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To the reader.

The Institute of Dentistry, University of Helsinki, has the pleasure of sending to you our Publications 2010. This publication, sixteenth in a series, has 111 entries and includes 101 articles in English or Finnish; summarized in English for your convenience.

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With kind regards

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The aim of the present study was to determine relationships between insurance status and utilization of oral health care and its characteristics and to identify factors related to insured patients' selection of dental clinic or dentist.

The study was based on cross-sectional data obtained through phone interviews. The target population included adults in the city of Tehran. Using a two-stage stratified random technique, 3,200 seven-digit numbers resembling real phone numbers were drawn; when calling, 1,669 numbers were unavailable (busy, no answer, fax, line blocked). Of the 1,531 subjects who answered the phone call, 224 were outside the target age (under 18), and 221 refused to respond, leaving 1,086 subjects in the final sample. The interviews were carried out using a structured questionnaire and covered characteristics of dental visits, the respondent's reason for selecting a particular dentist or clinic and demographic and socio-economic background (gender, age, level of education, income, and insurance status). Data analysis included the Chi-square test, ANOVA, and logistic regression and the corresponding odds ratios (OR).

Of all the 1,086 respondents, 57% were women, 62% were under age 35, 46% had a medium and 34% a high level of education, 13% were under the poverty line, and 70% had insurance coverage; 64% with the public, and 6% with a commercial insurance. Having insurance coverage was more likely for women (OR=1.5), for those in the oldest age group (OR=2.0), and for those with a high level of education (OR=2.5). Of those with dental insurance, 54% reported having had a dental visit within the past 12 months; more often by those with commercial insurance in comparison with public (65% vs. 53% p<0.001). Check-up as the reason for the most recent visit occurred most frequently among those with commercial insurance (28%) compared with those having public insurance (16%) or being non-insured (13%) (p<0.001). Having had two or more dental visits within the past 12 months was most common among insured respondents, when compared with the non-insured (31% vs. 22% p=0.01). The non-insured respondents reported tooth extractions almost twice as frequently as did the insured ones (p<0.001). Of the 726 insured subjects, 60% selected fully out-of-pocket-paid services (FOP), and 53% were unaware of their insurance benefits. Of those who selected FOP, good interpersonal aspects (OR=4.6), being unaware of dental insurance benefits (OR=4.6), and good technical aspects (OR=2.3) as a reason had greater odds of selecting FOP.

The present study revealed that dental insurance was positively related to demand for oral

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health care as well as to utilization of services, but to the latter with a minor extent. Among insured respondents, despite their opportunity to use fully or highly subsidized oral health care services, good interpersonal relationship and high quality of services were the most important factors when an insured patient selected a dentist or a clinic. The present findings indicate a clear need to modify dental insurance systems in Iran to facilitate optimal use of oral health care services to maximize the oral health of the population. A special emphasis in the insurance schemes should be focused on preventive care.


Hammashoitovakuutus oli yleisempi naisilla, vanhimmalla tutkitulla ikäryhmällä ja korkeimmin koulutetuilla. Runsaat puolet vakuutetuista oli käynyt hammaslääkärissä viimeksi kuluneen vuoden aikana ja yleisintä se oli kaupallisen vakuutuksen omaavien keskuudessa. Hampainen tutkimus oli käynnin yli 28 prosentilla kaupallisen vakuutuksen omaavilla, 16 % julkisesti vakuutetulla ja vain 13 % vakuuttamattomilla. Vakuutetuilla oli useampia hoitokäyntejä vuoden mittaan vakuuttamattomiin verrattuna. Hampaa poistot olivat lähes kaksi kertaa yleisempiä vakuuttamattomilla.

Vaikka vakuutuksen omaavilla potilailla olisi ollut oikeus joko kokonaan tai osittain korvattuun hoitoon, niin monet kuitenkin maksivat hoidon kokonaan itse, koska se mahdollisti hammaslääkärin valinnan ja toisaalta hoidon teknisen tason uskottiin olevan parempi korvaamattomassa yksityishoidossa. Toisaalta hieman yli puolet ei ollut edes tietoinen vakuutusturvastaan.

Väittelijän mukaan Iranin nykyiset hammashuoltovakuutukset kaipaavat kehittämistä, jotta väestön suun ja hampaiden terveys voidaan maksimoida palvelujen sisältöä kehittämällä. Erityisen suuri tarve on sisällyttää ehkäisevä hoito vakuutusjärjestelmiin.
CHARACTERIZATION OF CYTOKINES, MATRIX METALLOPROTEINASES
AND TOLL-LIKE RECEPTORS IN HUMAN PERIODONTAL TISSUE
DESTRUCTION

BEKLEN TANZER ARZU

Periodontal Disease affects the supporting structures of the teeth and is initiated by a microbial biofilm called dental plaque. Severity ranges from superficial inflammation of the gingiva (gingivitis) to extensive destruction of connective tissue and bone leading to tooth loss (periodontitis). In periodontitis the destruction of tissue is caused by a cascade of microbial and host factors together with proteolytic enzymes. Matrix metalloproteinases (MMPs) are known to be central mediators of the pathologic destruction in periodontitis. Initially plaque bacteria provide pathogen-associated molecular patterns (PAMPs) which are sensed by Toll-like receptors (TLRs), and initiate intracellular signaling cascades leading to host inflammation.

Our aim was to characterize TNF-α (tumor necrosis factor-alpha) and its type I and II receptors in periodontal tissues, as well as, the effects of TNF-α, IL-1β (interleukin-1beta) and IL-17 on the production and/or activation of MMP-3, MMP-8 and MMP-9. Furthermore we mapped the TLRs in periodontal tissues and assessed how some of the PAMPs binding to the key TLRs found in periodontal tissues affect production of TNF-α and IL-1β by gingival epithelial cells with or without combination of IL-17.

TNF-α and its receptors were detected in pericoronitis. Furthermore, increased expression of interleukin-1β and vascular cell adhesion molecule-1 was found as a biological indicator of TNF-α ligand-receptor interaction. MMP-3, -8, and 9 were investigated in periodontitis affected human gingival crevicular fluid and gingival fibroblasts produced pro-MMP-3. Following that, the effect of IL-17 was studied on MMP and pro-inflammatory cytokine production. IL-17 was increased in periodontitis and up-regulated IL-1β, TNF-α, MMP-1 and MMP-3. We continued by demonstrating TLRs in gingival tissues, in which significant differences between patients with periodontitis and healthy controls were found. Finally, enzyme-linked immunosorbent assays were performed to show that the gingival cells response to inflammatory responses in a TLR-dependent manner.

Briefly, this thesis demonstrates that TLRs are present in periodontal tissues and present differences in periodontitis compared to healthy controls. The cells of gingival tissues respond to inflammatory process in a TLR-dependent manner by producing pro-inflammatory cytokines. During the destruction of periodontal tissues, the release (IL-1β and TNF-α) and co-operation with other pro-inflammatory cytokines (IL-17), which in turn increase the inflammation and thus be more harmful to the host with the increased presence of MMPs (MMP-1, MMP-3, MMP-8, MMP-9) in diseased over healthy sites.


Tulokset osoittivat, että parodontaalikudokset ilmentävät TLR:eita tasoilla, jotka eroavat parodontaalisesti sairaiden ja terveiden välillä. Ienkudoksen solut reagoivat tulehdusen TLR-riippuvaisesti tuottamalla tulehdusvälineitä, TNF-α ja IL-1β. Parodontiitissä tulehdusvälineidien tuotanto ja niiden yhteistoiminta IL-17:sta kanssa voimistaa isännälle haitallista tulehdureaktiot ja jossa myös vapautuu enemmän MMP:ja (MMP-1, MMP-3, MMP-8 ja MMP-9) verrattuna terveisiin henkilöihin.

Tutkimuksen perimmäinen tarkoitus on kerätä tietoa mahdollisia uusia hoitomenetelmiä varten, jotka olisivat turvallisia, tehokkaita, huokeita ja johtaisivat vähäisiin haittavaikutuksiin ihmisiä, jotka kärsivät suun tulehduskista.

**CERVICAL HEADGEAR IN CLASS II DIVISION 1 CORRECTION IN CHILDREN**

KIRJAVAINEN MIRJA

Class II division 1 malocclusion occurs in 3.5 to 13 percent of 7-12 year-old children. It is the most common reason for orthodontic treatment in Finland. Correction is most commonly performed using headgear treatment. The aim of this study was to investigate the effects of cervical headgear treatment on dentition, facial skeletal and soft tissue growth, and upper airway structure, in children.

65 schoolchildren, 36 boys and 29 girls were studied. At the onset of treatment a mean age was 9.3 (range 6.6-12.4) years. All the children were consequently referred to an

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orthodontist because of Class II division 1 malocclusion. The included children had protrusive maxilla and an overjet of more than 2mm (3 to 11 mm). The children were treated with a Kloehn-type cervical headgear as the only appliance until Class I first molar relationships were achieved. The essential features of the headgear were cervical strong pulling forces, a long upward bent outer bow, and an expanded inner bow. Dental casts and lateral and posteroanterior cephalograms were taken before and after the treatment. The results were compared to a historical, cross-sectional Finnish cohort or to historical, age- and sex-matched normal Class I controls.

The Class I first molar relationships were achieved in all the treated children. The mean treatment time was 1.7 (range 0.3-3.1) years. Phase 2 treatments were needed in 52% of the children, most often because of excess overjet or overbite. The treatment decreased maxillary protrusion by inhibiting alveolar forward growth, while the rest of the maxilla and mandible followed normal growth. The palate rotated anteriorly downward. The expansion of the inner bow of the headgear induced widening of the maxilla, nasal cavity, and the upper and lower dental arches. Class II malocclusion was associated with narrower oro- and hypopharyngeal space than in the Class I normal controls. The treatment increased the retropalatal airway space, while the rest of the airway remained unaffected. The facial profile improved esthetically, while the facial convexity decreased. Facial soft tissues masked the facial skeletal convexity, and the soft tissue changes were smaller than skeletal changes.

In conclusion, the headgear treatment with the expanded inner bow may be used as an easy and simple method for Class II correction in growing children.

The results of this study suggest that the headgear treatment with the expanded inner bow may be used as an easy and simple method for Class II correction in growing children.

Tutkimuksen yhteenvetona todettiin niskavedon soveltuvan hyvin lasten II luokan purentavirheen hoitoon.

ASSOCIATIONS AMONG EMDOGAIN®, HUMAN ORAL CARCINOMA CELLS AND ORAL PROTEOLYTIC ENZYMES

LAAKSONEN MATTI

The Enamel matrix derivative Emdogain® (EMD) is a commercially available tissue extract preparation of porcine enamel origin. Studies have shown EMD to be clinically useful in promoting periodontal regeneration. EMD has been widely used in periodontal therapy for over ten years, but the mechanism of its action and the exact composition are not completely clear. EMD is predominantly amelogenin (>90%). However, unlike amelogenin, EMD has a number of growth factor-like effects and it has been shown to enhance the proliferation, migration and other cellular functions of periodontal ligament fibroblasts and osteoblasts. In contrast, the effects of EMD on epithelial cell lines and in particular on oral malignant cells have not been adequately studied. In addition, EMD has effects on the production of cytokines by several oral cell lines and the product is in constant interaction with different oral enzymes. Regardless of the various unknown properties of EMD, it is said to be clinically safe in regenerative procedures, also in medically compromised patients.

The aim of the study was to examine whether gingival crevicular fluid (GCF), which contains several different proteolysis enzymes, could degrade EMD and alter its biological functions. In addition, the objective was to study the effects of EMD on carcinogenesis-related factors, in particular MMPs, using in vitro and in vivo models. This study also aimed to contribute to the understanding of the composition of EMD.

GCF was capable of degrading EMD, depending on the periodontal status, with markedly more degradation in all states of periodontal disease compared to healthy controls. EMD
was observed to stimulate the migration of periodontal ligament fibroblasts (PLF), whereas EMD together with GCF could not stimulate this proliferation. In addition, recombinant amelogenin, the main component of EMD, decreased the migration of PLFs. A comparison of changes induced by EMD and TGF-β1 in the gene profiles of carcinoma cells showed TGF-β1 to regulate a greater number of genes than EMD. However, both of the study reagents enhanced the expression of MMP-10 and MMP-9. Furthermore, EMD was found to induce several factors closely related to carcinogenesis on gene, protein, cell and in vivo levels. EMD enhanced the production of MMP-2, MMP-9 and MMP-10 proteins by cultured carcinoma cells. In addition, EMD stimulated the migration and in vitro wound closure of carcinoma cells. EMD was also capable of promoting metastasis formation in mice.

In conclusion, the diseased GCF, containing various proteases, causes degradation of EMD and decreased proliferation of PLFs. Thus, this in vitro study suggests that the regenerative effect of EMD may decrease due to proteases present in periodontal tissues during the inflammation and healing of the tissues in vivo. Furthermore, EMD was observed to enhance several carcinoma-related factors and in particular the production of MMPs by benign and malignant cell lines. These findings suggest that the clinical safety of EMD with regard to dysplastic mucosal lesions should be further investigated.


Tämä tutkimus pyrki selvittämään kykeneekö runsaasti proteolyttisiä entsyymejä sisältävää ientaskuneste hajottamaan Emdogainia ja muuttamaan sen vaikutuksia solutasolla. Lisäksi tutkimuksen tarkoitus oli selvittää Emdogainin vaikutuksia suun syöpäsoluihin ja syövän kasvuun liittyviin entsyymeihin solu- ja eläinkokeissa.


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Molemmat koeaineet lisäsivät läheisesti syöpään liittyvien kudostuoentsymien, matriksin metalloproteinaasien (MMP-9 ja MMP-10), ekspressiota. Soluviljelmissä Emdogainin havaittiin lisäävän MMP-2, MMP-9 ja MMP-10 tuotantoa myös proteiinitasolla sekä kiihdyttävän syöpäsolujen liikkumista. Eläinkokeissa Emdogainin todettiin edistävän syöpäkasvainten metastasointia.


MIELENTERVEYSKUNTOUTUJIEN SUUN TERVEYDENHUOLLON KEHITTÄMINEN KERAVAN JA VANTAAN KAUPUNKIEN PERUSTERVEYDENHUOLLOSSA SEKÄ HYKS/PEIJAKSEN SAIRAALAN PSYKIATRIAN KUNTOUTUSPOLIKLINIKALLA

MURTOMAA HEIKKI, HAAVIO M.

CANDIDA PROTEINASES IN THE DEGRADATION OF ORAL MUCOSAL TISSUE COMPONENTS ASSOCIATED WITH CANDIDA INVASION

PÄRNÄNEN PIRJO

The aim of this thesis was to compare the degradation of human oral epithelial proteins by proteinases of different Candida yeast species. We focused on proteins associated with Candida invasion in the cell-to-cell junction, the basement membrane zone, the extracellular matrix, and local tissue inflammatory regulators. Another main objective was to evaluate the effect of the yeast/hyphal transition and pH on the degradative capability of Candida.

The enzymatic activity of the Candida proteinases was verified by gelatin zymography. Laminins-332 (Lm-322) and -511(Lm-511) produced by human oral keratinocytes were gathered from the growth media, and E-cadherin (E-Cad) was isolated from the cell membrane of the keratinocytes by immunoprecipitation. The proteins were incubated
with Candida cells and cell-free fractions, and degradation was detected by fluorography. Fibronectin degradation was visualised by sodium dodecylsulphate polyacrylamide gel electrophoresis (SDS-PAGE). Matrix metalloproteinase-9 (MMP-9) activation and tissue inhibitor of metalloproteinase-1 (TIMP-1) fragmentation was detected by using the Western blot and enhanced chemoluminescence (ECL) techniques. Residual activity of TIMP-1 was evaluated by a casein degradation assay. A fluorimetric assay was used to detect and compare Candida proteinase activities with MMP-9.

These studies showed that the ability of the different Candida yeast species to degrade human Lm-332, fibronectin, and E-Cad vary from strain to strain and that this degradation is pH-dependent. This indicates that local acidic pH in tissue may play a role in tissue destruction by activating Candida proteinases and aid invasion of Candida into deeper tissue. A potential correlation exists between the morphological form of the yeasts and the degradative ability; the C. albicans yeast form seems to be related to superficial infections, and hyphal forms can apparently invade deeper tissues between the epithelial cells by degradation of E-Cad. Basement membrane degradation is possible, especially in the junctional epithelium, which contains only Lm-332 as a structural component. Local tissue host inflammatory mediators, such as MMP-9, were activated, and TIMP-1 was degraded by certain Candida species, thus indicating the possibility of a weakened host tissue defence mechanism in vivo.


