

## Sažeci kongresa s međunarodnim sudjelovanjem: "Minimalno invazivni pristup u dentalnoj medicini"

Stomatološki fakultet Sveučilište u Zagrebu 27. i 28. studenog 2015., Zagreb, Hrvatska

### Abstracts of Congress with International Participation: "Minimally Invasive Approach in Dental Medicine"

School of Dental Medicine University of Zagreb 27<sup>th</sup> and 28<sup>th</sup> November 2015, Zagreb, Croatia

Predsjednik kongresa • *Congress President*: Prof.dr.sc. Ivana Miletić

Urednici • *Editors*: Doc.dr.sc. Anja Baraba, Prof.dr.sc. Ivana Miletić

#### PREDAVANJA

##### STAKLENOIONOMERNE RESTAURACIJE: LEGENDA SE VRATILA?

Şebnem Türkün  
Zavod za restaurativnu stomatologiju, Stomatološki fakultet, Egejsko  
sveučilište, Izmir, Turska  
mail: sebnemturkun@hotmail.com

Cilj ovog predavanja će biti pregled materijala u dentalnoj medicini koji se rabe za izradu ispuna u stražnjoj regiji s naglaskom na staklenoionomerne cimente. Opisat će se jedinstvena svojstva ove skupine materijala, njihova uporaba u minimalno intervencijskom pristupu u dentalnoj medicini i donijet će se zaključak, na temelju kliničkih istraživanja, o uporabi ovih materijala kao trajnih ispuna u stražnjoj regiji.

#### LECTURES

##### GLASS IONOMER RESTORATIONS: IS THE LEGEND BACK?

Şebnem Türkün  
Department of Restorative Dentistry, School of Dentistry, Ege University,  
Izmir, Turkey.  
mail: sebnemturkun@hotmail.com

The purpose of this lecture will be an overview of dental materials that are usually used to restore posterior cavities and then focus on glass ionomers. We will talk about the unique properties of this group of materials, their use in minimally invasive dentistry concept and we will decide, based on clinical studies, if they can be considered as definitive restorative materials for posterior teeth.

##### IZBJELJIVANJE ZUBA: POBOLJŠANA ESTETIKA VS. PROMJENE TVRDIH ZUBNIH TKIVA

Elizabeta Gjorgievska  
Zavod za pedodontiju, Stomatološki fakultet, Sveučilište Ćirila i Metoda,  
Vodnjanska 17, Skopje, Makedonija.  
mail: egjorgievska@stomfak.ukim.edu.mk

Izbjeljivanje zuba je postalo vrlo popularno usprkos brojnim nedostacima koji su opisani kao posljedica spomenutog postupka. U predavanju će se opisati različiti pristupi u izbjeljivanju zuba s posebnim naglaskom na izbjeljivanje potpomognuto laserom. Osim prikaza kliničkog iskustva s različitim tehnikama izbjeljivanja, raspravit će se promjene strukture i sastava cakline. Preosjetljivost zuba je najčešća posljedica izbjeljivanja. Kako bi se zaštitila caklina i kako bi se popravile promjene cakline koje dovode do preosjetljivosti, mogu se rabiti fluoridi i novija remineralizacijska sredstva kao bioaktivno staklo, CPP-ACP i hidroksiapatit. Opisat će se djelovanje spomenutih sredstava na caklinu.

##### TOOTH BLEACHING: IMPROVED AESTHETIC VS. HARD TISSUE ALTERATIONS

Elizabeta Gjorgievska  
Department of Pedodontics, Faculty of Dental Medicine, University "Ss. Cyril  
and Methodius", Vodnjanska 17, Skopje, Macedonia.  
mail: egjorgievska@stomfak.ukim.edu.mk

Tooth bleaching has become very popular, regardless of the many disadvantages that have been reported as a consequence of this procedure. The lecture will focus on different approaches in tooth bleaching, with special emphasis on the laser-enhanced procedure. Apart from presentation of the clinical experience with the different methods of bleaching, the ultrastructural alterations and changes in the enamel composition will be discussed. Enamel hypersensitivity following bleaching is the most frequent discomfort that is related to bleaching. Fluoride, as well as the novel remineralizing agents (such as bioactive glasses, CPP-ACP and hydroxyapatite) can be used in order to protect the enamel and repair the enamel alterations which lead to occurrence of post-operative hypersensitivity. The mechanism of action and their effect on the enamel will be described.

##### BRZA I UČINKOVITA INSTRUMENTACIJA I DEZINFEKCIJA KORIJENSKIH KANALA

Sebastian Riedel  
Privatna praksa za endodontiju, Berlin, Holsteinische Strasse 53, Njemačka  
mail: riedel.sebastian@me.com

Uspješno endodontsko liječenje ovisi o pravilno izvedenim svim fazama: od trepanacije, određivanja radne dužine do punjenje korijenskog kanala. Mehaničkom obradom korijenskog kanala uklanjaju se ostaci pulpnog tkiva i/ili nekrotični sadržaj. Iako su razvijeni brojni sustavi za strojnu instrumentaciju korijenskog kanala, još uvijek nije moguće potpuno obraditi cijeli endodontski sustav. Iz tog razloga, uz mehaničku instrumentaciju, provodi se i kemijska dezinfekcija. Najčešće rabljeno sredstvo je vodena otopina natrijevog hipoklorita u koncentraciji od 2,5% do 5,25%. Zagrijavanjem hipoklorita povećava se njegova učinkovitost. Ultrazvučna aktivacija pojačava dezinfekcijski učinak hipoklorita. Za dezinfekciju korijenskog kanala pokazao se učinkovit i PIPS nastavak erbijskog lasera koji djeluje na principu fotoakustičnog učinka.

##### FAST AND EFFICIENT ROOT CANAL DISINFECTION THROUGH EFFECTIVE PREPARATION WITH CORRECT LENGTH MEASUREMENT

Sebastian Riedel  
Private Practice for Endodontology, Holsteinische Strasse 53, Berlin,  
Germany  
mail: riedel.sebastian@me.com

Successful endodontic treatment depends on all phases being performed correctly: from opening the access cavity, determining working length to root canal filling. The remnants of pulp tissue and/or necrotic tissue are mechanically removed from root canals. Although different rotary instruments have been developed for root canal instrumentation, it is still not possible to use them alone to clean the entire endodontic space. Therefore, besides mechanical instrumentation, chemical disinfection of root canals is performed. Usually, sodium hypochlorite is used in concentration form 2.5% to 5.25%. Hypochlorite is even more efficient if heated. Ultrasonic activation enhances the disinfection effect of sodium hypochlorite. For root canal disinfection, PIPS tip for erbium laser, based on photoacoustic effect, is also efficient.

**SLIČNOSTI I RAZLIKE U TERAPIJI KOD DJECE I ODRASLIH**Ivana Miletić<sup>1</sup> • Hrvoje Jurić<sup>2</sup>

Zavod za endodonciju i restaurativnu stomatologiju, Stomatološki fakultet, Sveučilište u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska<sup>1</sup>, Zavod za dječju i preventivnu stomatologiju, Stomatološki fakultet, Sveučilište u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska<sup>2</sup>  
 mail: miletic@sfzg.hr; juric@sfzg.hr

Terapija bolesti tvrdih zubnih tkiva, bez obzira na dob pacijenta, se provodi na temelju individualne procjene rizika od nastanka karijesa. Ovisno o dobivenim podacima temeljem detaljne medicinske i stomatološke anamneze te kliničkog pregleda, pacijenti se mogu svrstati u skupine niskog, srednjeg i visokog rizika za nastanak karijesa. Kod djece koja imaju visok rizik za nastanak karijesa, potrebna je aktivna prevencija fluoridnim preparatima, sredstvima temeljenim na CPP-ACP-u te pečaćenje fsura. I kod djece, i kod odraslih s visokim rizikom za nastanak karijesa potrebno je sanirati aktivne karijesne lezije bioaktivnim materijalima koji imaju remineralizacijski učinak. Kod odraslih pacijenata dolazi do povlačenja gingive te eksponirana površina korijena predstavlja predilekcijsko mjesto za nastanak karijesa. Pri saniranju takvih lezija izbor materijala ovisi o tome koliko je uznapredovala karijesna lezija i može li se osigurati suho radno polje.

**ORALNO ZDRAVLJE HRVATSKIH ARHEOLOŠKIH POPULACIJA**

Marin Vodanović

Zavod za dentalnu antropologiju, Stomatološki fakultet, Sveučilište u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska  
 mail: vodanovic@sfzg.hr

Zubi i usna šupljina pružaju mnogo informacija o pojedincu. Paleostomatološke analize zuba i usne šupljine mogu biti od pomoći pri rekonstrukciji važnih činjenica vezanih uz život drevnih populacija. Analizirani su zubi i usta populacija koje su u kasnoj antici (3. – 6. stoljeće) i ranom srednjem vijeku (7. – 10. stoljeće) živjele na području današnje Hrvatske. U kasnoantičkoj populaciji je utvrđena prevalencija karijesa od 8,7%, dok je u ranom srednjem vijeku bila 12,2%. Prevalencija zaživotnog gubitka zuba je u kasnoj antici bila 3,9%, a u ranom srednjem vijeku 9,4%. Abradirani zubi s izloženim dentinom su pronađeni kod 98,6% analiziranih uzoraka iz kasne antike, te kod 94,0% uzoraka iz ranog srednjeg vijeka. Naslage zubnog kamenca su pronađene kod 50,3% pripadnika kasnoantičke populacije, te kod 49,1% pripadnika ranosrednjevjekovne populacije. Predstavljeni podaci ukazuju na pogoršanje pokazatelja oralnog zdravlja kao što su zubni karijes i zaživotni gubitak zuba kod ranosrednjevjekovne populacije. Promjene u načinu prehrane, koje se u potvrđene drugim arheološkim nalazima mogu biti jedno od mogućih objašnjenja.

**MINIMALNO INVAZIVNE PREPARACIJE**

Anja Baraba

Zavod za endodonciju i restaurativnu stomatologiju, Stomatološki fakultet, Sveučilište u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska  
 mail: baraba@sfzg.hr

Današnji trend u restaurativnoj dentalnoj medicini je usmjeren na maksimalnu poštedu tvrdih zubnih tkiva i izradu biomimetičkih restauracija. Za nadoknadu postoje mnogo-brojni materijali kao staklenoionomeri, tekući kompoziti i nanopunjeni kompozitni materijali. U predavanju će se kroz kliničke slučajeve prikazati kada s obzirom na specifičnu indikaciju izabrati pojedini materijal. Opisat će se everStick vlakna koja su jednosmjerna i dugačka, silanizirana E-staklena vlakna uložena u nepolimerizirani matriks polimetil metakrilata (PMMA) i bisfenol A glicidil metakrilata (Bis GMA). Prikazat će se primjena vlakana na površini zuba bez izrade preparacije ili uz minimalno invazivne preparacije za nadoknadu pojedinog zuba prema minimalno invazivnom principu.

**UNAPREDENJE ORALNOG ZDRAVLJA SLIJEPIH OSOBA**

Jelena Dumančić

Zavod za dentalnu antropologiju, Stomatološki fakultet, Sveučilište u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska  
 mail: dumancic@sfzg.hr

Zahvaljujući preventivnim mjerama u novijoj povijesti, učinjen je veliki napredak u smanjenju proširenosti i težine najčešćih oralnih bolesti, karijesa i parodontitisa. Ipak, u nekim populacijama nalazimo "tihu epidemiju" zubnih i oralnih bolesti, a teret bolesti ograničava pogođenim osobama aktivnost u školi, na poslu i u kući i smanjuje im kvalitetu života. Slijepe osobe vulnerabilna su skupina pacijenata sa značajno lošijom oralnom higijenom i oralnim zdravljem, koja znatno rjeđe posjećuje stomatologa u odnosu na osobe s normalnim vidom. Dodatna nepovoljna okolnost je činjenica da će osobe sa smetnjama vida teško same prepoznati oralne bolesti u ranoj fazi, a nemogućnost vizualne percepcije otežava i pristup informacijama o općem i oralnom zdravlju. Ključ promocije oralnog zdravlja je podučavanje oralne higijene, koje se obično provodi uz vizualna pomagala poput mode-

**SIMILARITIES AND DIFFERENCES IN TREATMENT PLANNING FOR CHILDREN AND ADULTS**Ivana Miletić<sup>1</sup> • Hrvoje Jurić<sup>2</sup>

Department of Endodontics and Restorative Dentistry, School of Dental Medicine, University of Zagreb, Gundulićeva 5, Zagreb, Croatia<sup>1</sup>, Department of Paediatric and Preventive Dentistry, School of Dental Medicine, University of Zagreb, Gundulićeva 5, Zagreb, Croatia<sup>2</sup>  
 mail: miletic@sfzg.hr; juric@sfzg.hr

Treatment planning, regardless of the age of the patients, should be determined by individually assessing caries risk factors. Based on medical and dental anamnesis and clinical examination, patients are categorized as having low, medium and high risk of caries occurrence. In children with high risk, it is important to start with active prevention using fluoride based products or products with CPP-ACP and to perform fissure sealing. For both children and adults with high risk of caries occurrence, all active lesions should be sealed with bioactive materials with remineralizing potential. Furthermore, adults and the elderly may have exposed root surfaces which are predilection site for caries lesion. For those lesions, choice of material depends on depth of the lesion and possibilities of maintaining dry working field.

**OVERVIEW OF ORAL HEALTH OF ANCIENT CROATIAN POPULATIONS**

Marin Vodanović

Department of Dental Anthropology, School of Dental Medicine, University of Zagreb, Gundulićeva 5, Zagreb, Croatia  
 mail: vodanovic@sfzg.hr

Teeth and mouth provide a lot of information about an individual. Paleo-odontological analysis of teeth and mouth help us reconstruct some important facts about life of ancient populations. Teeth and mouth of late antique (3<sup>rd</sup> – 6<sup>th</sup> century) and early medieval populations (7<sup>th</sup> – 10<sup>th</sup> century) living on the territory of today's Croatia were analysed by different paleo-odontological methods. Caries prevalence in late antique population was 8.7% and 12.2% in early medieval population. Prevalence of ante-mortem tooth loss in late antique population was 3.9% and 9.4% in early medieval population. Tooth wear with exposed dentine was found in 98.6% of the late antique sample, and in 94.0% of early medieval sample. Calculus deposits were recorded in 50.3% of late antique sample and in 49.1% of early medieval sample. Presented findings suggest a decrease of oral health indicators as caries or ante-mortem tooth loss in the early medieval population. Changes in dietary pattern confirmed by archaeological findings are one of possible explanations.

