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07.06.

CONTEMPORARY CONCEPTS OF ENDODONTICS - *IN MEMORIAM PROF. DR TATJANA BRKANIC* AND ORTHODONTICS THERAPY

08.06.

CONTEMPORARY CONCEPT OF DENTOALVEOLAR REHABILITATION

Novi Sad

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On behalf of the Scientific Committee, I'm pleased to welcome you at the Third International Scientific Conference Dentistry 2018 Novi Sad "Contemporary concepts of endodontics-In Memoriam prof. dr Tatjana Brkanić and orthodontics therapy" and "Contemporary concept of dentoalveolar rehabilitation".

The Scientific and Organization Committee have made every effort to plan a conference that is scientifically satisfactory and socially interesting. You will meet with an exceptional program covering different topics, from basic research areas to areas within daily practice of Restorative Dentistry, Endodontics, Prosthodontics, Oral Surgery and Implantology, Periodontology, Paediatric and Preventive Dentistry. Technical and Dental Material exhibits will also form an important segment of the Conference.

Apart from the scientific aspect od the Conference we wish you to experience the traditional hospitability of Novi Sad and to strengthen the existing friendships and create a lot of new ones.

President of the Scientific Committee
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DETERMINATION OF TOOTH ROOT CANAL LENGTH BY CONE BEAM COMPUTED TOMOGRAPHY

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Abstract
Determination of tooth root canal length is one of the key factors that may affect the outcome of endodontic therapy. Incorrectly determined working length results in insufficiently filled or overfilled canal. Conventional radiography has its limitations in odontometry because of superposition of anatomical structures. Measuring errors may be the consequence of the technique sensitivity (lengthening or shortening of the x-ray image) or the anatomical foramen may be positioned laterally, causing the measuring error. This method determines the position of the physiological apical foramen 0.5-1 mm below the anatomical one. Besides, the patient is exposed to radiation. In odontometry, apex locators with high degree of reliability are often used (within 0.5 mm from the anatomical foramen) for determination of tooth root canal length. However, the measuring of root canal working length may be compromised by the presence of moisture, irrigating solution, remnants of the pulp, pus or serous secretion. Today, more reliable multiple frequency apex locators are used for measuring. Computed tomography enables creation of 3D image of the inside of the human body based on the large number of 2D x-ray images, which are created around the same rotation axis. CBCT - cone beam computed tomography is irreplaceable tool in endodontics for determining of canal system of the tooth, tooth fracture, internal and external tooth resorptions, large periapical lesions, monitoring of periapical regeneration and quality of mechanical processing of the root canal and finally, odontometry. Presence of the obstacle within canal (most often pulp stones) prevents the free movement of the needle inside the canal and measuring of the working length. In such situations, cone beam CT is the method of choice for odontometry measuring and monitoring of endodontic therapy (clinical case report).

Introduction:
Treatment of the tooth root canal is serious microsurgical procedure that requires the skillful therapist above all. The main prerequisite of therapy is the knowledge of the canal morphology, for all canals of the root need to be mechanically treated without changing their shape, disinfected and sealed. Missed canal is often the cause of unsuccessful endodontic treatment. Another important prerequisite is the determined working length, according to which the mechanical and drug therapy is applied along the canal and up to its physiological narrowing (apical foramen). Correctly performed odontometry often prevents the consequences of the canal pre-instrumentation, being the following:

- Periapical tissue irritation
- Pushing of infection into the periapical space and acute exacerbation of periodontitis
- Damage to the adjacent anatomical structures (maxillary sinus, mandibular canal)
- Protrusion of canal instruments
- Extrusion of canal filling into periapical space [1].

Odontometry is the usual method for determination of the working length of the tooth root canal. Most endodontists use x-ray image to check the electro-odontometric measuring. However,

taking the working length from the x-ray image has some objective disadvantages due to the different angle of x-ray machine tube positioning, different vertical positioning of the film that may cause elongated or shortened tooth length in the image, position of anatomical foramen may be laterally positioned, as well as some subjective disadvantages – being subjective in image interpretation [2]. Modern clinical practice use new imaging methods in diagnostics like digital radiography, densitometry, computed tomography, magnet resonance, ultrasound and nuclear techniques. High resolution and ability to analyze a small field of oral structures enables early diagnosis of disorders of teeth and other structures, monitoring of healing process, identification of additional canals and foreign bodies, as well as odontometry [2,3].

CBCT (cone bean computed tomography) enables 3D imaging of the tooth that is focused on the narrow area of interest with significantly lower effective dose of radiation comparing to the conventional CT, high resolution of details, correct quantitative and qualitative values and simple use of images [4,5,6]. Visualization of vertical layers of tooth and line measuring in all three dimensions enables determination of the tooth root canal length.

Use of CBCT in endodontics for the purpose of odontometry

CBCT is an extra-oral system of imaging and exploring of maxillofacial region and its structures with the field size varying from 15 to 5 mm and even less [7]. Excellent imaging of the third dimension is useful in assessing of periapical pathology and endodontic space of the tooth. Endodontic interventions became predictable, faster and safer. The use of dental CT brought the endodontics a new diagnostic tool for assessment [8]. It is applied in different phases of endodontic therapy and used in analysis of morphology and dimensions of root canals, identification of periapical lesions, identifying and locating of resorptions, for pre-surgical planning and for postoperative control and monitoring [9]. Recently, CBCT has been described as interesting endodontic tool for measuring the length of tooth root canal, i.e. for odontometry. The research showed high correlation between the image of histological sections of tooth and respective CBCT image [10]. Quantitative analysis of root canal requires segmenting of endodontic space. Segmentation of CBCT image separates endodontium from surrounding tissues – dentine and cement of the tooth root. Selection of segmentation technique is important for it affects morphometric parameters. First, the position of the anatomical apical foramen, as the first reference point, is determined by the analysis of the CBCT section. Then, line measurements to the second reference point are performed (second reference point is determined arbitrarily – incisal border, top of the cusp or rounded surface). Line measurements are parallel to axial plane of the tooth and they are performed from one reference point to another, selecting the axial slice that enables drawing a straight line from anatomical foramen to the cusp top or to the incisal border [11,12,13]. The measurement is more reliable if performed on mesiodistal and vestibule-oral slices, after which the average value of measurement is calculated and taken as the working length. In case of curved canals, the use of segmented line measurements that form an angle between canals is suggested. Disadvantage of such odontometry method is the placement of reference points on the curved line of the canal, which might influence the repetitiveness of the measurement [14,15]. In order to avoid possible discrepancies, the use of 3D Endo-software (Dentsply Sirona, Salzburg, Austria) is recommended. Innovative characteristic of this software is semi-automatic detection of the root canal midline after scanning the canal entrance, minimizing the possible subjective error of the operator. The software also compensates for curved surfaces and unevenness or depressions inside the canal, resulting in more reliable measured length [16].

CBCT uses ionizing radiation, so indications are to be strictly considered and ALARA principle (as low as reasonable achievable) to be observed. Recommendation is to use of the smallest field of imaging, short exposition, the lowest intensity and pulse imaging, in order to decrease the exposition of the patient.

Conclusion:
Odontometry determined by CBCT imaging is a reliable method of determination of the tooth root canal length. Indications have to be strictly determined because of the exposition of the patient to the ionizing radiation. However, once made, CBCT image is saved in the electronic database and it represents the set of working lengths for future endodontic treatments if need be.

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IS ONE INSTRUMENT ADEQUATE ENOUGH FOR COMPLETE ROOT CANAL PREPARATION?

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Because of the fact that dental implants cannot adequately compensate for tooth loss, special attention is given to endodontic therapy today. This type of treatment of diseased teeth has been significantly improved in recent years, but still requires high expertise and qualifications of therapists.

With the help of new methods of "cleaning and shaping" and new instruments, endodontic therapy is becoming safer and more efficient and enables preparation and opturation of very complex canal systems.

The basic precondition for the success of endodontic therapy is adequate realization of all phases of endodontic treatment, starting from the preparation for endodontic procedure, to the specific technique of canal preparation and its three-dimensional opturation.

A special problem in the preparation of the root canal system is the apical third of the canal, due to its complexity. The biggest problem is impossibility of adequate cleaning of this part of the canal, and formation of an appropriate apical barrier and opturation.

Today, modern endodontics cannot be imagined without machine NiTi instruments. The use of these instruments with limited speeds and high flexibility greatly accelerates the instrumentation and reduces the possibility of error but also prevents frustration of many practitioners from possible instrument fractures during this intervention.

The use of NiTi rotating instruments makes the preparation of the canal simple, fast, safe and very efficient even in very complex canal systems. The proper selection of NiTi instruments and their adequate use can provide high-quality therapeutic solutions and significantly facilitate the solution of everyday endodontic problems in practice.

The fact is that almost all NiTi instruments are susceptible to fractures due to possible screwing and breakage of the instrument in the canal. Proper choice and use, or good tactile control during preparation, is an important precondition for eliminating possible mistakes and fears of fracture of the instrument. This fear is significantly greater with NiTi sets with more instruments.

However, it is difficult to reach all parts of the canal, even by careful selection of manual or mechanical files, and almost 30-50% of the surface of the walls remains untouched. This significantly reduces the efficiency of hemomechanical procedures in the canal and significantly complicates the cleaning of inaccessible parts of the canal (constrictions, ramifications, additional canals, diverticulums). Therefore, efficient, abundant and long-term irrigation is also necessary for optimal cleaning of the canal. The concept of endodontic therapy with one instrument (one file endo) involves cleaning and shaping the canal with only one instrument. In this way, the canal instrumentation is significantly accelerated, but also significantly reduces the possible risk of fracture because only one instrument (not a set of instruments) is used for canal preparation.

In the one instrument technique of preparation NiTi rotary instruments (XP Endo Shaper, HyFlex EDM One File, One File S, One Shape) are used, or instruments with reciprocal

movements in the canall (UNICONE, VDW RECIPROC ONE FILE ENDO), as well as designed self-adjusting file (SAF-SELF ADJUSTING FILE)

XP ENDO SHAPER is a unique file with a "snake" shape and extreme flexibility that extends and contradicts the canal and adapts it to canal irregularities. This instrument is non-aggressive but very efficient in cleaning and shaping, as it can reach inaccessible parts of the canal.

UNICONE is a NiTi instrument with reciprocal movements in the canal. It provides efficient canal preparation because of its extreme flexibility. A specific process of heat treatment, in addition to flexibility, also provides greater resistance to cyclic fatigue, which with reciprocating movements significantly reduces the possibility of fracture of the instrument.

Self-adjusting file (SAF) is a specially designed hollow and flexible file that reshape to three-dimensional canal shape during instrumentation. This file allows continuous irrigation of the canal because it is connected to the source of irrigation via a silicone tube. This file vibrates during the instrumentation, forming turbulence of the solution, which significantly enhances the effect of irrigation.

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REGENERATIVE IMPLICATIONS OF ORTHODONTIC TREATMNENT

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Abstract
Tooth movements with appliances based on nickel and titanium has got great osteogenic potential and can regenerate deficient parts of alveolar bone and gingiva and rehabilitate compromised occlusal relations and a patient's masticatory function. Still, orthodontic treatment raises certain risks for periodontal ligament and alveolar bone, especially in patients with reduced periodontium. Oral corrosion of orthodontic appliances can change mechanical characteristics of orthodontic appliances, reduce elasticity and increase stiffness of appliances based on nickel and titanium. It influences dynamics of tooth movement, cellular activity of osteoclasts and osteoblasts, bone turnover and regeneration of deficient parts of alveolar ridge. This process should be kept in mind in orthodontic treatment of patients with reduced periodontium. The lecture demonstrated possibilities of treatment of patients with reduced periodontium – regeneration potential and side effects.

Introduction
Orthodontic treatment aims at providing an acceptable functional and aesthetic occlusion. Orthodontic movements of teeth has got great osteogenic potential and can regenerate deficient parts of alveolar bone and level the gingival margins. Lack of alveolar bone support is probably the most common and challenging dilemma confronting the interdisciplinary dental team in rehabilitation of partially edentulous patients.
Orthodontics and periodontology are disciplines that interweave tightly because they both deal with the phenomenon of the periodontal ligament. The periodontal ligament represents the way the teeth is related to the alveolar bone and how it transmit the occlusal forces. It is also the basis of the tooth movement during orthodontic treatment. Orthodontic treatment can be an adjunct to periodontal therapy, and periodontal therapy an adjunct to orthodontic treatment, therefore it is referred to as periodontally facilitated orthodontics and orthodontically facilitated periodontology (1). The loss of alveolar bone height, periodontal support or tooth can result in elongation of the tooth, spacing or protrusion of the incisors, rotation and tiping of premolars and molars with collapse of occlusion and reduction of the vertical dimension. On the other hand, orthodontic movement of the tooth can facilitate the restoration of restorative and aesthetic problems of adults. In the case of successful periodontal therapy, in adult patients with reduced but healthy periodontium, it is possible to move teeth without further deterioration of the periodontal condition.
Existence of periodontal defects is not a contraindication for orthodontics; orthodontic treatment improves the ability to preserve and restore affected dentition, and the risk of reoccurrence of the active periodontal disease is not increased during active orthodontic treatment (2). However, adult orthodontic patients have a relatively higher risk for periodontal tissue destruction in comparison to adolescents.

Risks of orthodontic treatment
Although the movement of the teeth has an osteogenic potential, orthodontic treatment carries certain risks - the accumulation of plaques around the elements of the orthodontic appliance, the difficulties in maintenance of oral hygiene, occurrence of white spot lesions of enamel and gingivitis (3). There is also a significant influence on alveolar bone and periodontal ligament,

especially in patients with reduced periodontium. Loss of alveolar bone height, gingival recession, root resorption, tooth mobility and pain and effects on pulp are also possible.
Additionally, oral corrosion of orthodontic appliances in interaction with saliva, oral antiseptics, fluorides and probiotics can cause nickel release, nickel-induced gingival hyperplasia and nickel allergy (4). Changes in mechanical characteristics of orthodontic appliances can occur to some extent due to corrosion (5). The reduction of elasticity, i.e. elastic range of nickel-titanium archwires influences dynamics of tooth movement, cellular activity of bone and regeneration of deficient parts of alveolar ridge. This process should be kept in mind in orthodontic treatment of patients with reduced periodontium and modify forces and mechanics.
Alveolar bone loss is not only a consequence of orthodontic treatment and periodontal disease, it is also the natural course of aging of the organism. Aging causes loss of bone mass, disturbs the balance of the lips, cheeks and tongue, and the tongue tends to protrude the teeth and create spacing.

Regenerative implications

The number of adult patients seeking orthodontic treatment has increased substantially. One of principal reasons are changes of dentition and occlusal relationships due to aging. Although adults cooperate better than adolescents, they present a challenge due to abraded teeth, uneven gingival margins, missing papillae and bone loss. All of that distorts the red-white esthetics and complicates ideal treatment result (6). Therefore, goals of the treatment have to be realistic, the mechanics and the force adjusted to the amount of periodontal support, and retention should be lifelong.
The orthodontist can be considered a tissue engineer because of remodeling of the alveolar bone during orthodontic treatment and tissue regeneration. By orthodontic treatment it is possible to extrude the bone and level the gingival margins. By moving the teeth into deficient parts of alveolar ridge orthodontist can develop site for implant placement. It is possible to intrude supraerupted teeth with periodontal attachment loss and so reduce the amount of loss of attachment.
Active periodontal disease is a contraindication for the start of orthodontic treatment, but reduced healthy periodontium is not. There are certain benefits of orthodontic treatment for a periodontal patient. Orthodontic treatment can create recessions due to extensive torquing of the roots resulting in resorption the alveolar cortex. Evaluation of gingival biotope is one of the ways to determine the risk of recession, with the thin or highly scalloped gingival biotype associated with thin alveolar cortex, increasing the chance of alveolar bone resorption and recession (7). In order to reduce the risk of recessions, periodontal surgery can be used to thicken the vestibular gingiva before orthodontic treatment.
By means of orthodontic treatment, the roots of teeth with recessions can be moved by torquing into the center of the alveolar bone, causing the recession to decrease and increase the success of later periodontal surgery (8). The interventions of periodontal plastic surgery can treat recessions successfully in patients in whom edge of recession does not reach the mucogingival junction (Miller Class I) or when it reach the junction but without loss of papilla (Class II). They are partially successful in treatment of recession with loss of papilla (Class III), and unsuccessful when recession is accompanied with greater loss of alveolar bone height (Class IV). The addition of connective tissue graft and enamel matrix derivative to coronally advanced flap enhance the clinical outcomes of treatment of gingival recessions (9).
Several studies have been published focusing on the possibility of orthodontic treatment of patients affected by periodontal defects - infraosseous defects, gingival recessions and furcation lesions. However, the evidence of efficacy is weak, controversial and unclear (10, 11).

Conclusion

Orthodontic treatment aims to achieve optimal function and aesthetics by moving the teeth. These movements depend on the status of supportive periodontal tissues. Active periodontal

disease is a contraindication for start of orthodontic treatment, but orthodontic treatment is not contraindicated in people with reduced but healthy periodontium. The goals of the treatment have to be realistic, the mechanics and the force adjusted to the amount of periodontal support, and retention should be lifelong.

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MINI-IMPLANTS IN DENTISTRY - PARAMETARS AFFECTING PRIMARY STABILITY

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Abstract

A stable anchorage is the basic prerequisite for a successful orthodontic treatment. Achieving an adequate anchorage for tooth movement is one of the key problems in orthodontics. To avoid unwanted movement of the teeth, experiments done in recent years show that mini-implants can be used as the anchorage of the orthodontic movement of the teeth and that they open up for completely new possibilities.

Given that they provide an absolute anchorage, mini-implants can make orthodontic therapy more effective, and at this point this form of skeletal anchorage represent an interesting aspect of clinical orthodontics. Using mini-implants significantly reduces therapy time.

In spite of all the indicated possibilities the orthodontic mini-implants can offer, problems, however, occur. Occasionally, the implant loss before the therapy goal has been achieved, which represents, if not the only one, then most certain their biggest deficiency.

The cause for this appearance may sometimes be unknown. Many factors could affect the success rate and effectiveness of mini-implants as an absolute anchorage. Some of these factors are: mini-implant characteristics, general patient health, surgical technique, placement of the mini-implant, the type and strength of the orthodontic force applied to the implant, and also the maintenance of the implant and care for it by the patient, with a special emphasis on oral hygiene.

It has not been fully explained which one of these factors and to what extent it has an influence, and which is most responsible for the success of the mini-implant use. The aspect of stability of mini-implants is still the subject of many research.

Introduction

Anchorage is a key problem of orthodontics - any desired movement of the target teeth as a reaction has an unwanted movement of the teeth anchorage unit. The anchorage is, therefore, the resistance to reactive forces commonly made by teeth, sometimes the palate, head or neck (via extraoral forces) and (less common) anchorages embedded in the jaw (1). A stable anchorage is the basic prerequisite for a successful orthodontic treatment.

Long time ago it has been observed that the use of other structures, other than teeth as the anchorage, can produce a tooth movement or modify growth without unwanted side effects.

