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GLOBAL DISTRIBUTION OF EARLY CHILDHOOD CARIES

Gugliermo Campus*
Klinik fur Zahnerhaltung, University of Bern, Switzerland

Early childhood caries affects half of the preschool population worldwide. According to the geographical area ECC prevalence varies significantly.
This talk aims to systematically review studies on the global prevalence of early childhood caries.
Cross-sectional and cohort studies published between 2011 to 2021, reporting the prevalence of early childhood caries in children under 71 months in urban or rural communities, were included in the review. Three electronic databases were screened: PubMed, Embase and Scopus. Eligibility criteria included primary outcomes such as the dmft index and caries prevalence, as well as secondary outcomes like socio-economic indicators including Gross National Income per capita (GNI), literacy rate (LiR), Gini Index and unemployment rate (UR).
More than 100 papers from all continents were retrieved. ECC prevalence ranged from less than 10% to almost 100%, with high values recorded in Africa and South America.
In Africa, the prevalence of ECC is lower than the global pooled prevalence, while Asia, Oceania and Europe reported ECC prevalence above the average global estimate. North and South America have a prevalence within the global estimate. Nevertheless, as the precision of the results of the systematic review relied on results from many countries and areas, many countries did not report information on ECC prevalence which could be included. In those countries, which prevalence has been reported, the distribution of ECC suggests that there are significant differences between the structures of ECC prevention.
Key words: Early childhood caries, Caries prevalence, DMFT index

NON-OPERATIVE CARIES MANAGEMENT: NEW EVIDENCE

Gugliermo Campus*
Klinik fur Zahnerhaltung, University of Bern, Switzerland

Although preventable, dental caries continues to be one of the most prevalent chronic diseases among children worldwide and one of the most common unmet healthcare needs of poor children. The aim of this presentation is to evaluate the therapeutic effect of HAF on active caries lesions compared to a standard dentifrice containing 1450 ppm F. This new approach aims to remineralise caries lesions underlining those non-operative procedures are recommended for the management of early caries lesions. Preventive strategies are recommended to control caries risk factors (Schwendicke et al., 2015). Fluoride has the most consistent benefit in preventing caries development and re-mineralizing initial lesions, as these lesions should be identified and controlled at the non-cavitated level (Nyvad and Baelum, 2018). However, non-cavitated lesions may vary widely in their risk of progression. Caries lesion activity assessment differentiates lesions deemed caries active from lesions deemed caries inactive to provide optimal care planning (Machiulskiene et al., 2020). There is low to moderate scientific evidence that fluoridated toothpastes can modify caries activity by increasing the remineralizing effect (Schmoeckel et al., 2020). One of the new caries remineralizing technologies is biomimetic systems, including synthetic hydroxyapatite (HAF; Ca5(PO4)3(OH), applied in micro-cluster or nanocrystalline forms. HAF is a bioactive and biocompatible material with a chemical composition similar to the apatite crystals of human enamel. In a previous study, HAF toothpastes were able to reduce caries increment in children over a period of 2 years more effectively than traditional fluoridated toothpastes (Campus et al., 2022). This presentation outlines recommendations for dentists for the treatment of caries, with an emphasis on early childhood caries (ECC), primary teeth, and occlusal surfaces in permanent teeth. The consensus was achieved by an expert panel nominated by the European Organization for Caries Research (ORCA) and the European Federation of Conservative Dentistry (EFCD) boards. The main findings were that the more polarized disease distribution in children and adolescents along social gradients should be taken into account when managing the caries process at the individual, group, and population. Controlling or reducing caries activity is essential for successful caries management, with adequate daily oral hygiene and fluoride application. Non-invasive interventions, such as fluoride varnish or silver diamine fluoride, are also suitable to arrest or control initial or even cavitated dentine caries lesions in the absence of irreversible pulpitis. In primary molars, preformed metal crowns are more successful than multisurface fillings. Thus, some of our old believes have been replaced by new approaches, sometimes on very high levels of evidence and these should be applied in general practice.
Key words: Caries; Children; Prevention; Therapy; Inactivation

NATIONAL PREVENTIVE PROGRAM - IS IT WORTH IT?

