

*Conference proceedings***2nd CONGRESS OF THE FACULTY OF DENTAL MEDICINE UNIVERSITY OF RIJEKA, RIJEKA, SEPTEMBER 2nd-3rd 2021.****RELATIONSHIP BETWEEN ORTHOGNATHIC FUNCTIONAL TREATMENT NEED IN PATIENTS WITH SKELETAL FACIAL DEFORMITY AND THEIR QUALITY OF LIFE***

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*First prize awarded for presentation of research

Abstract

Aim: To investigate relationship between orthognathic functional treatment need in patients with pronounced skeletal facial deformity and their quality of life.

Materials and methods: Cross-sectional study included 95 Caucasian subjects (65% females), aged 17-46 years (median 21, interquartile range 19-25). They were consecutive patients referred to University Dental Clinic Rijeka for treatment of their skeletal malocclusion that required combined orthodontic-surgical treatment. Malocclusions were objectively characterized in sagittal, vertical and transversal dimensions with an Index of Orthognathic Functional Treatment Need (IOFTN) grades. All participants completed Orthognathic Quality of Life Questionnaire (OQLQ).

Results: Positive linear correlation between IOFTN grades and OQLQ dimensions, except awareness, was detected. Correlation ranged from moderate for SA to strong for OF (Spearman correlation, $r=0.501-0.613$; $p<0.001$). The relationship had a better fit when using a cubic rather than a linear function. There were significant differences in OQLQ dimensions between IOFTN grades with moderate to large effect size mainly with grades ≥ 4 having much higher values than grades ≤ 3 ($p<0.001$). Awareness had a moderate effect size ($\eta^2=0.097$), while the other had a large effect size (0.321-0.425), the largest FA.

Conclusion: Relationship between clinical norms for orthognathic treatment need based on IOFTN index and self reported quality of life is not completely linear. It seems that the boundary is IOFTN grade 4 and that higher grades (great and very great need for orthognathic treatment) mostly induce significantly higher awareness of facial deformity, aesthetic concern, disturbed social interactions and more functional limitations than lower grades.

Keywords: orthognathic surgery; treatment need; quality of life

KNOWLEDGE AND ATTITUDES OF DENTAL STUDENTS REGARDING OBSTRUCTIVE SLEEP APNEA**

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Abstract

Aim: The objective of this study was to assess the knowledge and attitudes of dental students in Croatia about obstructive sleep apnea (OSA).

Materials and methods: There were 143 students from the Study of Dental Medicine, University of Split School of Medicine (MEFST), 84 students from the Faculty of Dental Medicine, University of Rijeka (FDMRI) and 74 students from the University of Zagreb School of Dental Medicine (SFZG) included in the study. The study was conducted using the Obstructive Sleep Apnea Knowledge and Attitudes Questionnaire (OSAKA) which was distributed to the participants through Google Forms. The first part of the questionnaire comprised general questions about age, gender and history of studying. The second part comprised 18 questions about the knowledge regarding OSA and third comprised five statements estimating attitudes about OSA.

Results: The total knowledge score of dental students in Croatia about OSA was 8.65 ± 3.85 points, out of a possible 18. Students studying in MEFST presented significantly better knowledge (MEFST 10.01 ± 3.52 points) in comparison to those in FDMRI (7.92 ± 3.72 points, $p<0.001$) and SFZG (6.86 ± 3.63 points, $p<0.001$), while there was no statistically significant difference between FDMRI and SFZG students ($p=0.069$).

Conclusion: The results of this study indicated insufficient knowledge about OSA and lack of competence in recognizing and treating OSA patients among dental medicine students in Croatia. Therefore, it is necessary to implement dental curricula changes and better educational programs regarding OSA and dental sleep medicine in general.

Keywords: obstructive apnea; dental student; knowledge

SMILE ESTHETIC-RELATED QUALITY OF LIFE AND TOOTH WHITENING***

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***Third prize awarded for presentation of research

Abstract

Aim: To investigate impact of teeth whitening on quality of life related with smile esthetic.

