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FOREWORD



The fourth issue of the magazine published by the Romanian Society of Oral Rehabilitation is traditionally associated with the coming edition of the International Congress of Dental Medicine in collaboration with the Autumn DENTA.

This issue focuses on the aspects approached by the Congress, namely dental medicine between standard and current practice, the articles dealing with various aspects of dental medicine providing an accurate image of the standards as well as of the practical means of oral rehabilitation in particular clinical cases.

In practical activity we are confronted with difficult clinical cases requiring standards in accordance with the spectacular evolution of the dental medicine methods and techniques.

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The President of Romanian Society of Oral Rehabilitation*

DENTAL PATIENTS' INVOLVEMENT IN INFECTION CONTROL: EDUCATIONAL ASPECTS

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Abstract: The dental patients' education regarding the involvement in their own health care, based on the evaluation of their attitudes and knowledge in infection control represents a strategy to strengthen the safety of the dental treatment. The aim of this survey was to evaluate the knowledge and attitudes of dental patients towards cross-infection control measures in dental practices; **Materials and methods.** To assess the patients' approach a questionnaire-based survey was initiated, a total of 110 patients aged between 16 and 68 years being interviewed. Data was processed using SPSS 15.0 in terms of age, gender and level of education. **Results:** 83.6% of the patients trust the medical staff taking into account that it protects them against illness spread. 45.5% of the subjects looking forward to the implementation of infection control procedures. 89,0% of them require that the dentists wear gloves throughout the dental treatment whilst 63.6% prefer the protection mask . **Conclusions** Dental patients' awareness in terms of infection control must influence the dentists' choice of using the equipments and protocols in order to adopt the European safety standards during the dental treatment.

Key words: infection control, patient involvement, safety of dental procedures.

INTRODUCTION

The increase of the educational level leads to a further preoccupation for a health-oriented way of life, as well as for the protection against potential infection sources. The patients' perception on infection prevention is particularly important in motivating the implementation of specific procedures and the option of adopting them by the dentists.

MATERIALS AND METHODS

In order to assess patients' attitudes regarding the risk of infection and its prevention during dental treatment, a questionnaire-based survey was initiated involving 110 patients aged between 16 and 68 years. In terms of on education level and occupation 20% of patients had a high education, 47.3% were students and 9.1% were retired. 60% of study group were

women, while 40% of them were males. The confidential questionnaire incorporated a total of 18 questions about the safety of the medical procedures in the dental office, the use of protective equipment, the high risk procedures, patients' knowledge about the diseases which may be transmitted during dental treatment. Data was analyzed by age, gender and level of education using SPSS 15.0 ($p < 0.05$).

RESULTS

The majority of the patients (83.6%) trust the medical staff, considering that it protects them against the spread of infectious diseases. Only 10.9% avoid treatment due to the risk of getting ill and 5.5% consider that they are not at risk during dental treatment. Men (95.5%) showed more confidence in the dental staff than women (75.8%) who manifest an

increased anxiety regarding the risk of disease (Fig. 1).

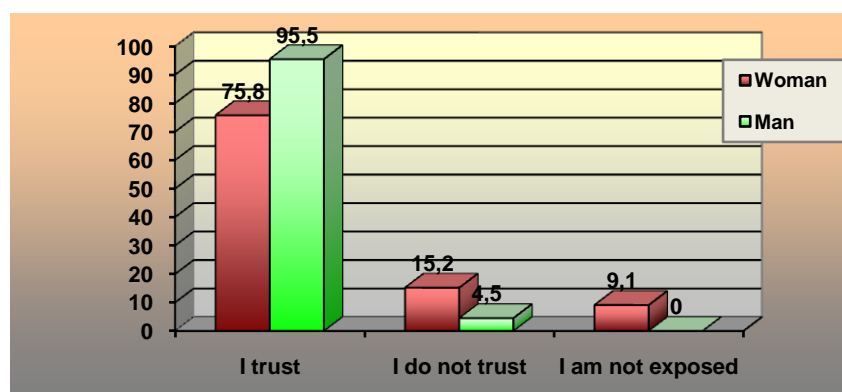


Fig.1. The patients' confidence in the dental staff

45.5% of the patients are interested in the enforcement of the measures to prevent infection transmission during dental treatment after each patient (changing the glass for oral rinses, the protective kit, the disinfection of surfaces). Most of them are young people situated between 19-35 years (46.7%) and 36-64 years (39.1%). Older people (80.2%) and those with medium education (69.2%) trust that appropriate measures are applied. 1.8% of the subjects

are not interested in these issues and 10.9% state they are not familiar with the appropriate measures. Differences by gender were significant, female subjects being twice as interested in the follow up of infection control procedures as males (51.1% vs. 27.3%). Also, 36.4% of men claim that validating the infection control procedures is not of their competence and 9.1% of them do not want to "offend" the medical staff. (Fig.2)

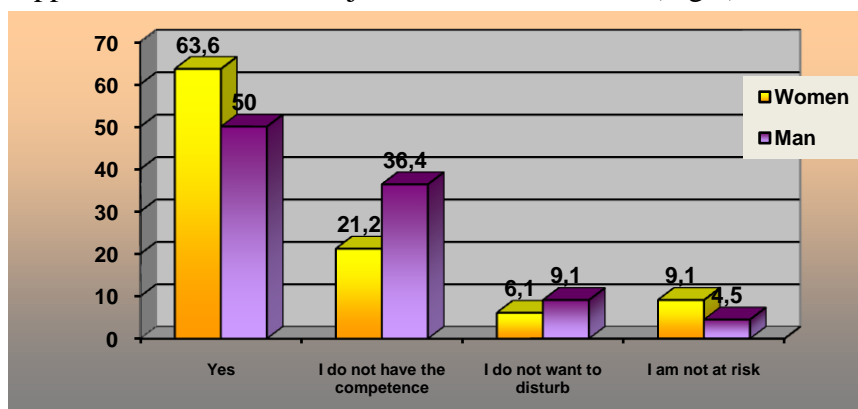


Fig. 2. Patients' involvement in the infection control

The diseases considered by the patients as being at high risk of transmission during dental treatment were HIV infection (67.3%), viral hepatitis B (60.0%), and viral hepatitis C (47.3%) (Fig.3).

The evaluation of the reactions regarding the protective equipment, the main component of Universal Precautions,

revealed that 89.0% of the subjects want the dentist to wear gloves, 63.6% - masks and 47.2% - glasses during the dental treatment (Fig.4).

The procedures considered most important as to prevent diseases during dental treatment were: hands cleaning (78.2%), surface disinfection after each

patient (56.4%) and the handling of the instruments (45, 5%).

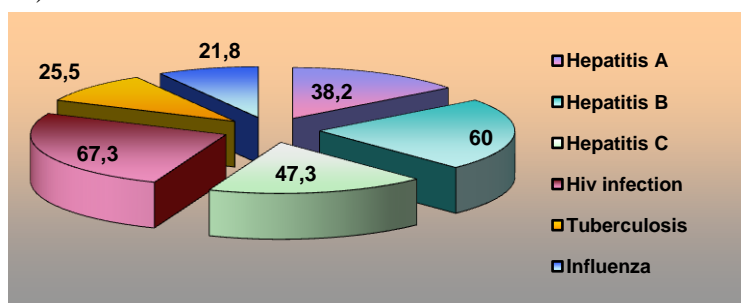


Fig. 3. Patients' insight on disease transmission in dental office

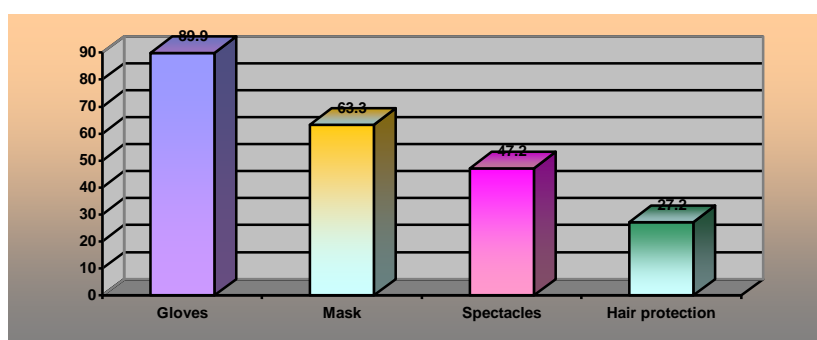


Fig.4. Patients options about the medical protective equipment

DISCUSSIONS

The study results reveal the patients' confidence in the medical team and the implementation of the infection control measures during the dental treatment. Patients expressed firm attitudes regarding infection control measures adopted by doctors in dental offices. Concerns about infection control procedures used by dentists are questioned especially by young people while older patients claim that they do not have the required facts or believes that would allow them to interfere in the doctor's procedures.

The proportion of subjects who follow the completion of these procedures was significantly lower in men than women. Also, the high level of education results in a high patient involvement in their own health care, with beneficial effects on the safety of the dental treatment. Most patients perceive rubber gloves as the indispensable

protective equipment in order to reduce the risk of infection transmission.

The proportion of patients keen to be involved in assessing the safety measures during the dental treatment is low due to confidence in the medical team, but possibly also because of the lack of knowledge about the risks of infection and the measures required to reduce it.

CONCLUSIONS

1. The implementation of effective infection control protocols in dental offices is very important as well as the raise of public awareness on the benefits of these practices and the stimulation of their recognition.

2. Health professionals have the compulsion to provide adequate information on the measures taken to reduce the risk of cross infection in order to increase the trust in dental treatments.

3. Effective dentist-patient communication may provide a constructive relationship and can shed light on the risk factors for both medical personnel and patients.

4. The evaluation of the patient perception towards infection control must influence the dentist decision about using the safety equipments and protocols in order to meet the European standards in this domain.

REFERENCES

1. Guidelines for environmental infection control in health-care facilities: recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee, CDC *MMWR* 2003 ; 52 (nr.RR-10).
2. Bârlean L., Dănilă I. “Prevenirea transmiterii infecției în stomatologie”, Ed. Edict, Iași, 2003.
3. *** EU Council Directive 89/391/EEC on Health and Safety of Workers
4. Molinari J.A. Infection Control: its evolution to the current standard precautions. *J.Am.Dent. Assoc.* 2003 ; 134(5) : 569-574.
5. Danilă Ioan - *Dentistica Preventivă* – Editura Didactică și Pedagogică, București, 2005
6. Palenik Ch.J. Strategic Planning for Infection Control *The Journal of Contemporary Dental -Practice* 2000; 1, (4) : 34-37
7. Pistorius A., Willweshausen B., Heffner N. Treatment aspects for patients with infectious diseases in dental practices-results of a survey . *Eur.J.Med.Res.* 2002 ; 7 (10) : 457-462.
8. Mousa A.A., Mahmoud N.M., Tag El-Din A.M. Knowledge and attitudes of dental patients towards cross-infection control measures in dental practice , *Eastern Mediterranean Health Journal* 1997; (3): 263-273.
9. Pistorius A., Willweshausen B., Heffner N. Treatment aspects for patients with infectious diseases in dental practices-results of a survey . *Eur.J.Med.Res.* 2002 ; 7 (10) : 457-462.
10. Lill M., Wilkinson T.J., Judging a book by its cover: descriptive survey of patients preferences for doctors appearance and mode of address, *B.M.J.* 2005; (331) : 1524-1527
11. Shulman E.R., Brehm M.S. Dental clinical attire and infection-control procedures. Patients' attitudes. *J.Am.Dent.Assoc.* 2001;132 (4):508-516

EFFICACY OF LASER IN ROOT CANAL TREATMENT

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Abstract: Although the interest in clinical use of laser systems for endodontic procedures is increasing there are still some concerns associated with their use, mainly, lack of sufficient well-designed clinical studies, which clearly demonstrate the advantage of lasers over currently used conventional methods and techniques. Bacterial contamination of the root canal system is considered the principle etiologic factor for the development of pulpal and periapical lesions. Obtaining a root canal system free of irritants is a major goal of root canal therapy. Biomechanical instrumentation of the root canal system has been suggested to achieve this task. However, because of the complexity of the root canal system, it has been shown that the complete elimination of debris and achievement of a sterile root canal system is very difficult and a smear layer, which covers the instrumented walls of the root canal, is formed. The task of cleaning and disinfecting a root canal system which contains microorganisms gathered in a biofilm became very difficult; certain bacterial species become more virulent when harbored in biofilm, demonstrating stronger pathogenic potential and increased resistance to antimicrobial agents since Biofilm has the ability to prevent the entry and action of such agents. Bergmans et al, tried to define the role of laser as a disinfection tool by using Nd:YAG laser irradiation on some endodontic pathogens ex vivo. The apparent consensus is that laser irradiation emitted from laser systems utilized in dentistry has the potential to kill microorganisms. In most cases the effect is directly related to the amount of irradiation and to its energy level.

Key words: endodontics, root canal, laser, disinfection

INTRODUCTION

The rapid development of laser technology as well as better understanding of lasers interaction with biological tissues widened the spectrum of possible applications of lasers in endodontics.

The development of new delivery systems, including thin and flexible fibers as well as new endodontic tips, made it possible to apply this technology in various endodontic procedures such as:

- Pulpal diagnosis
- Pulp capping and pulpotomy,
- Cleaning and disinfecting the root canal system
- Obturation of the root canal system
- Endodontic retreatment
- Apical surgery.

Although the interest in clinical use of laser systems for endodontic procedures is increasing there are still some concerns associated with their use, mainly, lack of sufficient well-designed clinical studies, which clearly demonstrate the advantage of lasers over currently used conventional methods and techniques.

Selection of the suitable wavelength from the various laser systems offered to the dental practitioners requires advanced training and good understanding of the different characteristics of each laser system. One of the most significant applications of lasers in endodontics relates to the cleaning and the disinfection of the root canal system and this article will focus on it.

MATERIAL AND METHOD

Cleaning and disinfecting the root canal system

Bacterial contamination of the root canal system is considered the principle etiologic factor for the development of pulpal and periapical lesions (1-3). Obtaining a root canal system free of irritants is a major goal of root canal therapy. Biomechanical instrumentation of the root canal system has been suggested to achieve this task. However, because of the complexity of the root canal system, it has been shown that the complete elimination of debris and achievement of a sterile root canal system is very difficult (4, 5) and a smear layer, which covers the instrumented walls of the root canal, is formed (6-8).

The smear layer consists of a superficial layer on the surface of the root canal wall approximately 1-2 μ thick and a deeper layer packed into the dentinal tubules to a depth of up to 40 μ (8). It contains inorganic and organic substances that include also microorganisms and necrotic debris (9). In addition to the possibility that the smear layer itself may be infected, it can also protect the bacteria already present in the dentinal tubules by preventing the application of successful intra-canal disinfection agents (10). Pashley (11) considered that a smear layer containing bacteria or bacterial products might provide a reservoir of irritants. Thus, complete removal of the smear layer would be consistent with the elimination of irritants from the root canal system (12). Also, Peters et al. clearly (13) demonstrated that more than 35% of the canals' surface area remained unchanged following instrumentation of the root canal using four

Ni-Ti preparation techniques. Since most currently used intra-canal medicaments have a limited anti-bacterial spectrum and a limited ability to diffuse into the dentinal tubules, it was suggested that newer treatment strategies designed to eliminate microorganisms from the root canal system should be considered. These, must include agents that can penetrate the dentinal tubules and destroy the microorganisms, located in an area beyond the host defense mechanisms, where they cannot be reached by systematically administered antibacterial agents (14).

It has also been documented in numerous studies that CO₂ (15), Nd:YAG (15-17), argon (15,18), Er,Cr:YAG (19) and Er:YAG (20, 21) laser irradiation has the ability to remove debris and smear layer from the root canal walls following biomechanical instrumentation.

The task of cleaning and disinfecting a root canal system which contains microorganisms gathered in a biofilm became very difficult; certain bacterial species become more virulent when harbored in biofilm, demonstrating stronger pathogenic potential and increased resistance to antimicrobial agents since Biofilm has the ability to prevent the entry and action of such agents (22). Bergmans et al, tried to define the role of laser as a disinfection tool by using Nd:YAG laser irradiation on some endodontic pathogens *ex vivo*. They concluded that Nd:YAG laser irradiation is not an alternative but a possible supplement to existing protocols for canal disinfections as the properties of laser light may allow a bactericidal effect beyond 1 mm of dentine. Endodontic pathogens that grow as biofilms, however,

are difficult to eradicate even upon direct laser exposure (23).

RESULTS

However, there are several limitations that may be associated with the intra- canal use of lasers that cannot be overlooked (24).

The emission of laser energy from the tip of the optical fiber or the laser-guide is directed along the root canal and not necessary laterally to the root canal walls (25). Thus, it is almost impossible to obtain uniform coverage of the canal surface using a laser (24, 25). Also, since thermal damage to the periapical tissues is potentially possible, the safety of such a procedure always has to be considered (25). Direct emission of laser irradiation from the tip of the optical fiber in the vicinity of the apical foramen of a tooth may result in transmission of the irradiation beyond the foramen. This, in turn, may undesirably affect the supporting tissues of the tooth and can be hazardous in teeth with close proximity to the mental foramen or to the mandibular nerve (25, 26). In their review, "Lasers in endodontics", Matsumoto and his team (26) also emphasized the possible limitations of the use of laser in the root canal system. They suggested that "removal of smear layer and debris by laser is

possible, however it is difficult to clean all root canal walls, because the laser is emitted straight ahead, making it almost impossible to irradiate the lateral canal walls." They strongly recommended improving the endodontic tip to enable irradiation of all areas of the root canal walls.

The Er:YAG laser has gained increasing popularity among clinicians following its approval by the Food and Drug Administration (FDA) for use on hard dental tissues (27).

Stabholz and his colleagues (25, 26) recently reported the development of a new endodontic tip which can be used with an Er:YAG laser system. The beam of the Er:YAG laser is delivered through a hollow tube, making it possible to develop an endodontic tip that allows lateral emission of the irradiation (side - firing), rather than direct emission through a single opening at its far end. This new endodontic side-firing spiral tip was designed to fit the shape and the volume of root canals prepared by Ni-Ti rotary instrumentation. It emits the Er:YAG laser irradiation laterally to the walls of the root canal through a spiral slit located all along the tip. The tip is sealed at its far end, preventing the transmission of irradiation to and through the apical foramen of the tooth. (Fig. 1, 2).



Fig. 1. The prototype of the RCLase™ Side Firing Spiral Tip is shown in the root canal of an extracted maxillary canine in which the side wall of the root was removed to enable visualization of the tip.



Fig. 2. The RCLase™ Side Firing Spiral Tip.

The efficacy of the endodontic side-firing spiral tip in removing debris and smear layer from distal and palatal root canals of freshly extracted human molars

was examined. SEM of the lased root canal walls revealed clean surfaces, free of smear layer and debris (26) - Figs. 3, 4, 5, 6A, 6B.

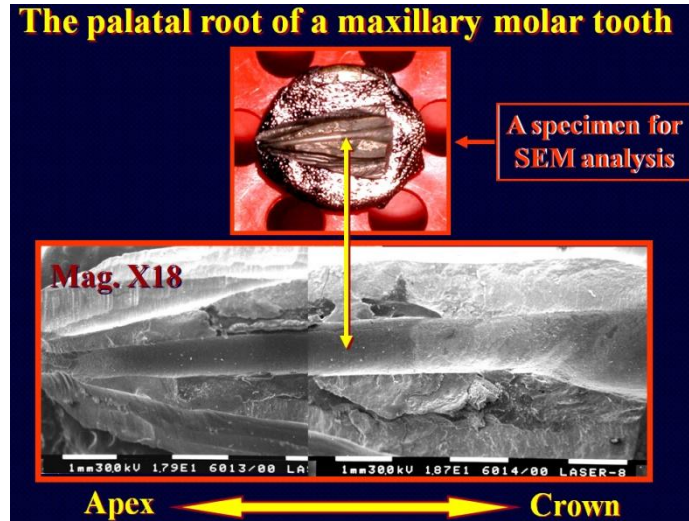


Fig. 3. Longitudinally split palatal root of a maxillary molar, sputter coated by gold and ready for a scanning electron microscope evaluation. The vertical arrow indicated the root canal as shown on the SEM photograph.

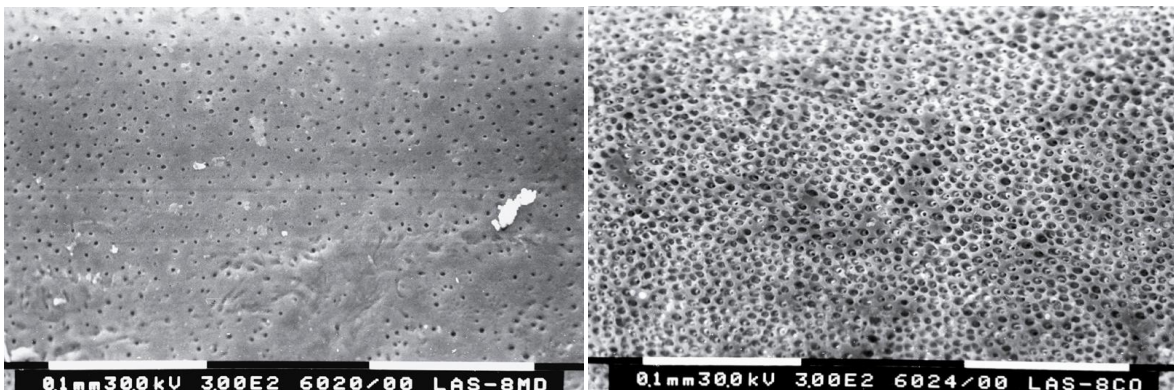


Fig. 4, 5. Scanning electron microscope photographs of a lased wall of a root canal demonstrate very clean surfaces of the root canal walls, free of smear layer and debris and clean open dentinal tubules (magnification X 300).

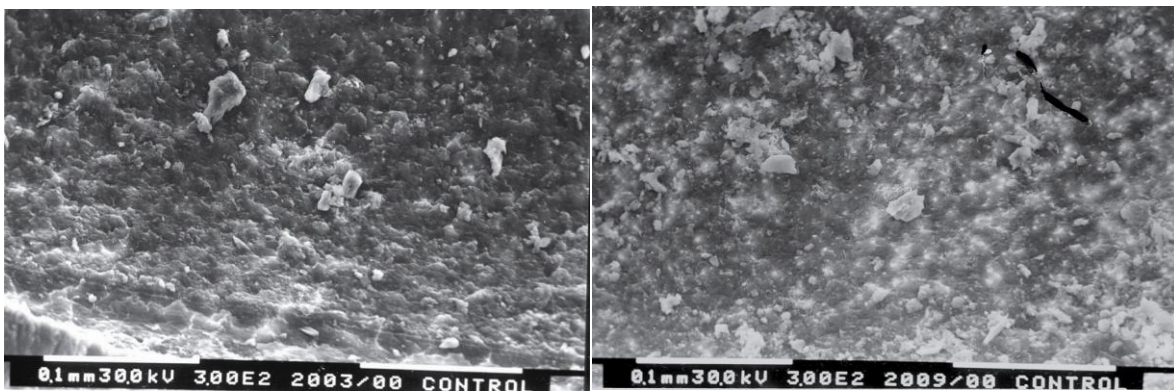


Fig.6 A, B. Scanning electron microscope photographs of a non lased wall of a root canal demonstrate unclean surfaces of the root canal walls with smear layer and debris. The dentinal tubules can not be seen (magnification X 300).

The dentinal tubules in the root run a relatively straight course between the pulp and the periphery, in contrast to the typical S-shaped contours of the tubules in the tooth crown (11). Studies have shown that bacteria and their byproducts, present in infected root canals, may invade the dentinal tubules. The presence of bacteria in the dentinal tubules of infected teeth at approximately half the distance between the root canal walls and the cementodentinal junction was also reported (28, 29). These findings justify the rationale and need for developing effective means of removing the smear layer from root canal walls following biomechanical instrumentation. This would allow disinfectants and laser irradiation to reach and destroy microorganisms harboring in the dentinal tubules.

In various laser systems used in dentistry, the emitted energy can be delivered into the root canal system by a thin optical fiber (Nd:YAG, KTP-Nd:YAG, Er:YSGG, argon, and diode) or by a hollow tube (CO₂ and Er:YAG). Thus, the potential bactericidal effect of laser irradiation can be effectively utilized for additional cleansing and disinfecting of the root canal system following biomechanical instrumentation.

This effect was extensively studied using lasers such as CO₂ (30, 31), Nd:YAG (32-35), KTP-Nd:YAG (36), excimer (37, 38) diode (39) and Er:YAG (40-42).

The apparent consensus is that laser irradiation emitted from laser systems utilized in dentistry has the potential to kill microorganisms. In most cases the effect is directly related to the amount of irradiation and to its energy level (Figs. 7A -7H).



Fig. 7A



Fig. 7B

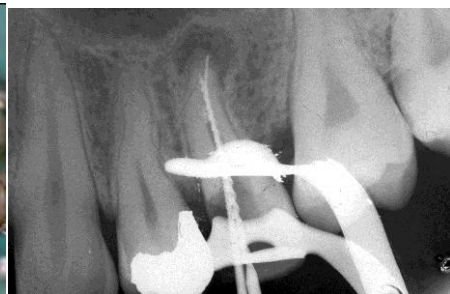


Fig. 7C



Fig. 7D

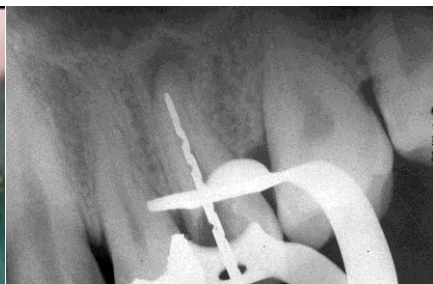


Fig. 7E



Fig. 7F



Fig. 7G

Fig. 7H

Fig. 7 (A to G). A, Preoperative radiograph of a second left maxillary premolar with chronic apical periodontitis. A periapical radiolucent area can be clearly seen; a root canal retreatment is indicated. Following access opening, the old root canal filling material was removed; the occlusal view shows very unclean root canals B. A length measurement radiograph, C demonstrates the presence of two separate root canals. Using Er:YAG laser irradiation for cleaning of the root canal system - the RCLase™ Side-firing Spiral Tip is introduced to the root canal after biomechanical preparation of the root canal with Ni-Ti (ProTaper™) files was completed, D and E (as seen on a radiograph). F and G, Radiographs showing both root canals filled with gutta-percha. A Six-month postoperative radiograph shows good repair, H.