Hrvoje Jurić*
Department of Pediatric and Preventive Dentistry, University of Zagreb School of Dental Medicine, Zagreb, Croatia; University Hospital Centre Zagreb, Croatia

The modern development of civil society and the progress of science as a whole in recent decades has greatly expanded, which in many ways affects the development of medicine, including dental medicine. At the same time, it is a clear fact that the health of the oral cavity is an integral part of general health and it is important to always consider it as such. Unfortunately, caries is still one of the most common diseases of modern man, leading to various short and long-term problems and ultimately affecting the quality of life of every individual from early childhood. Therefore, maintaining the health of the hard and soft tissues of the oral cavity is always a professional imperative, in the knowledge that the father of modern medicine, Hippocrates, who said: "It is nice to take care of people's health, but it is even nicer to take care of their good condition". For this reason, any national program that deals with disease prevention is of great value. It addresses how to reduce the incidence of disease, actively influences the awareness of the entire population about the importance of maintaining health, and pointing out the possibility and value of early diagnosis and preventive/interceptive treatment. National caries prevention programs are particularly important because they usually involve children from an early age, which ultimately has a positive long-term impact on all generations affected by such programs. What experiences have been made with prevention programs and how they can be effectively implemented in the healthcare system will be analyzed in the presentations from various aspects, with a focus on personal experiences from the development and implementation of prevention programs in the national healthcare system.
Key words: Dental medicine, Caries, Prevention,

TOOTH INJURY – FROM ANALOG TO DIGITAL?

Hrvoje Jurić*
Department of Pediatric and Preventive Dentistry, University of Zagreb School of Dental Medicine, Zagreb, Croatia; University Hospital Centre Zagreb, Croatia

The primary objective of this lecture is to provide precise and detailed guidance on managing patients who have experienced dental trauma, starting from initial emergency care through to planning long-term treatments that fulfill both the functional and aesthetic expectations of both the patient and the practitioner.

The first crucial step involves administering appropriate emergency treatment to the traumatized patient, beginning from the initial contact with the injured individual up to the completion of their first dental office visit. Gathering anamnestic data, and often heteroanamnesis (information provided by accompanying individuals, especially for minors), plays a pivotal role in evaluating the psychophysical condition of the traumatized patient. It is imperative to consider the possibility of physical trauma as part of the differential diagnosis, particularly when dealing with minors, to address issues such as child abuse or neglect.

Subsequent steps include conducting a clinical examination, performing radiographic diagnostics to assess the trauma, and conducting vitality testing, all of which precede the diagnostic evaluation. Following this, providing the patient with optimal treatment is essential, as this initial emergency intervention for the traumatized tooth significantly influences the subsequent course of therapy and long-term prognosis.

Once all aspects of the assessment and treatment effects have been reviewed, a definitive long-term treatment plan can be presented to the patient. This often necessitates collaboration with other specialized fields, particularly prosthetics and orthodontics.

This lecture will also cover additional topics such as the fabrication of splints for stabilizing injured teeth, restoration of lost dental hard tissue using adhesive techniques with composite materials, comprehensive endodontic management of traumatized young permanent teeth, and strategies for preventing dental injuries.

Key words: Dental trauma, Emergency treatment, Diagnostic assessment

CLINICAL GUIDELINES FOR THE TREATMENT OF MOLAR INCISION HYPOMINERALIZATION

Kristina Goršeta*
Department of Pediatric and Preventive Dentistry, University of Zagreb School of Dental Medicine, Zagreb, Croatia; University Hospital Centre Zagreb, Croatia

Molar incisor hypomineralization (MIH), affecting approximately 14% of the global population, has emerged as a significant public health concern. The universally accepted diagnostic criteria established by the European Academy of Pediatric Dentistry (EAPD) have greatly enhanced the quality of epidemiological studies and treatment planning. These criteria aim to assist clinicians in making informed decisions when selecting appropriate treatment modalities.