**MINIMALLY INVASIVE PREPARATIONS**

Anja Baraba

Department of Endodontics and Restorative Dentistry, School of Dental Medicine, University of Zagreb, Gundulićeva 5, Zagreb, Croatia  
 mail: baraba@sfzg.hr

Modern trend in restorative dental medicine is to maximally preserve hard dental tissues and to create biomimetic restorations. Many different materials are available for restorations: glass ionomer cements, flowable and nanofilled composite resin materials. In the lecture, indications for each material will be explained with presentation of clinical cases. EverStick fibers are composed of long, unidirectional, silanated E-glass fibers which are embedded into unpolymerized matrix of PMMA and Bis GMA. During the lecture, clinical cases and application of everStick fibers without the preparation or with minimally invasive preparations in cases of missing tooth will be presented.

**ORAL HEALTH PROMOTION IN BLIND INDIVIDUALS**

Jelena Dumančić

Department of Dental Anthropology, School of Dental Medicine, University of Zagreb, Gundulićeva 5, Zagreb, Croatia  
 mail: dumancic@sfzg.hr

In recent history, a considerable progress has been made in reduction of prevalence and severity of the most frequent oral diseases – caries and periodontitis. However, in some populations there is a silent epidemic of dental and oral diseases and a burden of disease limits the affected persons' activity in school, at work and at home, reducing their quality of life. Blind individuals are vulnerable group of patients with significantly lower level of oral hygiene and oral health, who visit dentist significantly less frequently in comparison to individuals with normal vision. Additional unfavourable circumstance is the fact that individuals with visual impairment will have difficulties in recognition of oral diseases in its early phase and lack of visual perception is aggravating the approach to information on general and oral health. The key of oral health promotion is oral hygiene education, us-

la i sredstava za otkrivanje zubnih naslaga. U pacijenta sa posebnim potrebama, pa tako i u osoba sa smetnjama vida, zdravstveni radnik treba uzeti u obzir druge metode podučavanja i individualni pristup prema perceptivnim i kognitivnim mogućnostima pacijenta. Predavanje će predstaviti preventivni program - Projekt za promociju oralnog zdravlja slijepih i slabovidnih osoba, koji je dobio potporu Grada Zagreba za 2014. i 2015. godinu.

#### MOŽE LI STROJNA ENDODONCIJA BITI MINIMALNO INVAZIVNA?

Jurica Matijević  
Zavod za endodonciju i restaurativnu stomatologiju, Stomatološki fakultet,  
Sveučilište u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska  
mail: matijevic@sfzg.hr

U eri minimalno invazivne stomatologije i endodontska terapija zauzima svoje mjesto. Suvremeni koncepti strojne instrumentacije uz napretke u konstrukciji i metalurgiji strojnih endodontskih instrumenata omogućavaju optimalno čišćenje i širenje apikalne, srednje i koronarne trećine korijenskog kanala. Cilj suvremene endodontske terapije je postići što potpunije uklanjanje inficiranog sadržaja uz snažan naglasak na irigaciji, ali i minimalno oštećenju zdravoj zubnoj strukturi koja svojim integritetom jamči dugotrajnost uspjeha endodontske terapije. U predavanju će se predstaviti minimalno invazivni koncept u okviru endodontskog liječenja s naglaskom na suvremene strojne tehnike obrade korijenskog kanala.

#### MINIMALNO INVAZIVNA TERAPIJA U FIKSNOJ PROTETICI

Marko Jakovac  
Zavod za fiksnu protetiku, Stomatološki fakultet, Sveučilište u Zagrebu,  
Gundulićeva 5, Zagreb, Hrvatska  
mail: jakovac@sfzg.hr

U modernoj dentalnoj medicini velika pažnja posvećuje se očuvanju tvrde zubne strukture. Isti trend postoji i u fiksnoj protetici. Građivni materijali danas zbog svojih svojstava omogućuju manje brušenje zuba s istim ili boljim estetskim izgledom konačnog rada. Jednako tako veliku ulogu imaju i optička pomagala kao što su lupe ili dentalni mikroskopi. U predavanju će se napraviti presjek novih građivnih materijala, postupaka i tehnika brušenja kao i utjecaj optičkih pomagala na preciznost rada. Na kraju, prikazati će se nekoliko kliničkih slučajeva minimalno invazivne terapije u fiksnoj protetici.

#### KOLIKO JE ZAPRAVO USPJEŠNA REGENERATIVNA PARODONTOLOŠKA KIRURGIJA - OD STANDARDNIH DO MINIMALNO INVAZIVNIH REŽNJEVA

Darko Božić  
Zavod za parodontologiju, Stomatološki fakultet, Sveučilište u Zagrebu,  
Gundulićeva 5, Zagreb, Hrvatska  
mail: bozic@sfzg.hr

Regenerativna parodontološka terapija, iako u upotrebi već više od 40 godina, i dalje izaziva skepsu i nepovjerenje kako kod pacijenata tako i kod kolega stomatologa. Što je tome razlog, teško je reći. Ovo predavanje dat će pregled tehnika i dugoročne uspješnosti takve terapije. Nadalje, opisat će se promjene u tehnikama koje su se zadnjih 10 godina dogodile od opsežnih režnjeva i uzimanja autogene kosti do današnjeg pristupa koji je sve više minimalno invazivan te uključuje uporabu faktora rasta.

#### UPOTREBA NISKOENERGETSKIH LASERA U ORALNOJ MEDICINI

Vanja Vučićević Boras  
Zavod za oralnu medicinu, Stomatološki fakultet, Sveučilište u Zagrebu,  
Gundulićeva 5, Zagreb, Hrvatska.  
mail: boras@sfzg.hr

Na temelju dosadašnjih istraživanja, poznato je kako niskoenergetski laser djeluju na slijedeći način: poticanje mitohondrijske aktivnosti, povećanje proizvodnje ATP-a, NADH, proteina, i reaktivnog kisika, proliferacija stanica, migracija stanica i proizvodnja faktora rasta, smanjenje brzine provodljivosti živca, selektivna inhibicija A delta i C živčanih vlakana (suprimira periferni osjet i ograničava daljnje otpuštanje neurokinina), formiranje prolaznih varikoziteta na aksonima (sprečavanje prolaska bolnih stimulusa do mozga) te uklanjanje bolova reduciranjem upale i smanjenjem upalnih komponenti. Većina prijašnjih istraživanja u inozemstvu i tuzemstvu je pokazala kako je niskoenergetski laser bio učinkovit u liječenju hiposalivacije i sindroma pekućih usta. Cilj je ovog predavanja prikazati djelotvornost niskoenergetskih lasera kod oboljelih od hiposalivacije i sindroma pekućih usta. Rezultati nedavnih istraživanja provedenih na Zavodu za oralnu medicinu su pokazali kako se u oboljelih znakovito povećala količina izlučene sline i smanjio osjećaj pečenja u ustima. Doduše, količina izlučene sline kao i osjećaj pečenja u ustima su se također poboljšali kada je i aparat bio ugašen, dakle kada nije radio, ta-

ing visual aids like models and plaque indicators. For patients with special needs, also for individuals with visual impairment, health worker needs to consider alternative methods of education and individual approach taking into account perceptive and cognitive capabilities of the patient. In the lecture preventive programme will be presented - Project for oral health promotion in blind and visually impaired individuals, which gained support of City of Zagreb in 2014 and 2015.

#### CAN AN ENGINE-DRIVEN ENDODONTICS BE MINIMALLY INVASIVE?

Jurica Matijević  
Department of Endodontics and Restorative Dentistry, School of Dental  
Medicine, University of Zagreb, Gundulićeva 5, Zagreb, Croatia  
mail: matijevic@sfzg.hr

In the era of minimally invasive dental medicine, endodontic therapy also has its' place. Modern concepts of mechanical instrumentation combined with advances in construction and metallurgy of engine-driven endodontic instruments result in optimal cleaning and shaping of apical, middle and coronal thirds of the root canal. The aim of modern endodontic therapy is to achieve almost complete removal of infected content with a strong emphasis on irrigation, but also on minimal damage to a healthy tooth structure. The integrity of hard dental tissues guarantees long term success of endodontic therapy. The lecture will present the minimally invasive concept within endodontic treatment, with an emphasis on modern techniques of mechanical instrumentation of the root canal.

#### MINIMAL INVASIVE THERAPY IN FIXED PROSTHODONTICS

Marko Jakovac  
Department of Fixed Prosthodontics, School of Dental Medicine, University of  
Zagreb, Gundulićeva 5, Zagreb, Croatia  
mail: jakovac@sfzg.hr

In modern dental medicine, the minimally invasive tooth preparation is very important. The same trend is also present in fixed prosthodontics. Nowadays, materials have better mechanical and aesthetic properties so there is no need for excessive tooth preparation. Optical devices also have a very important role in minimally invasive treatment. In the lecture, materials, principles and techniques of tooth preparation as well as optical devices for precise and minimally invasive approach will be presented. Finally, few clinical cases of minimally invasive fixed prosthodontic treatment will be presented as well.

#### HOW EXACTLY SUCCESSFUL IS REGENERATIVE PERIODONTAL THERAPY - FROM STANDARD TO MINIMALLY INVASIVE FLAPS

Darko Božić  
Department of Periodontology, School of Dental Medicine, University of  
Zagreb, Gundulićeva 5, Zagreb, Croatia  
mail: bozic@sfzg.hr

Regenerative periodontal therapy, although present in clinical settings for more than 40 years, still creates scepticism both in patients as well as fellow dentists. It is difficult to say what is the reason for this. This lecture will give an overview of techniques and long-term results of regenerative periodontal therapy. Furthermore, changes in surgical techniques over the last 10 years will be shown, going from standard large flaps using autogenous bone to minimally invasive surgical techniques utilizing growth factors.

#### THE APPLICATION OF LOW LEVEL LASER THERAPY IN ORAL MEDICINE

Vanja Vučićević Boras  
Department of Oral Medicine, School of Dentistry, University of Zagreb,  
Gundulićeva 5, Zagreb, Croatia.  
email: boras@sfzg.hr

On the basis of previous studies, it is known that low-level laser therapy operates as follows: stimulation of mitochondrial activity, increased production of ATP, NADH, proteins, and reactive oxygen species, cell proliferation, cell migration and production of growth factors, nerve conduction velocity reduction, selective inhibition of A delta and C nerve fibers (suppresses peripheral sensation and limits the further release of neurokinin), forming a transient varices on axons (preventing the passage of painful stimuli to the brain) and relieving pain by reducing inflammation through decrease of the inflammatory component. The majority of previous studies have shown that low-level-laser was effective for the treatment of hyposalivation and burning mouth syndrome. The aim of this lecture is to report the efficacy of low-level laser in patients suffering from hyposalivation and burning mouth syndrome. Results of recent research conducted at the Department of Oral Medicine showed that low-level laser therapy significantly increased amount of saliva as well as decreased burning mouth sensation in patients. Amount of saliva and burn-

ko da se veliki učinak ovih lasera može pripisati placebo. Ipak, s obzirom na poboljšanje simptoma u oboljelih neovisno o mehanizmu djelovanja preporučamo ovaj oblik terapije u ovih bolesnika.

#### PREDNOSTI UPOTREBE DIGITALNO NAVODENOG LASERA U ORALNOJ KIRURGIJI

Dragana Gabrić  
Zavod za oralnu kirurgiju, Stomatološki fakultet, Sveučilište u Zagrebu,  
Gundulićeva 5, Zagreb, Hrvatska  
mail: dgabric@sfzg.hr

U mnogim kliničkim situacijama u oralnoj kirurgiji i dentalnoj implantologiji potrebno je ukloniti patološke promjene ili nepromijenjeno meko i tvrdo tkivo unutar usne šupljine. Neke oralne lezije zahtijevaju poseban terapijski postupak, bilo zbog tendencije za malignu alteraciju, bilo zbog estetskog učinka ili funkcionalnih problema kod pacijenata. Kirurška terapija oralnih lezija uključuje klasičnu kiruršku eksciziju, kriokirurgiju i lasersku kirurgiju (ablaciju ili eksciziju). Ipak, postoje određena klinička ograničenja kod korištenja svake navedene tehnike. U posljednje vrijeme, laseri se navode kao visoko učinkoviti instrumenti zbog koagulacijskog učinka, smanjenog edema i smanjene razine postoperativne boli. To se posebno odnosi na Er:YAG lasere (visoka apsorpcija u vodi) koji se danas smatraju izrazito značajnim u kirurškom liječenju promjena usne šupljine. Digitalno navodena laserska zraka je novija tehnologija koja omogućava precizno i automatsko određivanje oblika i površine koja se uklanja laserom. Prednosti su brzo cijeljenje bez ožiljastih promjena i izostanak postoperativnih komplikacija.

ing sensation in the mouth were also improved when the device was turned off, when not working, therefore great effect of these lasers can be attributed to the placebo effect. However, in view of the improvement of symptoms in patients, regardless of mechanism of action, this form of therapy is recommended for such patients.

#### THE ADVANTAGES OF USING DIGITALLY CONTROLLED LASER HANDPIECE IN ORAL SURGERY

Dragana Gabrić  
Department of Oral Surgery, School of Dental Medicine, University of Zagreb,  
Gundulićeva 5, Zagreb, Croatia  
mail: dgabric@sfzg.hr

Many clinical situations in oral surgery and dental implantology require the removal of pathological, changed or healthy soft and hard tissues. Some oral lesions require special treatment, either there is a tendency of malignant transformation, or an aesthetic problem for a patient, or a lesion can represent a functional problem for a patient. Treatment for oral lesions may include classical surgical excision, cryosurgery and laser surgery (ablation or excision). There are certain limitations with every treatment modality. Lasers have been studied as high potential tools due to their coagulative properties and reduced oedema and postoperative pain level. Er:YAG laser (the most highly absorbed in water) appears to be a very promising tool for excision and ablation in the oral cavity. Recently, a completely new laser treatment method has become available with a digitally controlled dental laser handpiece. It provides the possibility to guide the Er:YAG laser beam automatically in the required shape and dimension. Automatic guidance of the laser beam allows higher repetitions to be used, and consequently the procedures are completed faster. After treatment, a perfect healing process, with no postoperative complications can be observed. Such precise cutting and coverage of large areas, especially in cases of bone surgery, is highly appreciated by oral surgeons and dentists.

