play their role. Especially important is the disturbance of metabolism, with acidosis, decreased chloraemia and low alkaline reserve, true general factors which may be incriminated in the etiology of periodontal diseases during early pathological pregnancies.

Equally important in the etiology of periodontal diseases during early pathological pregnancies are a series of local irritative factors and the functional changes which occur in connection with the maintainance functions. This cathegory includes reduction of individual functions and hygiene, reduced self-cleaning, vomit reflexes which may impair proper brushing.

In late pathological pregnancies, namely in pregnancy arterial hypertension, hormonal action is completed by circulation disorders, high blood pressure. Circulatory changes by artificial periodontal irrigation are an important dystrophy causing factor. Following the increase of blood pressure, dystrophic periodontal phenomena are frequently observed, together with inflammatory phenomena. Circulatory disturbances during late term pathological pregnancies, cumulated to humoral changes, true general factors, change the mesenchymal trophicity favouring the occurence of mixed periodontal diseases with inflammation and dystrophic components.

In the etiology of pregnancy periodontal diseases, an important role is played by neurovegetative dystonia caused by first term endocrine disbalance with vagal predominance, whereas during the third term a sympathetic predominance may be observed. During the first term of pregnancy an exacerbation of inflammatory and allergic phenomena may be observed, with important secretion and oedema, phenomena which are much diminished during the third term of pregnancy. Sympathetic predominance, characteristic for the third term, when late pathological pregnancies occur, favour dystrophic periodontal phenomena.

Where evolution is concerned, pregnancy generalized marginal gingivitis reaches its peak during the Vth month and is spontaneously cured after birth, leaving no traces. Gingival alterations are tenaceous and resistent to treatment but after birth they suddenly disappear, even if local irritation causes persist. According to the classification made by the Buchaarest school of periodontology, depending on the

site and expansion of periodontal lesions, the forms of periodontitis found during pregnancy are chronic marginal periodontal diseases. Due to the fact that clinical forms of periodontal disease are never pure, it is very hard to label them as one of the previously described forms.

Based upon the cited references, we may state that pregnancy dental-periodontal lesions may be, simultaneously or not, caused by a series of factors:

1) predisposing factors: hormonal, phospho-calcium metabolic disturbances, blood, kidney, liver, cardiac diseases, dysvitaminosis, endorcine disturbances.

2) local favouring factors: lack of oral hygiene, bacterial plaque, preexistent caries, fractures and residual root fragments, abnormal positions, partial edentation, iatrogenic treatments.

3) environmental factors: physical, psychological environment, lifestyle, social environment.

4) aggravating regional factors: occlusal dysmorphism, muscular disfunctions, TMJ dysfunctions.

The correct oral-dental assessment of pregnant women determins a particular approach from the dentist for every patient.

The particular aspects of dental treatment in pregnant women takes into consideration the specific individual character of changes occuring in the oral cavity. General aspects influence the behaviour of the dentist. Thus, a woman used to dental treatments will have a cooperant attitude, whereas a pregnant woman with major dental diseases, which have been neglected during the period prior to the occurence of pregnancy, will be more reticent, sensitive and much more difficult to treat.

Correctly informing the woman about changes occuring during pregnancy, about the risks and precautions to be taken during this period may be of beneficial influence for the oral health of the mother and improve her cooperation with the dentist and with the staff of the dental practice. The existence of an educational programme for pregnant women as well as for those wishing to become pregnant determins their better addressability to the dentist.

# MATERIAL AND METHOD

For this paper 30 first term pregnant women were monitored. Patients were aged between 20 and 35 years, comming from various social backgrounds and with different professional levels, and they were monitored weekly during the first term of pregnancy, inflammatory phenomena being more frequent during this period.

The evaluation programme included the following stages:

a) filling in the dental and periodontal files based on a thorough interview aiming to detect pregnancy specific manifestations in every patient:

- hygiene level
- type of brushing
- brushing frequency
- type of tooth paste used
- presence or absence of nausea and vomit
- changes of eating habits
- specific apetites
- number of pregnancies (primipara, multipara)
- habits changed due to pregnancy

b) evaluation of the oral-dental status by determining:

- gingival inflammation indexes
- periodontal indexes
- oral hygiene indexes

c) educational programme for understanding the importance of individual hygiene measures

d) implementing of primary prophylaxis measures, scaling, professional brushing, topical fluoride application, gingival dressing with neutral antiseptic solutions, repair of improper obturations and prosthetic devices.

e) reassessment of the oral status every 7 days by measuring gingival, periodontal and oral hygiene indexes.

f) interpretation of results.

g) conclusions.

In the group of 30 pregnant women included in the study during the 8-th week of pregnancy, inflammation signs were found in all cases and, regarding the stage of onset, the following were observed:

- 8 pregnant women presented congestion, hyperplasia, light bleeding upon examination, rapidly increasing gingival process, over- and undergingival tartar.

- 15 pregnant women had discrete onset phenomena of oedema, hyperaemia, discrete stasis, red, raspberry-like staining of the gingival margin.

- 7 pregnant women did not present inflammation phenomena.

The augmentation of gingival inflammation occurs especially around incisives and premolars.

Interproximal areas are the most frequent areas of onset for the periodontal disease. In severe cases, the gingiva around incisives, premolars and molars presents pockets of relative growth, the largest being in the area of anterior teeth. Sometimes congestion progresses to generalized marginal gingivitis.

Monitoring of the three groups of pregnant women during the 5 weeks period had the purpose of assessing the gingival and periodontal conditions, as well as the evaluation of oral irritative deposits.

For this purpose, gingival inflamation, periodontal and oral hygiene indexes were recorded in each group of pregnant women throughout the 5 weeks period.

Each pregnant woman came to the dental practice every week.

During the first visit, a professional oral hygienization was performed, with over- and undergingival scaling and professional brushing, advice was given for the achievement of a proper hygiene at home and for a balanced nutrition during pregnancy.

GI LOE and SILNESS gingival indexes which cause PDI periodontal destruction and those determining plaque accumulation were determined.

GI index reflects the severity of gingivitis in 4 areas: the distal-vestibular papilla, the vestibular margin, the mesio-vestibular papilla and the oral (lingual) margin of the examined tooth. The gingival sulcus is examined with a blunt periodontal probe looking for the presence or absence of gingival bleeding at this level.

The criteria for establishing the numeric score of the probed area are as follows:

0 – normal gingiva

1 – light, discrete inflammation, colour changes, oedema, no bleeding upon palpation.

2 – moderate inflammation, hyperaemia, odema, bleeding upon palpation.

3 – severe inflammation, marked hyperaemia up to cyanosis, oedema, ulcerations, spontaneous gingival bleeding.

By adding up scores around a tooth and dividing the result by four the GI/tooth is obtained.

By adding up scores for all teeth and dividing the result by the total number of teeth we obtain the GI/person.

GI values associated with various stages of gingival inflammation are as follows:

0.1-1.0 mild gingivitis

1.1-2.0 moderate gingivitis

2.1-3.0 severe gingivitis

After determining the gingival inflammation index in the three groups of pregnant women, during the first visit we obtained the following data:

- the first group of 8 pregnant women GI=2.1-2.6 severe gingivitis 26%

- the second group of 15 pregnant women GI=1.1-1.7 moderate gingivitis 50%

- the third group of 7 pregnant women GI=0.1-0.8 mild gingivitis 24%

The PDI Ranfjord index determining periodontal destruction by the periodontal probing component shows the clinical level of gingival epithelial attachment. Thus, the JSC-free gingival margin distance is measured, as well as the distance between the gingival margin and

the bottom of the gingival sulcus. The difference between the two measured values represents the level of clinical attachment.

In the three groups of pregnant women no changes of gingival attachment were found.

The OHI-S index which shows the accumulation of dental plaque is composed of the sum of dental scores divided by the number of examined teeth. It uses the same 6 teeth Ramfjord where the presence of the plaque is recorded with values between 0-3.

The 6 examined surfaces are the vestibular surfaces of 16, 11, 26, 31 and the lingual surfaces of 36, 46.

Each surface is horrizontally divided in the gingival, middle and incisal third.

The presence of plaque or tartar in the cervical third is scored with 1, in the other two thirds (cervical+midddle) is scored with 2 and the presence of plaque and tartar on the entire surface of the tooth is scored with 3. In order to determin the DI component of the plaque, the probe is placed in the incisal third and it is moved towards the gingival third. The presence or absence of plaque on the tip of the probe, as well as the area it was collected will be recorded .

DI-S of the person is obtained by adding up the sum of all scores/tooth which is then divided by the number of examined surfaces.

CI-S is determined with the probe by palpating the gingival sulcus starting distally onto the mesial area and revealing the presence of over-gingival tartar on the same 3 areas of the dental surface. The score/person is calculated by adding up the scores of the 6 teeth and dividing the result by 6.

The value of OHI-S=DI-S+CI-S

Determining these values in the three groups of pregnant women we obtained the following:

- the first group of 8 pregnant women OHI-S=3.1-3.8
- the second group of 15 pregnant women OHI-S=1.5-2.7
- the third group of 7 pregnant women OHI-S=0.2-0.9

In the first group, inflammation phenomena associated to subjective symptoms only allowed a gentle brushing.

Every week patients were monitored and a profesional hygienization was performed.

During the sixth week of pregnancy, calculation of indexes gave the followwing results:

- first group of 8 pregnant women GI=2.0-2.6 OHI-S=2.1-2.5
- second group of 15 pregnant women GI=0.7-1.5 OHI-S=0.6-0.9
- third group of 7 pregnant women GI=0.1-0.5 OHI-S=0.1-0.2

During the sixth week, the 8 patients with acute inflammation phenomena had slightly attenuated symptoms, the 15 of the second group had a slight bleeding during brushing and the third group had mild gingivitis phenomena.

During the following weeks the evolution of indexes was monitored and at the end of the first term of pregnancy we obtained the results shown below:

- first group of 8 pregnant women GI=1.8-2.2 OHI-S=1.8-2.0
- second group of 15 pregnant women GI=0.1-0.3 OHI-S=0.2-0.4
- third group of 7 pregnant women GI=0.0-0.1 OHI-S=0.0-0.1

These results led to the conclusion that pregnancy periodontal diseases are the result of multiple cause inflammatory diseases.

The presence of irritative factors sharpens inflammation phenomena but the main factors determining an acute pathology of pregnancy periodontal diseases are the specific changes within the

gingival tissues. They start with a process of hyperaemia with difuse inflammatory infiltration and oedema which later become fibrous.

The changes of the oral mucosa are linked to an increased hormonal activity, the excessively secreted folliculin and progesterone during pregnancy producing an endocrine or neuroendocrine disbalance of which the periodontal disease is the result.

Morpho-functional changes of the maternal organism, as well as the pregnancy-specific hormonal effects may be regarded as general factors influencing the reactivity of the periodontium.

During pregnancy a fragility of the gingival mucosa and sometimes a hypertrophia by hyperplasia and oedema occur, causing the onset of periodontal diseases. These causes determin a different evolution of periodontal diseases and a variable receptivity to treatment.

Making a correct diagnosis allows the dentist to prepare an individual programme of dental prophylaxis for each patient. In pregnant women in particular, establishing the risk group and monitoring as early as the first weeks of pregnancy is crucial for personal oral-dental health, as well as for that of the child. Work sessions must not exceed 30 minutes, avoiding trauma connected with painful procedures.

# RESULTS

After 6 weeks of assessment of first term pregnant women we found the following:

- patients with major inflammatory diseases were less receptive to prophylactic treatment and to hygienization, thus proving that there is a favouring hormonal and vascular component.
- treatments and maintainance of oral hygeine in these patients requires an increased attention in order to reduce or at least halt the progression of inflammation phenomena and to remove any irritative factor which may lead to exacerbation of already existent phenomena.
- in patients of the second and third groups, with medium and minor problems, respectively, hygiene checking allows the prevention of future plaque gingivitis.

Recommendations for a proper personal hygiene during pregnancy are made offering informative materials regarding brushing techniques and schedule, as well as a specific diet for the pregnancy period.

Making pregnant women aware of oral health improvement is important both for increasing their life quality as well as for preventing local and general complications which may occur following pregnancy-induced changes in the oral cavity.

# DISCUSSIONS

Starting to follow up the pregnant woman as early as the first term of pregnancy, we contribute, together with the obstetrician and family physician, to her monitoring, preventing any diseases which may affect the health of mother or child.

The pregnant woman investigated, treated and monitored in this manner may increase her life quality during this period, reducing the risk of acute diseases occuring later in the course of pregnancy and the need for aggressive dental procedures for the prevention of future complications.

The prophylactic and therapeutic attitude of the dentist is composed by individualizing treatment stages according to the patient's general and local status, to diseases prior to the onset of pregnancy, as well as to the future evolution of phenomena developed during this period.

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**PAGES 31 - 33**

# ROLE OF EDUCATION IN ORAL HEALTH

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## ABSTRACT

*Education – is the essential human adaptation form to the environment and it is accomplished by a tridimensional knowledge, assessment and action model; oral health education being a component of health education.*
*W.H.O. states that health education is an activity with a capital influence for the improvement of public health, also being the cheapest form of medical assistance. It represents the matrix, the support for all health programmes and actions, ensuring their efficiency by close cooperation with the population, the active beneficiary of these health promotion and maintenance actions.*
*A good communication with the patient has been found to increase the odds of obtaining a satisfactory therapeutic result, the patient will be more educated and will pay the appropriate attention to oral health; social effects materialized in a state of well-being (the core element of health) and an increased quality of life will be observed.*
*Key words: oral health, communication, patient, health education, prevention, physician.*

Health Education:

studies the level of knowledge, habits, attitudes and behaviours in a population, as well as the educational methods, means and procedures for shaping and developing a healthy sanogenic behaviour.

it is a group of measures including the perception of health, the teaching-learning process and participation, it constitutes the populational active or passive involvement in the protection of their own health.

The main objective of health education consists of shaping and developing of a sanogenic concept and behaviour, starting with the earliest ages, with the purpose of health protection, harmonious development and strengthening of the body, adapting it to living conditions, as well as population involvement in the task of granting health.

The objectives of health education in oral-dental health are the following:

achievement of population awareness on the need of dental care as early as childhood and throughout the entire life span.

knowledge on the causes of dental caries, periodontal disease and dental-maxillary abnormalities as well as ways of preventing them.

informing the population on the influence of oral-dental diseases upon general health of the organism.

spreading the news on the fact that oral-dental diseases are a fact of life and their limitation, especially where their consequences are concerned, can only be achieved with knowledge of and compliance with rules of oral-dental hygiene, nutrition and lifestyle.

Health education depends upon socio-economic conditions because the latter influence the number and type of dental health services, the level of resources allocated for dental medicine and health education, the place occupied by dental education in the national education system.
The institutions involved in health education programmes are: the Ministry of Health, Ministry of Education, Ministry of Social Protection, Ministry of National Defence, Ministry of Telecommunications, hospitals, policlinics, schools, religious organizations, trade unions, non-governmental organizations.

For oral health education we need a series of principles:

*Interest*: it is unlikely for people to listen to things in which they are not interested in.
*Participation*: this is one of the active learning methods.
*Achievement of new knowledge.*
*Understanding*: health education must be understood. If the educator will use words which cannot be understood this will lead to failure.
*Consolidation*: repetition is needed in health education leading to understanding and completeness.
*Motivation*: inducing the interest for learning.
*Learning*: by achievement of a practical process.
*Good human relations*: the educator must be kind and educated.
*The leader*: understands the needs and requirements of the community, identifies himself/herself with the community, accessible to the people, receptive to people's suggestions and vision, has the necessary ability and knowledge in order to require cooperation and obtain coordination of various organizations.

