

## Sažeci Međunarodnog kongresa Hrvatskog stomatološkog društva HLZ-a i 1. Međunarodnog kongresa Hrvatskog društva za minimalno intervencijsku dentalnu medicinu HLZ-a u suorganizaciji Stomatološkog fakulteta Sveučilišta u Zagrebu: „Znanost i umjetnost zajedno“

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### RADIONICE

#### PRIMJENA EVERSTICK VLAKANA

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Tijekom tečaja će se opisati sastav i fizičko-mehanička svojstva everStick vlakana te mogućnost njihove uporabe za izradu mostova u prednjoj i stražnjoj regiji bez preparacije susjednih zuba ili uz minimalno invazivne preparacije te primjena vlakana za izradu fiksnih retainera u ortodontiji. Polaznici će na modelima izraditi kompozitne mostove ojačane staklenim vlaknima i retainere.

### WORKSHOPS

#### APPLICATION OF EVERSTICK FIBERS

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During the workshop, composition and physico-mechanical properties of everStick fibers will be described and the possibilities for fabrication of fiber reinforced bridges in anterior and posterior region without preparation or with minimally invasive preparation of neighbouring teeth or fabrication of fixed orthodontic retainer will be presented. The attendees will fabricate fiber reinforced composite bridges on plaster models as well as fixed orthodontic retainers.

#### RAZLIKE I SLIČNOSTI U ENDODONTSKOJ TERAPIJI KOD DJECE I ODRASLIH

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Tijekom tečaja će se opisati razlike i sličnosti u endodontskoj terapiji kod djece i odraslih uz prikaz različitih postupaka i materijala koji se rabe u suvremenom endodontskom liječenju zuba. Polaznici će na plastičnim blokovima instrumentirati plastične blokove OneShape tehnikom instrumentacije i izraditi individualne estetske kolčiće.

#### DIFFERENCES AND SIMILARITIES OF ENDODONTIC TREATMENT IN CHILDREN AND ADULTS

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During the workshop, differences and similarities of endodontic treatment in children and adults will be explained with presentation of procedures and materials which are used in modern endodontic treatment. The attendees will use rotary OneShape technique for instrumentation of endoblocks and they will learn the technique for fabrication of individually formed aesthetic posts.

## OSNOVE KIRURŠKOG I PROTETSKOG PROTOKOLA ZA BEGO SEMADOS S SUSTAV

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Dentalna implantologija danas definitivno nalazi svoju primjenu u dentalnoj medicini kao potpora protetskoj rehabilitaciji potpunih i parcijalnih bezubosti. Svrha radionice bila je prezentacija kirurškog protokola preparacije ležišta Bego semados implantata te implantacija u zadovoljavajućoj protetskoj poziciji.

## POZVANA PREDAVANJA

### BIOLOŠKI ASPEKTI INSTRUMENTACIJE SAF-OM

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Uvjet uspješnog endodontskog liječenja je temeljito čišćenje i dezinfekcija korijenskih kanala. Tijekom proteklih godina, na tržištu se pojavio veliki broj instrumenata i sustava za obradu endodontskog prostora u svrhu poboljšanja ishoda liječenja. Nedostatak većine tih sustava je nevažavanje kompleksnosti endodontskog prostora i obrada svih kanala kao da su pravilnog, okruglog presjeka. Prije nekoliko godina, predstavljen je sasvim novi koncept instrumentacije korijenskih kanala pod nazivom Self-adjusting file (SAF). Instrument je dizajniran u obliku isprepletene zavojnice sa šupljinom u sredini. Lattice instrumenta prilagođavaju se stijenka kanala te ga obrađuju jednoliko, poštujući anatomske osobitosti svakog pojedinog kanala. Šupljina unutar instrumenta omogućuje ispiranje natrijevim hipokloritom istovremeno s instrumentacijom. Sve to dovodi do potpunijeg čišćenja i dezinfekcije korijenskih kanala, uz maksimalno očuvanje zdravih dijelova dentina. Minimalno invazivni pristup SAF sustava također smanjuje štetne sile koje se inače javljaju tijekom strojne instrumentacije, a dovode do mikrofrakture korijena, što u konačnici može dovesti do vertikalne frakture korijena.

### BIOAKTIVNI MATERIJALI ZA PUNJENJE KORIJENSKOG KANALA

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Punjenje korijenskog kanala predstavlja završnu fazu endodontskog liječenja zuba. Svrha punjenja je hermetički napuniti instrumentirani endodontski 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. U predavanju će, kroz kliničke slučajeve, biti prikazani bioaktivni materijali (Biodentin, MTA, biokeramika).

### DIJAGNOSTIKA I TERAPIJA BOLESTI MEKIH TKIVA USNE ŠUPLJINE

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Mnogi sustavni i lokalni čimbenici mogu izazvati oštećenja na oralnoj sluznici, te je zbog toga potrebno poznavati mehanizme koji u pojedinim prilikama mogu izazvati takve promjene. Neispravnom lokalnom primjenom lijekova i dentalnih materijala na oralnoj sluznici može se izazvati nastanak nekroza, ulceracija, hemoragičnih promjena, pigmentacija, alergijskih reakcija, atrofije. Sustavna uporaba pojedinih lijekova, ali i određene terapije, mogu imati nepoželjne učinke na oralnu sluznicu. Uslijed raznih uporaba pojedinih lijekova, kao i uslijed sustavnog uzimanja više vrsta lijekova, mogu se razviti razni tipovi stomatitisa i drugih oštećenja oralne sluznice. Cilj ovog predavanja je pregledom različitih slučajeva prikazati lokalne i sustavne čimbenike koji mogu imati štetne utjecaje na meka tkiva usne šupljine mogućnosti liječenja.

## BASICS OF SURGICAL AND PROSTHETIC PROTOCOLS OF THE BEGO SEMADOS S SYSTEM

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Dental implantology today definitely has its purpose in dental medicine as support to prosthetic rehabilitation of total and partial toothlessness. The purpose of the workshop was to present a surgical protocol for the preparation of the bearing of the Bego semados implant and the implantation in a convenient prosthetic position.

## LECTURES

### BIOLOGICAL ASPECTS OF SAF INSTRUMENTATION

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The success of endodontic treatment is conditioned by complete cleaning and disinfecting of root canals. A variety of products and systems for the root canal instrumentation appeared on the market in recent years in order to improve treatment outcomes. Shortcomings of most of these systems is a disregard for the complexity of the endodontic system and the treatment of all canals as if they had regular, round cross-section. A few years ago a completely new concept of the root canal instrumentation called Self-adjusting file (SAF) was introduced. The endodontic instrument is designed in the form of wire treads intertwined with an empty space in the middle. Lattice instrument adapts to the walls of the canal and prepares it uniformly respecting the anatomical properties of each individual canal. The hollow inside the instrument allows irrigation with sodium hypochlorite at the same time with instrumentation. All this leads to more efficient cleaning and disinfecting of root canals with maximum preservation of healthy dentin. Minimally invasive approach of SAF system also reduces the harmful forces that would otherwise occur during the classical rotary instrumentation, and lead to microfracture of root's dentin which can ultimately cause a vertical fracture of the tooth.

### BIOACTIVE MATERIALS USED AS ROOT CANAL FILLING

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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 of significant benefits in cementogenic and osteogenic properties. The aim of this lecture is to focus on bioactive materials application in clinical practice.

### DIAGNOSIS AND TREATMENT OF DISEASES OF THE SOFT TISSUES OF THE ORAL CAVITY

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Many systemic and local factors can cause damage to the oral mucosa, and therefore it is necessary to know the mechanisms that in certain circumstances can cause such changes. Improper local administration of drugs and dental materials on the oral mucosa can induce the formation of necrosis, ulceration, hemorrhagic changes, pigmentation, allergic reactions, atrophy. The systematic use of specific drugs and treatment may have some undesirable effects on the oral mucosa. Due to the different use of certain drugs as a result of systematic taking several kinds of medication can develop various types of stomatitis and other oral mucosal damage. The aim of this lecture is reviewing various cases and showing local and systemic factors that may have adverse effects on the soft tissues of the oral cavity and the treatment options.

**AUGMENTACIJSKI POSTUPCI: ODABIR I DOSEG**

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Značajniji gubitak tvrdog i mekog tkiva alveolarnog grebena onemogućuje predvidljivo postavljanje dentalnih implantata u jednoj posjeti. Rekonstrukcija takvih defekata nužan je korak u implantološkoj terapiji. Uporaba augmentacijskih materijala poput autoloških, alogenih, ksenogenih, aloplastičnih i kombiniranih već desetljećima ima čvrste kliničke dokaze. Autologna kost jedinstvena je zbog svoje tkivne podudarnosti i osteogenog potencijala u vidu direktne osteogeneze i osteoindukcije. Augmentacije većih defekata zahtijevaju i veći potencijal biomaterijala, odakle i česta indikacija za blok-augmentacijom s autolognom kosti. U ovom izlaganju prikazane su i uspoređene različite tehnike augmentacije tvrdog i mekog tkiva, predvidljive za rutinsku primjenu u oralnokirurškoj praksi.