#### POSTERSKE PREZENTACIJE

##### IN VITRO PROMJENA VRIJEDOSTI FLUORIDNIH IONA I PH UMJETNE SLINJE ZBOG UTJECAJA EROZIVNIH NAPITAKA NA UMJETNU SLINU

Dorothea Mihanović<sup>1</sup>, Dubravka Negovetić-Vranić<sup>2</sup>  
<sup>1</sup> Stomatološka poliklinika Zagreb, Perkovića 3, Zagreb, Hrvatska  
<sup>2</sup> Zavod za dječju i preventivnu stomatologiju, Stomatološki fakultet Sveučilišta u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska  
mail: dmihanovic@sfzg.hr

**Cilj:** Svrha ovog rada bila je utvrditi utjecaj svakodnevnih napitaka na promjenu potencijala fluorida i promjenu pH vrijednosti umjetne sline.

**Materijali i postupci:** Ispitano je deset različitih erozivnih napitaka koji su dostupni u slobodnoj prodaji i mjeren je njihov utjecaj na promjenu potencijala fluorida i pH vrijednost umjetne sline Gelclair. Fluoridni potencijal je mjeren pomoću potenciometrijskog titratora, uređaja sa selektivnom elektrodom koja mjeri isključivo vrijednosti fluorida iona. pH vrijednost je izmjerena pomoću potenciometrijskog titratora koji je predhodno tri puta baždaren.

**Rezultati:** Mjerenjem je dokazan najniži potencijal fluorida iona kod Jamnice, vrijednosti rastu u uzorcima ledenog čaja od brusnice, Cedevite, Multivitamina, Standard - umjetna slina i voda, Limunada, Jabuka, Coca-Cola, Coca-Cola Zero, Sprite i najviša vrijednost kod Fante. Praćenje promjene pH vrijednosti od najmanje kreću se kod Limunade, slijedi Fanta, Cedevita, ledeni čaj, Multivitamin, Coca-Cola, Jabuka, Coca-Cola Zero, Sprite, Standard, a najveća pH vrijednost je dobivena kod Jamnice (6,04).

**Zaključak:** Najbolji rezultat je postignut s mineralnom vodom Jamnicom koja ima najveći postotak slobodnih fluorida iona, dok je mjereni pH mineralne vode jednak pH ljudske sline, što upućuje kako neće doći do pojave caklinske erozije kao ni demineralizacije tvrdih zubnih tkiva.

#### POSTER PRESENTATIONS

##### IN VITRO CHANGES IN THE VALUE OF FLUORIDE IONS, AND PH OF ARTIFICIAL SALIVA DUE TO THE INFLUENCE OF EROSIIVE DRINKS IN ARTIFICIAL SALIVA

Dorothea Mihanović<sup>1</sup>, Dubravka Negovetić-Vranić<sup>2</sup>  
<sup>1</sup> Dental Clinic Zagreb, Perkovića 3, Zagreb, Croatia  
<sup>2</sup> Department of Pediatric Dentistry, School of Dental Medicine, University of Zagreb, Gundulićeva 5, Zagreb, Croatia  
mail: dmihanovic@sfzg.hr

**Aim:** The aim of this study was to determine the influence of everyday drinks on change of the potential of fluorides and pH change in artificial saliva.

**Materials and Methods:** Ten different erosive drinks that are available at the counter were examined and their effect on the potential change of fluoride ions and the pH value of artificial saliva Gelclair was measured. Fluoride potential was measured using potentiometric titrator, the device with selective electrode, which measures only the value of fluoride ions. pH value was measured using a potentiometric titrator, which was previously three times calibrated.

**Results:** Measurements have demonstrated the lowest potential of fluoride ions in Jamnica, while this value was higher in samples of Ice tea cranberry, Cedevita, Multivitamin, Standard - artificial saliva and water, Lemonade, Apple, Coca-Cola, Coca-Cola Zero, Sprite and Fanta with the highest value. Changes of the pH value from the lowest to the highest were as follows: Lemonades, followed by Fanta, Cedevita, Ice tea, Multivitamin, Coca-Cola, Apple, Coca-Cola Zero, Sprite, Standard, and the highest pH value was obtained for Jamnica (6.04).

**Conclusion:** The best result was achieved for mineral water Jamnica, which in its composition has a sufficient amount of free fluoride ions, while the measured pH of mineral water was equal to the pH of human saliva, which means that enamel erosion as well as the demineralization of dental hard tissues will not occur.



## NOVOSTI I PROTOKOL U DIJAGNOZI I TERAPIJI ORALNOG LIHENA I ORALNE LIHENOIDNE REAKCIJE

Ana Andabak Rogulj<sup>1</sup>, Matej Andabak<sup>2</sup>, Željko Rotim<sup>3</sup>, Željana Bolanča<sup>4</sup>, Vanja Vučićević Boras<sup>1</sup>, Danko Velimir Vrdoljak<sup>5</sup>

<sup>1</sup>Zavod za oralnu medicinu, Stomatološki fakultet Sveučilišta u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska

<sup>2</sup>Klinički bolnički centar Zagreb, Kišpatićeva 12, Zagreb, Hrvatska

<sup>3</sup>Privatna stomatološka ordinacija Rotim, Budimska ul., Sesvete, Hrvatska

<sup>4</sup>Klinički bolnički centar Sestre milosrdnice, Vinogradska cesta 29, Zagreb, Hrvatska

<sup>5</sup>Klinika za tumore, Klinički bolnički centar Sestre milosrdnice, Ilica 197, Zagreb, Hrvatska

mail: anaandabak@gmail.com

**Cilj:** Oralni lichen planus (OLP) i oralna lichenoidna reakcija (OLR) su klinički i histopatološki slične bolesti. Dok je OLP posljedica T-stanično-posredovanog imunološkog procesa na još uvijek nepoznati antigen, OLR mogu uzrokovati lijekovi, dentalni restorativni materijali i zubni plak. Cilj ovog preglednog rada bio je pretražiti literaturu na Pubmedu u zadnje tri godine vezanu uz OLP i OLR.

**Materijali i postupci:** Pretražena je Pubmed baza podataka te su u ovo istraživanje uključene 24 publikacije vezane za etiologiju, dijagnozu, malignu alteraciju i terapiju, objavljene u protekle tri godine.

**Rezultati:** Bolesnicima s OLR predložena je zamjena amalgamskih ispuna u blizini lezije na sluznici, odnosno kada je to moguće potrebno ih je poslati na kožno «patch» testiranje, kao i kada postoji sumnja na lijekovima uzrokovano OLR. OLR izazvane lijekovima trebale bi nestati nakon uklanjanja uzročnog lijeka. Histološki nalaz OLR pokazuje više eozinofila, plazma stanica i granulocita u usporedbi s OLP lezijama. Nadalje, OLP lezije pokazale su veću ekspresiju p53, bcl-2 i COX-2 u odnosu na OLR. Patohistološki su infiltracija, atrofički epitel, zubići poput pile i Max Josephovi prostori bili pouzdani kriteriji za razlikovanje OLP, dok su duboka infiltracija u vezivno tkivo i hiperparakeratoza bili kriteriji za dijagnozu OLR. Broj degranuliranih mastocita u retikularnom sloju kao i broj kapilara bio je veći u OLR u odnosu na OLP. Čini se kako su OLR lezije sklonije malignoj alteraciji u odnosu na OLP lezije.

**Zaključak:** Čini se kako standardni histopatološki nalazi pokazuju jasne razlike između OLP i OLR.

## UČINAK MEKOG LASERA U LIJEČENJU TRIGEMINALNE NEURALGIJE: USPOREDBA RAZLIČITIH VALNIH DULJINA LASERSKIH ZRAKA

Martina Brumini, Irena Glažar, Miranda Muhvić Urek, Sonja Pezelj-Ribarić  
Katedra za oralnu medicinu i parodontologiju, Medicinski fakultet Sveučilišta u Rijeci, Klinika za dentalnu medicinu KBC-a Rijeka, Braće Branchetta 20, Rijeka, Hrvatska

mail: martina.brumini@gmail.com

**Cilj:** Svrha ovog istraživanja bila je ispitati učinak različitih valnih duljina mekog lasera u liječenju idiopatske trigeminalne neuralgije (ITN) primjenom vizualne analogne skale (VAS) za ocjenu bolnosti.

**Ispitanici i postupci:** U istraživanju je sudjelovalo 20 ispitanika kojima je na Zavodu za oralnu medicinu i parodontologiju KBC-a Rijeka postavljena dijagnoza ITN-a. Ispitanici su ocijenili bolnost prema VAS skali pri čemu je 0 predstavljalo „bez boli“, a 10 „najgora moguća bol“. Ispitanici su liječeni galij-aluminij-arsenid laserom (Medio LASER Combi Dental, Iskra Medical, Ljubljana, Slovenija) 5 dana u tjednu tijekom 4 uzastopna tjedna: 10 ispitanika liječeno je laserom 660 nm valne duljine, a drugih 10 laserom 810 nm valne duljine. Meki laser primijenjen je na bolna područja lica tijekom 10 minuta (810 nm ili 660 nm, kontinuirani val, 30 mW izlazne snage, 3,0 J/cm<sup>2</sup>). Učinak mekog lasera procijenjen je po završetku liječenja. Statistička analiza provedena je uporabom *t*-testa za zavisne uzorke i *t*-testa za nezavisne uzorke. Sve statističke vrijednosti smatrane su značajnima na razini *P* < 0.05.

**Rezultati:** Meki laser 810 nm valne duljine pokazao se značajno učinkovitijim u liječenju ITN u odnosu na meki laser 660 nm valne duljine, usporedbom zabilježenih vrijednosti boli na VAS skali.

**Zaključak:** Veće valne duljine mekog lasera ostvaruju veći terapijski učinak vjerojatno zahvaljujući značajnijem prodiru u tkiva. Dobrobit uporabe mekog lasera u liječenju ITN-a je i u značajnom smanjenju troškova liječenja budući da se umanjuje potreba za uporabom lijekova i kirurškim zahvatima.

## UPDATES AND PROTOCOL IN THE DIAGNOSIS AND THERAPY OF ORAL LICHEN PLANUS AND ORAL LICHENOID REACTION

Ana Andabak Rogulj<sup>1</sup>, Matej Andabak<sup>2</sup>, Željko Rotim<sup>3</sup>, Željana Bolanča<sup>4</sup>, Vanja Vučićević Boras<sup>1</sup>, Danko Velimir Vrdoljak<sup>5</sup>

<sup>1</sup>Department of Oral medicine, School of Dental medicine, University of Zagreb, Gundulićeva 5, Zagreb, Croatia

<sup>2</sup>Clinical Hospital Center Zagreb, Kišpatićeva 12, Zagreb, Croatia

<sup>3</sup>Private dental practice Rotim, Budimska ul., 10360, Sesvete, Croatia

<sup>4</sup>Sestre milosrdnice University Hospital Center, Vinogradska cesta 29, Zagreb, Croatia

<sup>5</sup>Clinical Hospital for Tumors, Sestre milosrdnice University Hospital Center, Ilica 197, Zagreb, Croatia

mail: anaandabak@gmail.com

**Aim:** Oral lichen planus (OLP) and oral lichenoid reaction (OLR) are clinically and histopathologically similar diseases. Whereas OLP is a consequence of T-cell mediated auto-inflammatory process to a still unknown antigen, OLR might be caused by drugs, dental restorative materials and dental plaque. The aim of the of this review was complete literature search related to OLP and OLR on Pubmed in the last three years.

**Materials and Methods:** Pubmed was searched and 24 publications that were published over the last three years regarding aetiology, diagnosis, malignant alteration and therapy were included in this study.

**Results:** Patients with OLR who have amalgam fillings near lesions should have them replaced, i.e. when possible they should be sent to patch test as well as when drug-induced OLR are suspected. OLR lesions induced by drugs should disappear when the offending drug has been eliminated. Histology findings in OLR consists of more eosinophils, plasma cells and granulocytes in comparison to OLP lesions. Furthermore, OLP lesions showed higher expression of p53, bcl-2 and COX-2 when compared to the OLR. OLP is characterized by infiltration, atrophic epithelium, rete pegs and Max Joseph spaces while deep infiltration into connective tissue and hyperkeratosis were criteria for establishing diagnosis of OLR. The number of degranulated mastocytes in the reticular layer as well as the number of capillaries were higher in OLR in comparison to the OLP. It seems that OLR are more prone to malignant alteration in comparison to the OLP.

**Conclusion:** It seems that standard histopathological findings showed distinct differences in OLP when compared to the OLR.

## LOW LEVEL LASER THERAPY IN THE MANAGEMENT OF TRIGEMINAL NEURALGIA: A COMPARISON OF DIFFERENT LASER WAVELENGTHS

Martina Brumini, Irena Glažar, Miranda Muhvić Urek, Sonja Pezelj-Ribarić  
Chair of Oral Medicine and Periodontology, Medical faculty University of Rijeka, Clinical Hospital Centre Rijeka, Braće Branchetta 20, Rijeka, Croatia

mail: martina.brumini@gmail.com

**Aim:** The aim of this study was to investigate the efficacy of different wavelengths of low level laser therapy (LLLT) in the management of ITN by measuring the pain reduction using visual analogue scale (VAS).

**Subjects and Methods:** Study involved 20 patients with ITN who were examined at the Oral Medicine Unit, Clinical Hospital Centre Rijeka, Medical faculty University of Rijeka. ITN pain was quantified by the VAS: 0 indicated "no pain" and 10 indicated "the worst possible pain". The patients were treated 5 days per week for 4 consecutive weeks with Gallium-Aluminum-Arsenide diode laser (Medio LASER Combi Dental, Iskra Medical, Ljubljana, Slovenia): 10 patients were treated with 660 nm laser, and other 10 with 810 nm laser. LLLT was applied on painful sites for 10 minutes (810 nm or 660 nm, continuous wave, 30 mW output power, 3.0 J/cm<sup>2</sup>). The effect of LLLT was evaluated after the final treatment. Statistical analysis was performed using *t*-test for dependent samples and *t*-test for independent samples. All statistical values were considered significant at *P* < 0.05.

**Results:** Compared to 660 nm, 810 nm LLLT showed significantly better results in ITN patients assessed through VAS reduction.

**Conclusion:** Effectiveness of LLLT is greater when used in the higher spectrum because of increased penetration. LLLT is also important for reducing costs of treatment, as there is less need for surgical treatment or use of medications.