MIH manifests across a spectrum from mild to severe, with clinical presentations ranging from creamy/white to brown discoloration, often accompanied by post-eruptive enamel fracture and heightened tooth sensitivity. Despite an increasing body of research on MIH treatment, innovative solutions remain limited, and conventional restorative methods remain the predominant approach. The severity of MIH, alongside factors such as the patient's age and overall health, typically guide treatment choices.

The EAPD strongly advocates for employing all available procedures to treat hypomineralized teeth, emphasizing the importance of a painless and effective treatment regimen that prioritizes the dental, oral, and overall medical well-being of pediatric patients. This holistic approach aims to mitigate discomfort, restore functionality, and enhance the aesthetic appearance of affected teeth.

Continued research is crucial to advancing therapeutic options for MIH, exploring novel materials and techniques that offer durable and aesthetically pleasing outcomes. Collaborative efforts between clinicians, researchers, and manufacturers are essential to address the evolving challenges posed by MIH and improve the quality of life for affected individuals worldwide. By expanding our understanding and treatment capabilities, we can better meet the diverse needs of patients with this prevalent dental condition.

Key words: Children; Molar incisor hypomineralization; Hypersensitivity

DIAGNOSIS OF HYPOPHOSPHATASIA IN DENTISTRY

Jelena Bradić*
Department of Pediatric Dentistry, University of Zagreb School of Dental Medicine; University Hospital Centre Zagreb, Croatia

Hypophosphatasia is a rare hereditary disorder caused by a mutation in the gene that codes for non-specific alkaline phosphatase in tissue. The result of this disorder is a deficiency or low level of alkaline phosphatase in the serum, which leads to abnormalities in the mineralization of bones and teeth.

Alkaline phosphatase is a membrane enzyme that enables the dephosphorylation of inorganic pyrophosphate to inorganic phosphate, allowing binding to free calcium and the formation of hydroxyapatite crystals. The lack of incorporation of hydroxyapatite into the tissue leads to abnormalities in mineralization. The diagnosis of hypophosphatasia is made based on the clinical picture, radiographs and laboratory tests. With regard to the level of alkaline phosphatase and the resulting hypomineralization, a distinction is made between severe and mild forms. The dentist plays an important role in recognising milder forms of the disease, which are clinically manifested by early loss of deciduous teeth in children or permanent teeth in adults, hypomineralization of the enamel and abnormalities in the size of the pulp. As part of a medical history, the presence of previous diagnoses and/or pathologies such as craniosynostosis, epilepsy, rickets or osteomalacia as well as growth and developmental delays must be recorded. In addition, the dental status is determined during the examination. In the case of non-traumatic and non-inflammatory premature tooth loss, the presence of this anomaly must be ruled out. If hypophosphatasia is suspected, it is therefore necessary to refer the patient to specialists for laboratory and X-ray examinations in order to enable a timely diagnosis and treatment and to prevent the development of complications such as nephrocalcinosis and rickets or osteomalacia.

Key words: Hypophosphatasia, Hypomineralization, Pediatric dentistry, Tooth loss

RESTORATION OF TEETH UNDER GENERAL ANESTHESIA - EXPERIENCE OF THE DENTAL CLINIC, CLINICAL HOSPITAL CENTER RIJEKA

Nataša Ivančić Jokić*
Department of Paediatric Dentistry, Faculty of Dental medicine University of Rijeka; Clinical Hospital Center Rijeka, Croatia

Aim: The aim of the lecture is to present the experience and results of tooth restoration under general anesthesia at the Dental Clinic, Clinical Center Rijeka. Tooth restoration under general anesthesia, which has become an indispensable part of the daily work of specialists in pediatric dentistry, but also in other dental specialties, involves restoring the teeth of children with developmental disorders, very young children and children who have a pronounced fear of dental treatment.

Material and methods: The specialists of the Department of Pediatric Dentistry at Dental Clinic have been performing procedures under general anesthesia for more than five years. The procedures are performed in cooperation with the Clinics of Anesthesiology and Pediatric Surgery for children and the Clinics of Otorhinolaryngology for adults with disabilities.