REFERENCES

1. Kakehashi S, Stanley HR, Fitzgerald RJ: The effect of surgical exposures of dental pulps in germ-free and conventional laboratory rats. *Oral Surg Oral Med Oral Pathol* 1965; 20:340-349.
2. Bergenholz G: Microorganisms from necrotic pulps of traumatized teeth. *Odontologisk Revy* 1974; 25:347-358.
3. Moller AJ, Fabricius L, Dahlen G et al: Influence on periapical tissues of indigenous oral bacteria and necrotic pulp tissue in monkeys. *Scand J of Dent Res* 1981; 89:475-484.
4. Bystrom A, Sundquist G: Bacteriologic evaluation of the efficacy of mechanical root canal instrumentation in endodontic therapy. *Scand. J. Dent. Res.* 1981; 89:321-328.
5. Sjogren U, Hagglund B, Sundquist G, et al: Factors affecting the long-term results of endodontic treatment. *J. Endod* 1990; 16:498- 504.
6. McComb D, Smith DC: A preliminary scanning electron microscope study of root canals after endodontic procedures. *J. Endod* 1975; 1:238-242.
7. Moodnik RM, Dorn SO, Feldman MJ et al: Efficacy of biomechanical instrumentation; a scanning electron microscopy study. *J Endod* 1976; 2:261-266.
8. Mader CL, Baumgartner JC, Peters DD: Scanning electron microscopic investigation of the smeared layer on root canal walls. *J Endod* 1984; 10:477-483.
9. Torabinejad M, Handysides R, Khademi AA et al: Clinical implications of the smear layer in endodontics: A review. *Oral Surg Oral Med Oral Pathol* 2002; 94:658-666.
10. Haapasalo M, Orstavik D: In vitro infection and disinfection of dentinal tubules. *J Dent Res* 1986; 66:1375-1379.
11. Pashley DH: Smear layer: physiological considerations. *Oper Dent suppl* 1984; 3:13-29.
12. Drake DR, Wiemann AH, Rivera EM et al: Bacterial retention in canal walls in vitro: effect of smear layer. *J Endod* 1994; 20:78-82.
13. Peters OA, Schonenberger K, Laib A: Effects of four Ni-Ti preparation techniques on root canal geometry assessed by micro computed tomography. *Int Endod J* 2001; 34:221-230.
14. Oguntebi BR: Dentin tubule infection and endodontic therapy implications. *Int Endod J* 1994; 27:218-222.
15. Anic I, Tachibana H, Matsumoto K, et al: Permeability, morphologic and temperature changes of canal dentin walls induced by Nd:YAG, CO₂ and argon lasers. *Int Endod J* 1996; 29:13-22.
16. Harashima T, Takeda FH, Kimura, et al: Effect of Nd:YAG laser irradiation for removal of intracanal debris and smear layer in extracted human teeth. *J Clin Laser Med Surg* 1997; 15:131-135.

17. Saunders WP, Whitters CJ, Strang R, et al: The effect of an Nd:YAG pulsed laser on the cleaning of the root canal and the formation of a fused apical plug. *Int Endod J* 1995; 28:213-220.
18. Moshonov J, Sion A, Kasirer J, et al: Efficacy of argon laser irradiation in removing intracanal debris. *Oral Surg Oral Med Oral Pathol* 79; 1995:221-225.
19. Yamazaki R, Goya C, Yu DG, et al: Effect of Erbium, Chromium:YSGG laser irradiation on root canal walls: A scanning electron microscopic and thermographic study. *J Endod* 2001; 27:9-12.
20. Takeda FH, Harashima T, Kimura Y, et al: Efficacy of Er:YAG laser irradiation in removing debris and smear layer on root canal walls. *J Endod* 1998; 24:548-551.
21. Kimura Y, Yonaga K, Yokoyama K, et al: Root surface temperature increase during Er:YAG laser irradiation of root canals. *J Endod* 2002; 28:76-78.
22. Svenstater G, Bergenholz G: Biofilms in endodontic infections. *Endod Topics* 2004; 9:27-36.
23. Bergmans L, Moisiadis P, Teughels W, Van Meerbeek B, Quirinen M, Lambrechts P: Bactericidal effects of Nd:YAG laser irradiation on some endodontic pathogens *ex vivo*. *Int Endod J* 2006; 39:547
24. Goodis HE, Pashley D, Stabholz A: Pulpal effects of thermal and mechanical irritants. In Seltzer and Bender's dental pulp, Eds: Hargreaves KM, Goodis HE, Quintessence Books, 2002; Chapter 16:371- 410.
25. Stabholz A, Zeltzer R, Sela M, et al: The use of lasers in dentistry: principles of operation and clinical applications. *Compend* 2003; 24:811-824.
26. Matsumoto K: Lasers in endodontics. *Dent Clin of North Am* 2000; 44:889-906.
27. Cozean C, Arcoria CJ, Pelagalli J, et al. Dentistry for the 21st century? Erbium:YAG laser for teeth. *J Am Dent Assoc* 1997; 128:1080-1087.
28. Ando N, Hoshino E: Predominant obligate anaerobes invading the deep layers of root canal dentine. *Int Endod J* 1990; 23:20-27.
29. Armitage GC, Ryder MI, Wilcox SE: Cemental changes in teeth with heavily infected root canals. *J Endod* 1983; 9:127-130.
30. Zakariassen KL, Dederich DN, Tulip J et al: Bactericidal action of carbon dioxide laser radiation in experimental root canals. *Can J Microbiol* 1986; 32:942-946.
31. Le Goff A, Morazin-Dautel A, Guigand M et al: An evaluation of the CO₂ laser for endodontic disinfection. *J Endod* 1999;25:105- 108.
32. Moshonov J, Orstavik D, Yamauchi S et al: Nd:YAG laser irradiation in root canal disinfection. *Endod Dent Traumatol* 1995; 11:220-224.
33. Fegan SE, Steiman HR: Comparative evaluation of the antibacterial effects of intracanal Nd:YAG laser irradiation: An *in vitro* study. *J Endod* 1995; 21:415-417.
34. Rooney J, Midda M, Leeming J: A laboratory investigation of the bactericidal effect of Nd:YAG laser. *Br Dent* 1994; 176:61-64.
35. Gutknecht N, Moritz A, Conrads G: Bactericidal effect of the Nd:YAG laser in *in vitro* root canals. *J Clin Laser Med Surg* 1996;14:77-80.
36. Nammour S, Kowalyk, Powell L, Van Reck J, Rocca JP: external temperature during KTPNd: YAG laser irradiation in root canals: an in-vitro study. *Lasers Med Science* 2004; 19:27-32.
37. Stabholz A, Kettering J, Neev J et al: Effects of XeCl excimer laser on *Streptococcus mutans*. *J Endod* 1993; 19:232-235.
38. Folwaczny M, Liesenhoff T, Lehn N, et al: Bactericidal action of 308nm excimer-laser radiation: An *in vitro* investigation. *J Endod* 1998; 24:781-785.
39. Gutknecht N, Alt T, Slaus G, Bottenberg P, Rosseel P, Lauwers S, Lampert F: A clinical comparison of the bactericidal effect of the diode laser and a 5% sodium hypochlorite in necrotic root canals *J Oral Laser Applications* 2002; 2:151-157.

ORAL REHABILITATION ON SMALL SUBSTANCE LOSS CASES

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Abstract: The purpose of this study consists of the identification of implantologic and prosthetic methods and techniques used in substance loss rehabilitation, associated with identifying the specific biomaterials in perfect accordance with each case particularities, without leaving aside the bone-tissue deficiency etiology. A representative number of clinical cases were selected, cases which are relevant for the chosen theme. The possibility of reconstructing the natural parameters of the edentulous alveolar ridge areas is various, starting with augmentation materials of the autogenous and heterograft type biomaterials (Bio-Oss, Grafton, Cerasorb si MBCP) including the mixing of these two types of biomaterials, and going to epitheses, which are the best choice for complex substance loss.

Key words: augmentation materials, biocompatibility, facial prosthesis, implanto-prosthetic therapy.

INTRODUCTION

The implantologic and prosthetic territory represents a domain of excellence in operations of complex oral-maxillar-facial rehabilitation, and it is materialised during a specific and very important stage included in this complex algorithm (1).

The causes of substance loss are represented by oral-maxillar-facial trauma, by cyst and tumour removal, etiologies which confer a high degree of difficulty to these cases (2).

The rehabilitation of the substance losses has an ascendant way starting from intra-orally limited defects up to aspects having a crescendo character with the perturbation of the functions of the stomatognathic system without eluding two well delimited forms, namely the mutilating resorption and atrophy processes triggering serious facial modifications and the absence

of a significant bony capital caused by the tumor ablation.

PURPOSE

The purpose of this study consists of the identification of implantologic and prosthetic methods and techniques used in substance loss rehabilitation, associated with identifying the specific biomaterials in perfect accordance with each case particularities, without leaving aside the bone-tissue deficiency etiology.

The scientific activity unfolded abides by the objectives provided in the initial plan aiming at finishing the mathematical modeling in full compliance with the real clinical situations of a group of patients diagnosed with substance losses, of different sizes anchored in the intra or oral territory, their solving and the biomaterials involved being different.

MATERIAL AND METHODS

For the three - dimensional reconstruction of different types of intra and extra-oral maxillofacial substance losses we used the universal programme Amira for 3D reconstructions for any type of Computer Tomograph.

A representative number of clinical cases were selected, cases which are relevant for the chosen theme. The reconstruction of substance loss is of critical importance in re-establishing the optimal parameters which characterise the edentulous alveolar ridge areas.

The possibility of reconstructing the natural parameters of the edentulous alveolar ridge areas is various, starting with augmentation materials of the autogenous and heterograft type biomaterials, including the mixing of these two types of biomaterials, and going to epitheses, which are the best choice for complex substance loss.

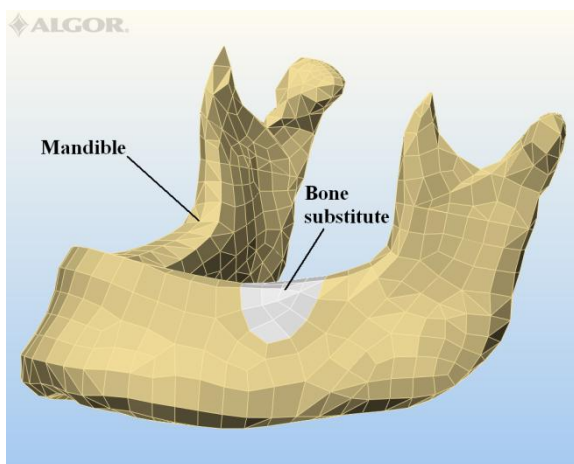


Fig. 1.

When it comes to the biomechanical and aesthetic reconstruction of the arcade, in the majority of the cases the implantologic variant was preferred, followed by the fixed

RESULTS

The dispersion of forces at the level of the mucous-bony support is fully linked to the masticatory force generated by the natural dentition, by diverse types of fixed restorations as well as by the mobile prostheses inducing low tensions at the level of the anatognostic arch, the presence of the silicon material proposed by us as lining material for these types of prostheses after the finishing of the adhesion mechanism between the two biomaterials being in full compliance with the biomechanical principle of reducing pressures at the mucous-bony level. A high frequency of the analyzed cases is represented by substance losses at the mandibular level, the analysis by finite element revealing tension concentrators at the level of the edges of substance defect (Fig. 1).

Aspects of mathematical modeling for a substance loss at mandibular level highlighting the influence of action of the muscular factor over the future reconstruction (Fig. 2).

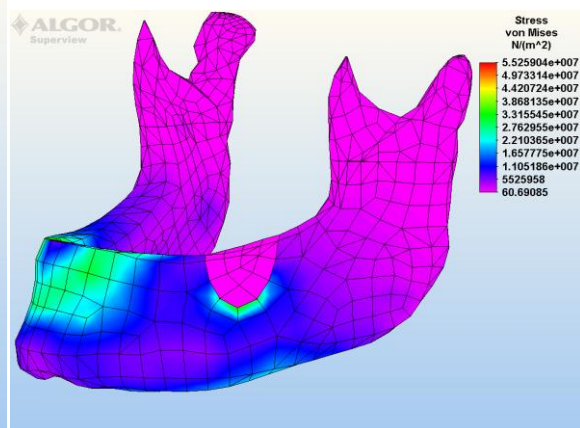


Fig. 2.

or removable prosthesis, which were realised either on a separate, post-augmentation stage, or in the same time with the augmentation stage (2).

The most frequent losses of substance are the intraoral ones, their immediate solution being shown in these two clinical cases - the loss of substance is a

consequence of the oral maxillofacial surgery intervention, the excision of pseudo tumor formations (Fig. 3).



Fig. 3. Aspects of intraoral losses of substance

In the both cases, we elaborated epitheses which aim the restoring of the alveolar and dental arch continuity, equally assuring aesthetic and functional rehabilitation by covering the loss of substance.

An important aspect of epithesis elaboration is the fidelity of the previous morphology restoring, which shows incongruence in both cases.

These fixed prosthetic constructions are the results of a rigorous technological

algorithm, the metallic frame will need special retentions in order to apply the aesthetic compound; the acrylic material can be flexible, protecting the muco-osseous support from traumatism of the aliments passing (Fig. 4).

The final retention of the epithesis is achieved by including the marginal teeth, assuring the restoring of the anterior dental arch, thus leading to the augmentation of the prosthetic construction stability (Fig. 5).



Fig. 4. The epithesis framework



Fig. 5. Final aspect of the epithesis

The morpho-functional and bio-mechanical characteristics of the clinical situation which ultimately resulted, after the

quantification of the clinical and para-clinical data, pleaded for the election of 11 Perio implants, type X class, represented

another cases, very important for this subject. The distribution of the implantations in the two dials was divided in 5 implants with a diameter of 3,3 and 4 mm, with lengths of 10, 11,5, 13 and 15 mm, with the full consensus of the dimensions of the bone support and of the

organic structures substituted in the dial 1:14, 15, 16, 17, 18. At the second dial's level 6 implantations were applied, having the diameter of 3,3 and lengths of 10, 13, 15 mm, corresponding to the dental elements 22, 23, 24, 25, 26, 27 (Fig. 6).



Fig. 6. The radiological aspects before and after implantation

The optimal results were obtained through the rigorous compliance with the bio-mechanical principals and the correlation of the increasing method in the same session with surgical insertion of the implantations, based on the usage of the

Cerasorb bio-material, having a granulation of 150-500 μm , with an inorganic, that reunites the derivatives of the calcium and phosphate, with a high degree of bio-compatibility (Fig. 7).



Fig. 7. Aspects of augmentation with Cerasorb

The confirmation from the images of the clinical and para-clinical jaws offer the radiography of a deficient jaw prosthetic field, the remaining odonθο-parodontal elements being characterized by negative clinical and biological parameters. The degree of the bone absorption, which stood at the basis of the pro-prosthetic preparation

stage, will offer the optimal for the prosthetic bed's design (3).

An important aspect in the case's success was represented by the increase of the ridge in the frontal zone, with the help of the Bio-Oss and of the Titan-made membrane. The manual labour was done at the same time with the implant, the

intervention pleading for the advantage of the limitation for the surgical timing.

The balance between success and failure had relatively limited lines, but for the present case the age and the reaction of the tissue were in favour of the post-operation evolution.

The Bio-Oss is substitute of the natural bone, osteo-inductiv that leads to the controlled bone increase at the level of the

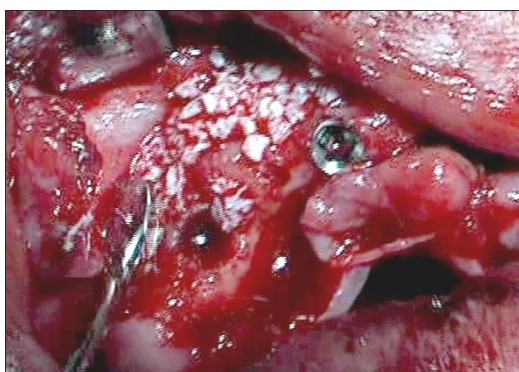


Fig. 8. Aspects of augmentation with Bio-Oss

prosthetic fields characterised by a parodontic affection or by substance losses at the bone level (Fig. 8). This therapeutic selection was based on the inducement of the bone crest at the situs' level, where it was transplanted (4). This decision was correlated with the application of the metal membrane, which is going to adapt at the future volume of the crest (Fig. 9).



Fig. 9. Aspects of Titan mesh in rehabilitation of frontal ridge

The immediate prosthetic was an important stage after the implant and increase, the final prosthetic offering the facial harmony and the confidence of the patient itself (5).

CONCLUSIONS

1. The intraoral losses of substances is a sever mutilation and its elective immediate treatment indication is the elaboration of epitheses.

2. The importance of the substance loss rehabilitation – a stage which is precedent or concomitent to that of implantologic therapy – is reflected in the appreciation of

the resorption and atrophy process on the edentulous crest level and this appreciation has a definitory influence upon accomplishing the final stage of the clinical case.

3. The mathematical modeling of the real clinical situations offers optimal data to choose the treatment solution fully compliant with the parameters characterizing the substance loss, the type of biomaterial involved in the structure of the prosthetic substitute, and in the case of maxillofacial prostheses an important role is played by the fixing means.

REFERENCES:

1. Forna N, Burlui V. *Clinical Guidelines and Principles in the Therapy of Partial Extended Edentation*. Iași: Ed. Apollonia, 2001, 470-477.
2. Norina Forna, *Evaluarea Starii De Sanatate Afectate Prin Edentatie*, Editura Demiurg, 2007 ISBN 978-973-152-017-9, Carte editata cu sprijinul Autoritatii Nationale pentru Cercetare Stiintifica, 25-26

3. Norina Forna, Magda Antohe, *Reabilitarea Pierderilor De Substanta Editura Demiurg, 2007, ISBN 978-973-152-035-3*, Carte editata cu sprijinul Autoritatii Nationale pentru Cercetare Stiintifica, 180-186
4. Büchter A, Kleinheinz J, Wiesmann HP, Jayaranan M, Joos U, Meyer U. Interface reaction at dental implants inserted in condensed bone. *Clin Oral Implan Res* 2005; 16: 509–517.
5. *** www.clinical-house.com
6. Sethi A, Kaus T, Sochor P. The use of angulated abutments in implant dentistry: five-year clinical results of an ongoing prospective study. *Int J Oral Max Implan* 2000; 15: 801–810.
7. Eger DE, Gunsolley JC, Feldman S. Comparison of angled and standard abutments and their effect on clinical outcomes: a preliminary report. *Int J Oral Max Implan* 2000; 15: 819–823.

FACE TRANSPLANTS: ETHICAL AND SCIENTIFIC STAKES

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Abstract: Since the first transplant of the mandible followed by the nose, the mouth and the chin, only some other rare interventions of face transplants were realized in France and across the world. To the complexity of the surgical operation, the ethical and deontological aspect that these transplants raise is added. The right to transplant a jaw, teeth, or mouth removed from a corpse on another human being quickly evolves; it takes into account the responsibility of the surgeon, the consent of the donor and his family and that of the sick collector.

Keywords: facial allotransplant, facial graft, composite tissues allograft, microsurgery, functional results, medical ethic

INTRODUCTION

The grafts or organ transplants represent an ancient dream of humanity. However, we had to wait until the middle of the 20th century for the organ transplants to be attempted with good chances of success. The first kidney transplants go back to 1951-1952 while the first heart transplants were attempted in 1968.

The techniques were largely experimental and the rate of success was small. The evolution of the surgical techniques, a better knowledge of the incompatibility systems of tissues, the apparition of medicine which allow a better control of the rejection phenomenon have favored the boom of organ transplants.

Today, organ transplants have become rather dull and they are multiplying. At the same time, the need for organs has increased. Grafts are scarce and the risks can lead to organ trafficking. This crisis explains the more and more frequent resort to multiple organs sampling after death.¹

Nevertheless, the face transplants through allotransplant remains a surgical treatment which differs dramatically from the other grafts...It's about sampling tissue and vascular and nervous elements from the donor in cerebral death and grafting them on a receiver who presents a maximum risk of rejection, imposing an immunodepressant treatment for his/her whole life.

Only a few cases of face transplants in the world...

In January 2003, the daily Figaro disseminated the information that in Rome a surgeon had successfully accomplished a mandible graft on an 80 years old man who had mouth cancer. The patient would die few days later.²

In November 2005, the teams of Amiens (France) with the professors Bernard Devauchelle, Testelin and Dubernard accomplished the first partial face transplant in the world (graft of the triangle comprised of the nose and the mouth) on a 38 years old woman who had been bit by a dog.

¹ *Essor des greffes, CD permanent de bioéthique et biotechnologie*, Ed. Législatives, 2009

² *Le Figaro*, 20.01.2003, p. 12.

In April 2006, a bear bit a Chinese hunter's face and he subsequently received a partial face graft comprising a cheek, the upper lip, the nose and an eyebrow. This patient died later on.

In January 2007, the team of Pr. Laurent Lantiéri from Créteil (France) made the second face transplant, after a 15 hours' surgery. The patient, aged 27, suffered from a severe form of the Von Recklinghausen disease, an incurable pathology that may deform the face, in its most severe forms. The patient suffered a graft of the nose-mouth-chin-cheeks.

In March 2009, the third face transplant in France was carried out for a 28 years old patient disfigured by a gunshot. A great part of the dead donor's face was grafted as well as the bone for the repair of the upper jaw.

In April 2009, the team of Pr. Laurent Lantiéri accomplished simultaneously a graft of a part of a face (the four eyelids, the hairy skin to the nape of the neck, the cheeks and the two ears) and of the two hands. This intervention required 40 surgeons and 30 hours of surgery. The eyelids graft was also presented as a world first. Aged 30, the receiver had suffered burns following an accident in 2004.³ The patient died later on from a cardiac arrest during the operation aiming at stopping the infection of the face, which occurred a few weeks after the graft.

In August 2009, a man whose jaw had been blown away by a gunshot suffered a transplant. He had waited for this intervention for four years.

On November 27th, 2009, a new transplant was accomplished by the team of

Pr. B. Devauchelle on a seriously burnt man as a result of an accidental explosion during a pyrotechnical manifestation in May 2008.

In total, in the whole world, only two other face transplants were made in the United States (Fig. 1), another one in China and one in Spain.

All the current indications of the face reconstruction concern ballistic traumatism, serious burns, face cancers and certain congenital anomalies. The patient needs to display a dilapidation corresponding to a necessity to make a graft, namely an injury that cannot be reconstructed by the means of traditional surgery.⁴

MATERIAL AND METHOD⁵

The allotransplant of composite tissues (ATC) is a surgical technique described since 1998. It comprises the sampling of tissues and of vascular and nervous elements belonging to a donor in the state of brain death. The immunitary incompatibility between the donor and the receiver requires the use of a life long immunodepressant treatment in the case of the receiver, whose potential side effects are the predisposition to infections, high blood pressure, diabetes and lymphoproliferative malign disorders such as skin cancers.

The allotransplant of the entire or only a part of the face shows a maximum risk of rejection, which can be estimated at 10% during the first year, and a risk of chronic rejection ranging from 30 to 50% in the case

³ *Synthèse de presse bioéthique, Double greffe du visage et des mains*, www.genethique.org, 7 avril 2009

⁴ Gérard S., *Greffe du visage: Il est encore trop tôt pour se prononcer*, www.lexpress.fr 30/03/2009

⁵ Report of CCNE, Comité consultatif national d'éthique. The allotransplant of composite tissues (ATC at the level of the face). Total or partial transplant of a face. Avis no 82 2004.

of grafted people between 5 to 10 years after the transplant.

The first French transplant was given large media publicity and its realization was

presented by the teams of Pr. Dubernard and Deveauchel.



Fig. 1. Montage photo de Connie Culp avant et après sa greffe de 80% du visage, subie en décembre 2008./CLEVELAND CLINIC / AFP

"⁶ On May 31st, 2005, at Amien (France), a patient aged 38 showed, following a dog bite, a vast substance loss of all the soft parts of the centro-facial region. Exposing largely her maxillofacial skeleton, the gums and the dental arches, the amputation concerned the distal half of the nasal pyramid, the upper and lower lips, the chin and extended laterally to the cheeks, especially in the right jugal region rather than the left one. From a functional point of view, the patient was unable to drink, eat or talk. Although her facial

expressivity was restraint only to the frontal-orbital region, the initial clinical examination showed that she had kept intact the proximal stumps of her lifting muscles of the lip and of the zygomatic.

The request for the authorization of an allograft had been filed to the competent health French authorities: l'Agence française de sécurité sanitaire des produits de santé (Afssaps), l'Agence de la biomédecine (ABM) and Le Comité consultatif de protection des personnes dans le cadre des recherches biomédicales (CCPPRB) which gave their consent and approved the proposed protocol.

⁶ Lengelé B.-G, Testelin S., Dakpe S., Carton S., Beziat, L. Badet J.-L., Morelon E., Dubernard J.-M., Deveauchelle B., «Greffe de visage»: views on the first partial composite allotransplant of the face, *Annales de chirurgie plastique esthétique*, Volume 52, numéro 5 pages 475-484 (octobre 2007)

All the steps were taken to ensure that the patient is informed clearly and completely with regard to the surgical intervention, to the psychological risks and the constraints related, particularly on the immunological plan, especially the need to follow a life long immunodepressant treatment as well as to the publicity inherent to such an intervention. A long-term psychological post-surgery follow-up was to be expected. The patient expressed her free and clear consent.⁷

During the waiting period for a compatible graft, the contour of the graft to be collected was modeled on the computer. (Fig. 2) and all the phases of the intervention were studied on anatomical subjects in order to determine the optimum plans of dissection and perfect integrity of the vascular network and of all tissues involved in the transplant.