### TEMPOROMANDIBULARNI POREMEĆAJI KOD PACIJENATA SA SINDROMOM PEKUĆIH USTA

Iris Zavoreo<sup>1</sup>, Vanja Vučićević Boras<sup>2</sup>, Vanja Bašić Kes<sup>1</sup>, Dubravka Ciliga<sup>3</sup>, Larisa Musić<sup>4</sup>, Tomislav Badel<sup>5</sup>

<sup>1</sup> Zavod za neurologiju, Klinički bolnički centar Sestre milosrdnice, Vinogradska 29, Zagreb, Hrvatska

<sup>2</sup> Zavod za oralnu medicinu, Stomatološki fakultet, Sveučilište u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska

<sup>3</sup> Zavod za opću i primjenjenu kineziologiju, Kineziološki fakultet, Horvaćanski zavoj 15, Zagreb, Hrvatska

<sup>4</sup> Zavod za parodontologiju, Stomatološki fakultet, Sveučilište u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska

<sup>5</sup> Zavod za stomatološku protetiku, Stomatološki fakultet, Sveučilište u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska

mail: lmusic@sfg.hr

**Cilj:** Sindrom pekućih usta (SPU) je poremećaj koji se manifestira simptomima pečenja usne šupljine te najčešće pogađa žene u postmenopauzi. Etiopatogeneza poremećaja još nije u potpunosti razjašnjena, međutim periferna i/ili centralna neuropatija se čini vjerojatnijim uzrokom. Noviji podaci govore u prilog povezanosti neuropatskih promjena u sindromu pekućih usta i temporomandibularnih smetnji. Poznato je kako temporomandibularna bol također može biti povezana sa senzoričkim poremećajima u slučajevima kronične boli koja inducira senzitivizaciju. Cilj ovog istraživanja bio je ustanoviti povezanost između temporomandibularnih poremećaja i sindroma pekućih usta te usporediti dobivene rezultate s rezultatima iz dostupne literature.

**Ispitanici i postupci:** 42 pacijenta sa sindromom pekućih usta (4 muškarca, 38 žena, 66,7±12 godina) sudjelovalo je u istraživanju. Kliničkim pregledom utvrđivana je bolnost u području glave i vrata i prisutnost zvukova tijekom mandibularnih kretnji otvaranja i zatvaranja te su analizirane RTG snimke sudionika.

**Rezultati:** 41% pacijenata navelo je osjet boli u području glave i vrata i temporomandibularnog zgloba, 36% pacijenata prilikom otvaranja usta uni- ili bilateralno imalo je škljocanje zgloba, a kod 21% ispitanika su promjene TMZ-a bile vidljive i na RTG snimci.

**Zaključak:** Neuropatija povezana sa sindromom pekućih usta rezultat je dopaminergičnih nigrostrijatalnih poremećaja koji utječu na nocicepcijsku regulaciju, uzrokujući potpuni gubitak inhibicije trigeminalnog sustava. Čini se kako se gubitak inhibicije očituje senzornom i motoričkom hiperfunkcijom i posljedično tome hiperaktivnošću mastikatornih mišića i nastupom temporomandibularnog poremećaja. Dobiveni rezultati djelomično koreliraju s podacima iz dostupne literature koji ukazuju na to kako postoji značajna povezanost sindroma pekućih usta i temporomandibularnih poremećaja.

### LUČENJE SLINE KOD SLIJEPIH I SLABOVIDNIH OSOBA

Irena Glažar, Bernarda Mrak, Ema Saltović, Miranda Muhvić Urek, Sonja Pezelj-Ribarić

Katedra za oralnu medicinu i parodontologiju, Studij dentalne medicine, Medicinski fakultet Rijeka, Braće Branchetta 20, Rijeka, Hrvatska

mail: glazarirena@yahoo.com

**Cilj:** U Republici Hrvatskoj je, prema podacima Hrvatskog zavoda za javno zdravstvo, registrirano je gotovo 18 000 slijepih i slabovidnih osoba. Svrha ovog istraživanja bila je utvrditi količinu lučenja sline kod slijepih i slabovidnih osoba.

**Ispitanici i postupci:** U istraživanje je ukupno bilo uključeno 25 (17 muškog spola i 8 ženskog spola) osoba s potpunim ili djelomičnim gubitkom vida. Ispitanici su odgovorili na upitnik koji je uključivao pitanje imaju li osjećaj suhoće usne šupljine i koliko utječe na njihove dnevne aktivnosti. Potom je određivana vlažnost oralne sluznice (Mucus ICST; Normalne vrijednosti 27- >30,3, Snižene vrijednosti <24,9-26,9). Kontrolnu skupinu su uključivale osobe koje su po dobi i spolu odgovarale ispitnoj skupini.

**Rezultati:** Ukupno 7 od 25 osoba ispitne skupine (28%) odgovorilo je pozitivno na pitanje o prisutnosti osjećaja suhoće. Srednja vrijednost vlažnosti oralne sluznice u istoj skupini iznosila je 18,2±12,3. Vrijednosti lučenja sline su značajno niže u usporedbi s kontrolnom skupinom.

**Zaključak:** Rezultati ukazuju da je lučenje sline kod slabovidnih i slijepih osoba smanjeno. Ovakav rezultat povezuje se s lijekovima koje osobe uzimaju zbog ostalih zdravstvenih problema. No, neovisno o uzroku smanjenog lučenja sline potrebno je posvetiti posebnu pažnju održavanju oralne higijene i nadoknadi sline. Dodatno istraživanje s većim brojem ispitanika je potrebno kako bi se potvrdila točnost ovog rezultata.

### TEMPOROMANDIBULAR DISTURBANCES IN BURNING MOUTH SYNDROME PATIENTS

Iris Zavoreo<sup>1</sup>, Vanja Vučićević Boras<sup>2</sup>, Vanja Bašić Kes<sup>1</sup>, Dubravka Ciliga<sup>3</sup>, Larisa Musić<sup>4</sup>, Tomislav Badel<sup>5</sup>

<sup>1</sup> Department of Neurology, Clinical Hospital Center Sisters of Mercy, Vinogradska 29, Zagreb, Croatia.

<sup>2</sup> Department of Oral Medicine, School of Dental Medicine and Clinical Hospital Center Zagreb, Gundulićeva 5, Croatia.

<sup>3</sup> Department of Basic and Applied Kinesiology, Faculty of Kinesiology, Horvaćanski zavoj 15, Zagreb, Hrvatska

<sup>4</sup> Department of Periodontology, School of Dental Medicine, University of Zagreb, Gundulićeva 5, Zagreb, Croatia

<sup>5</sup> Department of Prosthodontics, School of Dental medicine, University of Zagreb, Gundulićeva 5, Zagreb, Croatia

mail: lmusic@sfg.hr

**Aim:** Burning mouth syndrome (BMS) is a disturbance manifesting with burning symptoms which usually affects postmenopausal women. Its aetiopathogenesis is poorly understood, however, peripheral and/or central neuropathy seems to be the probable cause. Lately, it has been proposed that neuropathic alterations in BMS might correlate with TMD disturbances. It is known that temporomandibular pain may also be associated with sensorial disturbances when the pain is chronic and induces sensitization. The aim of this research was to evaluate a possible connection between BMS and TMD and compare the results to those already published in the available literature.

**Subjects and Methods:** 42 patients with BMS (4 males and 38 females, 66.7±12 years) have taken part in this research. Presence of pain in the head and neck area was determined by clinical examination, as well as sounds present during mandibular opening or closing movement, and participants' X-rays were analysed.

**Results:** 41% of patients reported pain in the head, neck and TMJ area, 36% had clicking sounds uni- or bilaterally during mandibular opening and closing, while X-rays of 21% of participants showed abnormal findings.

**Conclusion:** The possible explanation could be that neuropathy seen in BMS results from nigrostriatal dopaminergic disturbance that affects nociception regulation, causing a complete loss of the inhibition of trigeminal system - this would consist of a sensory and motor hyperfunction and then a masticatory muscles hyperactivity with consequential onset of TMD. Results of this study partially correlate to those found in literature, which indicate that there is indeed a significant relationship between BMS and TMD.

### SALIVATION IN BLIND AND VISUALLY IMPAIRED PERSONS

Irena Glažar, Bernarda Mrak, Ema Saltović, Miranda Muhvić Urek, Sonja Pezelj-Ribarić

Department of Oral Medicine and Periodontology, Medical Faculty, University of Rijeka, Braće Branchetta 20, Rijeka, Croatia

mail: glazarirena@yahoo.com

**Aim:** Prevalence of people with blindness and visual impairment is almost 18 000 in Republic of Croatia according to Croatian Institute of Public Health. The aim of this study was to determine salivation in blind and visually impaired persons.

**Subjects and Methods:** The study included 25 participants (17 males and 8 females) with full or partial loss of vision. Participants answered the questions on oral dryness and its effect on everyday activities. Oral dryness was determined using the Oral moisture checker Mucus (ICST; Normal values 27-30.3, Low values 24.9-26.9). The control group included age and sex matched participants.

**Results:** Total of 7 participants of 25 (28%) answered positively to the question about the presence of oral dryness. The mean oral dryness value was 18.2 ± 12.3. The values were significantly lower compared to the control group.

**Conclusion:** The results indicate that the secretion of saliva in visually impaired and blind people is reduced. This can be associated with drugs that participants take for other health problems. Regardless of the cause of reduced secretion, it is necessary to pay special attention to oral hygiene and saliva substitution. Further investigation with a larger number of subjects is necessary to confirm the accuracy of these results.

### UTJECAJ IZBJELJIVANJA ZUBA NA PERCEPCIJU DENTOFACIJALNE ESTETIKE - RANDOMIZIRANI KONTROLIRANI POKUS

Marija Kolčeg<sup>1</sup>, Daniela Kovačević Pavičić<sup>2</sup>, Andrej Pavlič<sup>3</sup>, Vlatka Lajmert<sup>2</sup>, Stjepan Špalj<sup>3</sup>

<sup>1</sup>Studentica Studija dentalne medicine, Sveučilište u Rijeci, Braće Branchetta 20, Rijeka, Hrvatska

<sup>2</sup>Katedra za stomatološku protetiku, Studij dentalne medicine, Braće Branchetta 20, Sveučilište u Rijeci, Braće Branchetta 20, Rijeka, Hrvatska

<sup>3</sup>Katedra za ortodontiju, Studij dentalne medicine, Sveučilište u Rijeci, Braće Branchetta 20, Rijeka, Hrvatska

mail: daniela.kovacevic@medri.uniri.hr

**Cilj:** Kliničari primjećuju da pacijenti ponekad ne iskazuju onoliko količinu zadovoljstva rezultatom dentalnog tretmana koju bi terapeuti očekivali stoga je cilj istraživanja bio ispitati u kojoj mjeri pacijenti percipiraju razliku zbog izbjeljivanja zubi.

**Ispitanici i postupci:** Studija je kreirana kao dvostruko slijepi, placebo kontrolirani randomizirani pokus. Ispitanici su bili 29 studenata dentalne medicine, dobi od 19 do 28 godina (26 žena) nasumice raspoređeni u eksperimentalnu (N=16) i kontrolnu skupinu (N=13). Uključujući kriteriji su bili frontalni segment obje čeljusti bez ispuna, protetskih nadomjestaka i izrazitih malokluzija. Eksperimentalnoj skupini su frontalni zubi obje čeljusti izbjeljeni standardiziranom metodom lampom i gelom za izbjeljivanje (Signal Easy Lamp Plus i Signal Fast professional plus set, Signal, Unilever, Argentina) tijekom 30 minuta, a kontrolna je izložena istom postupku gelom bez aktivne tvari. Svi ispitanici su prije i tjedan dana nakon postupka ispunili psihometrijske instrumente kvalitete života Oral Health Impact Profile (OHIP) i Orofacial Esthetic Scale (OES). Istim ispitanicima je prije i nakon postupka određena boja na gornjem desnom, središnjem sjekutiću kalibriranim digitalnim spektrofotometrom (SpectroShade, Handy Dental Type 713000, MHT, Verona, Italy). Pomoću CIE L.a.b. formule određena je kromatičnost, translucencija i svjetlina.

**Rezultati:** Promjena boje i kromatičnosti značajno je veća u skupini s aktivnom supstancom od kontrolne skupine ( $4.2 \pm 1.5$  vs.  $1.8 \pm 1.5$  i  $2.9 \pm 2.4$  vs.  $0.3 \pm 0.9$ ;  $p < 0.001$ ). Ispitanici izbjeljenih zubi reportiraju značajno povećanje OES te smanjenje dimenzija orofacijalni izgled (OFI) i psihosocijalni utjecaj (PSU) OHIP-a ( $p < 0.05$ ). U kontrolnoj skupini iako nema objektivne promjene boje ispitanici su isto reportirali značajno povećanje OES-a te smanjenje OFI ( $p < 0.05$ ). Iznos promjene boje i svjetline uslijed izbjeljivanja korelira s PSU na razini granične značajnosti ( $r = -0.491$ ;  $p = 0.054$  i  $r = -0.476$ ;  $p = 0.062$ ).

**Zaključak:** Rezultati ovog rada upućuju da ljudi slabo uočavaju promjenu boje zubi uslijed izbjeljivanja, a placebo učinak ima značajni učinak.

### IMPACT OF TOOTH WHITENING PERCEPTIONS ON OROFACIAL ESTHETIC - RANDOMIZED CONTROLLED TRIAL

Marija Kolčeg<sup>1</sup>, Daniela Kovačević Pavičić<sup>2</sup>, Andrej Pavlič<sup>3</sup>, Vlatka Lajmert<sup>2</sup>, Stjepan Špalj<sup>3</sup>

<sup>1</sup>Dental student, School of Dental Medicine, University of Rijeka, Braće Branchetta 20, Rijeka, Croatia

<sup>2</sup>Department of Prosthodontics, School of Dental Medicine, University of Rijeka, Braće Branchetta 20, Rijeka, Croatia

<sup>3</sup>Department of Orthodontics, School of Dental Medicine, University of Rijeka, Braće Branchetta 20, Rijeka, Croatia

mail: daniela.kovacevic@medri.uniri.hr

**Aim:** Clinicians noticed that patients sometimes do not show the same amount of satisfaction with results of dental treatment as would be expected so the goal of this study was to examine the extent to which patients perceive a difference after tooth whitening.

**Subjects and Methods:** The study was designed as a double blind, placebo-controlled randomized trial. The subjects were 29 students of dental medicine, aged 19 to 28 years (26 women) randomly assigned to an experimental (N = 16) and control group (N = 13). Inclusion criteria was anterior segment of both jaws without fillings, prosthodontic appliances and pronounced malocclusion. In the experimental group, front teeth of the both jaws were bleached using standardized method with lamp and whitening gel (Signal Easy Plus Professional Fast signal set signal, Unilever, Argentina) for 30 minutes, while in the control group, the gel was used but without the active substance. Before and one week after the treatment all subjects completed a psychometric instruments of quality of life Oral Health Impact Profile (OHIP) and Orofacial Esthetic Scale (OES). Also, before and after the treatment, the color on the top right, central incisor was determined using calibrated digital spectrophotometer (SpectroShade Handy Dental Type 713000, MHT, Verona, Italy). Using the CIE L.a.b. formula, chromaticity, translucency and brightness were determined.