Materials and methods: The study was designed as a double-blind placebo-controlled randomised trial. The 50 examinees, age 19 to 23 (74% women), who had intact frontal teeth, randomly assigned to an experimental (N=24) and a control group (N=26) were analysed. Frontal teeth of the experimental group were whitened with light activated gel (Signal Fast professional plus set, Signal, Unilever, Argentina) for 30 minutes, while the same procedure was done with the control group, with no active ingredient in the gel. The examinees were assessed before (T0), a week after (T1) and a year after (T2) the procedure. The Smile Esthetic – Related Quality of Life and Tooth Whitening (SERQoL) was used to measure Dental self-consciousness (DSCf), Social contact (SC), Dental self-confidence. The colour of the upper right, middle incisor was determined with a calibrated digital spectrophotometer (SpectroShade, HandyDental Type 713000, MHT, Verona, Italy). Using the CIE L.a.b. formula, chromaticity, transparency, and brightness were determined.

Results: Short-term in the active group occurs increase of brightness and significant decrease of chromaticity, in the long-term recurrence occurs in both dimensions. Ultimately, the chromaticity is lower and brightness is higher than before bleaching. Transparency is decrease in both groups. The short-term color-change was significantly higher in the active than the control group, with a large effect size ($p<0.001$; $r=0.543$) but in the long-term the difference decreased. Ultimately, the color-change was still higher in active than the control group, with a moderate effect size ($p=0.025$; $r=0.318$). The amount of change in color due to bleaching didn't correlated with the intensity of change in psychosocial influence measured by the SERQoL.

Conclusion: Teeth whitening doesn't necessarily cause an improvement quality of life related with smile esthetic.

Keywords: teeth whitening; quality of life; long-term

OROFACIAL PAIN AND TEMPOROMANDIBULAR DISORDERS IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Abstract

Aim: The aim of this study was to evaluate the prevalence of temporomandibular disorders (TMD) in patients diagnosed with rheumatoid arthritis (RA) and control group, patients without any diagnose of rheumatoid arthritis.

Materials and methods: The sample size was 90 individuals age 32-75 years old (median 53; interquartile range 46-75; 76% women). Samples were divided in two groups, group with 45 patients diagnosed with RA and other group of 45 patients without any diagnosis of RA. The Diagnostic Criteria for TMD was used for clinical evaluation.

Results: Orofacial pain is higher in patients with RA than in control group (37.8% vs. 15.6%, $p=0.031$). Orofacial pain intensity ($p=0.005$) and chronic pain intensity ($p<0.006$) is higher. Intensity of chronic pain is higher than in control group (22.2 vs. 6.7%, $p=0.069$). None of the patients in control group presented disability due to high chronic pain but 8.8% patients in group with RA did. In patients with RA mandibular dynamic was reduced but not significantly. The prevalence of TMD is also higher in the group with RA (42.2% vs. 22.2%, $p=0.07$). Arthralgia is higher than in control group (20% vs. 4.4%, $p=0.05$) and degenerative changes of TMJ weren't significantly higher (15.6% vs. 11.1%) also with disk displacement (15.6% vs. 11.1%), myofascial pain (8.9% vs. 4.4%). Somatization ($p<0.001$) and depression ($p<0.001$) were higher in patients with RA.

Conclusion: Prevalence and orofacial pain intensity is greater in group with RA compared to those patients without RA due to depression and somatization. Arthralgia of the TMJ is most common TMD in patients with RA.

Keywords: orofacial pain; temporomandibular disorders; rheumatoid arthritis

THE ROLE OF THE PSYCHOLOGICAL FACTORS AND THE PHYSICAL THERAPY IN TREATMENT OF THE CHRONIC MASSETER MYALGIA

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Abstract

Aim: The aim was to analyze the effectiveness of physical therapy on the treatment of chronic masseter myalgia and the role of psychological factors.

Materials and methods: 54 subjects with masseter myalgia of more than 3 months in duration were invited to participate and 42 cases were available at the end and analyzed. Age range was 16-67 years (median 33, interquartile range 25-53), and 62% were women. The effectiveness of two types of therapy was tested: 1. consultation on the problem and home self-massage with warm-moist compresses, 2. biostimulation laser for a period of one month. Both groups had 21 subjects who were followed one month after the start of therapy when the effects of therapy were analyzed. The Chronic Pain Grading Scale was used to express the duration and intensity of pain and the degree of disability due to pain.