Health education in the field of dental medicine refers to:

the dentist and health education;
auxiliary staff and education;
education of the people;

The fundament of health education is *communication.* The dentist or the nurse transmit knowledge about the state of the patient. The communication between doctor and patient has an important role in the fulfillment of oral health objectives and it is better accomplished under the following circumstances:

use of a simple and concise language;
the physician must be certain that the patient understands the message;
appropriate environment;
esteem-based relationship between doctor and patient;
the physician must have pedagogic and psychologic abilities and take into consideration the age of the patient, his or her social status, level of knowledge, perception of the information and the capacity to understand the need to put into practice the achieved knowledge;

Prevention has a special importance in health education and it is justified by:

early onset of dental-maxillary diseases;
high frequency of dental-maxillary diseases;
high cost of curative care;
progressive evolution of caries and periodontal disease;
the effects of these conditions on the development and general somatic and psychological state of the individual;
limited knowledge of these diseases in the major part of the population;

The role of the dentist in oral-dental health education is represented by the achievement of the following objectives:

general knowledge of the main oral-dental diseases and their importance for oral health;

knowledge of the causes of dental caries, periodontal disease, dental-maxillary abnormalities and ways to prevent them;

the need for systematic dental care since early childhood;

knowing and implementing oral-dental hygiene, nutrition and living rules will lead to limitation of diseases and their consequences;

In conclusion, dentists must understand human behaviour in order to shape it for oral health promotion and for practicing successful dentistry.

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PAGES 35 - 39

# MUSCULOSKELETAL DISORDERS A CONSEQUENCE OF WORKING ROUTINE?

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## ABSTRACT

*Dental professionals commonly experience musculoskeletal pain during the course of their careers.*
*The main goal of the study was to try to identify the incidence of musculoskeletal disorders depending from the way of work from different specialty of dentistry. This study is trying to improve the efficiency, the security and the comfort during dental procedures. In order to do this study we have selected 155 dentists from our regions with different ages and sex.*
*The data were processes using SPSS v 15.*
*We have found that it is a big difference between the ways in which they are working depending from their age. We have noticed that those with ages after 45 years prefer to work standing with the patient in a sitting position. Our results confirm that there is a statistic association between musculoskeletal disorders and the working position.*

## INTRODUCTION

Dental professionals commonly experience musculoskeletal pain during the course of their careers. While the occasional backache or neck ache is not a cause for alarm, if regularly occurring pain or discomfort is ignored, the cumulative physiological damage can lead to an injury or a career-ending disability. The musculoskeletal health of dental professionals has been the subject of numerous studies worldwide, and their focus has been on the pain experienced by the practitioner[1].

A number of studies have found that the mechanisms leading to work-related musculoskeletal pain are multifactorial[2,3].
The human body was designed for movement. Over thousands of years, the human body has depended on movement for its survival; for example, if early humans did not hunt and gather food, they died. Human physiology has evolved around movement for thousands of years. In the last 250 years, with the onset of the Industrial Revolution, increasing numbers

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of workers have performed stationary tasks. More recently, with the advent of computers and as the number of sedentary jobs have increased; the number of MSDs has risen dramatically. This has, in part, resulted in the formation of such organizations as the Occupational Safety and Health Administration and National Institute of Safety and Health in 1970. One study showed that the prevalence of low back pain increased by 2,700 percent from 1980-1993[4].

Dentists frequently assume static postures, which require more than 50 percent of the body's muscles to contract to hold the body motionless while resisting gravity. The static forces resulting from these postures have been shown to be much more taxing than dynamic (moving) forces.

When the human body is subjected repeatedly to PSPs, it can initiate a series of events that may result in pain, injury or a career-ending MSD. Muscle imbalances, ischemia, trigger points, joint hypomobility and spinal disk degeneration are some of the physiological consequences of PSPs[5].

## Material and methods

The delivery of modern clinical dentistry means that practitioners regularly maintain static postures. During treatment, however, operators should strive to maintain a neutral, balanced posture[6]. Even with the best ergonomic equipment, operators can find themselves in sustained awkward postures. These postures often consist of forward bending and repeated rotation of the head, neck and trunk to one side. Over time, the muscles responsible for rotating the body to one side can become stronger and shorter, while the opposing muscles become weaker and elongated. The stressed shortened muscles can become ischemic and painful, exerting asymmetrical forces on the spine that can cause misalignment of the spinal column and decreased range of motion in one direction over the other[7].

The main goal of the study was to try to identify the incidence of musculoskeletal disorders depending from the way of work from different specialty of dentistry. This study is trying to improve the efficiency, the security and the comfort during dental procedures. In order to do this study we have selected 155 dentists from our regions with different ages and sex.

The dates were collected by two pairs of independent examinators.

The dates are category and numeric type. The dates were processes using SPSS v 15

[4] Pope M. Muybridge lecture. In: Proceedings of XIVth Congress International Society of Biomechanics, July 1993. Paris: International Society of Biomechanics; 1993.

[5] Bethany Valachi. Practice dentistry pain free. Portland: Posturedontics Press; 2008.

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[7] Valachi B., Valachi K. – Mechanisms leading to musculoskeletal disorders in dentistry – JADA, 123, 10/2003, 1344-1350.

Table 1. Repartition by age /selection of the subjects.

.

| 55 - | | 45-55 | | 35-45 | | 25-35 | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|
| b | f | b | f | b | f | b | f | b | f |
| 61/10 | 86/14 | 21/3 | 95/16 | 96/16 | 164/27 | 150/26 | 269/43 | 328/55 | 614/100 |

Figure 1. Correct way of working.

All subjects answered to a series of questions in order to determined in witch position they are working, and if they experienced pain during work.

## Results

We have found that it is a big difference between the ways in which they are working depending from their age. We have noticed that those with ages after 45 years prefer to work standing with the patient in a sitting position.

The ANOVA test shows extremely significant differences from statistical point of view.

Table 3. Working Routine & Posture General statistics

| AgeGroup<br>1 → <35<br>2 → 35-45<br>3 → 45-55<br>4 → > 55 | | N | Mean | StdDev | StdErr | 95% CI for Mean | | Min | Max |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | LowBound | UppBound | | |
| Hours/day | 1 | 76 | 7.32 | 1.961 | .225 | 6.87 | 7.76 | 3 | 12 |
| | 2 | 37 | 7.14 | 1.932 | .318 | 6.49 | 7.78 | 3 | 12 |
| | 3 | 21 | 7.71 | 1.765 | .385 | 6.91 | 8.52 | 5 | 12 |
| | 4 | 21 | 6.38 | 1.830 | .399 | 5.55 | 7.21 | 3 | 10 |
| Days/week | 1 | 76 | 4.92 | .744 | .085 | 4.75 | 5.09 | 2 | 6 |
| | 2 | 37 | 4.70 | .878 | .144 | 4.41 | 5.00 | 2 | 6 |
| | 3 | 21 | 4.95 | .384 | .084 | 4.78 | 5.13 | 4 | 6 |
| | 4 | 21 | 4.95 | .865 | .189 | 4.56 | 5.35 | 3 | 7 |
| No of breaks | 1 | 76 | 2.70 | 1.751 | .201 | 2.30 | 3.10 | 0 | 10 |
| | 2 | 37 | 2.24 | 2.140 | .352 | 1.53 | 2.96 | 0 | 10 |
| | 3 | 21 | 1.95 | 1.717 | .375 | 1.17 | 2.73 | 0 | 6 |
| | 4 | 21 | 1.24 | 1.179 | .257 | .70 | 1.77 | 0 | 3 |
| Ortho | 1 | 76 | 26.89 | 27.941 | 3.205 | 20.51 | 33.28 | 0 | 100 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| working posture | 2 | 37 | 30.43 | 32.322 | 5.314 | 19.66 | 41.21 | 0 | 100 |
| | 3 | 21 | 54.33 | 37.186 | 8.115 | 37.41 | 71.26 | 0 | 100 |
| | 4 | 21 | 76.67 | 32.762 | 7.149 | 61.75 | 91.58 | 0 | 100 |
| Sitting working posture | 1 | 76 | 73.11 | 27.941 | 3.205 | 66.72 | 79.49 | 0 | 100 |
| | 2 | 37 | 69.57 | 32.322 | 5.314 | 58.79 | 80.34 | 0 | 100 |
| | 3 | 21 | 45.67 | 37.186 | 8.115 | 28.74 | 62.59 | 0 | 100 |
| | 4 | 21 | 23.33 | 32.762 | 7.149 | 8.42 | 38.25 | 0 | 100 |
| Patient sitting | 1 | 76 | 29.95 | 30.685 | 3.520 | 22.94 | 36.96 | 0 | 100 |
| | 2 | 37 | 31.89 | 32.218 | 5.297 | 21.15 | 42.63 | 0 | 100 |
| | 3 | 21 | 41.19 | 37.413 | 8.164 | 24.16 | 58.22 | 0 | 100 |
| | 4 | 21 | 68.52 | 39.746 | 8.673 | 50.43 | 86.62 | 0 | 100 |
| Patient at 45 degree | 1 | 76 | 41.46 | 27.157 | 3.115 | 35.25 | 47.67 | 0 | 100 |
| | 2 | 37 | 41.35 | 31.461 | 5.172 | 30.86 | 51.84 | 0 | 100 |
| | 3 | 21 | 36.19 | 28.719 | 6.267 | 23.12 | 49.26 | 0 | 100 |
| | 4 | 21 | 26.24 | 33.199 | 7.245 | 11.13 | 41.35 | 0 | 100 |
| Patient lying | 1 | 76 | 29.62 | 29.367 | 3.369 | 22.91 | 36.33 | 0 | 100 |
| | 2 | 37 | 26.49 | 28.598 | 4.702 | 16.95 | 36.02 | 0 | 100 |
| | 3 | 21 | 22.62 | 28.444 | 6.207 | 9.67 | 35.57 | 0 | 100 |
| | 4 | 21 | 5.24 | 11.233 | 2.451 | .12 | 10.35 | 0 | 40 |
| Interval between holiday periods (months) | 1 | 76 | 5.84 | 2.608 | .299 | 5.25 | 6.44 | 1 | 12 |
| | 2 | 37 | 5.49 | 2.388 | .393 | 4.69 | 6.28 | 1 | 12 |
| | 3 | 21 | 6.67 | 3.183 | .695 | 5.22 | 8.12 | 2 | 12 |
| | 4 | 21 | 8.24 | 3.434 | .749 | 6.68 | 9.80 | 3 | 12 |
| No of patients: 155 **(100 - F; 55 - M)** | | | | | | | | | |

Table 4.

Results of ANOVA (df 3; 151)

| | F | Sig | Differences AgeGroups | Sig – Post-hoc |
|---|---|---|---|---|
| Hours/day | 1.898 | .132 | | |
| Days/week | .872 | .457 | | |
| No of breaks | 4.005 | .009 | 1 ↔ 4 | .006 |
| Ortho working posture | 16.797 | .000 | 1 ↔ 2 | .941 |
| | | | 1 ↔ 3 | .003 |
| | | | 1 ↔ 4 | .000 |
| Sitting working posture | 16.797 | .000 | 1 ↔ 2 | .941 |
| | | | 1 ↔ 3 | .003 |
| | | | 1 ↔ 4 | .000 |
| Patient sitting | 7.803 | .000 | 1 ↔ 4 | .000 |
| Patient at 45 degree | 1.645 | .181 | | |
| Patient lying | 4.461 | .005 | 1 ↔ 2 | .940 |
| | | | 1 ↔ 3 | .727 |
| | | | 1 ↔ 4 | .002 |
| Interval between holiday periods (months) | 5.251 | .002 | 1 ↔ 4 | .003 |
| | | | 2 ↔ 4 | .002 |

## Discussions and conclusions

In our group of study 62% from the dentist with the age over 45 years old they have at least one spinal cord diseases and they accused pain and limitation of the movement.

We have applied a logistic regression in order to identify associations between musculoskeletal disorders and the way in witch they were working.

Our results confirm that there is a statistic association between musculoskeletal disorders and the working position.

We are trying to investigate the others factors that can influence the apparition of the musculoskeletal disorders.

Preventing chronic pain in dentistry may require a paradigm shift within the profession regarding clinical work habits, including proper use of ergonomic equipment, frequent short stretch breaks and regular strengthening exercise.

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**PAGES 41 - 47**

# PREDICTION OF CARDIOVASCULAR EVENTS USING AMBULATORY BLOOD-PRESSURE MONITORING IN PATIENTS WITH ANTIHYPERTENSIVE TREATMENT

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## ABSTRACT

*Aim*
*The objective of this study was to establish whether ambulatory blood pressure offers a better estimate of cardiovascular risk than does its blood-pressure measurements obtained in the physician's office and other cardiovascular risk factors in patients with treated hypertension.*
*Methods*
*This prospective study assessed the association between base-line ambulatory blood pressures in treated patients and subsequent cardiovascular events over time during an average follow-up of 48±6 months among 544 patients.*
*Results*
*During the follow-up, 76 patients had cardiovascular event (20 with coronary heart disease, myocardial infarction, or angina pectoris; 41 with cerebrovascular disease, stroke; 10 with progressive heart failure; 5 with hypertensive emergency). The higher category of ambulatory blood pressure was associated with older age, male sex, current smoking, high cholesterol level and higher office blood pressures. Patients with cardiovascular events are older, more likely to be male, smokers, with high level of cholesterol and history of cardiovascular disease. The cardiovascular events were better predicted by the ambulatory blood pressure measurement than the office blood pressure alone.*
*Conclusion*
*Our study shows that 24-hour ambulatory blood pressure is a feasible method for predicting the risk of future cardiovascular events in patients with treated hypertension.*
*Key Words: ambulatory blood pressure monitoring, office blood pressure measurement, treated hypertension, cardiovascular risk*

## INTRODUCTION:

Population-based studies and several prospective clinical studies have indicated that the incidence of cardiovascular events is predicted by blood pressure as measured conventionally or with ambulatory methods, even after treatments for a number of established risk factors.[8, 9, 10, 11] Several event-based cohort studies have

[8]Perloff D, Sokolow M, Cowan R. The prognostic value of ambulatory blood pressure. JAMA 1983;249:2792-2798
[9] Khattar RS, Swales JD, Banfield A, Dore C, Senior R, Lahiri A. Prediction of coronary and cerebrovascular morbidity and mortality by direct continuous ambulatory blood pressure monitoring in essential hypertension. Circulation 1999;100:1071-1076.
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shown that ambulatory blood pressure measurement (ABPM) improves cardiovascular risk stratification over and beyond traditional risk factors, including office blood pressure (BP). Most of these studies have been conducted in the general population[12, 13, 14] or in subjects with essential hypertension who were untreated at the time of execution of ABP monitoring.[15, 16, 17, 18, 19, 20]

In most of these studies, the majority of data on ambulatory blood pressure were recorded in initially untreated subjects or during a placebo run-in phase, which were used to predict end points, and treatment was initiated afterward. The prognostic value of ambulatory blood-pressure monitoring in patients with treated hypertension in whom both ambulatory measurements of blood pressure and office-based measurements of blood pressure are recorded when patients are receiving active treatment [15] is not well know in our areas, despite high incidence of hypertension in Romanian population.

We proceed to a prospective study assessing the incidence of cardiovascular events over time in patients with treated hypertension, to establish whether ambulatory BP offers a better estimate of cardiovascular risk than do its clinical BP counterparts.

This prospective study assessed the association between base-line ambulatory blood pressures in treated patients and subsequent cardiovascular events over time during an average follow-up of 48 ± 6 months among 544 patients.

## Methods

### Selection of Study Participants

A group of 544 patients who leave in Caras Severin County were included in the study. All patients gave written informed consent. All decisions concerning the study design, the collection, analysis, and interpretation of the data and the intellectual content of the manuscript were made independently, without the involvement of the pharmaceutical-industry sponsors.

The inclusion criteria were the following:

1. Documented hypertension (with standard condition of blood pressure measurement) at two separate visits within a one-year

potent predictor of total cardiovascular risk in hypertension. Hypertension 1998;32:983-988

[11]Zweiker R, Eber B, Schumacher M, Toplak H, Klein W. "Non-dipping" related to cardiovascular events in essential hypertensive patients. Acta Med Austriaca 1994;21:86-89

[12]Imai Y, Ohkubo T, Tsuji I, Nagai K, Satoh H, Hisamichi S, Abe K. Prognostic value of ambulatory and home blood pressure measurements in comparison to screening blood pressure measurements: a pilot study in Ohasama. *Blood Press Monit*. 1996;1(suppl 2):S51–S58.