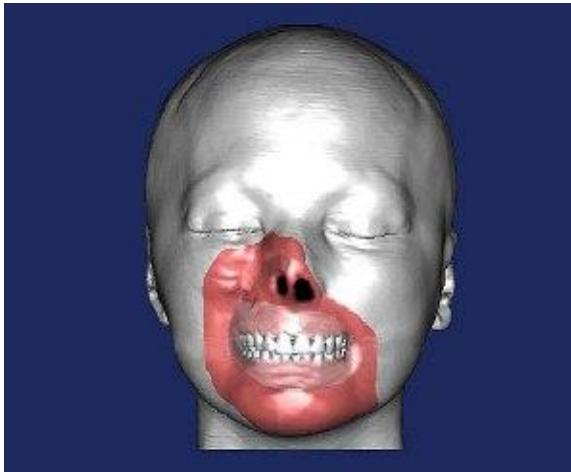


Fig. 2. Description schématique du greffon transplanté lors de la 1ere greffe de visage. (www.canalacademie.com/Semaine-speciale-Recherche-sante.html)

⁷ The French Agency of Sanitary Safety of the products and the Agency of Biomedicine wish to remind of the different stages of expertise previously conducted for the face partial graft, made on November 27 2005. <http://www.agence-biomedecine.fr/article/361>

After six months of waiting, a potential donor was found. Aged 48, in the state of brain death, her skin texture and color corresponded to that of the patient. She also had the same blood type and five HLA antigens out of six.

The facial graft was collected following the protocol established in the laboratory (Fig. 3). The exact contour of the tegument surface was drawn on the face in conformity with the substance loss of the receiver. After that, the facial vessels were exposed towards the lower rim of the mandible with the marginal branch of the facial nerve.

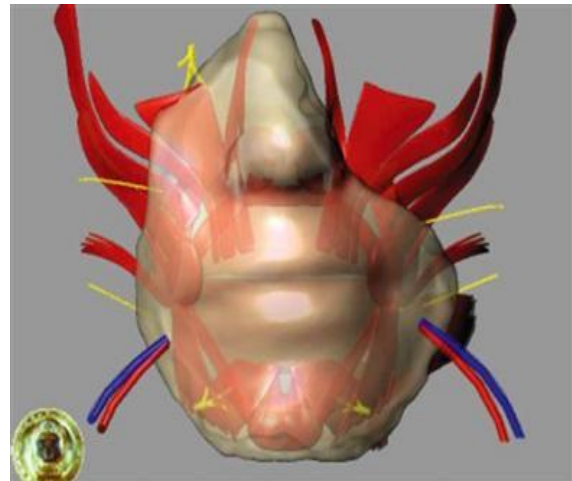


Fig. 3. Crédit : REUTERS

Laterally, after having reached the proximal insertions of the peri-oral lifting muscles, the dissection showed all the facial nerve bundles on the right and on the left, followed to the surface by the fascia maseterina and sectioned in their emergence from the parotidian lodge. Deeper, after the division of the buccinator muscle, the facial mask was eventually lifted on a sub perinosteum plan, easily exposing, coming out from the foramina infra-orbitary and the mental, the sensitive terminal bundles of the maxillary and mandibular nerves, elongated by endo-bony dissection in order to obtain satisfactory stumps of

microsurgical coaptation. The final frontal cut of the nasal and circumferencial mucosa and of the oral vestibule were enough to render the transplant autonomous.

The surgical intervention lasting for 16 hours, the patient wakes up peacefully and discovers, starting the next day, impatiently and fearlessly, her new face.

In order to prevent the rejection of the graft, she received an immunodepressant treatment and a triple anti-infectious prophylaxis.

After a brief transitory edema, the facial graft healed very fast, with no sign of sufferance or necrosis. No acute rejection occurs in the critical period of the first 12 days.

On the 18th post-surgery day, however, an erythema occurring simultaneously on the facial transpland and on the sentinel graft leads to a suspicion of rejection which is easily controlled by a drug re-orientation.

The patient is able to eat four days after the intervention. During the sixteenth month, the patient shows a complete active and passive labial occlusion (Fig.4). In parallel, her speech impediment ameliorates significantly and, during the eighteenth month, she displays a spontaneous and symmetrical smile. A second phenomenon of rejection appears later on. As in the case of other face transplants, the two manifestations of rejection were dealt with and controlled.



Fig. 4. Isabelle Dinoire, première greffée, en 2005 et aujourd'hui. AFP

DISCUSSIONS

The face transplant was considered as a serious therapeutic option during the Congress of Plastic Surgical Research Council from Boston (USA) in April 2002. However, the report of the Royal College, triggered by the publicity made around the declarations of Doctor Butler in December

2002 in front of the British Association of Plastic Surgeons, expresses the deepest concerns and underlines the fact that it is not simply a surgical reparatory technique like any other.

In France, *Le Comité Consultatif National d'Ethique* concluded on February 6th, 2004:

«Facial transplants are not organ transplants and they are far from limb transplants. That is why they shouldn't be attempted as long as more complete researches are made on the procedures themselves and as long as we fail to have the elements that allow us to appreciate correctly the risks accompanying this type of graft and to validate the results. (...)

A complete facial transplant (ATC) doesn't make too much sense at the moment. The question is not raised from a medical or technical point of view. The possibility of a partial ATC reconstructing the mouth – nose triangle which grants the face a certain new morphological identity still belongs to the domain of research and high-risk experimentation. It shouldn't be presented as a future ideal and accessible solution for the painful problems related to the face alteration. In the event such possibility is envisaged, it should be done within a strict multi-disciplinary and multi-centric protocol, approved by the *Etablissement Français des Greffes* or other instances with the same attributions. »⁸

We shall also note that the National Council for the Order of Doctors had made public, on December 15, 2005, “a solemn reminder to the ethics, deontology and the law” with regard to the partial face transplant. The organism admitted that it is about “an undeniable surgical performance” which “sparks off a legitimate hope for other people”. However, the council “deplores that a premature, uncontrolled communication has led to an augmentation of the technical realization over the respect due to the patient, to the

person of the donor, to his/her generosity and that of the family, contrary to the professional rules stipulated by the deontological code”.⁹

These interventions have therefore aroused ethical disputes:

Ethical questions:

For the receiver:

- The face is unique, it fundamentally characterizes an individual. The patient who first benefited from a face transplant stated in 2009: “before the transplant I represented nothing. Six months without a face. A mask covered my face. You cease to exist when you don't have a face”.¹⁰ Can a face be transmitted to somebody else? How can one live in somebody else's skin? Will the receiver be able to accept this new appearance which will turn him/her into somebody else? The patient would never discover the traits of his/her former face, therefore, what can be done if the patient doesn't accept this new face? How will the patient deal with the way the others perceive him/her? How to deal with the psychological difficulties? ¹¹

- Does the state of the patient really allow him/her to consent to all risks, hazards, constraints related to this difficult surgical intervention?

- The patient will have to deal with the constant risk of rejection. These grafts weigh against the real prejudice of the patient and the prejudice generated by the treatment. Can we accept the fact that the

⁸ CCNE avis n°82 du 6 février 2004, www.ccne-ethique.org

⁹ Conseil National de l'Ordre des médecins, avis du 15 décembre 2005, www.conseil-national.medecin.fr

¹⁰ Dinoire I, *Les défis de la science Paris Match* 30 décembre 2009 p:84-85

¹¹ CCNE avis n°82 du 6 février 2004, www.ccne-ethique.org

patient “who must take five pills in the morning, one at noon and five in the evening”¹⁰ should make out of this a daily re-education and that the patient should be treated all life long with immunodepressants with serious side effects?

- The secret of the intervention cannot be kept for a long time. As soon as the press conference¹² organized by the medical teams was over, photographs were made public. The image of the body or the corporal appearance is classically protected by the human right¹³ which aims at providing the respect to the dignity of the human person.¹⁴ Are we heading for a “spectacle surgery” where the grafted patient will allow him/herself to be photographed for money?
- As far as the small number of donors is concerned; who should suffer the transplant? The young or the old? The employees or the retired? The people who suffered deep burns or those with cancer? The choice will be morally acceptable if the principles of this choice are universal (identical and invariant for all), irrevocable and public.¹⁵
- At last, a question of social legitimacy of the organ donation is raised: isn't it more advantageous to invest more in the prevention of certain serious maladies rather than to compensate them belatedly by the transplant?

Other questions are also raised for the donor and his/her family. They refer to the

image of the corpse, the definition of death, to consent and the principle of non-merchantability of the body¹⁶, to the issue of the anonymity of the organ donors.

CONCLUSION

Beyond the moral question, this technique represents the hope of all mutilated people. Ugliness is not admitted in our society. Without a face, a person is nothing but a curious animal.

In the case of the first transplant on a woman, can we say that it wouldn't have been vital to the extent that particular woman could no longer cope with her destructed face? It is not about talking of this surgery, experimenting, but giving a therapeutic answer to a patient in pain, who nowadays is thankful to the medical team and about opening other ways for progress.

Depending on the grafted organs, the questions are raised differently. Numerous people who had face transplants are dead or have attempted to commit suicide. Who remembers that the first project of cardiac catheterism was rejected as contrary to ethics towards 1935 by an eminent scientific society?¹⁷ Otherwise, it stands as an inspiration today for all heart surgeries.

History therefore has the duty to validate a technique, to warrant its ethics and morality and to grant it the right of legal existence.

¹² Pirnay P., *De l'éthique au droit et du droit à l'éthique*
Ed hospitalières, soumis 2010

¹³ Hassler T., note sous TGI Paris, 15 avr. 1987, D. 1987,
Jur. p. 551.

¹⁴ Corpart L., *La dignité de la victime photographiée face à la liberté de la presse*, note sous Civ. 2ème 4 novembre 2004, D. 2005, 696 ; JAC n° 49, décembre 2004

¹⁵ Course of the Faculty of Medicine from Bichat – Lariboisière, *Greffes et transplantations d'organes*, 2009

¹⁶ Read on the subject the article of Nancy Scheper-Hughes, anthropologist at the University of California, Berkeley (United States), *Le commerce du corps en «pièces détachées»*, www.unesco.org

¹⁷ Bernard J., *Les conséquences morales de la révolution biologique*, CD - Encyclopedia universalis, 2000

REFERENCES

1. CD permanent de bioéthique et biotechnologie. Essor des greffes, Ed. Législatives, 2009
2. Le Figaro, 20.01.2003: 12.
3. Synthèse de presse bioéthique, « Double greffe du visage et des mains », www.genethique.org, 7 avril 2009.
4. Gérard S, Greffe du visage: Il est encore trop tôt pour se prononcer, www.lexpress.fr 2009 .
5. Rapport du Comité consultatif national d'éthique, L'allotransplantation de tissus composites (ATC au niveau de la face). Greffe totale ou partielle d'un visage. Avis no 82 2004.
6. Lengelé B-G, Testelin S, Dakpe S, Carton S, Beziat J-L, Badet L, Morelon E, Dubernard J-M, Devauchelle B. «Greffes de visage»: regards portés sur la première allotransplantation composite partielle de la face. *Annales de chirurgie plastique esthétique* 2007; 52,5: 475-484.
7. L'Agence française de sécurité sanitaire des produits de santé et l'Agence de la biomédecine tiennent à rappeler les différentes étapes et expertises qui ont été menées préalablement à la greffe partielle de la face, réalisée le 27 novembre 2005. <http://www.agence-biomedecine.fr/article/361>.
8. Conseil National de l'Ordre des médecins, avis du 15 décembre 2005, www.conseil-national.medecin.fr.
9. Pirnay P., De l'éthique au droit , du droit à l'éthique, Ed. Hospitalières, soumis 2010.
10. Hassler T, note sous TGI Paris, 1987, D. 1987, Jur.: 551.
11. Corpart I, La dignité de la victime photographiée face à la liberté de la presse, note sous Civ. 2ème 2004, D. 2005, 696 ; JAC n° 49, décembre 2004.
12. Dinoire I, Les défis de la science, *Paris Match* 2009; 30 décembre:84-85.
13. Commission Nationale de Santé Publique et de Bioéthique du Grand Orient de France. *Humanisme* 2007; 276: 71.
14. Scheper-Hughes N, Le commerce du corps en «pièces détachées», www.unesco.org.
15. Bernard J, Les conséquences morales de la révolution biologique, CD - *Encyclopedia universalis*, 2000.

TELESCOPING IMPLANT PROTHESES WITH GALVANO MESOSTRUCTURES

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Abstract: 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 prosthesis.

Key words: telescopic implant prostheses, galvano-telescopic copings.

INTRODUCTION

Dental implants are made to be placed in the jaw bones to give prosthetic restorations stability and retention. 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.

MATERIAL AND METHOD

Although telescoping restorations 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 prosthesis 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.

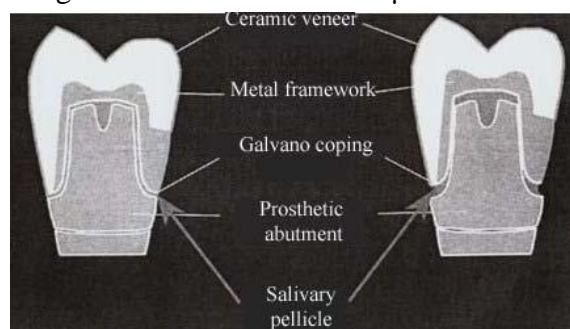


Fig. 1. Hidraulic retention

TECHNIQUE

A number of 3 edentulous patients were rehabilitated using this technology (2 males and 1 female with ages between 49 and 60 years) – Table 1.

Table 1. The patients characteristics

Name	Age	Sex	Diagnostic	Type of restauration
M.I.	54	M	Maxillary subtotal edentation	Partial fixed-removable prosthesis
P.I.	60	M	Maxillary 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

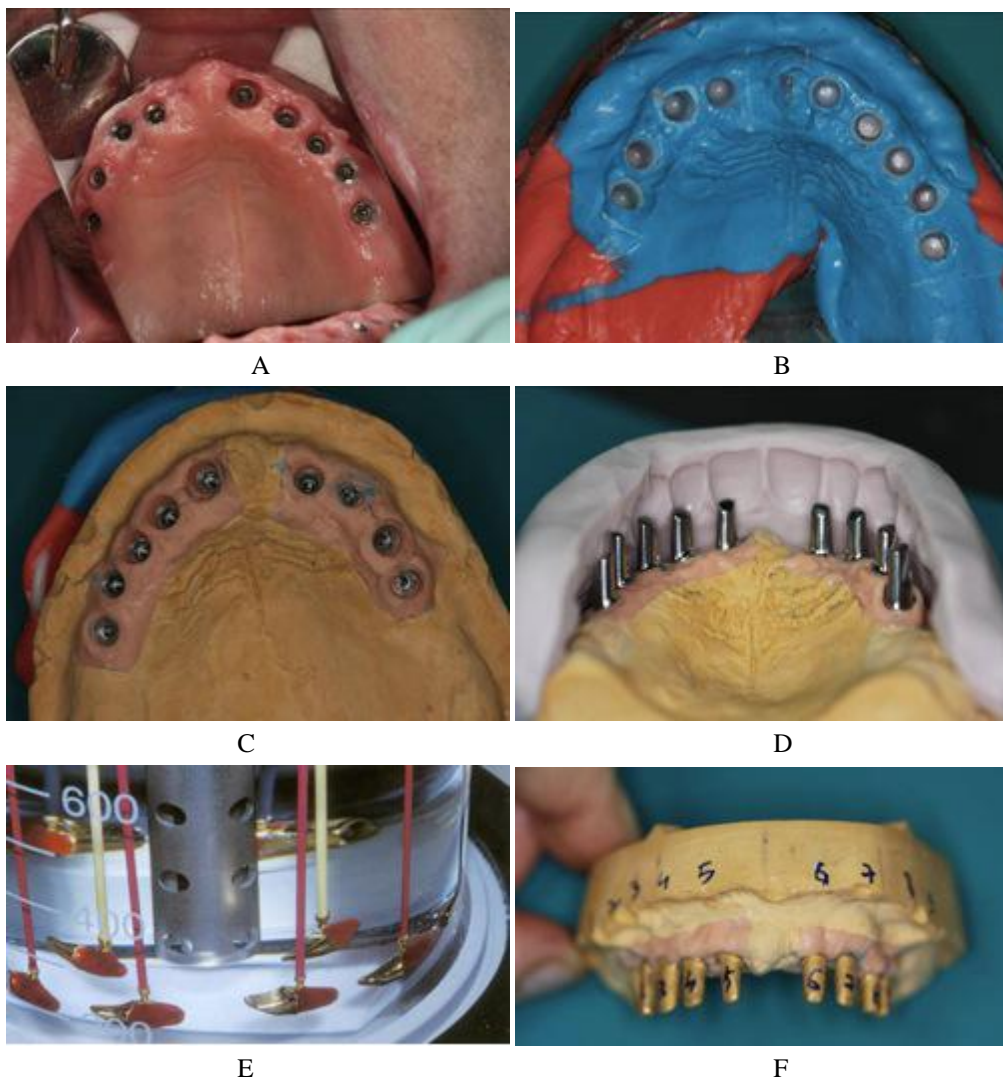
insulated wire (AGC Contact rod, Wieland). Carefully apply a thin layer of silver conductor (AGC Elektroforming System, Wieland) to the abutments and the acrylic resin of the screw openings. Perform the electroforming process in the galvanobath. Create copings with a thickness of 0.3 mm (Fig. 2 e).

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 prostheses.



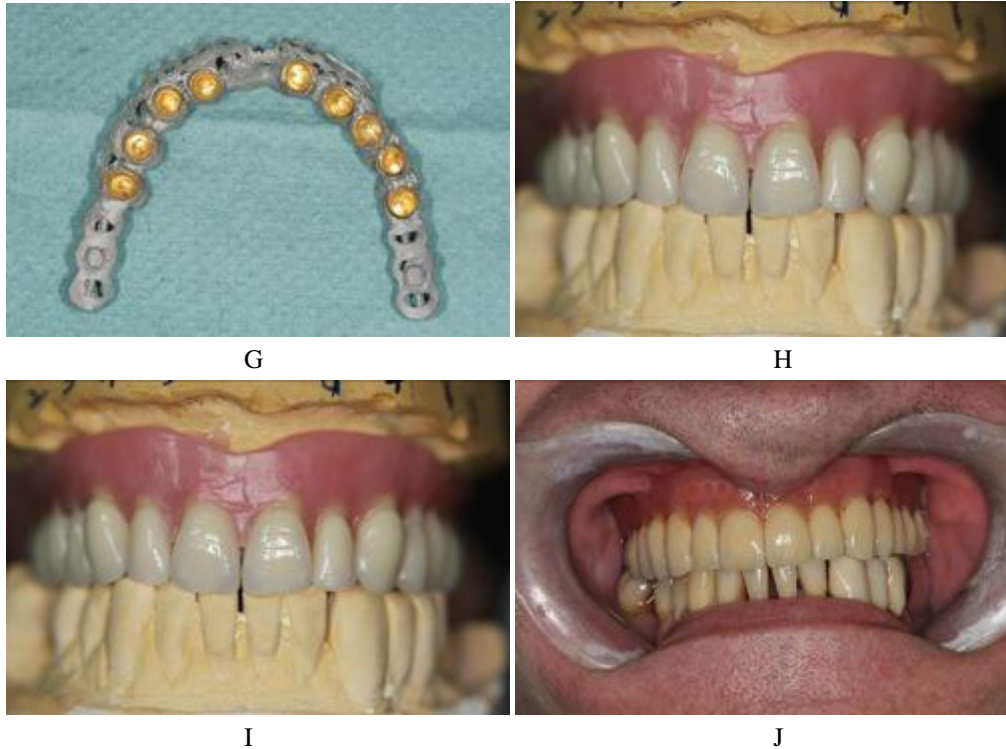


Fig. 2. Healing after surgery (a); indirect impression (b); master cast with gingival mask(c); prosthetic abutments prepared at 2 degrees and the silicone markup(d);galvano forming bath with the prosthetic abutments placed(e);numbering of the galvanoformed copings (f); the galvanoformed copings placed in the metal cast (g); the wax probe (h); final restoration-mucozal aspect (i); and extraoral aspect(j)

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 restorations which are excellent 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.

Although telescoping using galvanoformed copings is relatively new in implantology it is starting to appear in implantology because of the major advantages which it offers: passive fit, high mechanic resistance, permit for good hygiene and the possibility of numerous adjustments

CONCLUSIONS

1. With this kind of restorations it is possible to obtain the Passive Fit Adaptation which is a decisive factor for implant supported prostheses;
2. The restorations are removable which gives the patients the possibility for very good oral hygiene, the medic possibility to work around the implants and technicians to correct whatever failure may occur
3. We recommend to extend the use of these restorations in our country because of the numerous advantages even though the cost is a little higher.

REFERENCES

1. Bragger U, Aeschlimann S, Burgin W, Lang NP. Biological and technical complications and failures with fixed partial dentures (FPD) on implants and teeth after four to five years of function. *Clin Oral Implants Res* 2001; 12: 26-34.
2. Branemark PI. Osseointegration and its experimental background. *J Prosthet Dent* 1983; 50: 399-410.
3. Bratu D, Bratu E, Antonie S. Restaurarea edentațiilor parțiale prin proteze mobilizabile. Ed Medicală, Buc 2008.
4. Bratu D, Scurtu S- Gallavoformarea Partea a II-a. Proteze parțiale fixe. *Revista Națională de Stomatologie*, vol I, nr. 3, 2003, 142-147
5. Chee W, Felton DA, Johnson PF, Sullivan DY. Cemented versus screw-retained implant prostheses: which is better? *IntJ Oral Maxillofac Implants* 1999; 14: 137-41.
6. Dolger J, Gadau C, Rathmer R. Treatment behavior and complete-mouth rehabilitation using AGC crowns: a case report. *IntJ Periodontics Restorative Dent* 2001; 21: 373-9.
7. Erpenstein H, Borchard R, Kerschbaum T. Long-term clinical results of galvano-ceramic and glass-ceramic individual crowns. *Prosthet Dent* 2000;83:530-4.
8. Geering AH, Kundert M, Kelsey CC. Complete denture and overdenture prosthetics. New York: Thieme Medical Publishers Inc; 1993. p. 110-6, 204-5.
9. Greven B, Luzpke M, von Dorche S: Telescoping implant prostheses with intraoral luted galvano mezostructures to improve passive fit. *The Journal of Prosthetic Dentistry* vol 98, 3, 2007, 240-244.
10. Guichet DL, Caputo AA, Choi H, Sorensen JA. Passivity of fit and marginal opening in screw- or cement-retained implant fixed partial denture designs. *IntJ Oral Maxillofac Implants* 2000; 15: 239-46.
11. Hebel KS, Gajjar RC. Cement-retained versus screw-retained implant restorations: achieving optimal occlusion and esthetics in implant dentistry. *J Prosthet Dent* 1997; 77: 28-35.
12. Heckmann SM, Karl M, Wichmann MC, Winter W, Graef F, Taylor TD. Cement fixation and screw retention: parameters of passive fit. An in vitro study of three-unit implant-supported fixed partial dentures. *Clin Oral Implants Res* 2004; 15:466-73.
13. Kan JY, Rungcharassaeng K, Bohsali K, Goodacre CJ, Lang BR. Clinical methods for evaluating implant framework fit. *J Prosthet Dent* 1999; 81: 7-13.
14. Karl M, Rosch S, Graef F, Taylor TD, Heckmann SM. Static implant loading caused by cast metal and ceramic-veneered superstructures. *J Prosthet Dent* 2005; 93: 324-30.
15. Jaert I, Quirynen M, van Steenberghe, Darius P. A study of 589 consecutive implants supporting complete fixed prostheses. Part II: Prosthetic aspects. *J Prosthet Dent* 1992; 68: 949-56.
16. Pietrabissa R, Gionso L, Quaglini V, Di Martino E, Simion M. An in vitro study on compensation of mismatch of screw versus cement-retained implant supported fixed prostheses. *Clin Oral Implants Res* 2000; 11: 448-57.
17. Setz J, Diehl J, Weber H. The marginal fit of cemented galvanoceramic crowns. *IntJ Prosthodont* 1989; 2: 61-4.
18. Setz J, Kramer A, Benzing U, Weber H. Complete dentures fixed on dental implants: chewing patterns and implant stress. *Int J Oral Maxillofac Implants* 1989; 4: 107-11.
19. Taylor TD. Prosthodontic problems and limitations associated with osseointegration. *J Prosthet Dent* 1998;79:74-8.
20. Wee AG, Aquilino SA, Schneider RL. Strategies to achieve fit in implant prosthodontics: a review of the literature. *IntJ Prosthodont* 1999; 12: 167-78.
21. Wirz J, Hoffmann A. Electroforming in restorative dentistry: New dimensions in biologically based prostheses. Chicago: Quintessence; 2000. p. 132-61, 238-67.
22. Zitzmann NU, Marinello CP. Treatment plan for restoring the edentulous maxilla with implant-supported restorations: removable overdenture versus fixed partial denture design. *J Prosthet Dent* 1999;82:188-96.

PERIODONTAL ASPECTS IN CHILDREN AND ADOLESCENTS WITH DOWN SYNDROME

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Abstract:

The Down syndrome is the most frequent genetic anomaly, presenting an incidence of 1/650 births (Winston, 2004). The individuals affected by DS frequently develop a form of aggressive periodontitis which affect both temporary and permanent teeth (Saxen, 1977, Svantum and Gjermo, 1978 a.o.) and can lead to the precocious expulsion of the teeth. Starting with these data, we tried to clinically evaluate the periodontal status in a group of 12 patients with DS, compared to the control group (which comprised 24 children without general diseases) and establish on the basis of clinical indicators (QHI, PBI, CAL) the forms of periodontal disease. Our results showed the preponderance of superficial chronic periodontitis (66.67%) in the children with DS, followed by gingivitis (33.3%), the aggressive forms (aggressive periodontitis) not being probably encountered due to the fact that the group was too young for the juvenile stage and however the children were hospitalized in the dental office of Sfânta Maria Policlinics, Iasi.