Results: Self-massage are less likely to reduce the degree of chronic laser pain in the short term, but not statistically significantly (62% vs. 43%). Characteristic pain intensity and disability score assessed by the Chronic Pain Grading Scale decreased significantly in both treatment groups after one month ($p < 0.05$). In both groups there was a decrease in the number of subjects in higher degrees of chronic pain and an increase in lower degrees after one month ($p < 0.05$). The amount of change in the characteristic pain intensity after one month did not depend on the type of therapy, gender, age, psychological characteristics, parafunction, presence of intracapsular disorders, persistent pain, degree of disability or health competence.

Conclusion: Laser and consultation with home self-massage and compresses reduce the intensity of pain and disability in the short term. Laser is no more effective than consulting with self-massages and compresses. As the placebo effect has not been evaluated, the effect of autosuggestion cannot be ruled out. Psychological factors do not affect the success of treatment in the short term.

Keywords: myalgia; pain; disability; laser

IMPACT OF OROFACIAL DISORDERS ON QUALITY OF LIFE IN PATIENTS WITH MULTIPLE SCLEROSIS

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Abstract

Aim: Multiple sclerosis (MS) is a chronic autoimmune, inflammatory disease of the nervous system that includes manifestations in the orofacial region. Chronic diseases significantly reduce the quality of life.

The aim of this study was to determine the impact of orofacial disorders on quality of life in patients with MS.

Materials and methods: The study involved 53 MS patients and 36 non-MS control subjects. Subjects completed questionnaires of orofacial symptoms and problems, and quality of life (subjective assessment and OHIP-49), and after they were clinically examined.

The number of oral lesions, symptoms and ailments, the number of facial ailments, and the correlation of the number of orofacial ailments with the quality of life were analyzed.

Results: In subjects with MS, we found a statistically significant difference in the increased number of oral lesions compared to the control group and in the increased number of oral symptoms and ailments ($P \leq 0.05$). The number of facial ailments was statistically significantly increased in patients with MS ($p \leq 0.05$). In the subjective assessment of oral health, the impact of oral health on quality of life, a significant difference between the groups was not found. No significant correlation was found between the number of symptoms and lesions with quality of life ($p > 0.05$).

Conclusion: Despite significantly more ailments and lesions in the orofacial region, the results of this study show that orofacial disorders do not significantly affect the quality of life of patients with MS.

Keywords: multiple sclerosis; orofacial disorders; quality of life

THE PREVALENCE AND ASSOCIATED FACTORS OF BURNING MOUTH SYNDROME

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Abstract

Introduction: Burning mouth syndrome (BMS) is chronic pain disorder characterized by intensive burning sensation of the healthy oral mucosa in the absence of local or systemic cause. The condition commonly affects women in the middle to elderly age (menopausal or postmenopausal women). BMS primarily affects the tongue (particularly the tip and lateral border), lips, hard and soft palate. In addition to the burning, tingling or itchy/numb sensation, other symptoms such as dryness of the mouth (xerostomia) and taste alterations (phantom tastes and dysgeusia) may be present and commonly accompany the burning sensation. The aim of the study was to assess prevalence and associated symptoms of burning mouth syndrome in Orofacial Pain Center, Clinical Hospital Center Rijeka.

Materials and methods: Since 2018, in Orofacial Pain Center in Clinical Hospital Centre Rijeka were diagnosed 32 new BMS cases. Clinical diagnosis relies on the analysis of data obtained from anamnesis, physical and laboratory examination. Burning sensation/pain unremitting for at least 4 months and intact oral mucosa was considered BMS.

Results: The sample consisted of 32 newly diagnosed cases of BMS, 29 (91%) women and 3 (9%) men, with a mean age of 58,9 (median 62; range 34-81). Participants were predominantly pensioners (58.2%) with high school education (62%). The burning sensation was present in the multiple sites in the mouth (87.5%), the dominating site being tongue (the tip of the tongue – 59.3%, lateral borders - 37.5%, dorsal surface - 21.87%, tongue in general - 18.75%) followed by the lips (21.87%) and palate (18.75%). Among the participants, symptoms were measured using Visual Analogue Scale (VAS), yielding a mean score 58 (median 50; range 15-100) while the nature of sensation was reported as moderately strong (59.3%). The average duration of burning symptoms was 11.65 ± 22.29 months with significantly higher results of dry mouth (67.7%). Taste alternation was not significantly important, only 28.2 % participants reported changes in taste.