**Results:** Change of color and chromaticity was significantly higher in the group with the active substance than the control group ( $4.2 \pm 1.5$  vs.  $1.8 \pm 1.5$  and  $2.9 \pm 2.4$  vs.  $0.3 \pm 0.9$ ;  $p < 0.001$ ). Subjects with bleached teeth reported significant increase of OES and reduced dimensions of orofacial appearance (OFA) and psychosocial impact (PSI) OHIP-a ( $p < 0.05$ ). In the control group, although there was no objective change in color, subjects also reported significant increases OES's and OFI reduction ( $p < 0.05$ ). The amount of change in color and brightness due to bleaching is correlated with power to limit the level of significance ( $r = -0.491$ ;  $p = 0.054$  and  $r = -0.476$ ;  $p = 0.062$ ).

**Conclusion:** Results of this study showed that people can not detect the color change due to teeth whitening, and that the placebo effect has a significant effect.

### UČINKOVITOST DIREKTNE IRADIJACIJE LASEROM I LASERSKI AKTIVIRANOG ISPIRANJA U DEZINFEKCIJI KORIJENSKIH KANALA

Silvija Kasić<sup>1</sup>, Marita Knezović<sup>2</sup>, Dragana Gabrić<sup>3</sup>, Anja Baraba<sup>4</sup>

<sup>1</sup>Privatna ordinacija dentalne medicine, Rojičani 2, Ivankovo, Hrvatska

<sup>2</sup>Dom zdravlja Istok, Ljubijaska 60, Zagreb, Hrvatska

<sup>3</sup>Zavod za oralnu kirurgiju, Stomatološki fakultet, Sveučilište u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska

<sup>4</sup>Zavod za endodonciju i restaurativnu stomatologiju, Stomatološki fakultet, Sveučilište u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska  
mail: silvija.kasic@gmail.com

**Cilj:** Svrha istraživanja bila je utvrditi utjecaj različitih tehnika dezinfekcije korijenskih kanala na smanjenje broja *Enterococcus faecalis* (*E. faecalis*) i *Candida albicans* (*C. albicans*).

**Materijali i postupci:** Za istraživanje je odabrano 40 jednokorijenskih zuba s jednim korijenskim kanalom. Korijenski kanali instrumentirani su strojnom ProTaper tehnikom instrumentacije, površina korijenova zapečaćena je adhezivom, a apikalni otvori zatvoreni su adhezivom i kompozitom. Korijenovi su fiksirani pomoću adheziva i kompozita u Eppendorf plastične tubice i zatim sterilizirani u autoklavu. Zubi su slučajnim odabirom podijeljeni u četiri eksperimentalne skupine (n=10). U tako sterilizirane korijenske kanale nasadeni su *E. faecalis* i *C. albicans* u mikrobiološkom laboratoriju. Nakon inkubacije tijekom sedam dana, određen je broj *E. faecalis* i *C. albicans* u svakom korijenskom kanalu uzimanjem uzoraka pomoću sterilnoga papirnog štapića i nasadivanjem na odgovarajuće hranjive podloge. U prvoj eksperimentalnoj skupini korijenski kanali isprani su s 5 ml 2,5% natrijevog hipoklorita tijekom 60 sekundi korištenjem sterilne jednokratne šprice i igle. U drugoj eksperimentalnoj skupini rabljen je Er:YAG laser s PIPS nastavkom. U trećoj eksperimentalnoj skupini rabljen je Nd:YAG laser s R23 nastavkom. U četvrtoj eksperimentalnoj skupini rabljen je Er,Cr:YSGG laser.

**Rezultati:** Nakon različitih tehnika dezinfekcije korijenskih kanala ponovno je određen broj *E. faecalis* i *C. albicans* u svakom korijenskom kanalu uzimanjem uzoraka pomoću sterilnoga papirnog štapića i nasadivanjem na odgovarajuće hranjive podloge. Natrijev hipoklorit, Er:YAG i Er,Cr:YSGG laseri smanjili su broj kolonija *E. faecalis* i *C. albicans*

### EFFICACY OF DIRECT LASER IRRADIATION AND LASER ACTIVATED IRRIGATION IN ROOT CANAL DISINFECTION

Silvija Kasić<sup>1</sup>, Marita Knezović<sup>2</sup>, Dragana Gabrić<sup>3</sup>, Anja Baraba<sup>4</sup>

<sup>1</sup>Private Dental Office, Rojičani 2, 32281 Ivankovo, Croatia

<sup>2</sup>Public Health Center East, Ljubijaska 60, Zagreb, Croatia

<sup>3</sup>Department of Oral Surgery, School of Dental Medicine, University of Zagreb, Gundulićeva 5, Zagreb, Croatia

<sup>4</sup>Department of Endodontics and Restorative Dentistry, School of Dental Medicine, University of Zagreb, Gundulićeva 5, Zagreb, Croatia  
mail: silvija.kasic@gmail.com

**Aim:** The aim of this study was to compare the efficacy of different disinfection protocols on eradication of *Enterococcus faecalis* (*E. faecalis*) and *Candida albicans* (*C. albicans*).

**Materials and Methods:** Forty single-rooted teeth with one root canal were selected for the study. Root canals were instrumented using rotary ProTaper technique, root surfaces were sealed using adhesive while the apical openings were closed with adhesive and composite resin material. Roots were fixated using adhesive and composite resin material in Eppendorf tubes and then sterilized in autoclave. All specimens were randomly divided into four experimental groups (n = 10). Sterilized root canals were inoculated with *E. faecalis* and *C. albicans* in microbiological laboratory. After a seven-day incubation period, number of *E. faecalis* and *C. albicans* was determined for each root canal by taking swabs with sterile paper points and its inoculation on agar. In the first experimental group, root canals were rinsed with 5 ml of 2.5% sodium hypochlorite solution for 60 seconds using sterile plastic syringe and needle. In the second experimental group, Er:YAG laser was used with PIPS fibre. In the third experimental group, Nd:YAG laser was used with R23 fibre. In the fourth experimental group, Er,Cr:YSGG laser was used. After different root canal disinfection protocols, the number of *E. faecalis* and *C. albicans* was determined again for each root canal by taking swabs with sterile paper points and its inoculation on agar.

**Results:** Sodium hypochlorite, Er:YAG and Er,Cr:YSGG lasers eradicated significantly number of colonies of *E. faecalis* and *C. albicans* ( $p < 0.05$ ), while Nd:YAG laser did not



( $p < 0,05$ ), dok Nd:YAG laser nije statistički značajno smanjio broj ispitivanih mikroorganizama ( $p > 0,05$ ). Natrijev hipokloritom uklonjen je veći broj *E. faecalis* i *C. albicans* u usporedbi s ostalim eksperimentalnim skupinama ( $p < 0,05$ ).

**Zaključak:** Natrijev hipoklorit bio je najučinkovitiji u usporedbi s ostalim ispitanim postupcima dezinfekcije korijenskih kanala u uklanjanju *E. faecalis* i *C. albicans*.

show statistically significant reduction of these microorganisms ( $p > 0,05$ ). Sodium hypochlorite eradicated more colonies of *E. faecalis* and *C. albicans* in comparison to other experimental groups ( $p < 0,05$ ).

**Conclusion:** Sodium hypochlorite proved to be the most efficient in eradication of *E. faecalis* and *C. albicans* in comparison to other experimental groups.

#### ISTRAŽIVANJE UTJECAJA SUBJEKTIVNOSTI NA ODREĐIVANJE BOJE ZUBI VIZUALNOM METODOM

Slađana Milardović Ortolan<sup>1</sup>, Maja Brestovac<sup>2</sup>, Anđela Bubalo<sup>2</sup>

<sup>1</sup>Zavod za fiksnu protetiku, Stomatološki fakultet Sveučilišta u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska

<sup>2</sup>Studentice šeste godine Stomatološkog fakulteta Sveučilišta u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska

mail: mbrestovac@sfzg.hr; andjela.bubalo@gmail.com

**Cilj:** Vizualna metoda određivanja boje zubi smatra se nepouzdanom i subjektivnom. Stoga je svrha ovog istraživanja bila ispitati može li se terapeuta navesti na odabir određene boje za neki zub i koliki utjecaj poznavanje korištenog ključa boja ima na konačni odabir, točnost i ponovljivost odabira.

**Ispitanici i postupci:** Sudjelovala su 23 doktora dentalne medicine čiji je zadatak bio dva puta odrediti boju 4 prirodna gornja sjekutića ključem Vitapan Classical koji koriste u svakodnevnom radu i njima nepoznatim ključem Vita 3D-Master, pri čemu su kod drugog odabira oznake boja bile prikrivene. Isti zadatak dobilo je i 27 studenata dentalne medicine bez iskustva u radu s ključevima boja. Rezultati točnosti i ponovljivosti odabira boje analizirani su  $\chi^2$  i Fisher's Exact testovima.

**Rezultati:** Dobivene su statistički značajne razlike u točnosti i ponovljivosti određivanja boje ključevima s vidljivim ( $p=0,00$ ) i skrivenim oznakama ( $p=0,00$ ) s obzirom na boju zuba. Koristeći se ključem Vitapan Classical s vidljivim oznakama, doktori su češće odabirali boju A3 i za zub koji je zaista bio boje A3, ali i pogrešno za zub boje C2. Nisu zabilježene statistički značajne razlike u točnosti i ponovljivosti određivanja s obzirom na korišteni ključ boja ( $p=0,34$  doktori i  $p=0,12$  studenti). Statistički značajne razlike postojale su u točnosti i ponovljivosti određivanja boje ključevima s vidljivim i skrivenim oznakama ( $p=0,00$ ) s obzirom na skupinu ispitanika, pri čemu je u skupini doktora zabilježen veći broj točnih i veći broj ponovljenih odabira boje. Pritom su se odabiri najčešće podudarali za zub B1, dok su za zub C2, u skupini doktora, najrjeđe prvi i drugi put odabrane iste boje.

**Zaključak:** Unatoč ograničenjima, rezultati ovog istraživanja ukazuju da postoji sklonost doktora dentalne medicine odabiru boje A3 kada koriste ključ Vitapan Classical čak i kada se objektivno ne radi o toj boji.

#### INFLUENCE OF SUBJECTIVITY ON VISUAL TOOTH COLOR MATCHING

Slađana Milardović Ortolan<sup>1</sup>, Maja Brestovac<sup>2</sup>, Anđela Bubalo<sup>2</sup>

<sup>1</sup>Department of Fixed Prosthodontics, School of Dental Medicine, University of Zagreb, Gundulićeva 5, Zagreb, Hrvatska

<sup>2</sup>Students of sixth year, School of Dental Medicine, University of Zagreb, Gundulićeva 5, Zagreb, Hrvatska

mail: mbrestovac@sfzg.hr; andjela.bubalo@gmail.com

**Aim:** Visual evaluation is considered unreliable and inconsistent. The aim of this study was to examine whether the therapists could be led to select a certain tooth color, and what is the impact of familiarity with a commonly used shade guide on the final selection, accuracy and repeatability of color determination.

**Subjects and Methods:** A total of 23 prosthodontists used the familiar Vita Classical shade guide and the Vitapan 3D-Master shade guide they never used before to determine the shades of 4 maxillary right incisors two times. The second time the shade tab identification codes were masked to prevent bias. The same task was performed by 27 dental students with no experience in using shade guides. Results of color matching accuracy and repeatability were analyzed using  $\chi^2$  and Fisher's Exact tests.

**Results:** Statistically significant differences were found in accuracy and repeatability of color matching using the shade guides with visible and masked identification codes ( $p=0,00$ ,  $p=0,00$  respectively) regarding tooth color. It was found that doctors often chose color A3 when using Vitapan Classical with visible identification codes, even for color C2. There were no significant differences in accuracy and repeatability of color matching regarding the utilized shade guide ( $p=0,34$  doctors;  $0,12$  students). There were significant differences in accuracy and reproducibility of color matching using the shade guides with visible and masked identification codes regarding the group ( $p = 0,00$ ), whereby within the group of doctors a higher number of correct and repeated selections were recorded. In most cases, the selection matched for tooth B1, whereas in the group of doctors for tooth C2 the highest number of mismatches was recorded.

**Conclusion:** Within the limitations of this study it can be concluded that there might be a tendency among dentists to choose color A3 while using Vitapan Classical, even for other colors of similar range.

#### PROCJENA pouzdanosti DIAGNODENT I CARIESCAN UREĐAJA TE VIZUALNE ICDAS METODE U IN VIVO I IN VITRO UVJETIMA

Lucija Koncul<sup>1</sup>, Zrinka Kovačević<sup>1</sup>, Davor Illeš<sup>2</sup>, Silvana Jukić Krmeč<sup>3</sup>

<sup>1</sup>Studentice šeste godine Stomatološkog fakulteta Sveučilišta u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska

<sup>2</sup>Zavod za mobilnu protetiku Stomatološkog fakulteta Sveučilišta u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska

<sup>3</sup>Zavod za endodonciju i restaurativnu stomatologiju Stomatološkog fakulteta Sveučilišta u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska

mail: akoncul@sfzg.hr

**Cilj:** Svrha ovog istraživanja je bila *in vivo* i *in vitro* procijeniti pouzdanost dvaju elektronskih uređaja, DIAGNODent-a i CarieScan-a Pro, za detekciju karijesa te vizualne ICDAS metode (The International Caries Detection and Assessment System) u usporedbi s histološkim nalazom.

**Materijali i postupci:** Ispitivanje je provedeno na krunama 16 ljudskih trajnih zuba, predviđenih za vađenje zbog otežanog nicanja, ortodontskih ili parodontoloških razloga. Jedan uvježbani ispitivač ispitao je 29 mjernih točaka na okluzalnim plohama koristeći ICDAS kriterije, DIAGNODent pen i CarieScan Pro uređaje. Nakon ekstrakcije, ponovljena su mjerenja i zubi su histološki klasificirani. Podaci su statistički obrađeni Hi-kvadrat testom i Međuklasnim korelacijskim testom, pri razini značajnosti  $p < 0,05$ . Izračunata je osjetljivost, specifičnost i točnost metoda detekcije karijesa.