Key words: Down Syndrome, children, teenagers, clinical evaluation, periodontal disorders

INTRODUCTION

The Down Syndrome – 21 Trisomy is the first genetic disease described in 1866 by John Langdon Down. DS is the most frequent genetic anomaly, presenting an incidence of 1/650 births, being characterized by an autosomal transmission of the 21 chromosome trisomy. The individuals affected by DS frequently develop an aggressive form of disease which affects both temporary and permanent teeth (Cohen, 1961, Johnson și Young, 1973, Saxen, 1977, Svantum and Gjermo, 1978 a.o.) and can lead to the precocious expulsion of the teeth.

Starting with these data, we tried to clinically evaluate the periodontal status and to establish the forms of periodontal diseases in a group of children with DS.

MATERIAL AND METHOD

For realizing that purpose we constituted two groups of study:

I. Group I (control) – comprised 24 children with ages between 6-18 years old, without general diseases, being under

dental treatment in the assistance requested by the Infantile Dentistry Clinics Iasi, Dept. of Pedodontics.

II. Group II (active) – comprised 12 patients with age comprised between 5-16 years old being in the evidence of Neuropsychiatry – Genetic Diseases Office and the Dental Office of Sfânta Maria Policlinics.

The evaluation of the periodontal status was performed in the groups of children and adolescents through the calculation of the following indexes of diagnostic for periodontal disease:

The Quigley and Hein coloured bacterial plaque index

Papillary bleeding Index (Saxen and Muhlemann)

The level of attachment loss (CAL) evaluated through periodontal probing and radiological exam.

All the evaluations of clinical indexes were performed at the level of Ramfjörd teeth, mesial sites. The evaluation of plaque deposits were made with the help

of coloured plaque indexes Quiqley – Hein, as it follows:

$$QH = \frac{\text{The sum of values for every tooth of B and L surfaces}}{\text{The total number of examined surfaces}}$$

This index is evaluated on the basis of scores:

- 0 – absence of plaque
- 1 – separated isles of plaque at the level of cervical area
- 2 – fine band of plaque of up to 1 mm height at cervical area
- 3 – band of plaque comprised between 1 mm and 1/3 from the crown of the tooth
- 4 – band of plaque comprised between 1/3 and 2/3 from the tooth crown
- 5 – bacterial plaque which covers more than 2/3 of the tooth crown

The intensity of inflammation was appreciated through the intensity of papillary bleeding (PBI index). Indicator of gingival bleeding severity, it notes from 0 – 4 different progressive phases of bleeding

- 0 = without bleeding
- 1 = punctiform bleeding
- 2 = line/points, fine line of bleeding or several points at gingival margin
- 4 = drop that flows – massive bleeding

The clinical attachment loss was evaluated through periodontal probing appreciating the depth of the pockets and also the degree of recession, at the level of every test tooth in at least 6 sites (B, L, MB, ML, DL) the reference element for evaluating the attachment loss was amelocementar junction (AML) expressing the distance between the bottom of the sulcus/pocket in millimetres.

The Rx exam, useful in appreciating the importance of attachment loss was

performed on retro-dento-alveolar cliches in isometric and orthoradial incidence or through ortopantomography (OPT). Comparisons were made between the two groups for every calculated index, the values for every patient were calculated together for creating the average of the group, using a common ground estimated as standard of correction for the error of unequal variances. Under this circumstance the patients were in the centre of the study and not the number of sites.

The statistical differences between the averages of the values of interest according to the groups were tested using the One-Way ANOVA test completed of KRUSKAL-Wallis test (or Mann-Whitney/Wilcoxon test) for the average age and clinical values. The statistically significant differences were considered for the values of the level of significance (p) lower than 0.05, according to a level of confidence of 95%.

RESULTS

The bacterial plaque index

For evaluating the patients with Down syndrome from the point of view of the clinical indexes, their values were compared to the values recorded in the control group. In the analysis of every clinical index the statistical indicators which describe correctly the characteristics of the group were calculated, comparing them at the same time with the values of the respective indicators of the control group.

Table I. The statistical indicators of the Quikley-Hein index of bacterial plaque (QHI) for the group of patients with Down Syndrome

Group \ QHI	Average	-95%	+95%	Std. Dev	Variance	Std. Error	Min	Max	Q25	Median Value	Q75
Control	2.995	2.859	3.130	0.576	0.332	0.068	2.166	4.133	2.500	3.000	3.500
Down Syndrome	3.622	3.408	3.836	0.632	0.400	0.105	3.000	5.000	3.083	3.495	3.830
Total	3.204	3.077	3.330	0.663	0.439	0.064	2.166	5.000	2.660	3.000	3.660



Fig.1. Average values of the bacterial plaque index in the control group (QHI) and the group of patients with Down Syndrome

Clinical Attachment loss (CAL)

Table II. Statistical indicators of the attachment loss for the group of patients with Down Syndrome

Group \ CAL	Average	-95%	+95%	Std Dev.	Variance	Sst Er.	Min	Max	Q25	Median Value	Q75
Control	0.388	-0.067	0.842	1.077	1.160	0.220	0.000	4.000	0.000	0.000	0.000
Down Syndrome	1.417	0.562	2.272	1.346	1.811	0.388	0.000	3.500	0.000	1.750	2.500
Total	0.731	0.306	1.155	1.254	1.574	0.209	0.000	4.000	0.000	0.000	1.750

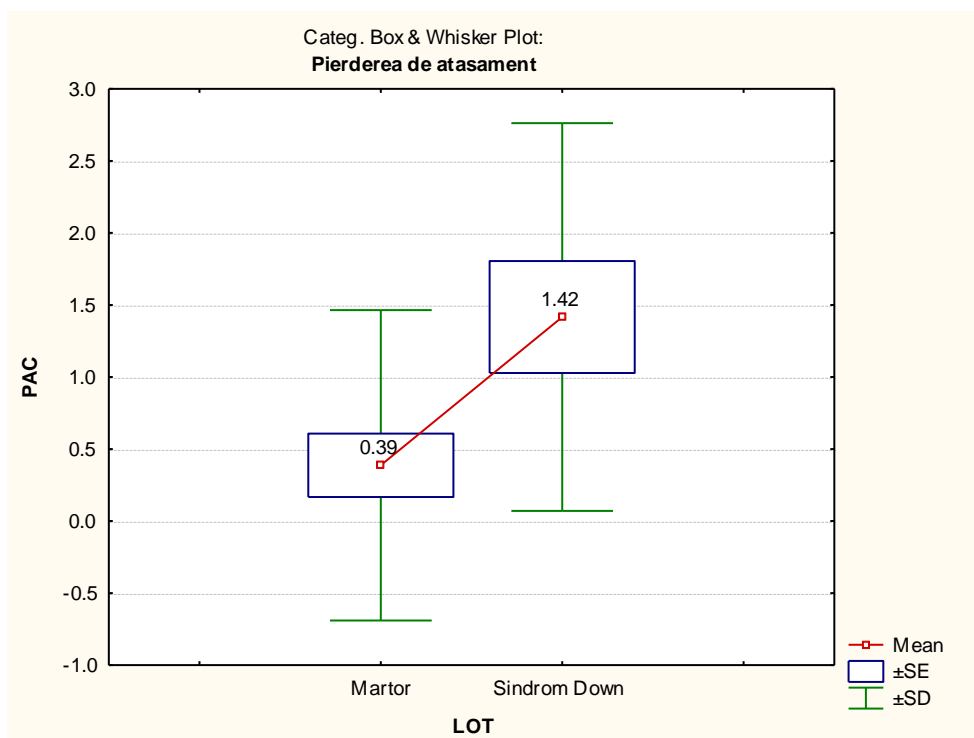


Fig.2. The average values of attachment loss (CAL) in the control group and the group of patients with Down Syndrome

From the above image an increase of 3.6 times higher of the average value for the CAL index in the Down group

compared to the control group can be noticed.

Papillary bleeding index

Table. III. The statistical indexes pf the papillary bleding index for the group of patients with Down Syndrome

Group \ ISP	Average	-95%	+95%	Std. Dev.	Variance	Std.Er.	Min	Max	Q25	Median Value	Q75
Control	1.560	1.271	1.850	0.686	0.470	0.140	0.500	2.660	0.833	1.500	2.165
Down Syndrome	2.678	2.291	3.064	0.609	0.370	0.176	2.000	4.000	2.248	2.580	2.830
Total	1.933	1.647	2.218	0.843	0.711	0.141	0.500	4.000			

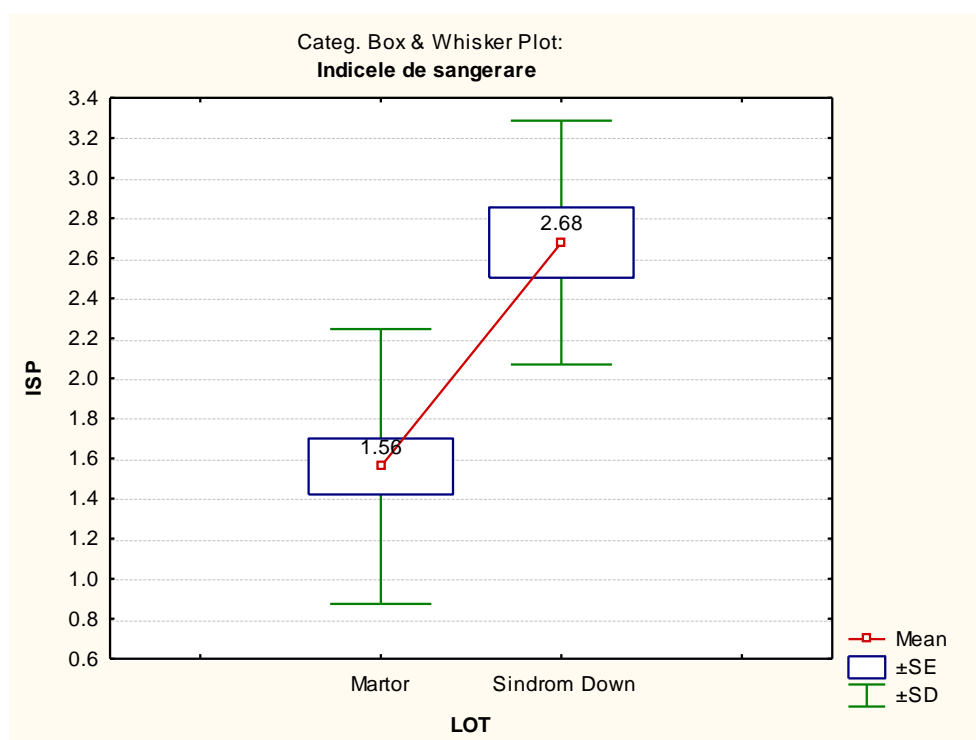


Fig.3. The average values of PBI in the control group and the group of patients with Down syndrome

Corroborating the clinical exam with the values of the calculated clinical indexes (QHI, PBI, CAL) and with the radiological exam, we established the periodontal diagnosis for every patient.

The analysis of the parameters connected with the repartition depending on diagnostic and systemic condition showed the following:

Control group

The highest weight belongs to the microbial inflammatory diseases induced by bacterial plaque, gingivitis respectively (87.50%), followed by the superficial alteration of the sustaining periodontium (chronic superficial periodontitis) (8.33%), and aggressive periodontitis (4,17%) (Table 4).

Table IV. The incidence of the cases depending on the diagnosis in the control group

Diagnostic (control group)	No. of cases	%
Generalized bacterial gingivitis	21	87.50%
Chronic superficial periodontitis	2	8.33%
Aggressive (juvenile) periodontitis	1	4.17%
Total	24	

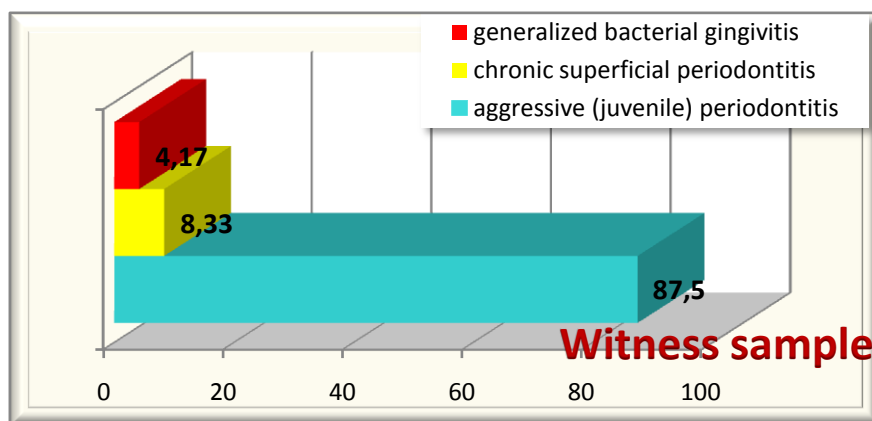


Fig.4. The incidence of the diseases in the control group

The group of patients with Down Syndrome

Although the data from literature show that in the patients with Down Syndrome aggressive forms of periodontitis are encountered (Cohen et al. 1961, Johnson and Young 1963, Saxen et al. 1967, Snajder et al., 1968, Svatum and Gjermo,1978) in a proportion of 90% (Dow 1951) and between

90-100% (Kisling and Krebs, 1963, Cohen and Goldmann, 1960, Johnson and Young 1963), in our study for the patients with Down Syndrome, the highest weight is represented by chronic superficial periodontitis(66.67%), followed by gingivitis (33.33%), the aggressive forms of disease being absent.

Table V. The repartition of cased depending on diagnosis

Diagnosis	No of. cases	%
Generalized bacterial gingivitis	4	33.33%
Chronic marginal periodontitis	8	66.67%
Aggressive periodontitis	0	0.00%
Total	12	

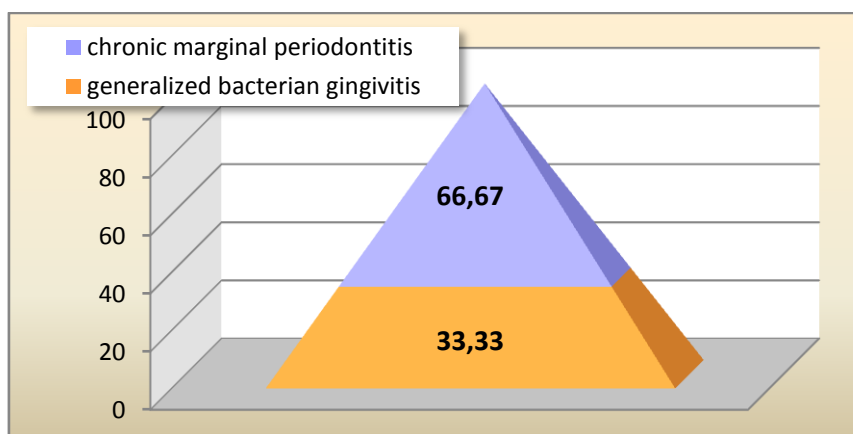


Fig. 5. The repartition of the cases depending on diagnosis

DISCUSSIONS

The Down Syndrome – 21 Trisomy - the first genetic disease described in 1866 by John Langdon Down. DS is the most frequent genetic anomaly, (1/650 new bourns). The affected individuals frequently develop a form of aggressive periodontal disease which affects both temporary and permanent teeth (Cohen 1961, Johnson and Young 1973, Saxen 1977, Snajder 1968, Svatum and Gjermo 1978) and can lead to the precocious expulsion of the teeth, loss of alveolar bone measured on orthopatomography, being found in 69% from the patients with 21 trisomy (Saxen et al. 1977).

The periodontal destructions are characterized by the formation of deep periodontal pockets, associated to increased quantities of bacterial plaque and intense gingival inflammation (maximum values QHI=5, PBI=4, CAL=4 mm), values which cannot be explained only on local factors (bacterial plaque, calculus) (Ulseth, 1991).

Dow in 1951 reported that more than 90% from the children with Down syndrome, having ages between 8-12 years old, develop some forms of periodontal disease. Subsequent studies also reported the prevalence of periodontal disease in percentages of 90-100% in the patients with 21 trisomy (Kisling and Krebs, 1963; Johnson and Young, 1963; Cohen and Goldman 1960) and 76.5% of the cases

(Rusu et al. 1972); Orner (1976) reported that the periodontal index in the children with Down Syndrome was 4.5 times higher than in the healthy patients.

Our results enrol as patient data in those from literature, the prevalence of periodontal disease being 33.33% generalized bacterial gingivitis and 66.67% chronic marginal periodontitis.

Numerpus other studies have shown an increased prevalence of periodontal disease in patients with Down syndrome compared to other deficiencies (Johnson and Young 1963; Snajder 1968, Cutress 1971, Brown 1973; Reuland – Bosma and Van Diyk 1986, Cichon 1998 and others) and Shallow (1964) found an increased prevalence of periodontal disease in hospitalized children with Down Syndrome compared to those not hospitalized.

CONCLUSIONS

Although the data from literature shows that in the patients with Down Syndrome aggressive forms of periodontitis are encountered Cohen 1961, Johnson and Young 1973, Saxen 1977, Snajder 1968, Svatum and Gjermo 1978) in a proportion of 90% (Dow 1951) and between 90-100% (Kisling and Krebs, 1963, Cohen and Goldmann, 1960, Johnson and Young 1963), in our study of patients with Down Syndrome, the weight is represented by chronic marginal

periodontitis (66.67%), followed by gingivitis (33.33%), the aggressive forms of periodontal disease being absent; probably due to the fact that our group was

too small for the juvenile stage and however our patients were already hospitalized in the dental office of Sfânta Maria Policlinics, Iasi.

REFERENCES

1. Dow R.S., A preliminary study of periodontoclasia in Mongolian children at Polk State Scholl, Am J Ment Defic., 1951, Apr; 55(4):535-8.
2. Kisling E., Krebs G., Periodontal Conditions In Adult Patients with Mongolism (Down's Syndrome), Acta Odontol Scand., 1963 Nov; 21:391-405.
3. Rusu M., Cura E., Fratu A., Roșu M., Luchian A., Orientări și perspective în profilaxia afecțiunilor stomatologice în România. Culegere de probleme de stomatologie infantilă, 1990.
4. Toma V., Modificări ale compoziției lichidului crevicular în boala parodontală la copil și adolescent, Teză doctorat, 2004.
5. Ulseth JO, Hestnes A., Stovner LJ, Storhaug K., Dental caries and pedodontitis in persons with Down Syndrome, Spec. Care Dentist, 1991 Mar-Apr;11(2):71-3.
6. Winston RM, Conn CM, Cozzi J., Harper JC, Delhanty JD, Preimplantation genetic diagnosis for couples at high risk of Down Syndrome pregnancy owing to parental translocation or mosaicism, J Med Genet., 1999 Jan;36(1):45-50.

THE INTERIM DENTURE – A CASE REPORT

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Dedicated to the memory of Victor Săvulescu

Abstract: There are a lot of clinical situations when a denture made entirely in acrylic resin is the most appropriate answer due to the low cost and the easy way to modify it. Using an interim denture the dentist can appreciate if a higher VDO will be supported by the edentulous patient, can decide what teeth are useful for the final RPD and can have a clearer idea about retention, support and esthetic solutions.

Key words: interim denture, vertical dimension of occlusion, esthetics

INTRODUCTION

The need and demand for removable partial denture (RPD) is a common problem in the dental offices¹. The replacement of missing teeth is often very complex or/and costly. Sometimes the difficulty of the case supposes a complicated decision and postpones a definitive treatment plan.

In this situation the solution can be an interim (diagnostic) denture^{2, 3}. This provisional, temporary denture used for a short interval of time will provide esthetics, mastication, occlusal support and convenience³. Sometimes this denture can be helpful in conditioning the patient to accept the final prosthesis. The patient may wear the interim RPD for a very short

period or for a more extended period of years, depending on the situation.

MATERIAL AND METHOD

In our case the patient was a 32 years old woman, with a modest social position, whose dental care was neglected in her childhood and young age, due to the material possibilities of her mother. The only dental treatments provided were as emergency solutions, so a lot of extractions were done over the years. The long-term absence of antagonists has resulted in an over-eruption of remaining maxillary and mandibular teeth. The situation at the first visit of our patient is illustrated on the documentary casts (Fig. 1a, b, c).



Fig. 1. Documentary casts at the first visit of the patient – some of the remaining teeth are contacting the opposing edentulous ridges. Note the 23/33 reverse contact.

The reason that determined the patient to begin a treatment was the imminent loss of the right upper incisor, with subsequent esthetic consequences. The radiologic examination confirmed the fact that the extraction of the tooth was inevitable (Fig. 2).



Fig. 2. Radiological examination for the right upper central incisor - an accentuated recession complicated with an apical lesion.

RESULTS AND DISCUSSIONS

After the removal of the upper central right incisor emerged a need for immediate replacement of the extracted tooth. Due to the labially drifting of the anterior teeth and the 90° rotation of the right upper lateral incisor (1. 2) the remaining edentulous span was very large and with a major bone defect. At the VDO the prosthetic space was very limited in the anterior area and

practically inexistent in the lateral area both in the dentate area as in the right distal area where the maxillary tuberosity was oversized in the vertical direction (Fig 3a, b, c; Fig 1a). Our intention was to preserve as much as it was possible the remaining teeth and supporting structures, to restore esthetics and phonetics and to improve mastication. We explained all our options to the patient and we had his informed consent. We expected a good prognosis due to the fact that our patient was young, co-operant and motivated.

We decided for the moment to keep all the remaining teeth so endodontic treatment was provided to all teeth excepting the four mandibular incisors (Fig. 4).

The main problem was to obtain a minimal vertical prosthetic space, so we reshaped the occlusal surfaces of the involved teeth. Shortening the crown we also provided a better crown/root ratio considering that all these teeth had also a reduced periodontal support. Minimal preparation also provided an economic advantage for the patient (crowns were not required). The difference of needed vertical prosthetic space was obtained by the alteration (increasing) of vertical dimension of occlusion.



Fig. 3. Clinical aspect after the removal of the tooth 1.1



Fig. 4. Radiological examination after the endodontic treatment of the over-erupted teeth.

We selected a design that fitted the present situation of teeth and soft tissues, but having in mind the subsequent required tissue alterations. Because teeth of questionable prognosis were present, the design was chosen so that it would enable the partial denture to be adapted if such a tooth was lost.

In the design of denture base we used broad tissue base support. Maximizing the denture base coverage provided better stress distribution and resistance to displacement by lateral forces. Distally the denture base was extended over the maxillary right tuberosity and bilaterally included the hamular notches.

We decided that the teeth 1. 5. and 2. 3. to be used as abutments and that option provided sufficient retention for the partial denture. We placed retentive arms as upper as possible for esthetics.

Denture acrylic teeth were selected to harmonize with the shade, shape, length and width of the remaining dentition. Acrylic teeth are easier to arrange, modify and adjust.

Because appearance was compromised and we were confronted with an unusual long edentulous span and excessive alveolar bone loss complicated with the 1. 2. teeth rotation, in order to improve esthetics, we made an unusual teeth arrangement using two artificial teeth (a central and a lateral incisor) that fitted perfectly in the available

space (Fig. 5.). So we obtained not only an improvement of esthetics but also better conditions for bone healing after the central incisor extraction due to better protection provided by the largest saddle.



Fig. 5. Note the improved appearance of the dental arch due to the atypical teeth arrangement

After the denture delivery we obtained teeth contacts simultaneously and bilaterally, having contact on both natural and partial replacement teeth in centric position.

Very important was to determine how the patient reacted to the changes of the VDO. As expected, we have not acceptable phonetics due to the disappearance of the closest speaking distance. So we decided to adjust as soon as possible the VDO. If it was easy to modify the remaining teeth and the denture teeth, the main problem was to obtain posterior space. So we needed to modify the right tuberosity by surgical reduction. In our case it was relatively simple because the big volume of the tuberosity was provided by an excessive

amount of fibrous tissues, as is obvious on the Orthopantomography (Fig. 4) and the bony tuberosity was not involved.

After surgery, the base of the acrylic denture was modified (Fig. 6a, b), one of the

important advantages of acrylic resin bases being the fact that they allow relining to follow the supporting tissues changes and to maintain a close mucosal support.



a



b

Fig. 6. The interim denture after relining the right tuberosity area a. general view; b. detail

CONCLUSIONS

After minor adjustments, the patient felt comfortable and had no evidence of tissue irritation. During the post insertion period we also reshaped the two left canines in reverse contact in order to allow an unrestricted closing movement (Fig. 7).

The final denture, an acrylic denture too, was made two years later on a stabilized situation. No tooth was lost during this period and no TMJ disturbance was observed.

The final denture restored our patient health and comfort and subsequently improved her quality of life.



Fig. 7. The reshaped reverse contact of the two left canines

REFERENCES

1. DAVENPORT J.C., BASKER R.M., HEATH J.R., RALPH J.P., GLANTZ P-O - Need and demand for treatment. Br. Dent. J, 2000; 189: 364-368
2. DAVENPORT J.C., BASKER R.M., HEATH J.R., RALPH J.P., GLANTZ P-O - Connectors. Br. Dent. J, 2001; 190: 184-191
3. MCGIVNEY G. P., CARR A. B. – McCracken's Removable Partial Prosthodontics, Tenth Ed, Mosby Inc 2000, 3

A COMPARATIVE CLINICAL STUDY OF IMPLANTS IN THE POSTERIOR MAXILLA: METHODS OF SINUS FLOOR AUGMENTATION VERSUS STANDARD IMPLANTATION

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Abstract: The purpose of this study was to evaluate the secondary stability of implants placed in the posterior Maxilla according to different surgical techniques of sinus floor augmentation versus standard implantation. 128 patients had been treated between the years 2005 to 2009 with SLA screw implants in the posterior maxilla. 3 surgical techniques have been performed depending on the residual bone height: lateral approach sinus floor elevation with graft material (Bio-Oss) in 30 patients with 88 simultaneous placed implants, flapless transalveolar sinus floor elevation without graft material in 50 patients with 66 placed implants, 79 Implants in 48 patients with standard implantation(control group). Periotest values (PV) of each implant in all groups were analyzed. No statistically differences were found between the groups. Clinical evaluations of the results showed stable implants according to PV.

Key words: Dental Implants, Sinus Floor Augmentation, Osteotome Technique.

