

Collagen Matrices for Drug Delivery: Preparation, Characterization and Kinetics of Release

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INTRODUCTION: The healing of connective tissues in the periodontal diseases requires deep lesions regeneration and the sub gingival plaque bacteria destruction [1]. Collagen playing an important part in tissue regeneration and doxycycline hyclate in infection treatment, their combination may represent a convenient system for the local delivery of drug for a prolonged period of time. This study presents the preparation of collagen-doxycycline matrices, emphasizing of their porous structure, *in vitro* biocompatibility and kinetics of drug release.

METHODS: Type I fibrillar collagen gels (C) were obtained from calf hide by acid and alkaline treatments [2]. The collagen matrices (CM) were prepared by lyophilization of 1,2% collagen gels containing 0.2% doxycycline hyclate (DH) (Fluka, BioChemica) and 0; 0.15; 0.20; 0.25 and 0.30% glutaraldehyde (GA) (Merck). The morphology of collagen matrices was visualized by scanning electron microscopy (SEM). The *in vitro* release of doxycycline hyclate was performed at 37±0.5°C in phosphate buffer solution (PBS) having pH = 6.8, using the USP paddle method. The amount of DH released was determined by UV-VIS absorption at 347 nm. The attachment of human endothelial cells (EA hy 926) was monitored by fluorescence microscopy.

RESULTS: The SEM micrographs of all the collagen matrices showed a highly porous structure of with interconnected pore channels. The *in vitro* cumulative release of DH from CM cross-linked with different percentages of GA is showed in Figure 1.

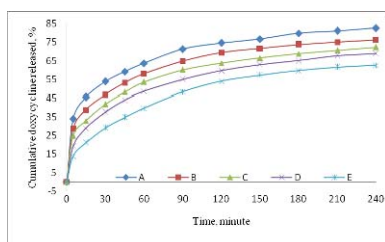


Fig. 1: *In vitro* release of DH from CM uncrosslinked (A) and crosslinked with: 0.15 (B), 0.20 (C), 0.25 (D) and 0.30% GA (E)

Investigation of drug release mechanism was performed by the Power law equation (1).

$$\frac{m_t}{m_\infty} = k \cdot t^n \quad (1)$$

where m_t is the amount of drug released, m_∞ – the total drug contained in the designed collagen matrices, m_t/m_∞ – the fractional release of the drug, k – the kinetic constant and n – the release exponent, indicating the mechanism of drug release. The five CM showed different kinetic parameters (Table.1).

Table 1. Kinetic data of DH release from CM.

GA in collagen matrices, %	0	0.15	0.20	0.25	0.30
Release exponent (n)	0.23	0.26	0.28	0.33	0.41
$t_{50\%}$, min	23.0	38.5	55.9	75.8	113.9

The biocompatibility studies revealed that all the collagen supports sustain the endothelial cell growth and proliferation.

DISCUSSION & CONCLUSIONS: The porous structure of collagen matrices is advantageous for the release of drug molecules and controls the process. The higher the concentration of GA the denser the structure of the matrix. All the matrices exhibit a similar cumulative drug delivery profile, following the Peppas mechanism of release. The increasing of GA concentration in the collagen/DH matrices results in the decreasing of drug release percentage. The kinetics of release depends on the amount of cross-linking agent: n and $t_{50\%}$ increase with its increasing. Each cross-linked matrix has a good biocompatibility with the endothelial cells. The present study reveals that the drug is releases locally from such formulations, having thus a high benefit-to-risk ratio. The studied collagen-doxycycline hyclate matrices have appropriate characteristics required by the application.

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Possible Errors in Full Dentures Casting

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INTRODUCTION: Casting full dentures represents nowadays an alternative to the classical manufacturing of full dentures by barothermopolymerisation, as well as to modern injection techniques [1,2]. Acrylic autopolymerisable resins, suitable for casting, have a characteristic casting temperature below 65°C, being prepared in a firmness suitable for casting.

METHODS: The authors used the Vertex casting system, and the specific acrylic resin Castapress (Vertex dental B.V., Zeist, Netherlands). The method includes the classical steps of the manufacturing technology for full dentures, to the final pattern step [3]. A special flask and a reversible hydrocolloid or a silicone material are used in investing the final pattern (fig. 1). After the setting of the impression material, the flask is unwrapped, the model being removed together with the denture base pattern (fig. 1).. The wax remains on artificial teeth are cleaned using the special Clean-Tray device.



Fig. 1: The wrapping of the final pattern (left), pattern resulting after the removal of the denture base pattern. (right).

The teeth are repositioned in the already created investment (fig. 2). The acrylic resin is prepared and poured in the flask through the special orifice, until it is full. Afterwards the polymerisation of the denture is carried out, by immersing it in a special polymerisation pot, filled with water at 50+/-5°C, at a pressure of 2,5 barr, for 30 minutes. Finally, the denture is extracted from the investment, with minimal subsequent adjustments (fig 2.)



Fig. 2: The teeth repositioned in the investment (left), the unwrapped denture (right).

RESULTS: The deficiencies appear mostly when using reversible hydrocolloids (not detected when using a silicone material), because of the air bubbles which develop when pouring the material into the flask (fig. 3). If we try to eliminate these bubbles by pressing the flask, it may result in the melting of the wax pattern (fig.3).



Fig. 3: Bubbles in the reversible hydrocolloid (left), melting of the wax pattern (right).

The deficiencies may also develop due to the air incorporation when pouring the acrylic resin into the investment, and they appear as porosities on the mucosal surface of the denture (fig.4). In other cases the dentures appear incomplete, due to the short working time of the resin used and too early setting (fig.4).



Fig. 4: Porosities on the mucosal surface of the denture (left), lack of substance (right).

DISCUSSION & CONCLUSIONS: When using a new technology, one should consider all the aspects incurred, namely both the advantages and the disadvantages offered by the system.

The study revealed possible errors subsequent to full denture casting, i. e., flaws that develop on the mucosal surfaces, which may be a consequence of a flaw in preparing acrylic resins, and mainly in improper pouring.

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Structure Anomalies of Enamel and Dentine Connected with Syndromes. Dental Report of 2 cases.

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INTRODUCTION: This case report describes the dental management of 2 children with 2 different genetic disorders affecting the hard tissues of teeth. These anomalies are: osteogenesis imperfecta (OI) and epidermolysis bullosa (EB). Both of them are uncommon genetic disorders, in which the structure of the enamel and dentine are also affected (Fig. 1 and 2).

OI and EB are autosomal dominant defects and the characteristic features vary greatly from person to person. On the score of the treatment the main challenges for the dental clinician are: 1. recognition and early diagnosis, 2. management and treatment of the oral complications, 3. disease prevention.

OI is a genetic disorder characterized by bones that break easily. There are 8 main types of OI and the most common and mildest type of OI is Type I.¹ OI is often accompanied with dentinogenesis imperfecta (DI). It is a disorder of tooth development; it causes the teeth to be discoloured and translucent.

A very important part of the dental management of OI children to teach how to brush and floss his teeth, because in case of DI teeth have an increased incidence of decay. The first “real” treatment for OI patients with DI involves restorative treatment of the affected teeth. The aim of our treatment is to keep teeth in the mouth without complain as long as possible. If the teeth will wear excessively or they need extraction, crowns and bridges should have placed on the teeth.

EB is a rare group of genodermatoses, where blisters develop on the skin and mucosa in response to minor trauma.

Because of the severe caries, advanced and frequent periodontal disease and the inadequate oral hygiene thanks to the deformities of the fingers these patients become soon toothless.²

The plan for oral rehabilitation was to restore the teeth and improve the mastication. In many cases crowns provide the best treatment.

At present there is no real cure for these disorders. The goal of the treatment is to prevent and control symptoms and subsequent complications. The aim of this article was to review 2 rare, genetic disorders with main characteristics and show 2 concrete cases and their treatment.



Fig. 1: Teeth with DI diagnosed at patient with OI.



Fig. 2: Upper teeth of the patient with EB.

DISCUSSION: OI and EB is rare and associated with unnecessary delays in diagnosis and effective treatment. Dentists are in a key position to recognize the oral manifestations of these anomalies because they are accompanied with many dental problems, like structure anomalies. Early recognition and treatment will improve the success of the therapy and the prognosis of the disease.

The purposes of this paper were to present the dental characteristics of moderate DI associated with OI, such as EB, and discuss the possible methods of dental treatment. The early dental involvement and oral hygiene instruction can be of help in reducing the necessity of extensive dental care.

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Diagnostic Aspects in Lymphoepithelial Lesion of the Parotid Glands - Case Report

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INTRODUCTION: Bilateral parotid masses are a rare clinical entity, although it can be observed in a wide variety of pathological conditions like neoplasms, Sjögren syndrome, sialadenosis, AIDS and behavior diseases.

METHODS: A 30 year-old female patient had a bilateral parotid swelling with a two-years history, minimal tenderness and no dryness in her mouth. Her medical history was irrelevant. On physical examination there were bilateral parotidian pseudotumours, the right side larger than the left. No other abnormalities were found and Schirmer's test was normal. Laboratory studies had normal values. She tested negative for hepatitis C virus (HCV), tuberculosis, human immunodeficiency virus (HIV1/HIV2), human T-lymphotrophic virus (HTLV1/HTLV2), cytomegalovirus and Epstein-Barr virus (EBV). No diagnosis criteria for Sjögren disease were met. The patient was diagnosed with benign lymphoepithelial lesion based on the MRI scan and on the clinic, cytological and histopathological investigations. The decision to operate by complete excision with facial nerve preservation, was taken for aesthetic reasons and considering the progressive enlargement of the lesions. The patient is currently under observation for recurrence or malignant transformation.

RESULTS:

MRI: two well-delimited parotid masses, right – 5,4/3/2,9; left – 5/3/2,8 cm; speckled pattern, the so called "salt and pepper aspect". (Fig.1)

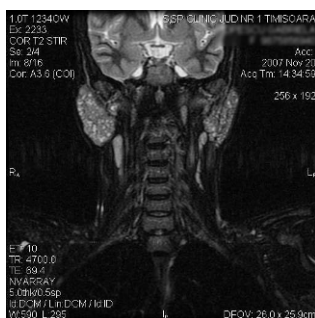


Fig.1: MRI scan.

CYTOLOGY: cytological samples using fine needle aspiration (FNA), showing mononuclear cells: lymphocytes, plasma cells, immunoblasts, histiocytes. (APT-Dragan – original method, immersion). (Fig.2)

HISTOPATHOLOGY: benign lymphoepithelial lesion with typical epimyoeptithelial islands berried

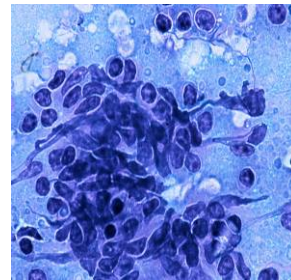


Fig.2: Cytological sample.

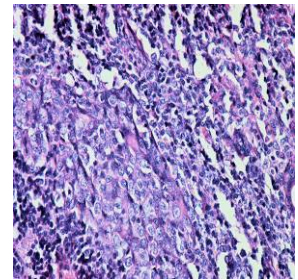


Fig.3: Histopathologic aspect.

in a lymphoid tissue with follicular and diffuse pattern, with a heavy lymphocytic cellular population (paraffin section, H and E, X 200). (Fig.3)

DISCUSSION & CONCLUSIONS: Tumour-like lesions must be distinguished from the true tumours of the salivary glands. The lesion can affect only the salivary gland without systemic manifestations or it can be a tissue manifestation of the primary or secondary Sjögren's syndrome. Also it may occur in AIDS or the MALT lymphomas. This type of lesion could develop into lymphomas. Benign lymphoepithelial lesion predilect affects female patients of any age, but is most common at the age of 40 to 60. The prognosis is generally good, but in our case, the early onset of the disease has an increased risk of turning into a lymphoma, knowing that a long history of preexisting benign lymphoepithelial lesion can become malignant. [1,2,3]

Long term follow-up is mandatory in patients with benign lymphoepithelial lesion, especially in younger patients who should undergo periodic investigation of the affected areas. We consider that MRI and FNA cytology are the appropriate means of diagnosis through their accuracy and the advantage of being noninvasive.

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Noninvasive Alternative Techniques for the Early Detection of Occlusal Overload

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INTRODUCTION: Bruxism is a parafunction that causes heavy occlusal loads. Our research team proposed for the first time the microstructural characterization of occlusal overloaded dental hard tissues by means of optic coherent tomography (OCT) in vitro [1]. The reliable results of that preliminary OCT investigation encouraged us to continue and to restrict the in vitro OCT examination to maxillary anterior teeth, which are most frequently exposed to occlusal overload in patients with horizontal bruxism.

METHODS: OCT was used to investigate 12 extracted maxillary anterior teeth, derived both from patients with active bruxism and from subjects without parafunction. All 12 examined teeth had no pathological attrition. Prior to the extraction of teeth, the patients were screened for bruxism by means of a Bite Strip device. Five of them had first degree bruxism and the other seven didn't practice that parafunction. An OCT microscope from Michelson Diagnostics Ltd of Kent UK was used for this study. The system uses an 1300 nm swept-source laser and can capture real time images 6mm wide with better than 10 micrometers optical resolution in both axial and lateral directions over the 1 mm imaging depth in the probe.

RESULTS: The OCT investigation of seven maxillary anterior teeth derived from patients without bruxism revealed homogeneous structure of the superficial enamel (fig. 1).

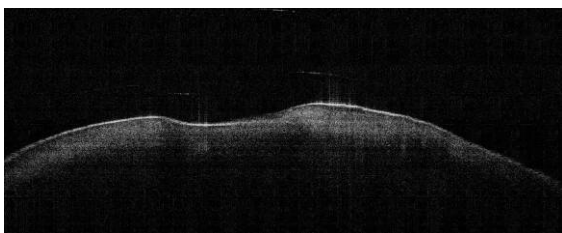


Fig. 1: OCT image of a tooth extracted from a patient with physiological attrition (B Scan in active evolution, image 80 from 100 slices in stuck, 18 degree in air)

Despite the normal morphology of teeth extracted from patients with first degree bruxism, the OCT images showed signs of enamel damage. The occlusal overload produced a characteristic pattern of enamel cracks, which didn't reach the tooth

surface (fig. 2).

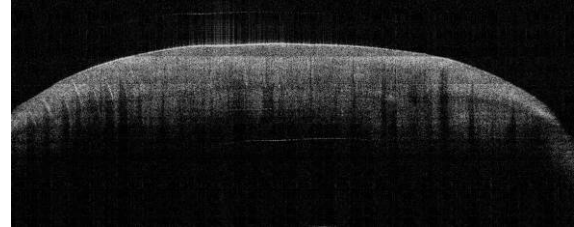


Fig. 2. OCT image of teeth from patients with active first degree bruxism (B Scan in active evolution, image 79 from 100 slices in stuck, 18 degree in air).