**Rezultati:** Ponovljivost mjerenja je bila najveća za DIAGNODent *in vivo* uvjetima (Interclass Correlation Coefficient - 0,969). Pronađena je statistički značajna razlika između *in vivo* i *in vitro* mjerenja za oba uređaja. Najjačnja korelacija između ispitivane metode i histološkog nalaza izražena Cohenovom Kappom postignuta je kod vizualne ICDAS metode (0,660), potom kod DIAGNODenta *in vivo* (0,313) i isti uređaj *in vitro* (0,243). CarieScan Pro *in vivo* pokazao je negativnu korelaciju (-0,058), a *in vitro* nešto bolju korelaciju (0,192). Najtočnijom se pokazala ICDAS metoda (95,6%) dok su *in vivo* uvjetima DIAGNODent i CarieScan Pro pokazali jednaku točnost (79,3%), no DIAGNODent uređaj je pokazao daleko veću specifičnost (40%) u odnosu na CarieScan Pro (0%).

#### PERFORMANCE OF DIAGNODENT, CARIESCAN DEVICES AND VISUAL ICDAS METHOD IN IN VIVO AND IN VITRO CONDITIONS

Lucija Koncul<sup>1</sup>, Zrinka Kovačević<sup>1</sup>, Davor Illeš<sup>2</sup>, Silvana Jukić Krmeč<sup>3</sup>

<sup>1</sup>Students of sixth year, School of Dental Medicine University of Zagreb, Gundulićeva 5, Zagreb, Croatia

<sup>2</sup>Department of Prosthetic Dentistry, School of Dental Medicine University of Zagreb, Gundulićeva 5, Zagreb, Croatia

<sup>3</sup>Department of Endodontics and Restorative Dentistry, School of Dental Medicine University of Zagreb, Gundulićeva 5, Zagreb, Croatia

mail: akoncul@sfzg.hr

**Aim:** Aim of this research was to evaluate clinical performance of two electronic devices, DIAGNODent and CarieScan Pro and visual ICDAS (The International Caries Detection and Assessment System) method in caries detection using histological gold standard.

**Materials and Methods:** The study was performed on 16 human permanent teeth, which were indicated for extraction because of tooth eruption problems, orthodontic and periodontal reasons. A trained examiner assessed 29 measurement points on occlusal surfaces using ICDAS criteria, DIAGNODent pen and CarieScan Pro devices. After tooth extraction, measurements were repeated, and the samples were histologically evaluated. Results were statistically analyzed using Chi-square test and Interclass correlation test, with significance level  $p < 0,05$ . Sensitivity, specificity and accuracy were calculated for these caries detection methods.

**Results:** The repeatability of measurements was the highest for DIAGNODent *in vivo* (Interclass Correlation Coefficient - 0,969). Statistically significant difference was found between *in vivo* and *in vitro* measurements for both devices. The strongest correlation between examined method and histological validation expressed by Cohen's Kappa was achieved using visual ICDAS method (0,660), DIAGNODent *in vivo* (0,313) and *in vitro* (0,243). CarieScan Pro *in vivo* had negative correlation (-0,058), which was supported *in vitro* (0,192). The most accurate was ICDAS method (95,6%), while *in vivo* DIAGNODent and CarieScan Pro had similar accuracy (79,3%), but DIAGNODent had much higher specificity (40%) in comparison to CarieScan Pro (0%).



**Zaključak:** Temeljem ovog istraživanja može se zaključiti da je ICDAS metoda pouzdanija u dijagnostici karijesa u odnosu na istraživane elektronske uređaje. Premda je korelacija s histološkim nalazom veća kod CarieScan-a Pro, veća ponovljivost mjerenja i specifičnost čini DIAGNOdent pouzdanijim uređajem za detekciju karijesa *in vivo*.

#### MINIMALNO INVAZIVNA ORTODONCIJA U TERAPIJI MALOKLUZIJE III KLASJE –PRIKAZ SLUČAJA

Vesna Jankulovska, Gabriela Kjurchieva Chuchkova  
Zavod za ortodontiju, Stomatološki fakultet, Sveučilište Ćirila i Metoda,  
Skoplje, Vodnjanska 17, Makedonija  
mail: vesna\_jankulovska@live.com

**Cilj:** Prikazati učinke ranog ortodontskog liječenja pacijenata s progenijom tretiranih miofunkcionalnom terapijom aparatima sustava Myobrace i-3.

**Ispitanici i postupci:** Prikazana su 2 pacijenata, 7-godišnji dječak i 7-godišnja djevojčica, primljeni na Klinici za ortodontiju u Skoplju. Tijekom kliničkog pregleda pacijenata, ekstraoralno je uočen izražajan konkvitet profila, dok je intraoralno dijagnostičirana prognija. Napravljene su ortopantomografske snimke i uzeti su otisci za izradu studijskih modela. Kod oba pacijenata, terapija je provedena kroz tri faze upotrebom aparata Myobrace i-3 sistema. Pacijentima su dane smjernice za korištenje aparata: tijekom cijele noći i još jedan sat tijekom dana. Miofunkcionalna terapija kod pacijenata pratila se kroz redovite kontrole, prva za 2 tjedna, zatim svaki mjesec dana, kliničkim pregledom i obveznim intraoralnim i ekstraoralnim fotografijama.

**Rezultati:** Rezultati terapije s Myobrace i-3 pokazali su korekciju prognije oba pacijenata još tijekom prve faze. Već nakon jedne godine praćenja, zahvaljujući redovitom nošenju Myobrace i-3 aparata, maksimalno su iskorištene sve 3 faze sistema i primjetan je prijelaz prognije u bridni zagriz, s tendencijom obrnutog preklapa uspostavljanja normalnih vrijednosti prijelaza i pregriza. Prema fotografijama, primjetna je i ekstraoralna promjena, odnosno postizanje pravilnog profila u oba slučaja.

**Zaključak:** Iz rezultata možemo zaključiti da Myobrace i-3 sistem pokazuje velik uspjeh u liječenju prognih ugriza, koji se, ako se ne liječi u ranoj dobi, može razviti u teži oblik prognije te je nužna ortognatska kirurgija. Rezultati pokazuju da je miofunkcionalno liječenje s Myobrace aparatima učinkovito, a rani tretman je preporučljiv.

**Conclusion:** Based on this research, ICDAS method was more reliable in caries detection than electronical methods. Although correlation with histological validation was higher with CarieScan Pro, greater repeatability of measurements and specificity makes DIAGNOdent more reliable device for caries detection *in vivo*.

#### MINIMALLY INVASIVE ORTHODONTICS IN TREATMENT OF MALOCCLUSION CLASS III: CASE REPORTS

Vesna Jankulovska, Gabriela Kjurchieva Chuchkova  
Department of Orthodontics, Faculty of Dental Medicine, University "Ss. Cyril and Methodius", Vodnjanska 17, Skopje, Macedonia  
mail: vesna\_jankulovska@live.com

**Aim:** To present the effects of early orthodontic treatment in children with malocclusion Class III, treated with myofunctional therapy by Myobrace i-3 system appliances.

**Subjects and Methods:** Two clinical cases are presented: a 7-year-old boy and a 7-year-old girl, who were admitted at the Department of Orthodontic at Dental Clinic in Skopje. During the clinical examination of patients, expressive concavity of the face profile was noticed extraorally, whereas anterior cross bite was diagnosed intraorally. Recordings were made for both patients, using orthopantomograms, cephalograms, and study models. The treatment was performed in three stages using the Myobrace i-3 system appliances. The patients were given proper instructions to use the appliances: during the night and one hour throughout the day. The myofunctional treatment in patients has been monitored through regular check-ups (first visit after 2 weeks, then one visit per month) by clinical examination and mandatory intraoral and extraoral photographs.

**Results:** The results of the treatment with Myobrace i-3 showed a correction of the anterior cross bite in both patients even during the first phase. After one year of follow-up, due to regular wear of Myobrace i-3 appliances, all three phases of the system were maximally used and there has been a transition of the anterior cross bite into a 'tete-a-tete' bites, with a tendency of establishing normal values of the overjet and overbite. According to the photographs, extraoral improvements are noticeable, in fact straightening of the face profile is achieved in both cases.

**Conclusion:** According to the results, we can conclude that Myobrace i-3 system showed successful effect in the treatment of malocclusion Class III, which, if not treated at early age, can develop into a more severe form, and occasionally orthognathic surgery is necessary. The results show that treatment with myofunctional Myobrace appliances is effective and early treatment is essential for these anomalies.

#### INFILTRACIJA BIJELIH MRLJASTIH DEMINERALIZACIJA ICON SUSTAVOM – PRIKAZ SLUČAJA

Dubravka Knezović Zlatarić<sup>1</sup>, Silvana Jukić Krmek<sup>2</sup>, Marija Jurčević Grgić<sup>3</sup>,  
Jurica Matijević<sup>2</sup>  
<sup>1</sup>Zavod za mobilnu protetiku, Stomatološki fakultet Sveučilišta u Zagrebu,  
Gundulićeva 5, Zagreb, Hrvatska  
<sup>2</sup>Zavod za endodonciju i restaurativnu stomatologiju, Stomatološki fakultet  
Sveučilišta u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska  
<sup>3</sup>Katedra za endodonciju i restaurativnu stomatologiju, Medicinski fakultet  
Sveučilišta u Rijeci, Braće Branchetta 20/1, Rijeka, Hrvatska  
mail: jukic@sfz.hr

**Cilj:** Svrha ovog rada bila je prikazati klinički slučaj rješavanja hipomineralizirane bijele lezije uporabom infiltracijske smole.

**Ispitanici i postupci:** U ovom radu se prikazuje slučaj 18-godišnjeg mladića koji dolazi na Stomatološki fakultet zbog uočljive hipomineralizirane bijele mrlje na gornjem lijevom središnjem sjekutiću. Odlučeno je pokušati leziju mikro-invazivno tretirati infiltracijskom smolom (ICON, DMG, Hamburg, Njemačka) čija namjena je popunjavanje poroznosti cakline. Nakon izolacije, na leziju je nanešena 15%-tna hidroklorna kiselina čime se postiglo otvaranje poroznosti lezije. Slijedeći korak je bio sušenje etilnim alkoholom, a potom nanošenje niskoviskozne smole s visokim koeficijentom penetracije nakon čega je slijedila polimerizacija svjetlom.

**Rezultati:** Ishod terapije je bio izuzetno zadovoljavajući ne samo za pacijenta već i za terapeute, a pri tome je izbjegnuta mehanička intervencija i oštećenje okolnih zdravih tvrdih zubnih tkiva.

**Zaključak:** Lokalizirane demineralizacije cakline u frontalnoj regiji često su značajan estetski nedostatak, posebice kod mladih osoba s potpuno intaktnim zubima. Do sada se taj problem rješavao uglavnom restauracijskim postupkom, jer su pokušaji remineralizacije bili dugotrajni i uglavnom neuspješni. Nedavno su se na tržištu pojavili preparati za infiltraciju demineraliziranih lezija koji zaustavljaju karijesni proces u početnim stadijima, ali mogu se koristiti i za infiltraciju porozne, demineralizirane cakline nastale kao posljedica slabosti u razvojnoj fazi dentinogeneze.

#### INFILTRATION OF THE WHITE SPOT DEMINERALIZATION LESIONS WITH ICON SYSTEM – A CASE REPORT

Dubravka Knezović Zlatarić<sup>1</sup>, Silvana Jukić Krmek<sup>2</sup>, Marija Jurčević Grgić<sup>3</sup>,  
Jurica Matijević<sup>2</sup>  
<sup>1</sup>Department of Removable Prosthodontics, School of Dental Medicine,  
University of Zagreb, Gundulićeva 5, Zagreb, Croatia  
<sup>2</sup>Department for Endodontics and Restorative Dentistry, School of Dental  
Medicine, University of Zagreb, Gundulićeva 5, Zagreb, Croatia  
<sup>3</sup>Department for Endodontics and Restorative Dentistry, School of Medicine,  
University of Rijeka, Braće Branchetta 20/1, Rijeka, Croatia  
mail:jukic@sfz.hr

**Aim:** The aim of this study was to show clinical case of treatment hypomineralized white spot lesion with infiltration resin.

**Subjects and Methods:** This paper presents a case of 18-year-old young man who came to the School of Dentistry for noticeable hypomineralized white lesions on the upper left central incisor. It was decided to treat the lesion micro-invasively with resin infiltration (ICON, DMG, Hamburg, Germany) which can fill the porosities of the enamel. After the isolation of the lesion, the 15% hydrochloric acid was applied to open the porosities of the lesions. Next step was the drying of the operating field with ethanol, and then application of the low viscosity resins with a high coefficient of penetration, followed by light curing.

**Results:** Outcome was very satisfactory, not only for the patient but also for therapists, and thereby mechanical intervention and damaging of surrounding healthy hard dental tissue was avoided.

**Conclusion:** Localized demineralization areas of the enamel in frontal region are often an aesthetically significant disadvantage, especially in young adults with fully intact teeth. So far, this problem was solved mainly by restorations because the remineralization attempts were time consuming and mostly unsuccessful. Recently, products for infiltration of demineralized carious lesions that interrupt the process in the beginning stages appeared on the market, which can also be used for infiltration of porous demineralized enamel, a result of weaknesses in the development phase of dentinogenesis.

**ORALNI VERUKOZNI KARCINOM: PRIKAZI SLUČAJEVA**

Miranda Muhvić Urek<sup>1</sup>, Martina Brumini<sup>2</sup>, Irena Bonifačić<sup>3</sup>, Irena Glažar<sup>1</sup>, Sonja Pezelj-Ribarić<sup>1</sup>

<sup>1</sup>Katedra za oralnu medicinu i parodontologiju, studij Dentalne medicine Sveučilišta u Rijeci, Braće Branchetta 20, Rijeka, Hrvatska

<sup>2</sup>Katedra za endodonciju i restaurativnu stomatologiju, studij Dentalne medicine Sveučilišta u Rijeci, Braće Branchetta 20, Rijeka, Hrvatska

<sup>3</sup>studentica poslijediplomskog studija Medicinskog fakulteta Sveučilišta u Rijeci, Braće Branchetta 20, Rijeka, Hrvatska

mail: miranda.muhvic.urek@medri.uniri.hr

**Cilj:** Verukozni karcinom je karakterističan oblik planocelularnog karcinoma niskog stupnja malignosti, sporog rasta i bez metastatskog potencijala. Opisao ga je Ackerman 1948. godine te se još naziva i Ackermanov tumor.