**REKONSTRUKCIJA ENDODONTSKI LIJEČENIH ZUBA**

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Restauracija endodontski liječenih zuba predstavlja izazov u svakodnevnoj kliničkoj praksi. Uspjeh endodontskog liječenja ovisi ne samo o kvaliteti punjena korijenskog kanala nego i o odgovarajućoj koronarnoj restauraciji. Tijekom predavanja, objasnit će se biomehaničke promjene tvrdih zubnih tkiva nakon gubitka vitaliteta zuba te estetski i funkcionalni čimbenici restauracija prednjih zuba,

**RESTAURACIJE U ESTETSKOJ ZONI: IZAZOVI I RJEŠENJA**

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Moderna dentalna medicina ima značajnu ulogu u postizanju estetike lica. Pacijenti očekuju od doktora dentalne medicine da im podare lijep i privlačan osmijeh. Međutim, programi tijekom studija dentalne medicine obično ne ostavljaju dovoljno vremena za detaljno proučavanje estetike osmijeha. Proporcije i položaj zuba, slaganje boja, komunikacija između ordinacije i dentalnog laboratorija, važni su čimbenici koji su vrlo često zanemareni u svakodnevnoj kliničkoj praksi. U predavanju će se prikazati, s estetskog aspekta, zahtjevni klinički slučajevi i pokušaj da se postigne zadovoljavajući estetski rezultat. Također će se naglasiti potreba za postizanjem odgovarajućeg anatomske oblika, odgovarajućih proporcija, slaganja boja, dogovor s dentalnim laboratorijem i važnost odabira modernih restaurativnih materijala.

**PRIMJENA LASERA U PEDODONCIJI**

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Primjena lasera u medicini i stomatologiji u liječenju mekotretnih promjena datira iz sedamdesetih godina prošlog stoljeća. Indikacije za primjenu lasera od tada su se proširile, posebno u dječjoj stomatologiji. Rad s djecom podrazumijeva provođenje preventivnih, interceptivnih i terapijskih mjera, u ugodnom okruženju i uz što manje stresa. Američka akademija za dječju stomatologiju prepoznala je 2013. godine opravdanost primjene lasera u liječenju oralnih tkiva dojenčadi, djece i adolescenata, uključujući i osoba s posebnim potrebama. Laseri se primjenjuju u ranoj detekciji karijesa omogućavajući intervencije manjeg opsega, čuvajući na taj način zdravo tvrdo zubno tkivo. Predstavljaju korisnu tehniku preparacije kaviteta u mlječnoj i trajnoj denticiji. Daljnji razvitak koncepta primjene lasera mogao bi doprinijeti potpunom isključenju rotirajućih instrumenata u obradi karijesnih lezija. Osim uklonjanja karijesa, primjena lasera na tvrdim zubnim tkivima ima i druge indikacije. Predtretman zuba laserom povećava učinke lokalne primjene fluorida, a zanimljiva je i primjena u zaštiti fisura i jamica stapanjem kristala hidroksiapatita na okluzalnim površinama. Laseri su se pokazali učinkoviti u terapiji ozljeda zuba. Dobro dekontaminirajuće i baktericidno djelovanje na tkivima čini ih pogodnima za primjenu u liječenju korijenskih kanala. Primjena lasera u oralno-kirurškim intervencijama kod djece pokazala se vrlo uspješnom i lako prihvatljivom za pacijente i osobe koje pacijente prate. Liječenje podrazumijeva smanjenu primjenu lijekova (anestetika, analgetika i antibiotika) i znatno manje krvarenje tkiva za vrijeme i nakon intervencije. Isključuje potrebu za šivanjem rana te stvara dobru podlogu za brže zarastanje rana i manji razvoj ožiljaka. Spomenute prednosti značajne su i u liječenju djece oboljelih od sistemskih bolesti. Laseri omo-

**GRAFTING PROCEDURES: CHOICE AND RANGE**

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Extensive hard and soft tissue defects affecting the edentulous ridge prevent predictable implant placement. Regeneration of such defects is a mandatory step in preprosthetic surgery. After decades of use, autogenous, allogeneic, xenogenous, aloplastic and composite grafts have gathered a respectable amount of clinical support. Autogenous bone remains distinct from others, because of its unique tissue compatibility and osteogenic potential regarding direct osteogenesis and osteoinduction. Grafting procedures in larger defects demand higher biomaterial potential, with autogenous block-grafting often indicated. In this presentation, different hard and soft tissue grafting techniques are shown, with emphasis on those considered predictable for routine use in oral surgery practice.

**RECONSTRUCTION OF ENDODONTICALLY TREATED ANTERIOR TEETH**

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Restoration of endodontically treated teeth represents a challenge for everyday clinical practice. Success of endodontic treatment depends not only on quality of root canal obturation but also on appropriate coronal restoration. During the lecture, biomechanical consideration of hard dental tissues after loss of tooth vitality and integrity will be considered, aesthetic and functional demands of restoration of anterior teeth

**REVISITING THE ESTHETIC ZONE RESTORATIONS: CHALLENGES AND SOLUTIONS**

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Modern dentistry has evolved as a significant entity for cosmetic services. Patients often expect the dentist to be the creator of attractive smiles. The challenge is enormous since the average dental curriculum is too dense to allow in-depth esthetic education and training. Tooth proportions, tooth arrangements, color matching, office-lab communication, etc. are important issues that are often neglected. The lecture includes presentation of challenging clinical cases related to the esthetic zone, and the attempts to create pleasing results. It places emphasis on pleasing anatomical shapes, correct proportions, color-matching techniques, communication with the prosthodontic lab, and comments on the selection of modern restorative materials.

**USE OF LASERS IN PEDODONTICS**

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Use of lasers in medicine and dentistry began in 1970's for soft tissue application. Since then, their use has been broadened to many indications, especially in paediatric dentistry. Preventive, interceptive and therapeutic measures in children need to be performed in comfortable, pleasant and less stressful surroundings. In 2013, the American Academy of Paediatric Dentistry recognized the use of lasers as beneficial for restorative and soft tissue procedures in infants, children, and adolescents, including special needs patients. Lasers allow early caries detection which, combined with minimally invasive preparation and appropriate adhesive material, contribute to preservation of healthy tooth tissues. Laser technique is useful for cavity preparation in primary and permanent teeth. Besides caries removal, lasers have numerous hard dental tissues indications: pretreatment with lasers improves the efficacy of topical fluoride, and their use may be beneficial for pits and fissure sealing, for treatment of traumatic dental injuries, etc. Due to their decontaminating and bactericidal properties, lasers are valuable for root canal treatment. Laser is a proven tool for soft tissue management in children and is well accepted by patients and their parents. When used for oral surgery procedures, lasers allow lesser use of medications (anaesthetics, analgesics and antibiotics), and intraoperative and postoperative bleeding is significantly reduced. Lasers eliminate the need for sutures and produce faster wound healing and less scarring. This is of special importance in children suffering from systemic diseases. Lasers allow optimal preventive and interceptive interventions in both hard and soft tissues, always using minimally invasive approach. It has to be pointed out that adequate education and training have to precede the use of lasers in clinical practice, so the optimal results may be achieved.

gućavaju optimalne preventivne i interseptivne mjere na mekim i tvrdim tkivima, uvijek primjenjujući minimalno invazivne postupke. Neophodno je napomenuti da upotrebi lasera mora prethoditi odgovarajuća edukacija i praktičan rad vezano uz primjenu nove tehnologije. Izbor odgovarajuće vrste lasera, ovisno o terapijskom postupku i tkivu na kojem se primjenjuje, neophodan je da bi se postigli željeni rezultati.

#### **“GUMMY SMILE” – KIRURŠKI I NEKIRURŠKI POSTUPAK**

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Osmijeh je vrlo važan u interakciji s ljudima. Zubi i gingiva određuju lijep osmijeh. Važno je imati zdrava zubna i parodontna tkiva, međutim osmijeh uz vidljivu gingivu, asimetriju zuba i gingive te boja gingive mogu utjecati na bijelu i crvenu estetiku. U predavanju će se opisati kako procijeniti osmijeh i parodontološke tehnike kojima se može postići ljepši osmijeh, uz ili bez kirurških postupaka. Kroz kliničke slučajeve i videa, prikazat će se različiti slučajevi koji su uobičajeni u kliničkoj praksi i koji mogu pomoći u konzervativnoj i protetskoj terapiji.

#### **GUMMY SMILE – SURGICAL OR NONSURGICAL PROCEDURE**

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Smile is very important for relationship with people. Teeth and gums determine a pleasant smile. The first issue is to obtain healthy dental and periodontal tissues, but gummy smiles, teeth and gum asymmetries, gingival color can affect both pink and white aesthetic. The presentation will address smile diagnosis and periodontal techniques used to achieve a more pleasant smile, with or without surgical procedure. Clinical cases and videos will address different situations that are common in clinical practice and will help in conservative and prosthetic treatment.

#### **RANI GUBITAK TRAJNIH ZUBI U FRONTI – KIRURŠKI ASPEKTI**

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Najčešći etiološki faktori gubitka trajnog zuba u fronti kod mlade populacije su povezani s dentalnim i maksilofacijalnim traumama. Zatim slijede genetski čimbenici kao uzroci nedostatka zametka zuba, od kojih su najčešće hipodontije kod djece. Kod mladih pacijenta nerijetko se kao etiološki čimbenik gubitka trajnog zuba u fronti nalazi i upalna podloga, od čega najčešće posljedice endodontskog liječenja i izoliranih resorpcija. Kirurški aspekt zauzima važno mjesto u terapiji, počevši od prezervacije traumatizirane alveole radi kasnije ugradnje dentalnog implantata te preko čitavog niza i spektra različitih tehnika augmentacije alveolarnog grebena koje prethode implantološkoj terapiji.