DISCUSSION & CONCLUSIONS: The group of applied physics from Kent used an OCT system and concluded on the possibility of measuring the mineralization/ demineralization degree of hard tissues in carious lesions [2]. The members of our team have already used OCT in vitro as a noninvasive method for the detection of defects in ceramic masses and for the visualization of defects in reinforced complete dentures [3]. In a preliminary OCT investigation we also identified a characteristic microstructural pattern for teeth with various degrees of dental wear [1]. The present study was focused on maxillary anterior teeth with a normal morphology, derived from patients without and with occlusal overload induced by active bruxism. The „hidden” occlusal overload was efficiently identified by means of OCT.

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The Pterygopalatine Fossa: Morphological Considerations

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INTRODUCTION: The pterygopalatine fossa (PPF), considered as the “Piccadilly Circus of the face” [1], may be approached using various techniques, to gain access via the pterygomaxillary fissure, greater palatine canal, maxillary sinus or the lateral nasal wall. We aimed to evaluate by dissection and on dried skulls the relevant topographic and morphometric features of the PPF in adults.

METHODS: We performed bilateral dissections in 15 human adult cadavers, fixed, using various approaches: (a) superior, via the middle cranial fossa floor; (b) anterior, transantral; (c) lateral, via the infratemporal fossa and (d) medial, via the nasal fossa. Also, measurements were performed on 50 CT scans and on 30 human adult dried skulls.

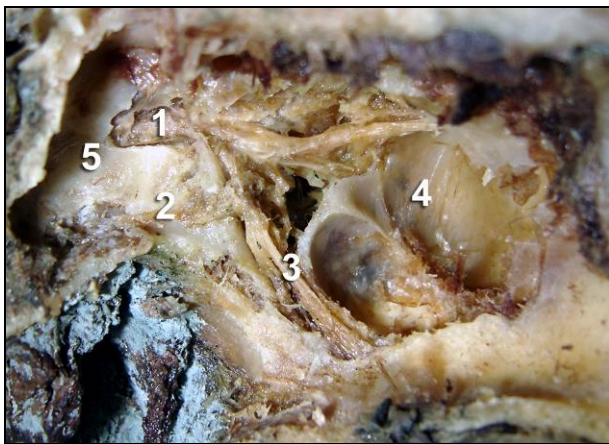


Fig. 1: General nervous topography at the level of the PPF evaluated after a medial (nasal) approach. 1.maxillary nerve; 2.vidian nerve; 3.greater palatine nerve; 4.maxillary sinus, presenting an incomplete transversal septum; 5.sphenoidal sinus.

RESULTS: The craniometric studies determined the mean length of the greater palatine canal 17,09 mm (SD: 2,98) with the axis directed in all the dried skulls we investigated anterior, inferior and medial. Even though the measurements of the greater palatine canal length and pterygomaxillary fissure length were corellable, no relevant correlation could be determined between these and the visceral skull height. The CT scans proved to be of real help for the PPF approaches; we mention here the angle we determined between the

sagittal plane and the direction of the transantral approach of the PPF that had a mean value of 16,46°. Dissections evaluated the anatomical structures that must be identified during various approaches of the PPF; perhaps the most relevant topographical detail is represented by the vascular layer disposed anteriorly to the neural contents of the PPF, a veritable obstacle increasing the risk if a transantral approach is preferred.

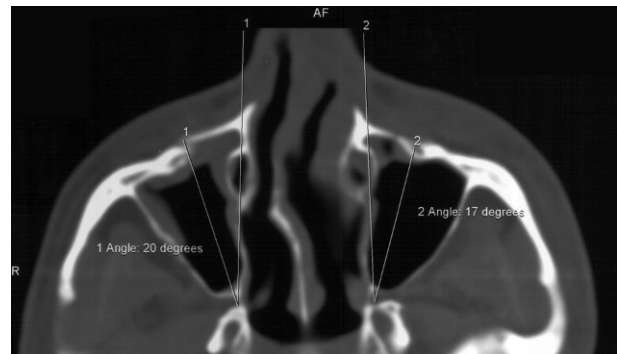


Fig. 2: CT evaluation of the transantral approach angle of the PPF.

DISCUSSION & CONCLUSIONS: Even though the traditional descriptions of the PPF seem well documented, the individual anatomical variation must not be neglected when a dental practitioner plans its approach. We are in agreement with those studies considering an extended PPF with distinctive recesses, the superior one being that one lodging the pterygopalatine ganglion [2, 3]. The safest approach seems to be the endonasal one that diminishes the risk of the vascular lesions at that level. CT evaluation of the PPF must be considered as a useful tool for determining the individual morphometric parameters to be used in patients.

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Study of the Caries by Stereomicroscopy in the Human Differentiated Tooth; Clinical and Morphological Correlations

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INTRODUCTION: Stereomicroscopy permits the three-dimensional study of the images and of laterality with superior quality in comparison with other methods. These advantages are given by the large examination fields and the wide work distances. The adding of the clinical and morphological data at the results gathered by stereomicroscopy and the stereomicrometry is useful in order to appreciate the depth and the width of the carious process and the necessity to reconsider the therapeutical strategy.

METHODS: During 2006-2007 we studied 10 third impacted molars, surgically removed and 20 premolars extracted for orthodontic reasons, with apparently sound surfaces. There were also been selected 13 periodontally affected premolars with different stages of caries, which were extracted without trauma. The in situ measurements at the occlusion surface were realized by using the fluorescent laser device DIAGNOdent. The base principles in stereomicroscopy stood at the base of the coaxial illumination techniques, obliquely and inellary one with optical adjustment of the alignment of the optical microscope and mechanical for the optimal illumination and micrometry. For the purpose of studying the samples in stereomicroscopy and trough polarized light we used the Olympus Microscope SZ $\times 7$ and an Olympus camera with $2,5 \times$ digital zoom and a $3 \times$ optical zoom.

RESULTS: The DiagnoDent has revealed that: from the 43 apparently healthy tooth: 18 presented values between 2 and 13 (D1), 13 values between 14 and 20 (D2), 12 values over 20 (D3). After the histological examination

in stereomicroscopy and in the polarized light: 25 teeth were healthy, 10 presented caries of the enamel and 8 presented dentin caries. The stereomicroscopy permitted the morphological study, the color absorption, the appreciation of the profundity of the substance loss that is very useful in grading the progression of the carious lesion(Fig.1).



Fig. 1: Deepness of the carious lesions studied by stereomicroscopy, $\times 8$.

DISCUSSION & CONCLUSIONS: The stereomicroscopic study correlated with clinical and morphological data permitted to appreciate the surface of the tissue involved in the carious process, but also the understanding of the demineralization process of the enamel, dentine and cement in proximity with the morpho-embriological markings of the human tooth structure.

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Modern Possibilities of Orthodontic Treatment in Adults

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INTRODUCTION: Interdisciplinary approach represents the key element in the oral rehabilitation of adult patient. The benefits of orthodontic treatment included improvement of the periodontal health, better occlusal intercuspitation and an easier approach of the prosthodontic design. The demand for orthodontic treatment in adults and the number of cases successfully treated have increased in the past years. In the past, adult patients avoided orthodontic appliances due to their inesthetic appearance [1,2]. Modern techniques, including lingual orthodontics, have increase the adresability of adult patients to their orthodontist [3,4]. The purpose of our paper is to exemplify, by clinical cases, the role of modern orthodontics in the esthetic and functional rehabilitation of adult patient, through the collaboration of dentists from different specialities: periodontology – orthodontics-implantology – prosthodontics.

METHODS: The case of a 39 years old woman with periodontal problems and consecutive migration of the upper incisors is presented. Periodontal problems were present, so it was important to establish a collaboration with the periodontologist and to stabilize the perio status before the initiation of active orthodontic therapy. After the periodontal therapy, the orthodontic treatment was started with a segmentar 2D lingual system from Forestadent.

The orthodontist had to carefully evaluate the case, to visualize the outcome and to establish realistic treatment goals, working together with a team formed by all dental specialities.

The patient was monitorised during and after the treatment in order to avoid periodontal breakdown.

RESULTS: The orthodontic treatment reestablished functional contacts and position upper incisors, and closed the spaces, in order to facilitate future prosthetic work.



Fig. 1: Initial situation.



Fig. 1: Results after 4 months.

DISCUSSION & CONCLUSIONS: The future orthodontics will become more biological and biomechanical correct, in order to respect the periodontal tissues.

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Strategic Marketing in Dental Medicine

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INTRODUCTION: The general marketing concept, as the medical one represent an area of particular interest for all categories of doctors, especially for dentists, where the majority develop their activity in dental surgery or private practices.

When the word marketing is mentioned, most of us think about advertising. However, marketing means much more.

Marketing, as a discipline overcame later to maturity, took over knowledge from other domains, adjusting them in concordance with the matter of studying the market [1,2]. Traditional marketing was characterized by capital building, capital leading or a medical service, delivering and selling the respective service.

METHODS: Among modern marketing, new functions² were added as: the market request, new product/service investigation, advertising and sales promotion, services for consumer/patient, etc.

Through marketing, a favorable correlation between service needs and offer can be accomplished.

Health marketing includes potential consumers who accomplish necessity conditions, requirements, wishes to obtain medical products/care, but which also have the economic availability to realize the transaction (medical insurance or financial resources).

The marketing concept in medical practice takes into account realizing a harmony between medical practice opportunities and patients, waiting to satisfy the medical service provider as well as the consumer. Marketing is seen as a profitable business for the doctor and the consumer, which develops in the market economy from the health systems.

The marketing strategy is a process that identifies opportunities, resources, objectives and works out a program to control marketing activities. The average, being a source of opportunities and unfavorable situations by adaptation strategy, the organization creates strategies according to the external conditions.

RESULTS: Marketing can be divided into two categories: internal and external.

Internal marketing is what is done at the consulting room standard to hold back the patient. It is very important to establish what the patient perceives about the medical team members attitude (first impression).

External marketing consists in identifying and attracting new patients through different advertising, some implicating high costs – newspapers, magazines, posters, distributing folders, advertising panel, relation with the people, telemarketing, e-marketing, websites [3] etc.

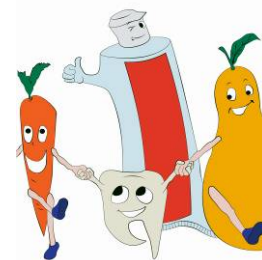


Fig. 1: Coloring book – Strategic marketing instrument for oral health promotion

DISCUSSION & CONCLUSIONS: The real marketing magic resumes to the real motive for what patients accept treatment and stay patients: Trust is the key of success.

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Application of Inductively Coupled Plasma-Mass Spectrometry to Investigate the Presence of Trace Metals in Human Tooth

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INTRODUCTION: The role of trace elements on human health and in environmental pollution has developed into an extensive field of research. Human tooth provides a nearly permanent and chronological record of an individual's nutritional status and anthropogenic trace metal exposure during development. It might thus provide an excellent bio archive.

This study describes a method of determination of trace metals incorporated in human dental hard tissues, as an indicator of exposure to environments with different grades of pollution during odontogenesis.

METHODS: The study was done using deciduous teeth exfoliated or extracted. The teeth were collected from areas with different pollution levels, Moreni and Bucharest.



Fig. 1: The areas from where the teeth were collected

The crowns separated from their roots were digested and analyzed for several metallic elements by inductively coupled plasma mass spectrometry. ICP-MS is a quantitative and qualitative technique for measuring trace elements (metallic ions). The digestion was done using 65% HNO₃. The device used was ELAN DRC-e from Perkin Elmer. Elemental concentrations of Pb, Cd, Mn, Cu and Zn were determined.

RESULTS: The concentrations of metals showed a different distribution between the two hard dental tissues layers (enamel and dentin) of analyzed primary teeth.

Experimental ICP/MS data, obtained from primary teeth samples indicated that dentin layer tends to contain more Cd, Pb and Zn than enamel layer.

Table 1. Results- samples from Moreni

Sample	Hard structure	Released ions				
		Pb	Cd	Mn	Cu	Zn
Moreni 5	Dentin	10.5	1	5.8	11.2	19.6
	Enamel	6	-	0.8	3.8	16
Moreni 6	Dentin	1.3	0.2	3.2	12	18.8
	Enamel	0.8	-	-	5.6	12.3

A very high content of heavy metals was found in areas with high pollution level such as Bucharest.

Table 2. Results - sample from Bucharest

Sample	Released ions				
	Pb	Cd	Mn	Cu	Zn
Dentin and Enamel Bucharest	132	11	43	1460	692

DISCUSSION & CONCLUSIONS: An inhomogeneous concentration of metals was discovered in enamel and dentin. Also an increase in heavy metal amount was detected for more degraded teeth.

So the study demonstrates the ability of ICP-MS to provide elemental presence information in dental hard tissues of primary teeth, by thus, being useful in decoding nutrition and pollution information concerning the development period of human enamel and dentin.

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Morpho-Cytological Assay Regarding Behavior of Dental Pulp Stem Cells in High Rich Glucose Medium

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INTRODUCTION: Taking into consideration the major interest in developing tissues engineering techniques using embryologic stem cells or progenitor stem cells for tissular regeneration our approach was to release a cytological assay regarding dental pulp stem cells using, as cellular stress factor, a high rich glucose medium[1].

METHODS: The aim of this study was to obtain in the first step the progenitor mesenchimal pulp stem cells followed in the second phase by the analyze of morphological character of the differentiated population in medium with high and low glucose concentration². The coloration of cells and cell material from the stem cells culture was made by using the May-Grunwald Giemse (MGG) method.

RESULTS: Modification of the cellular density was observed in high rich glucose medium, the increasing of the cells volume induced by the overrated nucleus cytoplasmatic volume, cytoplasmatic vacuolization, wiped cellular outline, with inequal intercellular spaces and variations in the shapes of the cells. The cellular behavior in medium with low glucose concentration is induced by the intervention of some oxidative and mechanic stress factors which induced apoptosis frequently recognized on smears.

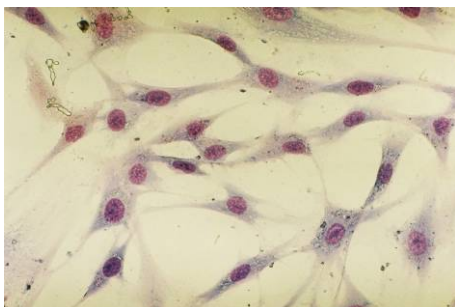


Fig. 1: Pulp stem cells culture smear with star appearance, effiliated prolongations, network disposal, unequal intercellular spaces, relatively constant cell volumes, shape and nuclear dimension uniformity; control prepartate in MGG staining, x 400.