INTRODUCTION

Implant insertion in the posterior maxilla is a challenging procedure. The reduced bone quantity and low bone quality are limitary factors (1, 2). Sinus pneumatisation and alveolar ridge resorption associated with removable prostheses can contribute to decrease bone height. Due to these restrictions, different methods such as tilted, short implants or additional vertical bone augmentation have been described. Many techniques have been introduced addressing vertical bone augmentation: sinus floor augmentation with lateral access (3) or transalveolar approach using osteotome technique, onlay graft (4), guided bone regeneration, oppositional bone graft or combination of these techniques.

The sinus floor augmentation and graft technique with a lateral access is now considered a state-of-art surgery and is the

most commonly used bone augmentation technique, which was first presented in 1977 by Tatum (5) and first published in 1980 by Boyne & James (3). Misch (6), Smiler & Holmes (7) Wood & Moore (8), Kent & Block (9) and Misch & Dietsh (10) later modified this technique. The sinus lift procedure can result in a dramatic increase in the height of bone available for implant placement. Among the variety of techniques that have been described, the most three that are widely used are the 2-step sinus lift and the 1 step sinus lift with lateral access (7) and the osteotomy technique (transalveolar approach) (11). The 2 step sinus lift is the treatment of choice when the residual bone height is less than 4 mm (12). In this procedure the implants are usually placed at least 6 months after augmentation. The 1-step sinus lift is applied when the residual bone height ranges between 4-6 mm. In this procedure implants can be placed

simultaneously with sinus floor elevation (12). In cases, where the residual bone height is more than 6 mm the osteotome technique can be performed with simultaneous implantation (11). The most important difference between the 1 to the 2 steps technique is that less time needed before prostheses. The long-term success of this often modified augmentation procedure has been documented (13). Different bone graft materials types of implants, timing of implant placement, failure analysis, radiographic analysis, indications or contraindications and prosthetic aspects have all been analyzed (13). A less invasive alternative osteotome technique can obtain a localized elevation of the sinus floor through a 3 to 6 mm diameter transalveolar osteotomy (14). This prevents the need of a larger lateral access. This technique proposed initially by Summers in 1994 (11) offers the advantages of more localized augmentation, a conservative surgical entry (15), a lesser degree of postoperative mediated morbidity and the ability for earlier implant loading. Transalveolar sinus floor elevation is performed using with elevation of the mucoperiosteal flap, preventing the contact between the osteotomes and Schneiderian membrane. Osteotomes expand gradually the osteotomy compressing and displacing apically cancellous maxillary bone. This act of compaction of bone increases the implant's primary stability. When residual bone height ranges between 5 to 7 mm, 2 to 7 mm of localized sinus floor elevation with simultaneous implant placement can be successfully achieved (16). As with lateral access sinus floor elevation, several grafting materials have successfully been used:

autogenous bone, allografts, xenografts, and combinations of these materials (15). High implant survival rates have been reported by several authors (17). There are some differences among 3 techniques described regarding surgical procedures and healing times. The one of the various techniques which provides the desired results in less time, least invasive, easiest to perform should be routinely applied. The measurement of SS of placed implants provides indications for the prosthesis phase and also for the survival rate prognosis. To date, there is no data have been published comparing the SS of implants placed in augmented sinus by lateral approach to implants placed with flapless transalveolar sinus floor augmentation or implants placed in pristine bone. At present the lack of comparative research makes it difficult to select the most appropriate procedure.

The purpose of our study was to evaluate the secondary stability (SS) of implants placed in the posterior maxilla in conjunction with different methods of sinus floor augmentation and to compare the results with standard implant placement in non augmentation bone.

MATERIAL AND METHODS

128 patients with atrophied posterior maxilla, 65 women and 63 men with medium age of 61.5 (range 25 – 86 years) had been treated between September 2005 and August 2008 with 233 SLA screw implants (Alpha-Bio) in the posterior maxilla. Both partially and completely edentulous patients were included. All patients had been treated at least 6 months prior to the examination with one or more implants in the premolar or molar regions in

the posterior maxilla. Clinical and radiographic examinations of all 233 implants were performed 6 months after implants placement. Patient with systemic diseases exhibiting risk factors for surgical procedures, as well as patients with untreated sinusitis was excluded. SS of the implants in both groups was measured with the Periotest (Medizintechnik Gulden, Germany) after screwing the healing caps.

According to the residual bone height between the alveolar crest and sinus floor determined by radiographical examination of the vertical dimension one of three surgical procedures was chosen for implant placement for each group:

1. Lateral approach sinus floor elevation with simultaneous implantation applied in cases with residual bone height less than 5 mm. The elevated sinus was filled with deproteinized bovine bone mineral as a grafting material (Bio-Oss, Geistlich, Wolhusen, Switzerland) and the lateral window was covered with a bio resorbable collagen membrane (Bio – Gide, Geistlich, Wolhusen, Switzerland). SLA screw implants with 3.75 to 6 mm in diameter and 11.5 to 16 mm in length were simultaneously placed at the time of sinus floor augmentation with force range 40 – 45 N cm. PV are demonstrated in Table 1. This group includes 30 patients with 88 implants.

TABLE 1. PV of Inserted Implants in the first group.

D	L	Periotest Value								
	13									
	11.5	-6 -6					-6	-6		
	10	-4 -3	-5 -4			-5				
	16	-5 -5 -4 -6	-4 -4 -6 -5	-4-7-5 -7	-4 -6		-7 -6 -5 -6	-5 -6 -5	-5	
4.2	13		-5							
	11.5	-5 -3 -4	-6 -4	-4-6-5 -7 -4	-5 -3 -6 -5	-6 -5	-7 -5 -4 -6	-5-6-4 -3 -6	-5-5-5 -2-4-5	
	10	-4	-3-5-4				-4	-4-3-4	-4	
3.75	13	-4 -4	-5-5-3				-4			
	11.5		-2	-6 -4 -4 -3	-6 -5	-5		+2	-2	
	10									
Teeth number		17	16	15	14	24	25	26	27	
Total implants		14	16	13	8	4	11	13	9	88 implants
30 patients										

PV of inserted implants with lateral sinus elevation and simultaneous implantation.

2. Flapless transalveolar sinus floor elevation without graft material performed in cases with residual bone height between 5 to 10 mm. SLA screw implants 3.75 to 6 mm in diameter and 8-13 mm in length were used. Bone quality was evaluated during surgery and implant sites were

underprepared to achieve maxim primary stability. Elevation was performed with only 1 osteotome. The diameter of the osteotome was similar with the implant apex port. The integrity of the sinus membrane was appreciated through Valsalva maneuver. The 2nd stage was performed no less than 6

months of implant insertion. PV are demonstrated in Table 2.

TABLE 2. PV of Inserted Implants in the second group.

D	L	Periotest Value								
5	13									
	11.5	-4			-4	-5		-4-4-5		
	10		-4 -2	-5-5-5	-4		-4-5-4	-6 -5		
	8		-3					-4		
4.2	13									
	11.5	-5	-5 -5-6	-4 -6	-4 -6	-5-6-3	-7-4-5	-6 -2		
	10	-5-7-7	-5-4-5	-4-5-5			-5-4-4	0-4-4 -	-5 -4	
			-5				-2	6		
3.75	13									
	11.5		-2	0-6 -6	-6					
	10			-2 -5						
Teeth number		17	16	15	14	24	25	26	27	
Total implants		5	11	13	5	4	16	14	2	70
50 patients										

PV of inserted implants by flapless transalveolar sinus floor elevation without graft materials

3. Standard implantation procedure carried out in cases where the residual bone height was more than 8 mm in non augmented posterior maxilla. 79 SLA screw implants with 3.75 – 6 mm in diameter and 8 to 16 mm in length were inserted in 48 patients included in this study. PV are demonstrated in Table 3.

TABLE 3. PV of Inserted Implants in the third group.

D	L	Periotest Value								
5.0	13			-5			-6			
	11.5		-5	-5 -5		-5		-4-7		
	10						-6	-5-4		
4.2	13			-6 -5	-4-4	-4-4-6	-5 -4 -4			
				-4-4	-4-3-6	-3 -6				
				-6-5-7						
4.2	11.5		-4 -3	-4-5-4	-5 -6	-4 -6	-6 -4 -4	-4-3		
				-4			-6 -6 -5			
	10	-3	-4 -7	-6	-5	-5	-5			
3.75	13			-2 -4	-5-4-4	-5-3-4		-6	-5	
						-4-5-4				
	11.5			-5-4-4	-5	-5-4	-5 -6			
				-3						
	10			-5						
Teeth number		17	16	15	14	24	25	26	27	
Total implants		1	5	17	14	18	16	7	1	79
48 patients										

PV of inserted implants by standard implantation.

Mean values between the groups were tested using analysis of the t-Student test.

RESULTS

According to analysis of implant distribution due to implant location it was observed that in the first group the most

implants were placed in the first molar region, in the second group the most implants were placed in the second premolar and first molar, in the third group most implants were placed in the premolar region (Table 4).

TABLE 4. Implant Distribution.

Group	First Premolar %	Second Premolar %	First Molar %	Second Molar %
1.	13,6	27,3	32,9	26,2
2.	12,8	41,5	35,7	10,0
3.	40,5	41,8	15,2	2,5

Implant distribution due to location and groups.

The average PV due to implant location showed different results, every group has specific characteristic: in the first group the highest PV of inserted implants were noted in the premolar region and logically the

lowest PV were noted in the molar region, a higher PV in the 2nd molar than in the premolar and 1st molar was noted in the 2nd group. In the 3rd group the lowest PV was noted in the second molar region (Table 5).

TABLE 5. Average PV

Group	First Premolar	Second Premolar	First Molar	Second Molar
1.	-5,0	-5,2	-4,3	-4,4
2.	-4,7	-4,6	-4,3	-5,2
3.	-4,6	-4,6	-4,5	-4,0

Average PV due to implant location and groups.

In the sinus lift group, 2 implants failed. In the osteotome group 1 implant failed 2 months after insertion because of postoperative infection. 4 implants failed in the standard implantation group. A mild degree of postoperative nasal bleeding occurred in few patients with membrane perforation. Mean PV for SS of the implants from the osteotome group was -4.6. In sinus lift group the mean value for SS of the implants was -4.7 and -4.6 for the standard implant group. No statistically significant difference was noted between the groups. Comparative study of SS between the 1st and 2nd group was t-Student=0.3584, P>0.05 and between the 1st and 3rd group was t-Student =0.0745, P>0.05 and between the

second and the third group was t-Student=0.4585, P>0.05. The osseointegration rate of implants for the lateral approach sinus lift group was 97.7%, 98.5% for transalveolar group and 95% for standard implantation group.

DISCUSSION

According to the average PV due to implants location relating to the different groups a higher PV (-5.2) was noted in the premolar region in the first group, in the 2nd molar in the second group and almost similar values were noted in the 3rd group. Logically explanations of that results in the 2nd molar in 2nd group is the fact, that in those regions, where a higher PV were

noted more non augmented residual autogenous bone is existing, which permit the bone formation after elevating the sinus floor around the implant apices in a shorter period of time than in sinus lift procedures with bone graft. Further possible explanations of the lower PV in the 2nd molar (-4.4) in the first group may be suggested is the low density of augmented bone 6 months postoperative. We suppose that augmented sinuses with different graft materials and simultaneous implantations need more healing time than six months to provide better PV of inserted implants (18, 19, 20). Long-term studies reporting on survival of implants in augmented sinuses and non augmented areas are needed to evaluate the outcome of survival rates.

CONCLUSION

Comparison of the SS of the inserted implants measured with Periotest showed

no differences between implants in grafted sinuses, implants placed using flapless transalveolar osteotome technique and implants placed in non augmented bone. According to the results of this study, SS provided by augmented bone through a sinus lift procedure or flapless transalveolar sinus elevation without bone graft is biomechanically identical to that found for standard implantation in non augmented bone in the posterior maxilla. The results from this study indicate that the implant SS measured with Periotest in grafted sinuses with different technique and in non augmented bone were similar after 6 months of insertion. The implant stability provided by the bone, regardless whether it came through a bone graft procedure or non augmented bone was suitable for prosthetic loading.

REFERENCES

1. Esposito M, Hirsch J, Lekholm U, Thomsen P. Biological factors contributing to failures of osseointegrated oral implants. (II). Etiopathogenesis. *Eur J Oral Sci* 1998; 106: 721 – 764.
2. Sennerby L, Roos J. Surgical determinants of clinical success of osseointegrated oral implants: A review of the literature. *Int J Prosthodont* 1998; 11; 408 – 420.
3. Boyne PJ, James RA. Grafting of the maxillary sinus floor with autogenous marrow and bone. *J Oral Surg* 1980; 30: 613 – 616
4. Jensen L, Sindet-Pedersen S. Autogenous mandibular bone grafts and osseointegrated implants for reconstruction of the severely atrophied maxilla: A preliminary report. *J Oral Maxillofac Surg* 1991; 49: 1277 – 1287.
5. Tatum H. Maxillary and sinus implant reconstruction. *Dent Clin North Am* 1986; 30: 207 – 229
6. Misch C. Maxillary sinus augmentation for endosteal implants: Organized alternative treatment plans, *Int J Oral Implantol*. 1987; 4:49 – 58.
7. Smiler D, Holmes R. Sinus lift procedure using porous hydroxyapatite: A preliminary report. *J Oral Implantol*. 1987; 13: 239 – 253.
8. Wood R, Moore D. Grafting of the maxillary sinus with intraorally harvested autogenous bone prior to implant placement. *Int J Oral Maxillofac Implants*. 1988; 3: 209 – 214.
9. Kent J, Block M. Simultaneous maxillary sinus floor bone grafting and placement of hydroxyapatite-coated implants. *J Oral Maxillofac Surg*. 1989; 47: 2238 – 2242.
10. Misch C, Dietsch F. Bone-grafting in implant dentistry. *Impl Dent*. 1993; 2:158-162.

11. Summers R. A new concept in maxillary implant surgery: The osteotome technique. *Compend Cotin Educ Dent* 1994; 15: 152 –160.
12. Zitzmann N, Schärer P. Sinus elevation procedures in the resorbed maxilla: Comparison of the crestal and lateral approaches. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1998; 85:8-17.
13. Jensen OT, Shulman L, Block M, Iacono V. Report of the Sinus Consensus Conference of 1996. *Int J Oral Maxillofac Implants* 1998;13; 11-45.
14. Albrektsson T, Zarb G, Worthington P, Eriksson A. The long-term efficacy of currently used dental implants: A review and proposed criteria of success. *Int J Oral Maxillofac Implants* 1986; 1:11-25.
15. Ioannidou E, Dean J. Osteotome sinus floor elevation and simultaneous, non-submerged implant placement: Case report and literature review. *J Periodontol* 2000; 71: 1613-1619.
16. Komarnycky O, London R. Osteotome single-stage dental implant placement with and without sinus elevation: A clinical report. *Int J Oral Maxillofac Implants* 1998; 13: 799 – 804.
17. Schmidlin P. R, Muller J, Bindl A, Imfeld Th. Sinus floor elevation using an osteotome technique without grafting materials or membranes. *Int J Periodontics Restorative Dent* 2008; 28: 401-409.
18. Fugazzotto P. Augmentation of the posterior maxilla: A proposed hierarchy of treatment selection. *J Periodontol* 2003; 74: 1682-1691.
19. Winter A, Pollack A, Odrich R. Placement of implants in the severely atrophic posterior maxilla using localized management of the sinus floor: A preliminary study. *Int J Oral Maxillofac Implants* 2002; 17: 687-695.
20. Leblebicioglu B, Ersanli S, Karabuda C, Tosun T, Gokdeniz H. Radiographic evaluation of dental implants placed using an osteotome technique. *J Periodontol* 2005; 76: 385 – 390.

THE ANTERIOR HYPERFUNCTION SYNDROM - FEM SIMULATION

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Abstract: Objectiv: Establishing a corelation of biomechanic behaviour with clinical observations, of the support area of masticatory presions, through out specific changes which characterise the anterior hyperfunction syndrom. **Material and method:** Starting with some oclusal considerations there are presented clinical observations concerning the anterior hyperfunction syndrom with predisposant factors, manifestation and consequences. There are evaluated, using finite element method FEM, the oclusal presions, analyzing the support area and their effects on oral structures, for oclusal forces of 100N. **Results and conclusions:** The biomechanic results with FEM are confirming the role of residual ridge in lateral area as zone of primary support and the important resorbtion in frontal ridge leading to flaby ridge, that characterise the anterior hyperfunction syndrom. The biomechanic results by FEM confirms the lateral ridge as primary support, and also the accelerated resorbtion in frontal crest, that appears in anterior hyperfunction syndrom.

Key words: anterior hyperfunction syndrome, FEM simulation

GENERAL CONSIDERATIONS

The anterior hyperfunction syndrom is most of the time asociated with the combination syndrom (CS, described by Kelly). In 1972, Kelly presents the clinical case, most frequent, of the combination of complete maxilar edentulous with cls I Kenedy, termino -terminal mandibular edentulous, which he calls *the combination syndrom (known as Kelly`s syndrom)*. This combination of edentulous areas and removable dentures implies some specific changes, morphological and functional, beeing characterised by Kelly through five clinical symptoms:

- the important resorbtion of the frontal ridge, frequently apearing the flabby ridge with mobility in horizontal plane;
- papillary hyperplasia (on the palatal mucosa)

- inferior hypertrophy of maxillary tuberosities;
- extrusion and bucal migration of anterior mandible teeth (with periodontal affectation of them) and frequently disorder of occlusal plane.
- considerable resorbtion under denture`s base, especialy mandibular. He describes for the first time the loss of bone and changes in soft tissues of the maxilar and mandible, in this combination of edentulouism treated with removabal dentures.

Later, some authors (Saunders 1979, Budts 1981, Keating 1997, M. Martin, Cunha 2003) completed with their observations the clinical picture of combination syndrom, such as:

- anterior position of mandible, with mandibular disfunction;

- diminution of vertical dimension of inferior floor of face;
- changes of occlusal plane because of diving the mandibular denture and over-eruption of mandibular anterior teeth.
- epulis fissuratum, in the labial mucosa of the maxilar;
- periodontal afectation of the anterior mandibular teeth;
- difficulties in accomodation with dentures.

Cuhna in 2003 shows that 85% of patients with this kind of edentulouism treated with removabal dentures are presenting the clinical signs described by Kelly, and some 5% are presenting only one sign. He shows that in over 7% of cases there are signs of mandibular disfunction, from wich 32% where moderate, 50% where reduced and 11% where none.

Shen and Gogloff (1989), by examing 150 patients with complete maxillary denture, they found:

- a frequency of 24% patients with complete maxillary denture oposing cls I Kennedy – bilateral edentulous areas located posterior to the remaining natural teeth, in mandible, with partial denture.
- in presence of a complete maxillary denture oposing a partial denture , with presence of molars, it was not described the simptomatology of the combination syndrom.

We can apreciate in this case, the importance of lateral teeth in preventing the combination syndrom.

The effects of occlusal pressions are depending of the size of muscular forces, of length of action, site and direction in wich it is working.

Lewin, Hartwel and Rahn divided the bearig area of support for the denture, in principal supporting areas, wich receives majority of oclusal pressions (the lateral ridge) and secundar supporting areas, wich receives more reduces pressions (the hard palat, tuberosities, frontal ridge).

The size of pressions applied to mucobony structures is different, bbeing implied different factors(age, sex, muscular tonicity, the tipe of mastication, thopografic zones, frontal or lateral), by Gateau, Chokroun, 1998.

A study of Bakke (1986) developed on 63 women and 59 men, of different ages, shows that mastication force depends on age. It is average of 356,9N at 5-10 years old, then it groes at 610,8N ,at 40-50 years old then it reduces at 373,8 N at 60-70 years old.

Depending on sex, Waltimo and Konen (1993) by mesuring the average loading in molar region, they found values of 847N for men and 597N for women. By decreasing the muscular tonicity of mandibular elevation muscles, wich come with time and by reducing the contribution of proteins, the mastication forces are limited.

The pain in maxilar bones and mucosa, in muscles or temporo-mandibular joint, limits the masticatory effort.

Erhardson (1993), shows in EMG study, that maximum occlusal forces are obtaind only in MI (maximum intercuspitation). In case of unilateral mastication this forces are reduced with 25%. He affirmed that second molar supports maximum contractions and this one diminishes by incisal zone (with 20%). On premolars the loading is about 400N (Kovarik).

The time of loading the support structures can be prolonged in case of heavy abrasion of teeth, in bruxism, dentures lack of stability or increasing of occlusal vertical dimension. By prolonging the action time on support structures, after Jores rules, it produces ridge resorbtion and replacing the bony tissue with fibrous tissue, leading to fibrous ridge.

The vertical and intermitent pressions are generally well supported by the mucobony structures. By alteration of occlusal relations or by heavy wearing of teeth asociated with tendency of mandibular propulsion, can appear horizontaly pressions, usually with anterior direction. This kind of pressions are producing occlusal instability and denture`s lack of stability with difficulties in wearing accomodation and distructive effects on the support structures.

The determinating factors of structural and functional changes in this syndrom are constituted by the presence of anterior mandibular teeth, or anterior prosthetic reconstructions (bridges) with antagonist, a complete maxillary denture. The artificial teeth from the denture are producing oversolicitation of the frontal ridge in maxila, by developing high pressions and denture instability.

The asociated modifications in combination syndrom are explained by the moving of the denture on the support areas and diving of the mandibular denture, with changes in the occlusal field (missing of contacts in lateral zone and mooving the occlusal field in frontal region) and instability of the maxilar denture. By loosing the occlusal contacts in lateral zone

there are using in mastication the frontal teeth. Because of that the combination syndrom is calling the anterior hyperfunction syndrom.

BYOMECHANICAL STUDY

The aim of this syudy is to corelate the clinical issues with biomechanic issues. The byomechanic study consisted in numerical analisys of the effort in bone surface at complete edentulous, which appear under the occlusal pression, throught digital investigation.

MATERIAL AND METHOD

For evaluation of deformation and tensions in bone structure of maxillar we used the FEM.

With a FORTRAN program we acomplished a geometrical model formed by volumes, throught which was represented the complete denture (base and artificial teeth), and the bony support of the denture (fig. 1).

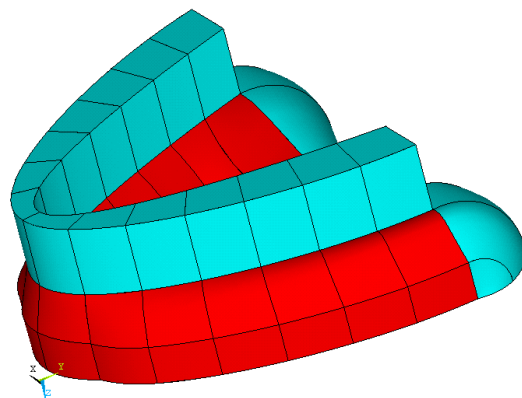


Fig. 1. Global geometrical model: artificial teeth, denture's base and area of support.

The volumes where discretisated in finite elements; the bony support, which is the study object, was shaped in volum and discretisated in tetraedric tridimensional elements. (fig. 2 a and b).

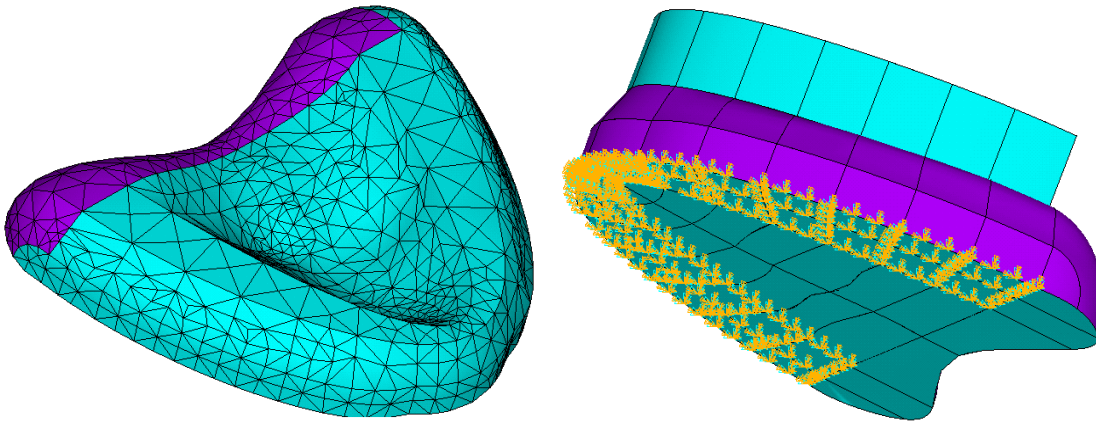


Fig. 2 a, b. The bony support of the denture discretised in volume elements.

For loading of the model we considered a force F of 100N, applied as vertical occlusal pression on the occlusal surface in the lateral area (a physiological aspect because lateral area is the one used in mastication) and frontal area (a modified functional situation as it happened in anterior hyperfunction syndrom).

The results are presented like equivalent von Misses tensions, in numbers and grafic in MPa.

THE BYOMECHANIC STUDY concerns:

1. Observations aiming application of pressions in lateral zone.

Was verified the solicitation throught occlusal surface by unilateral application. The loading of the model was on the lateral right side on the geometrical model, with a pression coresponding at F of 100 N, in vertical direction, in premolar-molar region, without incisal participation (fig.3).

The results are showing the deformation and tenssions field limited on a half of the rest area, between the passiv mobile mucosa and the middle line of hard palate, 1/3 from incisal zone and 1/3 to distal area, the Ah zone.

The tenssions values are decreasing from middle to periphery. The maximum is

0,85 MPa on the ridge area, in intern crest between molar and premolar. The values are decreasing in vestibular retrozygomatic area- 0,47 MPa untill 0,19 MPa.