Saatujen tulosten perusteella voidaan todeta, että useimmat Candida- hiivakannot pystyvät hajottamaan suun lintakalvon proteiineja. Niä tyypilliset mahdollisesti, että Candidat voivat edetä ientaskun epiteeliin liitosepoteelin läpi tai epiteelisolujen välästä kudoksiin. Tietty Candida-hiivakannot voivat aktivooida ientaskussa olevia MMP-9 entsyymejä joko suoraan tai välillisesti hajottamalla niitä estäviä proteiineja ja voivat näin edistää
Temporomandibular disorders (TMD) and psychosocial factors reportedly associate. The underlying factors remain partially obscure, however, and further studies are required to clarify the relationships. The aims of this study were thus to assess in a non-patient working population the prevalence of TMD and related symptoms, and to clinically diagnose and follow the natural courses of TMD over a one-year period. In addition, possible comorbidity of temporomandibular and/or neck muscle pain and perceived stress and their impact on work performance were investigated, as well as how various psychosocial aspects relate to TMD.

A questionnaire was mailed to all 30- to 55-year-old employees of the Finnish Broadcasting Company Ltd. whose employment in the Helsinki area had lasted at least five years (n = 1784). Of the 1339 subjects, who returned the questionnaire, 241 were examined according to the RDC/TMD and standard neck muscle palpation methods. Clinical signs of temporomandibular and/or neck muscle pain were found in 118 subjects. One-year follow-up TMD examinations were conducted on 211 subjects.

The prevalence of frequent painless TMJ-related symptoms was 10%, orofacial pain 7%, neck pain 38%, and headache 15%. TMD diagnoses were: myofascial pain (13%), disc displacements (16%), and arthralgia, osteoarthritis, osteoarthrosis (4%). Chronic myofascial pain was present in 7% and chronic disc displacement with reduction in 11% of the subjects. Symptoms were significantly associated with almost all the studied psychosocial symptoms. Reduced work performance was significantly positively associated with continuous pain, severity of pain, and health stress perception, and according to logistic regression, somatization with the probability of having chronic myofascial pain.

It could be concluded based on the results of this study among a non-patient working population that TMD and related symptoms are common and associated with psychosocial factors. Moreover, myofascial pain and disc displacement with reduction are the most common diagnoses of TMD. In addition, self-reported health related stress, and continuous pain in temporomandibular and/or neck muscles are associated with reduced
work performance, and somatization is significantly associated with chronic myofascial pain.

The present study assessed oral health and its determinants among Iranian preadolescents, and evaluated a school-based health education programme aimed to promote their oral health.

The target population of this study comprised a random sample of the third-grade school children (n = 459) of all public primary schools in 19 areas of Tehran city. The data came from a clinical examination of the children and two self-administered questionnaires: one for children, and one for mothers. The clinical dental examination was performed for recording children's oral health. The mothers' questionnaires covered background factors, oral self-care (OSC) behaviours and oral health-related knowledge and attitude statements.

After baseline data collection, a community trial was designed as a 3-month school-based intervention study. For the intervention trial, the third-grade classes as the clusters were randomly assigned to the intervention and control groups. Three kinds of intervention were implemented, one in class, one via the parents, and one as a combination of these. One group served as controls with no intervention. The outcome measures of the study were changes in plaque and bleeding scores recorded.

The results showed that mean dmft was 3.75 (SD = 2.8) for the primary teeth and mean DMFT was 0.4 (SD = 0.9) for the permanent teeth. All children had plaque on at least one index tooth and bleeding on probing in at least one index tooth occurred in 81%. About one-third (34%) of the children reported favourable OSC and less than half (46%) of the children reported brushing their teeth at least twice daily. Girls reported favourable OSC (OR = 2.0), had decay-free teeth (OR = 1.8) and treated permanent teeth (OR = 3.3) more than did boys. Mother's oral health-related aspects, i.e., mother's favourable OSC, high knowledge levels of and positive attitudes towards oral health, and active supervision of the child's tooth brushing had a positive effect on all aspects of children's oral health status and behaviours (ORs from 1.3 to 1.9). After the intervention, the results showed a strong intervention effect on healthy gingiva in both groups where parents were involved: the parental-aid group (OR = 7.7, 95% CI 2.2-27.7) and combined group (OR = 6.6, 95% CI 2.0-22.1).

To improve children's oral health, community school-based oral health educational programmes should be established to include all primary schools. These programmes should benefit from the common risk factor approach and a multi-sectored approach to employ for communication between the community, the school, and the family. Oral
health interventions should empower the parents' ability to improve their own oral health behaviour and then to transfer that healthy behaviour to their children.

Iranilaisten esimurrosikäisten suuterveys: koulussa toteutettu terveyskasvatuskokeilu ja sen tehokkuus.

Tutkimuksessa tutkittiin Iranilaisten esimurrosikäisten suun terveyttä ja siihen vaikuttavia tekijöitä iranilaisilla ja arvioitiin koulussa toteutetun terveyskasvatuskokeilun tuloksellisuutta.


Tulokset osoittivat, että koululaisilla oli keskimäärin 3,8 reikiintynyttä, reikiintymisen takia poistettua tai paikattua maitohammasta ja keskimäärin 0,4 vastaavaa pysyvää hammasta. Ilman reikää oli 78 % pysyvää hamppaita omaavista ja 15 % maitohampaallisista lapsista. Kaikilta lapsista löytyi hamma-splakkia ja 81 % ilmeni verenvuotoa ikenistä. Tutkittaessa hampaaiden harjauksen tiheyttä, fluoripitoisen hammastahnan käyttöä ja sokeripitoisen välipalojen määrää ilmeni että vain kolmasosa koululaisista voitiin luokitella nykyisten omahoitosuositusten mukaisesti käyttävyyn. Työillä suositusten mukainen omahoito oli yleisempää ja heillä oli useammin reikiintymätön tai hoidettu hampaisto kuin pojilla.

Äitien hyvä omahoitokäyttäytyminen, paremmat tiedot hammassairauksista ja suuterveyteen liittyvät myönteisemmät asenteet heijastuivat heidän lastensa parempaan suuterveyteen ja terveyskäyttäytymiseen. Aktiivisesti lasten harjaamista valvoneiden äitien tytöt olivat ahkerimpia harjaajia mutta täätä yhteyttä ei löytynyt heidän poikensa osalta. Heikoimmin koulutettujen äitien lapsilla oli eniten reikiintyneitä ja sen takia poistettuja seka pysyviä että maitohampaita.

Vanhempien mukanaolo vaikutti positiivisesti kokeilun tuloksellisuuteen. Sekä vanhempien yksin että yhteistyössä koulu kanssa tekemä terveyskasvatus näkyi selvästi kohonneena ienterveytenä kummassakin ryhmässä.

Tutkimustulokset tukevat käsitystä että lasten suuterveyden parantamiseksi koulussa toteutetut terveyskasvatusohjelmat ovat tuloksellisia ja ne tulisi olla osa koulujen arkea. Suuterveyskasvatus tulisi toteuttaa osana yleistä terveyskasvatusta jolloin moniammattilisesti voidaan vaikuttaa riskitekijöihin ja mahdollistaa koulun, lasten lähiympäristön ja perheen yhteistyö. Lasten vanhempien rooli terveyttä edistävän käyttäytymisen mallina on tärkeä.

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THE SIGNIFICANCE OF BRITTLE REACTION LAYERS IN FUSING OF DENTAL CERAMICS TO TITANIUM

SALONIEMI MIKKO

This thesis comprises four intercomplementary parts that introduce new approaches to brittle reaction layers and mechanical compatibility of metalloceramic joints created when fusing dental ceramics to titanium. Several different methods including atomic layer deposition (ALD), sessile drop contact angle measurements, scanning acoustic microscopy (SAM), three-point bending (TPB, DIN 13 927 / ISO 9693), cross-section microscopy, scanning electron microscopy (SEM), and energy dispersive X-ray spectroscopy (EDS) were employed.

The first part investigates the effects of TiO2 layer structure and thickness on the joint strength of the titanium-metalloceramic system. Samples with all tested TiO2 thicknesses displayed good ceramics adhesion to Ti, and uniform TPB results. The fracture mode was independent of oxide layer thickness and structure. Cracking occurred deeper inside titanium, in the oxygen-rich Ti[O]x solid solution surface layer. During dental ceramics firing TiO2 layers dissociate and joints become brittle with increased dissolution of oxygen into metallic Ti and consequent reduction in the metal plasticity. To accomplish an ideal metalloceramic joint this needs to be resolved.

The second part introduces photoinduced superhydrophilicity of TiO2. Test samples with ALD deposited anatase TiO2 films were produced. Samples were irradiated with UV light to induce superhydrophilicity of the surfaces through a cascade leading to increased amount of surface hydroxyl groups. Superhydrophilicity (contact angle ~0°) was achieved within 2 minutes of UV radiation. Partial recovery of the contact angle was observed during the first 10 minutes after UV exposure. Total recovery was not observed within 24h storage. Photoinduced ultrahydrophilicity can be used to enhance wettability of titanium surfaces, an important factor in dental ceramics veneering processes.

The third part addresses interlayers designed to restrain oxygen dissolution into Ti during dental ceramics fusing. The main requirements for an ideal interlayer material are proposed. Based on these criteria and systematic exclusion of possible interlayer materials silver (Ag) interlayers were chosen. TPB results were significantly better in when 5 μm Ag interlayers were used compared to only Al2O3-blasted samples. In samples with these Ag interlayers multiple cracks occurred inside dental ceramics, none inside Ti structure. Ag interlayers of 5 μm on Al2O3-blasted samples can be efficiently used to retard formation of the brittle oxygen-rich Ti[O]x layer, thus enhancing metalloceramic joint integrity. The most brittle component in metalloceramic joints with 5 μm Ag interlayers was bulk dental ceramics instead of Ti[O]x.
The fourth part investigates the importance of mechanical interlocking. According to the results, the significance of mechanical interlocking achieved by conventional surface treatments can be questioned as long as the formation of the brittle layers (mainly oxygen-rich Ti[O]x) cannot be sufficiently controlled.

In summary in contrast to former impressions of thick titanium oxide layers this thesis clearly demonstrates diffusion of oxygen from sintering atmosphere and SiO2 to Ti structures during dental ceramics firing and the following formation of brittle Ti[O]x solid solution as the most important factors predisposing joints between Ti and SiO2-based dental ceramics to low strength. This among other predisposing factors such as residual stresses created by the coefficient of thermal expansion mismatch between dental ceramics and Ti frameworks can be avoided with Ag interlayers.

Titaani on ollut olennainen osa hammashäiketieteen materiaalivalikoimaa jo pitkään. Viimeaikainen tuotantotekninen kehitys, titaanin erinomainen korroosionkestävyys, biokompatibiliteetti, saatavuus ja edullisuus ovat tehneet titaanimetallokeramiasta vartenottettavan vaihtoehton proteettiisiin ratkaisuihin. Vaikka titaanisoveluksilla on lyhytkestoisissa kliinisissä seurantatutkimuksissa saatu tyydyttäviä, hyviä ja jopa erinomaisia tuloksia niin kesäyvyydessä kuin estetiikassakin, titaanimetallokeramiaan liittyy edelleen ratkaisemattomia ongelmia, jotka rajoittavat titaanin käyttöä. Merkittävin ongelmia aiheuttaa hammaskeraamien polttoprosesseissa liitoksii muodostuvista hauraista reaktiokerroksista, jotka tekevät liitoksista titaanin ja keraamimateriaalin välillä verrattain heikkoja. Liitoslujuuden parantamiseksi on kehitetty lukuisia eri menetelmiä, mutta niiden vaikutus mukaanen ominaisuuksien kannalta kriittisten reaktiokerrosten muodostumiseen on edelleen epäselvää. Koska titaanimetallokeramia on jo vakiintunut kliniseen käyttöön, on hauraista reaktiokerroksista aiheutuvien ongelmiens ratkaiseminen ja liitoslujuuden maksimoiminen ensiarvoisen tärkeää.

CONE BEAM COMPUTED TOMOGRAPHY IN ORAL RADIOLOGY

SUOMALAINEN ANNI

In dentistry, basic imaging techniques such as intraoral and panoramic radiography are in most cases the only imaging techniques required for the detection of pathology. Conventional intraoral radiographs provide images with sufficient information for most dental radiographic needs. Panoramic radiography produces a single image of both jaws, giving an excellent overview of oral hard tissues. Regardless of the technique, plain radiography has only a limited capability in the evaluation of three-dimensional (3D) relationships. Technological advances in radiological imaging have moved from two-dimensional (2D) projection radiography towards digital, 3D and interactive imaging applications. This has been achieved first by the use of conventional computed tomography (CT) and more recently by cone beam CT (CBCT).

CBCT is a radiographic imaging method that allows accurate 3D imaging of hard tissues. CBCT has been used for dental and maxillofacial imaging for more than ten years and its availability and use are increasing continuously. However, at present, only best practice guidelines are available for its use, and the need for evidence-based guidelines on the use of CBCT in dentistry is widely recognized.

We evaluated (i) retrospectively the use of CBCT in a dental practice, (ii) the accuracy and reproducibility of pre-implant linear measurements in CBCT and multislice CT (MSCT) in a cadaver study, (iii) prospectively the clinical reliability of CBCT as a preoperative imaging method for complicated impacted lower third molars, and (iv) the tissue and effective radiation doses and image quality of dental CBCT scanners in comparison with MSCT scanners in a phantom study.

Using CBCT, subjective identification of anatomy and pathology relevant in dental practice can be readily achieved, but dental restorations may cause disturbing artefacts. CBCT examination offered additional radiographic information when compared with intraoral and panoramic radiographs. In terms of the accuracy and reliability of linear measurements in the posterior mandible, CBCT is comparable to MSCT. CBCT is a reliable means of determining the location of the inferior alveolar canal and its relationship to the roots of the lower third molar. CBCT scanners provided adequate image quality for dental and maxillofacial imaging while delivering considerably smaller effective doses to the patient than MSCT. The observed variations in patient dose and image quality emphasize the importance of optimizing the imaging parameters in both CBCT and MSCT.
Kartiokeilatietokonetomografia hampaiston ja leukojen alueen kuvantamisessa.


Väitöskirjatyössä selvitettiin äskettäin kehitetyn kolmiulotteisen röntgenkuvausmenetelmän, kartiokeilatietokonetomografian (KKTT), käyttöä hampaiston ja leukojen alueen kuvantamisessa. Koska KKTT:n käyttö perustuu tällä hetkellä kokemuspohjaisiin suosituksiin, tarvitaan tutkimusnäyttöön perustuvaa tietoa kyseisen kuvausmenetelmän käytölle.

Tutkimuksessa arvioitiin KKTT-laitteen hyödyllisyyttä hammashääräin päivittäisessä kliinisessä työssä. KKTT:n sekä perinteisen monileikitietokonetomografian (monileikette-TT) mittautuskertaluuta hammashammasalueilla, sekä selvitettiin KKTT-tutkimuksen käyttökelpoisuus alaleuan viisaahampaan kuvantamisessa, mm. alaleuan hermodisperomikimppu paikallistamisessa. Lisäksi selvitettiin kapeakenttä-KKTT-laitteiden sädeannoksia sekä kuvanlaatu verrattuna monileikette-TT-laitteisiin.

Yogurt consumption has been related to longevity of some populations living on the Balkans. Yogurt starter L. delbrueckii subsp. bulgaricus and Str. thermophilus have been recognized as probiotics with verified beneficial health effects. The oral cavity emerges as a target for probiotic applications. Probiotics have demonstrated promising results in controlling dental diseases and oral yeast infections. However, L. bulgaricus despite its broad availability in dairy products has not been evaluated for probiotic activity in the mouth.

These series of studies investigated in vitro properties of L. bulgaricus to outline its potential as an oral probiotic. Prerequisite probiotic properties in the mouth are resistance to oral defense mechanisms, adherence to saliva-coated surfaces, and inhibition of oral pathogens. L. bulgaricus strains showed a strain-dependent inhibition of oral streptococci and Aggregatibacter actinomycetemcomitans, whereas none of the dairy starter strains could affect growth of Porphyromonas gingivalis and Fusobacterium nucleatum. Adhesion is a factor contributing to colonization of the species at the target site. Radiolabeled L. bulgaricus strains and L. rhamnosus GG were tested for their ability to adhere to saliva-coated surfaces. The effects of lysozyme on adhesion and adhesion of Streptococcus sanguinis after lactobacilli pretreatment were also assessed. Adhesion of L. bulgaricus remained lower in comparison to L. rhamnosus GG. One L. bulgaricus strain showed binding frequency comparable to S. sanguinis. Lysozyme pretreatment significantly increased Lactobacillus adhesion.