DISCUSSION & CONCLUSIONS: The cytological assay regarding the behavior of the

dental pulp stem cells taking as cellular stress factor the high rich glucose medium evidence cellular modification in conditions created by high rich glucose medium fact that could suggest both reactivity of the host cells as well as of the bacteria.

If the actual therapeutic methods address especially to the restoration of the morpho-functional integrity of the teeth it is not excluded in the future the orientation of the methods towards the regeneration of dental structures.

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In vitro Evaluation of the Residual Obturation Material after Retreatment

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INTRODUCTION: The objectives are to evaluate the efficiency of the ProTaper retreatment and Universal instruments in removing gutta-percha fillings.

METHODS: Canals of 36 straight extracted roots (20 incisors, 6 premolars, 5 cuspids, 5 molar palatal roots) were instrumented using ProTaper instruments (Dentsply-Maillefer, Ballaigues, Switzerland), NaOCl 5,25% and EDTA 17%. The working-length was set using Morita DentaportZX (MoritaMfg.Corp., Japan) to the apical foramen. Roots were obturated using the lateral condensation technique and master cones (Meta Biomed Co, Korea) and auxiliary cones size A (Dentsply-Maillefer, Ballaigues, Switzerland) and sealer AH+(Dentsply-DeTrey, Zurich, Switzerland). After 2 weeks, gutta-percha was removed using the ProTaper retreatment and rotary ProTaper Universal instruments (Dentsply-Maillefer, Ballaigues, Switzerland), according to the manufacturer's indications. Last retreatment instrument was one size greater than the last instrument used for instrumentation. Control radiographs were taken. The roots were embedded in acrylate. 5 transversal sections were performed at 0.5mm, 1mm, 1.5mm, 2 and 2,5mm, and were examined under direct, polarized light microscope and stereomicroscope (OlympusBX51M, at 50X and 100X magnification). The images were captured using an Olympus ColorView IIIu digital camera and analyzed with the Analysis Auto system. Data were registered for each section: total perimeter of the canal and the residual gutta-percha perimeter. The Mann-Whitney test was used to compare the residual gutta-percha perimeter between sections.

RESULTS: The mean percentage of the residual gutta-percha perimeter area varied from 53.16±27.13 at 0.5mm of apex, to

36,22±32,55 at 1mm, to 46,36±29,70 at 1.5mm, to 50,22±29,18 at 2mm, and to 39,64±30,11 at 2.5mm. A significant difference was found between the residual gutta-percha perimeter at 1mm and 2mm, and between 2 and 2.5mm ($p < .05$).

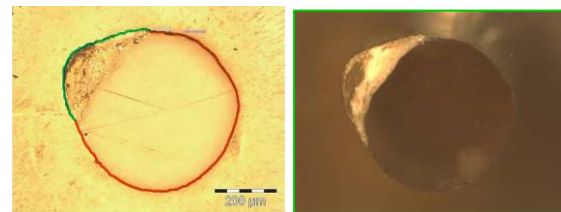


Fig.1: Sectional image of a sample in light- (left) and polarized light microscopy (right), with the "clean perimeter" (red) and the residual gutta-percha perimeter (green)(50x)

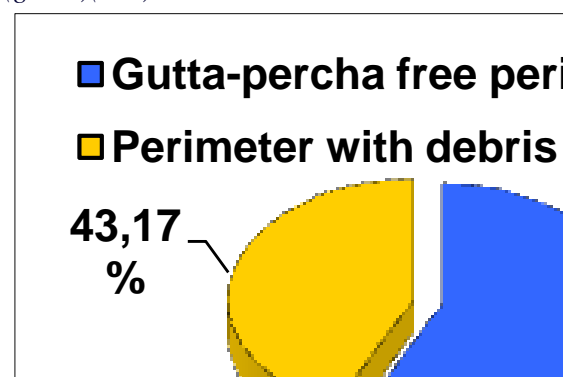


Fig. 2: The cumulated mean values of the "clean" and residual gutta-percha-perimeter (% from the total perimeter)

DISCUSSION & CONCLUSIONS: The highest percentage of residual gutta-percha was observed at 2mm of apex. When using rotary ProTaper retreatment and Universal instruments for removal of gutta-percha, a relatively high mean percentage (between 37-53%) of the root canal perimeter harbors

residual material within the last 2.5mm of the re-instrumented canal.

Orthodontic Management in Genetic Syndroms with Orofacial Pathern

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INTRODUCTION: The comprehension of the hereditary transmission process has difficulties by means of chromosomal network, to which the genetic reality is different from one person to another. This fact is influenced by different environment conditions, that modify the selective influence.

The gene is the hereditary information unit, a part of DNA-molecule that modifies the protein in charge of defining a character. The action of hereditary factors on cranio-facial morphogenesis may influence the bony tissues, neuromuscular system, the growth cartilage, teeth, dental arch and soft tissues.

METHODS: The present cases contain some interdisciplinary aspects (orthodontics, medical genetics, oral surgery, radiological), where specific clinical and paraclinical investigations, helped to establish a proper diagnosis and the accomplishment of the therapeutic objectives.

DISCUSSION & CONCLUSIONS: The normal chromosomal complex of the cellular nucleus, is a system that assures the development and the normal function of the organism.

The chromosomal anomalies modify the chromosomal system leading to modifications of genetic structures, causing disfunctions of hereditary factors and biologic activity of the organism.

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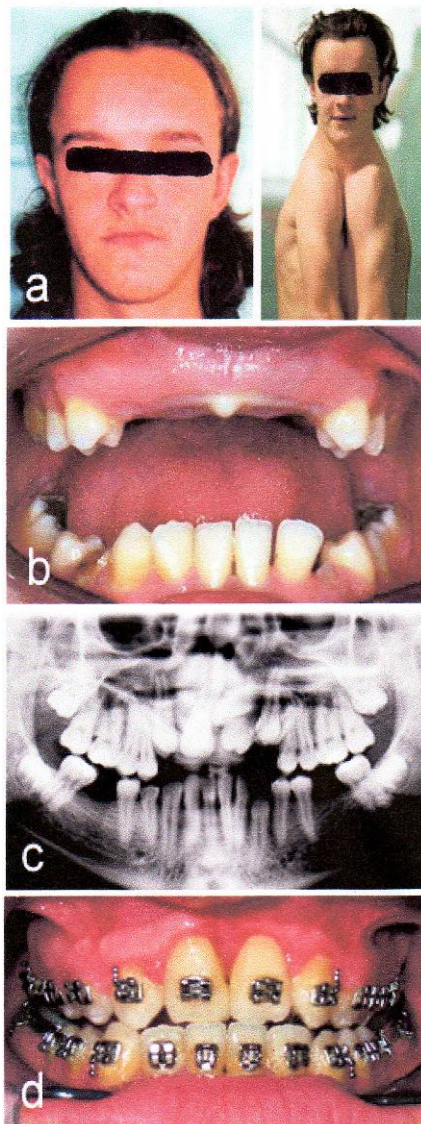


Fig. 1: Dysostosis cleidocranialis effect: a. exooral aspect; b. intraoral aspect; c. radiological exam; d. current clinical situation.

Functionalized Guided Tissue Regeneration (GTR) Membranes with Improved Drug Delivery Properties

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INTRODUCTION: The use of guided tissue regeneration (GTR) techniques to treat periodontal defects is now commonplace although membranes are found commonly colonized by oral bacteria. The purpose of this study was to develop a membrane applicable for periodontal GTR devices with drug delivery function in particular for the disinfections of deep periodontal pockets during the healing period. In the present work, polymeric cyclodextrins (CDs) or maltodextrins (MDs) were coated on non-resorbable polyvinylidene difluoride (PVDF) membranes for carrying antimicrobial agents [1,2]. CDs are cyclic oligosaccharides that present a doughnut shape, while MDs are linear starch oligomers with only hydrophilic groups.

METHODS: Microporous PVDF membranes were provided from Millipore®. The PVDF and cellulose membranes were coated with CD- or MD- citric acid mixtures resulting in a 12% and 18%-wt yield respectively. Then the coated devices were loaded with chlorhexidin (CHX). The complexation of CHX into CDs cavities and on MD molecules was demonstrated by UV spectrophotometry and Nuclear magnetic resonance (NMR) studies. - The cytocompatibility of the coated surfaces was assessed with the human epithelial cell line (L132) and the murine osteoblast line (MC3T3-E1): viability, vitality and proliferation. - Bacterial inhibition was performed on agar plates with a *Fusobacterium nucleatum* strain after impregnation and subsequent release in human blood plasma.

RESULTS: The maximum CHX release time from the two dextrans was similar (up to 10 days), but the amount of the CHX release was different: MD and β -CD grafted PVDF membranes released respectively 103 mg/g and 37 mg/g CHX. Apparently, MD coatings captured 3 times more CHX compared to coated β -CD and 100 times more compared to virgin membranes. Viability cloning tests with L132 cells demonstrated non-toxicity of CD and MD monomers and polymers with survival rates from 80 to 95 % at the highest concentrations of 4 mg/mL in culture medium.

In vitro cell proliferation and vitality tests revealed no difference between virgin and grafted membranes. After impregnating the virgin and

coated membranes in CHX, we observed a significant decrease of epithelial cell growth and survival due to the toxicity of CHX (0.4 mg/L), less remarkable on the coated than on the virgin membranes. Thus the controlled lower CHX release generates a lower cytotoxicity than the burst releasing behaviour of a non-grafted surface. Osteoblasts showed a similar behaviour.

Virgin membranes have no more antimicrobial activity after 24 hours. CHX loaded β -CD- and MD- coated membranes displayed an antimicrobial activity up to 48 and 72 hours, respectively (Fig. 1). Moreover, the inhibition zones for MD-coated membranes were always larger. CHX loading make them more efficient against *F. nucleatum*.

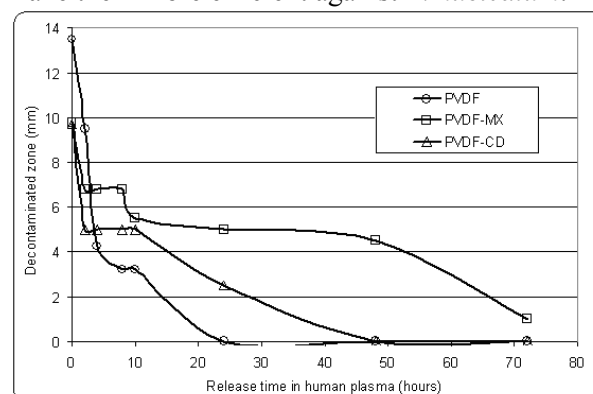


Figure 1: Antimicrobial effect of virgin and grafted membranes impregnated with CHX on *F. nucleatum* after release periods up to 72 hours in plasma.

DISCUSSION & CONCLUSIONS: The model of CDs coating could be a good Drug Delivery System, where CDs play the role of multipotent carrier for multiple bioactive molecules. The *in vitro* kinetic release study of the CHX in human plasma showed that grafted membranes could release a higher amount of drugs during a given period compared to virgin membranes. MD grafted membranes adsorbed higher amounts of CHX and maintained longer efficacy against bacteria compared to β -CD-grafted ones, which is essentially due to the ionic interaction between the CHX and the MD.

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Laser Welding Methods in Removable Partial Dentures Technology- a Finite Elements Method Analysis

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INTRODUCTION: The usability of the welding procedures is recognized in removable partial dentures technology [1,2,3,4]. The strength of the welds is connected to the residual stresses which appear immediately after welding procedure [22]. The combination of parameters in the laser welding creates difficulties in the performance of some reliable joints.

METHODS: The parameters of a dental alloy („C” from Vaskut Kohászati Kft - Budapest, Hungary) were used. The analysis with finite elements of the residual stresses was performed in two stages: a simulation of the welding processes with the with emphasis on heat distribution and heat flux, in fact a thermal analysis; a static analysis of the stress state which results as a consequence of the welding process.

RESULTS: Analysing the stress field of numerical simulated longitudinal section, the high values of stress from the heat affected zone and their orientation towards the welding exterior surface, it can be observed the highest temperature is obtained in the first second. (fig.1).



Fig. 1: Presentation on the longitudinal section of welded plates for the stress areas according to the welding type: a. on two faces; b. on one face

The temperature distribution on a period of 1-6s and total heat flux distribution of the fusion zones was evaluated, after the application of a welding arch (fig.2).

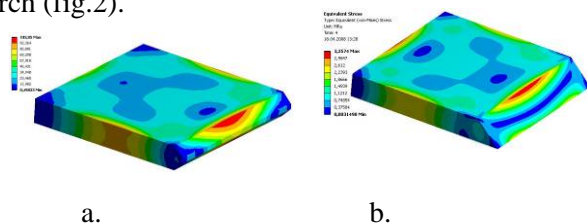


Fig.2: Stress distributions during the first second after welding: a. welding variant on two faces; b. welding variant on one face.

At the type one face joint (fig.3.b.), it can be noticed an intensification in tensions on the surface of the heated zone, this factor possibly contributing to the appearance and the spread of surface cracks (fig.3).

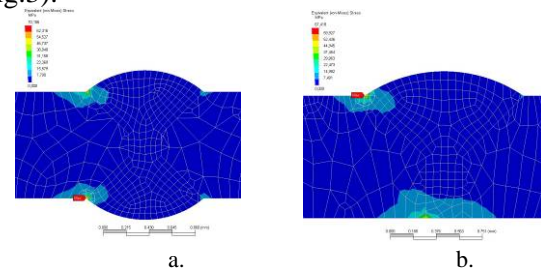


Fig. 3: Equivalent of von Mises stress for welded joints: a. on two faces; b. in one face

DISCUSSION & CONCLUSIONS: The study with finite elements has the advantage of being non-invasive and of permitting a correct prognosis of cracks appearing zones in the heat affected areas. Welding is a useful method for metallic prostheses repairs and for the control of welding heat input, contributing to the decrease of welding stress and to the avoidance of cracks.

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The Risk of Infectious Endocarditis after Dental Procedures – Case Presentation

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INTRODUCTION: Guidelines show that dental procedures for which antibiotic prophylaxis of infectious endocarditis is recommended in patients with cardiac conditions are all dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa.

METHODS: Clinical presentation of a case with infectious endocarditis after dental procedures. Male patient, aged 50 years, with idiopathic cardiomyopathy, who develops unregulated fever, lasting for 5 weeks, after dental procedures. The patient is treated with amoxicillin + clavulanic acid for 2 weeks, but the fever persists. Hemoculture identifies *Staphylococcus aureus* methicillin-resistant. Using the antibiogram, he is treated with the association of oxaciline + gentamicine + pefloxacin for another 10 days, remaining with high persistent fever.

RESULTS: From the moment in which therapy is switched to meropenem 2 x 2 g/day, fever disappears. Antibiotic therapy is continued for 10 days, offering complete afebrilisation.