In the beginning, they were classic osseointegrating dental implants. However, the use of classical implants from the orthodontic treatment point of view has had much more negative aspects than use of it. One of the main disadvantages is the long period of osseointegration of the

implant before it could be loaded with force (even from 4 to 6 months). Also, it would require a rather painful and invasive surgical protocol, expensive and uncomfortable for the patient, and in the end, their use with patients under sixteen years of age was excluded.
During the last decade, a great effort was made in order to achieve a skeletal or absolute anchorage, using various types of small titanium screws and plates. The conclusions of many studies conducted, are that screws, plates and similar mini-constructions can provide an absolute anchorage, compared with conventional, dental implants, much less invasive, have an insignificant anatomical limitation of implantation, are simple and easy to put in and remove, less expensive than conventional implants, can be used with children, and generally significantly improve orthodontic treatment, with minimal disturbances to the patient. Nevertheless, one of their most important advantage is that they can be loaded with force immediately after placement.

There are many types of such implants present on the market today. Generally, they are all of similar characteristics, made of titanium alloy. Most often, a mini-screw system is used.

Basically, according to the appearance of the head, mini-implants are divided into five different types.
According to the size of the implant three groups are distinguished: small diameter, medium diameter and large diameter and length.
According to the insertion mode, two types of implants are distinguished: mini-implants requiring preparation of a pilot hole in the bone with pilot-drill, prior to their self-tapping, and mini-implants that are self-drilling.

Mini-implants are used in all stages of orthodontic therapy when it is essential to completely exclude the reaction of anchorage teeth such as symmetric intrusion of the incisors, molar intrusion, closure of the extractions space, tooth movement for prosthetic rehabilitation, correction of the canted occlusal plane, asymmetric movements. Receantly, mini-implants olso have been applied with palatal expanders or extraoral appliances, such as headgears and face masks (2,3,4,5). The use of mini-implants significantly reduces the time of therapy.

In addition to their use in orthodontics, they are increasingly used in maxillofascial surgery for the purpose of maxilo-mandibular fixation, and in prosthetics, where they play a significant role in the stabilization and retention of overdenture. Also, many mini-implants have the approval of the Food and Drug Administration (FDA) to be used as part of fixed prosthetic therapy. With adequately set indications for their use for this purpose, the available literature has shown success that can compete with standard implants. This means that, if there is a lack of one or more teeth, a mini-implant can be placed and make a tooth crown that will attach to the head of the implant (6,7,8,9)

Nevertheless, despite all the possibilities that orthodontic mini-implants offer, there are certain problems that occur. It is primarily about loosening and prematurely removing the screw or mini-plate. Compared to dental implants, the degree of stability of mini-implants is relatively low (10.11). Unlike dental implants, which achieve stability through osseointegration, the stability of mini-implants is achieved through mechanical retention (12, 13).
Implant stability, immediately after its insertion, is marked as primary stability.

Since the use of a temporary skeletal anchorage does not require osseointegration, primary stability is of great significance for clinical success. The primary stability of mini-implants depends on many factors, first, the placement of the implant, the proximity of the root, the geometric design of the mini-implant, the state of soft tissue, operating techniques, and the strength and duration of the applied orthodontic force. Many authors studied these parameters

(14,15,16,17,18,19,20,21). However, despite of this, there is still no exact evidence to indicate which factors affect the stability of mini-implants.

In general, mini-implants can be placed in different places in the alveolar bone. Bone quality is undoubtedly the key factor for the stability of mini-implants. Also, stability is greater if the implant is placed in the area of the attached gingiva. Otherwise, placing implants in movable mucosa is known to cause irritation and inflammation of the tissue causing implants to fall-out (22).

The factors that still need to be considered when selecting the placement for placing the mini-implants, which also affect the type of implant, are soft tissue anatomy, interradicular space, sinus morphology, location of the nerves, buccal bone thickness, and buccal and lingual bone cortex thickness of maxillary and mandible. The thickness of the buccal cortical bone is generally greater in the mandible than in the maxilla.

When it comes to the impact of age and gender on the success rate of mini-implants, opinions vary. It appeares that cortical bone with women is thinner, while men over 18 years of age have a significantly higher thickness of the buccal-lingual, palatinal and buccal cortex.
Other studies show that there is no gender impact on the success of mini implants (23,24,25,26).

There are clinical evidence in dental implantology that primary stability plays a key role, even greater than the very quality of bone and oral hygiene for the stability and reliability of the implant itself. In many papers on this topic, the authors give recommendations on the appropriate way of preparing the location for dental implants, as well as on the choice of type of these implants according to the place of insertion in the oral cavity (27,28). However, one thing is certain, the maximum stability of the mini-implant is achieved by mechanical retention with the bone (29).

The primary stability of mini-implants depend on many factors, among which the key role is played by the characteristics of mini-implants, the quality of the bone at the insertion location, the operating technique, the strength and duration of the applied orthodontic force. Many authors used these parameters to describe the primary stability (14,30,31,32,33). Which of these factors and to what extent has the influence, and which one is responsible for the success rate of the orthodontic mini-implant, remains an open question.

Conclusion:

Experiments in recent years have shown that mini-implants can be used as anchorage for orthodontic movement of teeth and that they open up for completely new possibilities. Since they provide an absolute anchorage, mini-implants can make orthodontic therapy more effective, and given that they are new technique for orthodontic treatment, it can still be said that they are in development, and further research is needed to be done on this field.

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ORTHODONTIST'S ROLE IN DENTAL PROSTHETIC TREATMENT

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Abstract:
Dental prosthetic rehabilitation sometimes presents a special challenge regarding the treatment plan as well as the therapy itself. In such cases, a team approach is required, and a team may consist of several dental specialists- prosthodontist, orthodontist, oral surgeon, periodontist, etc. Despite the expertise of prosthodontist, there are cases that demand the somewhat different approach in treatment planning. Such an approach facilitates overcoming the obstacles of conjoint states, biological system itself, limitations of prosthodontic and orthodontic techniques. Patient's expectations and cooperativeness face us with need to prepare, modify our approach, and even compromise regarding the usual treatment protocols.
In this paper, following the individual approach to each particular patient, cases where treatment plan had to be modified according to associated state of dental arches, as well as with patients' wishes and expectations. Cases are shown in which no adequate prosthodontic rehabilitation would be possible without previous orthodontic treatment.
Clinical experiences in team approach show the need to treat our patients flexibly and multidisciplinary.

Dental prosthetic rehabilitation sometimes presents a special challenge regarding the treatment plan as well as the therapy itself. In such cases, a team approach is required, and a team may consist of several dental specialists- prosthodontist, orthodontist, oral surgeon, periodontist, etc. Despite the expertise of prosthodontist, there are cases that demand the somewhat different approach in treatment planning. Such an approach facilitates overcoming the obstacles given by conjoint states, biological system itself, limitations of prosthodontic and orthodontic techniques. Patient's expectations and cooperativeness face us with need to prepare, modify our approach, and even compromise regarding the usual treatment protocols.
In this paper, following the individual approach to each particular patient, cases where treatment plan had to be modified according to associated state of dental arches, as well as with patients' wishes and expectations. Cases are shown in which no adequate prosthodontic rehabilitation would be possible without previous orthodontic treatment.

Problems encountered by a therapist in the prosthetic rehabilitation of patients with congenital clefts of lips, jaw and palate originate both from the discrepancy between the dental arches, their interrelations, and the discrepancy between the total sizes of the upper and lower teeth. These problems origin from the conditions normally associated with these severe congenital disorders, such as hypo- and micro-dontia near the cleft site, with the specificity of the soft and bone-tissue configuration, as well as the presence of scar tissue in the area of previous operations in order to bridge the communication between the nasal and oral cavity, as well as defects on the lips.
In the case presented in this work, skeletal abnormalities are alleviated by the patient's orthogonal surgical treatment in accordance with the rules of such an approach. However, even after establishing eugnatic relationships between skeletal structures, the remaining occlusal irregularities are derived from dental structures, such as the frontal crossbite, the reduced size of the crowns of the incisors, and the insufficient space for its contouring, as well as the open bite, which resulted in unfavorable functional and aesthetic therapeutic effects. In order to correct the dental structures, a combination of orthodontic-prosthetic treatment was utilised, with the use of

fixed orthodontic devices with the straight arch technique. In order to improve the overall relationship between the sizes of the upper and lower teeth, the compensatory extraction of the lower central incisor, with the subsequent collapse of the lower arch height, as well as the expansion of the complete upper dental arch and replacing the teeth that are congenitally missing. The favorable circumstance was that during the pre-orthodontic treatment process, the deciduous canine was left distally from the permanent, while maintaining the vertical size of the bone, which facilitated the movement of permanent teeth after the extraction of the milk tooth during the preparation for definite care. Thus, prosthetic rehabilitation will be provided with multiple effects - with the replacement of the teeth and correction of the functions of the orofacial system, in addition, more favorable interocclusal relationships, as well as the support to the soft tissue structures of the lips, will be harmonized, and the patient's extraoral appearance will be harmonized.

Hypodontia - a congenital lack of permanent lateral incisors in the upper tooth arch, in addition to being an orthodontic irregularity itself, also leads to a functional mismatch of the bite, and since it is located in the aesthetic zone, to compromising the appearance of patients affected by this problem. The therapeutic orthodontic approach depends on occlusal relationships in the sagittal dimension. It is recommended that in patients with Class I relationships, rehabilitation is carried out by providing space with expansion to accommodate artificial teeth, which will be set up by the method most suited to the given case- implantology, bridges, etc. In patients with sagittal relationships in the Class II, camouflage approach is recommended, with the upper incisors and the canines contacting, which balances the interinincisal distance in the sagittal dimension - the overjet. At the end of the orthodontic treatment, the cuspids are contoured to look more like lateral incisors.

In this paper there are cases where the congenital agenesis of lateral incisors in patients with the Class I in the sagittal dimension is solved by making space for the replacement of dental implants.

Also, a case with skeletal class II, hypodontia of the upper lateral incisors, a traumatic deep bite, which led to a severe destruction of the supporting apparatus of the lower central and lateral incisors, and a large loss of alveolar bone in that region was also presented. During the diagnostic process and the development of the treatment plan, and in consultation with a periodontal specialist, prior to starting orthodontic treatment, the patient was shown that lower incisors would not be able to be saved, and that their extraction would be postponed until the end of the orthodontic treatment in order to provide multiple role-forming the proper lower dental arch as a prerequisite for correct prosthetic care, allowing proper speech, as well as the patient's satisfaction with her appearance during the duration of orthodontic treatment. In the upper dental arch, it is planned that the central incisors and the canines will be in contact, after which the shape of the cuspids would be adjusted to look more like lateral incisors. A particular challenge was the need to have a retention of the results achieved during the post-extraction period of the healing, as well as for the loss of the lower frontal teeth not to be visible. For these purposes, a foil retainer was made with inserted acrylic teeth which replaced the extracted incisors. In this way, the period necessary to heal before the definitive prosthetic care of the patient was not a traumatic period for the patient.

In patients with the Class II, division 2 and a extremely deep bite, after the loss of teeth in the posterior regions, with additional deepening of the bite, correct prosthetic rehabilitation is a challenge. The therapeutic effect on overbite, which is usually achieved by uprighting the posterior teeth and the intrusion of the front teeth, depends entirely on the dental support in relation to which the teeth move. As in this case, the dental support is weakened by the loss of lateral teeth, it has been found useful to provide an additional support using a TAD-Temporary Anchorage Device or orthodontic mini-implants in order to move intrusively anterior teeth that are in superposition. Thus, along with the movements of the rest of the lateral teeth, the influence on the interrelated relationships and the minimal intrusive influence of the fixed orthodontic apparatus, add intrusions movements with an absolute skeletal support, allowing for

a greater range of tooth movements, as well as a more favorable orthodontic therapeutic outcome in the patient preparation for definitive prosthetic rehabilitation .
Patients in whom, due to the loss of the vertical dimension of the face due to the loss of posterior teeth, by having occlusal contacts only between the lower and upper teeth, as well as the weakened periodontal apparatus, the incisors took the emphasised flared position with diastema between all teeth-the flared protrusion due to the loss of lateral teeth a case where there is a need for pre-prosthetic orthodontic movements of the teeth in order to obtain the conditions to properly compensate for the missing teeth. As the patient was planned to be taken care of by the means of metal based removable dental prosthesis prostheses, the pre-prosthetic period, alongside with the palatal inclining of the frontal teeth, was also used to provide better dental wear for the attachments of the removable prostheses. Better parallel alignment of axes of the carrying teeth was achieved.
Complex conditions associated with tooth defects, as well as the consequences of loss or inborn deficiency of teeth, supporting tissue, and severe developmental irregularities, require a team approach in solving, in order to achieve balance of orofacial functions, aesthetic rehabilitation, as well as morphological integrity to the greatest extent, by the means of dental techniques available.

Clinical experiences in team approach show the need to treat our patients flexibly and multidisciplinary.

POSTOPERATIVE SENSITIVITY AFTER COMPOSITE RESTORATION

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Abstract

A strong and durable bond between composite materials and dental tissues is one of the most important restorative dentistry requirements. Positive properties of composite materials, as observed in clinical practice, compromise the formation of micro-gap between the cavity wall and composite due to polymerization shrinkage and incoherent coefficient of linear thermal expansion of the composite and dental tissues, resulting in the penetration of microorganisms, toxins and oral fluids towards the pulp.

Microleakage is defined as clinically undetected penetration of bacteria, molecules, or ions between cavity walls and composite filling, manifested by the consequences of microleakage; marginal breakdown, postoperative tooth sensitivity, and appearance of secondary caries and pulp inflammation. The polymerization shrinkage of composite is result of approaching the molecules during the conversion of monomers into the polymer network. The degree of polymerization shrinkage is influenced by the type and quantity of the organic matrix/resin and the mutual relationship between the resin and the filler, or the chemical composition of the composite. Volumetric reduction of the composite caused by the contraction during the light polymerization develops the strain on the adhesive joint on cavity wall. High strain values greatly affect the adhesive bonding of the composite fillings. Namely, if the value of the strain exceeds the strength of the adhesive joint, micro-gap will occur during the placement of the composite filling. The strain is developing not only within the composite, but also on the cavo-surface margin, and it is also transferred to the surrounding tooth structures.

The reduction of degree of polymerization shrinkage is achieved by a layering placement technique and changing the light polymerization protocol. Also, the size and design of cavities have a significant impact on the degree of contraction and strain distribution. A particular chapter of restorative dentistry is use of so-called "non-shrinkage" composites as a dentine substitutes that have appeared on the market in recent years. Considering the socio-medical importance of caries in Serbia, the durable quality of composite fillings is one of the primary goals of restorative dentistry.

Introduction

In contemporary dentistry, dental composites are materials of choice for restorations of lost tooth structures, thanks to their optimal esthetic and mechanical properties, as well as their ability to bond adhesively to both enamel and dentin, without additional removing of healthy tissues. Achieving long-term and predictable marginal adaptation of dental composites to cavity walls represents the key factor from a clinical standpoint (1). It would be ideal to accomplish this requirement immediately after finishing polymerization process and maintain under occlusal forces and thermal changes in oral environment. However, in spite of the constant improvement in composition, as well as application of different placement and polymerization techniques of

dental composites, dimensional stability of this materials is usually compromised by polymerization reaction of organic matrix in this materials.

Recommended techniques to minimize the stress created by polymerization shrinkage

Postoperative sensitivity is closely related to the development of shrinkage stress during light polymerization process. Activation of polymerization process causes conversion of monomers into highly cross-linked molecules of polymers which leads to production of shrinkage stress on the adhesive bond between resin composite and cavity walls. When contraction stress overcomes adhesive bond strength, marginal gap is being formed followed by marginal leakage (2). However, if the adhesive bond survives, stress will be transfered to the surrounding tooth structure, which may result in cuspal deflection and crack formation in the dentin and enamel (3). Current composite resins shrink 2.9-7.1% during the polymerization process (4). In order to minimize negative effects of polymerization shrinkage of resin composites in clinical practice, there are several recommended placement and polymerization techniques, as well as application of low-shrinkage monomers.

One of the most commonly used method to decrease polymerization stress is placement of flowable resin composite with low elastic modulus as a first layer in cavities of Class I and II. These contributes to more uniformed distribution of stress over the adhesive interface between flowable and packable composite placed over it. Thanks to low content of filler, flowable composites are more flexible compared to the packable composites, taking over the role of stress-absorbing layer (5).

Incremental technique (horizontal, vertical, oblique) is also very usually used in practice, and implies placement and light-polymerization of composite in layers less than 2 mm thick. With decreasing C factor (ratio of the bonded surface area in a cavity to the unbonded surface area), it is provided partly releasing of contraction stress by flowing of resin composite from unbonded to bonded surfaces. Class I and II possess the highest C factor and restorations of these cavities are the most prone to the negative effects of polymerization shrinkage (6). With the aim of eliminating the singular stress point, placed metal or glass pin in geometric center of the cavity, increases the unbonded surfaces, thus decreasing the amount of composite resin placed as a first layer and changes the distribution of polymerization stress (7,8).

Polymerization stress has the maximum values at the start of the light-polymerization process (9). Verluis et al, in their study, concluded that resin composite reaches gel point in first 1,5-2 sec after activation of polymerization process (10). Postponing the onset of stress build-up can be achieved by prolongation of low viscosity period along with increasing the time for flow of the reacting molecules. At the beginning of polymerization process, monomers and small polymer chains are able to partly relief stress due to their mobility. After gel point, formed network of polymer becomes less mobile, what increases viscosity and reduces material's capability of relieving stress. That circumstances contribute to the damaging of the marginal seal and marginal leakage starts. The most widely used modifications of the light polymerization process are *soft-start* and *pulse-delay* techniques. In general, application of the higher light energy, causes more rapid development of polymerization stress (11). On the other hand, lower intensity light causes lower polymerization rate and allows more time for molecular rearrangements, decreasing the final polymerization contraction stress. *Soft-start* technique of light-polymerization process is a two-step mode which initially involves low intensity light, followed by high intensity light (12). *Pulse-delay* or discontinuous technique of light-polymerization implies dark interval after initial, short-term pulse of light energy, after which the light-polymerization process is continued normally (13). Although the longer duration of dark interval would be better for prolonging low

elastic modulus, total duration time of light-polymerization process should be as shorter as possible for clinical convenience.

The composition of composite materials for dental fillings has changed significantly since the time they were introduced into dental practice. These changes were related to the reduction of filler size for the purpose of more efficient polishing of composite materials and increased wear resistance. The current tests of composite materials are focused on the development of a polymer matrix system that would contribute to a lower polymerization contraction, a decrease in polymerization stress, and the possibilities of self-adhesion to dental structures.

Post-operative sensitivity of the tooth after placement of composite restoration can be caused by thermal, mechanical and osmotic stimuli. The occurrence of such a provoked pain indicates the existence of an exposed part of dentine where happened a failure to form and/or preserve the adhesive bond at the interface with the restoration. These failures may be noticeable during restoration finishing as a white line at margins, because the finishing debris collects in the defect and changes the index of refraction of light in area with cracks and fractures (14).