#### **SURGICAL ASPECTS OF THE EARLY FRONTAL TEETH LOSS**

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The most common etiological factors of loss of permanent teeth in frontal area of the jaw among the younger population are associated with dental and maxillofacial trauma. This is followed by genetic factors which causes the lack of teeth buds, like hypodontia in children. In case of younger patients, etiologic factor for the loss of permanent teeth in front region is inflammation due to endodontic treatment and isolated resorption. Surgical aspect occupies an important place in therapy, starting with the surgical procedure of alveolar ridge preservation after dental trauma for delayed implant placement, and over the whole range and spectrum of different techniques of alveolar ridge augmentation procedures prior to implant therapy.

#### **SMANJENJE KOMPLIKACIJA/ POSTOPERATIVI MORBIDITET NAKON AUGMENTACIJE U PODRUČJU MAKSIILARNOG SINUSA: NOVI MINIMALNO INVAZIVNI PRISTUP**

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Augmentacija kosti u području maksilarnog sinusa je dobro poznata i predvidljiva metoda za povećanje kvalitete i kvantitete atrofične kosti u gornjoj čeljusti u stražnjoj regiji. Ova tehnika se rabi u otprilike 50% slučajeva kada se postavljaju implantati u stražnjem dijelu gornje čeljusti. Ipak, postoji mogućnost komplikacija poput, perforacija dna sinusa, krvarenja, infekcije, migracije zuba, vertigo (u slučaju Summer tehnike zatvorene augmentacije). Za pacijenta je prioritet da nema postoperativnih komplikacija i da to ne utječe na njegove obaveze tijekom vremena oporavka. Stoga, mnogi kliničari pridaju pažnju načinima kako smanjiti postoperativne simptome. U predavanju će se prikazati preoperativna obrada, incidencija komplikacija i mogućnosti terapije. Također će se prikazati inovativni oblik augmentacije, hidraulički sinus lift – iRaise sistem. Također će se obraditi biološki i klinički aspekti komplikacija i postoperativnog oporavka kod pacijenta. Prikazat će se klinički podaci o komplikacijama i stopi uspjeha nakon šest godina kliničkog iskustva. Opisat će se CT nalazi odmah nakon augmentacije i nakon jednog tjedna.

#### **REDUCING COMPLICATIONS / POST OPERATIVE MORBIDITY OF SINUS AUGMENTATION: A NOVEL MINIMALLY INVASIVE APPROACH**

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Maxillary sinus augmentation is a well-known and predictable treatment choice intended to augment bone quantity and quality of the atrophic posterior maxilla. The procedure is used in about 50% of the cases of implants inserted in the posterior maxilla. Nevertheless, the procedure is not exempt from operative and postoperative difficulties such as the need for a complex surgical technic, perforation of the Schneiderian membrane, extreme bleeding, infection of the grafted sinus, migration of implants into the sinus cavity, vertigo (in case of Summer's technique for closed sinus augmentation). Patient's main priority is the immediate post-operative morbidity and implications on their quality of life during the recuperation phase. Consequently many clinicians pay attention to ways, which can ease and minimize patient's postoperative symptoms. The presentation will review preoperative considerations, complication rates and treatment options in varied sinus lift situations. Additionally, an innovative approach for hydraulic sinus augmentation – the iRaise system – will be presented. The biological and clinical aspects, as related to both complications and post-operative patient experience, will be reviewed. Clinical data regarding complications and success rates will be presented, summarizing 6 years of clinical experience with the system. CT scans radiological findings following maxillary sinus augmentation the immediate and early (up to one week) using a minimally invasive implant device will be described

#### **DEFINICIJA, ETIOLOGIJA, PREVENCIJA I TRETAMN PERIIMPLANTITISA**

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Gubitak zuba konačna je posljedica akumulacije biofilma i posljedičnih patoloških procesa koji se odvijaju na tvrdim i mekim tkivima. Usprkos i endodontalnoj i parodontalnoj terapiji, posebice kod kombiniranih lezija endodonta i parodonta, ekstrakcija „uspješno“ liječenih zuba iznenađuje pacijente te ih dovodi pred veliku odluku o načinu nadomještanja izgubljenog zuba. Ugradnja implantata nerijetko se nameće kao optimalan izbor, no umjetni korijen ne znači i prestanak borbe protiv biofilma. U ovom predavanju bit

#### **DEFINITION, ETIOLOGY, PREVENTION AND TREATMENT OF PERIIMPLANTITIS**

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Tooth loss is the final consequence of biofilm accumulation and subsequent pathological processes in hard and soft tissues. Despite endodontic and periodontal therapy, especially in combined lesions, extraction of “successfully” treated teeth is often a surprise for patients that confronts them with the difficult task of choosing the optimal treatment option. Implant placement is often the best choice, but an artificial root does not represent the end of the struggle against the biofilm. This lecture aims to present definitions, and



će prikazane definicije, te suvremene, na znanstvenim dokazima utemeljene, smjernice u kontroli biofilma i infekcije oko implantata. Bit će govora o optimalnoj oralnoj higijeni za pacijente s implantatima, rasporedu njihovih profesionalnih kontrola, strategiji liječenja periimplantatnih infekcija te opravdanosti upotrebe antibiotika u liječenju težih oblika periimplantitisa. Slušaatelji će biti u mogućnosti većinu tih postupaka odmah uključiti u svoj svakodnevni rad.

current, evidence-based, guidelines on biofilm control and control of the inflammation around implants. Optimal oral hygiene for patients with implants, recall schedules and strategy of periimplantitis treatment are going to be discussed, as well as the validity of antibiotic use in the treatment of advanced cases. Most of the presented strategies might be applied into everyday working practice.

## POSTERSKE PREZENTACIJE ZNANSTVENI SAŽECI

### ANTIBAKTERIJSKI UČINAK MATERIJALA ZA PUNJENJE KORIJENSKIH KANALA

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Uvod: Mikroorganizmi i njihovi produkti najčešći su etiološki čimbenici u pulpnoj i periapikalnoj patologiji. Dobra mehanička i kemijska obrada korijenskih kanala važne su u uklanjanju nekrotičnog tkiva i bakterija. Nakon što su kanali obrađeni, potrebno ih je napuniti materijalima koji će zabrtviti cijeli endodontski prostor i spriječiti reinfekciju. Bakterije koje se nalaze na površini dentinskih tubula korijenskih kanala lako se odstranjuju mehaničkom obradom za razliku od onih koje su se nastanile u dubljim dijelovima dentinskih tubula. Zato je antibakterijski učinak materijala za punjenje ključan u uklanjanju preostalih mikroorganizama te sprječavanju njihovog ponovnog rasta. Svrha ovog rada bila je ispitati antibakterijski učinak MTA, Endosequence, AH Plus i Endo N2 materijala za punjenje korijenskih kanala na bakterije *Streptococcus mitis* i *Streptococcus oralis*.

Materijali i postupci: Za ispitivanje antibakterijskog učinka MTA, Endosequence, AH Plus i Endo N2 materijala na bakterije *Streptococcus mitis* i *Streptococcus oralis* korištena su dva testa: test difuzije u agaru (ADT) i test izravnog dodira (DCT). Kod ADT-a, suspenzija svake bakterijske vrste nanesena je na površinu krvnog agara, gdje su potom dodani materijali za punjenje korijenskih kanala. Nakon inkubacije od 24 h, izmjeren je promjer zone inhibicije rasta oko svakog materijala. Kod DCT-a u zdence su postavljeni materijali na koje su dodane mikrobne suspenzije. Nakon 1 sata, u svaki je zdenac dodan BHI bujon te su uzorci inkubirani tijekom 1, 6, 20 i 24 sata. Pri završetku svakog vremenskog razdoblja, napravljena su razrjeđenja koja su nasadena na krvni agar te je sljedeći dan određen broj bakterijskih kolonija (CFU/ml).

Rezultati: Najveći antibakterijski utjecaj na *Streptococcus mitis*, prema ADT-u, imao je Endo N2, uz širinu zone inhibicije rasta od 15 mm. Na *Streptococcus oralis* najveći je antibakterijski utjecaj imao Endosequence, uz širinu zone inhibicije rasta od 14 mm. DCT-om najveći je antibakterijski utjecaj na *Streptococcus mitis* pokazao AH Plus kod kojeg je nakon inkubacijskog razdoblja od 24 sata broj bakterija bio  $1.45 \times 10^6$ . Najveći antibakterijski utjecaj na *Streptococcus oralis* imao je MTA s brojem bakterija, nakon inkubacijskog razdoblja od 24 sata,  $1.89 \times 10^2$ .

Zaključak: Najveću zonu inhibicije rasta ispitivanih bakterija pokazali su Endosequence i Endo N2. Kod DCT-a, za *Streptococcus mitis*, AH Plus i MTA pokazali su se djelotvornijim u usporedbi s Endosequence i Endo N2 materijalima, dok je najbolji antimikrobni učinak na *Streptococcus oralis* postignut MTA materijalom.

### ČVRSTOĆA SVEZIVANJA KALCIJ SILIKATNIH MATERIJALA ZA RETROGRADNO PUNJENJE KORIJENSKIH KANALA U ULTRAZVUČNO IZRAĐENIM KAVITETIMA

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Uvod: Utvrditi "push-out" čvrstoću svezivanja za dentin i način loma, tri materijala za retrogradno punjenje temeljena na kalcij-silikatu nakon ultrazvučne izrade retrogradnih kaviteta. Materijali i postupci: Korijenski kanali 30 izvađenih, jednokorijenskih humanih, trajnih

## POSTER PRESENTATIONS SCIENTIFIC ABSTRACTS

### ANTIBACTERIAL EFFECT OF ROOT CANAL FILLING MATERIALS

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Introduction: Microorganisms and their products are the most common etiologic factors in pulpal and periapical pathology. Good mechanical and chemical preparation of root canals are important for the removal of necrotic tissue and bacteria. Once the root canals are instrumented, root canal filling is performed using materials which will seal the entire endodontic space and prevent reinfection. The bacteria that are found on the surface of the dentinal tubules of the root canal are removed more easily by mechanical treatment than those found in the deeper parts of the dentinal tubules. Therefore, the antibacterial effect of root canal filling materials is essential to eliminate the remaining microorganisms and prevent their regrowth. The aim of this study was to examine the antibacterial effect of MTA, Endosequence, AH Plus and Endo N2 root canal filling materials, on *Streptococcus mitis* and *Streptococcus oralis*.