Low gelatinolytic activity was observed for all strains and no conversion of proMMP-9 to its active form was induced by L. bulgaricus. Safety assessment ruled out deleterious effects of L. bulgaricus on extracellular matrix structures. Cytokine response of oral epithelial cells was assessed by measuring IL-8 and TNF-α in cell culture supernatants. The effect of P. gingivalis on cytokine secretion after lactobacilli pretreatment was also assessed. A strain- and time-dependent induction of IL-8 was observed with live bacteria inducing the highest levels of cytokine secretion. Levels of TNF-α were low and only one of ten L. bulgaricus strains stimulated TNF-α secretion similar to positive control. The addition of P. gingivalis produced immediate reduction of cytokine levels within the first hours of incubation irrespective of lactobacilli strains co-cultured with epithelial cells.

According to these studies strains among the L. delbrueckii subsp. bulgaricus species may have beneficial probiotic properties in the mouth. Their potential in prevention and management of common oral infectious diseases needs to be further studied.
Jogurttibakteereista apua suu- ja hammassairauksiin?

MODIFYING THE EROSIVE POTENTIAL OF APPLE JUICE WITH MILK
CONSTITUTES

AHOLA AILA J., UUSI-RAUVA J., TOSSAVAINEN O., LOUNATMAA KARI,
GRONBERG L., PIIRAINEN L., POUSSA T., MEURMAN JUKKA H., KORPELA R.
Milchwissenschaft. 65(4): 418-421, 2010

Excessive consumption of acid-containing drinks is associated with an increased risk of
dental erosion. Milk has anti-erosive effects, and enrichment of acidic drinks with milk
constituents to reduce their erosive potential has been under increased interest. Our aim
was to compare the erosive potential of conventional apple juice (85% juice), apple juice
supersaturated with calcium phosphate (CaP), and apple juice enriched with calcium
lactate gluconate (CaLG) in vitro. Deionized water and citric acid (2%) were used as
negative and positive controls. A total of 14-16 enamel specimens were incubated in each
fluid for one hour. Erosion was examined by profilometry. One specimen per fluid was
studied with a field emission scanning electron microscope for morphological changes.
Citric acid caused erosion in all the specimens (100%), and conventional apple juice in
68.8% of the cases. One case in the CaP juice group showed visible erosion (6.7%), and
the specimens incubated in the CaLG juice and water showed no visible erosion.
Scanning electron microscopic data further confirmed the results. To conclude, addition
of CaP and CaLG to apple juice reduced enamel erosion compared to conventional apple
juice.

AETIOLOGY OF MOLAR-INCISOR HYPOMINERALIZATION: A
SYSTEMATIC REVIEW

ALALUUSUA S.
European Archives Paediatric Dentistry. 11(2): 53-58, 2010

AIM: This was to review and assess the studies on aetiology of Molar-Incisor
Hypomineralisation (MIH) or, as a proxy, of demarcated opacities in permanent first
molars and to consider the potential factors involved with findings obtained in animal
experiments.
METHODS: A systematic search by Medline online database was performed. Abstracts
behind appropriate titles were studied and finally the full articles were evaluated for their
strength of evidence in the aetiology of MIH.
RESULTS: From a total of 1,142 articles 28 were identified and selected for review. The
selected papers covered medical problems in prenatal, perinatal and postnatal period,
medication of the child during the first years of life, and exposure to fluoride or
environmental toxicants (dioxins and PCBs) in the early childhood. Based on the assessment of the articles it was still not possible to specifically name those factors causing MIH although correlations between several potential factors and MIH were presented. Among the factors suggested and found to cause enamel defects in animal experiments were: high fever, hypoxia, hypocalcaemia, exposure to antibiotics (amoxicillin, a macrolide), and dioxins.

**CONCLUSION:** Despite increased knowledge on the aetiology of MIH insufficient evidence to verify the causative factors exists. Further studies, especially prospective ones, are needed to improve the level and strength of evidence of the role of the present putative factors and to reveal new factors that may be involved. Any combined effect of several factors should be taken into account. Experimental dose/response studies and research on the molecular mechanisms causing the abnormal function of the ameloblasts are also necessary to deepen our knowledge of MIH.

**DIMENSIONS OF THE CRANIOCERVICAL JUNCTION IN LONGITUDINAL ANALYSIS OF NORMAL GROWTH**

**ARPONEN H., EVÄLAHTI MARJUT, WALTIMO-SIREN JANNA C.**
Childs Nerv Syst. 26(6): 763-769, 2010

**INTRODUCTION:** Abnormal configuration of the craniocervical junction in the form of basilar impression or invagination, with often-associated platybasia, is a clinically significant cause of neurological symptoms particularly in patients with inherited diseases affecting the connective tissue. To better understand the course of development of these basilar abnormalities and further define their diagnostic criteria in children, we analysed longitudinally changes in the vertical dimensions of the craniocervical junction and in the flexion of the anterior skull base in normal growing individuals.

**METHODS:** The distance of the odontoid process to four reference lines and the anterior skull base angle was measured in consecutive series of at least five lateral skull radiographs of 30 females and 23 males. Their mean age was 6.4 years at the beginning and 22.4 years at the end of the observation period.

**RESULTS:** In young children, the odontoid process was situated in a caudal relation to the skull base structures and reached a level similar to that of adults approximately at the age of 7 years in both males and females. Cross-sectional observation of the results camouflages, however, how the intra-individual changes were markedly non-linear. Changes in the anterior skull base angle remained nonsignificant.

**CONCLUSIONS:** Normal values for McRae's, Chamberlain's and McGregor's measurements and the more recently documented D-M measurement are age dependent. We provide reference values specific for ages from 4 years. A notable deviation from the documented values indicates a need of further examination.
PERIODONTAL TREATMENT NEEDS IN IRANIAN ADULTS WITH DIABETES ONE YEAR AFTER AN ORAL HEALTH INTERVENTION

BAKHSANDEH S., MURHOMAA HEIKKI, VEHKALAHTI MIIRA, SUOMALAINEN KIMMO
Oral Health Dental Management in the Black Sea Countries. 9(3): 122-130, 2010

WHY DO ADULTS ENTITLED TO FREE OR HIGHLY SUBSIDIZED DENTAL SERVICES SELECT FULLY OUT-OF-POCKET-PAID CARE?

BAYAT F., VEHKALAHTI MIIRA, MURHOMAA HEIKKI, TALA HEIKKI.
Community Dentistry and Oral Epidemiology. 38(1): 88-95, 2010

OBJECTIVE: To investigate patients' reasons for selecting a dental clinic given their choice of free or highly-subsidized dental services.

METHODS: The study was based on cross-sectional data obtained through phone interviews with adults in Tehran, Iran. The present study included those entitled to free or highly-subsidized dental services (n = 726). The data covered the patients' awareness of subsidized dental services and type of dental clinic for their most recent visit and their reasons for selecting that clinic. Awareness of subsidized dental services was dichotomized as being either aware or unaware of such subsidy. The type of clinic was dichotomized as providing either free or highly-subsidized (FHS) or fully out-of-pocket paid (FOP) services. Free format answers about the subjects' reasons for selecting a particular clinic were later sub-grouped as: convenient access, good technical aspects, good interpersonal aspects, low or reasonable fees, recommendation by a friend, and no reason. Socio-demographic status was based on background. Data analysis included the chi-square test and logistic regression model.

RESULTS: Of the subjects (n = 726), 60% were women and 58% were under 35 years of age. The subjects' mean age was 33.5 years with no difference by gender (P = 0.24) and the majority had public insurance (91%). Of all the subjects, 60% selected FOP. Good interpersonal aspects were the strongest reason for selecting FOP (OR = 4.6), follow by good technical aspects (OR = 2.3). Those subjects who were unaware of their benefit had 4.6 times the odds of selecting FOP.

CONCLUSIONS: Despite the opportunity to use highly-subsidized dental services, good interpersonal and good technical aspects lead patients to select private dentists and to pay fully out of pocket.
GCF AND SERUM MYELOPEROXIDASE AND MATRIX METALLOPROTEINASE-13 LEVELS IN RENAL TRANSPLANT PATIENTS

EMINGIL G., AFACAN B., TERVAHARTIALA TAINA, TÖZ H., ATILLA G., SORSA TIMO

AIM: The rationale of this study was to address whether local or systemic changes reflect proteolytic (matrix metalloproteinase-13) or oxidative (myeloperoxidase) stress in renal transplant patients receiving cyclosporine-A (CsA) and having gingival overgrowth (GO), in patients receiving CsA therapy and having no GO and patients receiving tacrolimus therapy.

MATERIAL AND METHODS: Gingival crevicular fluid (GCF) samples were collected from sites with (GO+) and without GO (GO-) in CsA patients having GO; GO- sites in CsA patients having no GO; sites from tacrolimus, gingivitis and healthy subjects. GCF and serum myeloperoxidase (MPO) and matrix metalloproteinase-13 (MMP-13) levels were determined by ELISA.

RESULTS: GO+ sites in CsA patients having GO had elevated GCF MPO levels than those of CsA patients having no GO, tacrolimus and healthy subjects (p<0.005), but comparable to those of gingivitis. GCF MPO levels were higher in GO+ compared to GO- sites in CsA patients having GO (p<0.05). Patient groups had similar, but higher GCF MMP-13 levels than healthy group.

CONCLUSIONS: These results show that CsA and tacrolimus therapy have not a significant effect on GCF MPO and MMP-13 levels, and gingival inflammation seems to be the main reason for their elevations.

MATRIX-METALLOPROTEINASE-2,-8 AND-9 IN SERUM AND SKIN BLISTER FLUID IN PATIENTS WITH SEVERE SEPSIS

Critical Care. 14(2): R49, 2010

Introduction: Matrix metalloproteinases (MMPs) have various roles in inflammatory states. They seem to be able to modulate endothelial barriers and regulate the activity of chemokines and cytokines. The timely development of the levels during severe sepsis and thereafter have not been investigated. In addition it was of interest to study alterations of MMP-levels in intact skin, as the skin is the largest barrier against external pathogens and MMPs have not been studied at organ level in human sepsis. The aim of this study was to
investigate the timely development of serum and skin MMP-2, -8 and -9 levels in human severe sepsis and their association with disease severity and mortality.

**Methods:** Forty-four patients with severe sepsis and fifteen healthy controls were included in this prospective longitudinal study. The amounts of MMP-2, -8 and -9 were analyzed from serum at days 1, 4, 6, 8, and 10, and from skin suction blister fluid at days 1 and 5 from the beginning of severe sepsis. Additionally, samples from the survivors were obtained after three and six months.

**Results:** The levels of MMP-2 and -8 were up-regulated in severe sepsis in comparison to healthy controls in skin blister fluid and serum. Compared to the controls MMP-9 levels were lower in sepsis from the fourth day on in serum and both the first and fifth day in skin blister fluid. Active forms of MMP-2 and -9 were present only in severe sepsis. The nonsurvivors had higher pro- and active MMP-2 levels than the survivors in skin blister fluid samples. Furthermore, MMP-2 levels were more pronounced in severe sepsis and serum samples in patients with more severe organ failures. In the survivors at 3 and 6 month follow-up the MMP levels had returned to normal.

**Conclusions:** MMP-2 and -8 are elevated in serum and blister fluid in severe sepsis, implying that they may play a significant role in the pathogenesis of severe sepsis and organ dysfunctions. Active forms of MMP-2 and 9 were only present in patients with severe sepsis, and higher MMP-2 levels in skin blister and serum were associated with more severe organ dysfunctions.

**DOXYCYCLINE EFFECTS ON SERUM BONE BIOMARKERS IN POST-MENOPAUSAL WOMEN**


We previously demonstrated that subantimicrobial-dose doxycycline (SDD) treatment of post-menopausal osteopenic women significantly reduced periodontal disease progression, and biomarkers of collagen destruction and bone resorption locally in periodontal pockets, in a double-blind placebo-controlled clinical trial. We now hypothesize that SDD may also improve biomarkers of bone loss systemically in the same women, consistent with previous studies on tetracyclines (e.g., doxycycline) in organ culture and animal models of bone-deficiency disease. 128 post-menopausal osteopenic women with chronic periodontitis randomly received SDD or placebo tablets daily for 2 years adjunctive to periodontal maintenance therapy every 3-4 months. Blood was collected at baseline and at one- and two-year appointments, and sera were analyzed for bone resorption and bone formation/turnover biomarkers. In subsets of the study population, adjunctive SDD significantly reduced serum biomarkers of bone resorption (biomarkers of bone formation
were unaffected), consistent with reduced risk of future systemic bone loss in these post-menopausal women not yet on anti-osteoporotic drugs.

DOXYCYLINE INHIBITS MONONUCLEAR CELL-MEDIATED CONNECTIVE TISSUE BREAKDOWN

GU Y., LEE H., SORSA TIMO, SIMON S. R., GOLUB L. M.
FEMS Immunology and Medical Microbiology. 58(2): 218-225, 2010

Chronic periodontitis is the most common chronic inflammatory disease and has been associated with an increased risk for serious medical conditions including cardiovascular disease (CVD). Endotoxin (lipopolysaccharide), derived from periodontopathogens, can induce the local accumulation of mononuclear cells in the inflammatory lesion, increasing proinflammatory cytokines and matrix metalloproteinases (MMPs), resulting in the destruction of periodontal connective tissues including bone. In this study, we show that doxycycline, originally developed as a broad-spectrum tetracycline antibiotic (and, more recently, as a nonantimicrobial therapy for chronic inflammatory periodontal and skin diseases), can inhibit extracellular matrix degradation in cell culture mediated by human peripheral blood-derived monocytes/macrophages. The mechanisms include downregulation of cytokines and MMP-9 protein levels and the inhibition of the activities of both collagenase and MMP-9. These pleiotropic, but nonantibiotic, effects of doxycycline explain, at least in part, its therapeutic potential for various chronic inflammatory diseases including periodontitis, and may reduce the risks of systemic diseases (e.g. CVDs, less manageable diabetes) associated with this and other local diseases.

LONGITUDINAL STUDY OF SALIVARY PROTEINASES DURING PREGNANCY AND POSTPARTUM

GÜRSOY M., KÖNÖNEN EIJA, TERVAHARTIALA TAINA, GÜRSOY U. K., PAJUKANTA R., SORSA TIMO

BACKGROUND AND OBJECTIVE: Matrix metalloproteinases (MMPs) and their regulators are connected to periodontal inflammation and destruction. However, the presence and role of the salivary MMPs in pregnancy-related gingivitis are not well known. Our longitudinal study aimed to monitor salivary proteinase levels and possible changes, and relate them to periodontal status during pregnancy and postpartum.

MATERIAL AND METHODS: Salivary samples were collected from 30 periodontally healthy pregnant women five times (once during each trimester, 4-6 wk after delivery and after lactation) and, as their controls, from 24 non-pregnant women three times (during
successive months). Periodontal examination included visible plaque index, bleeding on probing, probing pocket depth and clinical attachment level measurements. Matrix metalloproteinase-8 levels were measured by immunofluorometric assay, and MMP-2 and MMP-9 levels and molecular forms by gelatin zymography. Salivary elastase, myeloperoxidase and tissue inhibitor of matrix metalloproteinase-1 levels were measured by ELISA.

RESULTS: Elastase concentrations maintained stable during the follow-up, while myeloperoxidase concentrations increased significantly after delivery. During pregnancy, MMP-8 concentrations were significantly lower than postpartum concentrations, being lowest during the second trimester and highest after delivery, and varying inversely to pregnancy gingivitis, observed as elevated percentages of bleeding on probing and probing pocket depth during the second and third trimester. In pregnant women, the highest MMP-2 and MMP-9 levels were found in saliva after lactation. In the control group, both clinical and enzymological findings remained stable during the follow-up period.

CONCLUSION: Our results suggest that hormonal changes during pregnancy induce or enhance susceptibility to gingivitis, while salivary proteinase and myeloperoxidase levels are reduced.

PERIODONTAL STATUS AND NEUTROPHILIC ENZYME LEVELS IN GINGIVAL CREVICULAR FLUID DURING PREGNANCY AND POSTPARTUM

GÜRSOY M., KÖNÖNEN EIJA, GÜRSOY U. K., TERVAHARTIALA TAINA, PAJUKANTA R., SORSA TIMO
Journal of Clinical Periodontology. 81(12): 1790-1796, 2010

BACKGROUND: Pregnancy induces or enhances susceptibility to gingivitis; however, the presence and role of neutrophilic enzymes in pregnancy-related gingivitis are not well known. The present study demonstrates the relationship between neutrophilic enzymes in gingival crevicular fluid (GCF) and periodontal status during pregnancy and postpartum.