Results: From 2018 to July 2022, a total of 459 patients were treated, 66.2% of whom were men and 33.8% women. The procedure was performed on a total of 4181 teeth, 27.3% on permanent teeth and 72.7% on deciduous teeth. 69.9% of the treated permanent teeth were repaired and 30.1% were extracted. In the primary dentition, 34.6% of the teeth were repaired and 65.4% were extracted.

Conclusion: Protocols were developed for referrals for dental rehabilitation under general anesthesia and for the rehabilitation procedures performed. The satisfaction of patients and their parents justify the continuation of dental rehabilitation under general anesthesia.

Key words: General anesthesia, Children, Tooth preparation, Tooth extraction

CAN THE USE OF A DIODE LASER COMPLETELY REPLACE CONVENTIONAL PULPOTOMY IN PRIMARY TEETH?

Dubravka Negovetić Vranić*
Department of Pediatric and Preventive Dentistry, University of Zagreb School of Dental Medicine, Zagreb, Croatia

With the development of technology, the application of lasers is now ubiquitous in all areas of dental medicine, especially in pediatric dentistry. Due to the development of the concept of minimally invasive dentistry guided by the principle of „fillings without drilling," children and adolescents represent one of the target groups where the use of lasers is increasingly prevalent today. The diode laser is an effective tool for the removal of soft tissues in primary dentition, with the caveat that less energy is used compared to permanent dentition. During endodontic procedures on primary teeth using lasers, the dental practitioner must pay attention to the laser's impact on the pulp and root canals of the primary teeth, taking into account the anatomy of the apical openings and the depth of laser penetration into the tissues.

Key words: Laser, Pediatric dentistry, Pulp

MYOFUNCTIONAL THERAPY GUIDED DEVELOPMENT OF OCCLUSION IN DECIDUOUS AND PERMANENT DENTITION

Domagoj Glavina*
Department of Pediatric and Preventive Dentistry, University of Zagreb School of Dental Medicine, Zagreb, Croatia; University Hospital Centre Zagreb, Croatia

Guiding the development of occlusion in deciduous and permanent dentition is very important aspect of preserving oral health in children and adolescents. During the development of oro-facial structures, growth is directed anteriorly and downwards, and the musculature of the cheeks and tongue has a significant impact on the physiological position of deciduous and permanent teeth. The position of the tongue in the mouth, muscle tone, mouth breathing, and finger sucking affect formation of open bites and compression anomalies. The aim of myofunctional therapy is to eliminate unsuitable habits, correct tongue posture, and prevent open bites and compression anomalies. Additionally, the goal of therapy is to enable physiological eruption and occlusion formation. Besides traditional

orthodontic appliances, the use of prefabricated appliances is very popular today. These can successfully correct unsuitable habits, enable the correct position of the tongue in the mouth, and ensure proper muscular action of the buccal and masticatory muscles, thereby preventing the development of compression anomalies and promoting the development of physiological occlusal relations.
Key words: Pediatric dentistry, Occlusion development, Mouth breathing

MYTHS AND TRUTHS IN DENTAL MEDICINE FOR CHILDREN

Danko Bakarčić
Department of Pediatric Dentistry, Faculty of Dental Medicine, University of Rijeka, Rijeka, Croatia

Children are the most demanding and honest patients, making pediatric dental medicine quite different from dental medicine for adults. This lecture is based on the principle of „the most frequently asked questions" and provides answers to common problems encountered when working with children. Some methods established years ago are still applicable, while others have fallen out of use. Given that dental practitioners may find themselves questioning the validity of certain methods, this lecture aims to offer guidelines on how to act in various situations using modern approaches. Topics will range from the child's first visit to the dentist to conservative dental treatment and the care of traumatized teeth. By covering these procedures comprehensively, this lecture serves as a foundation for providing successful dental care in a primary healthcare setting. The focus will be on building trust and effective communication with young patients, employing the latest techniques and treatments to ensure their comfort and long-term oral health. This approach not only enhances the child's dental experience but also equips practitioners with up-to-date knowledge and practices for optimal patient outcomes.
Key words: Children; Caries; Dental treatment