DISCUSSION & CONCLUSIONS: The antibiotic prophylaxis is mandatory in patients with cardiologic risks before dental procedures. In choosing the appropriate antibiotic, it is necessary to have in mind the possibility of dissemination of a resistant bacterial agent. The therapy of infectious endocarditis must be initiated from the beginning with carbapenemes or 4th generation cephalosporins, in order to avoid bacterial resistance and lowering the duration of hospitalization and costs of the treatment.

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Crown's Destructions Restoration in the Esthetical Area - A Multidisciplinary Approach

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INTRODUCTION: Any dental restoration must rebuild the functional morphology of the teeth; in addition, the treatment of the teeth from the esthetical area needs to take in consideration the individual color characterizations and the other specific demands of esthetic dentistry.

METHODS: Crowns destructions localized in the frontal superior teeth area need to be evaluated from several points of view, including the localization and the tissues involved, the quality and the quantity of the remaining tooth structures and the patient's age. Aesthetic restoration of the maxillary anterior teeth can be accomplished using a variety of direct (fig.1a-1d) and indirect methods, associated sometimes, with plastic surgery; for the compromised teeth it ca be use the implant supported proteases.

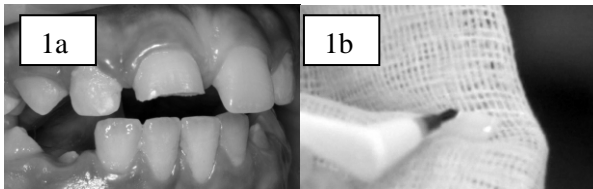


Fig.1a: Tooth 1.1 .- crown fracture (EllisII-nd class).
Fig.1b: Adhesive treatment of tooth's fractured fragment

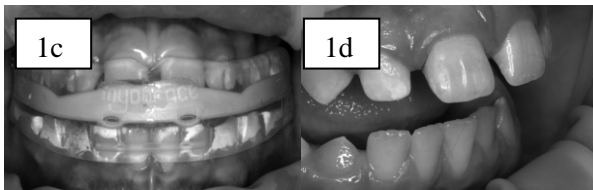


Fig.1c: Orthodontic treatment with Myobrace. Fig.1d: Final result, one year after adhesive reattachment of tooth's fractured fragment.

Complex cases, in which more than one tooth are involved, with crown destructions differing from each other, require individualized treatment, taking different advantage of the different remaining tooth structures (fig.2a-2d).

RESULTS: This paper presents different techniques of restoration applied to the esthetical area teeth beginning from the simple to the complex cases that required a multidisciplinary vision involving different dental specialties.

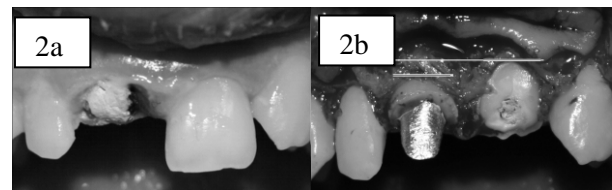


Fig.2a: Crown fractures of both superior central incisors: 1.1.crown lost and 2.1.subgingivally fracture, with the coronal fragment still in place. Fig.2b: The alveolar bone symmetrical re-contouring.

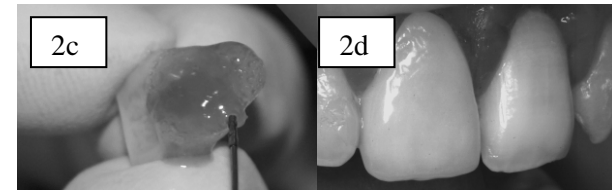


Fig.2c: Etching treatment of 1.1. tooth fractured fragment. Fig.2d: 1,5 year postoperatively: 1.1 restored with metal-ceramic crown and 2.1 restored by reattachment technique.

DISCUSSION & CONCLUSIONS: Given the esthetic impact of the superior anterior teeth, the primary goal of the treatment aims to obtain harmony of the smile

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Evidence of the Need for Ergonomics Training of the Dentists: There Are Costs of a Flawed Posture and Working Routine

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INTRODUCTION: International dental literature shows that about 65 % of the dentists (i.e. two of three dentists) have musculo-skeletal complaints more or less severe, with discomfort, pain, hindrance in functioning and also loss of working time[1]. The musculoskeletal disorders (MSDs) are progressively installed and the “ergonomic hazards” that cause them are often thought to be remedied by engineering improvements[1,2,3]. We aimed at evaluating the influence of the working habits and routine.

METHODS: We selected 155 dentists from Timisoara, arranged in four strata of age (the sample was randomized from a larger group of volunteers who signed an informed consent, based on the results from a previous pilot study). All subjects answered a questionnaire and their lumbar spines were visually examined by two independent examiners (a total of 95 items were registered for each subject). The data were statistically processed using SPSS v.15.

RESULTS: Table 1 shows the significant differences between the professionals of different age, concerning their working posture (ortho vs. sitting) and the position of the patient. As we can see, the dentists over 45 tend to work mostly in an orthostatic posture, although *ISO 11226*[2] recommends a sitting operating position.

We found that 62% of the practitioners over 45 years old suffered from at least one defect of the spinal curvature and they had serious complains about neck and shoulder pain, lower back pain, or wrist problems. Moreover, applying a logistic regression, we found a statistically significant association between the presence of MSDs and the working posture (an ortho vs. sitting position at least 80%) and routine (interval between the holiday periods): model Chi-square=6.621, p=0.037, Nagel R-square=0.198

DISCUSSION & CONCLUSIONS: As so many boards of professionals have emphasized[1,2,3], ergonomic conditions in the operatory may provide an easier, safer, and more efficient way to work,

enhancing the well-being of the patients and practitioners. Our findings concerning the working routine and its association with the MSDs proved that a flawed posture might lead to good results, but at the cost of serious health problems for the practitioner in the long term. In conclusion, we strongly believe more stress should be put on the ergonomic training and practical assessment of the dental students.

Table 1. Comparing the working posture for the four groups of age.

	AgeGroup	Mean	StdDev	ANOVA Sig
<i>1 → <35 years old (yo), n=76; 2 → 35-45 yo, n=37; 3 → 45-55 yo, n=21; 4 → > 55 yo, n=21</i>				
<i>Ortho working posture</i>	1	26.89	27.941	.000
	2	30.43	32.322	
	3	54.33	37.186	
	4	76.67	32.762	
<i>Sitting working posture</i>	1	73.11	27.941	.000
	2	69.57	32.322	
	3	45.67	37.186	
	4	23.33	32.762	
<i>Patient sitting</i>	1	29.95	30.685	.000
	2	31.89	32.218	
	3	41.19	37.413	
	4	68.52	39.746	
<i>Patient lying (supine position)</i>	1	29.62	29.367	.005
	2	26.49	28.598	
	3	22.62	28.444	
	4	5.24	11.233	

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Electronic Homeopathy in Testing Compatibility to Dental Alloys

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INTRODUCTION: Electronic homeopathy (ELH) is an alternative method for testing patient's tolerance to dental materials [1,3]. The aim of the study is to test the compatibility of the common components of dental alloys, using electronic homeopathy (ELH).

METHODS: The MORA device (Med-Tronik GmbH) is a sophisticated BioResonance device incorporating several preset assessment and therapeutic programmes [2]. ELH functions on the following principles: the complete information spectrum of a substance, in our case dental materials, is digitally recorded and stored. The digital information is transferred into its original analogue oscillation. The testing method is performed by electro-dermal screening.



Fig. 1: The MORA device (Med-Tronik GmbH).



Fig. 2: Electro-dermal screening.

Based on the results obtained by individual screening, we may determine the tolerance to a wide range of dental materials, such as: different metals, restorative materials, veneering materials, etc. or any chemical element. The device has an extensive range of materials included in its test

set, but it can also be calibrated in order to determine tolerance to any desired material.

Using the MORA device we tested 55 different dental alloys, as well as the chemical elements contained in these alloys, in 50 individuals with good oral health condition.

RESULTS: The results were analyzed both individually and as a screening method, being expressed in percentages, giving information as to which dental alloy best suits the patient's needs and which common components of the dental alloys are well/not well tolerated by the group of individuals we took in consideration.

Table 1. Results in percentages.

Element	Well tolerated	Not tolerated
Au	10%	10%
Ag	30%	20%
Pt	10%	20%
Pd	0%	40%
Ti	20%	10%
Cr	10%	30%
Co	0%	20%
Ni	20%	30%
Cu	10%	10%
Ru	0%	10%
Zr	40%	20%

DISCUSSION & CONCLUSIONS: Despite the fact that the results found may not be identical to the values already stated by the previous studies concerning compatibility to common components of dental alloys, electronic homeopathy (ELH) may be considered as an alternative method for testing patient tolerance to dental materials. Each patient should be treated as an individual, taking in consideration his/her particular tolerance to various materials; the differences between the results we found in each individual being extremely significant.

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Spaces Accommodating Dental Care Facilities – Architectural Problems

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INTRODUCTION: Dental care in Romania was influenced by the regime change that occurred. Once the “socialist” totalitarian regime came into existence, private dental practice vanished, being replaced by territorial dental care centres as well as enterprise and school cabinets. Beginning with 1990, private initiative reappeared in this particular field, with the privatisation of old state owned practices. Romania’s new position as a member of the European Union, since January 2007, requires the introduction of E.U. regulations respective to this particular area of medical care.

METHODS: The problem of the existing dental facilities in the studied city, Timisoara, was first considered from the *urban* point of view, in respect to the distribution in the city and the relation to the urban space. In both these issues the new private dental practices appearing after 1990 were not adequately studied. The result was the lack of a coherent policy concerning the coverage of the residential areas and the lack of much needed parking spaces and other utilities.

From the *architectural* point of view a special attention was given to two typical organisation patterns, chosen because they appear in numerous cases, therefore the conclusions of the study being useful for most of them. The first pattern concerns the district dental centres tributary to the standardised structural system used for collective housing, and as a result present several disadvantages. The second pattern deals with the recent privately owned individual practices, most of them accommodated in apartments also located in blocks of flats. Several of the existing types of organisation were studied and the shortcomings were stressed.

Last, but not least, the interior design (and very often lack of design) was considered. Colours, posters, paintings and plants appear without any consideration for ergonomics or health related issues.

RESULTS: The results will be presented by means of the example of the district dental centers with attached laboratory, a product of the socialist era, generally located at the ground floor of collective housing estates. The internal configuration is tributary to the architectural *parti* as well as the constructive system employed for the upper level apartments. Under the circumstances,

the overall size of the building and the surface area of the rooms are limited, thus making enfilade spatial configuration and access through a central corridor the preferred solution. The dysfunctions are:

- improper waiting space for certain utilities, narrow passages or access hallways
- intersecting paths of patients, medical and laboratory staff
- the centre’s inner traffic intersects with the access hallway etc.

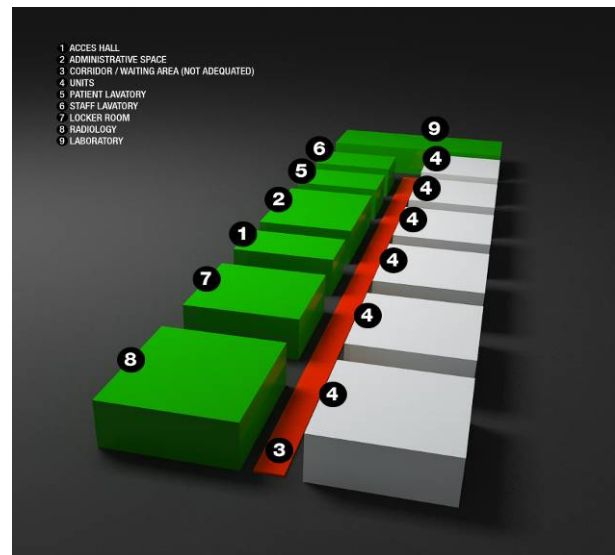


Fig. 1: Functional scheme and spatial relation in a typical district dental centre.

DISCUSSION & CONCLUSIONS: The spaces that accommodate dental care practices might receive a series of ameliorations, concerning both the architectural *parti* and the relations with the urban environment. There is a need for a more detailed study of circulations, functional relations within the dental practice as well as an exhaustive analysis of characteristic interaction typologies. Pertaining to the ambient, there is also room for improvement, with the aim of upgrading the various elements involved to contemporary standards.

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Experiments Based on Fracture Toughness and Cracks Spreading Speed of Dental Resins

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INTRODUCTION: Complete dentures often suffer unaccountable deteriorations, which can lead to total destruction of the prosthetic pieces without any chance for recovery. Characteristic for fatigue process is that the plastic deformations, elongations are located around areas containing defects or in the head of the cracks [1,2,3]. Fatigue crack has a progressive - masked character. The complete denture is normal until the crack has extended to some length and, after that, it produces the final fracture.

METHODS: For experimental researches, heat cure resins were used, such as Meliodent - (Heraeus Kulzer, Senden, Germany) and Royaldent Plus (Royaldent, Palatinál Foggyártó KFT, Gyöngyös Batthyány, Ungaria). Several plates were made using these materials (in the Dental Technician Specialization, of Faculty of Dentistry, Timisoara), with the following parameters: 2mm in thickness, 30 mm in length and 5 mm in width. Through experimental tests and soft analysis, using Zwick Roell (Zwick GmbH & Co. KG, Ulm, Germany) equipment, there were determined the moments of sample breaks or fractures after stretching. Zwick has a specific software named *testXpert*, which can standardize the applications. The Graphical Sequence Editor has an integrated simulation mode that combines tests, parameters, results. Measurement up to specimen break is possible using self clamping grips and mechanical long stroke extensometer (maximum force of 50 kN).

RESULTS: There are noticeable differences, depending on material type. Meliodent fractures itself faster and at lower traction forces than Royaldent Plus (fig. 1). So we can make some predictions regarding dental prostheses durability. In addition to that, Royaldent Plus heat cure resin (Royaldent, Palatinál Foggyártó KFT, Gyöngyös Batthyány, Ungaria) fractures itself more regularly- in the middle of the plate- and can resist to higher elongation forces (up to 1mm) than Meliodent heat cure resin (Heraeus Kulzer, Senden, Germany). This result was noticed in all experimental tests and graphics generated by *testXpert* software.