METHODS: At baseline, 30 periodontally healthy pregnant women (Pr group) and 24 non-pregnant women (N-Pr group) as their controls participated in the study. The Pr group was examined once per each trimester and twice during postpartum and the N-Pr group three times (on successive months). During each visit, GCF samples were collected from all first molars, and clinical measurements (visible plaque index, bleeding on probing [BOP], probing depth [PD], and clinical attachment level) were recorded. The samples were analyzed for matrix metalloproteinase (MMP)-8, polymorphonuclear neutrophil (PMN) elastase, myeloperoxidase (MPO), and tissue inhibitor of matrix
metalloproteinase (TIMP)-1. Their levels were compared to the periodontal status at the collection site.

RESULTS: In the Pr group, BOP and PD scores significantly increased between the first and second trimester, indicating pregnancy gingivitis. This increased inflammation was not reflected by the enzymes examined in GCF; the amounts of PMN elastase decreased continuously during the follow-up period, and those of MPO and MMP-8 did not increase until delivery, whereas TIMP-1 amounts remained stable throughout the follow-up period. In the N-Pr group, all parameters remained steady.

CONCLUSION: Despite an increased susceptibility to gingivitis during mid-pregnancy, the host response does not seem to activate its own degradative enzymes.

SALIVARY MMP-8, TIMP-1, AND ICTP AS MARKERS OF ADVANCED PERIODONTITIS

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AIM: Salivary matrix metalloproteinase (MMP)-8 and -14, tissue inhibitor of matrix metalloproteinase (TIMP)-1, and pyridinoline cross-linked carboxytermin-al telopeptide of type I collagen (ICTP) were analysed aiming to detect potential markers of advanced periodontitis in saliva. In addition, we compared two MMP-8 detection methods, a time-resolved immunofluorometric assay (IFMA) and an enzyme-linked immunoassay (ELISA), to differentiate periodontitis subjects from controls.

MATERIAL AND METHODS: Concentrations of MMP-8, MMP-14, TIMP-1, and ICTP were analysed from salivary specimens of 165 subjects, including 84 subjects having at least 14 teeth with periodontal pocket (pocket depth ≥ 4 mm) and 81 subjects without pocket depth as their controls.

RESULTS: Salivary MMP-8 detection by IFMA differentiated periodontitis subjects from controls more strongly than by ELISA. Salivary MMP-8, TIMP-1, and ICTP concentrations were higher in periodontitis subjects than those in controls. When only smokers were included in the analysis these differences were lost. The MMP-8/TIMP-1 ratio and the combination of MMP-8 and ICTP differentiated periodontitis and control groups even in smoker subjects.

CONCLUSION: Salivary MMP-8, TIMP-1, ICTP, and especially their ratios and combinations are potential candidates in the detection of advanced periodontitis. Differentiating periodontitis and control subjects with salivary MMP-8 detection is dependent on the selected techniques.
BACKGROUND: The present study evaluates the survival capability of Fusobacterium nucleatum strains in an aerobic environment and compares the invasive capability of F. nucleatum in biofilm and planktonic forms in an organotypic cell culture (OCC) model.

METHODS: Biofilms of F. nucleatum American Type Culture Collection (ATCC) 25586 or Anaerobe Helsinki Negative (AHN) 9508 were produced by culturing on semipermeable membranes on brucella agar plates. The oxygen tolerance of the F. nucleatum strains was examined by incubating 3-day-old anaerobically grown biofilms in an aerobic environment (CO(2) [5% in air] incubator) for an additional 48 hours. The OCC model was constructed by seeding keratinocytes on a fibroblast-containing collagen gel. In invasion assays, a 3-day-old anaerobically grown biofilm (and planktonic bacteria in solution as the control) was placed upside down on the top of OCC and incubated under 5% CO(2) for 24 hours. Invasion of the bacteria and morphologic changes in OCC were assessed using hematoxylin and eosin, Ki-67, and periodic acid-Schiff stainings.

RESULTS: In biofilms, both F. nucleatum strains continuously increased their cell numbers in an aerobic environment for 48 hours. After incubating the bacterial biofilm in contact with the OCC model, F. nucleatum AHN 9508 was able to pass through the epithelial/basement membrane barrier and invade the collagen matrix. The invasiveness of biofilm F. nucleatum ATCC 25586 was limited to the epithelium. Cytotoxic effects and invasiveness of F. nucleatum on the OCC were much stronger when the bacteria were in biofilms than in the planktonic form.

CONCLUSION: Biofilm formation regulates the survival and invasiveness of F. nucleatum in an aerobic environment.
We used Fgf10-lacZ reporter mice to investigate the distribution and fate of Fgf10-expressing cells in the developing and adult mouse brain. We find that the domain of Fgf10 expression expands post-natally and new niches emerge in the adult brain. Fgf10 is expressed in the adult cerebellum, thalamic, mid- and hindbrain nuclei and hippocampal CA fields, as previously reported in the rat brain. In addition though, we have discovered expression in: the hippocampal dentate gyrus; a discrete trail linking the ventral telencephalon with the olfactory bulbs; ventral ependyma of the third ventricle from where cells appear to disperse into the hypothalamus; and in the pituitary gland. Most Fgf10-expressing cells or their immediate descendants appear immature but a subset differentiates into neurons and glial cells. The manner in which Fgf10 is expressed in these active and quiescent neurogenic niches implicates it in control of neurogenesis and/or conservation of neurogenic potential.

SMOKING AFFECTS DIAGNOSTIC SALIVARY PERIODONTAL DISEASE BIOMARKER LEVELS IN ADOLESCENTS

BACKGROUND: The effects of smoking on periodontal biomarkers in adolescents are unknown. This study investigates matrix metalloproteinase (MMP)-8 and polymorphonuclear leukocyte elastase levels in saliva together with periodontal health indices accounting for body mass index and smoking in a birth cohort from Finland.

METHODS: The oral health of boys (n = 258) and girls (n = 243) aged 15 to 16 years was examined clinically. Health habits were assessed by questionnaire. Saliva samples were collected and analyzed by immunofluorometric and peptide assays for MMP-8 levels and polymorphonuclear leukocyte elastase activities, and investigated statistically with the background factors.
RESULTS: Median MMP-8 values of male smokers were 112.03 microg/l compared to 176.89 microg/l of non-smokers (P = 0.05). For female smokers corresponding values were 170.88 microg/l versus 177.92 microg/l in non-smokers (not statistically significant). Elastase values in male smokers were 5.88 x 10(-3) Delta OD(405)/h versus 11.0 x 10(-3) Delta OD(405)/h in non-smokers (P = 0.02), and in female smokers 9.16 x 10(-3) Delta OD(405)/h versus 10.88 x 10(-3) Delta OD(405)/h in non-smokers (P = 0.72). The effect was strengthened by high pack-years of smoking (MMP-8, P = 0.04; elastase, P = 0.01). Both biomarkers increased with gingival bleeding. However, statistically significant associations were observed with bleeding on probing and MMP-8 (P = 0.04); MMP-8 was suggestively associated with probing depth (P = 0.09) in non-smoking boys. In smokers with calculus, MMP-8 increased after adjusting with body mass index (P = 0.03). No corresponding differences were seen in girls.

CONCLUSIONS: Smoking significantly decreased both biomarkers studied. Compared to girls, boys seem to have enhanced susceptibility for periodontitis as reflected in salivary MMP-8 values.

ASSOCIATIONS BETWEEN MATRIX METALLOPROTEINASE-8 AND -14 AND MYELOPEROXIDASE IN GINGIVAL CREVICULAR FLUID FROM SUBJECTS WITH PROGRESSIVE CHRONIC PERIODONTITIS: A LONGITUDINAL STUDY

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BACKGROUND: Matrix metalloproteinase (MMP)-8 is a central mediator in chronic periodontitis. MMP-8 can be activated by the cooperative action of other MMPs such as MMP-14, reactive oxygen species, and microbial proteases. The aim of this study is to associate the levels, molecular forms, isoenzyme distribution, and degree of activation of MMP-8 and -14, myeloperoxidase (MPO), and tissue inhibitor of MMP (TIMP)-1 in gingival crevicular fluid (GCF) from patients with progressive periodontitis at baseline and after periodontal therapy.

METHODS: In this longitudinal study, GCF samples from active (n = 25) and inactive (n = 25) sites of subjects with periodontitis were screened at baseline for GCF levels of MMP-8 by immunofluorometric assay, of MMP-14 by specific activity assay, and of MPO and TIMP-1 by enzyme-linked immunosorbent assay. MMP-8 and MPO were also measured after periodontal treatment. Molecular forms were determined by immunoblot analyses and subjected to densitometric scanning and statistical analyses.

RESULTS: High MMP-8 and MPO levels and a strong MPO/MMP-8 positive correlation were found in active and inactive sites at baseline. After treatment, decreases in MPO and
MMP-8 were seen, except for active sites in which MMP-8 differences were not significant (P <0.05).

CONCLUSIONS: We present initial data that show that GCF levels and associations between MPO and MMP-8 are related to progression episodes and treatment responses in patients with chronic periodontitis. Our results suggest an interaction between the MPO oxidative pathway and MMP-8 activation, and this cascade might be useful as a potential biomarker for treatment outcomes.

FOLKE LAGERLOF 1939-2010
HOLBROOK P., MEURMAN JUKKA H.
Acta Odontologica Scandinavica. 68(3): 129-129, 2010

SALIVARY IMMUNOGLOBULINS AND PREVALENT CORONARY ARTERY DISEASE
Journal of Dental Research. 89(4): 389-394, 2010

Previous studies examined the serum immunoglobulin levels in relation to coronary artery disease (CAD). We hypothesized that the salivary immunoglobulins might better estimate oral infections in this relationship. Multivariate logistic regression analyses utilizing the data from 256 angiographically confirmed CAD patients and 250 non-CAD individuals that controlled for age, sex, smoking, diabetes, total/HDL cholesterol ratio, hypertension, and education revealed the trends that salivary IgA was positively and salivary IgG was inversely associated with CAD. The odds ratios (OR) of each increasing quartile of salivary IgA were 1.00 (first and second quartiles combined), 1.97, and 1.37 (p-value for trend = 0.06), while those for salivary IgG were 1.00, 0.77, 0.60, and 0.51 (p-value for trend = 0.02). Additionally, salivary IgA correlated positively with C-reactive protein and Asymptotic Dental Score (dental infection score), while IgG was inversely associated with these inflammation markers. Salivary IgA warrants further studies to confirm its role in the risk assessment of CAD.

SALIVARY LYSOZYME AS A PREDICTOR OF CARDIOVASCULAR MORTALITY
JETHWANI K., JANKET S., JONES J., BAIRD A., MEURMAN JUKKA H., VAN DYKE T.
Arteriosclerosis, Thrombosis, and Vascular Biology. 30: E234-E234, 2010
CREVICULAR FLUID MATRIX METALLOPROTEINASE-8,-13, AND TIMP-1 LEVELS IN TYPE 2 DIABETICS

KARDESLER L., BIYIKOGLU B., CETINKALP S., PITKÄLÄ M., SORSA TIMO, BUDUNELI N.
Oral Diseases. 16(5): 476-481, 2010

OBJECTIVES: To evaluate whether type 2 diabetes mellitus (DM) enlarged and if so the quantum of such increase in the gingival crevicular fluid (GCF) levels of matrix metalloproteinase-8 (MMP-8), MMP-13 and tissue inhibitor of metalloproteinases-1 (TIMP-1).

METHODS: Subjects (n = 73) were divided into five groups as follows: 12 DM patients with gingivitis (DM-G), 12 DM patients with periodontitis (DM-P), 12 systemically healthy patients with gingivitis (H-G), 13 systemically healthy patients with periodontitis (H-P) and 24 periodontally, systemically healthy volunteer subjects (H-C). Full-mouth clinical periodontal measurements were performed at six sites per tooth. Gingival crevicular fluid samples were obtained from two sites representing the clinical periodontal diagnosis in single-rooted teeth. Gingival crevicular fluid levels of MMP-8, MMP-13 and TIMP-1 were analysed by immunofluorometric MMP assay (IFMA), enzyme-linked immunosorbent assay (ELISA). Data were tested statistically by parametric tests.

RESULTS: All clinical periodontal measurements were similar in both diabetic and systemically healthy patients with periodontal disease (all P > 0.05). Total amounts of MMP-8 in GCF samples were significantly lower in H-C group than DM-G, DM-P, H-P groups (all P < 0.05). Matrix metalloproteinase-13, TIMP-1 total amounts were similar in study groups (P > 0.05). Diabetes mellitus patients exhibited similar levels of MMP-8, MMP-13, TIMP-1 with systemically healthy gingivitis/periodontitis patients (P > 0.05).

CONCLUSIONS: Within the limits of this study, DM does not seem to significantly affect GCF levels of MMP-8, MMP-13, TIMP-1 or clinical periodontal status.
PROPOSED REQUIREMENTS FOR A EUROPEAN DOCTORATE IN DENTISTRY: A DISCUSSION DOCUMENT PREPARED BY A SPECIAL INTEREST GROUP UNDER THE AUSPICES OF THE ASSOCIATION FOR DENTAL EDUCATION IN EUROPE

KERSTEN H., BEARN D., GUNDERSEN S., HOLBROOK P., KOTSANOS N., RADNAI M., VIRTANEN J.

In the Bologna process a third cycle is distinguished at the doctoral level. In documents on the Bologna process it is advocated to harmonise the structure and requirements of the doctorate, which in Europe are characterised by a wide variety. Differences exist in all possible requirements between countries, and even between schools within one country differences can be seen. In this paper an inventory is made of these differences in the dental doctorate between European countries. Moreover, the need for necessary harmonisation of requirements for a European dental doctorate is strongly advocated and a proposal is presented.

BIOABSORBABLE PLATES AND SCREWS FOR FIXATION OF MANDIBULOTOMIES IN ABLATIVE ORAL CANCER SURGERY

KETOLA-KINNULA T., SUURONEN RIITTA, KONTIO R., LAINE P., LINDQVIST CHRISTIAN

PURPOSE: The use of bioabsorbable self-reinforced poly(L/DL)lactide 70/30 (SR-PLDLA) miniplates and screws could offer many benefits compared with conventional metallic devices for fixation of access osteotomies in oral cancer surgery. The material neither interferes with imaging nor with postoperative radiotherapy. The plates and screws do not need to be removed. The number of operations can be diminished and rehabilitation with dental implants shortened. The purpose of the present study was to report our experience with bioabsorbable osteosynthesis in the fixation of access osteotomies of the mandible.

PATIENTS AND METHODS: A total of 15 patients (11 men and 4 women, mean age 63.1 years) were enrolled in the present study. All patients had oral squamous cell carcinoma. Three patients developed tumor recurrence, 2 of whom had previously undergone radiotherapy. Nine patients had radiotherapy scheduled postoperatively. The osteotomies were a straight-line cut and were situated medially or paramedially. For fixation, SR-PLDLA miniplates and screws (Biosorb 2.0 and 2.4 systems) were used without any maxillomandibular fixation.
RESULTS: The follow-up ranged from 0.3 to 7.1 years (median 3.5). No problems were encountered during the operation. One patient required reoperation owing to failure in fixation. Twelve osteotomy lines (80%) were clinically stable; radiologically, 6 were totally and 3 partly consolidated. During follow-up, 6 nonunions were radiographically noted, 3 of which were clinically stable.

CONCLUSIONS: Because of the high incidence of radiologic nonunion, bioabsorbable devices should not yet be used for fixation of access osteotomies in cancer surgery.

SMOKING AND ITS DETERMINANTS AMONG IRANIAN DENTAL STUDENTS

KHAMI M. R., MURTONAA HEIKKI, RAZEGHI S., VIRTANEN J. I.
Medical Principles and Practice. 19(5): 390-394, 2010

OBJECTIVE: The objective of the present study was to investigate smoking habits of Iranian dental students in relation to their background characteristics and oral self-care (OSC).

SUBJECTS AND METHODS: A survey in the form of a questionnaire was conducted of 327 senior dental students in seven randomly selected state dental schools in Iran. In addition to smoking habits and background characteristics, the students were asked about OSC. A recommended level of OSC was defined as a combination of brushing at least twice a day, frequent use of fluoridated toothpaste, and eating sugary snacks less than daily. Logistic regression models were used to estimate odds ratios (ORs) and 95% confidence intervals (CIs). A total of 263 students (113 males and 150 females) completely answered the questions and were included in the analyses.

RESULTS: Of the 263 students, 59 (23%, 37 males and 22 females) reported current smoking (cigarette, pipe, or water pipe). Current smoking was associated with male gender (OR = 2.9, 95% CI = 1.4-5.6), level of father's education (OR = 1.4, 95% CI = 1.1-1.8), and OSC (OR = 4.4, 95% CI = 1.3-14.9).