Materials and methods: For testing of the antibacterial effect of MTA, Endosequence, AH Plus and Endo N2, on *Streptococcus mitis* and *Streptococcus oralis*, two tests were used: agar diffusion test (ADT) and direct contact test (DCT). For ADT, a suspension of each bacteria was applied onto the surface of the blood agar plate and the root canal filling materials were added. After 24 h of incubation, the diameter of growth inhibition zone around each of the materials was measured. For DCT, materials were placed into the wells, and microbial suspensions were added. After one hour, BHI broth was added into each of the wells. Subsequently, the samples were incubated for 1, 6, 20 and 24 hours. Then, dilutions, plated on blood agar, were made after each incubation period. The number of bacterial colonies (CFU/ml) was determined the next day.

Results: According to ADT, Endo N2 had the most pronounced antibacterial effect on *Streptococcus mitis*, with a zone width of 15 mm, while Endosequence exhibited the best antibacterial effect on *Streptococcus oralis*, with a zone width of 14 mm. For DCT, AH Plus had a major antibacterial effect on *Streptococcus mitis*, with, after 24h of incubation, the number of bacteria  $1.45 \times 10^6$ . As for *Streptococcus oralis*, the greatest antibacterial effect was seen for MTA, after the same time period, with the number of bacteria  $1.89 \times 10^2$ .

Conclusion: Endosequence and Endo N2 exhibited the largest growth inhibition zone of the bacteria examined. For DCT, AH Plus and MTA were more efficient on *Streptococcus mitis* compared to Endosequence and Endo N2, while MTA had the best antibacterial effect on *Streptococcus oralis*.

### BOND STRENGTH OF CALCIUM SILICATE BASED ROOT-END FILLING MATERIALS AFTER ULTRASONIC RETROGRADE CAVITY PREPARATION

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Introduction: To evaluate push-out bond strength and failure mode of three calcium silicate-based root-end filling materials to dentine after ultrasonic retrograde cavity preparation.

Materials and methods: The root canals of thirty single-rooted extracted human teeth

zubi endodontski su obrađeni. Svaki korijen apikalno je skraćen za 3 mm nakon čega su ultrazvučnim nastavkom izrađeni retrogradni kaviteti dubine 3 mm. Zubi su nasumičnim odabirom podijeljeni u tri skupine (n = 10) ovisno o korištenom materijalu za retrogradno punjenje: 1) Micro-Mega mineralni trioksid agregat (MM-MTA), 2) Biodentin i 3) TotalFill materijal za reparaciju korijena (TotalFill RRM). Mikro "push-out" test izveden je pomoću univerzalnog uređaja za testiranje, dok se način loma analizirao stereomikroskopom. Za statističku analizu podataka, korišteni su jednosmjerna analiza varijance ANOVA i Tukey-Kramer HSD post-hoc testovi ( $p < 0,05$ ).

Rezultati: TotalFill RRM pokazao je najveću čvrstoću svezivanja od  $13,44 \pm 2,62$  MPa koja je bila statistički značajno različita u usporedbi s čvrstoćom svezivanja Biodentina i MM-MTA ( $p < 0,05$ ). Čvrstoća svezivanja Biodentina iznosila je  $8,93 \pm 2,62$ , dok je za MM-MTA iznosila  $8,40 \pm 2,78$ , bez statistički značajne razlike među njima ( $p > 0,05$ ). MM-MTA pokazao je samo adhezivni i miješani način loma. Biodentine i TotalFill RRM pokazali su pretežno miješane načine loma, iako su također imali i adhezivnih i kohezivnih lomova.

Zaključak: TotalFill RRM pokazao je veću čvrstoću svezivanja u usporedbi s Biodentinom i MM-MTA.

#### UTJECAJ PJSKARENJA POVRŠINE ABATMENTA IZRADENIH OD CIRKONIJEVA OKSIDA NA KVALITETU VEZE KOMPOZITNOG CEMENTA

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Uvod: Izrada nadomjestaka nošenih implantnim nosačima u frontalnoj regiji, zbog visokih estetskih standarda i problema vezanih s tankim biotipom gingive, često zahtijeva uporabu estetski zadovoljavajućih materijala, kao što je cirkonijev oksid. Iako posjeduje izuzetna mehanička svojstva, s druge strane izrazito kompaktna struktura cirkonijeva oksida onemogućava njezinu pripremu jetkanjem kiselinama i otežava vezu s drugim materijalima, uključujući i materijale za cementiranje.

Materijali i postupci: U istraživanju je korišteno 30 eksperimentalnih modela koje su činili kompleksni implant replike tvrtke Nobel Biocare, s abatmentom i nadoknadom izrađenom od cirkonijeve keramike. Uzorci su podijeljeni u tri eksperimentalne skupine od po 10 uzoraka: 1. skupina - netretirani abatmenti; 2. skupina - abatmenti pjeskareni česticama  $Al_2O_3$  veličine 50 mikrona, te 3. skupina - abatmenti pjeskareni česticama  $Al_2O_3$  veličine 250 mikrona. Nadomjesci su na abatmente cementirani kompozitnim cementom GC LINK Ace, GC Japan. Svi uzorci su pohranjeni u uvjetima apsolutne vlage, na temperaturi od 37 stupnjeva tijekom 24 sata nakon čega je izvršeno mjerenje inicijalne retencijske sile u Univerzalnoj mašini za kidanje.

Rezultati: Mann-Whitney U test je pokazao statistički značajnu razliku između vrijednosti retencijske sile svih ispitivanih skupina. Vrijednosti retencijske sile uzoraka s nepjeskarenim abatmentima statistički su značajno manje ( $p < 0,05$ ) u odnosu na uzorke s pjeskarenim abatmentima. Statistički značajno manje vrijednosti pokazuju i uzorci pjeskareni česticama veličine 50 mikrona u odnosu na uzorke tretirane česticama veličine 250 mikrona ( $p < 0,05$ ). Najviša je retencijska sila zabilježena kod uzoraka pjeskarenih česticama  $Al_2O_3$  veličine 250 mikrona ( $4,25 \pm 1,15$  MPa), slijede ga uzorci pjeskareni česticama  $Al_2O_3$  veličine 50 mikrona ( $3,43 \pm 1,18$  MPa). Najmanju retencijsku silu pokazuje grupa s nepjeskarenim uzorcima ( $2,22 \pm 0,56$  MPa).

Zaključak: Formiranje mikroretencijske površine cirkonijeva oksida pjeskarenjem znakovito povećava retencijsku silu kojom je nadomjestak vezan za abatment. S povećanjem veličine čestica upotrijebljenih za pjeskarenje raste retencijska sila. Potreban je oprez pri tumačenju rezultata zbog mogućeg slabljenja materijala velikom granulacijom čestica za pjeskarenje. Dalja ispitivanja trebaju ići u pravcu definiranja veličine čestica i kontrole dobivanja željene retencije.

#### ISTRAŽIVANJE RAZLIKE POLOŽAJA OKLUZIJE CENTRIČNE RELACIJE I RETRUDIRANOG KONTAKTNOG POLOŽAJA

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Uvod: Svrha ovog istraživanja je istražiti povezanost odstupanja između retrudiranog kontaktnog položaja (RKP) i okluzije centrične relacije (OCR) na razini kondila donje čeljusti.

Materijali i postupci: Istraživanje je uključilo dvadeset potpuno ozubljenih ispitanika (prosječna godina  $24,4 \pm 1,2$ ). Sva mjerenja kondilarnih položaja su rađena ultrazvučnim uređajem za snimanje kretanja donje čeljusti na temelju šest stupnjeva slobode. OCR odre-

were endodontically treated, the apical 3 mm of each root was resected, and 3 mm root-end preparations were made using an ultrasonic tip. These teeth were randomly divided into three groups (n = 10) according to the root-end filling material used: 1) Micro-Mega mineral trioxide aggregate (MM-MTA), 2) Biodentine, and 3) TotalFill root repair material (RRM). The micro push-out test was performed using a universal testing machine, and the failure mode was analyzed using a stereomicroscope. The data were statistically analyzed using the one-way ANOVA and Tukey-Kramer HSD post-hoc tests ( $p < 0.05$ ). Results: The TotalFill RRM had the highest bond strength of  $13.44 \pm 2.62$  MPa, which was significantly different when compared to the Biodentine and MM-MTA ( $p < 0.05$ ). The Biodentine and MM-MTA had bond strengths of  $8.93 \pm 2.62$  and  $8.40 \pm 2.78$ , respectively, with no significant difference between them ( $p > 0.05$ ). The MM-MTA showed only adhesive and mixed types of failures. The Biodentine and TotalFill RRM showed predominantly mixed types of failures, but also had adhesive and cohesive types present. Conclusion: The TotalFill RRM showed a higher bond strength when compared to the Biodentine and MM-MTA.

#### INFLUENCE OF ZIRCONIA ABUTMENTS SURFACE SANBLASTING TREATMENT ON SHEAR BOND STRENGTH OF RESIN CEMENT

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Introduction: Due to high aesthetic standards and problems related to thin gingiva biotype, the production of implant supported fixed dental prosthesis in the frontal region often requires the use of adequate esthetic materials such as zirconium ceramic. Although it has excellent mechanical features, the extremely compact structure of zirconia hinders its preparation by acid etching and makes connection with other materials difficult, including the materials for cementation.