Conclusion

Clinical application of dental composites for the restoration of posterior teeth can be maintained at a satisfactory level with the minimized occurrence of postoperative sensitivity when dentists are well aware of the properties of these materials, also by strictly follow the manufacturer's recommendations for placement them in cavity, as well as the application of scientifically and clinically established protocols in everyday practice.

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BOND STRENGTH BETWEEN DENTIN AND FIBER POST- COULD IT BE BETTER ?

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Post and core system has been very popular and widely used for teeth that are severely mutilated because of caries, trauma or even as a result of previous large restorations. In case of anterior teeth esthetics demands of the colour of the post would reveal from an otherwise perfect definitive restoration.1

The challenges during post placement are: anatomic considerations and features that will retain the post within the root canal, the retention of the core material built in the coronal portion of the tooth and the adhesive bonding cementation between the post and the dentin.2 In the beginning of this century it was belived that a post does not strengthen the tooth, thus the decision to use a post is dependent on whether the remaining tooth structure is sufficient to retain the final restoration.3,4 Cheung felt that by having the post and the dentin with similar physical properties bonded together, the post can strengthen and reinforce the root but still does not make the tooth stronger.5 A minimum of 2 mm coronal dentin is needed to provide stability for the post. Recent prospective clinical trials indicate that the placement of a fiber post may play a protective role against restoration failure, especially under conditions of substantial coronal destruction, such as inteeth retaining only a 2-mm-high ferrule or even deprived of the ferrule effect. According to the literature the post requirements are:6

1. Presence of an adequate ferrule
2. Sufficient length of canal to retain a post
3. Curvature and overall anatomy of root canal system
4. Sufficient root (radicular) dentine thickness for post preparation
5. Restorability of tooth

Zirconia posts have high strength. However, they are brittle and have a high modulus which can potentially lead to root fracture. It can be difficult to remove the posts if needed. Ceramic posts are made from a brittle material. These posts can be too strong which can lead to root fracture. It can be difficult and even impossible to remove a ceramic post. Fibre reinforced resins are a form of non-metallic posts and include carbon fibre, fibreglass and woven polyethylene ribbon-reinforced composites. These posts are more likely to fail as their fibres can fray.Carbon fibre posts show very little deformation and are able to absorb and transfer forces similarly to dentine. However, these posts can be dark in colour which may lead to an unaesthetic result as the post can shine through the tooth. Glass fibre posts are less brittle than ceramic posts. Posts that have unidirectional fibres are the strongest. However, it is difficult to produce this type of material as fibre bundles require infiltration and wetting with resin. This process can often leave voids on the surface of the fibres, leading to a weakened structure.[7]

Fibre post should be placed in an endodontically treated root canal if there is more than one missing dentin wall.When posts are bonded well to root dentin, the post, cement and dentin form a monoblock and this moment should be transferred into the coronal part.[8]

Besides the microstructural characteristics, the mechanical properties of the posts are influenced by other factors such as the adhesive interface between the matrix and fibers.[9] The feature that has more influence on the mechanical properties of the posts is the type of fiber. The hardness of the glass fiber post does not affect the bending strength.[10]

Total-etch, multiple-bottle (fourth generation) and dual-cure adhesives are the adhesives of choice when cementing a post within a root canal where light penetration and depth of cure will be limited.[11] In recent years, self-etch, dual-cure composite resin cements have been introduced. These cements offer an alternative to multiple steps and potential contamination within the root canal. This family of new resin luting agents has self-adhesive capability and eliminates the need for separate etching, rinsing and drying, primer, and adhesive steps adhesion of the fiber post within the root canal has been shown to be clinically acceptable and root-reinforcing.

Fiber reinforced posts has a higher risk of debonding.[12] The findings of clinical trials indicate that in the case of debonding of fiber-post restoration, an adhesive failure at the cement-dentin interface is involved most of the time.[13,14] This is the weak point in the system.To improve retentive bond strength between post and resin cement, many surface pretreatments procedures for posts were investigated. The aim of this lecture is to present in vitro study assessing the mechanical properties of two different fiber posts, in relation to their pretreatment prior to cementation. Pretreatments sometimes need equipement and lots of time to enhance the surface effects on the retentive strength of the posts. Pretreatment of posts: silanization include etching with 37% phosphoric acid gel for 60 seconds and silanized, etching with hydrofluoric acid 9,5% for 15 seconds, sandblasting with an airborne particle abrasion and pretreatment with a laser of the fiber post. The second purpose of this review is to present novel techniques of fabricated fiber-reinforced posts and their design in order to prevent negative concequences of the dentin-cement-post-restoration relationship.

What can be done after the debonding of a post? Either the same post can be re-luted, if it was possible to remove it intact from the crown, or a new post can be luted once the remaining cement has been carefully removed from the root canal walls with a large canal drill. Thereafter, the dentist should repeat the adhesive procedure.

A novel glass fibre post was recently introduced. This post is made of glass fibres embedded in an unpolymerized resin matrix. The post is supplied in a soft form and hardens upon polymerization with light. These glass fiber reinforcements have been developed to provide solutions for modern, patient-friendly dentistry. The fiber reinforcements are made of silanated glass fibers in thermoplastic polymer and light curing resin matrix and products address the advantages of minimally invasive dentistry where the patient´s own healthy tooth tissue is saved for as long as clinically possible. This also means that other treatment options remain available should the patient ever need them in the future. Proper bonding between the fibers and composite is the key factor for a successful treatment. The new product products have a unique, patented interpenetrating polymer network structure (IPN). Clinically this leads to superior bonding enabling reliable surface retained applications and perfect handling properties. The significance of the IPN structure is that surfaces can be reactivated even after the final polymerisation. Reactivation is crucial for superior bonding when laboratory-manufactured restorations are cemented to teeth. Fiber reinforced composite (FRC) devices are remodelled or repaired. The IPN structure makes the everStick products fundamentally different from any other fiber or composite materials available. This post shows anisotropic behaviour, i.e. its capacity to adapt its physical properties to the load direction of an endodontically treated, restored tooth undergoing dangerous lateral loads.

Another novel concept represents glass-fiber reinforced post which depending on its size, consist of a bundle of fine individual posts, 0.3mm in diameter, in varying number. It is strengthening the root and recommended for atypical root canal anatomies and pronounced

conicity. No pretreatment is needed. The system is compatible with all core buildup materials and requires no change in technique.

While placing, it is recommended to first polymerise the adhesive, place the post and then to polymerise the dual-cure cement.

Some morphological situations recommend the use of so-called flowable materials, other adhesion tests recommend the use of microhybrid composites. Clinical data gives positive results for both types of materials. Thus, the personal preference of the dentist is decisive, provided that the restorative procedure always follows the incremental technique, and the material itself is adapted to the coronal surface of the post and the remaining root structure.

The interaction of the modulus of elasticity and mechanical properties of the post with the luting material and core material are critical in the longevity of the restoration.

Image 1. Post cementation.

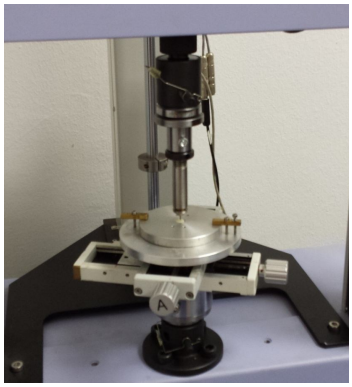

Image 2. Push-out test. Microtensile bond strength measurement.

Image 3. Scanning electro- microscopy

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THE FACTORS AFFECTING SUCCESFUL OUTCOME FOLLOWING NON-SURGICAL ROOT CANAL TREATMENT

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Diseases of the dental pulp often have an infectious origin, and treatments are aimed to control infections of the root canal system. Apical periodontitis is a chronic inflammatory disorder of periradicular tissues caused by aetiological agents of endodontic origin. Persistent apical periodontitis occurs when root canal treatment of apical periodontitis has not adequately eliminated intraradicular infection.

Multiple treatment factors affect an outcome of non-surgical root canal treatment which usually fails when the procedure is carried out inadequately. In most of the cases, the endodontic failure results from persistent or secondary intraradicular infection. Even when the most stringent procedures are followed, apical periodontitis may still persist as asymptomatic radiolucencies, because of the complex of the root canal system formed by the main and accessory canals, their ramifications and anastomoses where residual infection can persist. Further, there are extraradicular factors – located within the inflamed periapical tissue – that can interfere with post-treatment healing of apical periodontitis.

Endodontic treatment principles originally evolved on the basis of trial and error, while in contemporary endodontic therapy various scientific methods have been adopted to support clinical strategies. In light of the technical procedures often encountered in endodontic therapy, it is not surprising that research in endodontics has focused on the development of effective tools and materials to facilitate non-surgical root canal treatment. While the technological advances in endodontics have been impressive, the biological basis for root canal therapy has received comparatively little attention. That is why it was aimed to highlight and analyze some of the more heavily debated endodontic issues in recent years. The purpose of this presentation is to emphasize the factors responsible for predictable endodontic treatment, particularly of non-surgicaly treated root canals. Findings extracted from the contemporary scientific papers are based on best available evidence from the literature and the expert views of specialists in endodontics and restorative dentistry.

IRRIGATION IN ENDODONTICS

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According to an old and famous endodontic axiom, what is removed from the root canal is more important than what is placed inside. Without minimizing the importance of the obturation phase, it is nonetheless true that the phase of preparing root canal for obturation is undoubtedly the most important, the most complex and the most delicate phase of the endodontic treatment.

In modern endodontics, hand and rotary instruments are used for shaping and different irrigating solutions are used for cleaning the root canal system. It is said that instruments shape, irrigants clean. The success of endodontic treatment depends on removing the vital/inflamed/necrotic pulp tissue, microbes and other organic/inorganic debris from root canal space. Several studies using advanced techniques have demonstrated that proportionally large areas of the main root canal wall remain untouched by instruments during root canal therapy. Every root canal system has spaces that cannot be cleaned mechanically. The only way we can clean webs, fins and anastomoses is through the effective use of irrigation solution.

The most important goals of irrigation are removal of microorganisms and antibacterial action, dissolving of organic or inorganic tissue in the root canal, removal of the smear layer that is created during instrumentation. Irrigants can also help prevent packing of the hard and soft tissue in the apical root canal and reduce instrument friction during instrumentation.
An ideal irrigant solutions must fulfill some criteria:

- they should have broad spectrum antibacterial and germicidal properties
- they should be able to aid in the debridment of the canal system (washing action through a flushing mechanism)
- they should be able to dissolve organic matter (dentin collagen, pulp tissue)
- they should be able to dissolve inorganic tissue (be able to dissolve smear layer)
- they should be non-toxic and non-irritating to the periapical tissues
- they should lubricate the canal instruments
- they should prevent discoloration of the tooth
- they should have a low surface tension to reach the apical delta and all the areas that cannot be reached by the instruments
- they should be readily available and inexpensive

There is no single irrigant solution that alone sufficiently covers all of the function required from an irrigant. Optimal irrigation is based on the combined use of two or more different irrigating solutions, in a specific sequence, to predictable obtain the goals of safe and effective irrigation.

Sodium hypochlorite (NaOCl) is the most commonly used irrigating solution and it is used in concentrations between 0.5% i 6%. NaOCl is potent antimicrobial agent, regardless of the used concentration. It also effectively dissolves pulpal remnants. Hypochlorite is the only root canal irrigant of those in general use that dissolves necrotic tissue and tissue fragments that have lost their blood supply (it is less effective on vital tissue with an intact blood supply). Considering antimicrobial effect and organolytic ability, if lower concentration of NaOCl are to be used for

intracanal irrigation, it is recomended that the solution be used in higher volume and in more frequent interval to compensate for the limitations in effectiveness. NaOCl provides lubrication for the use of endodontic instruments and it is easily available and economical.

The weaknesses of NaOCl include the unpleasant taste and smell, toxicity and its inability to remove the smear layer. Although hypochlorite alone does not remove the smear layer, it affects the organic part of the smear layer, making its complete removal possible by subsequent irrigation with EDTA or citric acid. Considering the toxicity of NaOCl and irritation of periapical tissue and oral mucosa, the higher the concentration of solution, the more chances are that complications will occur. After the accident with NaOCl the following can be expected: severe pain, edema, profuse bleeding from root canal, profuse interstitial bleeding with hemorrhage of skin and mucosa and secondary infections is also possible. To manage these lesions, the clinician should control pain with local anesthesia and analgesics. The application of extraoral cold compresses to reduce swelling is effective, and after one day warm compresses for stimulation blood circulation should be used. The use of antibiotics is recommended in cases of high risk of secondary unfection.

Methods by which we can increase the efficiency of sodium hypochlorite are:

- time – since antimicrobial and organolytic effectiveness of NaOCl is directly related to its contact time with the content of the root canal, greater the contact time, more effective it is
- temperature / heat – it has been shown that warming low concentration sodium hypochlorite to about 60°C improves its organolytic and antimicrobial effectiveness
- quantity of the NaOCl and frequency of irrigation – in general, a canal should be copiously irrigated during and after instrumentation
- sonic and ultrasonic activation of hypochlorite, especially after instrumentation

Saline (0.9% NaCl) acts by flushing action. It is biocompatible in nature and does not cause side effects even if extruded periapically. Saline does not posses antimicrobial or organolytic activity, and does not remove smear layer. It is used for neutralisation of other irrigants, to prevent interaction between sodium hypochlorite, ethylenediamine tetra acetic acid (EDTA) and chlorhexidine (CHX).

Hydrogen peroxide (H_2O_2) – it is clear, odorless liquid; 3% solution is used as an irrigating agent. The rapid release of nascent oxygen in contact with organic tissue results in effervescence or bubbling action which is thought to aid in mechanical debridement. Hydrogen peroxide should not be used alone as irrigant, and while using in combination with NaOCl, never use hydrogen as the last irrigant.

Chlorhexidine (CHX) possesses a broad spectrum of antimicrobial activity, provides a sustained action and has little toxicity. Chlorhexidine does not posses some of the undesired characteristics of sodium hypochlorite (bad taste and smell, strong irritation to periapical tissue), but chlorhexidine also has no tissue dissolving capability (to dissolve organic tissue and remove the smear layer) and therefore it cannot replace sodium hypochlorite.

Chelating agents – **ethylenediamine tetra acetic acid** (EDTA) and **citric acid** (CA) are used in endodontics for several purposes, like lubrication, emulsification and flotation. EDTA and CA effectively dissolve inorganic material, including hydroxyapatite. As hypochlorite is active only against organic tissue EDTA or CA must be used to complete removal of the smear layer and dentin debris. The recommended time for removal of the smear layer with EDTA is 1 minute.

Interaction between sodium hypochlorite, ethylenediamine tetra acetic acid and chlorhexidine is undesirable and these solutions should not be mixed. If these solutions are used in root canal therapy then saline must be used for neutralisation after each of them. Although some of the main irrigating solution cannot be mixed together several combination products exist. **MTAD** (a mixture of tetracycline – doxycycline, citric acid and detergent, tetraclean and

QMiX are new products designed primarily for smear layer removal. It is recomended for this products to be used at the end of instrumentation, after NaOCl irrigation.

The effectiveness and safety of irrigation depends on the means of delivery. Traditionally, irrigation has been performed with a plastic sterile syringe of different sizes (1-20mL) and open ended needle. To maximize safety and control, use of 5mL syringes with Luer-Lock design is recommended. Considering type of needle, use of flexible or precurved closed ended needle is preferred. Both, the diameter and position of the needle outlet determine succesful debridement; placement close to working lenght is required to guarantee fluid exchange at the apical portion of the canal, but close control is required to avoid extrusion. Needle should never be wedged into the canal and should allow an adequate back-flow. Also, the irrigant solution must be introduced slowly and passively into the canal.

Another approach to afford better access of irrigation solution to the apical portion of the canal is negative pressure irrigation (EndoVac). Here, irrigant is delivered into the acces chamber and a very fine needle connected to the dental unit's suction device is placed into the root canal. Excess irrigant from the access cavity is then transported apically, sucked down the root canal and back up again through a thin needle with a special design. Compared with traditional needle irrigation and some other systems, the EndoVac system lowers the risk associated with irrigation close to the apical foramen considerably.

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PREVENTION OF DENTAL EROSION CAUSED BY INTRINSIC ACID

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Abstract:

Gastric juice entering the mouth causes dental erosion. The acid reaches the mouth eithet vomiting or by regurgitation.There is a number of disease with chronic gastric regurgitation. The most comman are psychosomatic complaints, such as alcoholisam,eating disorders (anorexia nervosa,bulimia nervosa) and gastroesophageal reflux disease (GERD).

Early erosion is seen with loss of enamel from the palatinal surfaces of the upper incisors,but as the erosion progresses, the palatinal cusps and surfaces of the premolars and molars also become involved. Finally, more generalised erosion on the occlusal surfaces of molars and the facial surfaces of all teeth produces severe tooth wear, tooth hypersensitivity,anterior open bite, bilateral parotide enlargement and xerostomia.

When eating disorderds, vomiting or gastric refluks are parts of risk complex, psychological counselling, lifestyle changes and medication are essential components for the prevention. Among the non-invasive preventive measures to arrest this chemical proces,diet changes,water rinses, fluoride-containing products, calcium additives, matrix metalloproteinases have been commanly suggested. They should be advised to avoid brushing or chewing hard foods for approximately two hours post regurgitation and to brush with soft toothbrush and use high fluoride dentifrices, varnishes or trays. The prevention of dental erosion from eating disorders, alcoholisam or GERD requires a multidisciplinary approach involving the family physician, internist, gastroenterologist, psychiatrist and dentist.

Keywords: erosive toothwear, intrinsic causes of erosion, preventive measures

Dental erosion is defined as the loss of tooth substance by chemical processes that do not involve bacteria(1,2). Gastric juice that reaches the oral cavity leads to the demineralization of hard dental tissue and formation of dental erosions, providing that there is a frequent and prolonged contact between the gastric juice and the tooth surfaces. Gastric juice consists of a hydrochloric acid, electrolyte, organic acid, carbohydrates, nitrogenous compounds, protein, vitamins and pepsin and its pH value is between 1.6 and 1.9. Dentists should be aware of the signs and symptoms of medical conditions and diseases that can lead to the presence of gastric juice in the mouth, in order to be able to take the appropriate preventive and therapeutic measures related to oral tissues, as well as to direct the patient, if not previously diagnosed, to the appropriate medical specialist(3,4).

Gastric juice in the oral cavity appears in cases of *repeated vomiting* (medical conditions, eating disorders, Cyclic vomiting syndrome, side effects of medications, chronic alcoholism and pregnancy induced emesis), *regurgitation* and *reflux disease* (4,5).

Medical conditions that are accompanied by frequent vomiting can originate from *gastrointestinal disorders* (peptic ulcer, chronic gastritis, gastric motility disorders), *endocrine and metabolic disorders* (diabetes mellitus and hyperthyroidism) but also from *central nervous system disorders and neurological diseases* (6-9).Cyclic vomiting syndrome is characterized by vomiting that occurs periodically and may last several days or months. Amongst the most common triggering factors we encounter stress, emotional excitement and infection (6,8).