CONCLUSION: Smoking among Iranian dental students is similar to their socioeconomic group, and is associated with the characteristics of their background, such as gender and father's level of education, as well as the quality of OSC. The results indicate a need to include smoking cessation education and public health activities in the dental curriculum to provide future health care professionals and role models for patients with adequate training in up-to-date patient management to control smoking.
BACKGROUND: For many years, dentists have migrated between the Scandinavian countries without an intentionally harmonized dental education. The free movement of the workforce in the European Union has clarified that a certain degree of standardization or harmonization of the European higher education acts, including the dental education, is required. As a result of the Bologna process, the Association for Dental Education in Europe and the thematic network DentEd have generated guidelines in the document 'Profile and Competences for the European Dentist' (PCD). This document is meant to act as the leading source in revisions of dental curricula throughout Europe converging towards a European Dental Curriculum. In order to render the best conditions for future curriculum revisions providing the best quality dentist we feel obliged to analyse and comment the outlines of oral pathology and oral medicine in the PCD.

METHODS: The representatives agreed upon definitions of oral pathology and oral medicine, and competences in oral pathology and oral medicine that a contemporary European dentist should master. The competences directly related to oral pathology and oral medicine were identified, within the PCD.

RESULTS: The subject representatives suggested eighteen additions and two rewordings of the PCD, which all were substantiated by thorough argumentation.

PERSPECTIVES: Hopefully, this contribution will find support in future revisions of the PCD in order to secure the best quality dental education.

Removal of miniplates is a controversial topic in oral and maxillofacial surgery. Originally, miniplates were designed to be removed on completion of bone healing. The
introduction of low profile titanium miniplates has led to the routine removal of miniplates becoming comparatively rare in many parts of the world. Few studies have investigated the reasons for non-routine removal of miniplates and the factors that affect osteosynthesis after osteotomy in large numbers of patients. The aim of the present study was to investigate complications related to osteosynthesis after bilateral sagittal split osteotomy (BSSO) in a large number (n=153) of patients. In addition to the rates of removal, emphasis was placed on investigating the reasons and risk factors associated with symptomatic miniplate removal. The rate of plate removal per patient was 18.6%, the corresponding rate per plate being 18.2%. Reasons for plate removal included plate-related complications in 16 patients and subjective discomfort in 13 patients. Half of the plates were removed during the first postoperative year. Smoking was the only significant predictor for plate removal. Patients undergoing orthognathic surgery should be screened with regard to smoking and encouraged and assisted to cease smoking, at least perioperatively.

LETTER TO THE EDITOR CONCERNING “EMDOGAIN® IN CARCINOGENESIS: A SYSTEMATIC REVIEW OF IN VITRO STUDIES”

LAAKSONEN M., SORSA TIMO, SALO TUULA

EMDOGAIN® IN CARCINOGENESIS: A SYSTEMATIC REVIEW OF IN VITRO STUDIES

LAAKSONEN M., SORSA TIMO, SALO TUULA

Emdogain is a commercial product of unknown composition and is clinically used to induce periodontal regeneration. This study aims to review current knowledge of the in vitro effects of Emdogain on oral tissues and, in particular, factors related to carcinoma. A systematic approach was used to review studies from the Embase and Pubmed databases; a total of 76 studies were included. These comprised in vitro studies of the cytokines in, or regulated by, Emdogain and assays designed to study the effects of EMD on human cells in oral tissues or malignant cells. Several studies have shown that EMD regulates the proliferation, migration, adhesion, gene expression, and cytokine production of (pre-)osteoblasts, periodontal fibroblasts, and gingival fibroblasts. However, the effects of EMD on malignant oral cells are not well understood. EMD seems to have broad regulatory effects on malignant cells and on several carcinoma-related factors. Evidence suggests that patients with premalignant or malignant mucosal lesions should not be treated with EMD.
GINGIVAL CREVICULAR FLUID CAN DEGRADE EMDOGAIN AND INHIBIT EMDOGAIN-INDUCED PROLIFERATION OF PERIODONTAL LIGAMENT FIBROBLASTS

LAAKSONEN M. O., SALO T., VARDAR-SENGUL S., ATILLA G., SAYGAN B. H., SIMMER J. P., BAYLAS H., SORSA TIMO

BACKGROUND AND OBJECTIVE: Emdogain (EMD), consisting mostly of amelogenin, is used in periodontal therapy to regenerate lost connective tissue. Emdogain is applied onto periodontally affected root surfaces, where it becomes exposed to proteolytic enzymes. In this study, we aimed to find out whether gingival crevicular fluid or matrix metalloproteinases (MMPs) could degrade EMD, and whether this degradation has consequences for in vitro cell proliferation.

MATERIAL AND METHODS: We studied the effects of 156 gingival crevicular fluid samples collected from subjects with different stages of periodontal disease and from healthy control subjects and the effects of MMP-1, -2, -8, -9, -13 and -14 on the degradation of EMD using EMD-embedded zymography. The effects of gingival crevicular fluid with or without EMD and the effects of amelogenin on the proliferation of cultured periodontal ligament fibroblasts were studied by cell proliferation enzyme-linked immunosorbent assay kit.

RESULTS: Degradation of Emdogain induced by gingival crevicular fluid was greater in samples from all stages of periodontal diseases compared with healthy control samples. Of the MMPs studied, only MMP-2 and MMP-8 showed limited EMD-degrading activities. One hundred micrograms per millilitre of EMD increased proliferation of periodontal ligament fibroblasts on average by 24% (confidence interval 0.60-0.64) and at 200 microg/mL by 30% (confidence interval 0.62-0.68) compared with control fibroblasts (confidence interval 0.48-0.52). However, gingival crevicular fluid (10 microg/mL) together with 100 microg/mL EMD induced the proliferation only by 6% (confidence interval 0.51-0.55) and with 200 microg/mL EMD by 12% (confidence interval 0.54-0.58). Amelogenin at 200 microg/mL decreased the proliferation of periodontal ligament fibroblasts by 54% (confidence interval 0.22-0.25).

CONCLUSION: We suggest that diseased gingival crevicular fluid containing various proteases leads to degradation of EMD and decreased proliferation of periodontal ligament fibroblasts.
Staphylococcus aureus device-related infection is a common complication in implantology. Bacterial adhesion on implant surfaces is the initial step in the infective process. The aim was to develop a method suitable for quantitative bacterial adherence studies and to test a new diamond-like carbon (DLC) coating against commonly used metallic biomaterials with regards to Staphylococcus aureus adhesion. Patterned silicon chips with spots of tantalum, titanium, chromium, and DLC were produced using ultraviolet lithography and physical vapor deposition. These patterned chips were used as such or glued to array plates, pretreated with serum and exposed to S. aureus (S-15981) for 90 min, followed by acridine orange staining and fluorescence microscopy. An adhesion index showed that the ranking order of the biomaterials was titanium, tantalum, chromium, and DLC, with the DLC being clearly most resistant against colonization with S. aureus. Micropatterned surfaces are useful for quantitative comparison of bacterial adherence on different biomaterials. In the presence of serum, DLC is superior in its ability to resist adhesion and colonization by S. aureus compared with the commonly used biomaterial metals tantalum, titanium, and chromium.

Runx1 is highly expressed in chondroprogenitor and osteoprogenitor cells and in vitro experiments suggest that Runx1 is important in the early stages of osteoblast and chondrocyte differentiation. However, because Runx1 knockout mice are early embryonic lethal due to failure of hematopoiesis, the role of Runx1 in skeletogenesis remains unclear. We studied the role of Runx1 in skeletal development using a Runx1 reversible knockout mouse model. By crossing with Tie2-Cre deleter mice, Runx1 expression was selectively rescued in the endothelial and hematopoietic systems but not in the skeleton. Although Runx1(Re/Re) embryos survived until birth and had a generally normal skeleton, the development of mineralization in the sternum and some skull elements was significantly disrupted. In contrast to wild-type embryos, the sternum of E17.5 Runx1(Re/Re) embryos showed high levels of Sox-9 and collagen type II expression and lack of development of hypertrophic chondrocytes. In situ hybridization analysis
demonstrated that, in contrast to the vertebrae and long bones, the sternum of wild-type embryos expresses high levels of Runx1, but not Runx2, the master regulator of skeletogenesis. Thus, although Runx1 is not essential for major skeletal development, it does play an essential role in the development of the sternum and some skull elements.

EFFECT OF CHLORHEXIDINE ON INITIAL ADHESION OF FIBER-REINFORCED POST TO ROOT CANAL

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Journal of Dentistry. 38(10): 796-801 2010

OBJECTIVES: Chlorhexidine is used as final irrigant before endodontic obturation and fiber-reinforced composite posts are recommended for restoration retention. Our aim was to evaluate the effect of chlorhexidine on adhesion of cements used in post cementation. We hypothesized that chlorhexidine would not negatively affect the immediate bond strength.

METHODS: Root canals of eighty human extracted third molars were prepared for post cementation with each post systems’ own burs. Four commercially available FRC posts (Glassix, D.T.Light-Post, Unicore, everStickPOST) with three cements (Duo-link with All-bond 2, PermaFlo DC with PermaFlo DC Primers, RelyX Unicem) were used. After etching, except with self-etching RelyX Unicem, the post spaces were irrigated either with 2% chlorhexidine (Consepsis) or physiological saline for 60 s. With RelyX Unicem, respective treatments were done before cement application. The roots (n=5 per group) were cut into 2 mm thick dentin discs. The bond strength was measured with push-out method, and the failure mode was evaluated with a stereomicroscope.

RESULTS: Significant differences in bond strength were observed between various post/cement combinations. Unicore/PermaFlo DC and everStickPOST/ RelyX Unicem showed significantly higher bond strengths than Glassix or D.T.Light-Post with Duo-link both with saline and chlorhexidine. Chlorhexidine improved the bond strength slightly with all posts/cements except with D.T.Light-Post, but the differences were not statistically significant. With chlorhexidine, significant reduction of adhesive failures towards dentin cohesive or mixed failures was observed with all posts/cements except with everStickPOST.

CONCLUSION: Chlorhexidine did not negatively affect the push-out bond strength in post bond cementation.
BEST CLINICAL PRACTICE GUIDANCE FOR CLINICIANS DEALING WITH CHILDREN PRESENTING WITH MOLAR-INCISOR HYPOMINERALISATION (MIH): AN EAPD POLICY DOCUMENT

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European Archives of Paediatric Dentistry. 11(2): 75-81, 2010

BACKGROUND: The European Academy of Paediatric Dentistry (EAPD) has long recognised the necessity of promoting further research and knowledge regarding the dental defect described as molar-incisor-hypomineralisation (MIH). Following the establishment by EAPD of the defect diagnostic criteria in 2003, the publication of various papers and a whole issue assigned to the defect in the European Archives of Paediatric Dentistry (2008), an Interim Seminar and Workshop on MIH was organized in Helsinki in 2009.

RESULT: The outcome of this event is the present consensus paper on the prevalence, diagnosis, aetiology and treatment for children and adolescents presenting with MIH. A clear diagnostic proposal and a treatment decision-making guide are presented together with suggestions on aetiology and guidance for future research.

CONCLUSION: MIH is an important clinical problem that often concerns both the general dental and specialist paediatric dentists; the present 'best clinical practice guidance' aims to further help clinicians dealing with the condition.

PREVALENCE AND SIMULTANEOUS OCCURRENCE OF PERIODONTITIS AND DENTAL CARIES

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AIM: The aim of the study was to evaluate the prevalence and simultaneous occurrence of periodontal disease and dental caries in Finnish adults.

MATERIAL AND METHODS: The study was performed as part of the nationally representative Health 2000 Survey. The study population was 5255 subjects aged 30 years and older. Probing pocket depth (PPD) and untreated dentinal caries were recorded by tooth. Teeth with PPD 4mm and deeper indicated periodontal disease, and teeth with PPD 6mm and deeper indicated a severe periodontal disease.

RESULTS: Sixty-four percent of persons had periodontal disease, 21% had a severe periodontal disease, and 29% had dental caries. Persons having periodontal disease had
significantly more often dental caries (33%) compared with those without periodontal disease (23%). This was even more evident in persons having severe periodontal disease (44%). Accordingly, persons having dental caries had significantly more often severe periodontal disease (31%) compared with those without dental caries (16%). The mean number of teeth with dental caries or periodontal disease per person was greater when the mean number of teeth with the other disease was also greater.

CONCLUSIONS: These data indicate that especially severe periodontal disease and dental caries tend to accumulate in the same subjects.

INFECTIOUS AND DIETARY RISK FACTORS OF ORAL CANCER

MEURMAN JUKKA H.
Oral Oncology. 46(6): 411-413, 2010

In addition to the classic risk factors of oral cancer, namely alcohol and tobacco, other factors both infectious and environmental are thought to be associated with the development of oral malignancy. Infections in the oral cavity may be an important preventable cause of cancer. Poor oral hygiene, periodontal disease, chronic candidiasis, human papilloma virus (HPV) and herpesvirus infections link statistically with cancer but the mechanisms involved are largely unknown. Infections may trigger cell proliferation, inhibit apoptosis, interfere with cellular signaling mechanisms and up-regulate tumor promoters. In addition, several oral micro-organisms metabolize alcohol to carcinogenic acetaldehyde thus explaining the association between poor oral hygiene, alcohol consumption and carcinogenesis. With regards to dietary factors the Mediterranean-type fruit and vegetable rich diet has been shown to reduce the risk of oral cancer but the evidence is weak, the effect of individual food components and trace elements on carcinogenesis remains unclear at present.

ORAL AND DENTAL HEALTH CARE OF ORAL CANCER PATIENTS: HYPOSALIVATION, CARIES AND INFECTIONS

MEURMAN JUKKA H., GRÖNROOS L.
Oral Oncology 46(6): 464-467, 2010

Oral cancer and its treatment can cause a variety of problems to patients, also as regards maintaining their daily oral hygiene. Surgery mutilates tissues which may hamper cleaning the teeth and mucosal surfaces. The patient may have complicated reconstructive structures that also need continuous attention. Radiotherapy-induced hyposalivation further complicates the situation and decreases the quality of life. Consequently, dental caries, mucosal diseases such as candidosis and sialadenitis become problematic to treat. Hence every effort should be focused on prevention. In caries prevention intensified
fluoride therapy together with dietary counseling is needed. Oral cancer patients also need to be frequently referred to dental hygienists for professional cleaning. Drinking enough daily and moisturizing mucosal surfaces with commercial dry-mouth products, vegetable oils, milk products and respective topical agents need to be individually recommended. In addition, patients with severe dry mouth cases may also benefit from the prescription of pilocarpine tablets. In oral candidosis, the microbiological diagnosis must be confirmed before administration of antifungal drugs in order to avoid the selection pressure to resistant strains.

MANAGEMENT OF ORAL CANCER PATIENTS: ORAL AND DENTAL HEALTH CARE OF PATIENTS WITH HYPOSALIVATION, CARIES AND CANDIDOSIS

MEURMAN JUKKA H., GRÖNROOS L.
Oral Oncology. 46: 464-467, 2010

Oral cancer and its treatment can cause a variety of problems to patients, also as regards maintaining their daily oral hygiene. Surgery mutilates tissues which may hamper cleaning the teeth and mucosal surfaces. The patient may have complicated reconstructive structures that also need continuous attention. Radiotherapy-induced hyposalivation further complicates the situation and decreases the quality of life. Consequently, dental caries, mucosal diseases such as candidosis and sialadenitis become problematic to treat. Hence every effort should be focused on prevention. In caries prevention intensified fluoride therapy together with dietary counseling is needed. Oral cancer patients also need to be frequently referred to dental hygienists for professional cleaning. Drinking enough daily and moisturizing mucosal surfaces with commercial dry-mouth products, vegetable oils, milk products and respective topical agents need to be individually recommended. In addition, patients with severe dry mouth cases may also benefit from the prescription of pilocarpine tablets. In oral candidosis, the microbiological diagnosis must be confirmed before administration of antifungal drugs in order to avoid the selection pressure to resistant strains.
HUMAN ORAL KERATINOCYTE E-CADHERIN DEGRADATION BY CANDIDA ALBICANS AND CANDIDA GLABRATA


BACKGROUND: E-cadherin (E-Cad) is a 120-kDa adhesive protein found in adherens junctions of the digestive tract epithelium. We tested the ability of two Candida strains to degrade human E-Cad in the Candida virulence factor perspective.