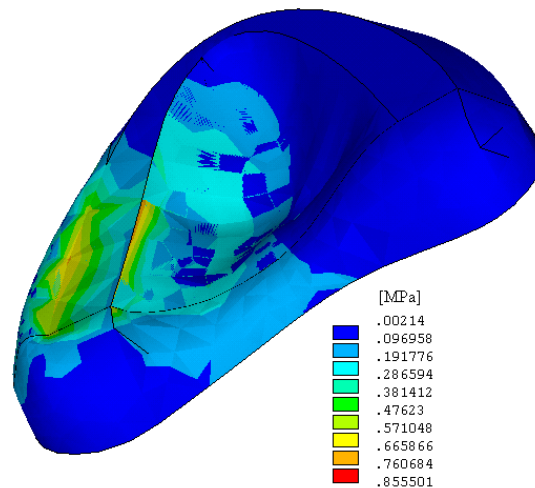


Fig. 3. The tention field in lateral crest on bearing area

On palatinal zone it is observed a decreasing of tensions arriving on middle line at 0,009 MPa.

In the other regions of the rest field of the denture, the values of tenssions are insignificant on a surface of 52%, this phenomen could affecting the denture stability.

2. Observations aiming application of pressions in frontal zone.

The frontal application of pressions can appear in anterior guiding or in food

incision, but as we know, most of the authors are forbidden remaking the anterior guiding at dentures, as same as incisal function.

We applied a force of 100N, in incisiv zone. It shows o increasing of bone tensions in frontal ridge, with values of 1,735MPa (fig.4), which are reducing in lateral way, in canine zone is 0,77MPa. In other areas the values of tennsions are insignificant.

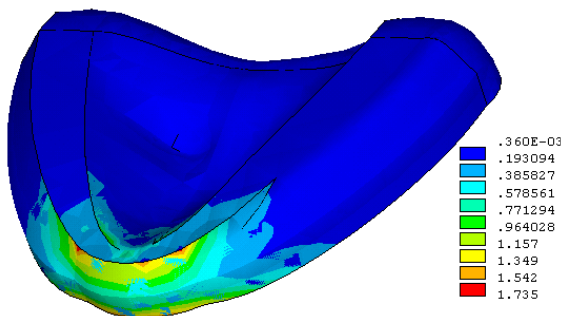


Fig. 4. The frontal tennsions

CONCLUSIONS

We can say that:

- the oclusal presions are beginning on oclusal level throught tooth to tooth contacts or tooth- food-tooth contact;
- these oclusal presions are transmited throught denture's base on the support structures;
- in normal, physiological raport (with mastication in lateral region), the pressions are supported first by lateral ridge, capabal to sustain vertical pressions, in some valoric limits;
- the pressions transmited in frontal region are not functional, especialy when they became horizontal, they are distructive on the support structures, explaining the great resorbtion on frontal ridge with aspect of fibrous ridge, from anterior hyperfunction syndrom;
- the byomechanical simulations confirms the clinical observations concerning, the capacity of support structures and modifications at this level in unphysiological situations, of excesiv pressions, in the anterior hyperfunction syndrom.

REFERENCES:

1. Budts-Jorgensen E. - Prosthodontics for the Elderly, Quintessence Publishing, Co., Inc. 1999.
2. Gateau Ph, H Choukroun - Le point sur les reconstitutions corono-radicales. AOS , 1998, nr 204.
3. Kelly E. - Changes caused by a mandibular removable partial denture apposing a maxillary complete denture. J. Prosthet. Dent., 1972, 27, 140.
4. Langer Y, Laufer BZ, Cardash HS: Modalities of treatment for the combination syndrome. J Pros Dent. 1995,4:76-81.
5. Levin B – Impressions for complete dentures, Quintessence, 1984
6. Magureanu-Murariu C, M Păuna, M, Glăvan – Edentația totală. Aspecte de analiză biomecanică, București, Ed Cerma, 2002
7. Ottenhoff, A. van der Bilt, H.W. van der Glas, F. Bosman and J.H. Abbink - The relationship between jaw elevator muscle surface electromyogram and simulated food resistance during dynamic condition in humans. Journal of Oral Rehabilitation, 1996, **23**: 270-279.
8. Pauna M, Preoteasa E – Aspecte practice în protezarea edentației totale, Ed Cerma, București, 2002
9. Preoteasa E - Sindromul combinației, Medicina stomatologică, 2004, 5, 15
10. Saunders TR, Gillis RE, Desjardins RP: The maxillary complete denture opposing the mandibular bilateral distal extension partial denture: Treatment considerations. J. Prosthet Dent 1979, 41:124-128.
11. Shen K, Goggloff RK: Prevalence of the combination syndrome among denture patients. J Prosthet Dent 1989;62:642-644.

LATEST FUNCTIONALLY ORTHODONTIC TREATMENT WITHOUT TOOTH EXTRACTION BEND ON SPECIAL BELONGINGS OF HUMAN BEING!

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Abstract: This article is about the modeling of jaws and positions of teeth as the orthodontic treatment with holistic global aspects. In order to achieve a neuro-functionally reorganization (NFR) of human being, it is necessary to consider in which way we could sustain the development of individual growth. Only human beings who have learned to take care for their own life, will be able to continue and to support society. Orthopedic and orthodontic is the art to prevent and to adjust while childhood the deformations of the body. In this respect parents and the social environment involved in elevation are playing an important role. Besides a special dental treatment can be used in these circumstances and the dentistry may help to create self-conscious and self-responsible people. My personal aspect in this field is, to point out before all, that not dentists are the ones who claim for long-term results but patients themselves. Orthopedic and orthodontic is not the alignment of teeth by technical features but by individual ways of progresses in different human areas. These are BODY, SOUL and SPIRIT, the only entrance to each individual universe. These three partials are the main sources for self-healing processes. To sustain these aspects is what dentistry and orthodontic should do, instead of alignments with only technical views and regards.

Key words: orthodontics, anomalies, treatment, prevention

AIM

Reflection on human being!

Determination is various!

Personality!

Equilibrium!

Prevention!

As these theses are common to all treatments, I want to explain the specialty of my way of treatment. It needs an understanding in a different way. The difference is, that in the past we had the functional orthodontic treatment that has been overwhelmed by the technical treatment with braces. But there is no need to treat every dislocation of teeth with technical support. Sometimes it is much easier not to treat with technique but with mental healing programs. Even if each culture has developed own ways, by

comparing the three elements body, soul, spirit we will find similar.

For my way of treatment I use some well known elements. Each of them has been founded separately. In the special combination of these different systems I found out a way to treat orthodontic disorders without tooth extraction in a smooth way only with removables.

The three levels for the neuro-functionally reorganization are:

- Curing Eurythmy from Dr. Rudolf Steiner and Dr. Ita Wegmann;
- Primary Motoric Structure from Monika Prischl;
- Activator from Prof. Soulet and Prof. Besombes from France.



Essentials of Soulet & Besombes

In order to give a structure to the alignment of teeth, both of them introduced a chewing piece based on caoutchouc in the 1950th, nowadays called “Activator Soulet-Besombes” (S-B/see picture above). On this apparatus people have to chew and by the form given through this S-B they receive the formation wished to get. As it is always the harmonic half bow, you may use 25 various forms to come to the final aim. For the starting is different, the S-B is partitioned into four main sections, comparable to the Angle classes. The four sections are: Transversal Expansion, Retromorphose, Antemorphose and Conformation. As the description is quite well the real meaning of what is done with each form, the difference within each section is made by the size. There are different sizes in order to support different ages too. The younger patients are, the smaller the S-B has to be, the older the bigger normally it is. With the grow and the appearance of the permanent teeth S-B’s sizes up, until the final use of the form “Conformation”.

This functionally orthodontic system does mean a low cost system for everybody, a flexible formation system for the elastically human system, the theory of

„occlusale balancing“, rehabilitation of the neuro-occlusale system and the development of rules for the stomatognathe system. Before all it does mean modeling versus standardized regulation, the interior and exterior muscle balancing of tongue and cheek and a universal simple technique to receive a consideration of a harmonic occlusion and arch of teeth.

Furthermore it means the neuro-occlusale rehabilitation designed by Prof. Planas from Spain. Two fundamental precepts are introduced by Planas, the “Principle of Minimal Elevation” and the “Functional Masticating Angle Planas (FMAP)“. To show how the function is, Planas built two plates on lane to get the most effective shift to the lower jaw. Therefore and in order to move he made one lane to each side a lower and an upper plate.

The theory behind the approach of Soulet-Besombes described by Planas.

The “Principle of Minimal Elevation“:

- Every lower jaw side shift causes a vertical change in elevation which is steady and habitual.
- Everyone tries to reproduce this positioning.
- In best case the maximum intercuspitation will be reached by the centered occlusion.
- In case of non-centering: damages of the jaw junction occur, because of forcing the jaw to search for the best position.

The “Functional Masticating Angle Planas (FMAP)“

- Angle between the horizontal depending to each side shift of the mandible seen by the incisal interdental contact 31-41.

- 15 – 20 degree by the elevation of deciduous (milk) teeth.
- Angle decrease until the age of 6.
- Enhancement during the mixed dentition.
- Decrease to „0“ degree until the 65th – 70th age.
- Sameness in angles means a bilateral mastication.
- In case of dissimilarity mastication happens to the side with the smaller angle.

AIM

Release of the mandible side shift.

Equalization of the Functional Masticating Angle Planas (FMAP).

Aquirement for a peak of contacts while side shifts from mandible.

Therapy concept

- Selective looping-in.
- Prevention of early side shift contacts.
- Receipt of the natural abrasion which is not achievable by civilized food.
- Activating with stimulation of the transversal increase: especially M. temporalis, M. masseter, M. pterygoideus.

“Selective looping in” does mean the equalization of the occlusion in order to receive an almost identical harmonic side shift. Only if the side shift can be used in a bilateral same way, people can chew without oncoming pain and stress. To get those results either you have to use a plate or to elongate the occlusale part of side teeth. To increase the occlusion one side of the natural teeth becomes a surface like a veneer, for example left side lower teeth and right side upper teeth. With this kind of elevation you will retain a minimum of

intercuspatation, but you are be able to size up the sagittal distance. It is the best compromise for either to treat but also to keep almost natural functions.

If it is necessary to decrease the sagittal distance it is much easier. You only have to grind teeth very carefully. This work mostly has not to be done, as almost all patients are in an abrasive situation. Furthermore rarely often you will find prosthetics or fillings which are milled off. These grindings always are accompanied by a decrease of the sagittal distance (chin closer to the nose). The facial view is either with skinfolds or skindent caused by stronger muscle force to bring teeth to the occlusion. You may also see a stronger/bigger M. masseter. The head is becoming more squared.

For clearer understanding I take a special view to the embryology part of human growth. Embryological development first starts with conjunctive tissue and the muscular system. Subordinately cartilage and bone is growing. Muscles are conducting the direction of bone growth! (fig. 1).

Therefore muscles are positioners for teeth and jaws and their relations. Ossification and/or bone growth is a product of muscles functions and immune defense. In opposite ossification encourages muscles to hold on them. It is a conjunctive system in order to structurate the body. Invalide muscles injurers bone (lordosis, skyphosis, multiple sklerosis, spasticity,etc.) and may show us, what happens if diseases are involved. You even may see the result of tetracycline within the enamel structure when given while early childhood. Therefore it is no longer allowed to treat

children under the age of 3 with those tetracyclines. The same you may see with other irregularities. Can you imagine which small quantities of detoxifying materials

within food or air or natural water can provoke disorientation to muscles and so to bone?

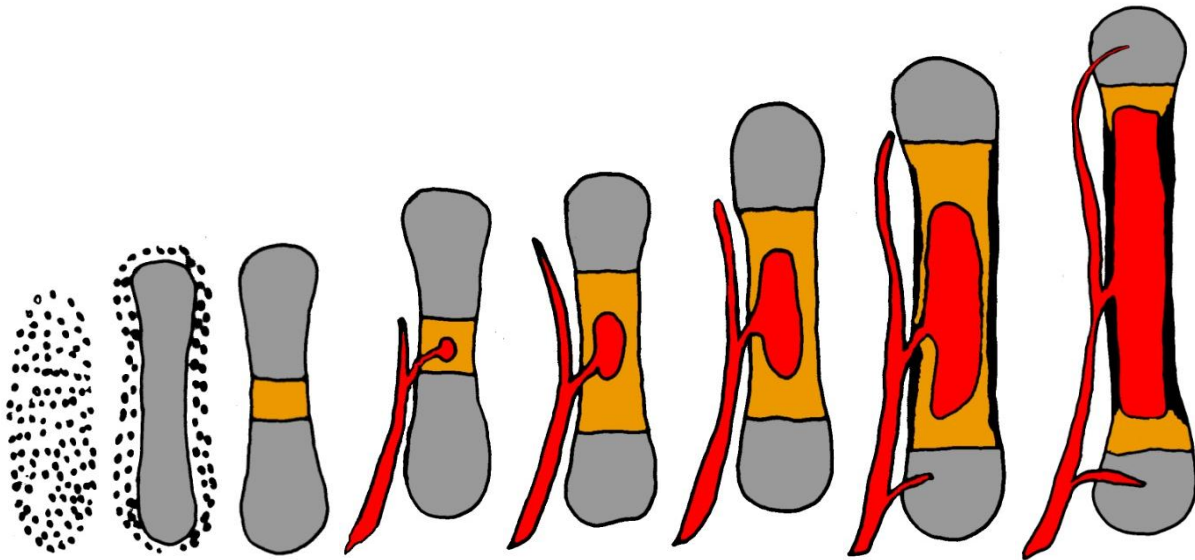


Fig. 1.

The neuro-vegetative function takes part in a lot of different regions. Below I will mention the most important one.

Ectoderm: i.e. enamel, sebaceous and sweat gland

Mesoderm: head musculature, tongue, dental papilla

Innervation: Nerv. III / IV / V / VI / VII / IX / X / XII - Somitomere 1-7

Striated muscles: torso = Somites / head = Somitomere

Extremities: Myoblasts went off the somites

Because of the overwhelming effects to the body it is important to understand, that herewith you only take attention to one third of all if only you take care to the physiological disturbances and physical factors. In addition to the body you should also sustain mind and soul as important parts of human being.

Analysis of Soulet-Besombes for the body level (S-B)

Both Soulet and Besombes defined four main classes for the orthodontic examination and therapy. They took simply the reason why to treat a certain situation for the description of this class. The classes are named (in French): “Retromorphose”, “Antemorphose”, “Expansion Transversale” and “Conformateur”. There is no translation necessary. Each activator is built to both upper and lower jaw concomitantly.

1. Retromorphose

To be comparable and because of the international specification this class is comparable with the Angle II class. It is the treatment of the retrognathic lower jaw in order to elongate 16 26 36 46, to get the intrusion of 13-23 and 33-43, to receive the protrusion of the lower jaw and to harmonize the alveolar bow.

2. Antemorphose

This is the class Angle III and made to treat the pseudo-prognathism. The form of the activator is done to sustain the extrusion of 13-23 and 33-43. At once this type does intrude all sections from 14-17, 24-27, 34-37, 44-47. Simultaneously you may achieve a harmonic arch.

3. Expansion transversale

The meaning of the specification is wide spreaded in Angle I + II + III and is made especially for the widening of the palatum. This enlargement does include the mandible and accelerate the strengthening of the tongue by the special butterfly form that is built to the oral part of upper and lower jaw.

4. Conformation

Angle I is the class that is the international standard specification for this situation. It is the easiest and mostly final treatment to get to the desired position of teeth. With this kind of activator you claim for the harmonic bow and for the adaption from jaws and muscles to guarantee a long-term confidential patient.

Additional therapies for “ Mind and Soul”

Curing Eurythmy for the mind level

Comparable with Tai Chi / Chi Gong this therapy is the one who claims energy towards itself by itself. Similar to the Asian style curing eurythmy is a healing process to sustain the transformation from the past to the now. Developed by Dr. I.Wegmann and Dr. R.Steiner you may live to see what happens to children having done this. With only curing eurythmy you see childrens' incontinence is going off or even dyslexia. I have seen a boy where jammed teeth 12 and

22 with vestibular protrusion went back to their normal positions.

“Eurythmy differs from other arts of movement in that it is an interpretation of speech as well as of music.”(R.Steiner)

It is a therapy forecast of 10 weeks (once a week) where patients are involved into and to work with.

Primary mobilization for the soul level - (PRIMO®)

Training for the muscle balancing with regard to the neuro-functional system, this therapy does mean to sustain people to receive a muscular equilibrium all around. The main problem for the equilibrium is to understand, by looking onto the long way growth, from fertilization to birth to upright standing. While staying within the uterus each human being normally lays in a head-down-position. From birth on a person is laying flat. With the age of 4-6 month human starts to set up for a walking position, this means a head-up-position. So human being has to do a turnaround of 180 degrees. It is imaginable very easily that a lot of “defects” or “wrong programmings” are achievable. These programmings do have the effect by the muscular system, because every function done by the body must be “informed” by the “harddisk”, called brain. To set up a new programming is the aim of this therapy. Therefore people have to learn once again all these things they should have done in early childhood (birth to walk). To eliminate programming defaults the particular examination is done by audit checkings and physical exercises.

The therapy is to be done by itself at home for at least three month every day. Each day you should spend 15 minutes. The

less time you spend each day the longer you need. People have to re-learn such things as crawling on all four, creeping, rolling and to use baby-soother.

Following we may see different times of treatment and the results obtained by this period.



Fig. 2. Therapy – 3 months



Fig. 3. Therapy – 3 years

CONCLUSION

This therapy should help to implement patients' expectations with esthetics, low costs and functions. It is not necessary to achieve the same esthetic with all patients. As we are individuals we may have different types of tooth positions. To be a little different is what is full of curiosity. If we looked all the same, it would be a very

boring world. To treat for a long-term health is what is required in order to receive this aim. I propose to more reflect on side-effects to the muscular system and to all the neuro-vegetative functions in order to pretend pain and especially headaches introduced by fixed ligatures over long time braces.

ASPECTS OF THE BIOACTIVE IMPLANTS INVOLVED IN PERIOINTEGRATION CONCEPT

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Abstract: Introduction. The change of the implants' surface becomes a sine-qua-non condition for the realisation of the perio-integration concept, essential aspect for the viability of the implant-prosthetic therapeutic solutions. **Methods:** The experiments were conducted on dental implants manufactured from titanium Ti6Al4V and Periotype implants from the Kavo Company, with a micro RBM (resorbable Blasting Media) surface. The process of total bio-mimic covering made use of two solutions which can deposit calcium phosphate from watery solution, at the body's temperature the synthetic biological fluid – FBS and the oversaturated solution in ions of SCS-calcium. **Results:** From the study of the microscopic structures obtained and researched it resulted that the micro bio-mimic ceramic layer is continuous, porous and adherent to the metal surface. Through AFM electronic microscope studies it was highlighted, within 3D coordinates, the relief of the ceramic layer deposited. This phenomenon confirms itself also through *in vivo* experiments conducted on animals. The determining of the chemical nature for the ceramic layer was conducted through a diffractometric study with X-XRD ray. The evolution in time of the reconstruction process of the bone tissue and of bone integration was measured through micro-X-raying of the implanted areas at a 30-days interval; [3] In the case of the experiments done on animals, these determinations. **Discussion & Conclusions:** Following the specific operating times specific to such type of therapeutic manual labour, after the finalization of the implant's application it was radio-physiologically ascertain at four months after the very good intervention of the implant, that the bone structure presented an evident condensation, a fact which pleads in favour of the correct integration in full harmony with the sustaining structures. The bio-active apatite's layer led to considerable results regarding the surface's state. It is remarkable the highly degree of bio-compatibility, facilitating a very good osseous-integration of implants with the surface's state thus modified.

Key words: bioactive implants, periointegration, prosthetic

INTRODUCTION

Edentation, along with its distinct clinical forms: unilateral, partial, subtotal or total is a complex clinical phenomenon with deep impact on the appearance of the dento-maxillary apparatus, also influencing the patient's social insertion in an age governed by aesthetic demands. In the past few years the progress achieved in the precision techniques, biology, biomaterial sciences, masticatory function analysis as well as in research focused on both basic and applied sciences have allowed a

significant increase in the number of patients who recover the functions affected by edentation due to implanto-prosthetic rehabilitation.

In 1981 Albrektsson established the classical requirements that should be met in order to attain long term osteointegration:

1. implant biocompatibility
2. implant design
3. implant surface treatment
4. osseous bed treatment of removable prosthesis
5. insertion surgical technique

6. occlusive loading conditions attained by means of rehabilitation

The complex aspects of tissue conditioning induced by the implant shape and surface in order to have a firm attachment, a real barrier against bacterial colonization, pleads in favour of periosteal integration as opposed to osteointegration associated with unidirectional bond implant-osseous capital.

A complex of factors contribute to this aspect starting with the implant surface, the implant type, the augmentation biomaterials associated with the prosthetic field preparation in the view of implant insertion.

AIM

This study has in view the practical use of the periosteal integration concept by forming an active bioceramics layer on the implant surface as well as the analysis of its biocompatibility and higher quality compared with the untreated surface implants.

METHODS

The experiments were conducted on dental implants manufactured from titanium Ti6Al4V and Periosteal implants from the Cavo Company with a micro RBM (resorbable blasting media) surface.

The process of biomimetic coverage confirmed and completed the working parameters for the three covering stages:

1. The controlled oxidation of the implant surface in diluted solution of NaOH with Sodium Titanate formation according to the given reaction:

2. The thermal treatment of the implant surface at 600°C so that the Sodium Titanate layer may bond to the metal

3. The formation and fixation on the implant oxidated surface of the micronic ceramic layer of Calcium Phosphates in calcic biologic solutions at the normal human body temperature of 36-37°C according to the basic reactions.

A highly important aspect was the clinical application of the periosteal implant at a patient diagnosed with partial reduced edentation where the implant-prosthetics solution was best fitted. The clinical experiments were conducted in two steps: on animals, namely rabbits, using titanium metal thighbone implants under the form of screw samples either covered or not by an apatite-like bone layer and on human patients under the form of actual dental implants covered by bioactive ceramic film.

RESULTS

The micronic layer of apatite formed on the implant surface was studied as follows:

- The physical properties of the layer thickness, consistence, continuity and roughness were obtained by means of optical microscopy, electronic microscopy SEM (in collaboration with the Technical Physics Institute, Iasi), and by means of electronic microscopy AFM (in collaboration with the "A. I. Cuza" University, Iasi), confirming the proper form of a continuous and consistent layer of ceramic material on the implant surface.

Fig 1 shows the physical aspect of the ceramic layer formed on the studied implants starting from the geometric shape of the dental implant.

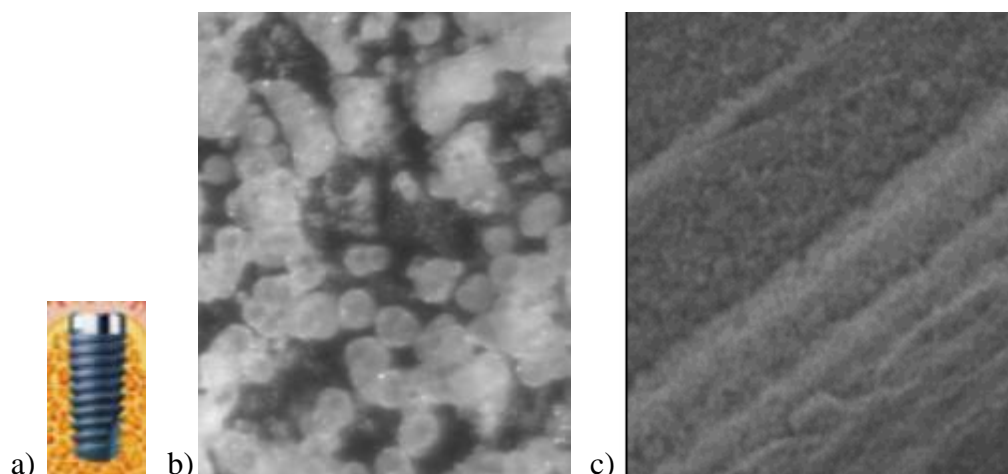


Fig. 1. Physical aspect of the studied implants: a) the geometric form of the covered implant
b) the optical microscopy aspect (X50) of the applied ceramic layer
c) the electronic microscopy SEM of the formed ceramic layer

From the study of the obtained and analyzed microscopic structures resulted that the applied biomimetic microceramic layer was continuous, rough, porous and adherent to the metallic surface.

The electronic microscopy studies AFM presented in 3D the relief of the

applied ceramic layer with an uneven rough aspect necessary for the growth and development of the biologic tissue at the living tissue-implant interface, a phenomenon confirmed by the “in vivo” experiments on animals (fig. 2).

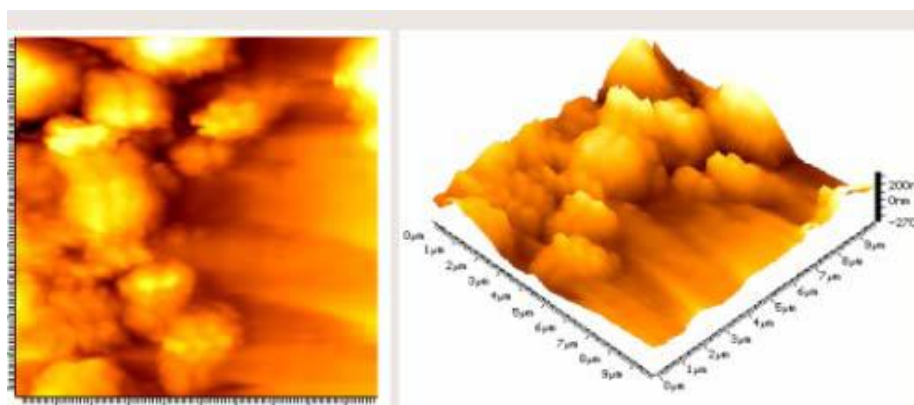


Fig. 2. The aspect of electronic microscopy AFM for the ceramic layer applied on dental implants

Qualitative Determinations By Means of XRay Diffractometry

The chemical nature of the ceramic layer was determined by means of X-XRD ray diffractometric study (in collaboration with the Institute of Technical Study, Iasi), as shown in fig 3. The modern method of analysis used in research highlighted the formation and presence of a superficial

ceramic layer of apatite on the implant surface.

These determinations brought into evidence the difference in calcium phosphate components formed in synthetic fluid solution in the two different procedures. The ceramic layer immersed in SBF solutions is richer in hidroxyapatite than the layer introduced in SCS that presents a higher concentration of calcium

phosphates of the Ca_3PO_4 type. The influence of the organic phosphatic compounds on the ceramics bioactivity was shown during the “in vivo” experiments on

animals, in collaboration with the Faculty of Veterinary Medicine of the Agronomic Institute Iasi.