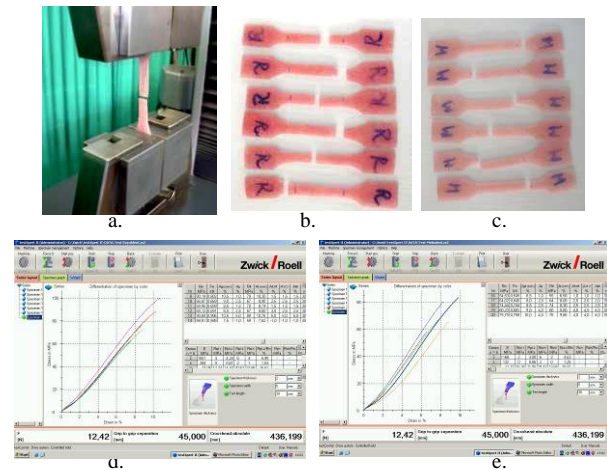


Fig. 1. Testing Royaldent Plus, Meliodent - a. Optimal fractured plate- in the middle; b. Aspects of fractures for 6 plates – Royal Dent; c. Aspects of fractures for 6 plates – Meliodent d, e. Computer evaluation using *Zwick testXpert* software.

DISCUSSION & CONCLUSIONS: Meliodent fractures itself more often and at lower force and stress than Royaldent Plus, when submitted to traction. The methods we used allow an objective evaluation of dental prostheses material and life time, having as a target the certification of dental materials quality aspects and of adequate technologies in dental medicine.

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Immun-inflammatory Markers in the Periodontal Disease

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INTRODUCTION: Periodontitis represents a multifactorial pathological entity, which has as a major cause the “periodontopath germs” (Actinobacillus Actinomycetemcomitans and Porphyromonas gingivalis) that contribute to the generation of a local immune response. These germs induce an inflammatory local immune response. The antigenic persistence contributes to the amplification of the immune inflammatory response that determines the progressive destruction of the periodontium, the detachment of the periodontal ligaments, the bone resorption and the teeth mobilization [1]. The interleukin 1 (IL-1) is a multifunctional cytokine which comprises the proinflammatory cytokines IL-1 α and IL-1 β [2]. The interleukin 6 (IL-6) is an important parameter in periodontal research because of its role in inflammation and bone resorption by stimulating activity of the osteoclast [2-3]. The tumor necrosis factor α (TNF- α) is a mediator of inflammation, which stimulates phagocytosis, degranulation and antibody dependent cytotoxicity of polymorphonuclear cells, were represent the majority of the inflammatory infiltrate cells in the acute phase [1-2]. Interferon γ (IFN- γ) is the immunomodulating cytokine placed in the middle of the cytokine cascade released in the cellular inflammatory immune response [1; 3].

METHODS: **1.** Patient selection: in this study were included 24 patients, from 15 to 65 years of age, males and women, treated since 2007 in the Oral Rehabilitation Clinic of “Victor Babes” University of Medicine and Pharmacy Timisoara, as compared to control group (witness group). The patients were divided into three cohorts, according to their dental status: the cohort 1 of aggressive periodontitis (n=9), the cohort 2 of adult periodontitis (n=6), the cohort 3 of adult gingivitis (n=9) and a control group (witness cohort, n=8). **2.** Determination immune-inflammation markers: we measured the levels of immune marker by a sandwich ELISA (enzyme-linked immunosorbent assay) technique, and used the protocol indications of the ELISA Quantitative kits: IL-1; IL-6; TNF- α and INF- γ human Endogen, from Woburg MA, USA (sensitivity <2pg/ml). The standard curve was generated using six standard concentrations:

0pg/ml; 25.6pg/ml; 64pg/ml; 160pg/ml, 400pg/ml and 1000pg/ml.

RESULTS: We used crevicular gingival fluid (CGF) samples and determination levels of proinflammatory cytokines (IL-1; IL-6; TNF- α) and immunomodulating cytokines (IFN- γ) measured by a sandwich ELISA technique [Table 1].

Table 1. The crevicular gingival fluid (CGF) levels of the marker.

Marker (mean \pm SD)	Cohort 1 (n=9)	Cohort 2 (n=6)	Cohort 3 (n=9)	Control groups (n=8)
IL-1 (pg/ml)	780.4 \pm 104.1	702.2 \pm 223.5	275.5 \pm 78.4	127.5 \pm 36.4
IL-6 (pg/ml)	148.2 \pm 88.5	21.4 \pm 10.3	7.7 \pm 4.8	3.13 \pm 0.7
TNF- α (pg/ml)	16.3 \pm 2.3	12.1 \pm 4.3	4.1 \pm 1.2	2.2 \pm 0.4
IFN- γ (pg/ml)	46.5 \pm 21.1	16.1 \pm 2.3	4.4 \pm 2.7	2.6 \pm 0.8

DISCUSSION & CONCLUSIONS: This study has proved a significant increase of inflammatory cytokines: IL-1, IL-6, TNF- α , and immunomodulating cytokines IFN- γ in periodontitis (aggressive periodontitis and adult periodontitis) comparing to gingivitis (p<0.01, statistically significant). In conclusions we considered a local increase of proinflammatory (IL-1, TNF- α , IL-6) and immunomodulating (IFN- γ) cytokines in the crevicular gingival fluid (GCF) has been shown to the patients with different stages of periodontitis and gingivitis, comparing to healthy subjects. The increased level of the marker is expression of the inflammatory response in periodontitis and gingivitis. The intensity of the immune response correlates with the increase of these mediators that represent evolution and monitoring markers of the periodontitis progression.

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Structural Analyses of the Human Temporomandibular Joint Disk: the Chondrocytes

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INTRODUCTION: The temporomandibular joint (TMJ) disk consists of a fibrocartilaginous tissue composed of a collagenic extracellular matrix (ECM) and several types of cells, with variable amount depending on the normal either pathologic status: fibroblast-like cells, fibrochondrocytes and chondrocyte-like cells [1]. The few available studies regarding the structure of the human TMJ disk define the control discs as those obtained from virtually unaffected persons or those with preserved normal macroscopic morphology [1-3]. No available study refers the histopathological changes to a normal histological structure. We aimed to evaluate the cells of the human TMJ disk, virtually unaffected by the internal derangement and macroscopically normal, in adults.

METHODS: We used 15 human adult TMJ discs obtained from human adult specimens, with respect to the locally acting ethical rules. Sex ratio was 9:6, the average age was 62. The discs were divided sagittally and one half was kept for paraffin embedding while the other half was submitted to the ESEM (Environmental Scanning Electron Microscope) analysis. The paraffin embedded sections were initially evaluated with hematoxylin-eosin and were further immunoassayed with primary antibody anti-CD34 that stains the endothelial cell cytoplasm.

RESULTS: By the present studies we could determine the metrical parameters of the fibrochondrocytes (FC) and chondrocyte-like cells (CLC) that may be present within the adult TMJ disk (*fig.1*). The presence of the CLC's within distinctive discal parts was not specific, these cells seeming uniformly distributed; individually, only their density differed. As for the immunolabeling for CD 34 we evidenced the centripetal evolution of the positive reaction that identified nascent capillaries. Also, the ESEM analyses confirmed the pathognomonic appearance of the CLC's on the histological preparates: cells with large nuclei, surrounded by a large halo of cytoplasm.

Unfortunately, the histological methods were not enough to certify the presence of the FC.

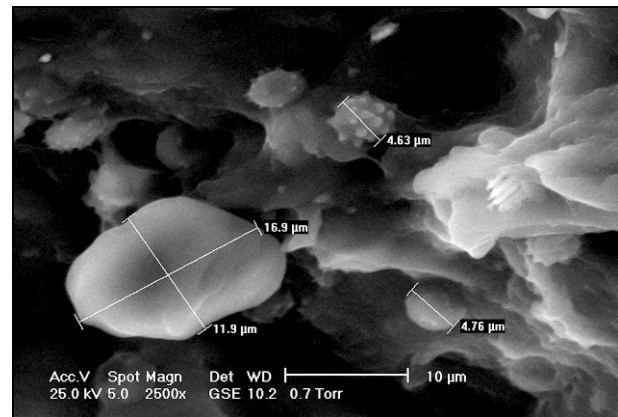


Fig.1: Morphometry of a chondrocyte-like cell (16,9 / 11,9 μm) and fibrochondrocytes (4,63 μm, 4,76 μm) in the human adult TMJ disk.

DISCUSSION & CONCLUSIONS: Our study brought relevant evidence for a better evaluation of the human adult TMJ disk cells and furthermore raises doubts on the direct correlation of the chondrocyte-like cells presence and the altered discal status in the TMJ internal derangement. We would rather associate these cells presence with a normal discal status in elderly persons with altered dental occlusion, in the absence of evident damages due to an internal derangement of the TMJ.

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Cytodiagnosis as a Screening Method for the Periodontal Disease

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INTRODUCTION: Periodontal disease describes a large number of clinical entities that affect gingiva, gingival attachment, periodontal ligament, cementum and supporting alveolar bone. Unique ecologic niches are observed in most areas of the mouth such as the gingiva margins and tooth surface. The aim of the study is to qualify the significance of the cytodiagnosis for the identification and evolution in the periodontal disease.

METHODS: Between 2004-2007 we have selected 345 patients with lesional and non-lesional periodontum. Periodontal disease was classified in seven major categories including periodontitis as a manifestation of a systemic disease. The cytological samples were obtained by aspiration, brushing or imprints of the periodontal areas. The samples were air-dried or alcohol fixed before staining with cytological methods (Papanicolaou, Blue-Polichrom-Tanin-Dragan, MGG). The cytodiagnosis was correlated with clinical data and the histodiagnosis by histochemical methods (Alcian blue, PAS, silver impregnation) or immunohistochemical stainings (Cks, S100protein, Vim, Desm, lymphoid markers and Ki-67).

RESULTS: According to clinical examinations we have found 3 groups of lesions: C1-C2-C3 (a,b) depending of the inflammation, tissue destruction, bone resorbtion and impaired tissue regeneration. In C1-C2 samples most of the examined cells were epithelial scuamous with different nucleo-cytoplasmic alterations. In C3a-C3b samples, according with the cytological features we have found numerous conjunctive-inflammatory cells. The periodontals disease has a grading of severity from level I to III, coresponding with the deepness of the tissue loss (1mm to 3mmm). Bacterial flora is quite similar to all the 3 categories of lesions depending on the host individual defence (fig. 1).

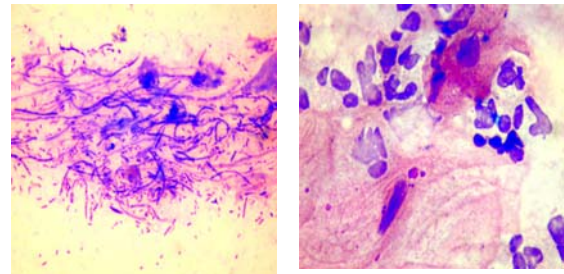


Fig. 1: Oral bacterial flora in the periodontal disease level III (left) and C2 sample with inflammatory and epithelial scuamous cells (right), Blue-Polichrom-Tanin-Dragan method.

DISCUSSION & CONCLUSIONS: We agreed that the cytodiagnosis is an important method for the screening and the management in periodontal lesions with a sensitivity of 82 %, specificity of 76% and a false-negative fraction of 12-15 %.

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Digital Age in Cephalometric Analysis

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INTRODUCTION: Cephalometric analysis is an important tool in orthodontic diagnosis, treatment planning, evaluation of treatment results and prediction of growth. Hand measurements are time consuming and there is always a risk of human errors. Rapid advances in computer science have led to its wide application in cephalometry, therefore in recent years digital cephalometric analysis is gaining popularity in orthodontic practices. The use of modern cephalometric software requires import of digital cephalograms or digital capture of analogue data: scanning and digital photography. Moyers[1] was stating that cephalometrics is a radiographic technique for abstracting the human head into a geometric scheme. Cephalometric analysis is currently used in order to evaluate skeletal and dental development, to identify malocclusion, to plan the treatment and to evaluate therapy results[2,3]. In order to reduce the human errors in evaluating cephalometric radiographs, a significant number of computerized systems were introduced[4]. One of them is CEPHX, that is a web based service that provides complete solution for ceph analysis. The principle is simple: the doctor scans with a high resolution the cephalometric XRay, and will upload it to the Cephx server. The computer will establish the repers and plans and will send it back fully analysed in maximum 48 hours. The software enables the orthodontist to upload the patient photos and to share the results with other doctors.

The purpose of our paper was to describe the use of computer cephalometric analysis in the diagnosis of orthodontic cases.

METHODS: The research was conducted at the Department of Pediatric Dentistry and Orthodontics, University of Medicine and Pharmacy Timisoara, Romania. The lateral cephalograms were scanned with a high resolution and digitized images were obtained. A specific software(CEPHX) was used in order to obtain the cephalometric landmarks and plans. Computerised analysis were performed in order to obtain the skeletal, dental and facial measurements, in vertical and sagittal directions.

RESULTS: The software provided various types of analysis and measurements, very useful in a diagnosis and treatment planning. The computer enabled us to provide an accurate orthodontic diagnosis: low mandibular plane, skeletal and dental class III, prognathic mandible, long anterior lower face height.

DISCUSSION & CONCLUSIONS: When properly used, the computerized digital cephalometric analysis can provide a very accurate diagnosis and a valuable prediction of the treatment results, with excellent value especially in surgical cases.

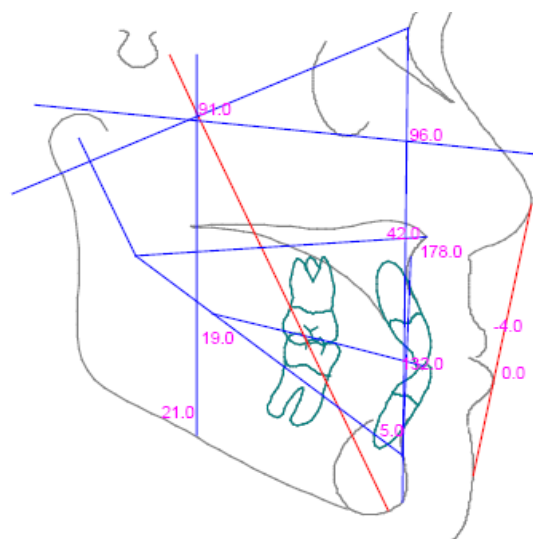


Fig. 1: Ricketts analysis with plans and angular values.

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Dental Health in a Group of Workers from Timisoara

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INTRODUCTION: Dental health is an actual problem between Romanian workers. Can working conditions affect the oral status? Is the activity in construction a risk factor for specific pathology? Which components of the professional exposure conduct at dental sufferings? Our aim is to put in evidence the effect on oral health of occupational exposure.

METHODS: We studied a group of 117 mechanics exposed in the road construction sector (EG), all male and a control group of 50 water operators (CG). We analyzed the working conditions, noxious level and the ergonomic aspects of the activity. The history data were taken, a complete clinical examination was performed, inclusive an oral examination. We applied a short questionnaire about oral health. Laboratory and other medical tests were performed, in according with working conditions. Data were analyzed in EPI Info Program.

RESULTS: Medium age of constructors was 41.8±10.51 years, and water operators were 39.43±8.72 years old. Seniority at the same workplace was 21 and 20.5 years.