MATERIALS AND METHODS: We set out to study oral mucosal E-Cad degradation by clinical and reference strains of Candida albicans and Candida glabrata. We also included hyphal and secreted aspartic proteinase (Sap) mutants of C. albicans to test the effect of yeast/hyphal transition on the ability to degrade E-Cad. The tests were performed at pH 4 and pH 6 to determine the effect of local tissue acidity on the activation of Saps. The C. albicans strains used were: CCUG 32723; clinical strain SC5314 which is known to be strongly invasive; hyphal mutants of SC5314: HLC52 (efg1/efg1), HLC54 (cph1/cph1 efg1/efg1) and JKC19 (cph1/cph1); clinical strain B1134; Sap 1-3 and Sap 4-6 mutants of SC5314. The C. glabrata strains used were ATCC 90030, and the clinical strains 5WT and G212.

RESULTS: The sonicated yeast cells of C. albicans JKC19 and SC5314, both in hyphal form, degraded E-Cad at pH 4. The 10x concentrated growth media of the strains HLC-52, HLC-54, 32723 and B1134; all in yeast form, caused degradation at pH 4, HLC-52 and HLC-54 also at pH 6. The C. glabrata strains did not degrade E-Cad.

CONCLUSIONS: pH is a strain dependent triggering factor in activating yeast or hyphal form related Candida Saps in degrading epithelial cell associated E-Cads.

MOLECULAR CHARACTERIZATION OF STREPTOCOCCUS MUTANS STRAINS CONTAINING THE CNM GENE ENCODING A COLLAGEN-BINDING ADHESIN


OBJECTIVE: Streptococcus mutans, known to be a major pathogen of dental caries, is also considered to cause infective endocarditis. Its 120-kDa Cnm protein binds to type I collagen, which may be a potential virulence factor. In this study, we characterized S. mutans clinical strains focusing on the cnm gene encoding Cnm.
DESIGN: A total of 528 S. mutans strains isolated from Japanese, Finnish, and Thai subjects were investigated. Using molecular techniques, the distribution frequency of cnm-positive strains and location of the inserted cnm were analyzed. Furthermore, isogenic mutant strains were constructed by inactivation of the cnm gene, then their biological properties of collagen-binding and glucan-binding were evaluated. Southern hybridization of the genes encoding glucan-binding proteins was also performed.

RESULTS: The distribution frequency of cnm-positive strains from Thai subjects was 12%, similar to that previously reported for Japanese and Finnish subjects. Furthermore, the location of insertion of cnm was the same in all cnm-positive clinical isolates. As for the cnm-inactivated mutant strains constructed from 28 clinical isolates, their collagen-binding activity was negligible. In addition, glucan-binding activity in the cnm-positive clinical isolates was significantly reduced and corresponded to a lack of gbpA encoding glucan-binding protein A.

CONCLUSIONS: Our results indicate that strains with cnm genes, the most crucial factor for the collagen-binding property of S. mutans, are detectable at similar frequencies over several different geographic locations. In addition, the common properties of these strains are a high level of collagen-binding activity and tendency for a low level of glucan-binding activity.

EFFECTS OF INHALED CORTICOSTEROIDS ON METALLOPROTEINASE-8 AND TISSUE INHIBITOR OF METALLOPROTEINASE-1 IN THE AIRWAYS OF ASTHMATIC CHILDREN

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International Archives of Allergy and Immunology. 151(3): 247-254, 2010

BACKGROUND: The effects of corticosteroids on the level and expression of matrix metalloproteinase-8 (MMP-8; collagenase-2) and tissue inhibitors of metalloproteinases (TIMPs) in airway tissue are poorly characterized in vivo.

METHODS: We compared MMP-8 and TIMP-1 levels in induced sputum and their expression in airway inflammatory cells of healthy children (n = 27) and of children with newly diagnosed asthma with mild (n = 20) or moderate symptoms (n = 19), before and after 6 months of treatment with inhaled budesonide.

RESULTS: At baseline, MMP-8 was higher in asthmatic children with moderate symptoms, TIMP-1 was lower and the MMP-8/TIMP-1 ratio was higher in both groups of asthmatic children compared with controls. Inhaled budesonide increased TIMP-1 levels in both groups of asthmatic children and normalized the MMP-8/TIMP-1 ratio, and this
paralleled the improvement in forced expiratory volume in 1 s in children with mild symptoms. At baseline, asthmatic children had significantly more MMP-8-positive macrophages than control children, whereas the number of TIMP-1-positive macrophages was almost the same. Budesonide decreased the percentage of MMP-8-positive macrophages and increased that of TIMP-1-positive macrophages; these changes were significant in asthmatic children with mild symptoms.

CONCLUSIONS: Inhaled budesonide normalized the MMP-8/TIMP-1 ratio in asthmatic children by upregulation of TIMP-1 production and downregulation of MMP-8 production by airway macrophages. This change may be a biochemical marker of an effect on airway inflammation and possibly of an ongoing remodeling process that should be further investigated using biopsy specimens.

ELEVATED MMP-8 AND DECREASED MYELOPEROXIDASE CONCENTRATIONS ASSOCIATE SIGNIFICANTLY WITH THE RISK FOR PERIPHERAL ATHEROSCLEROSIS DISEASE AND ABDOMINAL AORTIC ANEURYSM1

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Scandinavian Journal of Immunology. 72( 2): 150-157, 2010

Matrix metalloproteinases are responsible for degradation and remodelling of extracellular matrix and exert important roles in initiation and progression of inflammatory diseases. We aimed to examine the role of Matrix metalloproteinases (MMPs) and their regulators in degenerative arterial diseases. Serum samples were collected from patients with arterial disease (n = 126), who underwent surgery because of symptomatic aorto-occlusive disease (AOD, n = 18), carotid artery stenosis (n = 67) or abdominal aortic aneurysm (n = 41). Serum MMP-1, MMP-8, MMP-13, TIMP-1, myeloperoxidase (MPO) and neutrophil elastase (HNE) concentrations were determined by ELISA, and the molar ratio of MMP-8 and TIMP-1 was calculated. To get reference values, the determinations were done on samples of healthy blood donors (n = 100). In univariate analyses, the patients had higher MMP-8 (P < 0.001), TIMP-1 (P = 0.045), and MMP-8/TIMP-1 (P < 0.001), and lower MPO (P < 0.001) when compared with the blood donors. All three subgroups had higher MMP-8 (P < 0.001) and MMP-8/TIMP-1 (P < 0.001), and lower MPO (P < 0.01, except AOD) levels when compared with the references. In multiple logistic regression analyses, the male gender (P < 0.01), age (P < 0.001), elevated MMP-8 (P < 0.001) and decreased MPO (P < 0.001) concentrations associated significantly with the risk for arterial disease, and provided an area under curve (AUC) of 0.97 in the Receiver operating characteristics analyses. In multiple linear regression analyses, HNE correlated with both MMP-8 (P < 0.001) and MPO (P = 0.008) concentrations. Combination of high MMP-8 and low MPO level in serum eventually
reflecting selectively modified neutrophil degranulation may indicate increased risk for arterial disease.

**PLASMA LEVEL OF TISSUE INHIBITOR OF MATRIX METALLOPROTEINASE-1 BUT NOT THAT OF MATRIX METALLOPROTEINASE-8 PREDICTS SURVIVAL IN HEAD AND NECK SQUAMOUS CELL CANCER**

PRADHAN-PALIKHE P., VESTERINEN T., TARKKANEN J., LEIVO I., SORSA TIMO, SALO T., MATTILA P. S.  
Oral Oncology. 46( 7): 514-518, 2010

Expression of matrix metalloproteinase-8 (MMP-8) in tongue cancer cells has been associated with an improved prognosis. MMP-8 is inhibited by tissue inhibitor of matrix metalloproteinase-1 (TIMP-1) and elevated levels of TIMP-1 in blood have been associated with poor prognosis in many cancers. We wished to evaluate the usefulness of peripheral blood MMP-8 and TIMP-1 levels as well as the genotypes of MMP8 and TIMP1 in predicting prognosis in head and neck squamous cell carcinoma (HNSCC). Plasma concentrations of MMP-8 and TIMP-1 were analyzed in 136 HNSCC patients. MMP8 and TIMP1 genotypes were determined by analysis of single nucleotide polymorphisms (SNP) in peripheral blood DNA. The mean follow-up time was 3.3 years. We found that plasma MMP-8 level did not predict survival but that TIMP-1 level was associated with survival. The adjusted hazard ratio of death scored as a continuous variable on the log(10) scale was 23.2 (95% CI 1.88-286, P=0.01) and that of MMP-8 1.24 (95% CI 0.54-2.84, P=0.61). Immunohistochemical staining showed that TIMP-1 was expressed in vascular endothelium of tumor. TIMP-1 levels were associated with TIMP1 genotype in women but not in men. MMP8 genotype did not correlate with survival or MMP-8 level. Plasma TIMP-1 levels predict survival in HNSCC. TIMP-1 expression is genetically controlled in women. As TIMP-1 inhibits the activity of MMP-8 and it also functions as a growth factor, it may directly influence HNSCC progression.

**ASSOCIATION OF SALIVARY LYSOZYME AND C-REACTIVE PROTEIN WITH METABOLIC SYNDROME**

Journal of Clinical Periodontology. 37( 9): 805-811, 2010

INTRODUCTION: Salivary lysozyme (SLZ) is a proteolytic enzyme secreted by oral leucocytes and contains a domain that has an affinity to advanced glycation end products (AGE). Thus, we hypothesized that SLZ would be associated with metabolic syndrome (metS), a pro-inflammatory state.
METHODS: Utilizing cross-sectional data from 250 coronary artery disease (CAD) and 250 non-CAD patients, the association of SLZ with metS was tested by logistic regression analyses controlling for age, sex, smoking, total cholesterol and C-reactive protein (CRP) levels. The analyses were stratified by CAD status to control for the possible effects of CAD.

RESULTS: MetS was found in 122 persons. The adjusted odds ratio (OR) for metS associated with the highest quartile of SLZ was 1.95 with 95% confidence interval (CI) 1.20-3.12, p-value=0.007, compared with the lower three quartiles combined. Among the 40 subjects with metS but without CAD, the OR was 1.63 (CI: 0.64-4.15, p=0.31), whereas in the CAD group, SLZ was significantly associated with metS [OR=1.96 (1.09-3.52), p=0.02]. In both subgroups, CRP was not significantly associated with metS.

CONCLUSION: SLZ was significantly associated with metS (OR=1.95) independent of CRP level. Future longitudinal research is warranted.

ASSOCIATION OF GINGIVAL CREVICULAR FLUID BIOMARKERS DURING PERIODONTAL MAINTENANCE WITH SUBSEQUENT PROGRESSIVE PERIODONTITIS


BACKGROUND: The analysis of biomarkers in gingival crevicular fluid (GCF) may be helpful in forecasting patient vulnerability to future attachment loss. The purpose of this study is to correlate GCF biomarkers of inflammation and bone resorption with subsequent periodontal attachment and bone loss in a longitudinal trial of a matrix metalloproteinase (MMP) inhibitor.

METHODS: GCF was collected from two periodontal pockets (mean +/- SD: 5.1 +/- 1.0 mm) at baseline and annually in postmenopausal females with moderate to advanced periodontitis undergoing periodontal maintenance every 3 to 4 months during a 2-year double-masked, placebo-controlled, randomized clinical trial of subantimicrobial dose doxycycline (SDD; 20 mg two times a day). Subjects were randomized to SDD (n = 64) or a placebo (n = 64). GCF was analyzed for the inflammation markers interleukin (IL)-1beta (using enzyme-linked immunosorbenent assay), total collagenase activity (using hydrolysis of a synthetic octapeptide), and MMP-8 (using a Western blot) and the bone-resorption marker carboxyterminal telopeptide cross-link fragment of type I collagen (ICTP) (using a radioimmunoassay). Generalized estimating equations were used to associate these biomarkers, categorized into tertiles, with subsequent clinical attachment (using an automated disk probe) or interproximal bone loss (using radiography). Odds ratio (OR) values compared highest to lowest tertile groups.
RESULTS: Increases in GCF IL-1beta and MMP-8 during the first year of periodontal maintenance were associated with increased odds of subsequent (year 2) periodontal attachment loss (OR = 1.67; P = 0.01 and OR = 1.50; P = 0.02, respectively) driven by the placebo group. Elevated baseline ICTP was also associated with increased odds of 1- and 2-year loss of alveolar bone density (OR = 1.98; P = 0.0001) in the placebo group, not the SDD group, and a loss of bone height (OR = 1.38; P = 0.06), again driven by the placebo group.

CONCLUSION: These data support the hypothesis that elevated GCF biomarkers of inflammation and bone resorption from a small number of moderate/deep sites have the potential to identify patients who are vulnerable to progressive periodontitis, and SDD may modify that risk.

GLI3XT-J/XT-J MICE EXHIBIT LAMBDOID SUTURE CRANIOSYNOSTOSIS WHICH RESULTS FROM ALTERED OSTEOPROGENITOR PROLIFERATION AND DIFFERENTIATION

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Human Molecular Genetics. 19( 17): 3457-3467, 2010

Gli3 is a zinc-finger transcription factor whose activity is dependent on the level of hedgehog (Hh) ligand. Hh signaling has key roles during endochondral ossification; however, its role in intramembranous ossification is still unclear. In this study, we show that Gli3 performs a dual role in regulating both osteoprogenitor proliferation and osteoblast differentiation during intramembranous ossification. We discovered that Gli3Xt-J/XT-J mice, which represent a Gli3-null allele, exhibit craniosynostosis of the lambdoid sutures and that this is accompanied by increased osteoprogenitor proliferation and differentiation. These cellular changes are preceded by ectopic expression of the Hh receptor Patched1 and reduced expression of the transcription factor Twist1 in the sutural mesenchyme. Twist1 is known to delay osteogenesis by binding to and inhibiting the transcription factor Runx2. We found that Runx2 expression in the lambdoid suture was altered in a pattern complimentary to that of Twist1. We therefore propose that loss of Gli3 results in a Twist1-, Runx2-dependent expansion of the sutural osteoprogenitor population as well as enhanced osteoblastic differentiation which results in a bony bridge forming between the parietal and interparietal bones. We show that FGF2 will induce Twist1, normalize osteoprogenitor proliferation and differentiation and rescue the lambdoid suture synostosis in Gli3Xt-J/XT-J mice. Taken together, we define a novel role for Gli3 in osteoblast development; we describe the first mouse model of lambdoid suture craniosynostosis and show how craniosynostosis can be rescued in this model.
TOBACCO USE AND REPORTED BRUXISM IN YOUNG ADULT TWINS: A NATIONWIDE FINNISH TWIN COHORT STUDY

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INTRODUCTION: Higher levels of smoking, leading to increased levels of nicotine and dopamine release, may be more strongly related to bruxism, although this relationship has remained unclear. Thus, the aim of the present study was to investigate the possible effect of cumulative tobacco use on bruxism in a large sample of young adults.

METHODS: The material of the present study derives from the FinnTwin16, which consists of five birth cohorts born in 1975-1979. A total of 3,124 subjects (mean age 24 years, range 23-27 years) provided data in 2000-2002 on frequency of bruxism and tobacco use. Multinomial logistic regression was used to explore the relationships of frequency of bruxism with smoking and smokeless tobacco use while controlling covariates (alcohol intoxication, alcohol problems [Rutgers Alcohol Problem Index, RAPI], illicit drug use, psychological distress [General Health Questionnaire], and coffee use).

RESULTS: Based on subjective response and multivariate analyses, weekly bruxers were more than two times more likely to report heavy smoking than never bruxers (odds ratio [OR] 2.5, 95 % CI 1.8-3.4). The significant association between heavy smoking and bruxism held when the effects of other tobacco use and multiple covariates were controlled. In addition, the use of smokeless tobacco emerged as an independent risk factor for bruxism.

DISCUSSION: Given the observed associations with both heavy smoking and smokeless tobacco and a dose-response relationship, the present results support our hypothesis of a link between nicotine intake and bruxism.

GENETIC AND ENVIRONMENTAL FACTORS IN ORAL HEALTH AMONG TWINS

RINTAKOSKI K., KAPRIO J., MURTOMAA HEIKKI
Journal of Dental Research. 89( 7): 700-704, 2010

To date, studies on the contributions of genetic factors to oral health have been inconclusive. We hypothesized that major dental diseases show a significant genetic component. The study was based on self-reported oral health among young adult twins. The data were derived from the fourth wave of the longitudinal FinnTwin16 study, in which participants completed a questionnaire in 2000-2002 enquiring about the number...
of filled teeth and the prevalence of gingival bleeding. We used quantitative genetic modeling, based on the genetic similarity of identical and non-identical twins, to calculate the most probable model for both filled teeth and gingival bleeding. The models revealed a strong genetic component behind the number of filled teeth, differing between males (49%) and females (68%), and a weaker genetic component affecting gingival bleeding, being similar for males and females (32%). Genetic factors contribute to inter-individual differences in oral health among young adults.