Materials and methods: In this study we used 30 experimental models that consisted of complex implant replicas of company Nobel Biocare, with zirconia abutment and zirconia-based all-ceramic crown. The samples were divided into three experimental groups of 10 each: 1<sup>st</sup> group - untreated abutment; 2<sup>nd</sup> group - abutment sandblasted with  $Al_2O_3$  particles 50 microns in size, and 3<sup>rd</sup> group - abutment sandblasted with  $Al_2O_3$  particles 250 microns in size. Crowns were cemented on the abutments with resin cement GC LINK Ace, GC Japan. All samples were stored for 24 hours under the conditions of absolute humidity at the temperature of 37°C, whereupon the initial shear bond strength was measured in the universal testing machine.

Results: Mann-Whitney U test showed a statistically significant difference between the values of the retention force of all the tested groups. The values of retention of samples without sandblasting were statistically significantly lower ( $p < 0.05$ ) compared to the samples with sandblasted abutments. Significantly lower values were obtained in the group of samples sandblasted with 50-microns particles in comparison to the samples treated with 250-micron particles ( $p < 0.05$ ). The highest shear bond strength was observed in the samples sandblasted with  $Al_2O_3$  particles the size of 250 microns ( $4.25 \pm 1.15$  MPa), followed by the samples sandblasted with 50-micron  $Al_2O_3$  particles ( $3.43 \pm 1.18$  MPa). The lowest shear bond strength was measured in the untreated control group ( $2.22 \pm 0.56$  MPa).

Conclusion: Formation of the micro-retention surface of zirconium by sandblasting significantly increases the retention force by which the crown is fixed to the abutment. The retention force increases with the increase in the size of the particles used for sandblasting. However, caution is advised while interpreting the results because of a potential weakening of the material by large granulation of the sandblasting particles. Further tests should aim to define the particle size and to test the wanted retention.

#### INVESTIGATION OF THE DIFFERENCE BETWEEN RETRUDDED CONTACT POSITION AND CENTRIC OCCLUSION

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Introduction: The purpose of this study was to investigate the difference between retruded contact position (RCP) and centric occlusion (OCR) at the level of mandibular condyles. Materials and methods: Study included 20 completely dentate participants (average  $24.4 \pm 1.2$  years). All recordings of the condylar deviations were measured with the use of the ultrasound jaw tracking device with six degrees of freedom. OCR was determined using active method of centric relation recording (participants were trained to stationary hinge

đena je aktivnom metodom određivanja centrične relacije (ispitanici su uvježbani šarnirsku kretanju uz zadržavanje položaja donje čeljusti na prvom zubnom dodiru/dodirima). RKP određen je pasivnom metodom određivanja centrične relacije (metodom vođenja brade). Pomoću uređaja za snimanje kretanja donje čeljusti, registrirana su odstupanja RKP i OCR prema referentnom položaju habitualne okluzije za lijevi i desni kondil na razini x (antero – posteriorne), y (vertikalne) i z (lateralne) osi. Iz vrijednosti Kartezijevog koordinatnog sustava utvrđena su linearna odstupanja RKP i OCR prema referentnom položaju (habitualna okluzija). Izračunata je deskriptivna statistika te su vrijednosti odstupanja RKP i OCR usporedene T testom zavisnih uzoraka.

Rezultati: Prosječna linearna vrijednost odstupanja kondila kod položaja OCR iznosila je  $1,30 \pm 1,14$  mm dok je kod RKP iznosila  $2,13 \pm 1,89$  mm. T testom za zavisne uzorke je utvrđena statistički značajna razlika između linearnih vrijednosti odstupanja položaja OCR i RKP.

Zaključak: Postoji razlika u položaju kondila unutar temporomandibularnog zgloba kod određivanja centrične relacije aktivnim i pasivnim metodama. OCR i RKP se mogu promatrati kao zasebni okluzijski položaji.

#### POLOŽAJ MANDIBULARNOG KONDILA KOD STABILIZACIJSKIH UDLAGA RAZLIČITE DEBLJINE

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Uvod: Stabilizacijske udloge su najčešći oblik terapije temporomandibularnih poremećaja. Mehanizam djelovanja udloga tijekom njihovog nošenja još uvijek je kontroverzan. Svrha ovog rada je utvrditi položaj mandibularnog kondila prilikom nošenja stabilizacijske udloge različite debljine.

Materijali i postupci: Istraživanje je uključilo 10 potpuno ozubljenih ispitanika (prosječna godina 23,8, 70 % žena, 30 % muških ispitanika), bez temporomandibularnih poremećaja. Svakom ispitaniku su napravljene po dvije akrilatne stabilizacijske udloge („Michigan splint“). Prva udloga je napravljena na visini od 1 mm u prostoru molara, dok je druga udloga napravljena na položaju 3 mm višem od prve udloge (gledano na razini incizalnog kolčića artikulatora). Mjerenja položaja lijevog i desnog kondila kod udloga izvedena su pomoću ultrazvučnog uređaja za snimanje kretanja donje čeljusti na temelju šest stupnjeva slobode. Nakon što se pričvrstila paraokluzijska žlica i namjestio obrazni luk uređaja, udloge su vraćene u usta. Izmjerena su odstupanja lijevog i desnog kondila u položaju okluzije udloga naspram referentnog položaja habitualne okluzije: na razini antero – posteriorne (x), vertikalne (y) i lateralne (z) osi. Iz vrijednosti Kartezijevog koordinatnog sustava, izračunate su linearne vrijednosti odstupanja udloga od položaja habitualne okluzije te su podatci statistički analizirani.

Rezultati: Linearna udaljenost između položaja habitualne okluzije i okluzije stabilizacijske udloge visine 1 mm na području molara iznosila je prosječno  $2,04 \pm 1,18$  mm, dok je kod druge udloge (+ 3 mm na razini incizalnog kolčića artikulatora) iznosila prosječno  $2,32 \pm 1,24$  mm. T testom nezavisnih uzoraka nije utvrđena statistički značajna razlika u vrijednostima odstupanja x, y, z osi niti u linearnim vrijednostima odstupanja između udloga različite debljine.

Zaključak: Podizanjem visine udloge ne mijenja se značajno položaj kondila unutar temporomandibularnog zgloba, te se kod „deblje“ stabilizacijske udloge ne može očekivati veća distrakcija unutar zgloba kod zdravih ispitanika.

#### UČINKOVITOST AKUPUNKTURE I VITAMINA C U LIJEČENJU SINDROMA PEKUĆIH USTA – PILOT STUDIJA

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Uvod: Sindrom pekućih usta (SPU) kroničan je oblik orofacijalne boli karakteriziran simptomima žarenja u usnoj šupljini. Učinkovitost dostupnih metoda liječenja, izuzev klonazepam i kognitivne bihevioralne terapije, je kontradiktorna, stoga su iskušane nove metode liječenja.

Materijali i postupci: Istraživanje je provedeno na 41 ispitaniku (37 žena i 5 muškaraca)

and to maintain the position of the lower jaw at the first tooth contact/contacts). RKP was determined with passive method of centric relation recording (chin point guidance method). RKP and OCR deviations to the reference position (habitual occlusion) were recorded with the use of the jaw tracking device at the level of x (anterior – posterior), y (vertical) and z (lateral) axis. From the values of the Cartesian coordinate system, linear RKP and OCR deviations were measured (with respect to the habitual occlusion). Descriptive statistics were calculated, and the RKP and OCR deviation values were compared using dependent sample T test.

Results: Average linear condylar deviation values for the OCR were  $1,30 \pm 1,14$  mm, and  $2,13 \pm 1,89$  mm for the RKP. Dependent sample T test showed statistically significant difference between RKP and OCR linear deviation values.

Conclusion: There is a difference in the position of the condyle within temporomandibular joint with passive or active centric relation recording methods. OCR and RKP can be observed as different occlusal positions.

#### CONDYLAR POSITION WITH STABILIZATION SPLINTS OF DIFFERENT THICKNESSES

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Introduction: Stabilization splints are the most common form of therapy for temporomandibular disorders. Splint mechanisms based on relief of signs and symptoms of temporomandibular disorders are still controversial. The purpose of this study was to determine position of mandibular condyles during wearing of stabilization (Michigan) splints the different thicknesses.

Materials and methods: Study included 10 completely dentate participants (average age of 23,8 years, 70 % female, 30 % male participants), without temporomandibular disorders. Two Michigan splints were made for each participant. First splint was made at required height of 1 mm at molar area, while the second splint was made 3 mm higher than the first splint (at incisal pin of the articulator). Measurements of the position of the right and left condyles during wearing of the splints were done using ultrasound jaw tracking device with six degrees of freedom. After paraocclusal tray and facebow were fixed, splints were returned in the mouth. Right and left condylar deviations between occlusion with splints and reference position (habitual occlusion) were measured: at anterior – posterior (x), vertical (y) and lateral (z) axis. From the values of the Cartesian coordinate system, linear deviations between splints and habitual occlusion were calculated and the data were statistically analyzed.

Results: Linear deviations between the habitual occlusion and occlusion with Michigan splint made at required height of 1 mm at molar area were on average  $2,04 \pm 1,18$  mm, while for Michigan splint made 3 mm higher than the first splint were  $2,32 \pm 1,24$  mm. Independent sample T test did not confirmed statistically significant difference for deviation values of the x, y, z axis nor for linear deviation values between the splints of different thickness.