Constructors are working usual 12 hours per day and water operators 8 hours per day in 3 shifts. The EG was exposed at vibrations, noise, silica dust, cement, aliphatic hydrocarbons. The limit value was exceeding for vibrations and dusts. 2/3 of constructors perform heavy activities, inclusive manual handling of materials. They have just one half hour break, per day, for lunch (at the workplace).

CG performs control activities, with light effort, visual solicitation and short time chlorine exposure, at low values of exposure. They have a 30 minutes lunch break, but they can take individual breather.

47% of EG and 38% of CG are cigarette smokers, at the same amount, approx. 20 cigarettes per day.

55.55% of EG use to drink one unit of alcohol per day, 17.1 two units and 9.4 consume three units per day. Alcohol intake is one unit for 44% of CG workers, two units for 12% and three units for 6% of them.

The oral cavity examination put in evidence edentation in 5 cases of constructors up to 58 years old, periodontal disease in both groups, but most

frequent in the exposed group at elder persons (39 cases in EG versus 7 cases in the CG, OR=3.07, RR=1.32, p=0.0104). Xerostomia was reported in both groups, too (61:15 cases, RR=2.16, OR=1.23, p=0.029) and gum disease was found at 24 cases in EG versus 5 workers in CG.

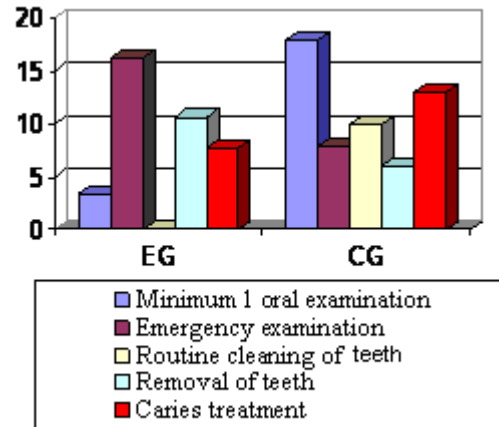


Fig. 1: Dental interventions in the last two years

DISCUSSION & CONCLUSIONS: Oral frequent pathology often severe is a reality in Romanian workers. They usual neglect these sufferings and their treatment because lack of time, financial reasons, pain causing manoeuvres, deficit in health promoting education. Smoking increases the risk of gum disease; silica and cement dust exposure may be associated with abrasion-related deterioration of dental health, chlorine exposure can explain xerostomia. Defectively oral hygiene is more evident in construction workers, linked at yard conditions, education level and mentalities. A national program for basic oral health, inclusive education and health promotion, seems to be a necessity in Romania.

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Modern Ways of Communication in Oral Health Education

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INTRODUCTION: The means and methods of health education refer to the ways of transferring the message from the communicator to the receiver and had to be modulated by the perception rank of the target group¹. If the visual means are well accomplished, they can transmit the more efficient than other means, mostly to that category of population with a reduced rank of schooling (children from kindergarten and elementary school).

METHODS: Dental health education has three stages of approaching the images from the oral cavity: a) through graphic images; b) through patterns; c) through demonstrations in vivo. Because the first contact with the educational information is made through external representations for this purpose, the educators has to assure that the information reaches it's target and is properly associated in the brain of the person who is being educated.

The dynamic of representations plays a special role in the educational communication. Either it's about analogical images representing an external aspect of the ones that really exist, or diagrams that represent relationships between people in an abstract way simplifying the images – the sequences of actions are given better by images in motion². This is why modern didactics have much advantage by introducing the teaching-learning process educative TV shows and a study through means based on information technology³. The most recent and spectacular method of distant education is "e-Learning" (electronic learning) or education through electronic ways, especially by the internet.

RESULTS: The information technology advanced fast from the simple download-and-play mode to complex courses on the internet which can include online tests and complete monitoring of the entire distant educative activity, called e-Learning, that: extends fast, thanks to the present concentration of the technology, domain of information and the certification programs based on educational needs; has a big FLEXIBILITY in organizing the content and in the management of distant learning

processes, being implied fast in any kind of institution that needs such activity.



Fig.1: The object-image that supports the understanding of the process making the object of explanation was an expressive, humanized representation of a bacteria.

DISCUSSION & CONCLUSIONS: It's recommended a hard action through this informative way, e.g. by realizing sites that contain information, examples, images about the entire maintaining process of the oral environment.

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Using Mandible Inter-occlusal Devices in Painful Joint Pathology

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INTRODUCTION: Using inter-occlusal devices in occlusal pathology treatment is a traditional and at the same time up-to-date method by offering the possibility to use different devices and the chance of combining them in the treatment of each clinical case. Temporomandibular joint pathology is part of dental treatment. Most of the time, the cause of these joint malfunctions is the completely or partially incorrect treatment at dento-alveolar level. Therefore, it is the cause and not the effect that should be removed. These devices can have a favourable prognosis only when there are no long-term major morpho-functional changes at temporomandibular level and no adjusting modifications at dento-maxillary level.

METHODS: Each clinical case is a combination of etiological factors that lead to the development of a joint pathology. There are inter-occlusal phases and devices in keeping with the importance and order the underlying causes. Most of the time, one or more devices are used, depending on the severity and the time passed from the onset of the subjective and objective symptoms.

if morpho-functional modifications have occurred, or the patient is reluctant.

DISCUSSION & CONCLUSIONS: The clinical case that is the base of the above mentioned discussions is a common situation in the dental medicine. The favourable prognosis of the treatment is based on combining the theories found in literature with the results of the the study carried out on a considerable number of patients who have come to the dental surgery.

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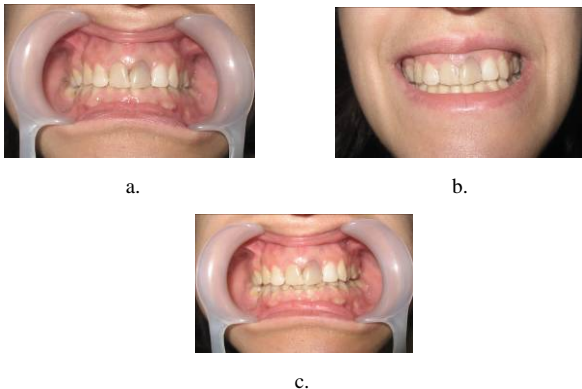


Fig. 1: a. Patient's initial occlusal status b. Superior semirigid casting applied on the maxilla. The first one applied in order to reduce the pain in the right temporomandibular joint c. Modified casting applied on the mandible in order to change the vertical dimension.

RESULTS: Results may be immediate, when the device/devices have been correctly chosen and the patient fully observes the dentist's recommendations. Incomplete investigations or a misdiagnosis in applying the occlusal chronology may result in partial or no results. This may happen after a long-term onset of the etiological factor, or

Cyto-Histological Aspects in Dental Caries on Experimental Model

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INTRODUCTION: High glucose quantity accelerates the initialization and progression of dental caries, but it seems to also affect dentin formation in young rats.

Based on the hypothesis that metabolically alterations of odontoblasts, morphologically evidenced through the decreasing of dentinal apposition, can predispose to an increasing carious attack¹ it was assumed that glucose can contribute to the progression of carious lesions through systemic mechanism.

The development of carious lesion determines dentinal apposition in order to prevent pulp exposure. The enunciated hypothesis that under carious lesion there exists increased dentinal apposition, was tested.

METHODS: The study focused on submandibular salivary glands because in the experimental model further presented, from the physiological and morphological point of view, these glands represent over 90% of the salivary anti carious activity.

The reactivity of the pulp-dentinal complex on experimental model was investigated in increased carious environment, modifying the diet (high glucose concentration) and the salivary function (ablation of the submandibular salivary glands).

In order to analyze the carious mechanism an experimental model was created and submitted carious risk factors.

The smears have been analyzed through cytohistological methods.

RESULTS: on the experimental model the effect of the salivary submandibular glands ablation and the high glucose concentration was the increasing carious activity, the study revealing the existence of complicated carious lesions and changes in the oral ecosystem in condition of the association of two carious risk factors. The high glucose concentration diet reduces mineralized dentinal apposition in young rat.

Dentin formation was smaller and the predentin zone wider in rats fed a glucose diet when

compared with rats fed the reference diet. Widening of the predentin zone in rats fed a high glucose diet may reflect changes in odontoblast function², such as reduced matrix synthesis and possibly disturbed mineralization. Dentinal caries progression may thus be modulated by odontoblast function, not as much by matrix formation but rather by mineralization.

In the control group, the dentinal apposition was significantly higher under the carious lesion.

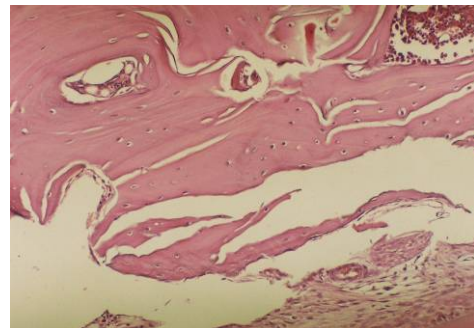


Fig. 1: Periapical osteitis in the case of an advanced caries in the experimental model with gland and hyperglucidic diet, col HE, x 200.

DISCUSSION & CONCLUSIONS: The high dose of glucose had as an effect the decrease of dentinal formation in comparison to the control group. The control group shows a defensive pulp-dentinal response whereas the carious diet shows a decrease of the pulp-dentinal response. The aspect reveals the importance of endogenous factors in the progression of dental caries.

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Serial Sections and Digital Microphotography for Evaluation of Vertical Condensation using 3 Types of Gutta-percha Cones

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INTRODUCTION: The aim of the study is to evaluate the sealing ability of 3 types of gutta-percha cones used in vertical condensation.

METHODS: Canals of 35 straight extracted roots (16 incisors, 13 premolars, 6 molars) were instrumented with ProTaper (Dentsply-Maillefer, Ballaigues, Switzerland) instruments, NaOCl 5,25% and EDTA 17%. The WL was set using Morita TrZX (MoritaMfg.Corp., Japan) to the foramen. Roots were randomly divided into 3 groups. Each group of 10 canals was obturated using SystemB (SybronEndo, Orange, CA, USA) and either .06 Meta (MetaBiomedCo., Korea) or non-standardized Autofit (Analytic-SybronEndo, Glendora, CA, USA) or ProTaper (Dentsply-Maillefer, Ballaigues, Switzerland) gutta-percha cones, and sealer AH+ (Dentsply, DeTrey, Zurich, Switzerland). Control radiographs were taken. Roots were embedded in acrylate. 3 transversal sections were performed at 0.5mm, 1mm and 1.5mm, and were examined under direct, polarized light microscope and stereomicroscope (Olympus BX51M, at 50 and 100X magnification). Images were captured using an Olympus ColorView IIIu digital camera and analyzed with the Analysis Auto system. Data registered for each section: total area of the canal, area of gutta-percha, total area of the voids, total area of the sealer+debris. The Kruskal-Wallis test was used to compare the gutta-percha-filled areas using the 3 types of cones, for each section.

RESULTS: The mean percentage of the gutta-percha-filled area varied at 0.5mm of apex from 80.45 ± 12.20 for Meta cones, to 56.28 ± 37.77 for Analytic cones, and to 52.12 ± 26.61 for ProTaper cones. At 1 mm of apex, the same parameter varied from 72.33 ± 15.57 for Meta cones, to 70.09 ± 19.42 for Analytic cones and 74.56 ± 18.89 for ProTaper cones. At 0.5 mm, a significant difference ($p < .05$) was found between Meta and the other types of cones.

Beyond 1mm, there was no significant difference between the 3 groups.



Fig. 1: A root canal section at 1.5mm of apex, under direct light microscope (50 X, cones Meta).

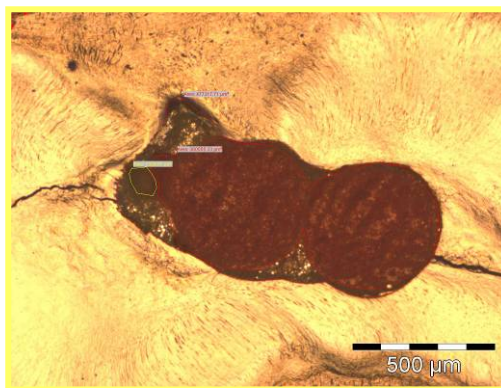


Fig. 2. The same section, under polarized light microscope (100 X). The gutta-percha area, the sealer+debris area and the voids area are delimited.

DISCUSSION & CONCLUSIONS: The vertical condensation technique using .06 Meta cones and SystemB seems to be superior to vertical condensation techniques using other types of gutta-percha cones, in terms of gutta-percha obturated area of the canal, within the first apical mm.

Acute Infection Dissemination from the Face to the Endocranium

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INTRODUCTION: The anatomo-pathological studies reveal the importance of vascular anastomosis in face and head pathology. That's why we considered important the following case presentation.

METHODS: The necropsy of an 11-year-old in-patient, with the following diagnosis: third degree coma, acute meningitis took place at the Department of Forensic Medicine. Fragments of the internal carotid artery (fig.1) and cerebral hemispheres (fig.2) were taken.

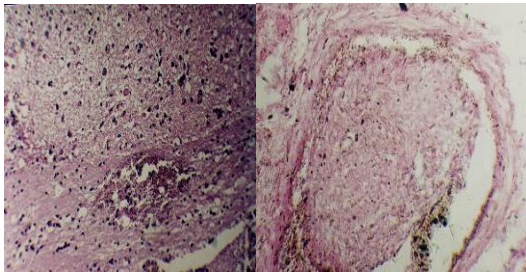


Fig.1: Microscopic aspects of internal carotid artery

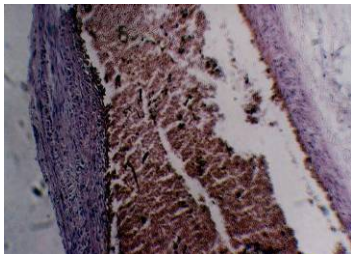


Fig.2: Microscopic aspects of cerebral hemispheres

The slides were studied at the optical microscope. The patient's history revealed the existence of severe headache, 40,5°C temperature with sudden onset, followed by coma in less than 12 hours. All this time the patient was treated, at home, with NSAIDs.

After arriving at the emergency room, the patient received intravenous NSAIDs and antibiotics. The temperature was between 38-40,5°C and the coma progressively developed. Despite the prompt treatment, after 48 hours the patient died.

The necropsy found an extensive abscess at the base of the right cerebral hemisphere and right cavernous sinus, with necrosis of the temporal lobe.

As for the cause of the cerebral abscess, the patient's mother said that 2 weeks earlier the patient had an abscess of the upper lip which developed after an excoriation and was treated with local medication, without having consulted any physician.

When the patient was admitted into ER, the abscess of the upper lip had disappeared, leaving only a slight scar.