One of the most frequent etiological factors of vomiting is the side effect of medications of some general medical illnesses. A wide range of drugs have been associated with the central emetic side effects and secondary effects due to gastric irritation. Amongst the drugs with central emetic effects we can account for opiate analgesics and chemotherapeutics agents. Other drugs can induce vomiting secondary due to gastric irritation, such as aspirin, diuretics and alcohol (5-10).

Chronic alcoholism has as its consequence a high incidence of tooth decay, stimulates the occurrence of bruxism or oral cancer and dental erosion. Erosive changes are caused by vomiting due to alcoholic intoxication or regurgitation. A very important role in the development of dental erosion is played by exogenous sources of acid, as it is a well-known fact that the pH value of white wine is 3.7, red wine - 3.4, while beer has a pH value (eg. Carlsberg) 4.4, which in combination with endogenous acids intensify the processes of demineralization, leading to generalized dental erosions that can even affect all tooth surfaces (6,11-13).

There are several diseases that are accompanied by chronic gastric regurgitation. The most common psychosomatic disorders / alcohol abuse, eating disorders (anorexia nervosa and bulimia nervosa) and gastroesophageal reflux (6-9).

Dental erosions produced by gastric juice activity affect a large number of teeth and dimensions are much greater than in case of the erosions caused by exogenous acids. Gastric acids that reach the oral cavity and come in contact with the teeth typically affect the palatal surfaces of the maxillary teeth. Dorsum of the tongue directs gastric juice to the palatal surfaces of the front teeth. Gastric acids erode the enamel and dentin. On smooth surfaces, the original luster of the tooth dulls. Later, the convex areas flatten or get the shape of shallow concavities. The thinning of enamel may lead to an increased incisal and proximal translucency and yellowish appearance on the teeth. On occlusal surfaces, the cusps become rounded or cupped and the edges of restorations appear to rise above the level of the adjacent tooth surfaces. In severe cases, the whole tooth morphology disappears and the vertical crown height can be significantly reduced. As the process progresses, changes become evident on the palatal surfaces of the cusps on the upper premolars and molars. Occlusal and vestibular surfaces of the posterior teeth are affected in the terminal stage (5,8,9).. The changes do not affect only the enamel but also the dentine. Pepsin and trypsin are present in gastric juice. The demineralized organic matrix can be degraded by gastric enzymes (the degradation of the collagenous matrix in the dentin), the dentin reduces the resistance to mechanical stimuli and intensify the loss of dentin tissue. It has been speculated that matrix metalloproteinases located within dentine itself could be exposed and activated during the erosion process and hence contribute to tissue breakdown. As a result, all of the above-mentioned lead to the loss of complete tooth morphology and the vertical dimension of the teeth may be significantly reduced. Repeated or prolonged exposure of teeth to acids leads to selective dissolution of specific components of the tooth surface, with eventual loss of tooth substance, hypersensitivity, functional impairment, and even the tooth fracture and in case of an excessive wear, possible complications include pain, pulpal inflammation, necrosis and periapical pathology (4-6,14-19).

The aforementioned facts point to the need to establish protocols of prevention of dental erosion in which erosive agent is of endogenous origin. First of all, a diagnostic questionnaire must be formed, which will contain previously entered data related to the overall medical history and dental history and then during a dental objective examination verify the presence and localization of erosive changes with the application of BEWE index. We recommend the verification and intake of food and beverages for a period of at least 3 days, including the weekend (the time of intake as well as the type) for evaluation of erosive foods and beverages. Particular attention should be paid to the diet (tea, alcohol, sports drinks, vitamin C tablets etc.), gastric symptoms (vomiting, sour taste in the mouth, stomach pain), medication (antiemetics, antihistamines, bronchodilators etc.). It is necessary to determine the amount of secreted saliva and its buffering capacity. Oral hygiene habits are extremely important (brushing techniques and

the type of tooth paste) and their verification is also required. Occupational exposure to acids (swimmers, taste testers) must also be verified as well as persons who have undergone the radiation therapy of head and neck. In order to be able to track the progress of a diagnosed dental disease, it is necessary to make a silicone impression of the teeth of the upper and lower jaws, gush working models, but also make photos that will provide the monitoring of disease and possible deepening of defects (6,19).

Patients must be suggested simple recommendations that shall reduce the risk of erosion by providing advice on diet as well as changing the lifestyle and remineralization of existing defects. One part of the preventive measures patients should conduct at home, following the advice received, whereas the second part of the prevention and control should be conducted in a dental office with professional applications of fluoride, agents which contain calcium, tricalcium phosphate technology, by covering the surface of the tooth using means with and without remineralization potential, as well as by protecting tooth surfaces using the shield. It should be specifically emphasized that all the preventive measures are meaningless if we do not include the therapy of general medical illness by applying antacid one hour after a meal or one hour before going to bed, constantly motivating patients to lead a healthy life and have a positive attitude (20,21).

Preventive measures carried out by the patient at home consist of application of advice provided by a consulting doctor of medicine and dentist.

Individually tailored advice for patients.

Patients should be given advice on simple, practical ways to reduce the risk of erosive tooth wear such as dietary advice, advice on modifying habits, remineralization of dental defects, maintaining proper oral hygiene, professional application of fluoride and the application of occlusal guard.

***Dietary advice*:** refer to the limited intake of acidic foods and beverages that are entered only during meals. We recommend the use of natural water in large quantities and teas from calendula and linden. The meal should finish with milk or milk products containing 1.5% of fat. Other nutrition advice should be given by the nutritionists(3-6). The reduction of reflux symptoms will occur if the followinig methods are respected:

Modifying lifestyle (to be emphasized to people with reflux symptoms):

- Refrain from eating three hours prior to bedtime;
- Avoid lying down right after a meal;
- Sleep on an elevated headboard;
- Stand upright or sit up straight and maintain good posture;
- Avoid large meals;
- Avoid fatty foods, chocolate, coffee, peppermint, spicy foods, citrus, tomato;
- Avoid alcohol ingestion and smoking;
- Regulate body weight;
- Eliminate excessive intake of analgesics, aspirin, ibuprofen, drugs against osteoporosis (the deal with certain medical specialists);
- Carbonated soft drinks should be consumed using a straw;
- Acidic drinks, alcoholic and non-alcoholic, should be drunk at once without sipping;
- Rinse the mouth with water after intake of carbonated beverages, wine and beer;
- Drink cold rather than warm beverages (if acidic) (3-9,21).

Remineralization of dental defects (individual recommendations):

- After vomiting or regurgitation, rinse the mouth with plain water (22) or
- Rinse with sodium bicarbonate (1ts in 250 ml water) (23);
- Once a day rinse your mouth with green tea (24);
- Rinse the mouth with chlorhexidine between the acid attack (21);
- Increase the salivation with sugarless chewing gums with xylitol (25);

- Use the mouthwash products with fluoride 200-300pp once a day(21) or
- Fluoride tablets or lozenges (21).

Oral hygiene advice:

- Brush the teeth twice a day for two minutes(26);
- Use the toothpaste with fluoride or with CPP-ACP (casein phosphor peptide-amorphous calcium phosphate) with low abrasiveness;
- Apply soft or medium-hard toothbrushes;
- Toothbrush should be changed every three months;
- After vomiting, brush the tongue;
- Check-ups should be done every six months (21).

Professional application of fluoride:

- Periodically, in cases of moderate high or high risk;
- The 2% solution of sodium fluoride 2-4 applications per year at high risk and 1-2 at moderate risk);
- 8-10% of stannous fluoride (solution or jelly) (21).

Application of protective products:

- Application of occlusal guard during sleep, swimming in the pool or provoked vomiting;
- Alkaline substances placed into the guard (Magnesium milk or neutral fluoride gels -5 min./24 hours with 1.1% neutral fluoride gel) (21,22).

The twenty-first century is claimed to be the century of preventive dentistry. The World Dental Association, the World Health Organization, the International Association for Research in dentistry have brought the general and specific objectives for the provision of oral health to be achieved by 2020. One of the general objectives is: to reduce the impact of general (systemic) diseases on oral health, whereas the previously manifested symptoms (oral or craniofacial) should be used for early prevention, diagnosis and the effective treatment of systemic diseases. Serbia needs to improve preventive strategies through health promotion and good primary prevention. It is fundamental to emphasize that without a valid multidisciplinary prevention, we cannot have a normal functioning of the stomatognathic system, as well as the protection of the hard-dental tissue in patients diagnosed with chronic diseases (21).

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„GLYDE PATH“ – THE IMPORTANCE OF INITIAL AND REPRODUCIBLE CANAL PATENCY IN ENDODONTICS

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Abstract
One of the most important stages of endodontic treatment is the achievement of initial and repeatable passage through dental root canals. This phase of work in the endodontic procedure is called "negotiation with a canal". It is important to list this name in order to emphasize the importance of a skill and patience needed to be invested in this first stage of a canal processing, after the access cavity is well prepared. It is, as its name itself describes, challenging and sometimes demanding, but it represents one of the stages that are a prerequisite for successful treatment of a root canal.
The goal for each clinician should be to achieve a canal passage at its full length, not only at the start of the treatment, but to be able to repeatedly preserve it during the entire endodontic procedure. Once the initial pathway through the canal is achieved, all other successive phases more easily follow one another, starting on a good basis.
For this phase of work, it is necessary to possess instruments of a small diameter for achieving the initial passage, as well as a viscous helator to be able to test the full-length canal morphology. The instrument needs to reach the canal terminus and to achieve an easy and repeatable glyde path through the complex canal morphology. For this phase of work, hand and rotating files have been designed, which offer a chance for clinitians who know-how, to significantly increase the success of the entire endodontic treatment. It should be emphasized that the most commonly occurring iatrogenic errors are closely related to this phase, which, therefore, should be taken as the endodontic phase of a great importance.

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Invited lectures

SOFT TISSUE CONDITIONING IN IMPLANTOPROSTHETICS FOR OPTIMAL ESTETHIC EFFECT - POSSIBILITIES AND LIMITATIONS

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Scientific results and clinical practice in application of implant supported restorations, show the high success rates. However, reaching optimal esthetic result in their application is still unpredictable. If the success of implantoprosthetic therapy is measured in its functional aspects, then the measure is well osseointegrated implant where the minor loss of bone around the implant does not minimize the therapy value. However, if the aim is to achieve optimal esthetic result then even the least lack of or irregularity in soft tissue is visible and compromise the success of therapy. Teeth, along with alveolar ridge and soft tissue that surrounds them have a specific function. Where there is no teeth, alveolar ridge and accompanying soft tissue will not develop regularly. Implantoprosthetic therapy showed that the key to optimal esthetic result is in harmonized soft tissue line - in other words: what our eye perceives as esthetic. Esthetics means nothing else but the successful mimic of nature - restorations should be congruently and fit the existing dental line unnoticed. While comparing the starting condition of implants with natural tooth, it is necessary to redefine the place where the crown exits the soft tissue (the soft tissue profile). Circular cross-section of implants with relatively small diameter is clearly differentiated from the natural tooth in that area. In order to reconstruct esthetically optimal crown, it is necessary to imitate the prepared teeth with prosthetic means corresponding to the natural tooth in its shape and color. Forming the adequate emergency profile for the implant supported crowns should begin already with the extraction of the tooth by proper preservation of the remaining tissue. The next step is modeling the adequate individual abutment and temporary crowns aiming at mimicking the natural tooth as ideal background for forming the crown's soft tissue profile as similar to the natural tooth as possible. In time, therapeutic concepts aiming at reaching the optimal esthetic results have set the key factors to be taken into consideration. However, different concepts are applied in practice still trying to define the protocols for shaping the soft tissue around the implant supported crown' soft tissue profile.

Dental implants are highly successful solution for replacing the lost teeth. Expansion and development of this field in dental medicine is accompanied by numerous scientific and clinical research whose results contribute to the fact that implantoprosthetics has reached its peak and can be considered a reliable and predictable therapeutic concept.

In the mid-1960ies, when the first implant were introduced, all efforts were directed towards achieving good primary stability and esthetic results was secondary. As in life, dental practice learns from mistakes and recognizing and detailed analysis of the previous mistakes resulted in setting up the protocol for soft tissue conditioning in the crown exit profile area. This is the basis of the present esthetic implantoprosthetic therapy [1].

Understanding of the soft tissue healing and long term preservation of the dental implant results is extremely important for success of implantoprosthetic therapy [2, 3].

Implantoprosthetic is based on the multidisciplinary approach of the oral surgeon and prosthodontist, therefore it is impossible to achieve the optimal result without their close cooperation throughout the entire therapy. Estimating the implantoprosthetic therapy's success can be done from several aspects. If the success of implantoprosthetic is valued from the functional aspect, then the minor loss of bone (1-2 mm) around well osseointegrated implant is

not considered a problem and does not minimize the success. However, if this concept is applied to soft tissue, then the loss of 1-2 mm of the soft tissue in the area of crown' exit profile on the implant represents significant esthetic defect. Such implantoprosthetic therapy's result is considered unacceptable by the modern dental medicine high esthetic standards [4].

Teeth, along with alveolar ridge and soft tissue that surrounds them are all together inseparable functional and esthetic complex. Where the teeth are missing, alveolar ridge and accompanying soft tissue will not have their physiological aspect. Loss of teeth results in the lack of the support structure that maintains the original bone and soft tissue structure, which is very difficult to reconstruct and bring to the esthetically acceptable form [5, 6, 7].

Knowledge and approach to therapeutic work of the oral surgeon who place the implant and prosthodontist who makes the prosthetics reconstruction, must be harmonized and coordinated. Otherwise, the final esthetic effect will default. In order to understand each other, define the end results of esthetic therapy and create the exact plan for therapeutic steps to achieve the result, the oral surgeon has to have good knowledge in prosthetics, while the prosthodontist should know the basics of surgery [8, 9, 10].

Implant supported crowns has to fit in the existing dental line invisibly and congruently. This is much harder to achieve in individual teeth replacements because next to it we have natural tooth to compare with and even the minor deviation from the natural esthetic is clearly visible.

Furhauser was the first to publish analysis relating to the "pink esthetic" and he defined limiting factors and most frequent complications that can affect the esthetic result [11].

Extended clinical crowns – Crown's visibility is defined by individually positioned patient's smile line, i.e. with visible length of the crown from incisive edge of the crown to the gingival margin. If there is a soft tissue deficit, no matter the adequately positioned incisive edges, clinical crowns will seem too long, which is often considered as esthetic complication in implantoprosthetic therapy. Today it is known which mistake of the oral surgeon has brought such result - in most cases it is setting the implant in wrong position or in non-augmented or inadequately augmented soft tissue during the therapy.

Existence of scar tissue in visible esthetic zone Soft tissue scars can be found already before the therapy or can come to existence during surgical procedures. Irrelevant of their origin, they have to be removed during the therapy.

Lack of interdental papilla -There are two different causes for the lack of papilla between the implant supported crowns. One is the already existing lack of soft tissue found by oral surgeon during the oral procedure of implementation, making the adequate esthetic reconstruction of papilla impossible. Second is the possibility of destroying the adequate amount of soft tissue by inadequate surgical treatment. Today there are defined protocols for soft tissue conditioning that have to be followed through. One has to have in mind that the papilla between the two implants or between the implant and natural tooth are not based on the same biological principles and that the soft tissue behaves differently in these situations.

Vestibular decreased soft tissue volume– Cavity resulted from the lack of bone tissue and soft tissue manifests as concavity form in relation to other structures. Such formation on the vestibular side of the ridge above the supplemented tooth forms unwanted shadow, which causes dark coloration. Vertical dimension of the tissue is insufficient. Therefore, it is necessary to have the horizontemental dimension as well, otherwise the favorable esthetic effect is missing. Particular problem is in high smile line making the mentioned defect more visible and ruining

esthetics. Therapeutic steps for solving this problem are either preventive control of vestibular resorption or surgical augmentation of tissue.

Soft tissue coloration– Depending on the gingiva type, applying the metal parts in implant system can cause coloration. Solution is sought in full application of ceramic materials [12].
Anatomic and prosthetic factors are equally responsible for esthetically appropriate soft tissue modeling around the implant [13, 14]. One of the basic preconditions is good vascularity which is necessary for the soft tissue to positively respond to prosthetic simulations [15].

In two-phase surgical technique, soft tissue conditioning can begin already during the healing phase. The simplest solution is making the adequate temporary mobile prosthesis, particularly in cases of single-tooth replacements, not involving the adjacent teeth. This temporary prosthesis should, apart from its esthetic role as temporary solution for the missing tooth, fulfill its therapeutic task in forming the soft tissue. Two basic conditions should be fulfilled: stability and distance of the supporting elements from the surgical area. This is the reason why small prosthesis whose surface is concentrated in the area around the inserted implant (such as classical prosthesis that we are used to in conventional prosthetics) are completely unacceptable. Ideal mobile reconstruction sticks with as larger surface as possible to the palate, preferably to the most distal teeth from both sides of the remaining teeth arch. Such palatal support ensures disburdening of the wound area. Retention is achieved with metal retention elements on distal teeth. Temporary mobile prosthesis is made before the tooth extraction and is placed in the patient's mouth immediately after the tooth extraction. Gingival side of tooth of mobile prosthesis is shaped with oval gingival base which are particularly prominent into the wound area. This shape of the tooth helps in maintaining the coagulum within the wound and backing the soft tissue forms helps in preserving their original form. As the wound healing progresses, the oval base should be modified. During the making of the crown on the prepared natural tooth, dentist's task is to preserve the already existing natural form of gingiva. After the grinding of the natural tooth in accordance with the rules, the technician should make the adequate crown and entire final esthetic effect depends solely on the technician. The situation is significantly more complicated in implantoprosthetics because the exit of the crown has to be remodeled at the beginning. If we take into consideration the circular cross-section and significantly smaller dimensions of the implants compared to the natural tooth, we face the problems already in modeling the starting root and neck part of the crown and soft tissue. In order to craft the esthetically optimal crown it is required to mimic the natural supporting tooth which corresponds to the natural tooth in both shape and color. Clinical experiences undoubtedly show that the suprastructure has to be formed differently than on the natural tooth [16, 17].

One of the efficient methods in modeling the soft tissue is pre-dimensioning of the crown. Shaping of the soft tissue around the implant starts at the level of implant's shoulder instead of the level of soft tissue presenting the visible soft tissue margin. Certain vertical dimension has to be available in order for us to be able to gradually expand the crown's exit profile from the implant diameter dimensions to the natural tooth dimension at the level of exit from the soft tissue. Pre-dimensioning means strongly controlled pressure over the soft tissue, resulting in its suppression and reduced vascularity. Controlled pressure requires maintaining of the pressure in biological framework so that vascularity could be back to normal in short term in order to avoid the soft tissue necrosis. Basic requirements that have to be filled in order to achieve optimal esthetic results, as well as their long term prognoses are well known today [4, 18, 19, 20].