VIOLENCE-RELATED FACIAL TRAUMA: ANALYSIS OF MULTIDETECTOR COMPUTED TOMOGRAPHY FINDINGS OF 727 PATIENTS

SALONEN E. M., KOIVIKKO M. P., KOSKINEN S. K.

OBJECTIVES: The multidetector CT (MDCT) findings of facial trauma in victims of interpersonal violence were assessed.

METHODS: All MDCT requests for suspected facial injury during a 62 month period were retrieved; 727 cases met the inclusion criteria. Images were interpreted by two researchers by consensus.

RESULTS: Of the 727 patients (aged 15-86 years old, mean 37), 583 (80.2%) were male and 144 (19.8%) female. Of all the patients, 74% had a fracture, and of these 44% had multiple non-contiguous fractures.

CONCLUSIONS: Violence is a very common cause of facial injury. Nasal and orbital fractures predominate. Males are more often involved; they are younger, sustain fractures more often and significantly more often present with high-energy fracture patterns. LeFort fractures are often unilateral or asymmetrical, and are frequently accompanied by other, clinically significant fractures. Up to 25% of patients with fractures do not have paranasal sinus effusions.

CHANGING CLINICAL FEATURES OF ODONTOGENIC MAXILLOFACIAL INFECTIONS

SEPPÄNEN L., RAUTEMAA RIINA, LINDQVIST CHRISTIAN, LAUHIO A.

Odontogenic maxillofacial infections occasionally require hospital care. Our aim was to study whether the number and the clinical features of patients hospitalized due to odontogenic abscesses in a large hospital district in Finland had changed in one decade. A retrospective analysis of two 12-month study cohorts one decade apart from the same
population base was conducted. The first cohort comprised 71 patients and the second cohort comprised 101 patients. The incidence of odontogenic infections requiring hospital care increased from 5.3 to 7.2 per 100,000 inhabitants. The need for intensive care increased significantly from 15% to 32%, and the maximal C-reactive protein levels were significantly higher in the latter cohort, 127 mg/L, compared to the first cohort, 104 mg/L. The proportion of previously healthy patients decreased significantly from 83% to 65%. Odontogenic maxillofacial infections have become more prevalent and more severe during the decade in our hospital district. An increasing proportion of patients had underlying diseases.

PERSISTENT CANDIDA ALBICANS COLONIZATION AND MOLECULAR MECHANISMS OF AZOLE RESISTANCE IN AUTOIMMUNE POLYENDOCRINOPATHY-CANDIDIASIS-ECTODERMAL DYSTROPHY (APECED) PATIENTS

SIIKALA E., RAUTEMAA RIINA, RICHARDSON M., SAXEN H., BOWYER P., SINGLARD D.
Journal of Antimicrobial Chemotherapy. 65( 12): 2505-2513, 2010

OBJECTIVES: Patients with autoimmune polyendocrinopathy-candidiasis-ectodermal dystrophy (APECED, APS-I) suffer from chronic candidosis caused mainly by Candida albicans, and repeated courses of azole antifungals have led to the development of resistance in the APECED patient population in Finland. The aim of our study was to address whether the patients are persistently colonized with the same or genetically closely related strains, whether epidemic strains are present and which molecular mechanisms account for azole resistance.

METHODS: Sets of C. albicans (n=19) isolates from nine APECED patients reported with decreased susceptibility to fluconazole isolated up to 9 years apart were included. The strains were typed by multilocus sequence typing. CDR1/2, MDR1 and ERG11 mRNA expression was analysed by northern blotting and Cdr1, Cdr2 and Mdr1 protein expression by western blotting, and TAC1 and ERG11 genes were sequenced.

RESULTS: All seven patients with multiple C. albicans isolates analysed were persistently colonized with the same or a genetically closely related strain for a mean of 5 years. All patients were colonized with different strains and no epidemic strains were found. The major molecular mechanisms behind the azole resistance were mutations in TAC1 contributing to overexpression of CDR1 and CDR2. Six new TAC1 mutations were found, one of which (N740S) is likely to be a gain-of-function mutation. Most isolates were found to have gained multiple TAC1 and ERG11 point mutations.

CONCLUSIONS: Despite clinically successful treatment leading to relief of symptoms, colonization by C. albicans strains is persistent within APECED patients. Microevolution
and point mutations occur within strains, leading to the development of azole-resistant isolates.

DETECTION OF GINGIVAL CREVICULAR FLUID MMP-8 LEVELS WITH DIFFERENT LABORATORY AND CHAIR-SIDE METHODS

SORSA TIMO, HERNANDEZ M., LEPPILAHTI J., MUNJAL S., NETUSCHIL L., MÄNTYLÄ P. A.

OBJECTIVE:
The aim of the study was to compare four methods for gingival crevicular fluid (GCF) matrix metalloproteinase (MMP)-8 detection.

METHODS:
Matrix metalloproteinase-8 levels from 20 GCF samples from two periodontally healthy subjects, 18 samples from two patients with gingivitis and 45 samples from six patients with moderate to severe periodontitis, altogether 83 samples, were analysed using (1) a time-resolved immunofluorometric assay (IFMA), (2) an MMP-8 specific chair-side dip-stick test, (3) a dentoAnalyzer device and (4) the Amersham ELISA kit. Western immunoblot using same monoclonal anti-MMP-8 as in IFMA and dentoAnalyzer was used to identify molecular forms of MMP-8 in GCFs.

RESULTS:
Correlation between IFMA and dentoAnalyzer results calculated with Spearman's correlation coefficient was 0.95 (P = 0.01). The chair-side dip-stick test results were well in line with these assays. Periodontitis sites with unstable characteristics were differentiated with these methods. The Amersham ELISA results were not in line with the findings by other methods.

CONCLUSIONS:
Immunofluorometric assay and dentoAnalyzer can detect MMP-8 from GCF samples and these methods are comparable. Using Western immunoblot, it was confirmed that IFMA and dentoAnalyzer can detect activated 55 kDa MMP-8 species especially in periodontitis-affected GCF. dentoAnalyzer is among the first quantitative MMP-8 chair-side testing devices in periodontal and peri-implant diagnostics and research.
BIOACTIVE GLASS S53P4 IN THE FILLING OF CAVITIES IN THE MASTOID CELL AREA IN SURGERY FOR CHRONIC OTITIS MEDIA

STOOR PATRICIA, PULKKINEN J, GRENMAN R

OBJECTIVES:
Chronic infection of the middle ear and cholesteatoma can be treated surgically by exenteration of the mastoid air cells behind the ear. After a procedure with the canal wall-down technique, a cavity remains that is sometimes difficult to clean, collects crust, and becomes repeatedly infected. Such problematic mastoid cavities can be eliminated by filling the created cavity surgically after thorough removal of mucous membranes and cleaning of the bone.

METHODS:
We treated 7 patients with cavities after canal wall-down surgery for the treatment of chronic suppurative otitis media or cholesteatoma by filling the difficult-to-clean cavity in the mastoid cell area with granules of bioactive glass (BAG) S53P4 to avoid further retraction formation. The area with BAG was carefully closed with a musculoperiosteal flap.

RESULTS:
After the canal wall-down tympanomastoidectomy, the mastoid cavities were successfully filled in all 7 patients. No biomaterial-associated infection was seen, and no disadvantages for the patients due to the BAG were observed. The cavity in the mastoid cell area decreased in size in all patients treated.

CONCLUSIONS:
This BAG seems to be a promising material for filling mastoid cavities after canal wall-down tympanomastoidectomy.

AWARENESS OF TOOTH GRINDING AND CLENCHING FROM ADOLESCENCE TO YOUNG ADULTHOOD: A NINE-YEAR FOLLOW-UP

STRAUSZ T., AHLBERG JARI, LOBBEZOO F., RESTREPO C. C., HUBLIN C., AHLBERG KRISTIINA, KÖNÖNEN MAUNO

How bruxism develops from adolescence to early adulthood remains unclear. A previous database was revisited to evaluate the natural course of self-reported tooth grinding and clenching among young Finns aged 14-23 using four assessments. Overall, the self-reported frequencies of both grinding and clenching increased during the examination
period: from 13.7% to 21.7% and from 9.2% to 14.8%, respectively. There were significant increases (without a statistically significant difference between genders) in both grinding ($P = 0.002$) and clenching ($P = 0.015$) between 15 and 23 years. A significant rise in grinding between 18 and 23 years was also found ($P = 0.011$). It is concluded that self-reported bruxism increases from adolescence to young adulthood. Moreover, there are large differences between individuals, and fluctuations may occur in the natural course of bruxism.

RELIABILITY OF CBCT AND OTHER RADIOGRAPHIC METHODS IN PREOPERATIVE EVALUATION OF LOWER THIRD MOLARS

SUOMALAINEN ANNI, VENTÄ IRJA, MATTILA M., TURTOLA L., VEHMAS T., PELTOLA J. S.

OBJECTIVES:
The aim of this study was to compare the reliability of cone-beam computerized tomography (CBCT) with that of other radiographic methods in preoperative radiographic determination of the number of roots of lower third molars and their relationship to the inferior alveolar canal (IAC).

STUDY DESIGN:
Forty-two teeth were clinically studied and imaged using CBCT and other imaging methods-panoramic radiography, multiprojection narrow-beam radiography (MNBR), and cross-sectional tomography. Statistical analysis (kappa values) was used to compare the diagnoses of 2 trained oral radiologists and the radiologic diagnoses with the findings at operation.

RESULTS:
Cone-beam CT revealed the number of roots of teeth more reliably than panoramic radiographs. CBCT examination was highly reliable in locating the IAC, whereas MNBR was unreliable and cross-sectional tomography fell between the two. With cross-sectional tomography, the IAC was noninterpretable in one-third of the cases.

CONCLUSIONS:
We recommend CBCT examination for preoperative radiographic evaluation of complicated impacted lower third molars.
AN EPIDEMIOLOGICAL STUDY OF DENTAL AGENESIS IN A PRIMARY HEALTH AREA IN SPAIN: ESTIMATED PREVALENCE AND ASSOCIATED FACTORS

TALLON-WALTON V., NIEMINEN P., ARTE SIRPA, CARVALHO-LOBATO P., USTRELL-TORRENT J. M., CRISTINA MANZANARES-CESPEDES MC.

OBJECTIVES:
To evaluate the prevalence of dental agenesis and its possible association with other developmental dental anomalies and systemic entities.

SETTING AND SAMPLE POPULATION:
Descriptive transversal study, for which 1518 clinical records, of patients visited by the Odontological Service of the Primary Health Centre of Cassà de la Selva (Girona-Spain) between December 2002 and February 2006 were reviewed. The data were recorded in relation to the oral and dental anomalies and the associated systemic entities, between the ones referred as concomitant in literature.

RESULTS:
Values of 9.48% (7.25% excluding the third molars) for dental agenesis and 0.39% for oligodontia were obtained. The presence of dental agenesis concomitant with some other forms of oral and dental anomalies was observed. Attention must be drawn to the fact that a greater number of concomitant systemic entities were observed in those patients that presented a severe phenotypical pattern of dental agenesis.

CONCLUSIONS:
The results of the present study do not differ from the ones reported in studies of similar characteristics among Occidental and Spanish populations. The relationship observed between certain systemic entities and developmental dental anomalies suggest a possible common genetic etiology.

ORAL FINDINGS IN MIDLINE SYNDROME: A CASE REPORT AND LITERATURE REVIEW

TALLON-WALTON V., NIEMINEN P., ARTE SIRPA, USTRELL-TORRENT J. M., CARVALHO-LOBATO P., MANZANARES-CESPEDES MC.

We describe a female patient with a midline syndrome. The patient presents agenesis of the corpus callosum, encephalocele, iris coloboma, hypertelorism, submucosal cleft palate and dental anomalies. Despite being very characteristic, her phenotypical traits do not coincide exactly with those reported to date in the literature. The karyotype and the molecular cytogenetic study do not show mutations. We identify the presence of dental...
anomalies in the mother and other family members, not being identified MSX1 and PAX9 mutations that could be related with their etiology. Despite the fact that dental agenesis has been related to a large number of other malformation syndromes and congenital conditions, dental anomalies have only rarely been mentioned when reporting midline syndromes. These dental phenotypical traits, present in the patient and her family, could be considered part of the midline syndrome in carriers as well as in the patients.

THE REQUIREMENT OF ZINC AND CALCIUM IONS FOR FUNCTIONAL MMP ACTIVITY IN DEMINERALIZED DENTIN MATRICES


The progressive degradation of resin-dentin bonds is due, in part, to the slow degradation of collagen fibrils in the hybrid layer by endogenous matrix metalloproteinases (MMPs) of the dentin matrix. In in vitro durability studies, the storage medium composition might be important because the optimum activity of MMPs requires both zinc and calcium.

OBJECTIVE:
This study evaluated the effect of different storage media on changes in matrix stiffness, loss of dry weight or solubilization of collagen from demineralized dentin beams incubated in vitro for up to 60 days.

METHODS:
Dentin beams (1mm×2mm×6mm) were completely demineralized in 10% phosphoric acid. After baseline measurements of dry mass and elastic modulus (E) (3-point bending, 15% strain) the beams were divided into 5 groups (n=11/group) and incubated at 37°C in either media containing both zinc and calcium designated as complete medium (CM), calcium-free medium, zinc-free medium, a doubled-zinc medium or water. Beams were retested at 3, 7, 14, 30, and 60 days of incubation. The incubation media was hydrolyzed with HCl for the quantitation of hydroxyproline (HOP) as an index of solubilization of collagen by MMPs. Data were analyzed using repeated measures of ANOVA.

RESULTS:
Both the storage medium and the storage time showed significant effects on E, mass loss and HOP release (p<0.05). The incubation in CM resulted in relatively rapid and significant (p<0.05) decreases in stiffness, and increasing amounts of mass loss. The HOP content of the experimental media also increased with incubation time but was significantly lower (p<0.05) than in the control CM medium, the recommended storage medium.

CONCLUSIONS:
The storage solutions used to age resin-dentin bonds should be buffered solutions that contain both calcium and zinc. The common use of water as an aging medium may underestimate the hydrolytic activity of endogenous dentin MMPs.
OCCURRENCE AND TYPES OF DENTAL INJURIES AMONG PATIENTS WITH MAXILLOFACIAL FRACTURES

THOREN HANNA, NUMMINEN L., SNÄLL J., KORMI E., LINDQVIST CHRISTIAN, IIZUKA T., TÖRNWALL JYRKI

The aim of this retrospective study was to clarify the occurrence and types of dental injuries in 389 patients who had been diagnosed with facial fractures, and to analyze whether the occurrence of dental injury correlates to gender, age, trauma mechanism and type of facial fracture. Dental injuries were observed in 62 patients (16%). The most common type of injury was a crown fracture (48%). Dental injuries were multiple in most patients (63%). Almost half (48%) of all injured teeth were severely injured. Most injured teeth (61%) were in the maxilla. The incisor region was the most prevalent site in both the mandible (45%) and the maxilla (56%). The occurrence of dental injury correlated significantly with trauma mechanism and fracture type: motor vehicle accidents and mandibular fracture were significant predictors for dental trauma. The notable rate of dental injury observed in the present study emphasizes the importance of a thorough examination of the oral cavity in all patients who have sustained facial fracture. Referral to a dental practice for further treatment and follow up as soon as possible after discharge from hospital is fundamental.

SYMPTOMATIC PLATE REMOVAL AFTER TREATMENT OF FACIAL FRACTURES

THOREN HANNA, SNÄLL J., KORMI E., LINDQVIST CHRISTIAN, SUOMINEN-TAIPALE L., TÖRNWALL JYRKI

AIMS:
To identify the rates and reasons for plate removal (PR) among patients treated for facial fractures.

MATERIALS AND METHODS:
A retrospective review of files of 238 patients.

RESULTS:
Forty-eight patients (20.2%) had plates removed. The reason for removal was objective in 33.3% and subjective in 29.2%. The most common subjective reason was cold sensitivity, and the most common objective reason was wound dehiscence/infection. Women had PR for subjective reasons more often than men (p=0.018). Removal was performed more
often for subjective reasons after zygomatico-orbital fractures than after mandibular fractures (p=0.002). Plates inserted in the mandible from an intraoral approach were removed more frequently than extraorally inserted mandibular plates, intraorally inserted maxillary plates, and extraorally inserted plates in other locations (p<0.001). Orbital rim plates had a higher risk of being removed than maxillary or frontal bone plates (p=0.02).