Conclusion: Raising Michigan splint height does not change significantly the position of the condyle within temporomandibular joint. With „thicker“ Michigan splint higher condylar distraction in the temporomandibular joint of healthy participants can not be expected.

#### EFFICACY OF ACUPUNCTURE AND VITAMIN C IN BURNING MOUTH SYNDROME-A PILOT STUDY

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Introduction: Burning mouth syndrome (BMS) is a chronic type of orofacial pain characterized by burning symptoms in the oral cavity. The available treatment efficacy, except for clonazepam and cognitive behavioural therapy, are contradictory, therefore, new treatment options are searched.

Materials and methods: Forty one patients (37 women and 5 men) were enrolled in the



koji su randomizacijom podijeljeni u dvije skupine, akupunktura i vitamin C grupa. Za simptome žarenja u usnoj šupljini akupunktura je provedena na 21 ispitaniku (2 muškarca i 19 žena), dok je kod drugih ispitanika (ukupno 21: 3 muškarca i 18 žena) primijenjen vitamin C. Akupunktura je provedena tijekom 4 tjedna u rasporedu od 3 puta tjedno po pola sata, na mjestima ST8, GB2, TE21, SI19, SI18 i LI4 bilateralno, kao i na GV20 u središnjoj liniji. Vitamin C je ordiniran u dozi od 1 mg nakon ručka. Prije i mjesec dana nakon terapije, ispitanici su ispunjavali upitnike: vizualno analogni skala (VAS), STAI, Hamilton i OHIP-CRO 14. Statistička analiza provedena je pomoću Student t-testa uz statističku značajnost  $p < 0,05$ .

Rezultati: Upotreba akupunkture pokazala je statistički značajno smanjenje vrijednosti svih provedenih testova u bolesnika sa SPU (STAI,  $p = 0,021$ ; OHIP-14,  $p = 0,029$ ; Hamilton,  $p = 0,037$ ; VAS,  $p = 0,041$ ). Primjena vitamina C pokazala je djelomično smanjenje vrijednosti svih provedenih testova, međutim rezultati nisu bili statistički značajni (STAI,  $p = 0,056$ ; OHIP-14,  $p = 0,061$ ; Hamilton,  $p = 0,059$ ; VAS,  $p = 0,067$ ).

Zaključak: Rezultati ovog istraživanja pokazali su kako je primjena akupunkture u bolesnika sa SPU učinkovita, dok je upotreba vitamina C samo djelomično smanjila simptome pečenja, ali bez statističke značajnosti.

study and randomized in two groups, acupuncture and vitamin C group. Twenty-one patients received acupuncture (2 men and 19 women), and other patients (21 in total: 3 men and 18 women) received vitamin C for treatment of burning symptoms. Acupuncture was performed over 4 weeks, 3 times per week, on points ST8, GB2, TE21, SI19, SI18 and LI4 bilaterally as well as GV20 in the midline, each session lasting half an hour. Vitamin C was given in a dose of 1 mg to be taken after lunch. Prior to and 1 month after either therapy, participants completed questionnaires: visual analogue scale, STAI, Hamilton and OHIP-CRO 14. Statistical analysis was performed using Student t test and significance was set at  $p < 0.05$ .

Results: Acupuncture was efficient in patients with BMS (STAI  $p=0.021$ ; OHIP-14  $p=0.029$ ; Hamilton  $p=0.037$ ; VAS  $p=0.041$ ). Vitamin C partially decreased values of all performed tests, but results were not statistically significant (STAI  $p=0.056$ ; OHIP-14  $p=0.061$ ; Hamilton  $p=0.059$ ; VAS  $p=0.067$ ).

Conclusion: The results of this study showed that acupuncture was efficient in patients with BMS, however, vitamin C only partially decreased results of all performed tests, however without statistically significant difference.

#### MINIMALNO INVAZIVNA TEHNIKA OČUVANJA STABILNOSTI PERIIMPLANTNIH MEKIH TKIVA KOD IMEDIJATNE IMPLANTACIJE – KLINIČKA STUDIJA

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Uvod: Alveolarni greben prednje maksile najčešće se sastoji od tanke i savitljive labijalne kortikalne stijenke i deblje palatinalne stijenke. Neizbježna posljedica gubitka zuba je i resorpcija kosti koja u prvoj godini gubitka zuba iznosi 3 – 4 mm visine kosti. Naravno, sve navedeno ima značajan utjecaj na estetski ishod implantoprotetskog rada. „Socket shield“ tehniku 2010. godine predstavili su Hürzeler i suradnici, a koristi se kod imedijatne implantacije u svrhu očuvanja bukalne stijenke kosti i arhitekture mekih tkiva. Izvodi se tako da se tijekom ekstrakcije zuba ostavlja njegov bukalni korijen s očuvanim parodontnim ligamentom, a sam implantant postavlja se palatinalnije, najbolje u izravnom kontaktu s bukalnim ostatkom korijena. Tehnika djelomičnog očuvanja korijena zuba (Socket-shield) već je znanstveno i klinički potvrđena tehnika očuvanja bukalne kosti i gingivalnih tkiva kada se pristupa imedijatnoj implantoprotetskoj terapiji. Vođeni tom idejom, željeli smo na seriji slučajeva pokazati kliničke smjernice i indikacije kada se odlučiti na navedeni pristup.

Materijali i postupci: Na Zavodu za oralnu kirurgiju odabrani su pacijenti koji su željeli implantoprotetsko rješenje u prednjoj regiji, a imali su problem sa zubom koji je zahtijevao ekstrakciju istog i imedijatnu nadoknadu. Pacijenti su podijeljeni u skupine prema kliničkom nalazu odnosno indikaciji u:

1. Postendodontska uzdužna fraktura korijena koja je povoljna u smislu frakturne linije za očuvanje bukalnog dijela korijena zuba i imedijatnu implantaciju;
2. Postendodontska submarginalna fraktura krune zuba kada pacijent odbija ortodontsku ekstruziju;
3. Fraktura krune vitalnog zuba ispod razine marginalne kosti, pacijent ne želi ortodontsko liječenje i konzervativnu sanaciju.

U svakoj skupini je bilo po 5 pacijenata. Kod svih pacijenata je učinjena djelomična resekcija preostalog korijena uz očuvanje bukalnog dijela istog u razini bukalne kosti. Nakon resekcije isprepariralo se ležište za implantat koje je bilo palatinalnije u odnosu na zaostali dio korijena. Prije postavljanja implantata, preostali dio korijena zuba je prema Emdogain (Strazmann, Basel, Švicarska) gelom. Zatim se napravila imedijatna krunica koja je bila disokludirana. Za 4 mjeseca se pristupilo izradi trajnog implantoprotetskog nadomjestka. Kontrolne rtg snimke su napravljene 6 mjeseci nakon definitivne operacije. Rezultati: Pacijenti nisu imali komplikacije nakon kirurškog zahvata. Imedijatne krunice su zamijenjene trajnima nakon 4 mjeseca. Konture mekih tkiva su očuvane u svim slučajevima, uključujući i bukalnu kost. U razdoblju od 6 mjeseci, nije bilo bioloških ili mehaničkih komplikacija.

Zaključak: Očuvanjem bukalnog aspekta korijena pri imedijatnoj implantaciji moguć je postići predvidljivi i stabilni estetski rezultat uz očuvanje bukalne kosti i razine mekih tkiva. Pri odabiru je bitno poštovati smjernice i indikacije za navedenu tehniku.

#### MINIMALLY INVASIVE TECHNIQUE FOR PRESERVATION OF STABLE PERIIMPLANT SOFT TISSUES AFTER IMMEDIATE IMPLANT PLACEMENT – A CLINICAL STUDY

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Introduction: Alveolar bone of frontal maxilla is consisted of thin and flexible cortical bone wall and thicker palatal wall bone. Inevitable consequence of tooth loss is bone resorption, usually 3-4 mm of alveolar bone height in the first year after tooth loss. All written above, has a huge influence on esthetic outcome of implant prosthetic work. Socket shield technique, introduced by Hürzeler and associates in year 2010., is used at immediate implantation in order to preserve buccal wall bone and soft tissues. During tooth extraction, buccal root with periodontal ligament should be left in alveola and implant is inserted little bit towards palatal wall bone, in direct contact with buccal part of the root. The aim of this clinical study was to investigate clinical success of the socket shield technique and to evaluate its outcome on the esthetics of the final prosthetic rehabilitation.

Materials and methods: This clinical study enrolled 15 patients at Department of Oral Surgery with strong indication for tooth extraction in the frontal part of the maxilla. Patients were divided according to clinical indications:

1. Postendodontic horizontal tooth fracture where the fracture line enables preservation of buccal tooth root and immediate implant placement;
2. Postendodontic submarginal fracture when patient rejects orthodontic tooth extrusion;
3. Crown fracture of vital tooth beyond the marginal bone surface, but patient is not willing to have orthodontic therapy or conservative treatment.

Each group consisted of 5 patients. Partial resection of palatal root was performed in each patient in order to preserve buccal root as well as buccal bone wall. After resection alveolar bed for implant, located more palatal regarding the buccal root left in alveola, was prepared. Before implant was inserted, a buccal root was covered with Emdogain gel (Strazmann, Basel, Switzerland). After the described procedure, immediate crown was fabricated following non-functional loading concept. After 4 months a permanent implant prosthetic substitute was made, while x-ray analysis was made after 6 months.

Results: Patients did not have any kind of complications after surgery. Immediate crowns were replaced with permanent tooth crowns after 4 months. Soft tissue contours were preserved in all cases, as well as buccal bone wall was preserved. In a period of following 6 months, there were no biological or mechanical complications.