RESULTS: The infection of the upper lip propagates through the superior coronary artery in the facial the artery, through its terminal branch and its communicant in the supratrochlear branch of the ophthalmic artery.

Due to the patient's low immune status, the bacteria got into the internal carotid artery where the local abscess was formed (fig. 1) and through the middle cerebral artery branch into the cerebral hemisphere causing the cerebral abscess (fig.2).

DISCUSSION & CONCLUSIONS: This case emphasizes the importance of the vascular anastomosis of the head and neck, and the importance of correct and immediate treatment in acute infections appearing at this level.

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Correlations between Microbiological Features of the Endodontic Space and the Periodontal Pocket in Combined Endo-perio Lesions

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INTRODUCTION: The objective is to investigate the concomitance of 5 selected bacteria (Aa, Pg, Tf, Td, Pi), known both as periodontal and endodontic pathogens, in samples from combined endo-periodontal lesions.

METHODS: A total of 21 patients, patients in first group (n=11) presenting each a combined lesion of primary endodontic origin (ENDO), and patients in second group (n=10) presenting each a combined lesion of primary periodontal origin (PERIO). Patients having received antibiotics within the preceding three months were excluded. Clinical parameters of periodontal pockets (PD-Pocket Depth, GR-Gingival Recession, CAL-Clinical Attachment Level, BOP-Bleeding On Probing) were measured, X-rays and microbiological sampling from the endodontic space(endo) and from periodontal pockets(perio) were performed. Qualitative&semiquantitative evaluation of bacteria was performed by molecular genetic assay based on multiplex amplification with biotinylated primers and reverse hybridization (micro-IDent, Hain Lifescience, Germany). Sensitivity of the DNA-DNA hybridization assay was adjusted to permit the detection of 10,000 bacterial cells of a given species (1,000 for Aa). Statistical analysis: Spearman non-parametric correlation test was used to assess the co-variation of the intensity of detection of the periopathogens in the study groups; Kruskal-Wallis non-parametric test was used to assess the mean values of the clinical parameters of the periodontal pockets, in relation with the intensity of detection of the periopathogens.



Fig.1: Combined lesion of endodontic origin on tooth 26, involving both the disto-buccal and the palatal root.

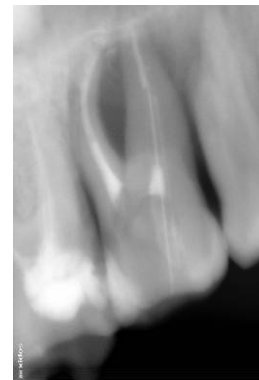


Fig.2: Rx image of tooth 26.

DISCUSSION & CONCLUSIONS: Combined endodontic-periodontal lesions could display interesting correlations between specific microbiota of endodontic lesion and of periodontal pockets. Analysis can be refined with an increased number of samples.

Quantitative Analysis of Trace Metals Accumulation in Teeth through Atomic Absorption Spectrometry

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INTRODUCTION: The environment is influenced by the humans, both in the positive way and also in the negative way. The pollution tend to diminish a series of advantages of the materials resulted in time trough the material development of the society, trough the deterioration of the life quality under biomedical account. This deterioration is showed by the appearing of some professional ill or by the frequency increase of population ill which is found in areas with intense and continuous pollution. An indicator of the environmental pollution degree from an area is the degradation degree of the teeth. In this paper we studied the environmental pollution degree from an industrial area. In this way we compared the concentrations of the essential elements (Ca, Na, K, and Mg) and of 8 trace elements (Cu, Zn, Cd, Pb, Cr, Fe, Mn, Co) from teeth resulted from population from the industrial area and from population from a rural area, which is not so exposed to pollution. A selection of teeth of different age group has been investigated, ranging from the first teeth of infants, trough the second teeth of children, to adults to trace the influents of environmental factors on the accumulation of the studied elements in the teeth. The concentrations of the studied elements were determined through atomic absorption spectrometry using an atomic absorption spectrophotometer.

METHODS: To study the environment exposure to the human health were selected for study teeth from both areas as followed: 20 teeth of infants, 40 teeth of children and 80 teeth of adults. For the analyse of the micro and macro elements from teeth, these were decayed at 600 °C during 1 hour. The resulted ash was mineralised with regal water and than was bring to a volumetric flash of 100 ml. From the resulted solution were determined the concentrations of the studied elements through atomic absorption spectrometry using an atomic absorption spectrophotometer Varian SpectrAA 110, equipped with an GTA-110 Graphite Tube Atomizer used for the determination of trace metals. The atomic absorption method, because of his sensibility and specification has a large applicability in a series of domain like analyse of

soil, water, air, foods and drinks, and also in the bio chemical domain. This fact made that the atomic absorption apparatus to be improved continuous.

RESULTS AND DISCUSSIONS: From the experimental data can be observed an increase of the trace elements concentration, respective a decrease of the essential elements concentration in the teeth selected from the population from the industrial area than the teeth selected from the population from the rural area. Also, it can be observed that the environmental exposure is not so evident at the infant and children, but this influence increase with the age increase of the adults.

CONCLUSIONS: The atomic absorption spectrophotometer method is an efficient method for the quantitative analyse of the essential and trace metals from teeth. It can be observed that there is a major difference between the concentrations of the studied elements from the selected teeth from the population exposed in an industrial area than the resulted concentration of the studied elements in the teeth from the population from a rural area. This indicates the fact that there is a possibility of metals accumulation in teeth for the people which are exposed to pollution. In conclusion the deciduous teeth can be used as indicators for environmental exposure of population.

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Tooth Extraction in Patients With Haemophilia

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INTRODUCTION: Tooth extraction in patients with hereditary hemorrhagic disorders can lead to severe bleeding, often life-threatening. The association of general anti hemorrhagic treatment with local haemostatic measures for bleeding control is mandatory with these patients (Fig.1,2). The therapy protocol is the result of an interdisciplinary collaboration, between a hematologist and an oral surgeon, in order to control and to reduce the severity of postoperative bleeding.

METHODS: The goal of our study was to assess the efficacy of a protocol combining general management and local hemostasis using periodontal cement packing, to protect the post extraction alveolar socket in the healing period. (Fig.3,4) Twenty patients divided into two groups underwent a simple tooth extraction. The study group of 10 patients, with hemophilia A, received systemic anti hemorrhagic therapy in the Hematology Clinic and post extraction special local treatment in the Oral Surgery Clinic. The control group of 10 patients had normal bleeding parameters.

RESULTS: We recorded hemorrhagic episodes in all patients of the study group – severe in one case, moderate in 8 cases and mild in one case. These patients were checked-up daily in the Hematology and Oral Surgery Clinic. The healing process took two weeks but no other complications were observed.

DISCUSSION & CONCLUSIONS: Controlling haemorrhage by using periodontal cement packing in patients with bleeding disorders is beneficial and cost effective in dental extraction. Local techniques still requires specific replacement therapy.¹⁻⁴ The adopted protocol produced a reliable outcome of dental extractions on an out-patient basis, with postsurgical comfort due to a



Fig.1. Local haemostatic.



Fig.2. Suture as local haemostasis.

combination of systemic treatment and local



Fig.3. Periodontal cement.

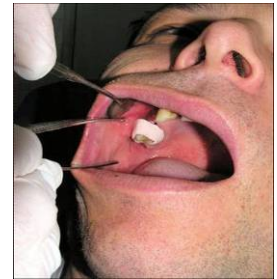


Fig.4. Coe-pak alveolar splint

improved hemostatic measures.

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The Approach of Oral Health at Individual and Community Level

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INTRODUCTION: Oral health is defined by the researchers of the last decades, as a multifactor product [1]. Besides the natural resistance of the organism, owned to the genetic factors, oral health is determined by certain environmental factors, as the quality of oral hygiene, all this interacting in time [2].

The field in which society can act deliberate in an immediate way concerning oral, individual and public health is taking care of oral health at a level that points out two constituent parts:

- the preventive component
- the therapeutic component

METHODS: The preventive component includes besides prophylactic measures also, educational measurements concerning the promotion of oral health, by oral hygiene practices and by directing the population towards the duty of oral care. The therapeutic component is concerning over the morpho-functional restoration of the dental organ and the dental arch by maintaining therapy, prosthetic, periodontal treatment, surgery and orthodontic practices.

RESULTS: According to this situation, we can consider that the responsibility concerning oral health belongs equally to the individual person, the medical staff and the community (society). The interaction of these three factors influences the oral health and implicit general health.

DISCUSSION & CONCLUSIONS: Health of human groups is defined as a synthesis of individual health state, all appreciated in a systematic and total vision.

OMS exposes the strategy "health for all in the 21st century" that includes the following fields of activity: The way of life and health; Risk factors that affect health and environment; Redirecting the health system.

This conception reflects the interrelationship between oral disease, general health status and an ensemble of economic, social, cultural life development, substantiating simultaneously the new conception³ over the importance of health care systems and justifying the social effort that needs organization and support.

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Fig. 1: The use of macromodels for demonstration

Canine Guidance Restoration in Bruxing Patients – Aesthetic and Occlusal Priority

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INTRODUCTION: Horizontal bruxism often wears the maxillary canine cusp down, with the sever consecutive alteration of esthetics and canine guidance. The case presented in this paper summerizes our experience in the interdisciplinary approach of patients with this type of parafunctional activity.

CASE REPORT: A 23 year old patient was referred from the maxillo-facial surgeon to the department of Occlusion as a result of a temporomandibular disorder. Her primary motivation for seeking treatment was pain in both temporo-mandibular joints (TMJ). She reported also that the jaw is locked closed so that normal opening cannot be achieved. Our patient complained also of the „disappearance” of the maxillary canine cusp tip, which affects her esthetics.

Our diagnostic protocol included a thorough history taking and a complete functional analysis of the stomatognathic system. Based on the anamnestic and clinical information, our diagnosis was: bilateral anterior disc dislocation without reduction, associated with horizontal bruxism.

Our therapeutic protocol restored the aesthetic appearance of the patient, simultaneous with the functional status of the TMJ and a mutually protected occlusion:

- Jaw exercises and management of stress
- Canine guidance restoration on study casts mounted in a semi-adaptable articulator and its subsequent transfer in the patients mouth; the detailed technique is presented in figure 1 and figure 2.
- Occlusal splint treatment (during sleep), to protect the restored canines and all other teeth from further damage.

DISCUSSION & CONCLUSIONS: Our team has great experience in managing patients with bruxism and temporo-mandibular disorders by an interdisciplinary approach [1, 2]. The key issue in solving the presented case was the restoration of an efficient canine guidance in laterotrusion, with the immediate disocclusion of the posterior teeth.

A less experienced clinician would have tried to eliminate the laterotrusive occlusal interferences by selective grinding. This approach is a big mistake, because it only aggravates the patients problems.



Fig. 1: Study cast were mounted in a semi-adaptable articulator and the functional morphology of the canine was restored with a composite resin (left above); putty silicone keys duplicated the new canine morphology (right above); the silicone keys were used in the patient mouth to restore the maxillary canine cusp tip (below)



Fig. 2: Adequate canine guidance in left laterotrusion, with the immediate disocclusion of the posterior teeth.

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Human Spine Investigation for a Good Posture in Dental Medicine

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INTRODUCTION: Scoliosis is a condition that involves very complex curves, lateral and rotational and some deformation of the spine. It is usually classified as congenital (the cause being anomalies in birth), idiopathic (classified as juvenile or adult and depends on the age of installing) or being developed like a secondary symptom of other pathologic condition.

METHODS: The investigation consists in taking over images in order to 3D reconstruct the body surface.

The system implemented is Inspeck 3D Half body that requires 3 digitizers for image drawing.

The system uses halogen spotlights for scanning the subject's body.

The system that contribute in the image drawing. is positioned in a triangular shape and the cameras are in the extremities of the triangle just like in the figure below.

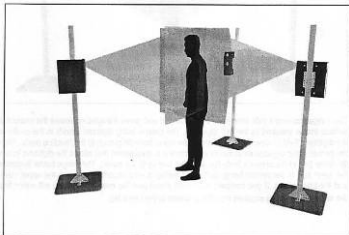


Fig 1: The arrangement of the cameras and the patient's position.

With the help of FAPS the images are captured and processed.

By using the Inspeck method for determining the deformation of the spine the risk of harmful radiation is reduced to zero, because these method involves only light and video capturing

RESULTS:. After capturing the images we may work develop a 3D model of the body on the PC and make some measurements which involve determination of the Cobb angle.

After marking the vertebrae we started determining any deformation of the spine but specially the scoliosis.



Fig. 2 The images captured by the 3 cameras and processed with the software(the spine is marked)

The points marked on the spine have a set of three coordinates that can be exported to the software.

DISCUSSION & CONCLUSIONS: In the medical practice the spine diagnostic is made by projecting it in 3 dimensions. The specialist appreciates the deformation of the spine and determines the Cobb angle by using X-rays.

By using the 3D system for body scanning, followed by an investigation of a group of subjects, we obtained data that lead in development of new methods of investigation and diagnosis, methods that reduce the time necessary for treatment and recuperation of spinal disease. This method reduces the X-ray exposure.

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Role of Orthodontics in Oral Rehabilitation of Dento-Alveolar Malocclusion with Spacing

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INTRODUCTION: The demand for orthodontics in adult patients has greatly increased over the last two decades. Orthodontic treatment for adults differ in many ways to the one for young patients. In many adults, complex therapy is required, including a collaboration between the periodontologist, orthodontist, prosthodontist and implantologist [1]. A specific area of adult treatment is adjunctive orthodontics, which represents tooth movements in order to facilitate other dental procedures. It involves repositioning and alignment of migrated teeth consecutive to old extractions, in order to adequately restore the edentulous spaces [2,3,4].

Consolidation of spaces, uprighting tipped teeth, opening space for a pontic or implant, intruding extruded molars require horizontal and vertical tooth movements.

METHODS: The case of a 26 years old patient with severe malocclusion with spacing is presented. Clinical examination revealed old and multiple edentulous spaces in both arches. The remaining teeth were severely migrated in both horizontal and vertical directions, causing obstacles to the mandibular movements and consecutive temporomandibular problems.

After accurate orthodontic diagnosis and treatment planning, orthodontic therapy was started. Both arches were bonded with Roth .018 brackets and bands and the succession of archwires were: twistflex, NiTi, stainless steel, round and rectangular. Orthodontic treatment allowed the intrusion of extruded molars, the uprighting and parallelizing the abutments and space closure. The remaining frontal spaces were closed and the posterior edentulous spaces were redistributed.



Figure 1: Initial situation, with large interdental spaces and teeth migration consecutive to the posterior bilateral loss(left) Clinical situation before debonding. Functional contacts were obtained and the prosthetic work was inserted. Upper frontal stability is provided by a fiber glass retainer (right)

RESULTS: The orthodontic active treatment greatly improved the possibility of prosthetic treatment planning, by allowing the development of a functional final occlusion.