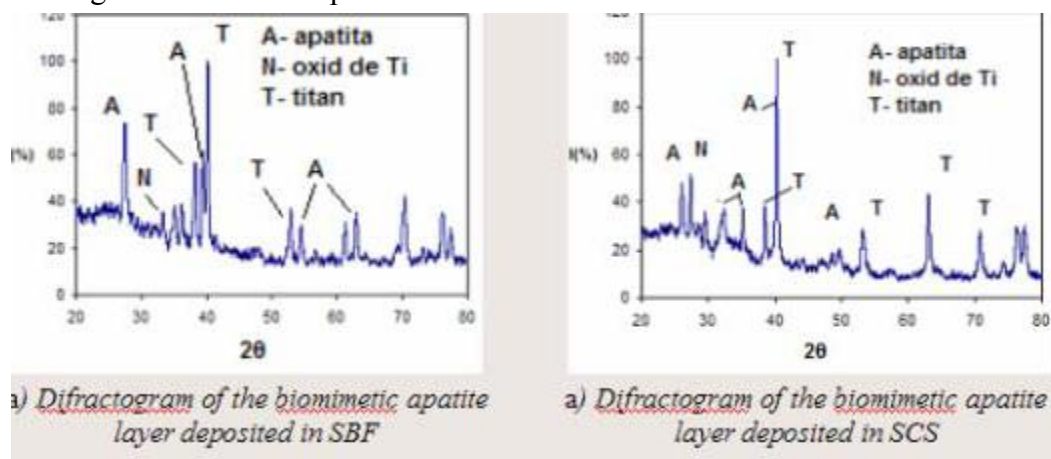


Fig. 3. Diffractograms obtained by means of XRD analysis showing the presence of hidroxyapatite and calcium phosphates in the ceramic layer.

The Study of Initial Biocompatibility of the Bioceramic Implant “in Vitro”

The laboratory experiments conducted to verify if, in accordance with the techniques presented above, the covered dental implants are completely biocompatible in salivary fluids having a composition similar with the human oral cavity. The tested implants were immersed in a prepared salivary solution of the Fusayama Neyer type and kept at 37°C in a thermostatic bath for 7 days. No chemical interaction between implants and solution were reported.

Phenomena indicating poor biocompatibility with the salivary medium are:

- a change of the salivary solution colour
- a change of colour in the surface of the implant covered by a white layer of hidroxyapatite.
- electrochemical corrosion at the sample surface.

There was concluded that the dental implant samples covered with a bioactive apatite layer immersed in artificial salivary solution showed no reaction between fluid and samples. The secondary stage of the biocompatibility test consisted in implants on rabbits.

The Study of Biocompatibility and Bioactivity “in Vivo” for the Bioactive Metallo- Ceramic Implants

This test is the decisive stage of research in the field of bioactive implants and focuses simultaneously on the bioactive and the biocompatible behaviour of the implants in contact with living tissue. Preliminary biologic tests were conducted in collaboration with the Faculty of Veterinary Medicine of the Agronomic Institute, Iasi.

The implant samples were made of titanium in the form of rectangular plates of 2 by 10 mm, biomimetically covered with a micro film of bioactive apatite by means of

SBF and SCS procedures in accordance with the technique presented at ch1.

After visual and microscopic evaluation the samples were handed to the specialists from the Faculty of Dental Medicine and the Faculty of Veterinary Medicine who conducted the “in vivo” experiments.

During this secondary stage of implant biocompatibility and bioactivity experiments (the 1st stage being done in salivary synthetic fluid medium), the samples were implanted subcutaneously in the thoracic area on a 2 month female rabbit. Two symmetrically positioned incisions were made.

There were taken samples by means of circular cutaneous and adjacent conjunctive tissue incision after 14 days. The tissue fragments along with the extracted samples were immersed in formol 10% for fixation,

then taken out from the seal. The histologic fragments were subsequently introduced in parafine, sectioned by microtome up to 5 micrometres each. The fragments were displayed on lamellas and HEA coloured. After the fixation and consolidation of Canada balm the resulting histologic fragments (6 for each sample) were interpreted at the optical microscope.

The samples SCS-3 and SBF presented reduced lymphohistiocitary and fibroblastic proliferation with a tendency of foreign body encapsulation into thin fibrous conjunctive tissue. The implanted samples did not affect the animal’s general health condition, were well tolerated and, histopathologically, they did not induce major inflammatory tissue reactions suggesting a good tissue compatibility as shown in figs 4, 5.



Fig. 4. The histologic aspect, sample SCS-3: reduced lymphohistiocitary proliferation with a tendency of foreign body encapsulation into thin fibrous conjunctive tissue

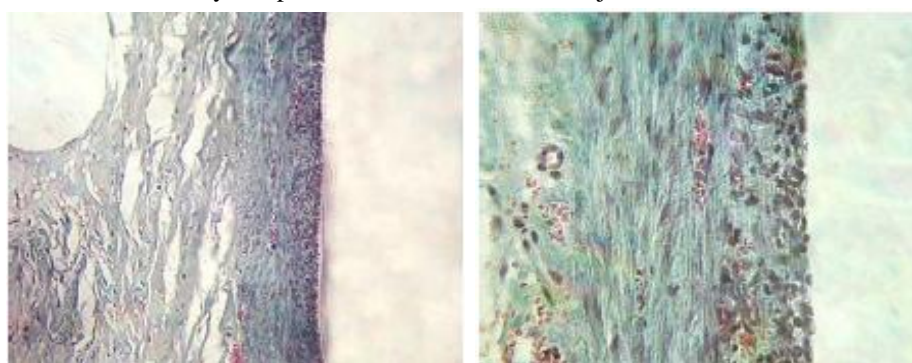


Fig. 5. Histological aspect

From a group of 5 patients diagnosed with partial edentation presenting a favourable general condition who gave their accord to the experiment with periotype

implants covered in active hidroxiapatite there was selected a clinical case of 3rd class Kennedy partial edentation where the therapeutic solution was implanto-prothetic. The periotype implant surface was treated as described above. The general algorithm followed the classical steps of implanto-prothetic rehabilitation. The post-implantary and subsequent 4-month radiovisiographic images showed uniform trabeculation, a marker of osteo- and periointegration with no negative symptomatology, preserving an osseous capital favourable to successful implantoprothetic rehabilitation. There was evidenced both better osseous capital recovery and higher biological integration as compared to the cases where this new type of optimization was not implemented.

There was also noted a good cellular integration and 70-90% adaptation to the implant surface. The tissue integration in the context of local growth factors allowed for the development and maturation of blood vessels between bone and implant.

In the first stage an extracellular matrix layer with precollagen fibres was inserted in the implant rough surface covered with active hidroxiapatite leading to local conjunctive transformation.

The tissue integration took place at the osseous, conjunctive and epithelial tissue levels. Fibroblastes, differentiated into osteoblastes with osseous matrix

mineralization, favoured the implant stabilization.

In the first osteointegration stage of the spongy tissue incorporation there is formed a 150-400micrometre gap between the preexistent osseous tissue and the implant surface, subsequently filled in by the newly formed spongy tissue. The next stage consists of remodellation of the spongy tissue formed from the lamellary tissue, which is rendered radiographically.

CONCLUSIONS

1. The technology of the biomimetic filming of titanium dental implants was conducted by means of two procedures namely immersion in SBF and SCS solutions.

2. The physico-chemical properties of the apatite ceramic layer were studied by means of modern techniques in authorized laboratories and confirmed the quality, adherence and chemical composition of the micro film.

3. The biocompatibility properties of the implant samples were tested in salivary synthetic fluid and "in vivo", i.e. in living biologic tissue, by means of both technologies of biomimetic filming.

4 The essential aspects of active bioceramics layer application are tied to the periointegration concept materialization – a sine-qua-non condition for the therapeutic solution viability.

REFERENCES

1. Forna N, Burlui V. *Clinical Guidelines and Principles in the Therapy of Partial Extended Edentation*. Iași: Ed. Apollonia, 2001, 470-477.
2. Norina Forna, *Evaluarea Stării De Sanatate Afectate Prin Edentatie*, Editura Demiurg, 2007 ISBN 978-973-152-017-9, Carte editata cu sprijinul Autoritatii Nationale pentru Cercetare Stiintifica, 25-26
3. Norina Forna, Magda Antohe, *Reabilitarea Pierderilor De Substanta* Editura Demiurg, 2007, ISBN 978-973-152-035-3, Carte editata cu sprijinul Autoritatii Nationale pentru Cercetare Stiintifica, 180-186

4. Büchter A, Kleinheinz J, Wiesmann HP, Jayaranan M, Joos U, Meyer U. Interface reaction at dental implants inserted in condensed bone. *Clin Oral Implan Res* 2005; 16: 509–517.
5. *** www.clinical-house.com
6. Sethi A, Kaus T, Sochor P. The use of angulated abutments in implant dentistry: five-year clinical results of an ongoing prospective study. *Int J Oral Max Implan* 2000; 15: 801–810.
7. Eger DE, Gunsolley JC, Feldman S. Comparison of angled and standard abutments and their effect on clinical outcomes: a preliminary report. *Int J Oral Max Implan* 2000; 15: 819–823.

REPORT TO THE NATIONAL ACADEMY OF DENTAL SURGERY

INFECTIOUS COMPLICATIONS OF ARTICULAR PROSTHESIS AND BUCCO-DENTAL INFECTION

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One of the major developments in postwar surgery was the replacement of seriously deteriorated articulations with articular prostheses.

The practice of mounting articular prostheses is currently met.

Nevertheless, the infectious complications at the level of the articular prostheses still raise problems. In effect, the consequences may be disastrous. We can arrive to the point of changing the prosthesis, if that's possible. In the contrary case, after the retraction of the prosthesis without replacement, a pseudoarthrosis appears and triggers a skeletal deficiency, shrinkage of the limbs and an important physical deterioration (Salvati 1984).

In the worst case, the infection of an articular prosthesis may lead to a chronic osteomyelitis which can cause amputation or death.

We can distinguish between primary and secondary infections.

- the primary infections appear within less than two months after the replacement of the articular prostheses. They are due to post-operative contamination. They are the most frequent. Yet, due to the use of the pre-operative antibioprohylaxis, on

one hand, and of the evolution of techniques on the other, their incidence decreased during the last two decades.

- The secondary infections, due to bacteria coming from distant infectious sites: bucco-dental, urinary, oto-rhino-laryngological, respiratory, cutaneous or others.

It is crucial to identify this possible bucco-dental etiology in order to come up with strict therapeutic rules.

Orthopedic surgeons, odontologists and dentists are perfectly aware of the risk, but this risk is difficult to assess, even more difficult in the case of infectious endocarditis. This latter affection has made the object of two conferences in the field, one in March 1992, the other revised in 2002.

This difference in evaluation comes from several factors.

The endocarditis appears at patients who show a previous cardiopathy; the mounting of valvular prostheses does nothing but increase the risk. On the contrary, the mounting of articular prostheses is often conducted on patients who show no general pathology.

Moreover, if the bacteriological evidence is difficult to evaluate in the presence of an endocarditis, it is infinitely more difficult to assess in the presence of an infection around an articular prosthesis.

It results that the medical literature, so abundant in the case of endocarditis, is scarce in articular matters.

These facts impact on the relationships between the orthopedic surgeons and odonto-dentists. The former require the latter to search and eliminate all infectious dental sources, patent or latent. The latter are caught between two fires: they either enlarge the indications and suppress, except obvious sources, all suspect sources, thus edentating a patient maybe too much and for no good reason, or they are more economical and see, in case of an articular infection, their responsibility challenged.

There has to be drawn a separation between three categories of patients:

- research of infectious sources of dental origin prior to the mounting of an articular prosthesis
- dental treatments appeared after a bucco-dental infection at a patient carrier of an articular prosthesis
- around an articular prosthesis. Research of a possible bucco-dental etiology.

RESEARCH OF INFECTIOUS SOURCES OF DENTAL ORIGIN PRIOR TO THE MOUNTING OF AN ARTICULAR PROSTHESIS

The 1997 conference of the American Dental Association and the American Academy of Orthopedic Surgeons simply suggests:

“The patients who need the mounting of an articular prosthesis must have a good

dental health before the intervention and should be encouraged to solve their dental issues if necessary”.

These directives are vague and force us to turn to those issued for the infectious endocarditis with a corrective capital. We shall further see the rarity of articular infections not certainly but probably of dental origin and the difficulty to prove it. That’s why it seems to us that we should keep the broad lines of the directives issued for the endocarditis but apply them with less severity.

There are two categories of patients: patients without risks and patients with a risk of infection on articular prosthesis.

Patients without risks:

They are patients who, beside their articular pathology, do not show any general pathology.

There is no counter-indication for non hemorrhagic dental acts (Table 1).

Table 1.

Acts of prevention <ul style="list-style-type: none"> • application of fluoride • sealing of fissures
Conservative care (coronary restauration)
Non hemorrhagic prosthetic care (plaster cast)
Mounting of orthodontic removable prosthesis
Mounting or adjustment of orthodontic devices

For the hemorrhagic acts the attitude should be as follows:

Two general rules:

- the antibiotic treatments have the same indications as in the case of a fault free patient
- it would be advisable to apply the general rule of a mouth wash with a chlorexidine based solution for 30 seconds before the dental intervention.

Detailed indications:

- contrary to the rules indicated when confronted with a risk of endocarditis, the edodontic care can be thought of. Ideally, the care should be done at least 3 months prior to the intervention on the articulation to follow the treatment evolution and extract the tooth in case of an infectious complication. We remind the fact that the interventions of orthopedic surgery are not necessarily urgent and collaboration between the odontologist and the surgeon avoids ill-timed acts.
- Retake of radicular treatments: the same rules may be admitted
- Pulped teeth with perfectly treated channels. DESCROZAILLES doesn't consider as an infectious source a tooth having suffered a correct channel obstruction more than a year before and which shows no periapical lesion
- Pulped teeth with channels not treated totally. It seems to us possible to be relatively indulgent on condition that the treatment lasts for more than one year and a minute examination shows no peri-radicular lesion
- Peri-apical surgery: it would be great to perform it 3 months prior to the mounting of an articular prosthesis. The tooth can be kept if after such delay there is a hint of calcification, if not, it needs to be extracted.
- Parodontal care. THYNE and FERGUSSON insist on the role of the parodontal malady as factor of articular infection. The tartar removal doesn't pose any problems, on the contrary, as the prognostic of parodontal surgery acts

is not always assured, the extractions have broad indications.

- Irrecoverable teeth: to be extracted
- Teeth included in an open pericorony sack: to be extracted
- Dental implants: the articular prosthesis is a foreign body similar to an implant, but this foreign body is completely buried in the organism, while the dental implant communicates with the oral cavity. The apparition of a peri-implantitis is unpredictable. Abstention should be the rule.
- Trauma: extra-cameral coronary fractions do not raise any problems. The endodontic treatments will be conducted conforming to the above mentioned directives. Radicular fractions will need extraction. Reimplants should be discouraged.

Patients with risks:

Their list is to be found in the table below:

Table 2.

Patient carrying articular prostheses for less than two years.
Patients with antecedents of infection on articular prostheses.
Patients with general pathologies such as: <ul style="list-style-type: none"> - Insulin dependant diabetes - Malnutrition. - Hemophilia. - Cancer - AIDS - Kidney failure - Heart failure - Liver failure.
Immuno-depressants patients: immuno-depression gained, constitutional or therapeutic Rheumatic arthritis (rheumatoid polyarthritis, erythematous lupus ...) <ul style="list-style-type: none"> - Long term intake of medicine (cortical therapy, chemo therapy...)

Selon Ching and coll., Murray and coll., Jacobson and coll., Johnson and Bannister, Berbari and coll.

It is obvious that the directives are too strict.

- the antibiotic treatments have too broad indications
- the endodontic care is inspired from the rules issued for endocarditis: treatments carried out under surgery, in one sitting, on perfectly accessible channels (monoradicular)
- intake of radicular treatments, periapical surgery: counter-indicated
- pulped teeth with perfectly treated channels: to keep according to the norms of DESCROZAILLES.
- Pulped teeth with channels not totally treated: extraction
- Parodontal care: no parodontal surgery

DENTAL TREATMENTS APPEARED AFTER A BUCCO-DENTAL INFECTION AT A PATIENT CARRIER OF AN ARTICULAR PROSTHESIS

After the conference held by the American Dental Association and the American Academy of Orthopedic Surgeons, the antibiotic prophylaxis is not indicated in the case of patients carriers of plaques and screws or in the case of patients carriers of articular prosthesis.

The risks of antibiotherapy are well known: digestive problems, toxicity, allergy, development, selection and transmission of a microbial resistance.

The reports risks/benefits and cost/efficiency do not justify such a prescription. The comparison between the articular infection and the infectious endocarditis is not valid, because the

anatomy, blood circulation, germs and the mechanism of infection are totally different. Any patient showing an acute oral-facial infection must be energetically treated through the elimination of the source of infection (incisions and drainage, endodontic treatments, extractions) and antibiotherapy. Usual signs at the level of the articulation must raise an alarm: tumefaction, pain, fever and temperature.

If the authors blame the systematic antibiotic prophylaxis at the moment of dental treatments, they make an exception for the patients with a risk of infection on the articular prosthesis (see table above).

A new reunion took place in 2003. The conclusions remain the same except for a modification in the classification of patients with a potential risk.

ROTHSTEIN insists on these conclusions and on the distinction between patients with a high risk and the patients with a low risk.

FIELD and MARTIN insist as well on the fact that the antibiotic prophylaxis is not systematically justified.

SEYMOUR and coll. Go a little bit further. The relations between the articular infections and the dental treatments are doubtful and there is no evidence that an antibiotic prophylaxis protects the patients. The relationship between dental treatments which provoke a bacterial disease and the articular infections stands and if an oral germ is involved it may come either from a spontaneous bacterial disease or from a dental infection. The antibiotic prescriptions recommended by orthopedists haven't been evaluated in a study with control-placebo. There is therefore little reason to institute an antibiotic prophylaxis. Besides, the risk of

prescribing such a prophylaxis is bigger than the risk of an articular infection.

In effect, for SEYMOUR, from 100 000 patients carrying an articular prosthesis, only 30 developed an infection which imposed its replacement.

From another point of view, the prescription of antibiotics would be the cause of 40 cases of anaphylaxis and 4 cases of death.

This statement is confirmed by JACOBSON and coll. According to these authors, the infectious risk is minimum: 29.3 cases for 10(6) dental acts. The risk of death from an oral therapy with penicillin is bigger. The prophylactic antibiotherapy is therefore a costly strategy. The author makes nevertheless certain concessions in particular cases.

LITTLE marks the same reserves with regards to the antibiotherapy because its benefit is not proven and the antibiotics may have side effects. The final decision is taken by the odontologist.

THYNE and FERGUSON have shown in the literature 21 cases of articular infection of dental origin. In only 3 cases a viridians streptococcus was found in the articulation.

The patients showed a marked parodontal malady. These authors quote a study by AINSCOW and DENHAM who followed 1000 patients, carriers of 1112 articular prostheses. No antibiotic was prescribed for covering a dental intervention or surgery. Only 3 patients showed an articular infection associated with an established cutaneous infection.

WAHL goes further in an article called "the myths of the infection of articular prostheses of dental origin".

The first myth is the similarity with the infectious endocarditis.

The bacteriology contradicts this myth: the viridians streptococcus was found only in 1.6 – 6% of the cases of articular infection. On the other hand, the staphylococcus found in 60% of the cases of articular infection doesn't form but 0.005% of the oral flora and was not isolated in the acute dental infections.

For the same author, less than 25 cases were recorded to prove these relationships. The physiological causes (mastication, tooth brushing, use of dental floss) provoke more endocarditis than the interventions. Why than accuse the interventions in the articular field?

No animal experiment showed that a bacterial disease of dental origin triggers an infection on the articular prosthesis.

For WAHL, only 0.5% of the patients who carry an articular prosthesis are attacked by an infection after a dental treatment.

The systematic antibioprohylaxis is therefore not justified, for two reasons: the inherent risks and, more importantly for the Americans than the Europeans, its cost. WAHL, following TSEVAT, insists on the countless failures of the antibiotic prophylaxis in the case of endocarditis; therefore it isn't certain whether the results are better in the articular pathology.

WAHL's conclusions are final:

"It is now time to stop the practice of antibiotic prophylaxis in order to prevent an articular infection around prosthesis after a dental intervention".

Other authors seem less hostile against antibioprohylaxis. Their opinion is based

on the results of investigations conducted by various practitioners.

SCHAAF and YODER estimate that there is a menace of infection through hematogens after dental interventions. There is no shared protocol to guide odontologists to determine the methods of treatment. That's why they carried out an investigation to which 121 orthopedists answered. Most of them recommend an antibiotic prophylaxis in the case of oral surgery, extractions and acute dental infection. The British Orthopedic Association advises on such a prophylaxis when the dental treatment is complex and long termed (more than 45 minutes).

A similar study was made in Great Britain by SANDHU and coll. on 250 dentists and orthopedic surgeons. 77.7% of the dentists recommended an antibiotic prophylaxis and only 29% of the orthopedic surgeons. The authors concluded that the cooperation between the specialties turns out to be necessary in order to set up strict rules.

SCHROUT and coll. conducted an investigation on 110 orthopedic surgeons and 63 odontologists. 9.3% of the former considered that the bacterial diseases after dental infections could affect the articular prostheses as opposed to 75% of the latter. The two groups thought the same about the consultation of the orthopedist before any dental treatment.

98% of the orthopedists are partisans of an antibiotherapy prophylaxis before a dental treatment, as well as for the whole duration of the patient's life. Certain authors make a difference between the great articulations (knees and hips) and the other

articulations for which this rule would be less strict.

NORDEN distinguishes between "ordinary" dental interventions which do not call for antibiotherapy as opposed to periodontal affections or potential dental infections.

Clinical consequences

What should therefore be the attitude of the odontologist or the dentist when they have to act on or treat an infectious accident at a subject who carries an articular prosthesis?

Antibioprophylaxis

It seems to be rejected by several authors on grounds that its possible inefficiency and side effects may be serious. It must be noted that Anglo-Saxon authors seem to be more troubled by the seriousness of these side effects than the European practitioners.

In reality it seems that it is advisable to prescribe it before any infectious phenomenon of oral dental origin.

Regarding the interventions, it seems pointless, except for complex interventions or long term interventions (more than 45 minutes).

This attitude is valid for the patients without risks. The indications of antibiotics for patients with risks are much broader.

Nature of the intervention

The endodontic care may be practical. An antibiotherapy will be instituted at the slightest menace of an infection. The periapical, parodontal surgery, the implants seem to us counter-indicated.

**INFECTION AROUND AN
ARTICULAR PROSTHESIS.
RESEARCH OF A POSSIBLE BUCCO-
DENTAL ETIOLOGY.**

For SHROUT and coll., the bacteria provoking most of the late infections around the articular prostheses have but few representatives in the oral cavity.

For the Conference of the American Dental Association and American Academy of Orthopedic Surgeons a bacterial disease of dental origin may trigger an articular infection either precociously after the intervention or several years after. The most critical period would appear 2 years after.

SKIEST and COYKENDALL state an observation of the infection of a hip prosthesis following a dental intervention. They remind the fact that the literature could reveal beforehand 21 cases of such an infection.

It was about a man of 39 years of age affected by lupus, treated by corticoids, carrier of a hip prosthesis and showing fever for more than 2 weeks, pain and limitation of movement of the hip. Seven weeks before, algia at the level of the 2nd upper right molar had been extracted. Because of a penicillin allergy, he had taken 2 hours before the extraction 3g of erythromycin and 500mg 6 hours after. Several dental interventions were conducted the following weeks, with an intake of erythromycin before each. The hip prosthesis had been placed ten years before and replaced 5 years later because of an infection with the golden staphylococcus. He was treated with irrigation, drainage and replacement of the prosthesis. The examination would show an oralis streptococcus, part of the viridians

streptococcus which was resistant to erythromycin.

According to SKIEST, 1 million people in the US are carriers of articular prostheses. The infection incidence is estimated around 0.5%.

Most of the infections were due to Staphylococci followed by Corynebacterium, hemolytic β and anaerobic streptococci. The viridians streptococci are recorded only in 2% of the cases and only 0.04% of these infections admit a dental etiology. For these reasons, the systematic antibioprophyllaxis is not justified for an oral dental intervention except the case of obvious infection. This opinion is confirmed by the Academy of Oral Medicine, The Council of Dental Therapeutics. Despite these recommendations, the author quotes a survey indicating that 93% of the American orthopedists recommend such a prophylaxis.

SEYMOUR and WHITWORTH confirm the distinction between precocious articular infection (within the two months following surgery) and late infection. The precocious infection is the consequence of the surgery; the late one comes from a hematogenic dissemination starting from a distant infectious source.

On the bacterial plan, more than 66% of the articular infections are caused by the staphylococcus and only 4.9% by the viridians streptococcus of possible oral origin.

The authors quote a record of 21 cases of articular infection attributable to a dental act. With one of these patients, the same microorganism was found in the cultures coming from saliva, blood and the articular

prosthesis. It was the hemolytic β streptococcus.

Another study incriminates primarily an infection of the skin and of the soft tissues. In 110 cases, 4 could be attributed to viridians streptococcus. These 4 patients had been victims of a recent acute dental infection.

ROUGERIE was able to record 28 cases of infected hip prostheses.

In 3 cases, the germs identified were certainly not of oral origin: the golden staphylococcus after spondylodiscitis, Escherichia coli, epidermis staphylococcus after the leg ulcer.

The author couldn't take samples from more than 6 other patients. There was no germ identification except one case: a 21 years old patient, affected by stiff spondylarthritis. A non-classifiable streptococcus was found at the level of a residual lacteal root and at the level of his hip prosthesis. Nevertheless, the antibiograms revealed a different sensitivity to certain antibiotics. From where the following conclusion:

"If certain authors have described clinical cases of late infections of total hip prosthesis, with strong suspicions of oral dental origin, none has recorded absolute evidence in reality".