[13] Ohkubo T, Imai Y, Tsuji I, Nagai K, Watanabe N, Minami N, Itoh O, Bando T, Sakuma M, Fukao A, Satoh H, Hisamichi, Abe K. Prediction of mortality by ambulatory blood pressure monitoring versus screening blood pressure measurements: a pilot study in Ohasama. *J Hypertens.* 1997;15:357–364

[14] Ohkubo T, Imai Y, Tsuji I, Nagai K, Watanabe N, Minami N, Kato J, Kikuchi N, Nishiyama A, Aihara A, Sekino M, Satoh H. Relation between nocturnal decline in blood pressure and mortality: the Ohasama study. *Am J Hypertens.* 1997;10:1201–1207

[15]Verdecchia P, Porcellati C, Schillaci G, Borgioni C, Ciucci A, Battistelli M, Guerrieri M, Gatteschi C, Zampi I, Santucci A, Santucci C, Reboldi G. Ambulatory blood pressure: an independent predictor of prognosis in essential hypertension. *Hypertension.* 1994;24:793–801

[16]Verdecchia P, Borgioni C, Ciucci A, Gattobigio RP, Schillaci G, Sacchi N, Santucci A, Santucci C, Reboldi G, Porcellati C. Prognostic significance of blood pressure variability in essential hypertension. *Blood Press Monit.* 1996;1:3–11

[17]Verdecchia P, Schillaci G, Borgioni C, Ciucci A, Porcellati C. Prognostic significance of the white-coat effect. *Hypertension.* 1997;29:1218–1224

[18]Verdecchia P, Schillaci G, Borgioni C, Ciucci A, Gattobigio R, Guerrieri M, Comparato E, Benemio G, Porcellati C. Altered circadian blood pressure profile and prognosis. *Blood Press Monit.* 1997;2:347–352

[19]Pickering TG, James GD. Ambulatory blood pressure and prognosis. *J Hypertens*. 1994;12(suppl 8):S29–S33

[20]Staessen JA, Thijs L, Fagard R, O'Brien ET, Clement D, de Leeuw PW, Mancia G, Nachev C, Palatini P, Parati G, Tuomilehto J, Webster J, for the Systolic Hypertension in Europe (Syst-Eur) Trial Investigators. Predicting cardiovascular risk using conventional vs ambulatory blood pressure in older patients with systolic hypertension. *JAMA.* 1999;282:539–546

period before enrollment. (Hypertension was diagnosed if the mean of three sphygmomanometer readings of diastolic blood pressure-DBP when exceeded 90 mm Hg in a patient who was currently taking antihypertensive medication or 95 mm Hg in a patient who was not taking such medication.

2. Patients of either sex who were 18 years age or older

Criteria for exclusion included suspicion of secondary hypertension, recent acute myocardial infarction, recent stroke (occurring within the previous three months), diabetes mellitus, recent hospitalization for chronic heart failure, recent revascularization or planned cardiovascular intervention during the succeeding three months, chronic obstructive pulmonary disease, any coexisting diseases that might seriously reduce life expectancy, pregnancy, and no cooperation to undergo repeated ambulatory blood-pressure monitoring.

All patients had a complete clinical workup at the beginning of the study to rule out secondary hypertension and to assess the presence of end-organ damage. The physician chose the antihypertensive drugs as he wish, but according with the current guidelines and to target a blood pressure bellow 140/90 mmHg, measured in office while the patient was sitting.

Information about traditional cardiovascular risk factors, history of cardiovascular events, current medications, demographic and anthropometric data was collected. At that time, a sample of venous blood was drawn to assess base-line factors and routine 12-lead electrocardiogram was obtained.

BP was measured with a mercury sphygmomanometer in a quiet environment, with the patient in a sitting position after 5 minutes of rest, following the recommendations of the British Hypertension Society.[21] Systolic BP (SBP) and DBP (Korotkoff phase I and phase V, respectively) represented in each visit the mean of three different readings measured at 5-minute intervals. ABPM was performed with the use of an oscillometric monitor on a regular working day, during the normal intake of the usual antihypertensive treatment. Following the standard protocol, readings at intervals of 30 minutes between 8 and 20 and at intervals of 60 minutes between 20 and 8. Daytime ambulatory blood pressure was defined as that between 8 and 20, and nighttime ambulatory blood pressure as that between midnight and 6. The average of SBP, DBP, and mean blood pressure were calculated for every one of the periods. The ratio between the averages of BP during the day period and during the night period, day/night ratio, was calculated as an estimate of circadian variability.

Before starting the study, reliability of BP values measured with the monitor were checked against simultaneous measurements with a mercury sphygmomanometer. Differences of <5 mm Hg were allowed. Those patients with recordings showing an error rate in >25% of the total readings were excluded from the study.

**Follow-up of the Patients**

Patients were followed for a period of 48±6 month. After the initial evaluation, a comparison of the incidence of cardiovascular events and the association with the risk factor was made during the follow-up. Cardiovascular events included myocardial infarction, angina pectoris, stroke, sudden death, aorto-iliac occlusive disease, congestive heart failure.

Myocardial infarction was diagnosed on the basis of at least two of three standard criteria (typical chest pain, ECG QRS changes, and typical elevation of myocardial enzymes by more than twofold the upper normal laboratory limits). Angina pectoris was defined as chest pain

[21] Petrie JC, O'Brien ET, Littler WA, de Swiet M. British Hypertension Society. Recommendations on blood pressure measurement. *BMJ.* 1986;293:611–615.

accompanied by typical ischemic changes in the ECG. Stroke was diagnosed on the basis of rapid onset of localizing neurological deficit lasting 24 hours or longer in the absence of any other process that could explain the symptoms. Sudden death was defined as a witnessed death that occurred within 1 hour after the onset of acute symptoms, with no history of violence or accident playing a role in the fatal outcome. Progressive heart failure was defined as symptoms when appearing during the follow-up in patients without previous heart failure symptoms.

**Statistical Analysis**

All analyses were performed with the Statistical Analysis System (SAS). For each variable, values are expressed as mean ± SD. The distributions of base-line characteristics in the group of patients with cardiovascular events and the group without cardiovascular events were compared with the use of Fisher's exact test for proportions and the t-test for continuous variables. For all hypotheses a value of $p<0.05$ were considered significant.

**Results**

**General Characteristics of Patients**

544 patients (228 men and 316 women; mean age, 50±10 years), all white, who met the inclusion criteria, were included in the study.

The median duration of follow-up was 48±6 months. Characteristics of the patients according to category of ambulatory systolic blood pressure (<135 mm Hg or ≥135 mm Hg) are summarized in table 1.

Tabel 1. Baseline Characteristics of Participants

| Characteristics | ABPM <135 mmHg | ABPM >135 mmHg | P value |
|---|---|---|---|
| **Risk factor** | | | |
| Age (yr) | 44±7 yr | 46±8 yr | p=0.08 |
| Male sex (%) | 45% | 53% | p<0.001 |
| Body mass index | 29±5 | 30±4 | p=0.14 |
| Current smoking (%) | 60% | 70% | p<0.001 |
| Total serum cholesterol concentration (mg/dl) | 240±12 | 239±8 | p=0.24 |
| **Office BP (mm Hg)** | | | |
| Systolic | 152±16 | 164±18 | p<0.001 |
| Diastolic | 90±10 | 95±11 | p<0.001 |
| **ABPM (mmHg)** | | | |
| 24 H systolic | 124±7 | 147±8 | p<0.001 |
| 24 H diastolic | 80±8 | 91±9 | p<0.001 |
| Daytime systolic | 127±8 | 154±12 | p<0.001 |
| Daytime diastolic | 83±7 | 93±8 | p<0.001 |
| Nighttime systolic | 115±11 | 139±6 | p<0.001 |
| Nighttime diastolic | 70±7 | 83±8 | p<0.001 |

Values are means ± SD; the body-mass index is the weight in kilogram divided by square of height in meters

During the follow-up, 76 patients had cardiovascular event (20 with coronary heart disease, myocardial infarction, or angina pectoris; 41 with cerebrovascular disease, stroke; 10 with progressive heart failure; 5 with hypertensive emergency). The higher category of ambulatory blood pressure was associated with older age, male sex, current smoking, high cholesterol level and higher office blood

pressures. Patients with cardiovascular events
are older, more likely to be male, smokers, with high level of cholesterol and history of cardiovascular disease. The cardiovascular events were better predicted by the ambulatory blood pressure measurement than the office blood pressure alone.

Tabel.2 Cardiovascular events developed during the follow-up period

| **Cardiovascular events** | **ABPM <135 mmHg** | **ABPM >135 mmHg** | **p value** |
|---|---|---|---|
| Stroke | 5 | 36 | p<0.001 |
| Myocardial infarction | 5 | 15 | p<0.001 |
| Progression of cardiac failure | 3 | 7 | p=0.004 |
| Hypertensive emergency | 1 | 4 | p=0.001 |
| Sudden cardiac death | 0 | 1 | p=NS |
| **Total events** | **14** | **53** | |

**Discussion**

The results of our study are that the 24-hour ambulatory blood pressure provided additional prognostic information concerning cardiovascular events, after adjustment for classic risk factors including office blood pressure. The findings of our study are consistent with those of previously published outcome studies.[22]

We know that incidence of cardiovascular events is predicted by blood pressure as measured conventionally or with ambulatory methods, even after adjustment for a number of established risk factors.[1, 2, 3, 4] Several event-based cohort studies have shown that ambulatory blood pressure measurement (ABPM) improves cardiovascular risk stratification over and beyond traditional risk factors, including office blood pressure (BP). Most of these studies have been conducted in the general population[5, 6, 7] or in subjects with essential hypertension who were untreated at the time of execution of ABP monitoring.[8, 9, 10, 11, 12, 13]

Earlier data based on semiautomatic ambulatory blood-pressure monitoring demonstrated the potential value of ambulatory blood pressure in discriminating between hypertensive patients at high cardiovascular risk and those at lower risk; these data showed that such discrimination was possible on the basis of the variance in the daytime ambulatory blood pressure, which was not explained by readings obtained in the clinic.[1] In that study, for technical reasons, no nighttime monitoring was performed, which resulted in incomplete documentation of the 24-hour profile. In a large sample of a Japanese community comprising both treated and untreated subjects, ambulatory blood pressure also predicted the risk of fatal cardiovascular events. In a study of 688 patients with hypertension followed for more than nine years, the ambulatory intraarterial blood pressure recorded before treatment began was predictive of cardiovascular risk. In our study, a noninvasive approach to ambulatory monitoring of blood pressure was used. The prognostic value of ambulatory blood pressure has also been assessed in a small study of patients with treatment-refractory hypertension. [23]

[22]Denis L. Clement, M.D., Ph.D., Marc L. De Buyzere, Prognostic Value of Ambulatory Blood-Pressure Recordings in Patients with Treated Hypertension N Engl J Med 2003; 384:2407-15.

[23]Redon J, Campos C, Narciso ML, Rodicio JL, Pascual JM, Ruilope LM. Prognostic value of ambulatory blood pressure monitoring in refractory hypertension: a prospective study. Hypertension 1998;31:712-718.

Higher values for ambulatory blood pressure more accurately predicted future cardiovascular events than did clinic-based measurements of blood pressure. The mean blood pressure among patients in that study was considerably higher than the mean pressure in our study. We exclude of our study patients with diabetes mellitus and take in a count family history of coronary artery disease, urinary albumin excretion, levels of low-density lipoprotein cholesterol or high-density lipoprotein cholesterol, levels of physical activity, or dietary measures. The results of our study demonstrate the limitations of office readings as they are routinely obtained. The effects of drugs (e.g., peak and trough effects) influence the office blood-pressure measurement and had a greater influence on the variance in office readings than on that in 24-hour ambulatory readings. Our study was not designed to address the effects of individual drugs or classes of drugs; therefore, patients were allowed to take all classes of drugs, which were administered at the discretion of their physicians.

**Conclusion**

Our study shows that 24-hour ambulatory blood pressure is a feasible method for predicting the risk of cardiovascular events. Higher values of ambulatory systolic or diastolic BP result in a more accurate prognosis of future cardiovascular events in patients with treated hypertension than do office BP values. Although more studies are needed to better assess the prognostic value of ambulatory BP in treated hypertensive patients.

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[1]Verdecchia P, Porcellati C, Schillaci G, Borgioni C, Ciucci A, Battistelli M, Guerrieri M, Gatteschi C, Zampi I, Santucci A, Santucci C, Reboldi G. Ambulatory blood pressure: an independent predictor of prognosis in essential hypertension. *Hypertension.* 1994;24:793–801

[1]Verdecchia P, Borgioni C, Ciucci A, Gattobigio RP, Schillaci G, Sacchi N, Santucci A, Santucci C, Reboldi G, Porcellati C. Prognostic significance of blood pressure variability in essential hypertension. *Blood Press Monit.* 1996;1:3–11
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PAGES 49-55

# FRACTURE RESISTANCE OF GALVANO-CERAMIC AND COPY-MILLED FELDSPATHIC-CERAMIC CROWNS: FIVE-YEAR CLINICAL EVALUATION.

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## ABSTRACT

*In the last decades restaurative dentistry had a growing tendency to replace metalo ceramic restaurations with restaurations containing as litle metal as posible (galvano ceramic crowns) or no metal at all (full ceramic restaurations).*

*This article compares results obtaind with 63 galvano ceramic restaurations (Preciano, Heraeus-Kulzer Germany) on 41 patients versus 55 full ceramic crowns (Celay Mikrona Technologie, Switzerland) on 36 patients. Patient examination had been carried out at the insertion appointment and second after 4-5 years.*

*After five years in the oral cavity the succes rate for galvano ceramic crowns is 96,5% for the posterior zone and 92% for the anterior zone. Comparatively the succes rate for full ceramic crowns is only 70% ( 10,6) for the posterior zone and 82,7% ( 8,1%) for the anterior zone.*

*This study results reveals that full ceramic restaurations (feldspatic ceramic, Vita Celay Blanks) are not suitable as a single element restauration in the masticatory zone because of the high fracture risk. As a conclusion galvanoceramic crowns represint an alternative for traditional metalo ceramic crowns.*
*Crowns made with Celay instalation from feldspatic ceramic blocks (Vita Celay Blanks, Vita, Germany) must be used with exteme caution in such situations (masticatory zone).*

## Introduction

In the last decades, introduction of new technologies for dental technicians reduced considerably the popularity of conventional metal/ceramic crowns. The alternatives to conventional metal/ceramic techniques such as all-ceramic and galvano-ceramic crowns were promoted especially from esthetic, periodontal and alergologic considerations (fig.1) (22). Durability is also considered to be important when this types of restorations were clinically evaluated.

The standard for reliable, functional long-term success has been conventional ceramic on high noble content alloys. In daily use, metal-ceramic restorations have been very popular. Very often, patients rate durability greater than esthetics, contrary to the beliefs of many authors (4, 5, 22).

Most of the clinical studies on all-ceramic crowns considered fracture susceptibility an important factor. Therefore, many authors focused their research on testing the resistance of feldspathic and galvano-ceramic restorations to compressive stress. The resistance to compressive stress is significantly lower for all-ceramic feldspathic crowns (170 N) when compared with galvano-ceramic (270) and conventional PFM's crowns (520 N) (7, 8, 21, 23). This type of investigations are commonly considered to be incapable of

addressing all clinically pertinent criteria (9, 10, 13), further studies are necessary for a more complex outcome in evaluation of clinical performance of prosthetic restorations (6, 12, 14, 17). As part of the literature review conducted during this study it is important to observe the frequent discrepancies between manufacturers predictions and a large number of clinical studies (2, 11).

The aim of the present study was to evaluate the fracture resistance of galvano-ceramic and glass-ceramic individual crowns inserted between 2004 and 2009, in Department of Prosthetic Dentistry, Victor Babeş University of Medicine and Pharmacy, Timişoara.