DISCUSSION & CONCLUSIONS: Pre-prosthetic tooth movement can be a significant help in oral rehabilitation. It is important that orthodontist and prosthodontist cooperate together in order to provide an optimal environment for the occlusal success. Long term retention should be carefully planned in order to stabilize the final results.

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Osteoblast Responses to Different Oxide Coatings Prepared by the Sol-Gel Process on Titanium Substrates

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INTRODUCTION: Titanium (Ti) is used in medical applications because of its superior bulk and surface properties as compared to other metallic biomaterials. Its good biocompatibility has been explained by its thin (2-6 nm) native surface oxide layer of TiO₂ [1]. To improve bone integration of Ti-implants, surface modifications including structuring and composition were performed with coatings of different oxides. The tissue response are compared to commercially pure Ti (cp-Ti) and 316L [2]. In this work, such oxide layers are produced and characterised with respect to physical and chemical properties in order to achieve optimum results in biological tests.

METHODS: Mirror-polished cp-Ti substrates were spin coated by the *Sol-Gel* process with TiO₂, SiO₂, Nb₂O₅ and SiO₂-TiO₂. The modified surfaces were characterized by IR-spectroscopy, X-ray diffraction (XRD), Scanning electron microscopy (SEM), Ellipsometry, White light interferometry (WLI), Atomic force microscopy (AFM) and contact angle measurements. Cytocompatibility was investigated with MC3T3-E1 osteoblasts *in vitro* according to the ISO 10993-5 standards: cell proliferation, vitality, adhesion, cell morphology by SEM observations and cytochemical / immunolabelling of actin and vinculin [3,4].

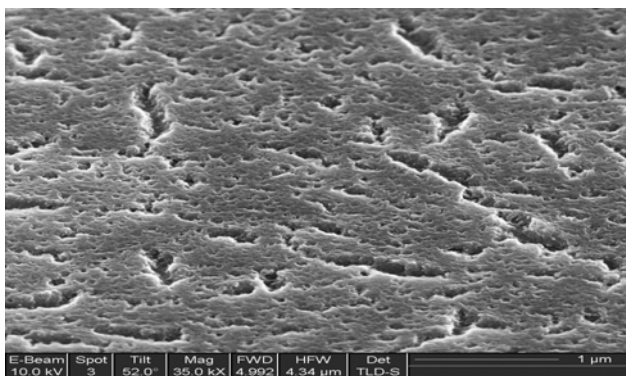


Fig. 1: SEM image of the nanoporous surface of a Nb₂O₅ spin-coated layer on a cp-Ti substrate by the Sol-Gel process and subsequent drying and annealing at 450 °C for 1 hour.

RESULTS: IR-spectroscopy approved the absence of organic residues. Ellipsometry determined the thickness of layers to approximately 100 nm. In the TiO₂ and Nb₂O₅ layers, HRSEM and AFM revealed a nanoporous structure (Fig. 1), whereas the SiO₂ and SiO₂-TiO₂ layers appeared almost

smooth. The roughness ranged from R_a 20-50 nm.

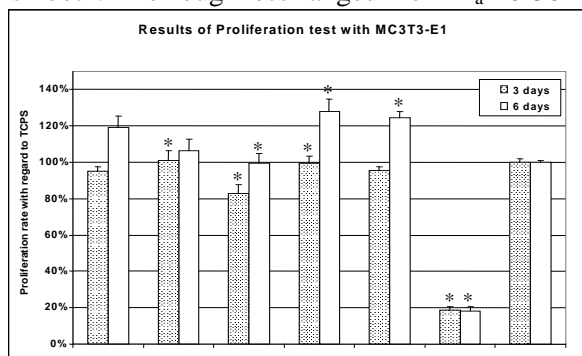


Fig 2: Cell proliferation test with MC3T3-E1 osteoblasts after 3 and 6 days of incubation.

The surface energy revealed the highest polar component for SiO₂ (30.7 mJ/m²) and the lowest for cp-Ti and 316L stainless steel (6.7 mJ/m²). The higher cell proliferation rates were found in SiO₂-TiO₂ and TiO₂, and lower for Nb₂O₅ and SiO₂ (Fig. 2); whereas the vitality rates increased for cp-Ti and Nb₂O₅. Cytochemical assays showed that all substrates induced a normal cytoskeleton and well-developed focal adhesion contacts. SEM revealed good cell attachment for all layers, and an increased spreading for Nb₂O₅ and SiO₂-TiO₂.

DISCUSSION & CONCLUSIONS: Titanium surface treatments by sol-gel derived oxide coatings optimise the cell interactions with the substrate. Physicochemical characterizations have shown a good chemical purity and distinct differences in the topography of the oxide layers. Biological tests revealed good cell reactions. SiO₂-TiO₂ coating showed a significantly higher proliferating rate than that of cp-Ti with only a natural oxide surface layer. The observed biological improvements are essentially due to the chemical composition of the surface coatings rather than to other physico-chemical parameters.

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Adjuvant Orthodontic Therapy in the Periodontally Compromised Patient

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INTRODUCTION: Orthodontic treatment may be adjunctive to periodontal treatment. Splinting may not be needed for most teeth with increased mobility after periodontal treatment (Ramfjord 1984). However, reduced mobility of teeth after combined periodontal and orthodontic treatment by using a bonded retainer would seem to be of considerable benefit.

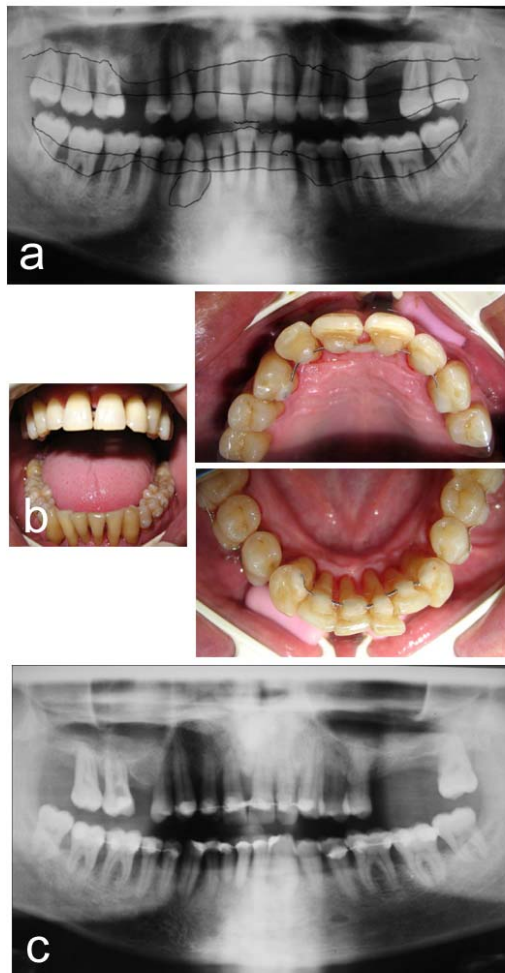


Fig. 1: a. radiological exam before periodontal surgery; b. intraoral aspect after treatment with the application of the retainers for contention; c. radiological exam after treatment.

METHODS: The patient, age 43, has been diagnosed with an aggressive form of periodontitis,

based on the following criteria: absence of significant systemic conditions, rapid attachment loss and bone destruction, familial aggregation of cases and lack of consistency between clinically visible bacterial deposits and severity of periodontal breakdown. It have been performed non-surgical initial periodontal treatment (scaling and root-planing) accordingly to the concept of one stage full mouth disinfection, antimicrobial therapy (amoxicillin 500mg, tid for 8 days + metronidazole 500mg, tid for 8 days; chlorhexidine mouthrinses, 3x/day) and the introduction of meticulous oral hygiene. Thereafter, flexible spiral wire retainer have been bonded, 3 on the maxilla (2 laterally, 1 palatally) and one mandibullary (frontal lingual region). The patient have been enrolled in a regular maintenance program, with recall visits for professional scaling every month.

RESULTS: At the 1 year recall visit, the periodontal status is stabile (BoP < 15%, PPD ≤ 4mm), without additional vertical bone loss and tooth mobility.

DISCUSSION & CONCLUSIONS: Orthodontic retainers concomitantly acts as a periodontal splint, which allows the individual teeth within the splint to exert physiologic mobility. Patients who receives combined periodontal and orthodontic treatment, may demonstrate excellent stability and apparently unchanged, or even improved, periodontal condition.

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The Importance of Immunohistochemical Assay in the Evaluation and Prognosis of Periodontal Disease

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INTRODUCTION: Periodontal disease (PD) represents not only a dental problem but also a medical and even social issue, given the fact that it is widely spread all over the world and that the number of lost teeth because of it is far greater than the number lost because of odontal lesions. Also, the inflammatory lesions of periodontal disease have a negative impact on the whole organism causing the appearance of dental infection and intoxication focuses. It is a proven fact that early diagnosis, disease leveling and prognosis of the patient have to set the basis for prophylaxis in periodontology [1]. At the moment, the diagnosis of PD is put on the base of clinical examination but the complexity of the disease imposes the need of some complementary interdisciplinary assays that require the collaboration of dentists with different other specialties: immunology, microbiology, genetics.

METHODS: Early diagnosis and screening of AP, using salivary citodiagnosis, from sulcular liquid and periodontal pockets using ATP- Dragan technique [2]. We examined 45 patients, 28 of them being diagnosed with chronic periodontal disease (confirmed through periodontogram and radiology assay) and 17 clinic healthy patients without inflammatory symptoms and loss of periodontal tissue. Patients have been investigated over a period of two years. We used small absorbent brushes for the cervicular liquid and saliva of both patient groups.

RESULTS: We evaluated the following sensibility and specificity indicators of the cytological method. Evaluation of exfoliated cells or cells obtained from tissues, allows us to get useful information and establish cytology classes (C1, C2, C3, C3a, C3b). For some of the case we tried to establish a correlation between the degrees of disease and the cytology class observing all clinical and radiological aspects of patients as well as interpreting cell cultures, and the results show clearly that periodontal diagnosis can be completed by cytology class diagnosis. Interpreting cytology cultures allows a correlation

between the lesion grading and estimating prognostic of disease. Immunohistochemical study of IHC: In order to determine immunohistochemical reactions we applied a coloring technique using monoclonal specific antibodies, which react to specific tissue antigens, on surgical obtained tissue samples after fixing those into 10% formaldehyde and including them into paraffin³. We used the LSAB coloring technique, the kit being purchased from DAKO-Carpinteria USA. In order to establish the pathological process in chronic periodontal disease we investigated the behavior of some categories of markers: epithelial (CK) and mesenchimal (CD31).

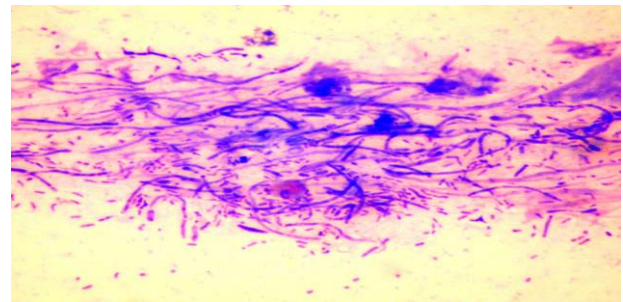


Fig.1 Active levuric cells, cocci and bacilli in supragingival plaque of evolutive periodontitis lesion in a C2 diabetic patient; col APT-Dragan imm.ob

DISCUSSION & CONCLUSIONS: This paper sustains the idea that interdisciplinary research in PD, in order to elucidate some less known aspects of the disease and set the basis for the diagnosis and prognosis of PD in patients without clinical symptoms. The IHC study evaluated the immunological reactivity of morphological tissues to some markers of epithelial differentiation.

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Oro-Facial Phenotypes Associated to Several Genetic Syndromes with Skeletal Dysplasia

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INTRODUCTION: In medical stomatological practice, genetic etiology accounts for an important part of dento-maxillary pathology. Hereditary involvement is a causative factor in isolated stomatological anomalies, but more often in complex syndromes. These syndromes are characterized by clinical heterogeneity, associating in phenotype oral manifestations and cranial, digital and scapulohumeral belt anomalies.

METHODS: The paper presents three clinical cases with specific phenotypes, but associating a pattern of anomalies of the cranio-facial structures derived from mesenchyme, dental agenesis, inclusions, anomalies of position and structure of the dental organ. The cases were diagnosed in the Medical Genetics Laboratory of the „Victor Babes” University of Medicine and Pharmacy Timisoara.

RESULTS: Case 1: Based on characteristic phenotypic manifestations: prominent nose, microphthalmia, broad first finger, with radial angulation, hyperextension, hypoplastic maxilla, first of the three cases was diagnosed with Rubinstein-Taybi syndrome. Cytogenetic analysis revealed a small deletion of the short arm of chromosome 16 (16p13).



Fig. 1. Patient 1. Dento-maxillar anomalies: agenesis 3.8, 4.8, disrotation of 1.4.

The second case, a male patient, aged 15, was diagnosed with Floating-Harbor syndrome, with an autosomal dominant inheritance. Specific phenotypical manifestations of the syndrome found in this patient are: facial dysmorphism, hypoplastic mandibula, thin upper lip, dental agenesis, disrotations, macrodontia, clinodactyly of fifth finger, bipartite clavicle, the ossific nucleus of pisiform revealed delay of bone age of 3-3 ½ years. Cytogenetic analysis showed the deletion of the q24.1-q24.22 region on chromosome 8.



Fig. 2. Patient 2. Agenesis of 1.2 ; 2.2 ; 3.1 3.2; 4;2; 1.8; 2.8; 3.8;4.8, dysrotation of 1.2 ; 4, rotation of 4.5, macrodontia of 1.1; 2.1; 2.3; 4.3, microdontia of 1.7.

The third case associates two different dysplasias: fronto-nasal and cleido-cranial dysplasia. The particularity of this patient's phenotype consists of association of facial aspects: hypertelorism, widow's peak, notched broad nasal tip—characteristic for fronto-nasal dysplasia, with skeletal and dental anomalies: hypoplastic maxilla, dysodontia, right clavicle hypoplasia with acromioclavicular disjunction, oblique right shoulder, short fifth finger – specific for cleido-cranial dysplasia. Dental anomalies found in this patient are: ectopic teeth, dysrotation, delayed eruption, crowded teeth.



Fig. 3. Patient 3. Orthopantomography - dental anomalies.

DISCUSSION & CONCLUSIONS: Compiling our data, the conclusion is that there is a strong correlation between the development of dental structures and oro-facial mesenchymal structures along with the development of skeleton. These pathological entities have direct consequences on the stomatognathic system, most of them being functional anomalies (mastication, deglutition and phonation disturbance, oral breathing), the disorders requiring preventive orthodontic approach and suitable management.

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