CHILD FEEDING PRACTICE AND PSYCHOSOCIAL RISK FACTORS ASSOCIATED WITH EARLY CHILDHOOD CARIES

Tomislav Škrinjarić*
Department of Pediatric and Preventive Dentistry, University of Zagreb School of Dental Medicine, Zagreb, Croatia; University Hospital Centre Zagreb, Croatia

The goal of taking care of children's oral health encompasses several key aspects: preventing the acquisition of harmful microflora, avoiding early childhood caries (ECC), establishing correct feeding practices, and starting an early preventive program. Early colonization by Streptococcus mutans and biofilm formation by the age of 18 months are strongly associated with the onset of ECC. The development of ECC is often linked to frequent night feeding or the use of sweetened beverages. Research has shown a significant association between the occurrence of ECC and the intake of sweet products and sweetened beverages between meals, as well as socioeconomic status. Interestingly, maternal consumption of xylitol chewing gum has been found to be beneficial in delaying an infant's early oral infection with Streptococcus mutans. Fluoride-based interventions are widely considered to be scientifically validated methods for preventing ECC. Daily use of fluoride toothpaste and the application of fluoride varnishes at least twice a year are regarded as the most effective strategies for preventing ECC. By incorporating these practices, caregivers can significantly contribute to the maintenance of their children's oral health, reducing the risk of ECC and promoting healthier oral hygiene habits from an early age.
Key words: Early childhood caries, Nutrition, Psychosocial risk factors

MANAGEMENT OF MOLAR INCISOR HYPOMINERALISATION ON SEVERRLY AFFECTED INCISORS – A CASE REPORT

Petra Bučević Sojčić[1*], Sarah Turjanski, Karla Mužinić[2], Vlatko Pandurić[3,4], Hrvoje Jurić[1,4].
[1] *Department of Paediatric and Preventive Dentistry, University of Zagreb School of Dental Medicine, Zagreb, Croatia*
[2] *Resident, Department of Paediatric and Preventive Dentistry, Clinical Hospital Center Zagreb*
[3] *Department of Endodontics and Restorative Dentistry, University of Zagreb School of Dental Medicine, Zagreb, Croatia*
[4] *University Hospital Center Zagreb, Dental Clinic, Zagreb, Croatia*

Introduction: Hypomineralization of the upper permanent incisors is an aesthetic problem, especially in adolescent girls. Therapeutic procedures usually include minimally invasive procedures, and more severe stages often require a combination of several different approaches.
Subjects and procedures: An xx-year-old girl diagnosed with molar incisor hypomineralization (MIH) was very unhappy with the aesthetic appearance of her maxillary incisors, which had an extremely negative impact on her quality of life. Clinical examination revealed a more severe stage of hypomineralization, particularly on tooth 11 with marginal collapse on the vestibular surface. The therapeutic approach included pretreatment with a three-stage microabrasion procedure using 37% orthophosphoric acid and zinc phosphate cement, followed by direct composite layering with minimal preparation as the final restoration.
Results: A minimal aesthetic restoration completely covered the brown-yellowish demarcations on the vestibular surfaces of the maxillary central incisors.
Conclusion: Pretreatment with microabrasion prior to the restorative procedure in severely affected incisors is an effective combination of procedures for the aesthetic management of MIH.
Key words: Molar incisor hypomineralization, Microabrasion, Composite layering

MASTICATION AND NUTRITION IN CHILDREN

Odri Cicvarić[1]*, Renata Gržić[2,3], Nataša Ivančić Jokić[1,2], Marija Šimunović Erpušina[1,2], Dorotea Petrović[1], Danko Bakarčić[1,2]
[1] *Department of Paediatric Dentistry, Faculty of Dental Medicine, University of Rijeka*
[2] *Clinic for Dental Medicine, Clinical Hospital Center Rijeka*
[3] *Department of Prosthodontics, Faculty of Dental Medicine, University of Rijeka*