Conclusion: The present findings indicate that occurrence of the BMS is higher in older subjects, primarily women with high school education. The intensity of symptoms is on average moderately strong and it is mainly localized on the tongue. Although burning symptoms may stand alone, they are commonly accompanied with oral dryness.

Keywords: Burning mouth syndrome; prevalence; VAS; location

ASSOCIATION BETWEEN SEVERITY OF ORAL LICHEN PLANUS AND ORAL SYMPTOMS

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Abstract

Introduction: Lichen planus is an immunologically mediated chronic inflammatory disease that affects mucosa and/or skin and has periods of clinical exacerbations and remissions. Oral lichen planus (OLP) occurs predominately in women and it is usually asymptomatic, but it can be followed with various symptoms, depending on the clinical appearance. This study aimed to determine a difference in the appearance of oral symptoms in OLP and control subjects and the connection between the severity of oral lichen planus and oral symptoms.

Materials and methods: Forty-eight subjects participated in the study (F/M=36/12), 24 OLP patients and 24 control subjects, sex- and age-matched. All participants completed a written questionnaire regarding their oral symptoms (xerostomia, burning/painful sensations, changed/weakened taste, and halitosis). Oral examination was conducted in OLP patients to determine disease severity using OLP scoring system (Elsabagh et al., score range 0-9).

Results: Chi-square tests were used for difference determination in oral symptoms appearance between groups. Statistically, a significant difference was found in xerostomia (p=0.039), burning sensation (p=0.008), and painful sensation (p=0.041) in favor of OLP patients, while for other symptoms no statistically significant difference was found. The mean OLP severity score was 3.79±1.93. OLP patients with scores above the mean value more commonly reported burning sensation, than those with lower scores (p=0.032).

Conclusions: Oral symptoms are common in OLP patients, and they depend on disease severity. As known, they cause a considerable decrease in the quality of life, so it is important to direct therapy towards symptoms reduction.

Keywords: oral lichen planus; oral symptoms; xerostomia

OXIDATIVE STRESS INDUCED BY ORTHODONTIC TREATMENT AND SUPPORTIVE ANTIOXIDANT THERAPY

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Abstract

The estimation of the health risk due to the amount of heavy metals released and the level of selected oxidative stress parameters generated during treatment with fixed orthodontic appliances is presented based on systematic review of literature. The estimated health risk is a minor one, as only very high metal concentrations induce cytotoxicity and oxidative stress, which was found in the studies on cell cultures. On the other hand, several studies reported that orthodontic treatment can induce transient imbalance in the ratio between oxidants and antioxidants in saliva as well as at the systemic level of clinically healthy subjects. The increased reactive oxygen species levels can occur at a local level in the oral cavity, which could pose a problem to patients with lower efficiency of endogenous antioxidant defense systems. Metal chelating antioxidants (transferrin, albumin, ceruloplasmin, flavinoids) could be used to prevent radical formation by metal ions from orthodontic appliances.

Keywords: oxidative stress; orthodontics; metals; antioxidants

CHANGES IN DENTITION AND HYGIENE IN THE RETENTION PHASE OF ORTHODONTIC TREATMENT

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Abstract

Objective: To assess changes of dentition and periodontium, and hygiene in retention after the end of the active phase of orthodontic treatment, and relationship with gender and pre-therapeutic condition.

Material and methods: A total of 51 subjects were recruited. A square retainer (0.673x0.268mm) was bonded in the mandible after completing the active phase of comprehensive orthodontic treatment with fixed appliances. After two years of retention, the sample for analysis consisted of 42 subjects of pre-therapeutic age 11-18 years (66% women). The Little's index

of irregularity of the incisors, intercanine width, accumulation of biofilm, calculus and gingivitis, and the incidence of retainer detachment were recorded in the mandible. Subjects were examined before orthodontic therapy, upon completion, and after two years of retention.