Basic precondition for adequate forming of the exit profile is presence of the sufficient amount of soft tissue. Distance between the two implants should be more than 4 mm in order to have sufficient soft tissue between them for shaping.

When we observe the natural tooth with its supportive tissue, supraalveolar part of the soft tissue has 3mm average vertical height while the value in approximal region is around 4,5 mm [21, 22]. In case of the distance from approximal bone edge to contact spot of the tooth, from 5 mm or less, there is almost always papilla present. With increase of the mentioned dimension, due to the loss of bone, papilla dimensions are decreased and approximal space remains partially or completely unfilled with papilla [23].

Unlike the natural tooth's soft tissue complex, peri-implant tissue is formed of sulcus, peri-implant space and epithelial attachment. Epithelial attachment is characterized by circularly oriented fibers, parallel to the implant's and abutment surface. Complex is nutritioned through alveolar and subperiosteal blood vessels and contain more parts of the collagen fibers and less fibroblasts compared to natural tooth. This is the reason it resembles more to the scar tissue with reduced vascularity [4, 24].

Adequate peri-implant tissue vascularity is necessary to fulfill the nutritional needs of the gingiva, similar to the natural tooth. Maintaining the adequate peri-implant tissue vascularity is important both during the surgical phase and during the soft tissue conditioning with healing cap or temporary supplement [25]. Height of the peri-implant space is 3 mm vestibular on average, similar to the natural tooth.

Papilla between the implant and natural tooth depends on the bone level at natural tooth because large part of this tissue's nutrition, as well as support, come from the natural tooth. Bone level around natural tooth is responsible for providing support for papilla [26]. In case there is movement of the bone approximal margin on the natural tooth, papilla moves with it apically. Reconstruction is quite difficult because, no matter the augmented tissue, papilla is lost again following the bone level. It is possible to try with tooth extrusion aiming at coronary movement of the tooth together with parodontium, with implant serving as stable anchorage [4, 27].

Distance between the implant and tooth should not be less than 1,5 mm in order to prevent the bone resorption and ensure sufficient amount of soft tissue for modeling. Bone remodeling around the implant results in bone degradation in horizontal and vertical direction from 1,2 to 1,5 mm. In case the distance between the implant and natural tooth is less than recommended 1,5 mm, during the bone resorption the tooth parodont will also degrade, resulting in loss of papilla's natural support and nutrition. The consequence is loss of papilla [4].

Tarnow et al. describe that in case of 3 millimeter distance between the implant and expected loss of bone of 1,5 mm, bone resorption will end at the implant shoulder [23]. Implant shoulder is placed apical compared to the approximal bone margin at natural tooth, so the height of the papilla will accordingly be expectedly low.

With distance between the implants less than 3 mm, bone level stops more apical from implant's shoulder. Optimal apical depth of the implant's shoulder in relation to the desired soft tissue profile depends from the implant's diameter and desired tooth diameter. The larger the difference, the larger the vertical distance between the implant's shoulder and gingiva margin is required. Optimal vertical height varies from 2 mm under ideal conditions to 6 mm in case of the need for large correction of the exit profile's width. Soft tissue's thickness required for prosthetic phase is minimum 3-5 mm in the papilla area and minimum 2-3 mm vestibular [4].

The most important rule in application of pre-dimensioned temporary crowns is that they must not have sharp edges. Pressure on the tissue should never be made over such formations because it will bring to the blood-stream interruption and tissue necrosis. Pressure should be spread over larger surface. It is considered that the allowed pressure can be a bit higher towards the

approximal than on vestibular soft tissue because the vertical dimension of vestibular soft tissue is significantly smaller than approximal which makes the pressure higher [4].

Factory-made suprastructures are highly unfavorable for soft tissue modeling because it is difficult to produce continuous pressure with positive effect on soft tissue with such suprastructure. Therefore, application of individual abutments is recommended.

Immediately after the placement of supplement, white coloration points to ischemia caused by pressure. This ischemia zone is visually lost after ten minutes maximum. The pale-pink color of healthy gingiva is not returned immediately after that, instead it is a bit red which points to the tissue trauma. Definite suprastructure should be built based on the temporary one. Approximal surfaces are shaped mildly concave in order to avoid making of the additional pressure to the already formed soft tissue [4].

In case of papilla forming between the implant and natural tooth, if we have sufficient volume of soft tissue, the situation is much more favorable because papilla is already preserved in part around natural tooth, and part of the papilla towards the natural tooth is well vascularized and supported by background tooth tissue.

Shaping of papilla between the implant and pontic is often the practitioner's task. Soft tissue conditioning in the area of pontic should be augmented on time, which can be achieved by applying the so called inlay transplants. By pressuring the oval shaped gingival surface of the temporary pontic, it is possible to shape the papilla between the pontic and implant in the prosthetic phase. By applying pressure from the central part towards mesial and distal pontic forms papilla.

Success of implantoprosthetic therapy in modern era of high-esthetic demands is largely based on the esthetic of work and its invisible fitting in shape and color into the natural teeth arch. Shape of the visible part of the implant supported crown largely depends on the soft tissue profile. Steps that lead to soft tissue modeling are distributed during the entire implantoprosthetic therapy and are highly complex. If we take into account that already the 0,5 mm lack of soft tissue in vestibular area and 1 mm in papilla region can significantly compromise esthetics, it is clear that high attention should be paid to forming of adequate exit soft tissue profile. Already during the surgical phase conditions should be made for the shaping of the soft tissue by suprastructure or temporary crowns to be possible at all. There are numerous factors to be taken into account, from biological limitations, gingiva type, bone level, to materials used for better esthetic effect. There are no exact defined protocols today leading to desired highly esthetic effect with utmost certainty. However, thanks to the previous rich clinical experience, recognized mistakes from which the dental community learned, as well as highly positioned awareness on good knowledge of surgical techniques, prosthetic procedures, as well as materials used, we have a largely well-grounded steps that we have to undertake in therapy.

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DIGITAL IMPRESSION TECHNOLOGY: THE BLUEPRINT OF EVERYDAY DENTISTRY

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The evolution of intraoral scanners in the last ten years has changed the way of recording dental impressions for prosthetic treatment. Direct intraoral digital impressions can avoid errors more than a conventional impression can. Additionally, this saves time for making conventional impressions and plaster models and also lowers the cost of materials.

Intraoral scanners require a direct line-of-sight on to any area they wish to record, and there are several factors that can affect the quality of image acquisition.

Purpose:

Two studies were performed: one was to compare the accuracy of digital intraoral impressions, regarding the marginal reproduction, when different clinical factors are simulated in vitro and other was to document the advantages and disadvantages of each type of prosthetic preparation.

Material and methods. A premolar on a superior typodont cast (Frasaco, Germany) was prepared for an all-ceramic crown with equigingival (buccal) margins and 1mm supragingival (lingual) margins.

The master cast scan was obtained by scanning the tooth with a model scanner (Cercon Eye, Degudent). An intraoral scanner (Planscan, Planmeca) was used to acquire sets of four scans, each under varying conditions: 1) the presence/absence of adjacent teeth; 2) with and without margins elevation; 3) with the model hand-held or mounted in manikin head. Every combination was investigated.

The master scan was aligned to each intraoral scan. The mean contour of each margin section was evaluated using Meshlab. The effect of each misidentify factor on the shape of the margin was analyzed using ANOVA.

Results: Compare to equigingival (buccal) margin, the supragingival (lingual) margin contour remained consistent regardless of scanning conditions. Mesial margin shape was significantly influenced in the presence of adjacent teeth and proximity to the gingivae and position of the wand.

Conclusions: Within the limitations of this study, it can be concluded that the accuracy of the margin recorded by an intraoral scanner is significantly influenced by factors that Intraoral scanners require a direct line-of-sight when scanning crown margins.

CONTOURING THE EMERGENCE PROFILE OF PERI-IMPLANT SOFT TISSUE

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The successful treatment with implant-supported reconstructions in the esthetic zone remains one of the biggest challenges in fixed prosthodontics.

The restoration of single-tooth implants in the esthetic zone is a demanding procedure that requires attention to peri-implant tissue, the surrounding dentition, implant position, and the materials used to restore them. In addition to the exact three-dimensional implant positioning, the creation of individually shaped supre-implant mucosa architecture is crucial for a predictable esthetic outcome.

The development of the supra-implant soft tissue can be achieved by several different approaches. More recent published technique describes step-wise conditioning using a provisional crown.

Proper emergence profile of an implant-supported restoration is important for hygiene and esthetics. Improperly contoured tooth-supported restorations are associated with compromised access for oral hygiene procedures and inflamed soft tissues that can result in compromised esthetics.

Dental implants differ from teeth not only by the nature of attachment to bone and soft tissue but also in their size and shape. Whatever the specific size of a particular manufacturer's implant, it is unlikely to correspond accurately to the size or shape of a natural tooth at the gingival level. Without the appropriate shape, size, and location of the implant restoration as it emerges from the soft tissue, the final esthetic result will be compromised. Even a large selection of abutments may not provide the contour required for an esthetically demanding situation.

Most healing abutments and transfer copings do not simulate the cross section of natural teeth, because they are round. which results in discrepancy to a patient-specific emergence profile. Use of these prefabricated elements for the restoration of esthetically challenging situations will usually result in an unnatural sulcular form around the abutments, and, thus, an esthetically unsuccessful definitive restoration.

In the esthetic zone, the emergence profile of dental implant restorations should mimic natural teeth. To achieve this, some degree of soft tissue modification is often required. Creating an optimal emergence profile is a challenging procedure, especially in areas where the existing hard and soft tissues are deficient. There are several different approaches. The first approach is to expand the tissues surgically, and this is done when healing abutments, which are preselected to correspond to the size of tooth to be placed in this location, are placed on implants at the second stage. Selecting an abutment from a wide assortment of various tapers and heights will achieve an emergence profile necessary to approximate the size of a natural tooth at the gingival margin. Full-thickness flaps are raised, contoured, and then adapted around the chosen healing abutments. The second approach is to remove excess soft tissue by gingivoplasty. In either case,

if the soft tissue surgical procedure is done at the time of definitive restoration placement, or if the prosthesis does not closely mimic the contour of the healing abutment, the final soft tissue contours will not be predictable and uncertain esthetic results can occur.

At the time of implant placement or after osseointegration, the fabrication of an implant screw-retained provisional prothesis can aid in developing ideal emergence profiles while initiating the shaping the peri-implant tissues. Wittneben et al. (2013) described a clinical procedure called the dinamic compression technique that consists of gradual conditioning of the soft tissues with a provisional restoration using selective pressure. This is accomplished through incremental adjusment of the contours of the provisional restoration to establish an adequate emergence profile. Interim restoration is a fundamental step in contouring the peri-implant soft tissue, which is crucial in the esthetic zone.

There are many advantages of this technique. The use of this dinamic compression technique allows control of the soft tissues around a customized provisional restoration with contours that mimic natural teeth. This can optimize the esthetic result. The patient and dentist can evaluate the esthetic potential before fabrication of the definitive prosthesis. Evaluation of the patient's ability to perform oral hygiene with the anticipated contours is also possible. A laboratory-made provisional restoration eliminates most of the chair time associated with this phase of treatment, and use of the indirect technique ensures a restoration with high surface quality that facilitates oral hygiene. This technique allows accurate determination of the gingival crest location if provisional restorations are maintained 12 to 20 weeks. The location of subgingival porcelain placement can subsequently be determined, reducing the risk of metal display. The use of a provisional restoration also allows evaluation of function by the patient. The dental laboratory will also have a cast of the soft tissue profile that is identical to the patient's. This ensures that the definitive restoration will match the provisional restoration when completed.

Also, there were described some disadvantages of the technique. An increase in total treatment time is to be expected whenever procedures to alter soft tissue contour are used. The development of restorative emergence profile with this technique is initiated below the level of the gingival crest and therefore direct observation to verify seating of the prosthesis is not possible. When the provisional or definitive restoration is removed, the soft tissue tends to collapse after a short period if left unsupported.

The prefabricated components used in conventional implant impression techniques are unable to reproduce anatomical variations, due to their standard round shape. As a result, it is difficult for the dental technician to create an ideal emergence profile.
Customized impression copings that can accurately reproduce any variation can then be created extraorally. The use of individualized impression copings provides the dental technician with the shape of the periimplant sulcus. The definitive abutments and definitive restoration have identical shape as compared to the provisional restoration, thus maintaining the exact soft tissue architecture and optimizing esthetics. Without the customized impression coping, the soft tissue may collapse into the space above the implant immediately after the interim restoration is removed.

The technique presented is an alternative indirect impression procedure that accurately captures the emergence profile and soft tissue contours around implants after a provisional restoration has been placed. The definitive restoration is shaped exactly like the provisional. Excellent esthetics can therefore be maintained.

In order to achieve predictable esthetic results, proper management of peri-implant tissues through contouring by the provisional restoration is critical to create mucosal contours that harmonize with the adjacent teeth.

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PROPHYLACTIC USE OF ANTIBIOTICS AFTER TOOTH EXTRACTION

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Tooth extrication is one of the most frequent interventions performed by dentists and oral surgeons in their everyday clinical work. After complicated or surgical tooth removal, most of the practitioners are facing dilemma weather to administer antibiotics, in order to prevent inflammatory complications.[1,2] By this, we mean mostly of alveolar osteitis and infection of the extraction wound. Since oral cavity houses many of microorganisms, it seems logic that antibiotics could eliminate the possibility of these complications.[3] However, literary data and clinical practice are telling as that it is not always the case.[4]

Dentists and oral surgeons every day face dilemma weather to prescribe antibiotics after tooth extractions. If so, which? What dosage? For how long? Are there alternative methods in order to prevent these complications?

Still there is no consensus on this matter among scientists and practitioners.[5]

Oral microbiome:

Both the upper and lower parts of the human digestive tract harbor a complex ecosystem of bacteria, fungi, protozoa and viruses, referred to as the microbiome. It begins to form prenatally, in the uterus, and continues to develop during first 2-3 years of life and finally becomes a stable fully functioning microbiome. Physiological changes associated with senescence lead to shifts in its composition. Also, oral microbiome is changed during many local and/or general pathological conditions. These changes may refer to present species of microorganisms and/or their number. Normally, all of the constituents of oral microbiome are in equilibrium with each other and with the host organism. Products of microbial activity include vitamins, fatty acids and other compounds important for host cell metabolism. Also, the host's physical interaction with or the microbial components is important for proper mucosal barrier function and mucosal immune system development and homeostasis. [6] Several hundreds of microbial species are considered normal inhabitants of oral cavity. Each individual's oral microbiome consists of a distinct set of microorganisms. But types of microbes may be quite similar among family members.[7] Oral microbiome composition is reflection of gender, age, immune system, physiologic status, diet and hygiene, along with many other cultural and lifestyle factors.[8]

Over 95% of oral microbiome consists of different species of Streptococcusa (mitis, oralis, infantis), Gemmella, Veillonella, Corynebacterium, Neisseria, Prevotella, Haemophilus, Fusobacteria i Actinobacteria, as well as fungi like Candida, Aspergillus and Cryptococcus.[9] The highest microbiota richness has been found in the gingival plaque and in saliva, whereas the lowest richness has been described in keratinized gingiva.[10]

A considerable number of oral conditions, including caries and periodontal diseases, endodontic infections, alveolar osteitis are connected to alteration in microbiota composition – a dysbiosis.[11]

Tooth extractions and their inflammatory complications:

During tooth extraction a tooth is pulled out of its alveoli. The reasons for this intervention can be a large number of pathological conditions of a tooth and/or its periodontium, such s caries, periodontitis, dental trauma or orthodontic malformations.

These are usually simple interventions, but sometimes tooth separation, and even elevation of periostal flap, as well as removal of bone is required. This happens with impacted teeth, in case of tooth ankilosis, or if coronal part of tooth is destroyed by trauma or pathologic condition.

Postextraction period is typically uneventful, but some complications in relation with present oral microorganisms, as extraction wound infection and alveolar osteitis, may occur.[1,2]

Wound infection is manifested as delayed healing, edema, hyperemia and pus in the wound.[12]

Alveolar osteitis is result of the decomposition of coagulum in the alveoli, and consequently bacteria inhabits the area. Literature reports this complication in 1,2-2% of all extraction wounds. Highest osteitis rate is after lower third molar extraction, with incidence of 5-30%.[13]

Some local and general factors favor these complications. Local are: size of the wound, localization, prolonged postextraction bleeding, hypoxia, thermal demage, tissue ischemia, oroantral communication, sharp edges of the bone, local anesthetic, previous infection, smoking; and general: malnutrition, HIV infection, malignant conditions, old age, diabetes, alcoholism, uremia, immunosuppressive therapy, corticosteroids, antiresorptive drugs, vitamins A and D deficiency, anemia, hypotireoidism and radiotherapy.[2]

Profilactic use of antibiotics:

Since Fleming discovered penicillin in the last century, antibiotics become irrepressible in infection control. However, along with the benefits of antibiotics, there has been an explosion in the number of bacteria that have become resistant to these drugs. The problem is mainly not the drugs but the way they are used. The overuse and misuse of antibiotics has produced a crisis as bacterial mutations develop resistant strains.

Worldwide, dental prescribing increased in last decade by 62,2% , so its proportionate contribution increased from 6,7% to 11,3% among all community prescriptions of antimicrobials. Most of these drugs are prescribed to patients aged 60 years and older.[14]

Absence of standardized protocols concerning prophylactic use of antibiotics after tooth extraction is an important issue. Research conducted in 2016., showed that in USA only dentists use 42 different schemes for antibiotics administration (type of antibiotic, dosage, frequencies, duration of therapy).[5]

The European Commission emphasizes that overuse and misuse of antibiotics are the main causes of antibiotic resistance.[14]

Inappropriate use of antibiotics leads to development of resistant strains, secondary infection, allergic reactions and antibiotic toxicity. About 6%-7% of patients treated with antibiotics experience some type of adverse reaction.[15]

Most practitioners prescribe antibiotics after tooth extraction in order to minimize recall visits.

In 1990. Peterson[16] delineated principles of antibiotic prophylaxis in oral surgery:

1. The surgical procedure should have a significant risk of infection
2. The correct antibiotic for the surgical procedure should be selected
3. The antibiotic level must be high
4. Antibiotic administration time should be correct
5. The shortest effective antibiotic exposure is chosen.

In order to prevent infection after tooth extraction usually amoxicillin is prescribed, alone or in combination with clavulanic acid. In case of allergy, azithromycin is prescribed.[17]

In routine tooth extractions, we must take precautions, and assure infection-free environment.

Only, if there are some additional risk factors increasing infection risk after tooth extraction, we should consider prescribing antibiotics.

Termine et al. reviewed the available scientific evidence regarding prophylactic use antibiotics in dentistry among healthy and medically compromised patients, and concluded that antibiotic prophylaxis is justified only in small number of patients with a severe risk of infective complications such as bacterial endocarditis, prosthetic joint infection, septicemia in immunocompromised patients, bisphosphonate related osteonecrosis of the jaw. They conclude that there is no or little scientific evidence for antibiotic prophylaxis in subjects with other systemic diseases and in healthy individuals.[18]

Most of the postextraction wound infections and alveolar osteitis are after third molar extractions.