## Material and method

Between October 2004 and March 2005, a total of 55 all-ceramic crowns (Celay Plus, Mikrona Technologie, Elveția) were placed in 36 patients, and 63 galvano-ceramic crowns (Preciano, Heraeus-Kulzer, Germany) were inserted for 41 patients. The patients were evaluated twice a year. The majority of the patients were women (54%); all patients were treated in the Department of Prosthetic Dentistry, Victor Babeş University of Medicine and Pharmacy, Timişoara, with a mean age of 40.4 years (± 9.6, Celay) and 41.5 years (± 11.8, Galvano-ceramic).

Table 1 presents an overview of patients and restorations included in this study. The two types of restorations (all-ceramic feldspathic copy-milled crowns and galvano-ceramic) were assigned to two groups of teeth - anterior region (incisors/canine) and lateral/posterior region (premolars and molars). In the anterior region a number of 30 all-ceramic crowns were manufactured using copy-milling (68%) and 25 crowns using galvanoforming (48%). In the posterior region, there were 25 feldspathic all-ceramic crowns (32%) and 38 galvano-ceramic (52%) crowns cemented (fig.2).

## Treatment and material

All the patients included in this study had successfully completed periodontal treatment till January 2004 or were periodontally healthy. One dentist performed all the periodontal treatments and assessment of periodontal health.

When compared with galvano-ceramic restorations, all-ceramic restorations were chosen because of the esthetic, periodontal and biocompatibility considerations. Globally, since 2007 the manufacture of feldspathic copy-milled all-ceramic crowns (Vita Celay Blanks, Vita, Germany) decreased due to large number of failures (especially because of the fractures). Until then, this kind of restorations were mainly used in cases with high esthetic demands in order to avoid the exposure of metal shoulder and bevel.

The protocol for tooth preparation included reduction of tooth structure using air turbine, followed by a low speed hand piece - blue code (1:1 micromotor, KaVo, Germany) with the use of cylindrical-shaped 1,8 mm diameter diamond bur (Hager & Meisinger, Germany). A 360°, 1 mm wide chamfer on the level of gingival crest (iso-gingivally) in a 10° to 15° angle per surface was prepared. The occlusal-incisal surface was reduced by 2 mm.

The impressions were made at the same day as the preparation in a two-stage procedure using an addition reaction silicone. In all cases immediate provisional restorations were cemented using a non-eugenol provisional cement (TempBond NE, Kerr, Germany). Stone dies were mounted in articulators (Dentatus, Sweden).

Crowns were adjusted to occlusion and proximal areas. After ceramic was glazed, all-ceramic restorations were luted with an adhesive cement (Ivoclar-Vivadent, Liechtenstein), and galvano-ceramic crowns with a normal setting phosphate cement (Harvard Cement, Hoffmann, Germany). Remaining luting agent/cement was removed using a curette, paying attention not to interfere with the periodontal health.

All individual crowns were manufactured in one professional dental laboratory, according to the manufacturers recommendations'. Stone dies were made from class IV die (Silky-Rock, WhipMix, USA), in combination with the Pindex system (Coltene-Whaledent, Germany).

## Results

During the occlusion adjustment stage were not observed fissures or fractures of the crowns. First fracture occurred for all-ceramic restorations after 9 months, and for the galvano-ceramic restorations after 6 months.

After a period of 5 years, we recorded a success rate of 82.7% (± 8.1) for Celay crowns and 92% (± 8.5) for galvano-ceramic crowns. In the lateral area, the values were 70% (± 10.3) for Celay and 96.5% (± 3.4) for galvano-ceramic. The results found for Celay and galvano-ceramic restorations revealed a significant difference. No significant differences were found between anterior (incisor, canine) and posterior (premolar, molar) restorations.

All 9 fractured feldspathic restorations were reconsidered. From a total number of 5 failures, two galvano-ceramic crowns became detached and in one case a longitudinal root fracture was noticed. Prolonged hypersensitivity was the cause for retreatment in one restoration.

## Discussions

The results of this study can be compared only partly with the available data due to the study model (Table 2) (1, 4, 5, 6, 12-20, 24). Prospective clinical long-term studies from different group of patients have not been yet published on this subject. Krieg (12), described a failure rate of 2,4% for galvano-ceramic restorations (crowns) at 4,1 years. All the available studies on all-ceramic restorations that have used the same statistical method are presented in Table 2.

Most of the studies suggest that feldspatic restorations that were cemented conventionally (non-adhesive) in the posterior area (premolars, molars) have a higher risk of fracture (2, 3). It is well know that an increased number of microcracks within the material (ceramic) finally lead to fracture of the restoration. For the galvano-ceramic restorations a higher fracture resistance was noticed due to the fact that microcracks did not occur with the same dynamics within the ceramics fused to galvano-formed frame.

For galvano-ceramic restorations cause of failure is considered in most of the cases to be considered fractures in the ceramic body. McLean (16) revealed that the ceramic fracture at galvano-ceramic restorations is strictly related to the existence of major defects in the metal frame. This hypothesis was confirmed in the laboratory study conducted by Horn and Kappert, which discovered that the galvano-ceramic crowns are less resistant than classical metallo-ceramic restorations. Thus, conventional metalo-ceramic restorations had a failure rate of only 3% at 5 years and 10% at 10 years and is considered the standard in terms of resistance for metalo-ceramic restorations (4, 5) For a comparative evaluation of metallo-ceramic and galvano-ceramic more prospective studies are required. Also additional studies should focus on the linking mechanism between the electroformed frame and ceramic.

## Conclusions

All-ceramic copy-milled crowns are contraindicated to be conventionally cemented (non-adhesive) due to the high risk of fracture.

After a period of minimum 10 years in function, approximately 20% of the all-ceramic restorations were fractured, requiring re-treatment. Based on data obtained in this study can be concluded that the galvano-ceramic restorations represent an aesthetically and functionally alternative to conventional metallo-ceramic restorations, while the ceramic restorations made with Celay should be carefully evaluated especially when a

posterior feldspathic (Celay Vita Blanks, Vita, Germany) restoration is considered.

**Article Tabels**

**Table 1. Overview of patients and restorations**

| | Type of restoration | | | |
|---|---|---|---|---|
| | Galvano anterior | Galvano posterior | Celay anterior | Celay posterior |
| Number of patients | 15 | 26 | 20 | 16 |
| Number of restorations | 25 | 38 | 30 | 25 |
| - male patients | 9 | 17 | 13 | 11 |
| - female patients | 16 | 21 | 17 | 14 |
| Mean age of patients | 40,3 (± 11.1) | 41,8 (± 11.8) | 40,8 (± 9.8) | 39,9 (± 9.4) |

**Table 2. Literature review for clinical studies.**

| Author | Year | Crowns | Time (years) | Fractures (%) | | Type of ceramics |
|---|---|---|---|---|---|---|
| | | | | **Anteriors** | **Posteriors** | |
| McLean | 1984 | 679 | Up to7 | 1-2 | 3-15 | $A1_20_3$ |
| Moffa | 1988 | ? | ? | | 35 | Dicor |
| Linkowski | 1988 | ? | ? | | 19 | Cerestore |
| Richter | 1989 | 103 | Up to 3 | | 9 | Dicor |
| Erpenstein | 1991 | 159 | 2,8 | 3 | 13 | Dicor |
| Krieg | 1994 | 498 | 4,1 | 1 | 3 | Galvano |
| Pang | 1995 | 35 | >2 | 9 | | In-Ceram |
| Erpenstein | 1995 | 217/169 | 5 | 3/11 | 1/20 | Galvano/Dicor |
| Fradeani | 1997 | 144 | 3 | 5 | | IPS-Empress |
| Lehmer | 1997 | 78 | 2 | 5 | | IPS-Empress |
| Borchland | 1998 | 769/173 | 7 | 8/19 | 5/30 | Galvano/Dicor |
| Massoud | 2002 | 324 | 3 | 2 | | In-Ceram |
| Potiket | 2004 | 114 | 8 | 5 | 7 | IPS-Empress |
| Wood | 2006 | | | | | CAD/CAM Cerec |
| Barnfather | 2007 | 176 | 4 | 7 | 8 | Lava |
| Marcharck | 2007 | 88 | 4 | 3 | 6 | CAD/CAM |

**Figure 1**

**Fig.1**. P.S., 23 years, 1.1 extensive coronal lesion, a) central incisor before treatment, b) tooth prepared for a galvano-ceramic restoration, c) the electroplated frame of metal-ceramic crown, d) clinical situation, 1 week after cementation; the same tooth recived an full ceramic crown for chomparation purposes:e) the preparation, f) ceramic frame, g) final result with the full ceramic crown, h) transilumination of both the galvano-ceramic and full ceramic crowns

**Figure 2**

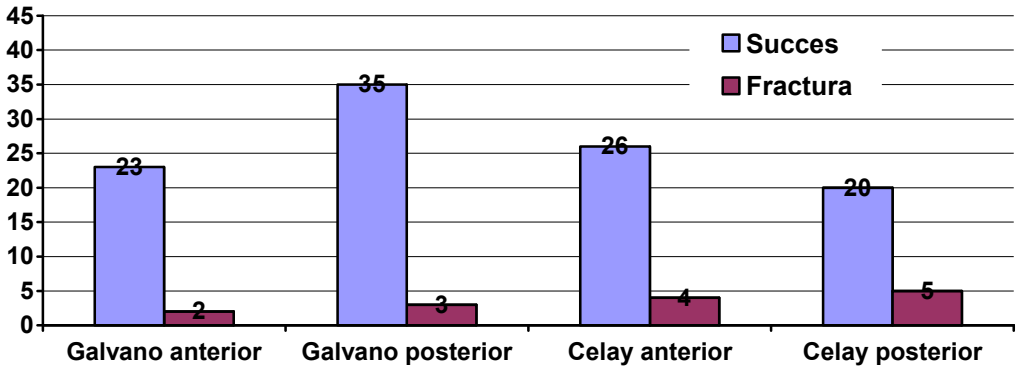


**Fig.2.** Number and type of restorations included in the study

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PAGES 57 - 61

# LIFESTYLE – A DECISIVE AGENT FOR ORAL HEALTH

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The lifestyle is an important agent for the state of health of the population. The OMS's program "Health for All"[1] is based on the capacity of the individual to acknowledge his lifestyle. The lifestyle of a person bears the fingerprint of the community's lifestyle where he was brought up.

The importance of one's lifestyle results from its weight in the determination of the state of health of a population.

**From the four main agents that determine health** [2]:

- the lifestyle has the greatest weight 51%;
- the biologic agents have a weight of 20%;
- the environment has a weight of 19%;
- the system of medical attendance 10%.

**Lifestyle has the following components:**

- eating habits and alcohol use or abuse;
- smoking;
- stress;
- drugs consumption;
- sexual behavior;
- driving behavior;
- physical activity (sedentary life);
- Professional risks.

**Lifestyle is influenced by:**

1. agents of the physical environment;
2. the pressure of the people around;
3. the social- economic development of a country;
4. the level of education of the population concerning health problems;
5. unhealthy habits determined by traditions, by the training level;
6. the individual's or the community 's financial resources;
7. the increasing of advertising at the products which have a negative influence on the population's state of health ( for instance, the alcohol industry);
8. the economic and the social policy of a country that encourages the production and the usage of goods with a negative influence on the population's state of health; [3] .

When talking about lifestyle, the **behaviorist agents** have a key role, especially from the educational perspective of the prophylaxis.

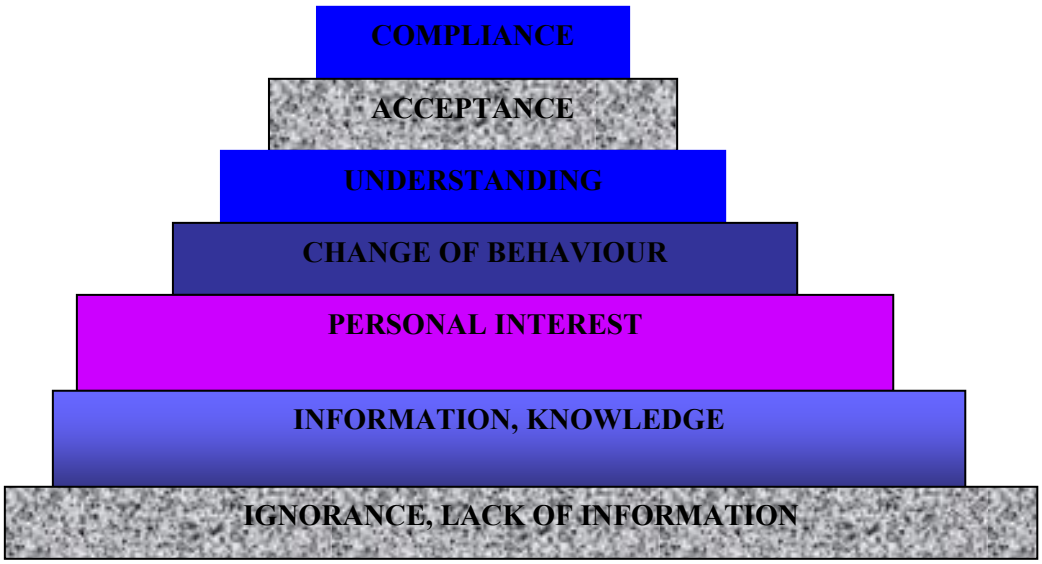
*The **behavior** is defined as a sequence of individual reactions at exterior or interior stimuli that are released at the level of the nervous system and reverberated including at biological level in the whole body*. In the elaboration of these reactions complex neural circuits intervene, and connections take place between the cognitive activity from the level of the cortex, the mechanisms of emotional life and the sub cortical ones, for controlling motions, of hormonal release and neural senders. As a result, when taking personal decisions we have reasons that come from the processing of some information taken from the natural environment and the social

one, including values, information's that have effect, with multiple mental representations, or a "subjective reasoning", the latter is meant to legalize the beliefs and the attitudes of the subject through referring to values that are established in the community.

**In the oral medicine, the ambiance is a very important agent, because in this environment the people come with delight or even with negative states**.

From the description above we can deduct the levels at which we can act, through education (more specifically- through oral education), for the population, for the individual, to be motivated to begin a healthy behavior [4].

The issue of the individual responsibility and of the social responsibility in comparison with the oral state of health is presented in Einwag's scheme, which shows the necessary stages for obtaining efficient and lasting changes of behavior.




**Picture 1. The steps which are necessary for obtaining efficient and long lasting changes of Einwang behavior**

To modify the basic situation, which is the ignorant one (lack of information), the first step is *information.* This should come from an authorized source, capable of supplying correct information, scientifically validated.

Though it is concrete, the information remains a non-operational luggage as long as the subject is not affected in any way, for whose avoiding it we have to apply the accumulated information. Therefore, the professionals are the most indicated to apply the information, they also being the beneficiaries of the epistemological studies, which led to the establishing of the risk categories. Thus they start from knowing the whole situation of morbidity and they target the message to the ones that feel the need for information and counseling in connection with a certain disease that affects them. In this respect, it was discussed about the information specific to the promoting of health as, just like a an action of the social marketing, ***marketing*** *being that activity where the needs of the potential consumers are studied and specific solutions are given for the satisfaction of needs* [5]. In other words, a change of behavior can be achieved if, guided by the specialist, the target – audience discovers a *personal interest* in the information about health that is supplied by a trustworthy source.

Only based on personal interest a healthy behavior can be implemented, so that an individual or a population would

renounce bad habits or pernicious ones that he is accustomed with, in spite of the effort that any renouncement and any new habits assume.

For the changes to take place, the addressee of the information, in his turn must not remain passive. In the first place, he must not show an attitude of compliance, he must not be passive when talking to the specialist, but he must listen the information faithfully, he must not hesitate in asking questions, in making personal observations, in informing about matters that were observed in his life (as an individual or as a collectivity).