Results: Orthodontic treatment significantly corrected incisor irregularity (mean 4.6±2.7mm) and increased intercanine width (mean 0.9±1.9mm; p<0.05). The treatment change in intercanine width linearly inversely correlated with the therapeutic change in the Little index (r=-0.472; p=0.002). As the intercanine width increased, the irregularity of the incisor decreased. The incidence of retainer detachment over two years was 38% of cases. There was a small but statistically significant increase in incisor irregularity in retention, while a decrease in intercanine width was not significant. The post-treatment incidence of irregularity was 17% (mean 0.1±0.2) and the incidence of mandibular intercanine width reduction 24% (mean 0.1±0.4mm). There were no difference between sexes. The post-treatment change in incisor irregularity correlated linearly inversely with the post-therapeutic change in intercanine width (r=-0.668; p<0.001). Calculus accumulation increased significantly during retention (p<0.001), but not biofilm accumulation and gingivitis extent.

Conclusion: Post-treatment changes of dental arches with bonded retainer are not big, but also not uncommon. Bonded retainer quite often detached and increases the accumulation of tartar. Similar in both sexes.

Keywords: orthodontic therapy; retention; dentition; hygiene

ANALYSIS OF BACTERIAL BEHAVIOR AFTER NICKEL EXPOSURE: ADHESIONS AND BIOFILM FORMATION ON ORTHODONTIC ARCHWIRES AND SUSCEPTIBILITY TO ANTIMICROBIAL AGENTS

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Abstract

Aim: Increased adhesion of bacteria to elements of orthodontic appliances could lead to biofilm formation and increased numbers of pathogenic bacteria in the oral cavity. Staphylococcus aureus has been associated with various oral diseases such as cheilitis, parotitis and mucositis. Exposure to nickel could alter bacterial behavior.

Materials and methods: S. aureus was subjected to exposure and

adaptation to various subinhibitory concentrations of nickel. Five bacterial strains adapted to nickel at concentrations ranging from 62.5-1000 mg/L were then tested for adhesion and biofilm on nickel-titanium archwires in saliva. Sub-cultivation on the Muller-Hinton agar was performed to measure the number of adhered colony forming units per mL. The disk diffusion method was performed with all bacteria to assess differences in antimicrobial susceptibility.

Results: Adhesion, biofilm formation, biofilm biomass and antimicrobial susceptibility significantly differed between bacterial strains ($p < 0.001$). Bacteria adapted to 250 mg/L of nickel ions showed better adherence, higher early biofilm formation, higher biofilm biomass and often higher antimicrobial resistance than other adapted and non-adapted strains. Bacteria adapted to subinhibitory concentrations of nickel, 62.5 – 250 mg/L, were more resistant to some antimicrobial agents. Bacteria that were subjected and adapted to higher doses, 500-1000 mg/L, were more sensitive to antimicrobial agents and displayed reduced adhesion.

Conclusion: Corrosion-induced nickel release from orthodontic appliances could alter the behavior of bacteria in the oral cavity depending on the dose of nickel released. Exposure to low nickel concentrations appears to have a low potential to alter bacterial adherence and biofilm formation, but a greater potential to induce bacterial resistance to antimicrobial agents.

Keywords: bacteria; nickel; adhesion; orthodontic archwire; antimicrobial resistance

WHICH DIMENSIONS OF QUALITY OF LIFE MOSTLY DISTINGUISH PARENTS AND THEIR CHILDREN ON ORTHODONTIC TREATMENT DEMAND?

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Abstract

Aim: To analyse characteristics of young adolescents and their parents considering agreement on orthodontic treatment demand expressed by their children.

Materials and methods: The study included 221 dyads of adolescents (11-14 years, 54% female) and their parents. Orthodontic treatment demand was assessed on a five-point scale (0=no; 4=very much) which was dichotomized with a cut-off point ≥ 3 =a lot. Child Perceptions Questionnaire, Parental-Caregivers Perceptions Questionnaire and Family Impact Scale

were self-administered. A discriminant analysis was used.

Results: Four groups were analysed: (1) parents-adolescents agreement on high treatment demand (N=103), (2) parents-adolescents agreement on low demand (N=46), (3) parents-adolescents disagreement with children expressing high demand while parents thought children expressed low (N=19) and (4) children expressed low demand while parents thought they expressed high (N=53). One statistically significant canonical function was detected (61.1% of variance; $p = 0.013$). Individuals with high treatment demand (parent-child agreement), clearly deviated from the other three groups and were characterized by the most disturbed psychosocial well-being, most frequent functional limitations (both from the adolescents' and parents' point of view) and financial burden. Cases where parents and children disagreed were similar and closer to the group in which parents and children agreed on low treatment demand characterized by lesser disturbance of these dimensions.