**Ispitanci i postupci:** Donosimo prikaz dva pacijenta s verukoznim karcinomom, postupak dijagnostike i liječenja. Slučaj 1: Pacijentica stara 78 godina upućena je s dermatologije zbog bolnih lezija na obraznim sluznicama. Kao slučajni popratni nalaz, pronađena je papilomatозна izraslina u boji oralne sluznice na lijevoj strani donjeg alveolarnog grebena. Učinjena je incizijska biopsija gdje je nađena displazija visokog stupnja. Odlučeno je da se lezija ukloni u potpunosti, a patohistološki je nalaz pokazao da se radi o verukoznom karcinomu. Slučaj 2: Pacijent star 52 godine zatražio je pomoć zbog bijelčaste izrasline na gingivi i alveolarnoj sluznici u području donjih prekutnjaka, očnjaka i sjekutića desne strane. Kliničkim je pregledom postavljena sumnja na verukozni karcinom te je pacijent biopsiran i potvrđena je dijagnoza patohistološki. Po patohistološkom nalazu učinjena je ekscizija karcinoma.

**Rezultati:** Oba pacijenta su postoperativno dobro i nema recidiva.

**Zaključak:** Verukozni karcinom često recidivira. Opisani su slučajevi tzv. hibridnih verukoznih karcinoma gdje tumor istovremeno ima karakteristike verukoznog i slabo diferenciranog planocelularnog karcinoma. Zbog toga ove pacijente treba dobro i redovito pregledavati.

**ORAL VERRUCOUS CARCINOMA: CASE REPORTS OF TWO PATIENTS**

Miranda Muhvić Urek<sup>1</sup>, Martina Brumini<sup>2</sup>, Irena Bonifačić<sup>3</sup>, Irena Glažar<sup>1</sup>, Sonja Pezelj-Ribarić<sup>1</sup>

<sup>1</sup>Department of Oral Medicine and Periodontology, School of Dental Medicine, University of Rijeka, Braće Branchetta 20, Rijeka, Croatia

<sup>2</sup>Department of Endodontics and Restorative Dentistry, School of Dental Medicine, University of Rijeka, Braće Branchetta 20, Rijeka, Croatia

<sup>3</sup>PhD student, School of Medicine, University of Rijeka, Braće Branchetta 20, Rijeka, Croatia

mail: miranda.muhvic.urek@medri.uniri.hr

**Aim:** Verrucous carcinoma is a distinctive variety of oral squamous carcinoma with low grade malignancy, slow growth and no metastatic potential. It was first described by Ackerman in 1948, hence termed as Ackerman's tumor.

**Subjects and Methods:** Here we present two patients with oral verrucous carcinoma and their diagnostic and therapeutic procedures. Case 1: A 78-year-old female patient was referred to our Clinic from the Department of Dermatology due to painful lesions on her buccal mucosa. During the clinical examination, as a random finding, we have detected a papillomatous formation in color of oral mucosa on the left side of lower alveolar ridge. Incisional biopsy was performed and the histopathological finding revealed high degree of dysplasia. It was decided to remove the lesion completely, and histopathological finding showed that it was a verrucous carcinoma. Case 2: A 52-year-old male patient sought help due to a whitish formation on gingiva and alveolar mucosa in the right lower premolars, canine and incisors region. Clinical examination raised suspicion that it might be a verrucous carcinoma. Incisional biopsy was performed and verrucous carcinoma was confirmed. After histopathological analysis the total excision of carcinoma lesion was conducted.

**Results:** Postoperatively, both patients are in good shape with no recidive.

**Conclusion:** Verrucous carcinoma often recurs. In the literature, the cases of hybrid verrucous carcinoma which simultaneously have the characteristics of verrucous carcinoma and less-differentiated squamous carcinoma are described. Therefore, careful examination and regular controls of these patients are recommended.

**PRIMJENA BIOKERAMIČKOG MATERIJALA ZA PUNJENJE KORIJENSKIH KANALA – PRIKAZ SLUČAJA**

Valentina Rajić<sup>1</sup>, Ivana Miletić<sup>2</sup>

<sup>1</sup>Zavod za bolesti zubi, KBC Zagreb, Gundulićeva 5, Zagreb, Hrvatska

<sup>2</sup>Zavod za endodonciju i restaurativnu stomatologiju, Stomatološki fakultet Sveučilište u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska

mail: valentina.brzovic@zg.t-com.hr

**Cilj:** Punjenje korijenskog kanala predstavlja završnu fazu endodontskog liječenja zuba. Svrha punjenja je hermetički napuniti instrumentiran prostor. Na tržištu postoje brojni materijali za punjenje korijenskog kanala temeljeni na cink-oksidi eugenolu, umjetnim smolama, kompozitu, silikonu. Bioaktivni materijali predstavljaju novu skupinu materijala za koje se navodi da potiču cementogenezu i osteogenezu. Cilj ovog rada bio je prikazati uporabu biokeramičkog materijala za punjenje korijenskog kanala.

**Ispitanci i postupci:** U ovom radu se prikazuje slučaj 28-godišnje pacijentice koja je upućena na Zavod za bolesti zubi sa Zavoda za oralnu kirurgiju pod dijagnozom kroničnog periapikalnog procesa. Kliničkim pregledom i uvidom u rtg snimku vidljivo je periapikalno prosvjetljenje u području zuba 46. Pacijentica navodi da se zub liječio šest mjeseci i kad bi se zatvorio, nastupili bi bolovi. Nakon primjene lokalne anestezije i izolacije zuba gumenom plahiticom, korijenski kanali su instrumentirani Reciproc tehnikom instrumentacije uz ispiranje 2,5% vodenom otopinom natrijevog hipoklorita. Nakon sušenja, korijenski kanali su napunjeni Reciproc gutaperkama i bioaktivnim punilom temeljenim na biokeramici. Neposredno nakon punjenja napravljena je rtg snimka na kojoj se vidi dobro napunjen endodontski proctor. Izrađen je privremeni SIC ispun.

**Rezultati:** Na kontrolnoj rtg snimci, nakon šest mjeseci, vidi se povlačenje upalnog procesa i cijeljenje periapikalnog tkiva. Zub je postendodontski opsrbjen vlaknima ojačanim kompozitom i klasičnim nanopunjenim kompozitnim materijalom.

**Zaključak:** U ovom kliničkom slučaju provedenim postupkom jednoposjetnog endodontskog liječenja uz uporabu biokeramičkog punila došlo je do prestanka simptoma boli i cijeljenja periapikalnog tkiva.

**BIOCERAMIC MATERIAL USED AS ROOT CANAL FILLING - CASE REPORT**

Valentina Rajić<sup>1</sup>, Ivana Miletić<sup>2</sup>

<sup>1</sup>Clinical Department of Dental Pathology, University Hospital Centre Zagreb, Gundulićeva 5, Zagreb, Hrvatska

<sup>2</sup>Department of Endodontics and Restorative Dentistry, School of Dental Medicine, Gundulićeva 5, Zagreb, Hrvatska

mail: valentina.brzovic@zg.t-com.hr

**Aim:** Root canal filling is important part of endodontic treatment. Root canal preparation and obturation phases of treatment are essential for achieving an adequate root canal obturation. Various materials are being used in endodontic therapy in clinical practice which include zinc oxide eugenol, resin sealers, composite resins, glass ionomer cement, calcium hydroxide etc. Bioactive materials are available for modern approach in endodontic treatment because they have the potential to induce cementogenesis and osteogenesis. The aim of this study was to present bioactive material for root canal filling.

**Subjects and Methods:** This study presents a case of 28-year-old female patient who was referred for tooth extraction to Department of Oral Surgery because of chronic periapical lesion after six months of painful and unsuccessful endodontic therapy of tooth 46. However, the patient was sent to Department of Endodontics and Restorative Dentistry for endodontic retreatment. After clinical examination and x-ray analysis, a procedure was performed under local anesthesia. The tooth was isolated with rubber dam, instrumented using Reciproc technique and irrigated with 2,5% sodium hypochlorite. After drying the root canals, root canal obturation was performed with Reciproc gutta-percha and bioactive root canal sealer based on bioceramics. A control x-ray was taken after endodontic retreatment was completed. Glass ionomer cement was used for temporary restoration.

**Results:** Clinical and radiographic evaluation after 6 months showed successful healing of periapical lesions. Final restoration was done using fiber reinforced composite resin material and nanofilled composite resin material.

**Conclusion:** This clinical report of one visit endodontic treatment using bioactive material for root canal filling showed pain free healing of periapical lesions.

### JEDNOPOSJETNA ESTETSKA REHABILITACIJA PACIJENTA S FRAKTUROM GORNJEG SREDIŠNJEG SJEKUTIČA

Aleksandra Grebenar<sup>1</sup>, Valentina Veselinović<sup>1</sup>, Vesna Kecman<sup>2</sup>

<sup>1</sup> Medicinski fakultet Banja Luka, Studijski program stomatologija, Save Mrkalja 14, Bosna i Hercegovina

<sup>2</sup> Privatna stomatološka ordinacija K-Dent, Braće i sestara Kapor 1, Banja Luka, Bosna i Hercegovina

mail: valentinav75@yahoo.com, vesnakec@gmail.com

**Cilj:** Traume zuba u području središnjih sjekutića su česte u kliničkoj praksi zbog njihovog položaja u čeljusti. Traume najčešće nastaju tijekom sportskih aktivnosti, prometnih nezgoda ili drugih oblika traume. Fraktura prednjih zuba predstavlja zdravstvenu i emocionalnu traumu za pacijenta. Svrha ovog rada bila je prikazati slučaj zbrinjavanja traumatskog oštećenja zuba.

**Ispitanici i postupci:** U ovom radu je opisana imedijatna rehabilitacija pacijenta muškog spola, starosti 30 godina, s frakturom incizalne trećine gornjeg desnog središnjeg sjekutića. Terapija je uključila dodatnu, minimalnu preparaciju zuba, uzimanje digitalnog otiska i izradu keramičke fasete cementirane estetskim kompozitnim cementom. Kompletna terapija je provedena u okviru prve posjete pacijenta u razdoblju od 2 sata.

**Rezultati:** Ovakvim terapijskim pristupom je postignuta estetska i funkcionalna rehabilitacija pacijenta u jednoj posjeti pacijenta ordinaciji dentalne medicine.

**Zaključak:** Suvremeni CAD CAM postupak omogućava jednostavnu, brzu i učinkovitu terapiju pacijenata s frakturama frontalnih zuba, čime je omogućena njihova brza estetska, funkcionalna i socijalna rehabilitacija.

### A SINGLE-VISIT AESTHETIC REHABILITATION OF FRACTURED UPPER CENTRAL INCISOR

Aleksandra Grebenar<sup>1</sup>, Valentina Veselinović<sup>1</sup>, Vesna Kecman<sup>2</sup>

<sup>1</sup> University of Banja Luka, Faculty of Medicine, Department of Stomatology, Save Mrkalja 14, Bosnia and Herzegovina

<sup>2</sup> K-Dent, Private Practice, Braće and sestara Kapor 1, Banja Luka, Bosnia and Herzegovina

mail: valentinav75@yahoo.com, vesnakec@gmail.com

**Aim:** Trauma of the central incisors is common in clinical practice because of their position in the upper jaw. Injuries usually occur during sports activities, car accidents or other types of trauma. Fracture of the anterior teeth presents health and emotional trauma for the patient. The purpose of this paper was to present a modern clinical protocol of taking care of patient with trauma of upper central incisor.

**Subjects and Methods:** The paper provides a detailed description of the immediate rehabilitation of a male patient, aged 30, with fracture of incisal third of the upper right central incisor. The therapy comprised of a minimally invasive tooth preparation, a digital impression, a 3D design and milling of a feldspathic veneer cemented by using esthetic light-curing luting composite cement. The complete therapy treatment was conducted during only one 2-hour visit.

**Results:** With this therapeutic approach both aesthetic and functional rehabilitation of a patient are achieved in only one visit to the dental clinic.

**Conclusion:** The modern CAD CAM procedure enables a fast, simple and efficient treatment of the patients with the fractures of the frontal teeth, which further helps a rapid aesthetic, functional, and social rehabilitation.

### UTJECAJ NAČINA POSTAVLJANJA UMJETNIH ZUBA U TOTALNIM PROTEZAMA NA ŽVAČNU UČINKOVITOST

Evdokija Jankulovska<sup>1</sup>, Vesna Jankulovska<sup>2</sup>

<sup>1</sup> Zavod za stomatološku protetiku, Stomatološki fakultet, Sveučilište Čirila i Metoda, Vodnjanska 17, Skoplje, Makedonija

<sup>2</sup> Stomatološka ordinacija PZU "JANKULOVSKI", Vidoe Smilevski Bato 9, Skoplje, Makedonija,

mail: vesna\_jankulovska@live.com

**Cilj:** Svrha ovog rada bila je dobiti podatke o utjecaju dva različita postupka postavljanja umjetnih zube na žvačnu učinkovitost totalne proteze.

**Ispitanici i postupci:** Ispitivanje su provedena u tri skupine ispitanika: *Skupina 1:* kontrolna skupina sastojala se od pacijenata s netaknutom denticijom i bez patoloških promjena u drugim dijelovima žvačnog sustava (n=45). U *skupini 2* pacijenti su imali proteze u kojima su umjetni zubi postavljeni u skladu s klasičnom Gisy-jevom metodom (n=10); i *skupina 3* sastojala se od pacijenata s protezama u kojem su umjetni zubi postavljeni prema suvremenom postupku primjenom bioloških načela (n=10). Za ispitivanje žvačne učinkovitosti provedena je elektromastikografija, pomoću testa hrane (matica=2,5g). To je grafički postupak za obradu registriranih pokreta donje čeljusti, kao i žvačnih mišića, tijekom procesa žvakanja. Žvačna učinkovitost je određena s učestalošću žvačnih ciklusa i vremenom procesa žvakanja, potrebnih da se hrana slomije u male čestice, onda da se homogeniziraju, do formiranja bolusa i pojava refleksa gutanja.

**Rezultati:** Za mehaničku obradu hrane s rezanjem (III faza mastikacije) u kontrolnoj skupini potrebno je vrijeme od 0,62 sekunde i 1,3 žvačna ciklusa, dok se mljevenje hrane (IV faza mastikacije) izvodi u 33 sekunde i 40 žvačnih ciklusa. Ispitanici iz skupine 2, pokazuju 41% mastikatorne učinkovitosti, dok ispitanici iz skupine 3, pokazuju 49% mastikatorne učinkovitosti, u usporedbi s kontrolnom skupinom.