Lodi et al. included 18 double-blinded placebo-controlled trials in their review in 2012, with total of 2456 participants. According to this review, antibiotics did reduce the risk of infection in patients undergoing third molar extraction by approximately 70%, and risk of dry socket by 38%.

This means that infection and dry socket are prevented in 1 person for every 12-17 patients given antibiotics. Simultaneously, for every 21 people who receive antibiotics, one will experience some kind of adverse effect. Authors did not find enough scientific evidence to support routine antibiotic prophylaxis in all healthy individuals.[19]

In another review, in 2016, Ramos et al. included 22 trials. There were 3304 teeth included (1825 in experimental and 1479 in control groups). After analyzing provided data, they concluded that infection and dry socket are prevented in 1 of 11-18 patients prescribed antibiotics. 1 of 16 patients experienced mild and reversible adverse effects. These group of sciences found that this is enough evidence to support routine antibiotic prescription after extraction of third molar.[15]

As an alternative to antibiotis prophylaxis, use of chlorhexidine gel or/and mouthwashes is suggested.[20]

We can conclude that routine antibiotic prophylaxis after tooth extraction is still controversial in healthy patients. There is still not enough scientific evidence regarding these interventions in medically compromised patients.

Antibiotics are necessary infighting infection, but their overuse and misuse can lead to development of resistant bacterial strains, and therefore should be avoided.

Continuous education and embracing of contemporary scientific knowledge is necessary for modern practitioners in order to be aware of all the benefits and risks related to antibiotics use. Knowing all available antibiotics is as important, as well as knowing indications for their usage and administration scheme. When making decision whether to use it as a preventive measure after tooth extraction, dentist should look at the big picture. Decision depends, not only, on tooth-related factors, but also on other patient-related factors that can influence extraction wound healing.

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COMPOSITE MATERIALS FOR EVERYONE

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Development of chemically polymerizing monomer in 1950 and future research may be considered as the beginning of adhesive dentistry as well as adhesive systems and composite materials [1]. Nevertheless, acid etching technique of enamel was introduced a few years later [2]. Initially acid etching was conducted using 85% phosphoric acid for 30 seconds but the research that followed led to reduction of acid concentration to 50% and to contemporary 32-37% [3].
Patients demand for esthetic solutions as well as for simple application of the materials led to faster technological development of esthetic dental materials and adhesive systems. In a relatively short time period , of fifty years, adhesive system bond strength to enamel and dentin has improved and the application became simpler and faster [4]. This kind of technological progress of composite materials and adhesive systems has changed dentistry in its basics and led to minimal invasive interventions without unnecessary healthy tissue removal [5].
Contemporary adhesive system classification [6] puts these materials into two groups:

1. Total etch adhesive systems
2. Selfetch adhesive systems

Since the development of universal adhesive systems they may be added to this classification as a third group.
Total etch adhesive systems represent systmes that are applied in two or three steps and according to that these systems are classified as two or three step systems [7-9]. Enamel and dentine 30 to 40% acid etching is the first step of application regardless of the number of steps that follow.
On the other hand, selfetch adhesive systems simplify their application since acid etching is not needed as a separate step and they prime and condition enamel and dentin at the same time. This effect is accomplished thanks to their possibility to go through the smear layer and partially dissolve hydroxyapatite thus making a resin infiltrated zone which includes mineral crystals [10]. While bond strength of these systems on dentin is considered as reliable and satisfactory, bond strength on enamel is problematic especially if enamel is intact and aprismatic layer is present [11].
Since selfetch systems do not have a reliable bond strength on intact enamel and sclerotic dentin, manufacturers have introduced some innovations thus making a completely new group of adhesive systems called universal adhesive systems [10]. Universal adhesive systems are a new group and may be used with or without acid etching as a separate step without compromising their properties or bond strength on dentin [12-15]. These adhesives are basically selfetch adhesive systems with an option of adaptation to different clinical situations. The decision whether they should be used with or without acid etching is on operator depending on the clinical case [12].
In line with adhesive systems development composite materials have developed as well from macro filled, micro filled, condensed, hybrid and flowable to nano filled composite materials [16, 17].
As restorative materials, composite materials are made of inorganic matter in a larger and organic matter in smaller percent. BIS-GMA is the organic part while different size fillers make

inorganic part [18]. While plasticity, time and type of polymerization come from organic part, inorganic particles set esthetic and physical properties of composite materials.
Composite material progress is extraordinary but certain problems remain. Polymerization shrinkage makes 1.5 to 5% volume of the material and still is an unsolved problem of these materials [19]. Of course this type of shrinkage may be handled since it is known that it moves toward the source of energy or light [20]. Nevertheless, recommendation for polymerization shrinkage are adequate light sources and manufacturers recommendation for layering technique [20]. If bulk composite materials are used it is necessary to know thickness of the layer which can be light cured.
Composite material application in dentistry is widely spread. In preventive dentistry these materials are used as pit and fissure sealants as well as preventive fillings. In pediatric dentistry they are applied as restorative materials in deciduous and permanent dentition. In traumatology fractured parts of teeth may be restored and immobilization can be made using composite. Structural anomalies, orthodontic brackets fixation, periodontal immobilization are all indications for composite materials. In prosthetics these materials are used for restoration of missing teeth, for temporary crowns, veneers and cementation.
Glass ionomer cements are considered as gold standard in pediatric dentistry because of their properties. However, composite materials are indicated and may be used as restorative materials they even may be preferred because of their esthetic properties. Problem is the application, especially in deciduous dentition because it is hard to acquire dry working field. Nevertheless, if dry working field is possible composite material fillings are indicated. However, the difference in deciduous and permanent teeth composition may present a problem in a sense of vulnerability of pulp tissue from even composite materials. Taking latter in consideration some authors recommend calcium hydroxide based pastes as first layers in young children and adolescents regardless of the dentition [17].
Pit and fissure sealing is a well-known technique which has been used for a century [21]. Since the first seling with cements to contmeporary sealing using composite materials and glass ionomers much time and many research has ben condusted [17]. Research show that 85% of the caries start at fissure system even tough that part makes only 15% of the whole tooth surface regardless of the dentition [17].
Fissures may be sealed using pit and fissure sealant, flowable composite resin or even self-adhering flowable composite.
Teeth trauma is often related to pediatric dentistry as a result of injury at playground, at school, at home, etc. If endodontic treatment is necessary and if one third of the tooth crown is missing additional retention in root canal is necessary. Introduction of composite fiber posts has made a revolution in dentistry. Their elasticity, which is similar to dentine and composite materials is a significant advantage compared to cast posts and fabricated metal posts. Modulus of elasticity of cast posts and prefabricated metal posts is several times higher compared to fiber posts which may lead to root fracture especially in thin root walls in children age [22, 23].
Safe and secure cementation is one of the main prerequisites for root canal posts longevity. Fiber posts may be cemented using composite resin or glass ionomer cements. Composite cements are used in correlation with adequate adhesive systems or they can be selfetching. Even tough cements that are used with adhesive systems are more demanding and technique sensitive, they represent materials which achieve higher bond strength values compared to selfetch composite cements [22, 24].
If the injury is complicated or complication of trauma and caries occurs and teeth are lost at young age, speech impairment, mastication, irregular tooth growth, psychological problems etc. may occur. In these kind of situations it is recommended to restore lost teeth with a prosthetic appliance as prosthesis or adhesive bridge until an implant may be placed. Adhesive bridges are a better solution compared to prosthesis because they do not impede growth and development of the face and jaws, superior esthetics, function, absence of preparation and acceptance on behalf of patients [25].

There are a lot of advantages of composite materials and some of them are: wide range of application, good mechanical properties, superior esthetics and affordable price. Innovations such as selfadhering composite resins, bulk composite and improved mechanical properties make their application easier and with more indications in pediatric and restorative dentistry.

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NON-SURGICAL PERIODONTAL TREATMENT IN DIABETES MELLITUS TYPE 2 PATIENTS

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Abstract
Periodontitis is a destructive inflammatory disease of the tooth-supporting tissues caused mainly by Gram-negative microorganisms. Although microorganisms play a crucial role in the development of periodontal disease, the degree of periodontal tissue destruction is determined by the interaction between microbial factors and host immune responses. Chronic periodontitis is one of the most frequent oral complications of diabetes. Extant research has shown that the degree of periodontal destruction, as well as periodontal therapy success, is primarily governed by the diabetes metabolic control level. Consequently, ascertaining the diabetes patients' glycemic control is essential for determining disease prognosis and planning periodontal therapy, in terms of recall intervals and potential supplementation with antibiotics.
On the other hand, owing to the development of periodontal medicine, inflammation and destructive processes in periodontal tissue are recognized as factors contributing to a number of systemic disorders. In particular, periodontal disease is increasingly cited as a risk factor for some common diseases, including worsening of diabetes metabolic control. Available evidence indicates that successful treatment of periodontal disease leads to a reduction in inflammatory mediators in serum responsible for insulin resistance, which can result in improved metabolic control in diabetes mellitus type 2 patients. Future studies are nonetheless needed to identify optimal conditions for improving metabolic control, such as the precise periodontal treatment protocols, along with the extent of periodontal disease and the level of glycemic control at baseline.

Periodontitis is a destructive inflammatory disease of the tooth-supporting tissues caused mainly by Gram-negative microorganisms. Although microorganisms play a crucial role in the development of periodontal disease, the degree of periodontal tissue destruction is determined by the interaction between microbial factors and host immune responses. Many risk factors also contribute to the disease development, in particular smoking, age, genetics, sex, socioeconomic status, and some systemic diseases, among which diabetes mellitus (DM) is one of the most significant (1).
Diabetes is one of the most common chronic non-communicable diseases. The number of affected individuals has been growing for decades and is reaching global epidemic proportions. The current worldwide prevalence of this condition is estimated at approximately 425 million individuals, and it is expected to reach 629 million by 2045 (2).
According to the latest data pertaining to Serbia, about 750,000 individuals, or 13.2% of the country's population, suffer from diabetes, which is the fifth leading cause of mortality. It is estimated that in Serbia, about 3,000 annual deaths are related to diabetes. In addition, it should be borne in mind that the actual number of diabetes-related deaths is far greater, as discrepancies arise due to errors in determining the cause of death in general, and ascribing it to diabetes in particular. This is especially challenging in cases of deaths following stroke, cardiac arrest or chronic renal insufficiency. In 2016, 14,191 new type 2 diabetes cases were diagnosed in all age groups. The risk of developing this chronic illness is higher in Vojvodina than in central Serbia. Given the population aging and the number of risk factors in the forthcoming period, a further increase in diabetes prevalence and mortality can be expected in Serbia. This upward trend will

result in diabetes and related health complications becoming one of the leading public health issues (3).
Previously used diabetes classification, based on the clinical characteristics and therapy type, has recently been replaced by an etiological classification, differentiating type 1 diabetes, type 2 diabetes, other specific diabetes types and gestational diabetes. Diabetes mellitus (DM) is a group of metabolic disorders characterized by hyperglycemia resulting from defects in insulin secretion, action or both. Type 2 diabetes is by far the most common form and occurs in 90% of all patients. This type of diabetes is characterized by insulin resistance, impaired insulin secretion, and increased hepatic glucose production (4).

As a part of disease progression, complications may occur in almost all organs and tissues in the body. The most common chronic complications are vascular in nature and may be macro- and microvascular. Macrovascular complications involve large blood vessels and they include cardiovascular, cerebrovascular and peripheral atherosclerosis. Microvascular complications involve the smallest blood vessels and their main manifestation is microangiopathy. Microvascular complications include diabetic retinopathy, nephropathy, and neuropathy (5).
In explaining the diabetes complications, non-enzymatic glycosylation is a very important mechanism, whereby glucose and other carbohydrates are chemically bound to the amino group of proteins without the aid of enzymes. Hemoglobin glycosylation, which leads to glycosylated hemoglobin (HbA_{1c}) formation, occurs continuously throughout the life of erythrocytes. Consequently, HbA_{1c} concentration is proportional to the average blood glucose concentration during the preceding 30−90 day period and does not depend on short-term changes in plasma glucose levels, which is why HbA_{1c} is used to monitor metabolic control in diabetic patients (6). Available evidence suggests that HbA_{1c} positively correlates with the development of chronic complications of diabetes and that a reduction in median annual HbA_{1c} values by only 1% reduces the risk of macrovascular complications by 37% (7). According to the American Diabetes Association guidelines, $HbA_{1c} < 7.0\%$ is the recommended therapeutic target for diabetic patients (8).
Changes in the oral cavity are common in DM cases. They are attributed to changes in blood vessels, as well as changes in the amount and composition of saliva, and vitamin deficiency. Dry mouth, changes in oral flora, lingual atrophy, difficulty swallowing, oral burning and taste dysfunction are some of the oral manifestations of diabetes (9). Gingival inflammation and periodontal disease are particularly pronounced. Studies have shown that diabetic patients have a 2−3 times greater risk of developing more severe periodontal damage than systematically healthy individuals, and that the degree of periodontal destruction depends to a large extent on the degree of metabolic control of diabetes (10). In addition to retinopathy, cerebrovascular, cardiovascular and peripheral atherosclerosis, peripheral neuropathy, renal dysfunction, and slow wound healing, the American Diabetes Association has included periodontal disease in the list of complications of diabetes (11).

Periodontal treatment is complex and comprises of four stages, namely I − nonsurgical therapy, II − surgery, III – restorative phase, and IV – supportive periodontal therapy. The nonsurgical phase of periodontal therapy is the foundation for the treatment patients suffering from periodontal disease undergo, and is performed in almost all cases. Its primary aim is eliminating the causes of periodontal disease, and consists of motivating and training patients to properly maintain oral hygiene, removing dental plaque and dental calculus using ultrasonic device and root planing with special curettes (12).
In diabetic patients, the periodontal disease treatment, as well as its outcome, largely depend on the degree of metabolic control of diabetes. Empirical evidence indicates that individuals with poorly controlled disease do not respond to periodontal treatment as well as healthy individuals do, while treatment outcomes in those with well-controlled DM are equally good to those achieved in healthy patients (13). It must be emphasized that very few studies have been

conducted on the effects of diabetes metabolic control on the periodontal therapy success, especially in the long term, and the reported findings are inconsistent.
In collaboration with the Department of Internal Medicine, Clinical Centre of Vojvodina and the Health Center Novi Sad, we have conducted a study at Clinic for dentistry of Vojvodina. The study sample comprised of 92 patients suffering from chronic periodontitis, 61 of whom had DM type 2 and 31 nondiabetic individuals that served as the control group. Based on their HbA_{1c} levels, subjects with DM were classified into two groups: D1, consisting of 29 subjects with good metabolic control (HbA_{1c} <7%), and D2, consisting of 32 subjects with poor metabolic control ($HbA_{1c} \geq 7\%$). Initially, DM patients showed significantly higher PI and GI values compared to the control group (14). Xerostomia and increased salivary glucose in patients with diabetes may be responsible for additional plaque formation. Furthermore, diabetes has been shown to promote alterations in immune cell phenotype and elevation of serum proinflammatory cytokine levels, which can explain exaggerated inflammatory host response (5). Three months after scaling and root planing an equally good improvement in plaque index, gingival index, bleeding on probing and clinical attachment level was achieved in all three groups. The only difference pertained to probing depth, as both diabetic groups showed a significantly lower PD reduction compared to the control group. This outcome could be attributed to low mean PD in patients with DM at baseline. No statistically significant differences in treatment success, as measured by any of the tested parameters, was noted between patients with good and poor metabolic control of diabetes (14). These results support the assertion of other authors that the degree of metabolic control does not significantly affect the success of nonsurgical periodontal therapy in DM patients (15, 16, 17).
Use of antibiotics in the treatment of periodontal disease yields the greatest benefits if the local debridement is carried out as soon as possible and the course of antibiotics is started immediately after its completion. For DM patients in whom nonsurgical periodontal therapy has failed to yield the desired results, tetracyclines are usually prescribed because, in addition to antimicrobial activity, they inhibit matrix metalloproteinase and glycosylation (18). In the maintenance phase, these patients should attend more frequent (every 2 to 3 months) checkups (19).

On the other hand, owing to the development of periodontal medicine, inflammation and destructive processes in periodontal tissue are recognized as factors contributing to a number of systemic disorders, including DM type 2 (20). In particular, periodontal disease is increasingly cited as a risk factor for worsening metabolic control of diabetes. For example, Taylor et al. (21) reported that the probability of deteriorating metabolic control is up to six times greater in patients with diabetes and advanced periodontitis compared to subjects with slight periodontal tissue destruction. The systemic influence of local inflammation in periodontium is the most frequently cited potential pathogenetic mechanism. This assertion is justified by the fact that the subgingival biofilm represents a permanent source of Gram-negative bacteria and their products, primarily LPS, which have access to deeper periodontal tissues and systemic circulation (20). Periodontitis is thought to contribute to an increase in insulin resistance in patients with diabetes, as LPS is a significant inducer of inflammation mediator synthesis, such as TNFα, IL-1β and IL-6, which are insulin antagonists (22). Therefore, clinical trials are currently being carried out to investigate whether periodontal treatment in diabetic patients has an effect on their metabolic control. The results yielded by these efforts are, however, inconsistent. Some studies show that periodontal therapy, besides positive local effects, such as reduction of the periodontal inflammation, has a positive systemic effect, as indicated by the decrease in the serum concentrations of inflammatory mediators that induce insulin resistance and assist in the improvement of metabolic control of diabetes, as well as reduction in the markers of oxidative damage to the molecules in the blood (16, 23).

Conclusion:
Individuals affected by DM type 2 might respond to nonsurgical periodontal therapy almost as well as do systemically healthy subjects. Tetracyclines are antibiotics of choice in cases where

nonsurgical periodontal therapy fails to yield adequate results. Considering the importance and growing prevalence of diabetes in the population, and the evidence indicating that periodontal therapy could positively affect the metabolic control of diabetes, it is essential to include dentists into the medical team involved in the treatment of these patients.

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Poster presentations

NONSURGICAL TREATMENT OF EXTENSIVE PERIAPICAL LESION DUE TO TRAUMA

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Abstract
The aim of this paper is to show a clinical case of a single-root, intact tooth with pulp necrosis and a large periapical lesion which reached full recovery after being non-surgically, endodontically treated with calcium-hydroxide in combination with iodoform. Traumatic injuries of teeth have frequent occurence and usually involve maxillary incisors in young patients. Pulpal necrosis and later bacterial contamination of root canal system usually happen after traumatic injury of the tooth. As a consequence of bacteria colonizing, host-defense system developes chronical inflamation and bone resorption in periradicular tissues. The patient is usually without any symptom, until the equilibrium between host and bacteria isn't damaged, when starts intense pain to chewing and/or swelling. Treatment options to manage large periapical lesions are non-surgical endodontic treatment and apical surgery. Proper mechanical preparation and debridement of root canal along with copious irrigation with NaOCl contributes to elimination of huge number of bacteria. Additional tretament includes root canal medication based on calcium-hydroxide which can be combined with iodoform in order to expand antibacterial spectrum that is mainly effective against remaining bacteria. After withdrawal of all patient's symptoms, root canal should be three-dimenzional obturated and coronal restoration should be placed as soon as it is possible to prevent microleakage. After 6 months, if the patients is out of symptoms, control radiograph should be taken to assess prognosis of treated tooth. In healthy, especially younger patients, first signs of healing periapical tissue could be detected in examined radiograph as a density changes within the lesion.