Conclusion: With buccal bone wall preservation as well as a preservation of gingival tissue using technique of immediate implant placement, very good esthetic results were achieved. When deciding which patients are candidates for this surgery, indications and guidelines written need to be followed.



## USPOREDBA UČINKOVITOSTI DIGITALNO NAVODENOG ER:YAG LASERA I IZOTRETONINA U LIJEČENJU PREKANCEROZNIH LEZIJA USNE ŠUPLJINE

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Uvod: Prema najnovijim istraživanjima, 85% svih lezija u usnoj šupljini čine upravo leukoplakične lezije. To je ujedno i najčešća prekancerozna lezija s mogućnošću maligne transformacije. Najnovija dostignuća u razvoju laserske tehnologije za dentalnu medicinu omogućila su vrlo dobre rezultate u liječenju prekanceroznih lezija, posebice leukoplakija. Inovativni digitalno navodeni Er:YAG laser uspješno se koristi pri liječenju leukoplakičnih lezija.

Materijali i postupci: U ovom istraživanju, 28 pacijenata s dijagnozom leukoplakije uspješno je tretirano digitalno navodeni Er:YAG laserom (LightWalker AT, Fotona, Slovenija). Godinu dana nakon provedene terapije nije zabilježen niti jedan recidiv lezija. Kontrolna skupina sastojala se također od 28 pacijenata, čije su leukoplakične lezije tretirane lokalnom terapijom 1%-tnim izotretinoinom, tri puta na dan tijekom tri mjeseca. Nakon završene terapije, kod svih pacijenata lezije su i dalje bile prisutne, osim kod jedne pacijentice kod koje se lezija smanjila, ali je ostala prisutna.

Rezultati: Nađena je statistički značajna razlika između muškaraca i žena, obzirom na lokalizaciju lezije, broj potrebnih terapija do potpunog uklanjanja lezije te VAS rezultata ( $p < 0,05$ ).

Zaključak: Er:YAG laser u digitalno navodenoj bezkontaktnom načinu rada učinkovita je terapija u liječenju oralne leukoplakije, no potrebna su daljnja, nešto opsežnija istraživanja na tom području.

## COMPARISON OF EFFICACY OF DIGITALLY CONTROLLED ER:YAG LASER AND ISOTRETINOIN FOR TREATMENT OF ORAL PRECANCEROUS LESIONS

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Introduction: According to the latest research, leukoplakia lesions constitute 85% of all oral lesions. At the same time, these are the most common precancerous lesion, with a capability for malignant transformation. The latest advances in dental laser technology provide very good results when treating oral precancerous lesion, particularly leukoplakia. A successful treatment option for oral leukoplakia is the innovative, digitally controlled Er:YAG laser.

Materials and methods: In the present study, 28 patients, diagnosed with oral leukoplakia were successfully treated with the innovative digitally controlled Er:YAG laser (LightWalker AT, Fotona, Slovenia). One year after the treatment we did not observe any recurrent or relapse lesions. The control group also consisted of 28 patients that were previously treated with 1% topical isotretinoin, three times per day for a period of three months. No improvement in the size of the leukoplakia was observed in the control group, except in one patient, where the lesion was clinically smaller but still present.

Results: Statistically significant differences between men and women regarding the localization of the leukoplakia, number of laser sessions and VAS, were found ( $p < 0,05$ ).

Conclusion: Er:YAG laser with non-contact X-Runner digitally controlled handpiece might be successful treatment option for oral precancerous lesions, but further research is needed.

## PRIKAZI SLUČAJEVA

### ODSTRANJIVANJE FRAKTURIRANIH VIJAKA IMPLANTA POMOĆU ULTRAZVUČNE SONDE - PRIKAZ SLUČAJA

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Ovaj prikaz kliničkog slučaja opisuje neinvazivnu metodu uklanjanja dva slomljena vijaka implantata pomoću ultrazvučne sonde. Pacijent, u dobi od 49 godina dolazi na kliniku s mostom na implantatima, vijčana veza (3 člana) (14-16), koji je ispao zbog prijeloma internog vijaka na oba ugrađena dentalna implantata. Klinička evaluacija i intraoralne snimke su pokazali dva dentalna implantata, postavljena u dobroj poziciji, s blagom resorpcijom alveolarne kosti. Vijci su bili slomljeni ispod razine heksagonalnog unutrašnjeg dijela. Učinjena je mala incizija za pristup dentalnim implantatima. Pomoću karbidnog svrdla je formiran mali utor. Vrh ultrazvučne sonde (Great Star G3, GGEE Co., Ltd, Kina) je bio postavljen u utor te su primijenjene usporene kretanje u smjeru suprotnom kazaljka na satu, čija se brzina postepeno povećala. Vijak implantata na poziciji 14 je izvađen nakon 2 minute kretanja, dok je vijak implantata na poziciji 16 izvađen nakon 4 minute kretanja. Nakon uklanjanja vijaka, učinjena je kontrolna rendgenska snimka kako bi se utvrdilo uklanjanje vijaka u potpunosti. Unutrašnja površina implantata je dezinficirana te je prethodni most ponovo fiksiran vijčanom vezom pomoću dva nova vijaka, učvršćenih do 25 N/cm. Nisu zabilježene kliničke komplikacije u razdoblju praćenja od 6 mjeseci. Korištenje ultrazvučne sonde može se smatrati uspješnom i neinvazivnom metodom za uklanjanje slomljenih vijaka implantata. Važno je nastojati izbjeći oštećenje unutrašnjeg dijela implantata, što može dovesti do nemogućnosti protetske opskrbe oseointegriranog dentalnog implantata.

## CASE REPORTS

### RETRIEVAL OF FRACTURED IMPLANT SCREWS USING ULTRASONIC SCALER - A CASE REPORT

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This case report presents a non-invasive method of removing two broken implant screws using ultrasonic scaler. A 49 years old male patient presented with a 3 unit screw retained bridge (14-16) which had fallen out, due to screw fracture on both implants. Examination and intraoral x-rays showed two dental implants, in good position, with slight crestal bone resorption. The screws were fractured below the level of the hexagonal lock. Small incision was made in order to access the screws. A small pit was formed with a carbide bur. The ultrasonic scaler tip (Great Star G3, GGEE Co., Ltd, China) was placed in the pit and slow anti clockwise movement was applied, which was gradually increased. The implant screw at position 14 was retrieved after 2 minutes of anti-clockwise movement, and the implant screw at position 16 was retrieved after 4 minutes of movement.

After removing the screws, a control x-ray was taken in order to confirm the removal of the screws. The internal surface of the implants was uncontaminated and the same screw retained bridge was placed with two new screws which were tightened up to 25 N/cm. No clinical problems were observed at 6 months follow-up. The use of Ultra sonic scaler can be a successful non-invasive method for retrieving broken implant screws. It is of great importance to avoid damage to the internal hex of the implants which can lead to prosthetically unrestorable implants.

## PRIMJENA LASERA U LIJEČENJU KRONIČNE BOLI TEMPOROMANDIBULARNOG ZGLOBA NAKON EKSTRAKCIJE UMNJAKA

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Bolovi temporomandibularnog zgloba nisu rijetkost. Izvor boli temporomandibularnog zgloba može biti u samom zglobo, ali i prenešena bol iz drugih struktura. Najčešći uzrok boli su upalne, degenerativne bolesti, infekcije zgloba i okolnih tkiva, tumori, neuralgije, sinusitisi, posljedica ekstrakcije zubi i mnogi drugi. Osim bolova česte su krepitacije i smanjen funkcijski status temporomandibularnog zgloba. Poslijeoperativni oporavak nakon vadenja umnjaka je individualan i varira od jednog dana do više tjedana. U kliničkoj slici dominiraju bolovi različitog intenziteta, lokalizirani oko područja rane, ali s mogućnošću širenja po cijeloj strani lica, glave i vrata. Laser je akronim za engleski naziv „Light Amplification by Stimulated Emission of Radiation“ što znači pojačavanje svjetlosti stimuliranim emisijom zračenja. U fizikalnoj terapiji koriste se laseri male snage koji ostvaruju biostimulativni efekt bez termičkog efekta i bez morfoloških promjena obasjanog tkiva. Laser pozitivno utječe na regeneraciju kosti, perifernih živaca, mišićnih vlakana i kože čime značajno ubrzava liječenje. Primjenjuje se u akutnoj i kroničnoj fazi bolesti. Nakon ekstrakcije gornjeg desnog umnjaka bolesnik je bolove u temporomandibularnom zglobo liječio analgeticima kroz 6 tjedana, nesteroidnim antireumaticima, a od fizikalno terapijskih procedura koristio je lokalno kriomasazu. Dva mjeseca nakon ekstrakcije, pregledao ga je specijalist fizikalne medicine i rehabilitacije te je bolesniku indicirana terapija laserom BTL 5000 aparat, energije 9 J/cm<sup>2</sup>, 1 min. kroz 10 dana, 10 Hz frekvencija, jačina 188 W. Ocjena boli prema vizualno-analognom skali (VAS) prije terapije laserom unatoč primjenjenim analgeticima bila je 8, a opseg pokreta u temporomandibularnom zglobo bio je reduciran te je otvaranje usta bilo ograničeno na 2 centimetra. Na kontrolnom pregledu nakon provedene terapije laserom bolovi su prema VAS skali bili 2, a funkcijski status temporomandibularnog zgloba bio je uredan te je otvaranje usta iznosilo 4 centimetra. Cilj ovoga rada je bio prikazati učinkovitosti diferentne fizikalno-terapijske procedure laserom kod bolesnika N.K. u dobi od 52 godine s kroničnim bolovima nakon ekstrakcije gornjeg desnog umnjaka i posljedičnim ograničenjem funkcijskog statusa temporomandibularnog zgloba. Terapijski laser u ovog bolesnika pokazao se učinkovitim, kako na smanjenje boli, tako i na uspostavljanje urednog fiziološkog opsega pokreta u temporomandibularnom zglobo što se odrazilo na kvalitetu aktivnosti svakodnevnoga života. Medikamentozna terapija se primjenom navedenog načina liječenja može izbjeći ili reducirati u najvećoj mjeri što zasigurno smanjuje mogućost nuspojava na medikamente, a nije nevažno napomenuti, uz smanjenje ekonomskih troškova i ubrzani oporavak bolesnika