Background: Impaired masticatory function can affect food choice and reduce food processing and absorption. The aim of this research was to examine the association between chewing efficiency and nutrition habits - macronutrient ratio.
Participants and methods: 77 participants were included in the research, 40 male and 37 female (median age 7.33 years). Chewing efficiency was determined using silicone bolus substitutes through 20 masticatory cycles. The surface area of chewed particles (mm^2) was determined using the Image J program (National Institutes of Health, Bethesda, Maryland, USA). 3-day food intake records of the participants were collected. Using the program Nutritionist ProTM (Axya Systems LLC, Redmond, USA) the average ratio of protein, fat, carbohydrates, and sugars was determined.
Results: There is a statistically significant correlation between the surface area and the caloric ratio of protein ($r=-0.402$, $p<0.001$, $r^2=0.162$), carbohydrates ($r=0.365$, $p=0.001$, $r^2=0.133$), and sugar ($r= 0.272$, $p=0.008$, $r^2=0.074$). The correlation between the surface area and the caloric ratio of fat is not significant ($p=0.044$, $r=-0.195$). The surface area of chewed particles significantly predicts the caloric ratio of protein, carbohydrate, and sugar intake ($\beta=-0.083$, $p<0.001$; $\beta=0.153$, $p=0.001$; $\beta=0.098$, $p=0.017$).
Conclusions: Bad nutritional habits are one of the causes of dental caries and premature loss of teeth which are the most common causes of impaired mastication in children. This research showed that the progression of masticatory impairment is associated with reduced protein intake and increased carbohydrate intake, which closes the negative loop of nutritional habits, caries, and mastication.
Key words: Children, Feeding behavior; Mastication.

SPECIAL FEATURES OF RADIOLOGIC ANALYSIS IN EXTERNAL RESORPTION

Bučević Sojčić P[1*], Jurić H[1,2]
[1]*Department of Paediatric and Preventive Dentistry, University of Zagreb School of Dental Medicine, Zagreb, Croatia*
[2]*University Hospital Center Zagreb, Dental Clinic, Zagreb, Croatia*

Introduction: External root resorption is a common complications following severe dental trauma in children, often with a poor prognosis for healing. Recently, regenerative endodontic treatments have demonstrated promising outcomes in extending tooth longevity.
Materials and methods: Intraoral periapical radiographs were taken initially and during follow-up of three patients diagnosed with external root resorption, who underwent a revascularization procedure consisting of four visits. During the first visit, a paste containing two antibiotics (ciprofloxacin and metronidazole) and a corticosteroid (dexamethasone) was applied in the root canal for two weeks. Subsequently, an antiseptic insert of calcium hydroxide paste was placed during the second visit, followed by induction of periapical bleeding to form a blood clot at the third visit. After stabilization of the blood clot, mineral trioxide aggregate was inserted into the cervical or middle part of the root canal during the fourth visit, and the crown was definitively restored using glass ionomer cement as a base and composite resin. Radiographic analysis was performed using Sordex Canora 5.1.2.4 diagnostic software.
Results: Radiographic analysis showed arrest of external root resorption, resolution of apical/lateral ostitis, thickening of the affected dentin walls, healing of the surrounding bone and, in the case of a root fracture, apical closure of the coronal fragment.
Conclusion: The revascularization procedure with a combination of two antibiotic pastes and corticosteroid proved to be successful in the treatment of external resorption.
Key words: External root resorption; Revascularization; Double antibiotic paste; Corticosteroid

CARIES EXPERIENCE OF CHILDREN IN THE PERIOD OF MIXED DENTITION

Dorotea Petrović[1*], Odri Cicvarić [1], Marija Šimunović- Erpušina [2], Nataša Ivančić Jokić [1,2], Danko Bakarčić [1,2], Hrvoje Jurić [3,4]

[1]*Department of Paediatric Dentistry, Faculty of Dental Medicine University of Rijeka, Rijeka, Croatia*

[2]*Clinic for Dental Medicine, Clinical Hospital Center Rijeka, Rijeka, Croatia*

[3]*Department of Paediatric and Preventive Dentistry, University of Zagreb School of Dental Medicine , Zagreb, Croatia*

[4]*University Hospital Center Zagreb, Dental Clinic, Zagreb, Croatia*

Objectives: to investigate the oral status of children and the oral hygiene habits of children and parents in the Osijek-Baranja County region.