When trusting one another, *accepting* is born – the emotional basis and the basic attitude of gathering information about health, an accumulation that leads to the next level: *the understanding.* Only after (on the basis of an assembly of emotions and positive attitudes) changes of the cognitive status have been produced, changes that are implied by the rezoning, we can speak about self control when talking about a *change of the behavior.*

**The social agents** are represented by an assembly of concepts and mental operations that are learned from the individual or that are functional in the collectivity, right at the level of informational relations between individuals, but also at the level of the relations between the individual and the public institutions (the working place, the leisure institutions are also comprised here), individual versus individual (when talking about working conditions, of leisure, of the means of transport etc. )

The social environment influences the individual in an imperceptible way, but in a profound manner, through some ideas whose implementing value is explicit and also effective, through unclear assemblies of cognitive and emotional contents, which are correlated with unseen ways, at a first look. For instance, for the common conscience of our age, the concept of *new* is associated with a positive emotional value, even if it is demonstrated that not everything that is *new* is superior to the old one. Thus, we believe that we can explain the positive silent investment of some practices that are known as damaging (smoking, alcohol, drugs and even the lack of personal hygiene, including oral hygiene) at young people. They are at an age when they feel too "old" to listen to their parents but also they do not feel prepared to confront the responsibilities of an adult life, some of them become the "cool children", who contest the system (linguistic tag under which complex notions hide – sometimes they are ambiguous-having in common the obligation to obey the rules of social life). The effect is almost mechanic: "it is not good" (the euphemism for "it is not allowed") is replaced with his opposite "it's desirable" and it is applied to all the interdictions to which the teachers have agreed upon. This option for this type of behavior does not exclude the young people from being aware of the validity of the information about health but to prefer the idea of *risk* instead of the idea if *personal safety* (also deconstructed) in their wish to individualize themselves, of detaching from the great mass of the population.

## 1. The abusive consumption of drugs

Nowadays it is acknowledged the involvement of the abusive consumption of drugs which cause serious diseases such as:

1.acute intoxication with alcohol;
2. hepatic cirrhosis;
3. pancreatitis;
4. neural – psychological affections;
5. cancer of the oral cavity;
6. hepatic cancer and esophageal cancer;
7. accidents;
8. violent deeds;

The abusive consumption of drugs is represented by the repeated self taking of ethylic alcohol, which causes medical effects and important social economical effects.

With all the problems connected to alcohol, there has never been an efficient global politics concerning the prophylactic effect of this calamity [3].

The alcohol consumption per capita is greater in the well developed countries than in the countries still in progress. [2].

The objectives of "Health for all" cannot minimize the major problems connected to the abusive consumption of drugs.

## 2. Smoking

A serious behavior, damaging to the health, smoking is responsible for a multitude of serious diseases such as: lung cancer, chronic lungs affections and digestive affections.

At a global level, smoking is considered to be the first avoidable health problem in the world [2].

The studies taken at a global level show a rising proportion of the smokers in the world, the most affected are the people in the highly industrial countries. [3]

On average, the tobacco bad habit "kills" six persons/ minute and a 1 smoker from 4 dies due to a disease connected to smoking.

Smoking contributes to the diminishing of the length of life four times more, if the person started smoking since 25 and 8 times more if person started smoking since 15 years old. (A. Jehan, 1995, see [3])

Also, the rate of smoking at the young women rose, so that in some countries, such as Spain, Italy, this overreacted statistics done at men [3].

Renouncing smoking is achieved in a difficult way, due tot the addiction state, induced by nicotine.

The legislation anti- tobacco exists in some countries and assumes [3]:

1. On the packs of cigarettes there has to be mentioned the health risks;
2. the diminishing or the interdiction of advertising cigarettes;
3. the interdiction (restriction) of smoking at the working place, in the public places (institutions, schools, hospitals);
4. preventing smoking at young people (through the interdiction of sailing cigarettes in schools);
5. the working out of programs anti-smoking that are addressed especially to the young people;
6. the diminishing of tobacco production;
7. the fiscal politics and price politics, discouraging prices for the teens;
8. Sanitary education, anti – tobacco, making known the risks for the smoker, and for the people around him.

Since 2000, ETS was included on the list of the substances that produce cancer, being controlled by the law of health regarding jobs [3].

The negative role of smoking does not refer to its bad action on the breathing apparatus, as a main impact organ, but it was demonstrated that there is not organ or apparatus that can be morphological – functional modified as a result of this habit:

1. Cardiovascular apparatus (angina pectoris, HTA, arteriopathic);
2. Dento-maxillary apparatus (stomatitis, gingivitis, the modification of the dental enamel, lip cancer, tongue cancer);
3. The reproductive apparatus (sexual impotency, abortion, abnormal insertions of placenta, metroragy).

## 3. Consumption of drugs

The consumption of drugs usually generates physical problems, mental problems, behavior problems, troubles in the family and problems with the law, with the finances, with the job, hard to solve problems when the drugs are taken since adolescence.

The phenomenon of the traffic and the consumption of drugs have known a strong development after the 60s, being considered a real "psycho-social epidemic".

The epidemic data shows an increase of drugs consumption especially in the still developing countries, the youth being the most affected individuals [1].

Lately, Romania has become a transitory country and partially a market for the drugs.

countries, it is a concern for all the social strata, the first appearance of drugs can be at any age. The consumption of drugs is an

important problem for the public health.

The consequences of the consumption of drugs for health are **medical** (AIDS, hepatitis of type B and C, sexual transmitting diseases) and **social** due to the neuropsychological anxiety that it causes (nervosity, depression, aggressivity, such persons being involved in violent acts, in accidents, in problems in the family, at work, at school etc.)

Doing campaigns through mass media adressed to the elements of protection regarding the consumption of drugs: increasing the youngsters'self esteem, self appreciation, the improvement of communication in the family.

The formation of profylactic and counselling antidrugs centres as institutions with legislative and proffesional personnel who would assure the permanence of the activities in the centre, the creation of free phone lines for counselling, such as help – lines, connected to FESAT (The European Foundation of Antidrugs phone services).

The purpose of creating a medical network involved in the treatment of the drugs consumer is to facilitate his access to all the serie of medical attendance, to assure a multiple medical investigation (infectious diseases, psychiatry, neurology etc.) as to have a complete medical perspective. Thus it would create the possibility of a very close monitoring of the medical problems which are connected to the consumption of drugs and also for making teamwork easier in the centre. The ideal of this network is that when the consumer appeals to any of the available medical services, the priorities of treatment would be established together with the other proficient doctors. For this to be achieved, the network has to be flexible, open to communication, tense all the time and to have a coordinator who would offer a guiding, a monitoring of the case.

The nowadays tendency is that the pattern of the state of health should comprise the identification of the priorities, including the determining of the state of health and also other elements which would influence the results in health, which could lead to the improvement of the state of health, to the reduction of death rate, to cure, thus it contributes to changes concerning the quality of life.

The determiners of the state of health can be changed by promoting health and profilaxy, to which the involvement of the community adds. The latter has a very important role.

The elements which influence the medical attendance can be changed by close diagnosis, screening, and also by involving the patient or the community [5].

The most important elements which influence health remain poverty, lifestyle, unemployment, uncorresponding dwelling places, the level of education of the population, the pollution of the environment.

Their approach at the national level, with interventions adequated at the level of the community should be based on programs and projects in which public and private resources should be used in that community.

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PAGES 63 -66

# PHOTOMETRIC FACIAL ANALYSIS

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## ABSTRACT

*Thorough facial analysis is the foundation for successful rhinoplasty. Every surgeon doing nasal cosometic procedure must master the techniques of successful analysis. In the present study by applying photometrics measurements of 18 patients.*
*Keywords: Nasion, Aesthetic*

The identification of aesthetic facial qualities began with ancient civilizations such as Egyptians and Greeks, who captured their ideals of beauty in artfrom (Peck and Peck, 1970). The classical Greek canons of facial proportions influenced anatomic scholars of Renaissance period, and many of these, with modifications, are still embraced as the basic foundation of aesthetic facial analysis today.

The favourable correction of nasal deformities constitutes one of the most challanging areas of facial aesthetic surgery. For such an important task baseline records and an understanding of their interplay are essential. Extensive literature is available for North-American and Europians, Powell and Humphries (1984) but similar baseline records are not available for Indians. Consistent quality photographs are important not only to document pre and post-operative results, communicating with patients, but also are essential in preoperative planning and accurate evaluation of postoperative results, Larrabee (1987).

## MATERIAL AND METHOD

To assist in analysis and documentation of nasal contours, techniques using dimensional assessments are extremely valuable. The standard at present is of reproductive photography.

Standardized views taken with a good quality 35mm single lens-reflex (SLR) camera is the most reliable choice in Photographic documentation. For this study we analysed 18 patients. We took frontal and right lateral views, from a fixed distance and keeping in mind the soft tissue Frankfurt horizontal plane, Tweed (1946). We took tracing of these photographs and made certain lines for vertical measurements.

Vertical measurements: A vertical line drawn from glabella to pogonion and divided into three parts from trichion to nasion, nasion to subnasale and subnasale to gnation (Fig. 1).

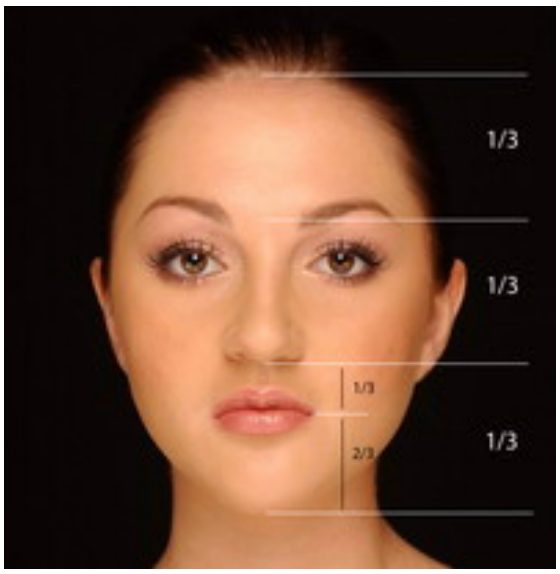


Fig.1 – The proportion of face

Distances between these were measured and converted into percent ratio:

$$P1 - \frac{Tr - N'}{Tr - Gn'} \quad P2 - \frac{N' - Sn}{Tr - Gn'} \quad P3 - \frac{Sn - Gn'}{Tr - Gn'}$$

## RESULTS

While analysing the fine anatomy of nasal contours, it is important also to have an idea of general facial characterstics.

Analysis showed that the percents varied (Table-I).

Table I

| P1 | P2 | P3 |
|---|---|---|
| 30 | 35 | 35 |
| 27 | 30 | 43 |
| 34 | 37 | 30 |
| 36 | 30 | 34 |
| 38 | 29 | 34 |
| 36 | 32 | 32 |
| 34 | 32 | 34 |
| 30 | 32 | 38 |
| 29 | 31 | 40 |
| 32 | 31 | 36 |
| 36 | 32 | 32 |
| 32 | 34 | 34 |
| 38 | 29 | 34 |

| | | |
|---|---|---|
| **33** | **33** | **33** |
| 37 | 34 | 29 |
| **33** | **33** | **33** |
| 35 | 30 | 35 |
| 36 | 32 | 32 |

Only 2 patients presented ideal facial simetry. For P1 minimum was 27%, maximum 38 and average value was 33,67% (Table II).

Table II

| Percent | Lowest | Highest | Average |
|---|---|---|---|
| **P1** | 27% | 38% | 33,67% |
| **P2** | 29% | 37% | 32 % |
| **P3** | 29% | 43% | 34,33% |

## DISCUSSION AND CONCLUSIONS

Leonardo da Vinci divided the face into thirds, from the frontal hair line to the root of the nose, the nasal root to nasal base and the nasal base to the bottom of the chin, Larrabee (1987). Because the frontal hairline may be absent in some individuals the proportions of the mid and lower face need only be analysed, Powell and Humphries (1984). Farkas et al (1985) performed anthropometric studies on different ethnic populations to assess the validity of the classical Greek canons for beauty and have produced tables of multiple normal values for various facial proportions. Powell and Humphries (1984) contributed their concept of Aesthetic triangle to facial analysis and included nasofrontal, nasofacial, nasomental and mentocervical angles in this system.

Photographic documentation as used here is the most convenient and helpful method for facial analysis and to compare pre and post operatively for facial plastic surgery as has been documented by others, Larrabee (1987) and Andrews & Schoenrock (1998). The present study shows that lower third of face is biggest and middle face is the smallest, having respective values of 34,33% and 32%.

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PAGES 67 - 73

# TELESCOPING IMPLANT PROTHESES WITH INTERAORAL LUTED GALVANO MESOSTRUCTURES

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## ABSTRACT

***Telescoping in general and galvanoformed telescoping in particular made posible the make of prosthetic restaurations with many extraordinary features:***

***- Passive Fit Adaptation- witch is a decisive factor for implant suported protheses;***

***- Excelent adaptation and fixed behavior of the resturation during function altrough there is the posibility of removal at patient's will. This means that the oral hygene may be excelent.***

***The autors are refering at three cases of edentulism. All of them were restaurated with fixed-removable implant suported protheses. The restaurations include galvanoformed copings (mezostructure) luted intraoraly in a metal cast (suprastructure).***

***The article describes the clinical and laboratory procedures for one of the cases.***

***We recomand to extend the use of these restaurations in our country because of the numerous advantages even trough the cost is a bit higher.***

## Introduction

The passive-fit of the implant superstructures is a prerequisite for the dental implant prostheses (2, 9). The lack of fitting of the frameworks to the implant abutments generates stress in two directions: in the superstructures (ceramic fissure) and connections (loosening and fractures of the screws) (1) and on the other hand it compromises the implant/bone interface with the result of bone loss and eventually implant failure. Because of the discrepancies of the screw-retained restorations, cementation of implant frameworks has been brought forward. However, the cement-retained prostheses have also disadvantages, including the lack of retrievability in case of the implant failure.

## Aim and objectives

This article will describe the technique for the fabrication of the telescoping implant prostheses with a very precise fit, achieved by luting intraorally the galvano mesostructures. The main result is the strain reduction, similar to the cemented fixed prostheses (12, 21).

By the use of galvano-telescopic copings, the advantages of retrievability can be combined with the improved fit of a cemented superstructure. The telescopic system permits simple retrievability for peri-implant hygiene, and repair procedures, if necessary.

The precision of implant superstructures is determined by the entire clinical and laboratory fabrication process. Errors may occur during the impression making, fabrication of the definitive cast, casting of the framework and ceramic veneering (14). Also, after extended edentulous periods, the replacement of hard and soft tissues is often necessary for esthetic or phonetic reasons. To compensate for the resorptive processes of the maxilla, a buccal flange may be required for adequate support of the lips and the facial profile. In these situations, a removable prosthesis may be given preference over a cemented fixed prosthesis or a screw retained prothesis.

## Material and method

Altrough telescoping restaurations was first proposed americans (18) the application of galvano-electroforming for telescoping units is primarily described in the German language literature . The galvano process is an electro-deposition of metal ions of an electrolyte solution to a negatively charged cathode, resulting in a pure metal structure on the cathode surface. It was introduced in the early 1960s for the fabrication of inlays and onlays. Only after the development of automatic systems with cyanid-free gold-sulfide baths could the electro-forming procedure be used in clinical practice (6, 21).

The main advantage of the galvanoformed coping is their retention, which is a non-friction one. The retention is an adhesion between the galvano coping and the prosthetic abutment, through the saliva pellicle. If one tries to take the prothesis off the prosthetic field, a vacuum effect is created because the saliva is inextensible and the restoration remains in place. A similar effect is obtained by the full denture's „suction". This type of retention is also known as hydraulic retention (3) or adhesive retention (fig.1). This kind of hydraulic retention can be obtained only when the fitting of the two structures (the galvano coping and the prosthetic abutment of the implant) is very precise and the marginal fit is between 20-30 μm.