## MINIMALNO INVAZIVNA ESTETSKA I REKONSTRUKTIVNA MUKOGINGIVNA KIRURGIJA PO EKSCIZIJI EPULISA- PRIKAZ SLUČAJA

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Svrha rada je prikazati klinički slučaj prekrivanja defekta po eksciziji epulisa korištenjem kolagene membrane u kombinaciji s PRF tehnikom. Iz anamneze doznajemo da se izraslina pojavila oko 2010. godine na istom mjestu te je njegov stomatolog kauterizirao promjenom. Promjena se ponovno pojavila početkom 2014. godine te je bila veličine zrna pšenice, a pacijent nije imao nikakvih simptoma dok se izraslina nije povećala na sadašnju veličinu te ga je smetala prilikom govora i jela te je povremeno krvarila nakon mehaničkih ozljeda te ga je sprječavala u održavanju oralne higijene. Kliničkim pregledom uočena je okrugla izraslina u području gornjeg desnog sjekutića koja je prekrivala gornju četvrtinu krune zuba, tvrde konzistencije na opip, glatke površine sa širokom bazom što je upućivalo na epulis. Zbog velike baze izrasline i velikog defekta koji bi nastao nakon njenog uklanjanja u području fronte, odlučeno je nakon uklanjanja izrasline postaviti kolagenu membranu u kombinaciji s PRF tehnikom. Pacijentu su prije zahvata izvađene dvije ampule krvi te su stavljene u centrifugu. Za vrijeme pripreme PRF membrana, izraslina je uklonjena termokauterizacijom kako bi se smanjilo krvarenje. Izraslina je po eksciziji poslana na PHD analizu kako bi se utvrdila dijagnoza. Na granici pomične i nepomične sluznice, sa

## TREATMENT OF CHRONIC PAIN OF TEMPOROMANDIBULAR JOINT WITH THERAPEUTIC LASER AFTER EXTRACTION OF WISDOM TEETH

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Temporomandibular joint (TMJ) pain is not uncommon. The cause of TMJ pain may be in the joint itself, but also referred pain from other structures. The most common cause of inflammatory pain are degenerative diseases, infection of the joint and surrounding tissue, tumors, neuralgia, sinusitis, result of extraction of teeth and others. Except pain, there are common crepitation and decreased functional status of the temporomandibular joint. Postoperative recovery after the removal of wisdom teeth is individual and varies from one day to several weeks. The clinical picture is dominated by pain of different intensities, localized area around the wound, but with the possibility of pain spreading over the entire side of the face, head and neck. Laser is an acronym for the “Light Amplification by Stimulated Emission of Radiation”. In physical therapy, low-power lasers are used that generate stimulative effect without the thermal effect or morphological changes in tissues. A positive impact affects bone regeneration, peripheral nerves, muscle fibers and skin, which significantly speeds up the treatment. It is used in acute and chronic phase of the disease. After extraction of the upper right wisdom tooth the patient's pain of TMJ was treated with analgetics for 6 weeks, NSAIDs, and he used local cryomassage as a physical and therapeutic procedure. Two months after extraction he was examined by a specialist in physical medicine and rehabilitation, and the physiatrist indicated laser therapy BTL 5000 appliance, energy 9 J / cm<sup>2</sup>, 1 min. for 10 days, 10 Hz frequency, power 188 W. Pain rating, according to the visual analogue scale (VAS) before laser therapy, despite analgetics administered, was 8 and range of motion in the temporomandibular joint was reduced by half of the physiological range of motion. On follow-up examination after treatment with laser, according to VAS scale, pain was 2 and functional status of TMJ was normal. The aim was to demonstrate the effectiveness of different physical therapy procedures with laser in patient NK age of 52 with chronic pain after extraction of the upper right wisdom tooth, and the consequent restriction of functional status of the TMJ. Therapeutic laser in this patient proved to be effective both in reducing pain, as well as in the establishment of proper physiological range of motion in the TMJ, which eventually had repercussions on the quality of the activities in everyday life. Drug therapy can be avoided or reduced to the great extent by using the previously mentioned modalities of treatment which certainly reduces the possibility of drug side effects to the and it is not irrelevant to mention that, while reducing the economic costs, it also accelerates patient recovery.

## MINIMALLY INVASIVE ESTHETIC AND RECONSTRUCTIVE MUCOGINGIVAL SURGERY AFTER EXCISION OF EPULIS - CASE REPORT

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The purpose of this case report was to present the clinical case of a patient with epulis and the operating procedure using collagen membrane and PRF.

The patient was referred by his dentist to the Department of Oral Surgery School of Dental Medicine in Zagreb due to a growth size of a pea in the vestibular area above the upper right incisor. The rest of the mucosa and gingiva showed no changes. From history we have learned that the growth appeared around 2010 at the same place and that his dentist had cauterized the growth. The growth reappeared in early 2014 and it was the size of a grain of wheat, the patient had no symptoms until the lump increased to the current size causing problems for patient while speaking and eating. It occasionally bleeds after mechanical injury and it prevents maintenance of normal oral hygiene. The clinical examination revealed: a round growth in the upper right incisors covering the top quarter of the tooth crown, the growth was of hard consistency to touch and had a smooth surface with a broad base which indicated that it was an epulis, but the diagnosis can be confirmed only by PHD analysis. Due to the large base of the growth and a large defect that would arise after it was removed from the place of origin which is in the area of the front, it was de-

svake strane rane iznad sjekutića napravljeni su vertikalni rezovi za tunel preparaciju s komunikacijom iznad sjekutića, te je isprepariran mukozni režanj sa sačuvanim periostom. Prema obliku defekta izmodelirana je kolagena membran te je natopljena PRF-om prije adaptacije. Zbog lakše adaptacije, konac je provučen kroz vertikalni režanj i režanj iznad sjekutića te je membrana prošivena koncem i njegovim laganim povlačenjem uz odizanje sluznice adaptirana na željeno mjesto. Radi bolje fiksacije, membrana je fiksirana resorptivnim koncem uz unutarnju stranu režnja. S vanjske strane fiksirana je monofilamentnim koncem 5.0 šavovima kako bi se spriječila dehiscijencija rubova rane. Membrana je ostala djelomično eksponirana, a taj dio je prekriven PRF membranama koje su fiksirane neresorptivnim koncem. Svrha PRF membrane je poticanje stvaranja kolagena zbog svojih čimbenika rasta, a time se ubrzava i cijeljenje rane. PRF membrana omogućava vlaženje eksponiranog dijela kolagene membrane te smanjuje postoperativnu bol. Deset dana nakon operacije konci su skinuti. Rana je u procesu cijeljenja, pacijent nema smetnji i bolova. Prva kontrola, mjesec dana nakon operacije pokazuje dobre rezultate, vidljiva je zdrava gingiva bez ožiljkastog tkiva, ružičaste boje, sa prisutnom malom recesijom na mjestu uklonjene lezije. Na zadnjoj kontroli tri mjeseca nakon zahvata, recesija je u potpunosti prekrivena, nema granulacijskog i ožiljkastog tkiva. Nalaz PHD-a je *Granuloma pyogenicum*.

cided that after the removal of the epulis a collagen membrane combined with PRF will be placed. Two vials of blood were taken from the patient before the procedure and were placed in a centrifuge. During the preparation of the PRF membranes, the growth was removed with thermocauterization to reduce bleeding. After the growth was removed from the oral cavity it was sent for a PHD analysis to determine the diagnosis. On the border between the moving and stationary mucous membranes, on both sides of the wound above the incisors vertical cuts were made for a tunnel preparation to allow communication over the incisors, a mucosal flap was made with intact periosteum. According to the shape of the defect, the collagen membrane was cut out and soaked in PRF prior adaptation. In order to facilitate the adaptation, the suture was pulled through the vertical flap and flap over the incisors, the membrane was trimmed at the end and gently pulled with the suture along the mucosal membrane until it was adapted to the desired location. For better fixation, the membrane was sewn with a resorption suture to the inner part of the lobe. On the outside, it was fixated with a monofilament suture with 5.0 stitches to prevent the dehiscence of the wounds edges. The membrane remained partially exposed, and was covered with PRF membranes which were fixed with non-resorption suture. The purpose of the PRF membranes is to enhance the formation and growth of collagen fibers due to the growth factors it possesses, and in that way help the wound heal better and faster. The PRF membranes also enable the hydration of the exposed parts of the collagen membrane and relieve the post-operative pain. After the procedure, the patient was advised to use mouthwash and avoid mechanical cleaning of the operated area. Ten days after the procedure, the stitches were removed, the wound was healing and the patient reported no pain or complications. The first check-up after a month, showed good results, the gingiva was healthy without any scar tissue, it has regular pink color, and a small recession was present. The last check-up three months after the procedure, showed that the recession was completely covered with no signs of scar or granulation tissue. The results of the PHD showed *Granuloma pyogenicum*.