Conclusion: The cases in which parents and children's opinions disagreed were more similar to those in which they agreed on a lower demand for treatment, mostly characterized by lower psychosocial influences.

Keywords: malocclusion; children; parent; perception

FAMILY IMPACTS OF CHILDREN'S MALOCCLUSION

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Abstract

Aim: The aim of this study was to investigate to what extent malocclusions, altered oral function and psychosocial well-being influence family relations.

Materials and methods: The study included 193 participants (children aged 11-14 years; 53% female) and their parents (84% mothers) recruited at the University Dental Clinics in Rijeka and Zagreb, Croatia, throughout 2017-2020. Severity of malocclusion was assessed by Index of Orthodontic Treatment Need Dental Health Component (IOTN DHC). Children and their parents reported children's oral symptoms (OS), functional limitations (FL), psychological (PW) and social well-being (SW) by Child Perception Questionnaire and Parental-Caregiver Perception Questionnaire. Family Impact Scale was self-administrated by parents. Predictors of family impacts were analysed by multiple linear regression analysis.

Results: Family impacts reported by parents were more related to parental perception of child's quality of life than child's reports and more by EW and SW than OS and FL. In multiple regression, when all predictors were controlled for significant predictors of family impacts were parental perception of child's EW, OS and SW ($p < 0.001$). Child's perception of his own quality of life, parental perception of child's FL, objective severity of malocclusion or gender of a child were not significant predictors (Adjusted $R^2 = 0.656$; $p < 0.001$), and parental EW had the biggest individual influence.

Conclusion: Family relations appear to more influenced by parental perception of alteration of child's quality of life rather than children's perspective of impairment, child's gender or objective severity of malocclusion.

Keywords: children; parents; family; malocclusion

PERIAPICAL BONE HEALING IN SMOKERS AND NON-SMOKERS AFTER NON-SURGICAL ENDODONTIC TREATMENT-A PROSPECTIVE STUDY

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Abstract

Aim: To compare the healing of periapical bone in smokers and non-smokers following non-surgical endodontic treatment in patients with apical periodontitis (AP).

Materials and methods: This prospective study involved sixty-six adult patients with AP diagnosis who were endodontically treated at Rijeka University Dental clinic (smokers $n = 33$, non-smokers $n = 33$). Data regarding smoking status were obtained from a self-administered questionnaire. The participants were matched according to gender and age. Healing of AP was determined utilizing periapical index (PAI) and dichotomized as healed (< 3) and not healed (≥ 3) at the six and twelve months follow up. Frequency distribution and chi-square test were used to evaluate PAI score change at baseline and subsequent intervals.

Results: There were 46 women and 20 men included in the study at baseline and six months interval. The mean age of participants was 35.4 years with a range of 19 to 65 years. In the non-smoker group, 24.2% ($n = 8$) of AP have healed at six months follow up, and 42.4% ($n = 14$) of AP in the smoker group. There were forty-eight participants included in the study after 12 months, 32 women and 16 men. In the non-smoker group 75% ($n = 18$) of

AP were healed in comparison to 70.8% ($n = 17$) in the smoker group. The analysis showed no statistically significant differences in healing rate between two groups after six months ($p = 0.191$) or after 12 months ($p = 0.821$).

Conclusion: The present data demonstrate no difference in healing rate between smokers and non-smokers.

Keywords: periapical periodontitis; smoking; treatment outcome

TO WHAT EXTENT DO SELF-REPORTED ORAL HYGIENE HABITS AND EATING HABITS RESPOND TO THE CLINICAL CONDITION IN THE MOUTH?

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Abstract

Objective: Patients often claim that despite the poor oral condition that the clinician finds in the mouth, they frequently perform oral hygiene and use additional oral hygiene products. The purpose of this study was to determine the association of self-reported oral hygiene and nutritional habits with the status of teeth and gingiva.

Materials and methods: The convenience sample consisted of 200 consecutive patients (18 to 65 years of age; 55% female) who visited the dental office in Lekenik in the period from October 2015 to May 2016. Caries experience and the extent of gingivitis have been assessed. Subjects self-administrated a questionnaire that reported the oral hygiene and nutritional habits.