## Technique

A number of 3 edentulos patients were reabilitated using this technology (2 males and 1 female with ages betwen 49 and 60 years).

| ***Name*** | ***Age*** | ***Sex*** | ***Diagnostic*** | ***Tipe of restauration*** |
|---|---|---|---|---|
| M.I. | 54 | M | Maxilary subtotal edentation | Partial fixed-removble prothesis |
| P.I. | 60 | M | Maxilary complete edentation | Fixed-removable restauration |
| C.P. | 49 | F | Mandibulary complete edentation | Fixed-removable restauration |

Make the indirect impression after second-stage surgery (Fig.2 a,b).Fabricate a stone cast of the artificial tooth arrangement as a guide for the dimensions of the framework and to preserve the desired position of the artificial teeth. Carve the prosthetic abutments with a 2-degree milling titanium cutter in the planned path of insertion, and place the abutment shoulder at the soft tissue level. (Fig.2 c,d). Fabricate an acrylic resin (Pattern Resin, GC) positioning jig over the completed abutments.Close the base of the abutments and the screw access openings with autopolymerizing acrylic resin (Pattern Resin, GC) and connect the abutments to an insulated wire (AGC Contact rod, Wieland). Carefully apply a thin layer of silver conductor (AGC Elektroforming System, Wieland) to the abutments and the acrylic resin of the screw openings. Perform the electroforming process in the galvanobath. Create copings with a thickness of 0.3 mm (Fig. 2 e).

Detach the galvano copings from the abutments and remove the silver connector with 25% nitric acid. Position the abutments and the galvano copings on the working cast and number the copings.(Fig.2 f)

Fabricate the frame for the prosthesis from a rigid nonprecious cobalt-chromium alloy. Allow enough space (approximately 0.1 mm) between framework and galvano copings for passive fit and the luting agent. Verify the clearance between the framework and the galvano copings.(Fig.2 g).Silanize (Rocatec, 3M ESPE) the framework and copings to prepare for intraoral luting.Attach the abutments to the implants by using the acrylic resin positioning jigs to verify the abutment position. Torque the abutments afterwards as recommended by the manufacturer. Place the galvano secondary copings intraorally and verify the passive fit of the tertiary framework. Bond the secondary copings intraorally to the framework with composite resin (AGC Cem; Wieland). Verify the final wax arrangement on the cast (Fig.2 h) and intraorally.Complete the acrylic resin portions of the denture with auto-polymerizing polymer. Finish and polish the prostheses in the conventional way. (Fig.2 i)Attach and torque the abutments to the implants as previously described. Cover the abutment screws with a thin layer of white gutta-percha material for retrievability. Place the completed telescoping denture intraorally (Fig. 2 j). Verify esthetics, function, and appropriate retention. Instruct the patient on the use and maintenance of the protheses.

## Results

The described technique permits the fabrication of a retrievable implant-supported denture with a passive fit comparable to cemented restorations. Retrievability allows simple repairs and modifications of the acrylic resin dentures and easy access for periimplant hygiene. The telescopic design with intraoral luted galvano copings provides excellent prosthesis retention and stability.

All the patients were pleased with the quality of the restaurations witch are excelent looking after about one year of use.

## Discussions

The correlation between misfit of implant-supported prostheses and an increased rate of mechanical failures is established, but the degree of fit accuracy necessary to prevent mechanical complications remains unclear (1). Although cementation of implant prostheses can compensate for fit discrepancies and cemented metal-ceramic prostheses can have esthetics superior to metal-resin dentures, fixed dental prostheses may not be indicated in all situations. The high costs of full arch metal-ceramic restorations are a limitation for many patients. In addition, porcelain failures remain a common problem. Esthetics and durability of adhesive systems for intraoral porcelain repair may not be satisfactory, and the removal and laboratory repair of a cemented metal-ceramic prosthesis is a potentially hazardous and costly procedure.

For patients with extensive residual ridge resorption, replacement of hard and soft tissues with a removable prosthesis may be considered a more suitable option than a cemented restoration. No screw access openings interfere with occlusal surfaces, improving esthetics and occlusion compared to conventional screw-retained prostheses. The thin galvano copings allow adequate space to be completely covered with the framework, which in association with the silanization procedure allows a durable connection.

Altrough telescoping using galvanoformated copings is relativley new in implantology it is starting to accaparate implantology because of the major advantages witch it offers: passove fit, high mechanic resistance, permise for good hygene and the posibility of numerous adjustments

## Conclusions

1. With this kind of restaurations it is possible to obtain the Passive Fit

Adaptation witch is a decisive factor for implant suported protheses;

2. The restaurations are removable witch gives the patients the posibility for very good oral hygene, the medic posibility to work around the implants and technicians to correct whatever failure may ocour

3. We recomand to extend the use of these restaurations in our country because of the numerous advantages even trough the cost is a little higher.

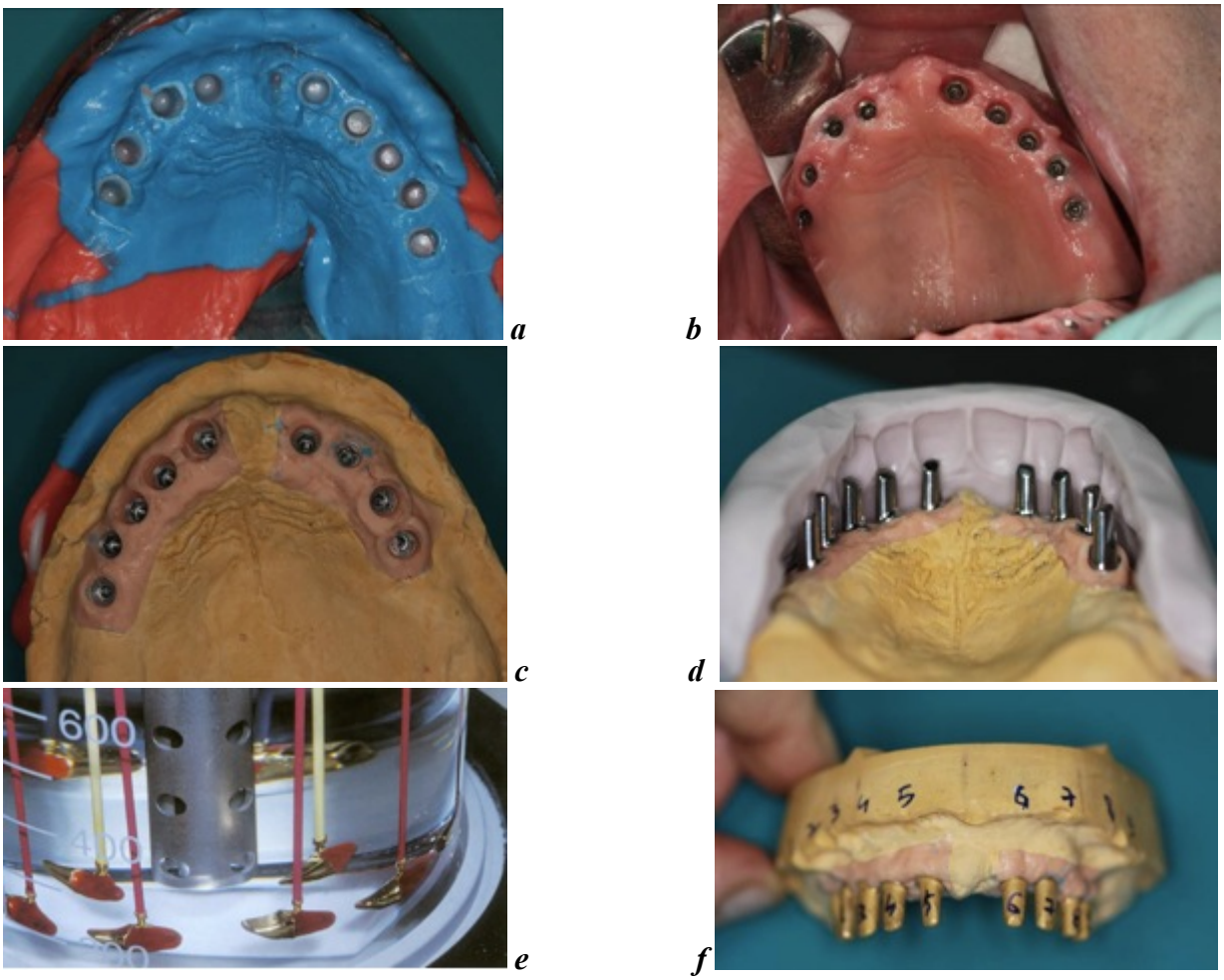


**Fig.2 :** healing after surgery (a); indirect impression (b); master cast with gingival mask(c); prosthetic abutments prepared at 2 degrees and the silicone markup(d); galvano forming bath with the prosthetic abutments placed(e); numbering of the galvanoformed copings(f)

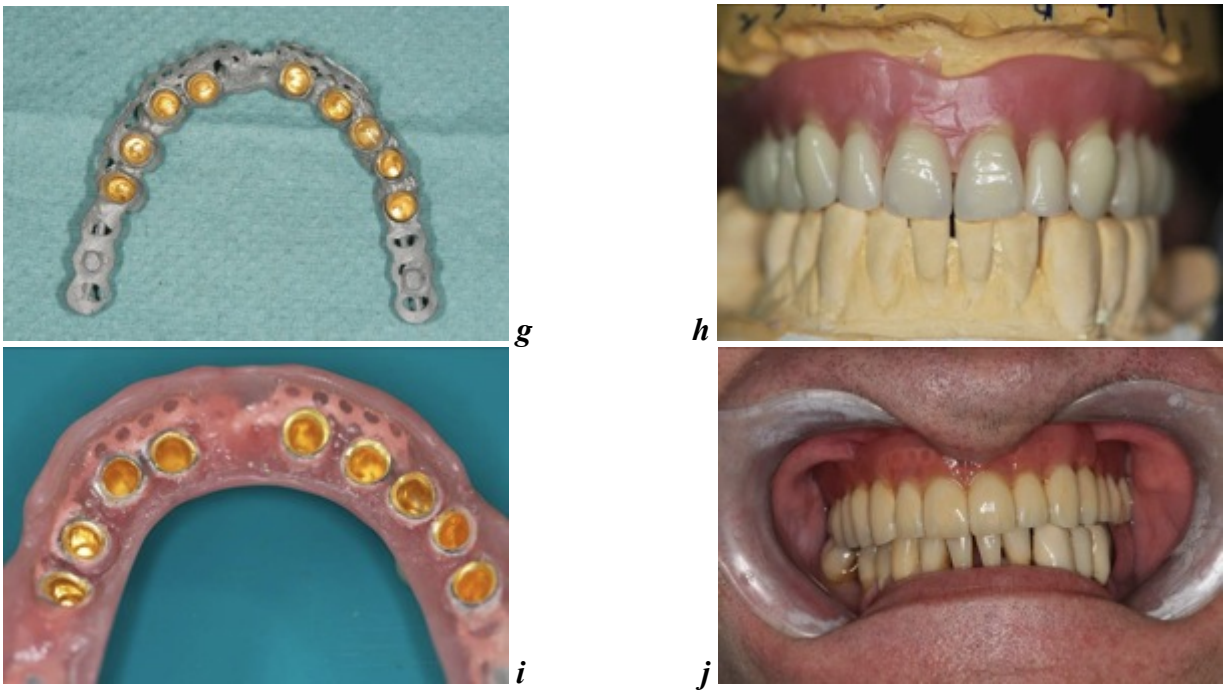


**Fig.2 continuing:** the galvanoformed copings placed in the metal cast (g);the wax probe (h); fnal resturation-mucozal aspect (i); and extraoral aspect(j);

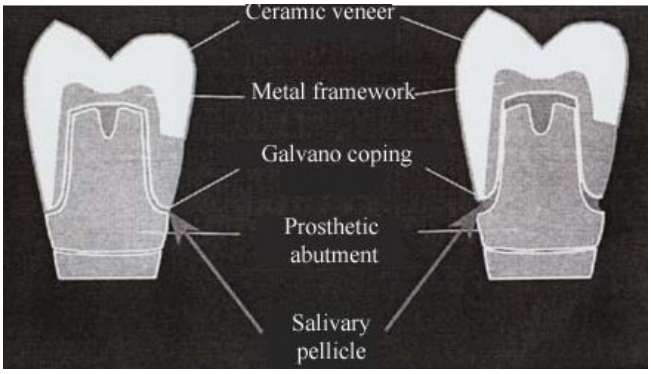


**Fig.1:** Hidraulic retention

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PAGES 75 - 78

# THE IMPORTANCE OF THE ALVEOLOTOMY IN THE PARTIAL EDENTOLOUS PATIENTS WITH FIXED PROTHESES

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## ABSTRACT

***The main conditions to make a alveolotomy as prosthetic reasons are the following:***
***the patient desire to maintain the prosthetic bridge***
***financial difficulties that make impossible to change the bridge***
***corono-radicular distruction at a short time after bridge insertion***
***In our study, we used patients with fixed protheses and destroyed roots under the bridges. The possibility of cutting and changing the bridges was excluded by the patients.***
***Key words: alveolotomy, root tip.***

## INTRODUCTION

Before construction of a tooth fixed prosthesis, the dentist should make sure that there are no root tip in the edentulous area that is being restored. If such roots are present, the general recommendation is to be removed before the final placement of the prosthesis.

Roots that are completely covered with bone, that show no pathologic changes, in patients more than 40 years old are unlikely to develop problems on their own. However, if a prosthesis is to be constructed on a ridge where a root tip is covered by only soft tissue or 1 or 2 mm of bone, it is likely that in time the overlying bone will be resorbed, the mucosa will perforate, and the area will become painful and often inflamed. If this occurs, the root tip will often need to be removed and the dental prosthesis either altered or refabricated.

Each situation must be viewed individually, and the risks and benefits of removing the root tips by alveolotomy must be given careful consideration. In older patients with tooth fixed prostheses, asymptomatic deeply impacted teeth can be safely left in place. However, if a tooth fixed prosthesis is to be made and the bone overlying the impacted tooth is thin, the tooth should probably be removed before the final prosthesis is constructed.

## DESCRIPTION OF TECHNIQUE

**Root extraction after removal of part of the buccal bone**

When the tooth is single-rooted and the level of the root is below the margin of the fixed protheses, an L-shaped incision is made, the flap is reflected and a large part of the buccal bone is removed using a round bur until the root is exposed. The root is then luxated using a straight elevator, which is placed mesial or distal from the root. The root is mobilized easily, using rotational movements with the elevator and applying a small amount of pressure outwards. After smoothing the bone margins, the surgical field is irrigated

with saline solution and, after repositioning the flap, the wound is sutured.

Luxation of the root in the outward direction using a straight elevator

When the tooth has two roots and the roots are below the level of the margin of the alveolar process without being separated, the extraction is performed as follows. First an envelope flap is created, beyond the root to be removed. Then part of the buccal bone is removed using a round bur, until the root bifurcation is exposed. The roots are sectioned using a fissure bur and are removed with a straight elevator. The socket is then cared and sutures are placed.

**Extraction of root after a window is created on buccal bone**

After making an L-shaped incision, the flap is reflected and a small window is created, using a round bur, with constant irrigation using saline solution, on the buccal bone, corresponding to the tip of the fractured root. The window is then enlarged, and enough of the root is exposed to allow its displacement from the socket using a narrow-angled elevator. After removal of the root, the socket is cared and sutures are placed.

Depending on the case, a trapezoidal or semilunar flap is created and complete or partial exposure of the bone follows. The root is then removed from the bone without difficulty, preferably using a narrow elevator. This technique is usually used in cases of fractured small roots, which remained in the socket for a long time and are totally covered by bone.

**Surgical extraction of root tips**

When a root tip is fractured deep in the socket and is impossible to remove with simple luxation, its removal may be accomplished using one of the before mentioned techniques for removal of roots, depending on the situation. The dentist must pay particular attention when removing root tips that have been dislodged towards the maxillary sinus.

When a root tip of a posterior maxillary tooth is fractured and displaced into the maxillary sinus during the luxation attempt, it is a serious complication and must be dealt with as soon as possible. In order to avoid such a possibility, before any extraction of a posterior maxillary tooth, radiographs must be examined carefully to determine how close the root tips are to the maxillary sinus.

This close proximity is usually observed when the maxillary sinus is pneumatized into the alveolar process between the root tips of molars and especially when there are periapical lesions that are in contact with the lower surface of the maxillary sinus. In cases such as these, if a root tip is fractured, it may be displaced into the maxillary sinus easily if movements during the luxation attempt are not gentle and if special narrow instruments are not used.

## MATERIAL AND METHOD

From the various surgical techniques for root removal, we used in our study the removal of the buccal bone, for luxation of the root buccaly.