**Zaključci:** Postupak postavljanja umjetnih zubi ima određeni utjecaj na žvačnu učinkovitost proteze. Dokazano je da ispitanici s umjetnim zubima koji su postavljeni u skladu sa suvremenom metodom primjenom bioloških načela, pokazuju bolju žvačnu učinkovitost.

### THE INFLUENCE OF THE METHOD OF SETTING TEETH IN DENTURES ON THE MASTICATORY EFFICIENCY

Evdokija Jankulovska<sup>1</sup>, Vesna Jankulovska<sup>2</sup>

<sup>1</sup> Department of Prosthodontics, Faculty of Dental Medicine, University "Ss. Cyril and Methodius", Vodnjanska 17, Skopje, Macedonia

<sup>2</sup> Dental office, PZU "JANKULOVSKI", Vidoe Smilevski Bato 9, Skopje, Macedonia

mail: vesna\_jankulovska@live.com

**Aim:** Aim of this study was to investigate the influence of two different methods of setting teeth on the masticatory efficiency of dentures.

**Subjects and Methods:** The study was conducted on three groups of examinees: group 1 consisted of patients with intact dentition and without any pathological changes in other parts of the masticatory complex (n=45), also referred as control group; group 2 consisted of patients with dentures in which artificial teeth were set according to the classical Gisy method (n=10); and group 3 consisted of patients with dentures in which artificial teeth were set according to contemporary method by applying biological principles (n=10). To examine the masticatory efficiency, computer electromasticatiography was performed using a test-food (nut=2,5g). Electromasticatiography is a graphical method for processing the registered movements of the lower jaw, as well as masticatory muscles, during the process of mastication. The masticatory efficiency was determined by the frequency of chewing cycles and time of mastication necessary for the food to be crushed into small particles, homogenized, formed into a bolus and the swallowing reflex to occur.

**Results:** According to the results, the mechanical food cutting (IIIrd fase of mastication) in the control group is performed in 0.62 s and 1.3 chewing cycles, while food grinding (IVth fase of mastication) is performed in 33 s and 40 chewing cycles. Subjects from group 2, were chewing with 41% of masticatory efficiency, whereas subjects from group 3 were chewing with 49% of masticatory efficiency compared to the control group.

**Conclusions:** The method of setting artificial teeth has certain influence on the masticatory efficiency of the dentures. The respondents whose teeth were set according to the contemporary method by applying biological principles were chewing with better masticatory efficiency.

**TRETMAN ORALNIH HIPERPLAZIJE - PRIKAZ SLUČAJA**

Lj. Simjanovska<sup>1</sup>, Evdokija Jankulovska<sup>2</sup>, A. Iliev<sup>3</sup>, Vesna Jankulovska<sup>4</sup>, S. Simjanovski<sup>5</sup>

<sup>1</sup>Zavod za oralnu kirurgiju, Stomatološki fakultet, Sveučilište Ćirila i Metoda, Skoplje, Vodnjanska 17, Makedonija

<sup>2</sup>Zavod za stomatološku protetiku, Stomatološki fakultet, Sveučilište Ćirila i Metoda, Vodnjanska 17, Skoplje, Makedonija

<sup>3</sup>Zavod za maksilofacijalnu kirurgiju, Stomatološki fakultet, Sveučilište Ćirila i Metoda, Vodnjanska 17, Skoplje, Makedonija

<sup>4</sup>Stomatološka ordinacija PZU "JANKULOVSKI", Vidoe Smilevski Bato 9, Skoplje, Makedonija

<sup>5</sup>Stomatološka ordinacija PZU "D-r Asenova", Vidoe Smilevski Bato 9, Skoplje, Makedonija

mail: vesna\_jankulovska@live.com

**Cilj:** Prikazati tretman oralne hiperplazije nastale zbog neprimjerno izrađene proteze kombinacijom dva različita kirurška postupka i protetskom rehabilitacijom.

**Ispitani i postupci:** U ovom radu, pacijent s oralnom hiperplazijom, izazvanom neprikladnim protezama, je primljen na Sveučilišni stomatološki centar u Skoplju, a kasnije je upućen na Sveučilišnu kliniku za maksilofacijalnu kirurgiju u Skoplju. Intraoralnim kliničkim pregledom bile su vidljive dvije izrasline bilateralno na donjem alveolarnog grebena i jedna u sublingvalnom području. Izrasline su bili mekane, pričvršćene na sluznicu i bezbolne na palpaciju. Promjene na vestibularnoj strani su uklonjene Er:YAG laserom -02 Fotona Laser, dok je ona koja je bila lokalizirana sublingvalno, uklonjena klasičnim postupkom. Pri tome, identificirani su i sačuvani oba Warthon-ova otvora. Pomoću elektrokauterizacije, lezija je uklonjena u submukoznoj ravnini u cijelosti. Šavovi i jodoform gaza su uklonjeni nakon sedam dana. Oba postupka su provedena pod lokalnom anestezijom. Završne histopatološke analize su pokazale proliferaciju epitela s submukozne fibrozom i kroničnom upalom. Nakon mjesec dana, provedena je protetska rehabilitacija.

**Rezultati:** Odlični rezultati su postignuti primjenom Er:YAG lasera. Postoperativne komplikacije kao što su oticanje, postoperativnih krvarenja ili hiperemije nisu bile prisutni, a tijekom kirurškog zahvata krvarenje je bilo minimalno. Klasični postupak je pokazao zadovoljavajuće rezultate dok su minimalna krvarenja bila kontrolirana bipolarnom kauterizacijom.

**Zaključak:** Oba postupka su bila učinkovita u uklanjanju oralnih hiperplazija. Međutim, odlična hemostaza se postiže korištenjem laserske zrake. Kako bi se izbjegli recidivi, važno je da se svaka fibromatозна promjena lokalizirana na oralnoj sluznici ukloni u cijelosti. Osim toga, neophodno je eliminirati čimbenike kronične iritacije kao što su neprimjerne proteze.

**POGREŠKE U PLANIRANJU IMPLANTO- PROTETSKE REHABILITACIJE - PRIKAZ SLUČAJA**

Jana Barić<sup>1</sup>, Mato Sušić<sup>2</sup>, Dragana Gabrić<sup>3</sup>

<sup>1</sup>Studentica 6. godine Stomatološkog fakulteta, Sveučilište u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska

<sup>2</sup>Zavod za oralnu kirurgiju, Stomatološki fakultet, Sveučilište u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska

<sup>3</sup>Zavod za oralnu kirurgiju, Stomatološki fakultet, Sveučilište u Zagrebu, Gundulićeva 5, Zagreb, Hrvatska

mail: jana.baric@gmail.com

**Cilj:** Svrha je bila prikazati klinički slučaj pacijentice s neuspjehom implantato-protetske rehabilitacije kao posljedice pogreške u planiranju terapije.

**Ispitani i postupci:** Pacijentici su početkom 2014. godine ugrađena dva implantata u gornjoj čeljusti lijevo, na poziciji 23 i 24, koji su zatim opskrbljeni keramičkim krunicama u bloku. Preostali zubi u istom kvadrantu su opskrbljeni fiksno-protetkim radom na poziciji 25-27. Godinu i pol nakon terapije implantat 24 je bio izrazito pomičan u vertikalnom i horizontalnom smjeru, uz subjektivne smetnje i poteškoće.

Na ortopantomogramskoj snimci uočen je vertikalni gubitak kosti u području postavljenih implantata te oštećenje korijena zuba 25 implantatom. Napravljen je i CBCT snimak lijevog kvadranta maksile na osnovi koje se potvrdio radiološki nalaz. Na snimci su uočeni zaostali korijeni zuba 26. Prilikom pregleda utvrđena je palpatorna pomičnost implantata u području 24. Prije zahvata uklonjen je most koji je povezivao 25 i 27 te su separirane krunice na implantatima. Plan prije početka operacije bio je vađenje 25 i 27, uklanjanje implantata na području 24 te eksploracija i uklanjanje 26. Odlučeno je napraviti eksploraciju implantata na području 23 te pokušati terapiju periimplantitisa otvorenom tehnikom.

**Rezultati:** Intraoperativno je pronađen opsežan gubitak kosti s vestibularne i palatinalne strane implantata 24. Elevatorom je implantat pomaknut iz ležišta i eksplantiran. Zatim su izvađeni parodontološki kompromitirani zubi 25 i 27. Lokacija zaostalih korijenova prema snimkama je bila u području maksilarnog sinusa, ali nakon eksploracije pronađeni

**TREATMENT OF ORAL HYPERPLASIA- CASE REPORT**

Lj. Simjanovska<sup>1</sup>, Evdokija Jankulovska<sup>2</sup>, A. Iliev<sup>3</sup>, Vesna Jankulovska<sup>4</sup>, S. Simjanovski<sup>5</sup>

<sup>1</sup>Department of Oral Surgery, Faculty of Dental Medicine, University "Ss. Cyril and Methodius", Vodnjanska 17, Skopje, Macedonia

<sup>2</sup>Department of Prosthodontics, Faculty of Dental Medicine, University "Ss. Cyril and Methodius", Vodnjanska 17, Skopje, Macedonia

<sup>3</sup>Department of Maxillofacial Surgery, Faculty of Dental Medicine, University "Ss. Cyril and Methodius", Vodnjanska 17, Skopje, Macedonia

<sup>4</sup>Dental office, PZU "JANKULOVSKI", Vidoe Smilevski Bato 9, Skopje, Macedonia

<sup>5</sup>Dental private practice PZU "D-r Asenova", Bul. Vidoe Smilevski Bato 9, Skopje, Macedonia

mail: vesna\_jankulovska@live.com

**Aim:** To present a treatment of denture-induced oral hyperplasia, by combining two different surgical methods as well as prosthodontic rehabilitation.

**Subjects and Methods:** In this study, a patient with oral hyperplasia, induced by inappropriate dentures, was first admitted at the University Dental Clinic Centar in Skopje and later the patient was also referred to the University Clinic for Maxillofacial Surgery in Skopje. Intraoral clinical examination revealed the presence of several masses: two situated bilaterally on the lower alveolar ridge and one in the sublingual area. The masses were soft, fixed to the underlying mucosa and non tender to palpation. The changes from the vestibular side were removed with Er:YAG laser-02 Fotona Laser, whereas those sublingually situated were removed by conventional means. Both orifices of the Warthon's ducts were identified and preserved. The lesion was removed completely in the submucosal plane using electrocauter. The sutures and iodoform gauze were removed after seven days. Both procedures were conducted under local anesthesia. Final histopathological findings showed reactive epithelial proliferation with submucous fibrosis and chronic inflammation. After one month, proper prosthodontic rehabilitation was performed.

**Results:** Excellent results were achieved using Er:YAG laser. No postsurgical complications like swelling, postoperative bleeding, or hyperemia were present, and during the surgical intervention minimal bleeding was observed. The conventional method showed satisfactory results as well. Minimal bleeding was controlled using bipolar electrocautery.

**Conclusion:** It can be concluded that both methods were effective in hyperplasia removal. However, excellent haemostasis was obtained when laser was used. In order to avoid relapse, it is important that every fibromatous change localized on oral mucosa is removed completely. Besides that, it is necessary to eliminate the irritating factors, such as inappropriate dentures.

**ERRORS IN PLANNING IMPLANTO- PROSTHODONTIC REHABILITATION - CASE REPORT**

Jana Barić<sup>1</sup>, Mato Sušić<sup>2</sup>, Dragana Gabrić<sup>3</sup>

<sup>1</sup>6th year student of School of Dental Medicine, University of Zagreb, Gundulićeva 5, Zagreb, Croatia

<sup>2</sup>Department of Oral Surgery, School of Dental Medicine, University of Zagreb, Gundulićeva 5, Zagreb, Croatia

<sup>3</sup>Department of Oral Surgery, School of Dental Medicine, University of Zagreb, Gundulićeva 5, Zagreb, Croatia

mail: jana.baric@gmail.com

**Aim:** The purpose was to present a clinical case of a patient with failure of implantoprosthodontic rehabilitation as a result of errors in treatment planning.

**Subjects and Methods:** The patient had two implants placed on the left side of the upper jaw in position of 23 and 24 at the beginning of 2014., which were then provided with crowns in the block. The remaining teeth in the same quadrant were provided with bridge construction in position 25-27. A year and a half after the therapy, implant 24 exhibited a distinct bone loss in the vertical and horizontal direction, with the subjective symptoms and difficulties.

Ortopantomograph showed vertical bone loss in the area of implants and damage to the root of tooth 25 caused by implant placement 24. CBCT radiographs of the left quadrant of the maxilla confirmed the x-ray findings. Residual roots of tooth 26 were detected on CBCT. During the examination, palpable floating of implants in the field of 24 was found. Before surgery, the bridge connecting 25 and 27 was removed and crowns on the implants were separated. The plan before the start of the operation was the extraction of 25 and 27, the removal of the implant in the area of 24, and exploration and removal of the residual roots of tooth 26. It was decided to make exploration of the implant in the area of 23 using open periimplantitis therapy technique.

**Results:** Intraoperative findings were extensive vestibular and palatal bone loss. Implants 24 was shifted from its place with excavator and explanted. Periodontally compromised teeth 25 and 27 were removed. Location of residual roots according to the images was in



su u vestibularnom i palatinalnom dijelu maksilarne kosti i uklonjeni, bez ulaska u antrum sinusa. Nakon eksploracije u području implantata 23 pronađen je izraziti cirkularni gubitak kosti. Implantat je eksplantiran trepan tehnikom, uz očuvanje palatinalnog zida ležišta. Po završetku je napravljena modelacija koštanog grebena gornje čeljusti. Po cijeljenju koštanog tkiva, isplaniran je i drugi kirurški zahvat augmentacije autolognim koštanim transplantatima radi nadoknade izgubljene alveolarne kosti kao posljedice lošeg planiranja implantato-protetske rehabilitacije i kirurškog zahvata u liječenju nastalih komplikacija.

**Zaključak:** Glavni cilj ovog prikaza slučaja je bio istaknuti važnost pravilnog planiranja terapije, jer i mala pogreška može dovesti do ozbiljnih posljedica.

the maxillary sinus but after exploration they were found in vestibular and palatal part of maxillary bone and removed, without entering the antrum of sinus. After exploration in the area of the implant 23, circular bone loss was detected. Implant was explanted with trepan technique, while preserving the palatal wall of the reservoir. After the healing of bone tissue, it was planned to perform a second surgical procedure with augmentation with autologous bone grafts to compensate for loss of alveolar bone as a result of poor planning implantato-prosthetic rehabilitation.

**Conclusion:** The main goal of this case presentation was to emphasize the importance of proper treatment planning, because even small oversight can lead to serious consequences. .