Materials and methods: In a cross-sectional study, 131 children aged 9 to 12 years and their parents/guardians were interviewed. The subjects were divided into two groups, the test group, which included 101 children of both sexes and their parents, mother or father, who came for an examination at a specialist dental office for pediatric and preventive dentistry, and the control group, 30 children of both sexes and their parents, who came for an examination at the chosen primary care dentist. During the dental examination, each child's DMF index, dmf index, and OHI-S index were recorded, and the children and parents independently completed a questionnaire on oral hygiene habits.

Results: Children who see a doctor, a specialist in pediatric and preventive dentistry, have higher DMF index scores. No statistically significant difference was found in the OHI-S index between the groups mentioned. The frequency of responses to the question about performing oral hygiene in the form of twice-daily tooth brushing is lower among children and parents in the group studied than in the control group.

Conclusion: Timely referral of children to a dentist, the first appearance of milk teeth in the jaw, education about oral examination and the dental environment from the first years of life or referral of children to specialist practices from an early age would enable timely and appropriate care of oral health, which could subsequently lead to a reduction in the DMF index and an improvement in oral hygiene habits.

Key words: Children; DMF index; dmf index; OHI-S-Index; Oral hygiene habits

REVASCULARIZATION PROCEDURE ON THE LOWER CENTRAL INCISOR AFTER UNSUCCESSFUL ENDODONTIC TREATMENT - CASE REPORT

Jasna Peručić[1], Karla Mužinić[2], Petra Bučević Sojčić[3*], Hrvoje Jurić[3,4]

[1]*Dental Polyclinic Zagreb, Zagreb, Croatia*

[2] *Dental Polyclinic Split, Split, Croatia*

[3] *Department of Pediatric and Preventive Dentistry, University of Zagreb School of Dental Medicine, Zagreb, Croatia*

[4] *Dentistry Clinic, Clinical Hospital Center Zagreb, Croatia*

Objectives: Revascularization is a procedure in which, by provoking bleeding from the periapex and stabilizing the blood clot, an attempt is made to achieve natural apexogenesis, i.e. healing of the periapical process and keeping the tooth in the dental arch. The aim of this case is to show how, even after unsuccessful conventional endodontic treatment, the revascularization procedure can bring successful results.

Materials and methods: A 12-year-old boy came to the Department of Pediatric and Preventive Dentistry of Clinical Hospital Center Zagreb referred by his primary dentist. Due to complicated crown fracture, patient's tooth 31 was treated by a primary dentist two years before coming to the Department, and was prescribed an antibiotic three times for the same tooth. At the Department the patient underwent conventional endodontic treatment with gutta-percha sticks, and due to the appearance of inflammation symptoms, the same treatment was endodontically revised twice within 2 years. After conventional endodontic treatment, the present periapical process was identified radiologically, and the revascularization process was started in three standard steps; in the first visit, a two-antibiotic paste was placed inside the root canal, in the second visit, the apex was over-instrumented, and in the third visit, an MTA was placed on the stabilized blood clot. The patient was further monitored after 1, 2 and 5 months.

Results: Five months after the end of the therapy, the tooth is free of subjective symptoms, and the periapical process has completely healed radiologically.

Conclusion: The revascularization procedure is not a therapy that must be reserved only for the treatment of young permanent teeth with incomplete growth and root development. According to the case described above, when conventional endodontic treatment does not bring the desired results, the revascularization procedure can be the next treatment option.

Key words: Revascularization; Lower central incisor; Conventional endodontic treatment