Odonto-stomatological consequences

It is clear that the infection around an articular prosthesis requires the conduction

of a rigorous oral dental examination. The patient will be considered as a subject with risks and treated as such. The indications of extractions are therefore enlarged.

The extractions should be taken advantage of in order to make a bacteriological study of the extracted teeth. The sampling technique through immersion of the apex should be applied (LEPOIVRE, COMMISSIONAT, CHIKHANI and coll.). One should try to confirm a similarity between the germs at the level of the articular prosthesis and the germs collected at the level of the dental apex.

The antibiotic coverage will be prescribed with the consent of the orthopedic surgeon.

GENERAL THERAPEUTICAL CONSIDERATIONS

After the conference mentioned above, the rules of dental hygiene before and after the intervention must be strict: elimination of tartar, manual or electrical brushing, cleaning of contact points, and use of hydropulsers.

We stated the reserves of a good many American authors concerning the antibioprohylaxis.

Still, when the antibiotics are prescribed, mainly in the case of high risk patients, the conference proposes the following scheme in order to classify the dental interventions (Table 3):

Table 3.

SITUATION	ANTIBIOTIC	POSOLOGY AND WAY OF ADMINISTRATION
Standard prophylaxis	Cephalexin, cephradine or amoxicillin	2g per os one hour before surgery
Unusable oral way	Cephalozin or amoxicillin	Cephalozin 1g or amoxicillin 2g IM ouIV one hour before

		surgery.
Allergy at lactamines B	Clindamycine	600mg per os one hour before surgery
Allergy at lactamines B and unusable oral way	Clindamycine	600mg IV one hour before surgery

A second dose is not recommended except in cases of infection.

It seems to us that in France it is wiser to rely on the advice issued by the conferences in 1992 and 2002 on the prophylaxis of the infectious endocarditis:

- amoxicillin 3 g one hour before surgery
- in case of allergy at betalactamines: clindamycin 600mg per os one hour before surgery or pristinamycine: 1g per os.

The germs of dental origin are indeed sensitive to these antibiotics.

We should add to the antibioprophyllaxis a local pre-operative antiseptic under the form of a mouthwash chlorexidine based.

BENDER quoted by DECROZAILLES and coll.:

“It was demonstrated that certain local antiseptics based on chlorexidine applied on the gum 3 to 5 minutes before the dental extraction reduce the possibility of bacterial infection after extraction. It is recommended to use them in conjunction with the antibioprophyllaxis and not as a replacement of it”.

Post-operative the patient should be asked to check the temperature the next morning and the following days. In case of abnormally high temperature, the patient has to revisit the orthopedist. Anyways, the patient should be consulted the day following the intervention, In case of normal cicatrisation, no treatment is recommended. In case of late cicatrisation, with blood clots associated to: fetidity, vivid

pain, peri-maxillary edema, a complementary antibiotherapy is suggested according to the conference.

“Except certain invasive gestures in an infected spot, it will be necessary to extend the antibiotherapy”.

Moreover, 3g of amoxicillin one hour before surgery will be completed by 1g every 8 hours or 3g for several days until the healing of the operatory wound:

- elimination of all suspect necrotic areas
- disappearance of all fetidity
- disappearance of a peri-maxillary edema

The control of the temperature should indicate a coming back to normal; otherwise the orthopedist must be consulted.

In case of allergy to betalactamines, clindamycine or pristinamycine shall be used according to the same principles.

CONCLUSIONS

For the American authors the infections on articular prostheses are rare: 30 from 100000 carriers of prostheses according to SEYMOUR. For SKIEST, 1 million people in the US are carriers of articular prostheses. The infection incidence is estimated at 0.5%. The dental etiology is even rarer. 29.3 cases for 10(6) dental acts. Since the infection on the articular prosthesis is rare, for these authors it is difficult to prove a link between this infection and a dental etiology. The germs found at the level of the articular prosthesis are rarely considered as factors of dental infection. The streptococci viridians are not found in more than 2% of

the cases and only 0.04% of them admit a dental etiology. (SKIEST)

For SEYMOUR the incidence of the viridians streptococci is of 4.9% and of 1.6 to 6% for WAHL.

In front of such statistic results the strict rules suggested for the infectious endocarditis should be kept?

It seems to us that for the patients showing no pathology except their articular pathology, these rules should be softened according the scheme mentioned above. On the contrary, at the high risk subjects, the rules must be kept as strict as possible.

Another problem is raised by the American authors. The systematic antibiotic coverage of dental acts at subjects who are carriers of an articular prosthesis provokes in them an ever greater reticence. It is not only useless, but it seems that more Europeans fear the side effects associated

with it. They still admit that a large number of practitioners recommend it in the presence of invasive dental acts or in the case of a dental infection.

We recommend in this report the observance by the carriers of articular prostheses of the rules elaborated for the infectious endocarditis, keeping at the same time the same prescription protocol, this prescription being valid in effect for the germs of dental origin.

Since the articular infection is declared, it is obvious that the same strict rules should apply. Extractions are generally necessary. It would therefore be advisable to use the technique of sampling through immersion of the apex to show the germs and to compare them avec those recorded at the level of the articular prosthesis.



**Interview with Prof. Dr. SAMI SANDHAUS,
Founding Member of the European Society of Oral
Rehabilitation**

R. Prof. S, you are an outstanding figure of modern dental medicine, your name being associated with the concept of complex oral rehabilitation. How would you define this concept

SS. My concept derives from the basic notions of dental medicine, especially the aspects of anatomy and immunology involved in the organism acceptance of implanto-prothetic substitutes. There should be also considered aspects of functionality aspects such occlusion and temporo mandibular joint problems.

R. Which is the main aspect that governs the complex oral rehabilitation concept

SS. In my opinion material biocompatibility is essential to obtain the cascade effect in oral rehabilitation. Thus biocompatibility and imunocompatibility are closely related to prothetic bioarchitecture which refers to the therapeutic solution of selection conceived in a physiological context which relates matter and biology to dental material selection. Zirconium is highly biocompatible being used in prothetic suprastructure as well as in dental implants, influencing

decisively their biomechanical and biologic behaviour.

R. What is your opinion concerning titanium implants and non metallic protheses such as ceramic on Zirconium

SS. Oral rehabilitation is a whole therefore we cannot speak of implantology associated to conventional protheses .the integrative concepts related to biocompatibility and the principle of stomatology medicalization is valid for the entire treatment period. Stomatology medicalization has implications on the patient ,s general condition. We cannot use an aesthetic prothesis if it affects metabolism.

R. What does the European Society for Oral Rehabilitation mean

SS. This society founded 35 years ago is a team of professionals each with a definite role .We have frequent meetings ,organize post university courses where the practitioners are taught practical and theoretical aspects of oral rehabilitation found at the basis of an individualized approach to the clinical case. Most of our

members teach at prestigious European Universities and they are carefully selected.

R. Do you think a Romanian Society of Oral Rehabilitation is needed

SS. Definitely. This is a target for each country as each practitioner must know and use oral rehabilitation as this concept does not include any stomatologic treatment. Besides our society a new perspective of the dental technician viewed as a biorchitect (bioarchitect) CS, my collaborator is a biorchitect, he uses a biological technique, understands and uses properly the oral rehabilitation concept and is not a

conventional dental technician. The dentist and dental technician must learn that oral rehabilitation is not separated from cytological, biochemical, histological and tribological implications. Special care should be paid to materials which must be observed for a longer period and selected according to general condition and saliva structure. To conclude I would be pleased if the Romanian Society of Oral Rehabilitation joined The European Society as they share common goals and I sincerely hope that Romania will gain its deserved place in the context of European dental medicine.

**THE 2ND INTERNATIONAL CONGRESS OF THE ROMANIAN
SOCIETY OF ORAL REHABILITATION
BUCHAREST, NOVEMBER 18-21, 2009**

**DENTAL MEDICINE BETWEEN STANDARDS AND CURRENT
PRACTICE**

THE 2ND INTERNATIONAL CONGRESS OF THE ROMANIAN SOCIETY OF ORAL REHABILITATION constitutes an influential scientific event which will take place in Bucharest, at ROMEXPO, between November 18 and November 21, 2009, in collaboration with the Dental Medicine International Exhibition, **Denta 2009 – the fall edition**, a not at all random association which offers the participants a unitary view on the actualities in the field of dental medicine and a clear image of the contemporary therapeutic limits and possibilities, with a profound practical character, reflected in the increased number of hands-on, on one hand, and the latest materials and equipment on the other hand, challenging and connecting the practitioner to all that is new and modern.

This congress is becoming a traditional scientific event organized by the Romanian Society of Oral Rehabilitation under the effigy of the International Society of Oral Rehabilitation in collaboration with the Romanian Dental Association for Education and the College of Dentists from Romania, together with the Romanian Society of Oral Implantology and Materials, the Society of

Esthetic Stomatology of Romania, the Romanian National Association of Orthodontics, the Romanian Society of Endodontics and the Romanian Society of Stomatology, the mixed efforts of all these famous professional societies being an argument in favor of the complex vision of rehabilitation.

The hands on which are part of the program of the congress will be materialized in an optimum environment for the practitioners in order to assist and effectively participate to maneuvers and avant-garde techniques of the modern stomatology and the round tables will generate the proper context to analyze the legislative aspects as well as the new specialties approved for the first time in Romania.

This Congress is individualized through the new manner of approach which reunites conferences held by most famous names of European and Romanian Stomatology, doubled by practical demonstrations for each specialty of dental medicine, corroborated with the biggest exhibition of materials and equipment in Dental Medicine on the territory of Romania, putting together a representative number of companies from

Romania, Germany, Sweden, China, France, United States of America, Ireland and Pakistan.

The solemn opening of the scientific event will take place on Wednesday, November 18, 2009, 10:00 in “Nicolae Balcescu” Hall at ROMEXPO, followed by conferences mixed with hands-on.

The themes of the conferences are anchored in the current aspects of implanto-prothetic rehabilitation, an important emphasis being placed on the success/failure ratio in this avant-garde field of dental medicine, the restorative therapy, surgery, dental prosthetics, orthodontics being part of the themes approached at the congress; the participants will also take a

deep interest in the details regarding the aspects related to malpractice and defensive stomatology.

The hands`on develop and deepen the practical aspects of the implanto-prothetic rehabilitation using Mis and Ankilos implants, the use of the diga being especially useful in the competitive dental medicine. The new endodontic techniques and the CAD-CAM methods will also be of interest in dental prosthesis.

In parallel with the themes of the congress there are post-university lectures in the field of oral rehabilitation delivered by personalities of national and international dental medicine.

Location of Congress: ROMEXPO, Bd. Marasti 65-67 sector 1 Bucharest. **Web site :** www.quartzmatrix.ro/congres09

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Prof. Univ. Dr. Norina Forna
President of Congress



Societatea Română de Reabilitare Orală
sub egida
Societății Internaționale de Reabilitare Orală



în colaborare cu
Asociația Dentară Română pentru Educație și Colegiul Medicilor Dentști din România
în parteneriat cu



Societatea Română de Implantologie Orală și Biomateriale,
Societatea de Stomatologie Estetică din România, Asociația Națională Română de Ortodonție,
Societatea Română de Chirurgie Orală și Maxilo-Facială,
Asociația Română de Endodonție și Societatea Română de Stomatologie



Societatea de Stomatologie
Estetică din România
Dedicată excelenței în estetica dentară



organizează

Al II-lea Congres Internațional de Medicină Dentară al Societății Române de Reabilitare Orală

cu tema

„Medicina dentară între standarde și practica curentă“

în colaborare cu **Denta de Toamnă**



Președinte Congres:
Prof. Univ. Dr. MIHAI AUGUSTIN



Președinte de Onoare:
Prof. Univ. Dr. SAMI SANDHAUS



Președinte Congres:
Prof. Univ. Dr. NORINA FORNA

ROMEXPO, București, 18-21 noiembrie 2009



**Sala Nicolae Bălcescu
Sala Nicolae Iorga**

Conferințe susținute de nume de prestigiu ale medicinei internaționale și naționale
Hands'on-uri pe teme de implantologie, protetică dentară, endodonție, odontologie

Contact

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CREDITE EMC: 32

**PRESENT DAY TOPICS APPROACHED DURING
THE CONFERENCE AND HAND'S ON
OF THE INTERNATIONAL CONGRESS
BUCHAREST, 18-21 NOVEMBER 2009**

3d Navigation-Impla Sistem

The benefits of the use of 3D navigation in the current practice: virtual guiding and planning: Shortening surgical time, Planning the exact cost, Easier communication with the patient, Economic stock of implants.

Perfect documentation, 3D planning provides the necessary data for the acknowledgement of the following dimensions, Bone thickness, Sinus position, Bone quality, Position of veins, nerves, roots.

IMPLA™ 3D

The benefits of Impla 3D system

- **Impla 3D is a perfect system** (all the components come from an experienced developer, Impla, Schütz Dental)
- **Production of prostheses** (partner dental laboratory)
- **Production of 2D and 3D prostheses in your lab (3 or 4 axes)**
- **Good graphic** (easy to understand for patients, marketing tool)
- **Open system** (2D planning for any possible implant)

Just a second... Immediate charging with the Impla system!

- (teeth in just one session – fixation of prosthesis in one session)
- Benefits of the practitioner: Overall view, Safety, Shortening the treatment time for the patient, Marketing, Additional value, Documenting. Esthetics.

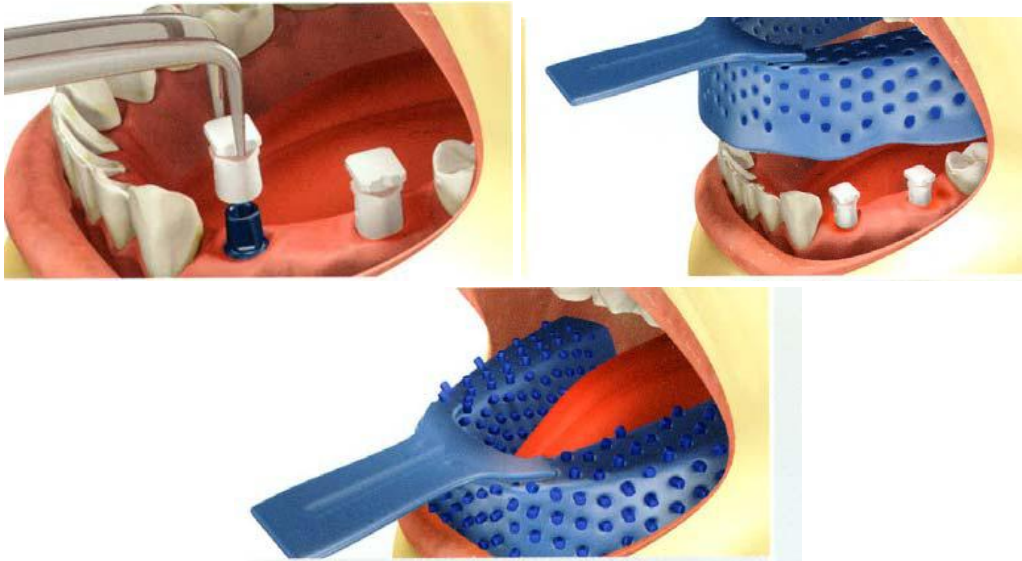
WHY 3D?

- The only system which is compatible with any implant system
- You make your own preoperative guide in a very easy way
- Information export to other colleagues (ex. for information update)
- The soft has no expiry date

A single CT/DVT is necessary

Impression in implantoprothetic rehabilitation

During the algorithm of implantoprothetic rehabilitation the impression stage is extremely important having a high degree of difficulty. It is essential for the dentist to know each step of this stage that combines various techniques and involves the correct application of prothetic accessories as well as the use of certain impression materials.



Stages of impression using MISS implants

The biomechanical characteristics of the impression material in use have great influence on the clinical finality, a special role having the present day therapeutic solutions rooted in implanto-prosthetics that use high precision impression material.

The impression material IMPREGNUM is associated with the automatic MIXING/MALAXATING equipment pentamix TM that mixes and doses homogeneously the impression material.

This impression material was used mainly in the case of implant prothesing. The use of Pentamix is associated with a simple procedure. The material reserves are introduced in the cartridge, the cartridge is

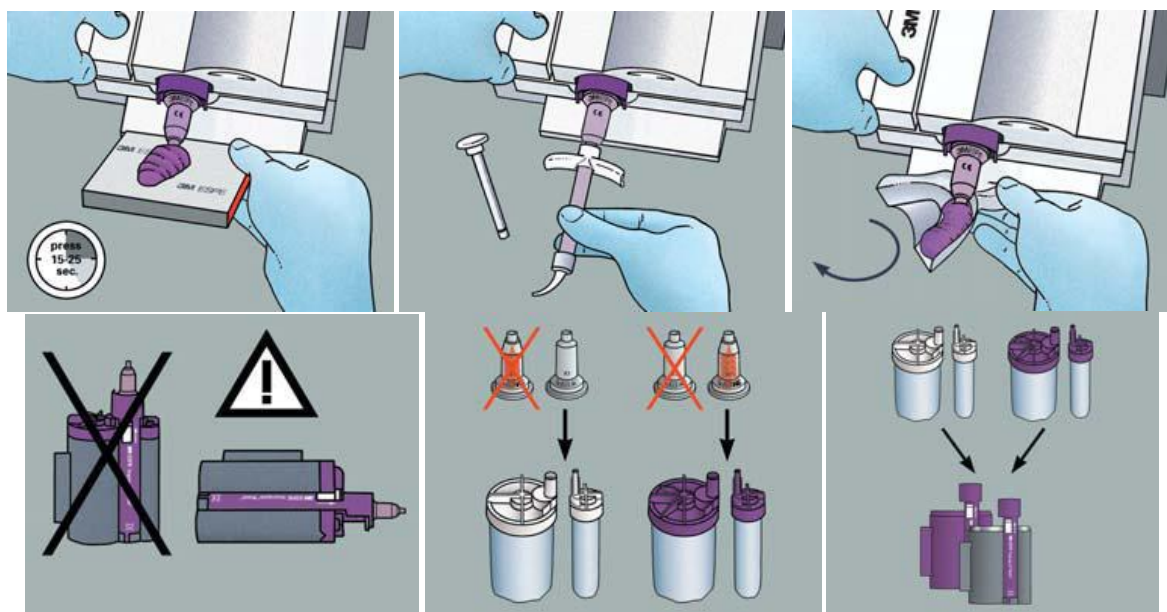
introduced in Pentamix, the mixing end and the cartridge are fixed in Pentamix and the material is dosed in tray.

The impregnum Penta Soft material composition includes Aluminium Sulphate, as retraction agent (for high precision mixtures).

The tixotropic properties make it easy to use.

The impression stability is up to 14 days allowing for the collaboration with dental technique laboratories placed at a distance from the clinic.

The material is hydrophilic, the slightly humid prosthetic field being acceptable
Aspects of using Pentamix and polyeteric material Impregnum



Guided osseous regeneration using BIO-OSS and BIO-GIDE.

The augmentation biomaterials have an essential role in prosthetic surgery of optimization the postextractionally resorbed alveolar ridges as well as in implanto prosthetic rehabilitation allowing for an optimum implant integration (periintegration).

The Bio Oss is a material of combination being elected in osseous defects associated with immediate or belated implanting

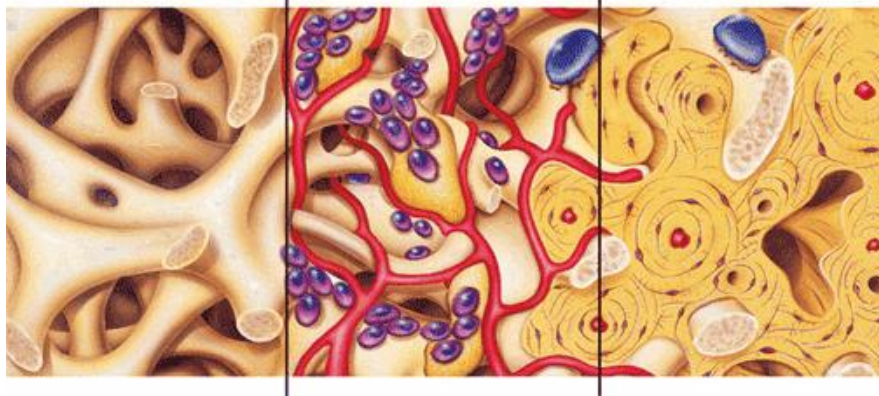
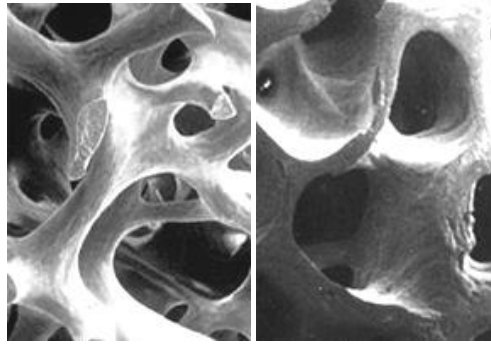
- it has osteoconductive properties and a high degree of biocompatibility
- the Bio Oss is a biologic guide of osseous remodelling
- it is a bovine anorganic substitute ABB
- due to slow resorbtion it maintains the optimum parameters of the osseous structure
- the resemblance with the human bone allows for the good regeneration with Bio Oss.



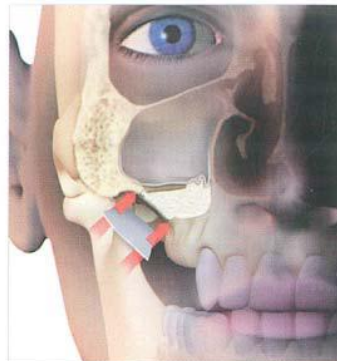
The TRABECULAR architecture and the crystalline structure of the Bio Oss allow for the formation of matrixes with high degree of osteoconductivity.

1. Bio Oss induces the process of revascularization, osteoblast migration and creation of a fine osseous network.

2. the micro SIMACROP interconnection stabilizes the blood clot, the premise of effective remodeling
3. the perfect integration of the new osseous structure associated with Bio Oss is completed in 6 months.



Indications of collagen membrane use

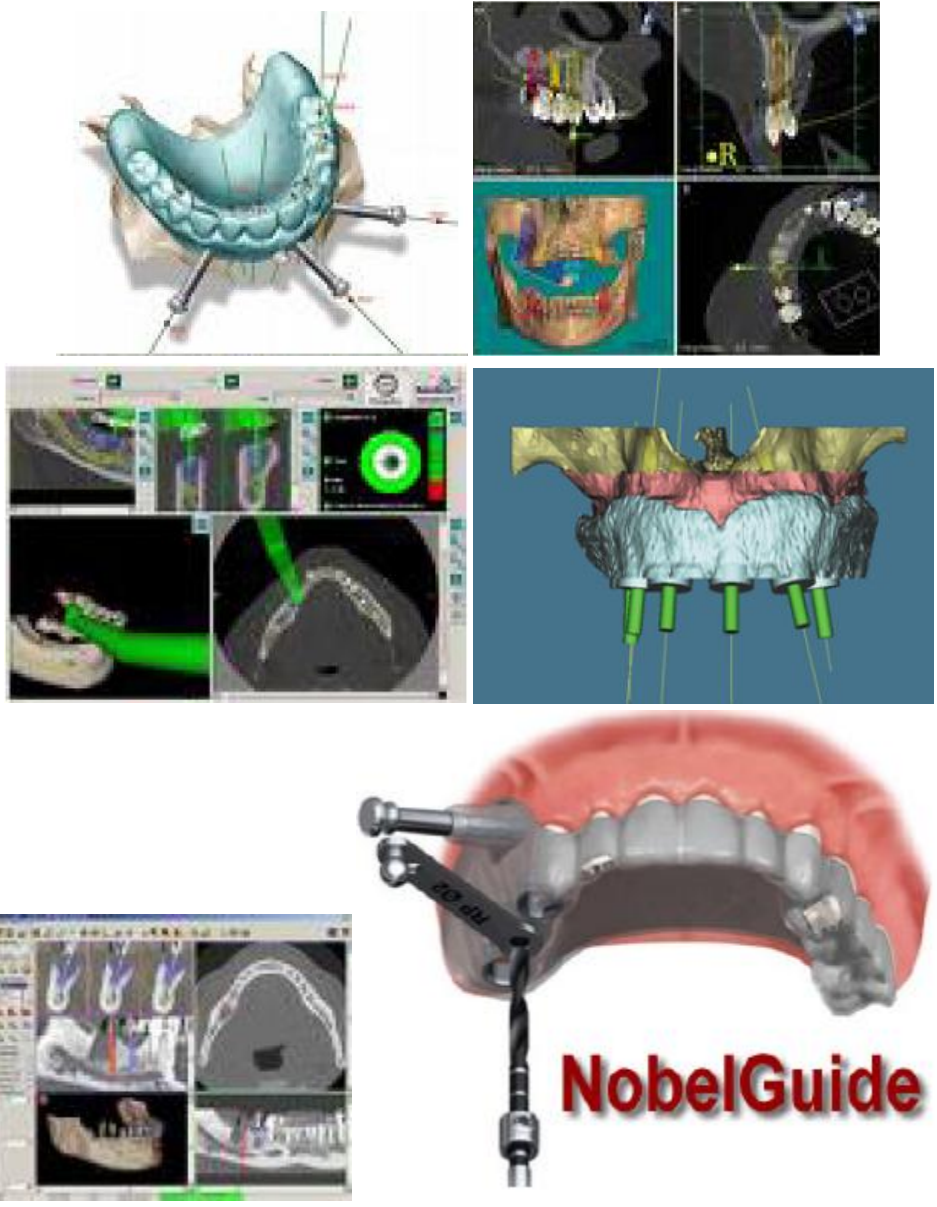


SINUSAL lifting

Graft protection in immediate or belated implants

Protecting grafted osseous defects
Protecting grafted SPONGY block





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seringa 10g

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priza **duala**



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+ varfuri aplicatoare



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MARCA NR. 1 RECOMANDATĂ ȘI UTILIZATĂ DE MEDICII DENTIȘTI DIN ROMÂNIA*

* conform unor studii din 2005, 2007

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