ANALYSIS OF HUMAN HEALTHY DENTINE-ENAMEL JUNCTION BY USING NONLYNEAR LASER-BASED OPTICAL MICROSCOPY

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Abstract

Dentine-enamel junction (DEJ) is a complex structure representing an interface bonding these two different mineralized tissues. It has an important role in initiating ameloblastic and odontoblastic activity during tooth growth, and keeps biomechanical integrity of fully formed teeth.

The aim of this study was to analyse the microstructure of dentine-enamel junction by using nonlinear optical microscopy.

The specimens of teeth were observed by a homemade nonlinear optical microscope at the Institute of Physics, Belgrade. Titanium-sapphire laser, adjusted at 730 nm wavelength, was used as an excitation source for two-photon excitation fluorescence microscopy (TPEF), while 1040 nm was used for second harmonic generation (SHG). This is a technique which uses nonlinear optical effects produced by ultrashort laser pulses (in femto-seconds), which enables excitation of the material in the infrared part of the spectrum and detection of its response in the visible. In this way, penetration depth of the laser beam is increased and laser damage effects are reduced.

DEJ is indicated as a scalloped interface in the TPEF images. Specific structural elements of dentine and enamel, as well as enamel cracks, propagating through enamel and ending at the DEJ, are clearly presented by the TPEF microscopy, owing to their intrinsic autofluorescence. At the interface, we can also recognize prominent collagen type I fibers penetrating about 100 nm into enamel from dentine, staying incorporated in enamel prism sheaths. The SHG signal can be detected in dentine due to presence of collagen type I (triple helical molecule organized in non-centrosymmetric fibrils), while this signal is completely absent for enamel.
A clear insight in the specific structure of DEJ could serve as a reference point for analysis of its structure-related biomechanical and functional properties.

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SERIES REPORT: INFILTRATION TECHNIQUE WITH HYPOMINERALIZED ENAMEL

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Abstract:
A term “hypomineralized enamel“ is related to the entire range of structural defects of enamel followed with esthetical deficiency. These defects are mainly presented as whiteish, yellowish and brownish areas at the tooth surface and besides its lack of aesthetics, structural defects are present too, hence, the enamel is less prone to external influences. Numerous researchers have tried to investigate ethiology of these defects that are mainly caused by genetic factors and influence of external sources. Besides these congenital and developmental disorders, these defects are significantly related to initial caries lesions known as “White Spot Lesions“.
Considering the location of these defects, that are mainly located in enamel, without propagation to deeper tissues such as dentin, the therapeutic procedures are limited to this tissue. Possible therapeutic solutions are restorative techniques such as dental fillings, veneers and dental crowns, but also a novel, minimally invasive approach called “Infiltration technique“.
In this series report, hypomineralized enamel was treated with ICON (DMG, Germany) in three patients. In first patients teeth, No. 11 and 13 were included. With second patients, enamel defect was present on the tooth No. 13, while in the third patient's teeth No. 11, 13, 21 and 23 were included in the treatment. Named teeth were polished with a rotary handpiece and polishing paste followed by treatment with ICON kit according to manufacturer's instructions with the same protocol in each patient. Results were registered with mobile phone camera (Samsung Galaxy S7, 12 MP) and patients were asked to express their impressions after the treatment.
Infiltration technique acquires satisfying esthetic results by minimally invasive procedure, without tooth preparation.

BIMAXYLLAR ORTHOGNATHIC SURGERY - COOPERATION OF THE SPECIALIST OF ORTHODONTIC AND MAXYLLOFACIAL SURGERY

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Summary

Introduction: Mandibular prognathism is defined as the excess of the lower jaw due to enlargement of the lower jaw body, enlargement mandibular ram or dull mandibular angle, with the lower jaw and the lower teeth shifted forward. More severe forms of mandibular progntism cann't be treated only by orthodontic devices, but require a surgical reconstruction. In the case of a combination of true mandibular prognathism and maxillary retrognathism, bimaxillary orthognathic surgery is required.

Case report: Patient aged 17.5 years appear to the Clinic for Dentistry of Vojvodina for examination and treatment by a specialist of Orthodontic. Anamnestic data were obtained that a familial presence of prominent chin and lower jaw. Based on a clinical examination, gnathometric analysis, orthopantomogram analysis and cephalometric analysis and photo analysis, a true mandibular prognathism was diagnosed. The patient was treated with fixed orthodontic appliance, where an ideal relationship between the upper and lower dental arrays was established, which were not consistent with each other, but with the goal of preparing the maxillofacial surgeon for an adequate reposition of bone structures. The analyses of the model, orthopantomography and cephalometric radiography were repeated. Computer reconstruction of the face, using photographs and cephalometric radiographs, was performed in the computer program "OnyxCeph" and the patient was referred to an orthognathic surgery with findings and instructions on the bone structure repositioning. Surgical treatment was carried out at the Clinical Center of Vojvodina at the Department of Maxillofacial Surgery. A fixed orthodontic appliance was removed 8 months after the surgical intervention and we made for the patient the mobile retaining device.

Conclusions: Due to the complexity of the overall treatment, cooperation between the specialist of Orthodontic and Maxillofacial surgeons, as well as the patient in terms of regular control and respect for all treatment protocol. The benefits of this treatment for the patient are multiple, both the aesthetic and functional, as well as psychological and social terms.

INFLUENCE OF THE PREPARATION DESIGN AND RESTORATIVE MATERIAL ON STRESS DISTRIBUTION IN PREMOLAR WITH MOD CAVITY

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Abstract

Severe fracture of a premolar with mesio-occlusal-distal (MOD) restoration, accompanied with the complete cusp loss, is a common phenomenon in dental practice. In order to prevent the occurrence of such a fracture, a special attention should be devoted to obtaining optimal biomechanical characteristics of the restored tooth beforehand, by planning adequate cavity preparation design and choosing proper restorative material.

The aim of the study was to determine the influence of cavity preparation design and restorative material on stress distribution in premolar with MOD cavity.

Three-dimensional model of an intact maxillary premolar was designed based on the computerized tomography scan images. Additional six models were created with three cavity preparation designs (MOD, MOD cavity with 2mm palatal cusp reduction-MODP, MOD cavity with 2mm palatal and buccal cusp reduction-MODPB) and two restorative materials (direct composite resin, ceramic). After applying a static load of 200N on occlusal surface of the tooth, stress distribution in the enamel, dentin and restoration was calculated using finite element analysis.

In all models, the highest stress values in tooth structures were obtained at the cemento-enamel junction on palatal surface. In models with composite resin restoration, additional area of high stresses was shown at palatal cusp tip in MOD cavity and at the reduced palatal cusp in MODP and MODPB cavities. Regards restoration, the highest stress values were on the occlusal surface at the loading areas.

In order to provide optimal biomechanical characteristics of tooth structures, premolars with MOD cavity should be restored with ceramic restoration covering both palatal and buccal cusp.

THREE-DIMENSIONAL ENDODONTIC TREATMENT PLANNING

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Introduction.
In modern endodontics, radiographic imaging is an essential part of diagnosis, treatment planning and monitoring. CBCT (Cone Beam Computer Tomography) is based on convex rays focused on a narrow area of interest, and this has a significantly reduced effective radiation dose compared to conventional CT, high visibility of detail, accurate quantitative and qualitative values, cost-effectiveness and easy use of images . It allows to visualize images by layers and cross-sections in all three dimensions. It is specifically designed to create unbranched three-dimensional information of maxillofacial structures, as well as a three-dimensional image of teeth and their surrounding structures. Computer tomography with conical ray allows the visualization of the root of the truncated systems in three dimensions without the superposition of the anatomical structures that appear in the conventional methods of radiography in dentistry. Recently launched 3D Endo software allows the clinician to perform pre-endodontic treatment planning both simple and complex endodontic cases, using DICOM (Digital Imaging and Communications in Medicine) with data from CBCT scanning. Innovative software enables identification, defining anatomical complexity, designing the cavity design, measuring the working length, and identifying channel curves before the actual procedure. In addition, the software, based on data entered in the database, suggests an instrument or system that will give a result optimal channel preparation for a specific shape or canal diameter.

Conclusion:
The preoperative planning phase with 3D Endo Software can provide vital information about the anatomy of the root canal complex, which significantly influences the choice of materials and techniques, as well as the predictability of the outcome of the therapy.

SALIVARY PARAMETERS OF PURGING BULIMIA

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ABSTRACT:

Introduction: Bulimia is in many cases followed by qualitative and quantitative changes of unstimulated and stimulated saliva due to frequent vomiting and sialoadenosis, medication, dehydration and abuse of the laxatives or diuretics.

Objective: The aim of the study was to determinate quantity of saliva, pH values and concentration of calcium, bicarbonate, phosphate and urea in unstimulated and stimulated saliva samples in purging bulimic patients and healthy subjects.

Methods: The study included 30 purging bulimic patients and 30 healthy subjects. Sialometry was used to determinate amount of saliva in milliliters per minute, pH values were determined using a standard pH paper indicator with a sensitivity of 0.5, and the concentration of electrolytes was determined by photometric color tests on Olympus analyzers (calcium, phosphates, urea) and ion selective electrodes ABL TM 520 (bicarbonates).

Results: Based on the results of the conducted study, it was found that purging bulimic patients have significantly less unstimulated saliva, significantly lower pH values in both saliva fractions, higher calcium concentrations in unstimulated saliva, lower phosphate concentrations in both fractions, lower concentrations of bicarbonate in unstimulated fraction and lower urea values in both saliva fractions.

Conclusion: Salivary changes following purging bulimia are characterized by presence of xerostomia, increased acidity of saliva and lower buffering potential, so it can be assumed that in these patients predisposition factors for more frequent occurrence of dental erosions, caries and gingivitis are present.

APICAL EXTRUSION OF ROOT CANAL FILLING MATERIAL DURING ENDODONTIC RETREATMENT

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Abstract

Background. During retreatment, filling material may extrude through the apical foramen and cause flare-up or chronic infection. The aim of this study was to compare the apical extrusion of gutta-percha and resilon filling materials during retreatment with different instruments.

Methods. Sixty extracted single-rooted teeth with single, straight canal were selected. Canals were prepared with ProTaper Universal rotary system to a size F2. Teeth were randomly divided into 2 groups of thirty teeth each and filled with gutta-percha or resilon points. In both groups teeth were randomly divided into three subgroups (n=10), based on the instruments used for retreatment: Hedstrom, ProTaper or Twisted File instruments. Re-preparation was done until apical size 40. Apical extrusion was detected visually, using a 4-degree scoring system. Mean scores were calculated and analysed statistically.

Results. Resilon obturation material showed similar degree of apical extrusion during retreatment as gutta-percha under tested experimental conditions. The highest mean score of extruded material was observed in the resilon group when manual, Hedstrom files were used and the difference was statistically significant in comparison to the results when rotary instruments were used.

Conclusion. The use of a rotary technique can be recomended to minimize apical extrusion, especially when resilon is removed during retreatment.

VISCOSITY CHANGES WITH TEMPERATURE INCREASE OF RESIN-BASED ENDODONTIC SEALER

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Abstract

Introduction: Endodontic sealers have viscoelastic properties, between elastic solid and viscous liquid, having more viscous-like or solid-like behavior. The elastic (storage) modulus G' measures the energy stored inside the material, while the viscous (loss) modulus G'' measures the dissipated energy.

Objective: To test the viscoelastic properties of resin-based endodontic sealer depending on temperature increase using a dynamic oscillatory measurements.

Material and methods: AH Plus (Jet system; Dentsply DeTrey GmbH Konstanz, Germany), mixed according to the manufacturer's instruction, was placed on the lower plate of rheometer (Thermo Fisher Scientific, Karlsruhe, Germany) preheated to the selected temperature (25°C, 35°C, 40°C and 65°C). The parallel plates geometry was used; 1mm gap between the plates was achieved. Linear viscoelastic region was determined by amplitude sweep test at a constant frequency (1 Hz); selected shear stress (1 Pa) was kept constant during frequency sweep test (0.1-10Hz); G', G'' and complex viscosity were determined. Three samples were measured at each temperature; mean values were used for statistical analysis (ANOVA, Tukey HSD, $p<0.05$).

Results: Higher values of G' compared to G'' were observed for each temperature tested; G' and G'' moduli increased as frequency increased while with temperature increase both moduli decreased. AH Plus demonstrated decreased viscosity with temperature increase. If Cox-Merz rule is assumed as a valid, AH Plus demonstrated the non-Newtonian, pseudoplastic behavior.

Conclusion: By knowing the viscosity changes of endodontic sealers with the function of temperature it is possible to properly handle the material and combine with obturation techniques according to clinical indications.

08.06.2018.
Poster presentations

EXPANSIVE GROWING PROCESSES IN A LOWER JAW BODY-RESIDUAL CYSTS

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Abstract

53 year old patient has been sent on Dentistry Clinic of Vojvodina, Oral surgery section, because of a lesion on the right part of a lower jaw. By detailed orthopantomography analysis it could have been noticed oval lightening in the right part of a lower jaw body. This oval lesion was situated in toothless section between first premolar and first molar. Surgical removal of a change was scheduled for 11.01.2018. when it has been enucleated completely. Considering knowledge about residual cysts being developed in middle aged and elder people, diagnosis has been determinated immediately which was confirmed by pathohistology.
Residual cysts are developing from epithelial cell proliferation which are left in a bone after procedures like teeth extractions and curettages of apical processes. Similar to this way of development residual cysts also can be developed after incomplete removal of radicular or residual cyst. They are in an inflammatory group of cysts which are caracterized with very infectious wall and they make 10% of all odontogentic cysts.

After total enucleation bone defect which has left did not demand any type of augmentation.

THE USE OF CONTEMPORARY RADIOLOGICAL TECHNIQUES IN COMPARATIVE DENTAL ANTHROPOLOGICAL STUDIES

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Abstract

Digital radiographies together with the cone-beam computed tomography (CBCT) are technologies widely used in everyday clinical practice with a growing interest for anthropological investigation due to non invasive nature of intraoral imaging which allows 3D visualization of the dental and bone structures scanned. There are various techniques for precise age estimation based on dental parameters. The aim of the present study was to assess the precision of two different radiological age estimation techniques, tooth coronal index (TCI) and Kvaal method. The sample consisted of 23 extracted one root teeth of known age and sex. The teeth were firstly photographed and numbered for blinded evaluation. The study was carried using digital X ray and CBCT imaging of teeth fixated in wax rim and stone casts in order to obtain digital images and 3D reconstructions for radiographic assessment. Crown height and pulp height were recorded for TCI whereas height and width at three different levels were obtained for Kvaal's method. TCI was found to be more accurate compared to Kvaal's method The use of CBCT and digital radiographies can support the findings obtained from dental clinical, archeological, anthropological and DNA investigations.

FREE GINGIVAL GRAFT - FGG

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INTRODUCTION

Free mucosal auto transplant indication:

- augmentation of the adherent gingiva
- removal of the coronal-insulated frenulum and plaque in the lower jaw
- the use of this method can be used in the postoperative period after the traction and liberation of the impaired canine, after which the adherent epithelium caused by this orthodonto-surgical method
- augmentation of peri-implant soft tissue to improve the quality of the soft tissue profile in implants

CASE

The preparation of the ***acceptor*** site begins with anesthesia and then the ***horizontal (SMILE)*** incision under the gingival fissure (mucogingival line) of the teeth 33 - 43 by the blade 15. Flap (mucosa and submucosa) is separated by a sharp dissection. Apically positioned flap is suturing with Vicril rapid 5-0, subperiosteally.

Donor site: palatinal auto transplantation is taken from the region of the hard palate of the rectangular shape behind the premolar and molar 2mm away from the edge of the free gingiva (exclude the palatine horns) at a depth of 1.5mm. After separation, it is placed on a gauze soaked with a saline solution and designed, on the defect to be covered. The FGG is placed at the prepared reception location. It is fixed to the coronary sutures.

CONCLUSION

The gingival recession (Class IV per Miller) was cured by the regenerative surgical method 9 years ago (operated by Widman.augmentatio cum bio oss et membranae) by the maxillofacial surgeon. After 9 years, a recurrence of the recession occurred because it did not affect the cause that has led to a recession, but it has affected the presenting problem. By acting on the cause, the coronal - insulated frenulum and plaque, and by setting SMAT in order to create a functional adherent gingiva that is able to resist the forces of the wolf near the insulated muscles, we prevent further development of periodontal disease.

21ST CENTURY - REALITY OF DENTAL MEDICINE IN SERBIA

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Abstract

We are living in an age where advanced technologies, computerized 3D planning and designing allow us to carry out the most complex and aesthetically demanding works, yet our reality is that we encounter patients whose oral status is in such a bad condition that it can seriously endanger their general health, almost on a daily basis.

Odontogenic infections represent the propagation of infection of tooth origin into adjacent tissues and spaces.
The direction of infection spread depends on the structure of the bone, position, length, and inclination of the root of the tooth, the muscle contraction and fascia.
If the infection that origins from the upper and lower premolars breaks the periosteum above or below the insertion of the facial muscles, infections of the cheeks will set in. The facial (cheek) area is restricted by m.buccinator and its facial, facial skin, m.zygomaticus major, m.depresor anguli oris, raphe pterygomandibularis, zygomatic arches and lower edges of the mandible body. It communicates with temporal, maseretic, parafaringeal and pterigomandibular space. In the clinical picture, there was a swelling of the entire cheek area which is tough and painful when using palpation, the skin over the swelling was red, shiny and taut. Increased body temperature and fatigue can also be present in this case.
In this paper, the case of a 19-year-old patient who was sent by a responsible dentist is presented. Based on the anamnesis, clinical examination and OPT image, the diagnosis of the abscess of the buccal space on the left side of the tooth 36 (Abscessus regio buccalis dentogenes d. 36) was set. After obtaining the consent, the extraction of the tooth that was the source of the problem was carried out, the skin was treated with gasoline and alcohol, extraoral incision with subcutaneous anesthesia was made and, finally, blunt preparation and evacuation of the purulent contents was done. The rubber dren was placed, a line was set up and antibiotic therapy was introduced (Clindamycin caps. 600 mg 2x1).

SURGICAL HANDLING OF BONE IRREGULARITIES

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INTRODUCTION:
Large number of patients do not require surgical intervention on the oral tissues before making prosthetic work.Prosthetic remnants without previous surgery on soft or bone tissue.It is estimated that there are about 4% to 6% of patients.Irreegularities that hinder the production of aesthetically and functionally good prosthetic compensation are divided into irregularrities in development and acquired irregularities.The mandibular toxis belongs to the group of bone tissue defects that occur during the developent of the fork.