Results: Self-reported observed gingival bleeding was associated with the clinically diagnosed extent of gingivitis ($p = 0.044$). As the frequency of observed gingival bleeding increased, the extent of gingivitis increased. Frequency of brushing teeth, dynamics of changing the brush, type of brush and use of oral antiseptics were not related to the extent of gingivitis. The caries experience was not associated with the self-reported frequency of daily brushing, the use of additional oral hygiene products, or the number of sweet snacks.

Conclusion: Self-reported oral hygiene habits and nutritional habits do not correspond to the clinical condition in the mouth. People who report better habits do not necessarily have less caries experience or gingivitis. Patients obviously do not realistically report their oral hygiene habits.

Keywords: oral hygiene; caries; gingivitis

TEMPORAL DYNAMICS OF ADHESION OF DENTAL BIOFILM BACTERIA TO ALLOYS OF ORTHODONTIC APPLIANCES

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Abstract

Aim: The aim of this study was to determine the dynamics of adhesion of the most common dental biofilm bacteria to alloys used in orthodontics.

Materials and methods: In an in vitro experiment, *Streptococcus mutans*, *Streptococcus oralis*, *Veillonella parvula*, and *Aggregatibacter actinomycetemcomitans* were incubated for four hours with nickel-titanium and stainless-steel orthodontic wires. The wires were then removed and bacteria were seeded on a hard nutrient medium. At the end of each experiment, number of colonies per mL was quantified. *Conclusion:* The use of a CBCT can facilitate the understanding and improve the treatment of complex root canal morphology. It is a helpful tool for determining endodontic success following endodontic space morphology, possible root fractures and periapical lesions undetectable by conventional radiographs but must be used judiciously.

Results: Over time, bacterial adhesion generally increased, but the growth trend differed for each bacterium and for each alloy. Higher growth over hours was observed in *S. mutans* and *A. actinomycetemcomitans*, while in *V. parvula* and *S. oralis* it was lower. *S. oralis* has a higher initial increase in NiTi alloy. *S. oralis* and *V. parvula* have higher adhesion to steel, and *S. mutans* to NiTi. In *A. actinomycetemcomitans*, the adhesion is higher in the first two hours to steel wires, but in the third and fourth hour it is higher on NiTi. Finally, *V. parvula* has the highest adhesion to both alloys, and *S. mutans* has the lowest.

Conclusion: The adhesion of bacteria to alloys of orthodontic appliances depends on the time, alloy and type of bacteria.

Keywords: dental biofilm; nickel-titanium; orthodontics; stainless steel.

PRESENCE OF SECOND MESIOBUCCAL CANAL IN MAXILLARY FIRST MOLARS IN THE CROATIAN POPULATION – PILOT STUDY

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Abstract

Aim: The aim of this pilot study was to determine the prevalence of second mesiobuccal (MB2) canal in upper first molars in the Croatian population.

Materials and methods: To determine the presence of MB2 canals 40 CBCT (cone beam computer tomography) scans of the maxilla, which were taken for diagnostic purposes in the time period from January 2015 to January 2020, were analyzed. A total of 80 maxillary first molars were analyzed. The scans were taken using 3D Accuitomo 170 (Morita®, Japan) devices in Dental radiology centers in major cities in Croatia and analyzed via OneVolume Viewer® software (Morita®, Japan). Exclusion criteria for this study were teeth with severe resorptions, decay, root end surgery and bad imaging with metal artifacts in which the exact morphology and number of root canals could not be determined. Before analyzing the CBCT scans the observer was calibrated by analyzing 10 CBT on two separate occasions with results matching percentage of 95%. The observer's results were controlled and confirmed by a specialist in the field of Endodontics. The collected data was stored and statistically analyzed using Microsoft Office Excell 2007 (Microsoft®, USA).

Results: In 62.5% of analyzed CBCT scans a MB2 canal was present, while in 37.5% the MB2 canal was absent.

Conclusion: This pilot study indicates a high incidence of MB2 canals in the Croatian population that coincides with recent literature.

Keywords: cone beam computer tomography; endodontics; canal

TAD'S ASSISTED SEGMENTED BIOMECHANICAL APPROACH IN ADULT ORTHODONTIC CASE

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Abstract

Introduction: Improving adult patients aesthetic harmony has always been a great challenge in orthodontic treatment.