Case 1

Patient, female, 36 years, come in the dental office, with a old ceramic left maxillary bridge with abutments 24, 25 and 27. The clinical examination show at 25 level gingival and bone pockets, with gingival inflammation. The radiographic assessment show 25 substantial crown-root caries. The patient desire is to maintain the bridges for 1 year long. In the surgical approach, we made an alveolotomy with removing the 25 tooth. The 25 bridge crown was filled with acrylic resine. The primary postoperatory healing was poor, with gingival dehiscence. The patient received antibiotic therapy and local lavage, with self healing after 1 month.

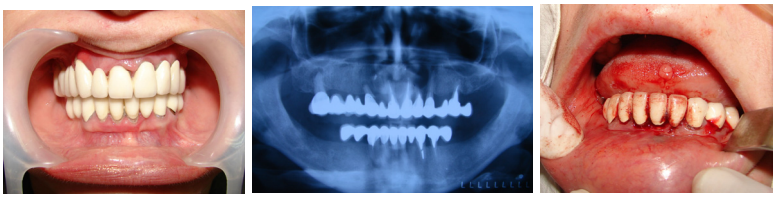
After 1 year the bridge was cutted, 25 extracted, and an other 24-27 ceramic bridge made.

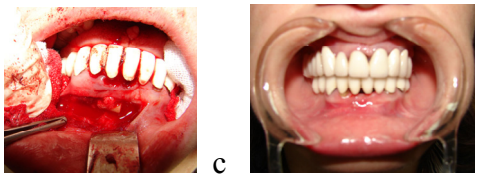
Case 2

Patient, male, 65 years, come in the dental office, with a 1 year old ceramic bridge and a discomfort at 23 level. The clinical examination show a cervical fracture of the teeth 23, with bad adaptation to the 23 ceramic crown, and gingival inflammation. The radiographic assessment show substantial caries with crown-root interruption. The patient don't accept the ideea to remove the ceramic maxillar bridge. In the surgical approach, we made an alveolotomy with removing the dental root and crown 23. The 23 bridge crown was filled with acrylic resine. The healing was good, and the esthetic results good too.

Case 3

Patient, female, 52 years, come in the dental office, with a 3 years old mandibular ceramic bridge. The clinical and radiological examination show deep gingival and bone pockets, with gingival inflammation, dental plaque, dental calculus, poor hygiene. The desire of the patient was to maintain as long as possible the dental bridge. In the surgical approach, we cut horizontaly at cervical level the teeth 31, 41. Than we made an vestibular alveolotomy with removal the dental roots 31, 41. After 6 month of controls, no medical problems.





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## RESULTS

The results were good. The healing of the surgical field was quick, and the maintenance of the bridges possible. With a careful work, we don't observe damages of the protheses or adverse reactions of the surrounding tissues.

## CONCLUSIONS

The surgical options for alveolotomy is a good choice for maintaining the fixed protheses in partially edentoulous patient, both relatively new prostheses or at the desire of the patient. This method is especially recommended for the anterior teeth. Its success primarily depends on correct preoperative evaluation and planning. For these reasons, a medical history, clinical examination of the patient, and radiographic evaluation of the area surrounding the destroyed tooth are deemed necessary.

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PAGES 79 - 86

# RADIOPACITY OF RESIN COMPOSITE

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## ABSTRACT

***The purpose of this study was to measure radiopacity of seven resin composites. The radiopacity values of Tetric EvoFlow_A2, Bleach L (Ivoclar Vivadent), AMELOGEN PLUS_A2 (Ultradent), Filtek Supreme XT Universal Restorative_A3, Filtek P60 Posterior_A3 (3M ESPE), Rok _C2 (SDI), Composan LCM_A3 (Promedica) and Brilliant Enamel_A1 (Coltene Whaledent) were determined with reference to aluminium step wedge and an equivalent thickness of enamel and dentin. Tetric EvoFlow_A2, Bleach L, Filtek P60 Posterior_A3, Brilliant Enamel_A1, Filtek Supreme XT Universal Restorative_A3, and AMELOGEN PLUS_A2 had radiopacity values significantly greater than enamel. Rok_C2 and Composan LCM_A3 had lower radiopacity values than enamel but greater than dentin and higher than 1 mm Al. Future resin composite are recommended to have higher radiopacity values than dentin and perhaps ideally similar to or higher than that of enamel for improving clinical detection.***

*Keywords:* radiopacity, diacrylic resin composites, x-ray, dentine and enamel

## INTRODUCTION

Dental composites have been introduced to replace human tooth loss, and the properties of the lost tissue. Tooth enamel is the most highly mineralized tissue found in the body. The composition of enamel is 87% hydroxyapatite mineral, 11% water, and 2% organic matrix by volume [*Craig* RG 2001]. Dentin is the hydrated composite structure that constitutes the body of each tooth, providing both a protective and nutrition function. Dentin mineralization begins at the level of the pulp tips, protecting the pulp and serving as a support for the overlying enamel. Enamel, with its exceptionally high mineral content, is a very brittle tissue. Without the support of the more resilient dentin structure, enamel is so brittle that it would fracture when exposed to the forces of mastication. Dentin supports and compensates the brittle nature of the enamel [Akay M 2006]. Dentin is composed of approximately 50% inorganic material, 30% organic material, and 20% fluid by volume. Dentin mineral is a carbonate-rich calcium deficient apatite. The organic component is predominantly type I collagen with minor contribution from other proteins that can be categorized as phosphoproteins, glycoproteins, and carboxyglutamate-containing proteins. The composition of dentinal fluid is reportedly similar to plasma; but it has been poorly characterized [Akay M 2006].

First materials that can replace human tooth were introduced for the first time in dentistry in the sixties of the last century [Bowen RL 1962]. Dental composite is a material composed of an organic matrix and inorganic fillers. For a good compatibility and bonding to polymer matrix inorganic fillers are coated with a coupling agent. The coupling agent is a difunctional molecule, which bonds to the hydroxyl groups on the surface of the glass filler by *silanol* groups and with the double bond to the monomer matrix. In the composition of dental composites can be find initiators, inhibitors, pigments, antioxidants, preservatives and antimicrobials in small amounts. Modern dental composite systems contain filler such as quartz, colloidal silica, silica glass containing barium, strontium and others. This filler increases strength and modulus of elasticity and reduces the polymerization shrinkage, the coefficient of thermal expansion, and the water sorption [Fortin D 2000]. In comparation with human tooth dental composites may contain 60-80% filler by volume [*Craig* RG 2001].

Radiopacity is widely acknowledged as a desirable property of all intra-oral materials, including denture base materials [Bloodworth KE 1992], denture liners [Goshima T 1992], elastomeric impression materials [Parissis N 1994], endodontic sealers, posts [Bodrumlu E 2007, Gambarini G 2006] and retrograde materials [Rud J 1996], direct-filling restorative materials and resin–cement luting agents [Akerboom HB 1993].

The aim of this study was to determine the radiopacity of some resin composites and to compare with the radiopacity of enamel and dentin.

## 1. Experimental procedure

### *2.1 Materials*

Eight resin composites ( Table 1 ) were investigated in this study and compared to the radiopacity of human enamel and dentin.

### *2.2. Methods*

#### 2.2.1. *Specimen preparation*

Four disks of resin composites measuring 8 mm in diameter and 1 mm thickness (± 0.01) cured by XL3000 photocuring source (3M Dental Products, St Paul, MN, USA) for 60s were selected for investigation. Specimens with voids were excluded from the study. Extracted human molars were sectioned mesiodistaly with a rotary cutting machine for obtaining 1 mm thickness of enamel and dentin samples. In addition to these samples, pure aluminum samples consisting of 1 to 5 mm thick step were prepared. The purity of the step wedge used in this study measured by optical emission spectroscopy was 99.52 % Al, 0.22 % Fe and 0.001 % Cu and was in agreement with the literature recommendation [Watts DC 1999, ISO 2000]. Samples of dental composites and tooth slices were placed alongside aluminum step wedges on the radiographic film. Radiographs were taken with a dental X-ray (X-Mind, Satelec) at 60kv, 7mA, for 0.32 sec. exposure time, with a target-film distance at 40 cm. Dental films (Kodak D-Speed) from the same batch after automatic development (Dürr XR 24, *Bietigheim*-Bissingen, Germany) at 28ºC, were digitalized with a flatbed scanner (Umax Astra 2400s) and exported as uncompressed images at 8 bit TIFF files. TIFF scanned radiographs were tested by Image J (version 1.37V, Wayne Rasband, National Institutes of Health, Bethesda, MD, USA) and average gray value was recorded for every sample. For each radiograph image was calculated the calibration curve generated from the grey scale values as a function of the aluminum thickness (Fig. 1). The radiopacity values of the samples were expressed in terms of the equivalent thickness of aluminum per 1mm unit thickness of material.

#### 2.2.2 *Statistical analyses*

Data were statistical analyzed by one-way analysis of variance (ANOVA) with the level of significance set at 0.05 to

determine significant differences between the mean values of materials tested.

### 3. Results and Discussions

The results (Fig. 2) show the mean of radiopacity values of the materials investigated. There was statistically significant difference between materials. All materials tested had radiopacity values greater than dentin. Tetric EvoFlow_A2 was the most radiopaque material evaluated in this study. This fact can be explained by the content of barium glass filler and ytterbium trifluoride and also by the high *filler volume* fraction [Ivoclar Vivadent AG]. Tetric EvoFlow_Bleach L, Filtek P60 Posterior_A3, Brilliant Enamel_A1, Filtek Supreme XT Universal Restorative_A3, and AMELOGEN PLUS_A2 had radiopacity values significantly greater than enamel and this behavior could be also explained by the presence of high atomic number element and high *filler volume* fraction in the composition of dental composites. Rok_C2 and Composan LCM_A3 had lower radiopacity values than enamel but greater than dentin and higher than 1 mm Al. All materials tested had radiopacity values higher than dentin and 1 mm Al and were in agreement with ISO-4049 [ISO 2000].

Radiopacity is a basic requirement for the restorative materials [ADA, ISO 2000] to permit radiographic distinction between the restorative material, tooth structure and detection of secondary caries [Espelid I 1991]. First, dental composites were not radiopaque and distinguishing of dental composite restorations from tooth structure on radiographs was not possible. According to American Dental Association (ADA) [ADA] and the International Standards Organization (ISO) [ISO 2000] specifications the radiopacity of posterior resin composites shall be equal to or greater than that of the same thickness of aluminium step if a manufacturer claims that the material is radiopaque.

Despite these standards, the level of radiopacity of composite resins required for clinical radiographic evaluations has not been fully established [Akerboom HB 1993]. From literature, is generally accepted that dental composites used for class I and class II restorations should be radiopaque. The minimum of radiopacity level required for dental composites have to be greater than the dentin radiopacity or to be slightly in excess than that of enamel for improving the clinical detection [Espelid I 1991, Goshima T 1989]. An radiopacity much greater than that of tooth tissues like amalgam, gold or other metal restorations is not an advantage of materials because there is the risk that adjacent caries and defects can remain undiagnosed hidden in the “shadow” of an amalgam or under metal restoration [Espelid I 1991, Goshima T 1989].

Until now on the market have been introduced many dental composites with different compositions and properties. Radiopacity is one of the important clinical properties of restorative materials required to dental composites for a good restoration. Obtaining of radiopaque dental composites can be made by inserting in composition of high atomic number elements such as barium, strontium, zirconium, zinc, ytterbium, titanium, tantalum, lanthanum, indium and tin in different concentrations and compositions [Toyooka H 1993, Watts DC 1987Schulz H 2008, Moszner N 2004, Watts DC 1987, van Dijken JW 1989, Toyooka H 1993]. These radiopaque elements are included generally in dental filler but also could be found sometimes in dental monomers [Moszner N 2004]. Based on these things the radiopacity of commercial dental composites differ from brand to brand [Willems G 1991]. Using too much radiopaque fillers in composition of dental composites can reduce translucence, mechanical properties [Taira M 1993, Fortin D 2000] and increase degradation of dental composites [Söderholm KJ 1983, Söderholm KJ 1984]. If there is a mismatch in the refractive index between filler and resin the composites will be clinically opaque [Willems G 1991].

### 4. Conclusions

The radiopacity of dental composites were found to have radiopacity values significantly higher than that of dentin. Two materials Rok_C2 and Composan LCM_A3 had lower radiopacity values than enamel but greater than dentin. All dental composites tested had radiopacity values higher than 1mm Al and passed the test ISO-4049 [ISO 2000]. Future dental composites are recommended to have higher radiopacity values than dentin and perhaps ideally similar to or higher than that of enamel for improving the clinical detection. Digital image could be an alternative to transmission densitometry for evaluation of the radiopacity of dental composites.

**Acknowledgements**

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**Table 1.** Resin composite investigated in this study. Information provided by the manufacturers.

| Nr. | Product | Manufacturer | Shade | Composition |
|---|---|---|---|---|
| 1 | AMELOGEN PLUS | Ultradent | A2 | Bis-GMA<br>76% wt inorganic filler<br>61% vol. inorganic filler |
| 2 | Brilliant Enamel | Coltene Whaledent | A1 | Methacrylate, Barium glass silanized, Amorphous silica, Hydrophobed<br>58.5% wt inorganic filler<br>77% vol. inorganic filler |
| 3 | Composan LCM | Promedica | A3 | 76,5% wt inorganic filler<br>60% vol. inorganic filler |
| 4 | Filtek Supreme XT Universal Restorative | 3M ESPE. | A3 | Bis-GMA, Bis-EMA, UDMA, TEGDMA, Zirconia/silica nanocluster<br>79.5% wt inorganic filler<br>59.5% vol. inorganic filler |
| 5 | Filtek P60 Posterior | 3M ESPE | A3 | Bis-GMA, Bis-EMA, UDMA, Zirconia/silica (0.01 to 3.5 µm)<br>61 % vol. inorganic filler (without silane treatment) |
| 6 | Tetric EvoCeram | Ivoclar Vivadent | A2 | Dimethacrylates (17–18 % weight), Barium glass, ytterbium trifluoride, mixed oxide and prepolymer (82–83 % wt). Additional contents: additives, catalysts, stabilizers and pigments (<1.0 % wt).<br>75–76 % wt inorganic filler<br>53–55 % vol. inorganic filler |
| 7 | Tetric EvoCeram | Ivoclar Vivadent | Bleach L | Dimethacrylates (17–18 % wt), Barium glass, ytterbium trifluoride, mixed oxide and prepolymer (82–83 % wt). Additional contents: additives, catalysts, stabilizers and pigments (<1.0 % wt).<br>79–80 % wt inorganic filler<br>60–61 % vol. inorganic filler |
| 8 | Rok | SDI | C2 | 17.7% wt (32.3% vol.) Multifunctional methacrylic ester.<br>82.3% wt (67.7% vol.) Inorganic filler (40nm - 2.5micron) |

**Bis-GMA**: Bisphenol A diglycidylmethacrylate; **Bis-EMA**: Bisphenol A polyethylene glycol diether dimethacrylate, **UDMA**: Urethane dimethacrylate; **TEGDMA**: Triethylene glycol dimethacrylate; **CQ**: Camphorquinone.