CASE REPORT:
The paper presents the case of a patient aged 66,who checked in a private dental offise for the prosthetic care of total toothlessness in the lower jaw.Based on the anamnesis,clinical examination,and analysis of the opt image,we established the presence of mandibular tooth region in the region of teeth 45 and 46.During the surgical intervention,it was necessary to modify the type of incision due to the specific shape of the mandibular tooth itself,which was oval shaped,linked to the alveolar part lower jaw.

CONCLUSION:
Torus mandible is a bone enlargement that occurs on the lingual side in the premolar molar region above the myeloid line.It can be unilateral or bilateral and get in about 7% of the population.Is does not cause any trouble until the mucous membrane that covers it is not enjured.Histological torus consist of a cortical part of the bone with very few complex parts,which is visible on radiography as the thicker part of the bone.

ESTHETIC CROWN-LENGTHENING PROCEDURE: A CASE REPORT

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Abstract

The appearance of the gingival tissues surrounding the teeth plays an important role in the esthetics of the anterior maxillary region. Abnormalities in symmetry of gingival margin and the incisogingival tooth length significantly affect the harmonious appearance of the natural dentition. Often, this problem can be improved by the crown-lengthening surgery.
There are various surgical techniques for lengthening of the clinical crown. Careful preoperative assessment of soft and hard tissue structures, and their relationship, is a key factor for the correct choice, and therefore the success of procedure.
We present a case of a 26 year old female patient reporting to our clinic dissatisfied with an unequal length of maxillary central incisors. Since the external bevel gingivectomy did not lead to a satisfactory result, a computed tomography was made to determine the level of vestibular alveolar bone. An unusual situation was recorded. The edge of the alveolar bone was at the more apical position in the frontal teeth on the left side. The esthetic problem was resolved by the flap surgery and osteotomy with apical relocation of the edge of the alveolar bone in the right maxillar incisors.
Crown lengthening should be treated in such a way to avoid any violation to biologic width and the level of the alveolar crest must be determined prior to any considerations regarding this aesthetic crown lengthening.

CORONEKTOMY OF THE TOOTH 38.- CASE REPORT

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Abstract

Introduction: Becouse of close contact of the lower third molar with the mandibular canal, there is a risk of violating channel contents. One way to avoid this complication is coronectomy or deliberately leaving the roots of third molars.

Work protocol: A 37-year-old patient appears at the clinic for dentistry in Vojvodina, with the swallen left side of faca. Anamnesticly patient gives the information that in that region six months ago, teeth extraction of tooth 38 was performed. Clinical examination shows the local pus collection in the vestibulum in the region of teeth 38 as well as the present fistula. Rtg analysis based on OPT as well as CBCT recordings locate the rest of the tooth roots 38 in the mandibular ramus to the left. Surgery in local anesthesia is indicated in order to remove the tooth roots. The choice of local anesthetic was 2% of lidocaine with adrenaline and anesthesia techniques are a inferior alveolar nerv block anesthesia with supplemental anestesia for buccal terminal brunches. After the anesthetic, the mucoperiostal flap was done, and an osteotomy was attempted to identify the residual roots of tooth 38. Due to the difficulty in identifying the roots, the decision was made to make an additional OPT shot with applied iodoform powder in the region of osteotomy, for easier positioning of the roots. After that, roots that were detected were extracted.

Conclusion: The presented surgical procedure is not a coronectomy in the true sense of the word, he speaks in favor that coronectomy, although it has its positive sides, there is a risk of subsequent infection of the residual roots and the need for their subsequent extraction.

IMUNOPATHOGENETIC MECHANISMS OF LOWER RESPIRATORY TRACT INFECTIONS WITH ORAL CAVITY BACTERIA

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Abstract

Pathogenetic mechanisms which link periodontal and respiratory infections are the current problem of numerous scientific research.

Periodontal diseases are associated with bacterial infections, inflammation, intense immune response and therefore a risk factor for many diseases (cardiovascular, atherosclerosis, cerebrovascular, diabetes, adverse outcome of pregnancy). They also can affect the course of respiratory infection and lead to pneumonia and exacerbation of chronic obstructive pulmonary disease. Dental plaque can be a reservoir of pathogens that lead to colonization of the upper respiratory tract and consecutive pneumonia.

The mechanisms of infection are associated with the aspiration of the pathogen of the oral cavity to the lungs. Salivary enzymes associated with periodontal disease can modify mucosal surfaces that become susceptible to adhesion and colonize respiratory pathogens, which are then aspirated into the lungs, destroying saliva pellicles on pathogenic bacteria and thus prevent their removal from the mucosal surface.

Cytokines from the periodontal tissue may change the respiratory epithelium that becomes susceptible to infection. An intense immunological reaction to an inflammatory process can explain the relationship between periodontal disease and lower respiratory tract infections.

Treatment of periodontal disease and good oral hygiene are an indispensable part in controlling and reducing the incidence of respiratory illnesses.

LITHIUM DISILICATE CERAMIC CROWNS IN PROSTHODONTICS THERAPY-CASE REPORT

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Abstract:

Introduction. Due to the constant development of therapeutic procedures and the improvement of dental restorative materials, modern restorative dentistry can respond to the increasing aesthetic demands of patients. Lithium disilicate ceramic crowns are one of the high-end therapeutic solutions when the usage of crowns in the frontal region is indicated.

Case Report. A 49-year-old patient visited the Dental clinic of Vojvodina in order to improve the appearance of her front teeth, which were covered by ceramic crowns one year ago. She complained of constant pressure on her teeth. During the examination of the patient, it was found that ceramic crowns were present on teeth 13, 12, 11, 21, 22 and 23. Mildly hypertrophic gingiva was found in the region of the tooth neck. Interaction relations, as well as occlusion, were within physiological limits. By analyzing the position of the crowns on teeth 13 to 23 and their inclinations, it was found that the crowns protruded and lifted the upper lip. For these reasons, patient's smile and the appearance of her lips had changed. Hypertrophic and slightly inflamed gingiva was observed in the neck region of the teeth after the old ceramic crowns were removed, most likely as a result of the mechanical pressure of the edges of the crown on the gingiva. Temporary crowns were made to the edge of the gingiva. To allow the gingiva to heal, the definitive impressions were taken one week later. Interoclusal relation was registered and transferred to the articulator, and an analysis of the position of the abutments and the lower teeth was performed. Trial crowns were made and the smile was analyzed. The patient was consulted about the aesthetics of the trial crowns and after that, the preparation of definite lithium disilicate crowns began. As the patient was satisfied with the color of the old crowns, it was decided that the color of the new crowns would not change. After finishing the crown, the cementation was done with composite cement.

Conclusion. Knowledge and application of basic aesthetic criteria, observance of contemporary principles of profession and accurate and precise work is necessary for best functional and aesthetic results in prosthetic therapeutic procedures. This patient's appearance was effectively reconstructed and superior aesthetics were achieved by creating a lithium disilicate crowns.

OSTEOFIBROMA CRANII MAXILLAE ET MANDIBULAE LAT. SIN. IN 71YEAR PATIENT- CASE REPORT

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Summary

A 71-year-old patient appears at the dental prosthetics department for the prosthetic repair of the oral cavity. On the basis of anamnesis and clinical examination, we get information that changes in the area of the lobe of the head and the head, appear for the first time in the 6th year of life, and the first operation in 1966. During this lifetime, we could have access to remediation of the remaining teeth by metal-ceramic crowns, refusing further rehabilitation with partial dental prostheses. After several years, he again appeals to the department of dental prosthetics, with desire to make partial acrylic dental prosthesis in some way. Due to the progressive increase of solid maxillary and mandible, we were not able to access further prosthetic rehabilitation.
The patient decides on the surgical intervention of the removal of parts of the bone and soft tissue of the mandible. It was re-occurring after surgery six months later, but due to the proliferation of soft tissues and lack of space, we were not able to access the partial acrylic dental prosthesis in the area of the residual alveolar ridge.

VITAMIN D EFFECTS ON FRACTAL ANALYSIS OF MANDIBULAR BONE IN PATIENTS WITH CHRONIC RENAL FAILURE

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Abstract

Chronic renal failure (CRF) is followed by mineral metabolism disorder called renal osteodystrophy. The aim of this study was to determine whether vitamin D supplementation has influence, and to what extent, on the fractal dimension (FD) of mandibula's trabecular and cortical bone in patients with CRF, by analyzing dental panoramic radiographs (OPT).

In this retrospective study, 130 OPT from 65 patients and 65 healthy controls (92 men and 38 women), average age of 53 ± 13.03 years (aged 18 to 80 years) were analyzed. Patients with CRF were divided into pre-dialysis (without vitamin supplementation) and hemodialysis (supplemented with D vitamins). The FD in two versions, 1 and 2, with defined localizations of six regions-of-interest (ROI) were determined for each patient, using specialized software.

A significant difference between hemodialysis and healthy subjects in version 2 FD for the jaw average is confirmed on the level of 5%. For version 1 FD, no statistically significant difference was found between diseased and healthy subjects. In relation to the gender, a significant difference was determined in version 2 FD on almost all ROI with significantly lower values for females.

The version 2 FD analysis of the mandibular trabecular bone showed that patients with CRF undergoing hemodialysis therapy have a more complex bone structure compared to healthy subjects comparable by gender and age. In the whole sample, males have more pronounced and developed trabecular bone architectonic than females.

Key words: Fractal dimension; Mandibular bone; Chronic renal failure; Vitamin D

ASSESSMENT OF CONDITION OF TMJ BY USING ULTRASONOGRAPHY AS A DIAGNOSTIC TOOL

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Temporomandibular Joint Diseases (TMD) and disorders refer to a complex and poorly understood set of conditions, manifested by the pain in the jaw area and associated muscles, and limitations in normal movements of speech, facial expression, eating, chewing, and swallowing. Temporomandibular disorders affect nearly 10-70% of population. Therefore, after clinical examination, a proper imaging of temporomandibular joint using appropriate diagnostic modalities is commonly required.

The purpose of this article was to present the use of ultrasonography as a diagnostic tool in the detection of temporomandibular joint disorders.

The most commonly used imaging methods include cone-beam computed tomography (CBCT), artrography and magnetic resonance imaging (MRI), which is also the gold standard in TMD imaging. Since 1992, ultrasound has been suggested as a non-invasive method in dynamic imaging that provides insight into the dynamics of the TMJ. Recent studies have shown that high-resolution ultrasonography (HR-USG) is a fast, comfortable, and less expensive modality, available in most centers. These are the main reasons for selecting this method when assessing condition of temporomandibular joint.

HR-USG has acceptable sensitivity in diagnostics of articular disc dislocation as well as joint effusion in the temporomandibular joint region. In patients with claustrophobia, pacemakers and mettalic prosthesis, HR-USG is recommended as an alternative to magnetic resonance in the assessment of temporomandibular joint.

SUPERNUMERARY TEETH ASSOCIATED WITH THIRD MOLAR IMPACTION

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Abstract

Supernumerary teeth are not a common occurrence, especially if they are not associated with different syndromes like kleidocranial dysplasia, cleft lip and palat, Gardner syndrome...

By definition a supernumery tooth represents the tooth added to the normal number of teeth, and can be located in any part of the dental arch.The clinical condition of having supernumerary teeth is also known as hyperdontia.

The presence of supernumerary teeth is noted in both dentitions.The frequency of supernumerary teeth in deciduous dentition amounts 0,8 percent, while that percentage in permanent dentition amounts 3,6 percent.According to the research, the ratio of supernumerary teeth in permanent dentition in men and women amounts to 2:1.

The premaxillary region appears to be the most common site of predilection. Supernumerary teeth can be seen in the region of incisor (mesiodens), beside premolars (para-premolar), beside molars (paramolar) and distal to the last molar (distomolar).

The most acceptable theory for the development of supernumerary teeth is explained by hyperactivity theory, which suggests that supernumerary teeth are the result of independent, local and conditioned hyperactivity of the dental lamina. Heritage also plays a role in the phenomenon of supernumerary teeth.

The paper presents a patient aged 20 years old sent by a dental Orthopedics.

Based on a health history, clinical examination and analysis of the panoramic radiograph a diagnosis was made of the impaction of upper third molar and presence of supernumerary tooth (Impactio dentis 18 et distomolar).Under local anaesthesia a full mucoperiostal, sulcular incision from the second molar tooth to the end of the alveolar arch was made. Mucoperiostal flap was reflected, wisdom tooth and supernumerary tooth were extracted, the flap was placed on its original position and sutured. After 7 days the wound healed and the sutures were removed.

PROSTHETIC SOLUTION FOR THE LACK OF SPACE FOR LATERAL INCISORS IN THE UPPER JAW

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Introduction

One of the biggest challenges of dental prosthetics is the ability to implement functional solutions, while considering all esthetic requirements and preserving as much dental substance as possible.

Case description

A patient interested in the restoration of the missing upper lateral incisors. The examination showed the reduction in mesiodistal spaces in the lateral incisor sectors to 4mm on the right side and 2.5mm on the left side. The reduction in mesiodistal space was the result of the long-ago removed teeth and consequent migration of both upper-jaw canines and their inclination towards the empty space.

The process of making the dental bridge

Following the examination, it was decided to make a dental bridge between 13 and 23 teeth, without devitalizing the canines. In addition, due to the binding of the teeth in one block, the diastema between the central incisors was closed

Stages:

1. We have started with the trimming of the teeth in the inter-canine sector. Most of the tooth substance was removed from the distal surfaces of both central incisors as well as from the mesial surfaces of the canines. As a result, the mesiodistal space was increased to 6mm on the right side and 5.5mm on the left side, which is in line with the average width of lateral incisors of 6.5mm. Thereafter, a silicone impression of the upper jaw and the lower jaw was taken.
2. We have performed the metal frame fitting test and we have determined the vertical dimension and dental color.
3. Once we have performed the bridge test and corrected minor esthetic defects, the bridge was cemented.

Conclusion

Despite the significant inclinations of the upper canines, we managed to compensate lateral incisors and provide a functional and esthetic solution.

INDIRECT RESTORATIONS IN ANTERIOR TEETH FRACTURE – CONTEMPORARY SOLUTIONS

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Abstract

Fracture indicates the interruption in continuity of different tissues under the influence of certain mechanical forces. In our case, it refers to the interruption in the continuity of hard dental tissues in the frontal region. The aim of this paper is to present a range of contemporary possibilities of restoration of various types of anterior teeth fracture.

There are a number of ways of prosthetic restoration of fractured teeth. The choice of restoration method depends primarily on the type, degree and localization of the tooth fracture. They are performed by direct and indirect methods. In the case of the tooth fracture class I, we use indirect replacements, in particular: ceramic facets, composite facets, veneers and lumineers. In the case of the fractures class II, we use indirect replacements, in particular: ceramic or composite facets, ceramic or metal-ceramic crowns. In the case of the tooth fracture class III, adequate endodontic treatment is necessary, followed by the cast post using various types of pins. Whereas, in the case of fractures class IV, the therapy is somewhat more complicated and depends on the height of the fracture line (gingival, middle and apical third), as well as its direction (horizontal or vertical).

The positive therapeutic outcome of fractured teeth requires teamwork and a multidisciplinary approach. Each patient is treated individually. The final decision on a reconstructive procedure is made depending on the fracture type, age, sex, degree of oral hygiene, aesthetic requirements, financial resources, as well as final reconstructive goals.

Contemporary dentistry always gives an advantage to indirect methods for restoration in the anterior teeth fracture, due to the replacement durability and a better aesthetic effect. Contemporary materials and technological advances nowadays enable a complete reconstruction of anterior teeth fracture, from both aesthetic and functional aspect.

TEETH SETTING IN TOTAL DENTAL PROTHESIS AT PATIENTS WITH THE III SKELETAL CLASS

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Introduction

Total dental prostheses are a type of dental remedy that is the only conservative way of oral rehabilitation of toothless patients.

Case description:

An 80-year-old patient came because he needed complete prosthesis to be made. Clinical examination, OPT and telegendreation were performed. The presence of III skeletal class was determined by analyzing the telerendgenic image.

Specificity of teeth setting in patients with III skeletal class:

1. The front teeth should be placed in an incision or a reversal relationship (a certain inclination of the anterior tooth is required ∟I / SpP <70º, ∟i / MP> 91-94º, the axes of the upper and lower teeth are locked ∟> 135º).
2. The basic rule which must be respected is that the lower lateral teeth should be placed so that their central fissures are above the center of the lower residual ridge.
3. Upper lateral teeth should be positioned in such a way that the central mandibular relationship comes in the best possible contact with the lower ones.
4. Side teeth are most often placed in a cross-section due .
5. Crossing usually starts in the area of other premolars. The hips of the second upper premolar are formed against the lumps of the other lower premolar and the first lower molar. The nipples must be filled with grinding, i.e. shorten, to get stable contacts.
6. In the area of the first molar, the ratio of lateral teeth is crossed. The buccal bulges of the upper molars contact with the central fissures and marginal edges of the lower molars.

Conclusion:

For total dentures in patients with III skeletion class to have an appropriate functional value, the position of artificial teeth must be adjusted to the skeletal relationship of the fork.

GINGIVAL NEUROFIBROMA IN PACIENT WITH NEUROFIBROMATOSIS TYPE 1. CASE REPORT

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Abstract

The term neurofibromatosis is used for a group of genetic disorders that cause appearance and tumor growth in the nervous system. Neurofibromatosis type 1 is the most common type of neurofibromatosis. It is one of the most frequent human genetic diseases, with a prevalence of one case in 3000 births. Neurofibromatosis type 1 is a complex syndrome that may affect all organ systems. Oral manifestations can be found in 72% of adult patients and 40% children with this disorder. The oral manifestation of neurofibromatosis type 1 is characterized by appearance of solitary and multiple benign tumors, neurofibromas, in oral cavity. Gingival neurofibromas are rare. In this case report is presented gingival neurofibroma in 10-year old male patient.

SUPERNUMERARY THEET IN PREMAXILA REGION - A CASE REPORT

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Abstract:

Supernumerary teeth or hyperdontia are defined as the existence of an excessive number of teeth in relation to the normal dental formula – 20 in the deciduous dentition and 32 in the permanent dentition. 90% of the supernumerary teeth occurred in the region of premaxilla, 92,8% of which were in the central incisor region. The other, 10% of the supernumeraries were located in the premolar, canine, molar and lower central incisor regions. 0,9 percent had at least one supernumerary tooth, but only 12 percent of these had two supernumeraries and 1 percent had three.

Case report:

Patient was referred by a nearby medical centre to the Department of Oral Surgery at the University School of Dentistry in Novi Sad, for surgical extractions of three impacted teeth in premaxila region. From thepatient's health history, we found out that she was an apparently healthy person and that she did not have any complaints about impacted teeth.After full clinical and radiographic evaluation, extractions of impacted teeth were planned to be performed procedures under local anaesthesia. Mucoperiostal flap was reflected into the fornix. Supernumerary teeth were extracted. The flap was placed on its original position and sutured. A standard protocol was conducted postoperatively, with cold compresses, antibiotic coverage, mushy food and adequate oral hygiene. The sutures were removed after seven days.