Case report: The present case report describes the treatment progress of a 42-year old Croatian female patient with several missing teeth and chief complaints of “protrusive upper teeth and affecting her smile”. Dental casts revealed Class II molar and canine relationships, severe overjet (13mm) and deep overbite (100%). The surgical intervention was suggested but refused by the patient. The treatment objectives were to align and level the teeth upright, derotate and intrude tooth 16, intrude upper and lower anterior teeth, correct lip incompetence and protrusion of the maxillary anterior teeth, achieve an optimal overjet, overbite and adequate position for prosthodontic solution. The treatment plan included TAD's (Temporary Anchorage Device)

to facilitate molar and incisor intrusion and incisors retraction. Treatment was initiated using a standard edgewise appliance with a 0.022×0.028 in slot. After leveling and aligning, TAD's were used as anchorage for "en masse" frictionless segmented retraction and intrusion her maxillary and mandibular teeth. The intrusion of upper molars and "en masse" retraction was done simultaneously.

Conclusion: The interdisciplinary treatment protocol resulted in significantly improvement of function, esthetics, and quality of life in adult patients.

Keywords: interdisciplinary treatment; segmental biomechanics; mini implants

FINITE ELEMENT ANALYSIS APPLIED IN CLINICAL DENTAL PRACTICE: A CASE REPORT

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Abstract

Introduction: Finite element analysis is a method commonly used in engineering to test out structure performance before the final construction. Lately this method is gaining ground in dentistry and is widely used for laboratory testing of material properties and performance as well as general structural design of dental restorations and prostheses before clinical application. The purpose of this case report is to present and suggest the use of finite element analysis as a tool for use in clinical practice.

Case report: A 51 year old male patient with severe bruxism was referred for prosthetic rehabilitation due to missing teeth 36 and 37. Teeth 34, 35, and 38 were prepared to receive a monolithic zirconium oxide dental bridge manufactured by CAD/CAM method. The preparations were scanned with an intraoral scanner and a digital model of the dental bridge was created with CAD software (3Shape Trios). The generated model was imported in Space Claim software where it was prepared for finite element analysis using ANSYS Mechanical 2020 R2 software. The necessary bite force parameters and material properties were determined by analyzing recent scientific literature. The performed analysis revealed areas in the proposed design with high static load stresses which were in turn modified in the CAD software to create the final design of the dental bridge. The bridge was then milled from a zirconium oxide monolithic block (IPS e.max ZirCAD, Ivoclar Vivadent) and cemented with a self-adhesive resin cement (SpeedCEM Plus, Ivoclar Vivadent).

Conclusion: Finite element analysis could be applicable for clinical use but additional clinical research is required to confirm it.

Keywords: CAD/CAM; dental bridge; finite element analysis; zirconia

A "MINIMALY" INVASIVE ENDO-PROSTHODONTICS APPROACH. A CASE REPORT

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Abstract

Introduction: Preparing an adequate access cavity, cleaning and shaping of the root canal system, post preparation and finally a crown preparation remove a lot of healthy tooth structure. The goal of this case report is to demonstrate an approach that conserves as much sound tooth structure as possible.

Casereport: A 29-year-old male patient was referred for endodontic treatment of tooth 46. An access cavity was prepared and three root canals were located. Glide path was established with size 15 K-files and cleaning and shaping was done with rotary nickel-titanium instruments (iRace FKG Dentaire) to a 30.04 size. The small 4% taper of the instruments enabled adequate cleaning of the root canal system while preserving root dentine. The case was obturated with cold lateral condensation technique (gutta-percha and AH Plus cement, Dentsply Sirona) and referred for final restoration. Since a lot of crown structure was preserved during endodontic treatment a minimally invasive restorative approach via endocrown was selected. A core material (Ionosit Baseline, DMG) was placed in the access cavity and the tooth was prepared for an endocrown. The preparation was scanned (CEREC Ommicam, Dentsply Sirona) and the endocrown was milled from a zirconia-reinforced lithium silicate block (Celtra Duo, Dentsply Sirona). Finally, the restoration was cemented with a composite cement (Variolink Esthetic LC, Ivoclar Vivadent) and the margins polished.

Conclusion: The use of smaller taper endodontic instruments and selecting an endocrown as a final postendodontic restoration enabled significant preservation of sound tooth structure.

Keywords: endocrown; endodontics; prosthodontics; postendodontic restoration