**Table 1.** Resin composite investigated in this study. Information provided by the manufacturers.

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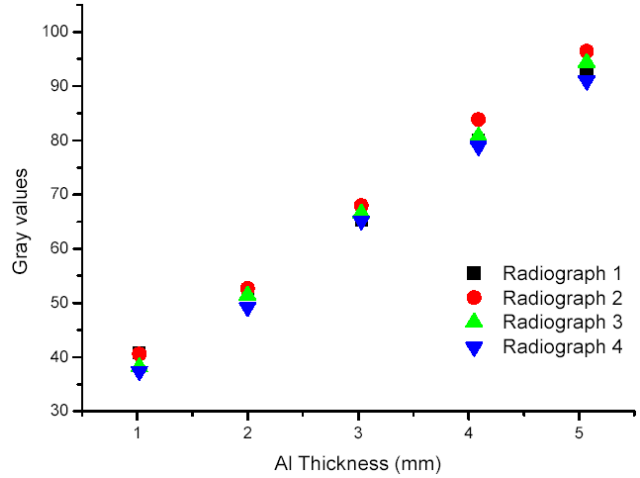


*Fig. 1. Calibration curve generated of the grey scale values versus the thickness of the aluminium.*

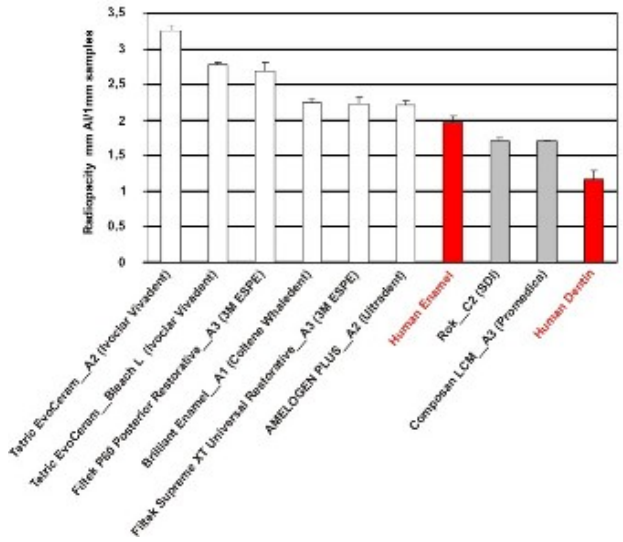


*Fig. 2. Radiopacity of resin composites, compared to dentin & enamel.*

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PAGES 87 - 92

# RECESSION-FREE HEALING OF THE INTERDENTAL PAPILLA AFTER ENDODONTIC MICROSURGERY WITH THE PAPILLA BASE INCISION TECHNIQUE – A CLINICAL EVALUATION

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## ABSTRACT

*Aim*
*The purpose of the present paper was to evaluate clinically the interdental papilla healing from the recession point of view after endodontic microsurgery, with the papilla base incision technique.*
*Material and methods*
*The preoperative papilla height was recorded. The papilla base flap, consisting of the papilla base incision and two releasing incisions, was used to expose the bone. The papilla base incision consisted of a shallow first incision at the base of the papilla and a second incision directed to the crestal bone, creating a split thickness flap in the area of the papilla base. Further apically a full thickness flap was raised. Following standard root-end resection and filling, flap closure was achieved with microsurgical sutures, which were removed 5 days after the surgery. The sites were evaluated clinically at the conclusion of the surgery, at suture removal and after 1 month, and compared to the preoperative findings.*
*Results*
*Complete closure of the wound was achieved after surgery. The patient displayed rapid healing; no noticeable space was created beneath the contact point area. The probing depth remained within normal limits. One month postoperatively, observation of the incision demonstrated that the incision defect could be hardly detected.*

## Introduction

Loss of interproximal dental papillae may cause functional, phonetic and aesthetic problems. Complete and predictable restoration of lost interdental papillae remains one of the biggest challenges in periodontal reconstructive surgery[1]. It is therefore imperative to

maintain the integrity of the papilla during restorative and surgical procedures.

Traditional periodontal surgical treatment opens the interproximal spaces, causing flattening or cratering of the interdental papilla. When a full thickness flap is raised during periodontal surgical treatment in an area with shallow pockets (1-3mm), loss of attachment results, whereas with deep pockets the attachment level can be maintained or even gained. Re-evaluation after 6.5 years postsurgery found sustained attachment loss in shallow pockets[2].

Endodontic surgery requires exposure of the bone covering the root(s) and the apices. To achieve access, a full thickness flap must be raised, which consists of gingival and mucosal tissue as well as periosteum. To mobilize the flap, various modes of incisions can be selected including horizontal incisions (sulcular and submarginal) and vertical releasing incisions. The care of the healthy periodontal tissues is a very challenging one and it is of utmost importance to prevent attachment loss and recession of the gingiva following endodontic surgery. Evan partial loss of the papilla should be avoided, as predictable correction of the interproximal papilla height is difficult.

In periapical surgery the sulcular full thickness flap is often used[3], but in narrow interproximal spaces complete mobilization of the papilla is often difficult causing tissue loss. Though sulcular flaps remain the most frequently used in endodontic surgery, the main disadvantage of these are recession and, especially, unpredictable shrinkage of the papilla during healing.

To prevent the marginal recession of the gingiva, a submarginal incision was suggested[4]. This incision is made within the attached gingiva parallel to the marginal contour of the gingiva. This flap design preserves the marginal gingiva and does not expose the crestal bone. The main disadvantages of the submarginal incision are the scar formation due to flap shrinkage, delayed healing and possible marginal tissue necrosis.

A persistent endodontic infection following periradicular surgery may be regarded as a contributing risk factor for a progressing marginal attachment loss[5].

## Aim and objectives

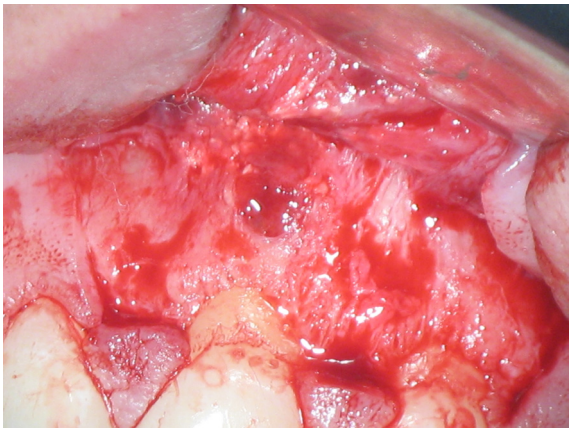
A new incision for the marginal mucoperiostal flap was designed to prevent loss of interdental papilla height[6]. The technique involves the preservation of the entire papilla, thus eliminating any potential loss of height as a result of the surgical or healing process. The purpose was to describe and evaluate this marginal incision technique – the papilla base incision, which preserves the integrity of the interdental papilla during and after endodontic surgery in cases where there is no evidence of marginal periodontitis.

## Material and methods

A patient, man, 26 years old, in good general health referred for surgical treatment of persistent apical periodontitis was included for this clinical evaluation. The tooth 1.1 had previously been root filled 6 month ago, but was failing , with persisting symptoms and apical radiolucency. A conventional retreatment had been performed and failed. The patient shows no periodontal disease. Periodontal health was defined as absence of bleeding on probing and probing depths not exceeding 3 mm on any of the teeth in the area of the surgery. Interdental papillae were occupying the interproximal space below the contact area (Fig. 1).

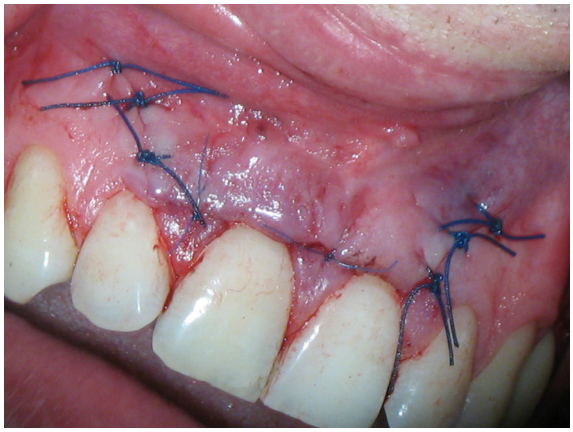
The teeth were anaesthetized with 4% articaine with 1:100 000 adrenaline infiltration and in the designated flap area additionally lidocaine with 1:50 000 adrenaline was administered for profound haemostasis. The entire surgical procedure was performed with microsurgical instruments and magnified vision using an operating microscope.

The papilla base flap consisted of two releasing vertical incisions, connected by the papilla base incision and intrasulcular incision. Initially, the vertical incisions were placed at least one tooth distal and mesial to the tooth to be treated. The marginal incision started with the preparation of the papilla base incision using a microsurgical blade, placed in the lower third of the interdental papilla. The incision started and ended in a 90 degree angle between the border of the tooth and the gingival margin, resulting in a curved line at the base of the papilla, ending at the crestal bone level, where the periosteum was separated from the bone (Fig. 2).

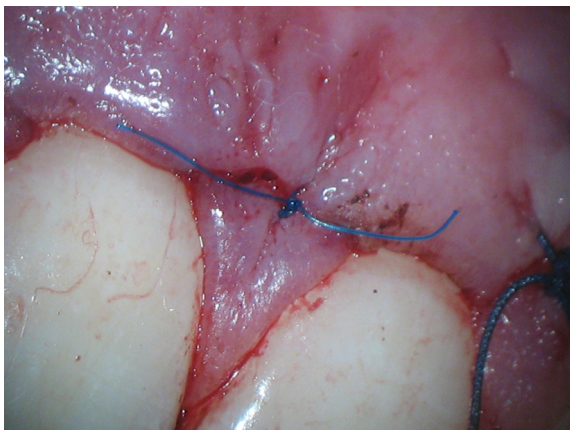


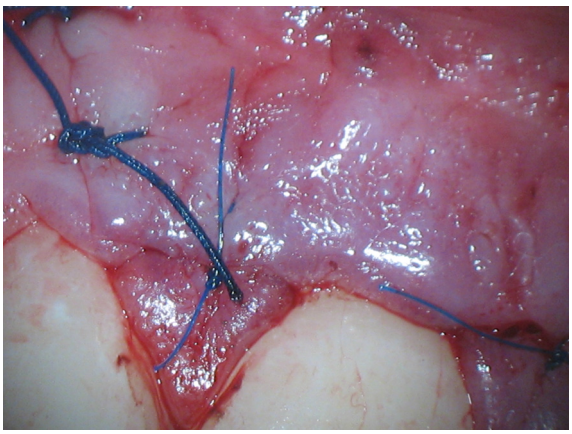
From there on the preparation continued in a full thickness muco-periosteal flap. Bucally over the tooth the vertical incision and papilla base incision were joined by an intrasulcular incision. The flap was mobilized and retracted during the root-end resection and filling.

The flap was initiated from the releasing incisions. For the vertical incisions 5/0 interrupted polyamide sutures were used. The papilla base incision was sutured with polypropylene 6/0 interrupted sutures (Fig. 3).



Great care was taken in passive reapproximation and perfect adaption of the wound margins without tension to the sutures (Fig. 4, 5).





The flap was compressed for 1 min at the conclusion of the surgery. The patient was instructed to apply a cold compress to the face for 15 min every hour for 2 days and were prescribed NSAID (Ibuprofen), 400mg three times per day for 5 days. The patient was instructed to refrain from mechanical oral hygiene in the operated area and rinse twice daily with 0.2% chlorhexidine during the firs week after the surgery. The sutures were removed 5 days post operatively.

The site was evaluated and the surgical area was photographed in the interproximal area: before surgery, immediately postoperatively and at a recall appointment 1 month postoperatively. The images were compared for increase of the space between the papilla and contact area as a sign of loss of height. The change of the position of the most coronal point of the papilla was determined by measuring the distance between a reproducible point on the tooth and papilla using a perio probe.

One month post operatively the experimental site was observed with a 3x magnification and graded as to whether a visible defect resulting from the incision could be detected.

## Results

Complete closure of the wound was achieved in the present case and no severe complications such as papilla necrosis occurred. The patient displayed rapid healing (Fig. 6).

The photographs did not reveal any noticeable opening of the space between the papilla and contact area as a result of the loss of papilla height at any observation time. The mean difference between a reference point and the most coronal point of the papilla comparing the preoperative and the one-month postoperative situation was 0.01 mm. The patient doesn't exhibit probing depths greater than 3 mm at one month. The visual observation of the incisions at this recall, demonstrated that the incision defect could be hardly detected and perfect healing occurred (Fig. 7).

## Discussions

It is of utmost importance to preserve epithelial and connective tissue attachment at its original level and traumatize the attachment apparatus as little as possible during the incision in order to obtain rapid healing through primary intention. This can be obtained by: complete and sharp incision of the tissues, avoiding crushing of the tissues, preventing

drying of the tissues during the procedure and perfect adaptation of wound edges upon closure[7].

In a study by Zimmermann[8], despite microsurgical techniques, the mobilization of the papilla resulted in considerable loss of height after 3-5 days. Besides, aesthetic disadvantages, this may create biological and phonetic problems, as well as food impaction. In periodontally healthy sites, particulary when subgingivally placed crown margins are present, recession is a risk when a surgical procedure is required to treat apical pathology. With the papilla base incision it is possible to prevent any noticeable recession of the papilla following apical surgery.

Although the papilla base incision achieved very predictable results, this technique is challenging to perform. First, atraumatic handling of the soft tissues is mandatory to obtain good results. Secondly, fine incisions are needed for good healing and to avoid excessive scar formation or an indentation at the site of the incision. The remaining papilla, as well as the raised flap, should be treated with great care, kept moist, and held in place without pressure during suturing. In addition, fine, non-resorbable and tissue tolerated polypropylene suture material should be used to avoid further irritation to the wound margins. The delicate atraumatic needles cause minor injury to the papilla and flap, provided the tissues are not pinched several times during suturing. Finally, the wound edges are perfectly reapproximated without tension on the suture. Tension will compromise blood circulation on both the papilla and flap and cause delayed healing[9]. In the buccal cervical area an intrasulcular incision is performed. This tissue is very delicate and can be injured easily, which will delay the healing. The attached tissue on the root surface must not dry out, as it facilitates the epithelial and connective tissue reattachment.

## Conclusions

The aim of the soft tissue management in apical surgery is to prevent attachment loss and recession of the marginal periodontium, especially when healthy conditions are present. Based on the results of this clinical evaluation, the recession of the papilla in healthy periodontal sites can be prevented during apical surgery. The papilla base incision displayed excellent healing without noticeable loss of height of the papilla. The mid-term healing of the incision at the base of the papilla was either invisible or slightly visible for the majority of incisions. Subjectively, the patient didn't noted any disadvantage aesthetically. Further studies will analyse the long-term healing in papilla base incisions and compare it to other modalities for the elevation of the papilla in marginal full thickness flaps.

## Figure legends:

1. Initial clinical status of the gingiva, preoperatively
2. The papilla base incision; the full thickness flap retracted
3. The flap sutured tension-free in the original position
4. The papilla base incision sutured
5. Detail of the suture, perfect adaption of the margins
6. Gingival healing after one month, postoperatively
7. Hardly detected incision defect, at 8x magnification

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# INSTRUCTIONS FOR AUTHORS

The journal publishes general reviews, studies and clinical, epidemiological, experimental and laboratory research, clinical case presentations, 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 A4 paper (fonts - Times New Roman 12, Romanian characters, line spacing 1.5, upper and lower margins 2 cm, left border 3 cm, right border 2 cm) and on CD, DVD or Memory Stick.
Manuscripts will not exceed:

- general reviews: 6-8 pages
- studies and researches: 5-7 pages
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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.
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- 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;
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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.
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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.

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## 6. PRESENTING THE MANUSCRIPT

For the journal *„Medicine in evolution"*, the manuscript must be typed double spaced, on white A4 paper – 210x297 mm, on one side (2.5 cm upper and lower borders, 3 cm left and 2 cm right border, respectively), in clear characters, no further corrections or addings. It is advisable that articles are presented on CD or other data transfer methods, in Word format, 12 Times New Roman fonts - using Romanian characters – respecting the same page order, accompanied by a printed version. Graphs – black and white or coloured – may be generated in MS Excel or MS Graph, inserted in the body of the paper or presented in a different file.
Infected materials will not be used.

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Together with the title and names of the authors, the first page must include the affiliation, professional and university degree (if applicable), marked by asterisc for every author; it is advisable to give at least a phone and/or fax number or e-mail address of the first author who may be contacted by the editors for additional recommendations or explanations.

### 6.2. ABSTARCT OF THE PAPER

*6.2.1 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

### 6.3 CONTENT OF THE PAPER

*6.3.1 For original articles*

The text will usually be divided into sections:
Introduction – presentation of general aspects, in the context of the approached theme
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Material and methods – 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).

Results – Present results in a logical succession as text, tables and illustrations. Emphasize or briefly describe only important observations.

Discussions – 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.

Conclusions – 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.

*6.3.2 Indications for case reports*

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:

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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:

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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.

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

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

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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.

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

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

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