CONCLUSIONS:
Subjective discomfort is a notable reason for PR among Finnish patients, suggesting that the cold climate has an influence on the need for removal. Patients receiving mandibular osteosynthesis with miniplates from an intraoral approach are at risk of hardware removal because of wound dehiscence/infection and loose/broken hardware, reminding us that more rigid fixation devices should not be forgotten despite the widespread use of miniplates.

OCCURRENCE AND TYPES OF ASSOCIATED INJURIES IN PATIENTS WITH FRACTURES OF THE FACIAL BONES

THOREN HANNA, SNÄLL J., SALO J., SUOMINEN-TAIPALE L., KORMI E., LINDQVIST CHRISTIAN, TÖRNWALL JYRKI

PURPOSE:
To identify the occurrence, types, and severity of associated injuries outside the facial region among patients diagnosed with facial fractures, and to analyze whether there are any factors related to associated injuries.

MATERIALS AND METHODS:
This was a cross-sectional study of 401 patients diagnosed with facial fractures during the 2-year period from 2003 to 2004.

RESULTS:
Associated injuries were observed in 101 patients (25.2%). The most common type of injury was a limb injury (13.5%), followed by brain (11.0%), chest (5.5%), spine (2.7%), and abdominal (0.8%) injuries. Multiple associated injuries were observed in 10% and polytrauma in 7.5%. The mortality rate was 0.2%. The occurrence of associated injury correlated significantly with trauma mechanism and fracture type; high-speed accidents and severe facial fractures were significant predictors of associated injury.

CONCLUSIONS:
Associated injuries are frequent among patients who have sustained facial fractures. The results underscore the importance of multiprofessional collaboration in diagnosis and sequencing of treatment, but also the importance of arranging appropriate clinical rotations for maxillofacial residents in training.
PURPOSE:
The aim of the present study was to identify the underlying patterns of oral cleaning habits and the use of fluoride, and to investigate their variations by studying the socioeconomic characteristics among Finnish dentate adults aged 30 to 64 years.

MATERIALS AND METHODS:
Participants of the nationwide Health 2000 survey who were dentate, aged 30 to 64 years, and underwent a health interview and a clinical oral examination, were included in the present study (n = 4419).

RESULTS:
In total, 79% of the women and 46% of the men reported to have brushed their teeth twice or more daily; 16% of the women and 14% of the men reported daily use of an electric toothbrush and 14% of the women and 5% of the men reported daily use of dental floss or an interdental brush. Factor analysis revealed five oral cleaning habit patterns, which were named modern, rational, before-breakfast, social and irrational. The modern cleaning pattern was associated with higher levels of education, and the rational cleaning with younger age, female gender and higher levels of education. The before-breakfast cleaning pattern was associated with male gender and lower levels of education, and the social cleaning with older age, female gender and higher levels of education. The irrational cleaning pattern was associated with older age.

CONCLUSIONS:
Adults have various oral cleaning habit patterns, each of which is associated with the subjects' socioeconomic characteristics.

EPITOPES ON PERIODONTAL PATHOGENS ARE RECOGNIZED BY ANTIBODIES BINDING TO OXIDIZED LDL

BACKGROUND: Periodontal bacterial infections increase risk for atherosclerosis but molecular mechanisms connecting oxidized LDL (OxLDL), innate immune reactions and infections are obscure. Progression of atherosclerosis is modulated by natural antibodies binding to highly immunogenic OxLDL. IgM antibodies to OxLDL are known to associate with atheroprotective properties in mice and man.

AIM: To demonstrate cross-reactive epitopes on OxLDL and periodontal pathogens Aggregatibacter actinomycetemcomitans (Aa) and Porphyromonas gingivalis (Pg) and to
assess the significance of innate immune recognition of these bacteria by anti-OxLDL antibodies in the development of atherosclerosis.

MATERIALS AND METHODS: Molecular mimicry between malondialdehyde modified type epitopes of LDL (MDALDL, a model of OxLDL) and periodontal pathogens Aa and Pg was discovered by chemiluminescent ELISA, Western blotting and flow cytometry. Mouse immune plasma samples and mouse monoclonal IgM clones selected for binding to MDA-LDL were used in analyses. For in vivo atherosclerosis study LDL receptor deficient (LDLR -/- ) mice were immunized with a serotype-mix of heat-killed Aa or Pg followed by a 4-month period of high fat diet (HFD). The extent of atherosclerosis was quantified by en face aortic lesion size analysis and by cross-sectional plaque areas at the aortic origin. Proinflammatory cytokines IL-1β, IL-6 and MCP-1 from LDLR -/- mouse plasma (after HFD) were determined by a magnetic bead-based multiplex fluorescence assay.

RESULTS: Several mouse monoclonal IgM clones to MDA-LDL recognized epitopes on Aa or Pg in ELISA, immunoblot and flow cytometry assays. Pg immunization of LDLR-/- mice significantly reduced atheroma development compared to controls whereas immunization with Aa did not confer atheroprotection. Pg immunization increased only protective IgM against MDA-LDL. However, IgG antibodies to MDA-LDL, which are suggested to be atheropromoting, were lacking in Pg immunized mice. Aa immunization induced both IgG and IgM against MDA-LDL and increased plasma levels of IL-1β, IL-6 and MCP-1, possibly leading to a failure in conferring atheroprotection.

CONCLUSION: Through molecular mimicry, bacterial antigenic stimulation induced production of antibodies with binding specificities typical of natural anti-OxLDL antibodies, which is suggested to modulate pathogen-accelerated atherosclerosis via innate immunity.

CHLAMYDIAL LIPOPOLYSACCHARIDE (cLPS) IS PRESENT IN Atherosclerotic AND Aneurysmal Arterial Wall-cLPS LEVELS DEPEND ON DISEASE MANIFESTATION

VIKATMAA P., LAJUNEN T, IKONEN T. S., PUSSINEN P. J., LEPÄNTALO M., LEINONEN M., SAIKKU P.
Cardiovascular Pathology. 19( 1): 48-54, 2010

BACKGROUND:
The role of Chlamydia pneumoniae in peripheral atherosclerosis disease and abdominal aortic aneurysm (AAA) remains unclear. Chlamydia lipopolysaccharide (cLPS) detection is a method used conventionally in routine chlamydial diagnosis of gynecological or ophthalmic samples.
METHODS:
We compared cLPS concentrations, as well as other markers of bacterial load, in plaques and sera of patients operated on for carotid artery stenosis (n=110), aorto-occlusive disease (n=22), or AAAs (n=50) at the Helsinki University Central Hospital.

RESULTS:
The median levels of cLPS in plaques were 2.28, 0.80, and 0.29 ng/ml in AAA, aorto-occlusive disease, and carotid artery stenosis patients, respectively (P<.001, Kruskal-Wallis). cLPS in serum correlated with LPS binding protein levels (Spearman's rho=0.52, P<.001), suggesting that the presence of chlamydiae is sufficient to produce an innate immune response reaction in these patients. Serum inflammatory markers interleukin 6 and highly sensitive C-reactive protein also correlate with cLPS (Spearman's rho=0.42 and 0.51, respectively, P<.001).

CONCLUSIONS:
cLPS is present in arterial disease, and the potential role of C. pneumoniae in the pathogenesis of both peripheral atherosclerosis disease and AAA should not be forgotten. cLPS has a positive correlation with serum inflammatory markers, but this is no proof of a causal association.
ARTICLES IN FINNISH OR SWEDISH

SUUN JA HAMPAIDEN SAIRAUDET

ALALUUSUA SATU
Publication: Helsinki, 2010

MITÄ LAPSET EIVÄT OPPISI

ALALUUSUA SATU
Suomen hammaslääkärilehti. N.s. XVII(14): 32-33

TEORIA JA KÄYTÄNTÖ EIVÄT KOHTAA VASTAANOTON HYGIENISSÄ

ALAPULLI J., RICHARDSON RIINA, HIIRI A., TJÄDERHANE LEO
Suomen hammaslääkärilehti. N.s. XVII(7): 22-27, 2010

LÄHTOKOHDAT
Vastaanoton hoitokäytännöt muuttuvat tartuntatautien mukaan, joten ajanmukainen tieto hygieniakäytännöistä on tarpeen. Tutkimuksen tavoitteena oli selvittää hoitohenkilökunnan mielipiteitä hammasliikkeen hygieniasta, valmiuksia toimia hygieenisesti sekä hygieniatäydennyskoulutuksen osallistumista.

MENETELMÄT
Tutkimus tehtiin internetkyselynä, joka lähetettiin 3152 hammaslääkärille sekä 2074 hammashoitajalle ja suuhdyttäjille.

TULOKSET

JOHTOPÄÄTÖKSET
Asenteet hammasliikkeen hygieniaa kohtaan ovat positiivisia. Tiedoisissa ja ohjeiden noudattamisessa oli puutteita, joten koulutukseen tulee kiinnittää huomiota.
ENGLISH SUMMARY: ATTITUDES AND COMPETENCY IN INFECTION CONTROL AMONG FINNISH DENTAL STAFF: RESULTS OF A NATIONAL SURVEY

Practices used for infection control take into consideration and adapt to changes in infection epidemiology and to new infectious agents. To meet the challenges of today, it is important to update our knowledge regularly. The aim of this study was to evaluate the attitude of Finnish dental staffs concerning infection control in dentistry, their competency to adhere to guidelines for infection control and their participation in continuing programmes of professional development. The opinions and understanding of infection control were solicited in an internet-based questionnaire sent to 3152 dentists and 2074 dental hygienists and dental nurses. Of the recipients (n=4099), 46% completed the questionnaire. Most respondents claimed that hygiene is important in dentistry. Although they are familiar with the rules, regulations and guidelines, some admitted not adhering to them. About half of the respondents considered that they had received adequate education in infection control during their undergraduate training, but only 65% had participated in continuing programmes of professional development in infection control. In conclusion, the attitudes towards infection control in dentistry were positive; and it was considered to be important. Deficiencies in respondents’ knowledge and adherence to guidelines were noted. Obviously, it is essential to re-evaluate the contents of both undergraduate education and programmes of continuing professional development. An internet-based portal for control of infection in dental practice would be useful and should be developed.

LUUSTOLLISEN SYVÄN DISTAALIPURENNAN HOITO OIKOMISHOIDOLLAA JA KIRURGIALLA

ARPONEN H., ARTE S. T., LAINE P.

Tapausselostus esittelee Helsingin yliopistollisen keskussairaalan Suu- ja leukasairausklinikassa toteutetun ortodonttiskirurgisen potilaan hoidon.

HAMMASPUUTSHOIDON SIEÄMÄTÖN VAIKEUS

AVELLAN NINA-LI, ARTE SIRPA, HOLMING H., LAINE P.
Suomen hammaslääkärilehti. N.s. XVII(15): 22-26

Hammaspuutoshoidon sietämätön vaikeus – kun hammas puuttuu niin myös luuta puuttuu!

~ 77 ~
LÄHTÖKOHDAT
Yhden tai muutaman hampaan puuttuminen on ihmisen yleisimpiä kehityshäiriöitä. Viisaudenhampaat puuttuvat yli viidennekseltä väestöstä, ja yksi tai useampi pysyvä hammas puuttuu (hypodontia) vajaalta 10 prosentilta väestöstä. Laajat puutokset ovat harvinaisia: kuuden tai useamman hampan puutoksia (oligodontia) esiintyy vain 1-2 promillea. Synnynnäisten hammaspuutosten hoidon suunnittelua ja toteutusta hankaloitavat luu- ja pehmytkudospuutokset, pysyvien hampaiden vaihteleva koko ja muoto sekä vertikaalisen tilan puuttuminen.

MENETELMÄT

TULOKSET
Tyypilliset ongelmat synnynnäisten hammaspuutosten hoidossa liittyvät hammasharjanteen kasvattamiseen sekä hoitoa hankaloittaviin yksilöllisiin kudosreaktioihin. Hammasimplantit ovat vakiinnuttaneet paikkansa näiden potilaiden proteettisena hoitomuotona.

JOHTOPÄÄTÖKSET
Synnynnäisiin hammaspuutoksiin liittyvät kudospuutokset ovat merkittävin toiminnallista ja esteettistä implanttihoitoa hankaloittava tekijä.

AL-POTILAAN HAMPAISTON KUNTOUTTAMINEN OIKOMISHOIDOLLJA PROTEETIIKALLA

AVELLAN NINA-LI, WESTMAN EINE, WALTIMO-SIREN JANNA C., HOLMING H., ALALUUSUA SATU
Suomen hammaslääkärilehti. N.s. XVII(10): 26-29, 2010

Tapausselostuksessa kuvataan amelogenesis imperfecta (AI) –potilaan purennan toiminnallista ja esteettistä kuntouttamista Helsingin yliopiston hammaslääketieteen laitoksella ja Helsingin yliopistollisen keskussairaalan Suu- ja leukasairauksien klinikassa.
KRUUNUNPIDENNYSLEIKKAUS OSANA AMELOGENESLS IMPERFECTA - POTILAAN PURENNAN KUNTOUTUSTA

AVELLAN N., KEMPPI A., WESTMAN EINE, RUOKONEN H.
Suomen hammaslääkärilehti. N.s. XVII(2): 20-25

LÄHTÖKOHDAT
Amelogenesis imperfecta (AI) on geneettinen, periytyvästi tai tavallisemmin vallitsevasti periytyvä harvinainen hammaskiilteen kehityshäiriö. Mikäli potilaalla ei ole hampaiden kulumisesta johtuvaa purennan korotuksen tarvetta, voidaan riittävä retentio kruunutuksille saada aikaan kruununpidennysleikkausella.

MENETELMÄT
Kuvailemme Helsingin Yliopistollisen keskussairaalan Suu- ja leukasairauksien klinikassa toteutetun AI-potilaan purennan kuntoutuksen, jossa sivualueille tulevien kruunujen retentio ei olisi ollut riittävä ilman kruununpidennysleikkausta.

JOHTOPÄÄTÖKSET
Hampaiston restoratiivisten toimenpiteiden suunnittelussa ja toteutuksessa tulee huomioida biologiset, toiminnalliset ja esteettiset näkökohdat. Hyvä hoitotulos voi edellyttää erikoisalojen yhteistyötä. Valmistamalla tulevalle proteettiselle kruunulle riittävästi tilaa, voidaan välttyä myöhemmiltä hampaan kiinnityskudosten vaurioilta ja estetiikkaan liittyviltä ongelmilta. AI-potilaamme purennan toiminnallisessa ja esteettisessä kuntouttamisessa kruununpidennysleikkaukset olivat keskeinen osa onnistuneen hoitotuloksen saavuttamista.

SUMMARY IN ENGLISH: REHABILITATION OF A PATIENT WITH AMELOGENESIS IMPERFECTA USING A COMBINATION OF PERIODONTAL AND PROSTHETIC TREATMENT: A CASE REPORT
Amelogenesis imperfecta (AI) is a hereditary developmental disorder of the dental enamel that occurs in both primary and permanent dentition. The main clinical characteristics are extensive loss of tooth tissue, poor esthetics, and tooth sensitivity. AI can be characterized by enamel hypoplasia and/or hypomaturation or hypocalcification of the existing teeth. Restoration for patients with this condition should be oriented toward functional and esthetic rehabilitation and protection of existing teeth.
A 24-year-old man with amelogenesis imperfecta, who had anterior open bite and was concerned about the poor appearance of his teeth, was referred to the Department of Oral and Maxillofacial Diseases at Helsinki University Central Hospital. This paper presents a description of the patients oral rehabilitation with periodontal surgery before prosthodontic treatment. Crown lengthening in the molar and premolar areas was proposed.
TYÖNJAKO HAMMASHUOLLOSSA

KARJALAINEN H., TURUNEN S., MURTOMAA HEIKKI
Suomen hammaslääkärilehti. N.s. XVII(9): 22-27

Kyselytutkimus Helsingin terveyskeskuksen hammashuolto-osastolla.

LAHTÖKOHDAT
Muuttoliikkeestä johtuva väestön kasvu Helsingissä, talouden taantuma sekä asukkaiden tietoisuus julkisen palveluntuotantoon vaikutuksen kasvanut kunnallisen suun terveydenhuollon kysyntää. Näiden lisäksi ihmisten kiinnostus omia hyvinvointiaan ja vanhusten ja hammaslääkärin suhteen kasvanut. Yhtenä vastauksena näihin haasteisiin on pidetty hoitohenkilöstön työaika edelleen kehitettävä.

MENETELMÄT
Kaikille Helsingin terveyskeskuksen kliinistä työläisille lähetettiin kysely, jonka tavoitteena oli selvittää heidän käsityksensä työnjakoista.

TULOKSET
Hammaslääkärin halukkuuteen potilaata vahvistaa suuhygienistin hoitoon vaikuttavat tekijät suuhygienistin koulutus, työkokemus ja hammaslääkärin toteamus työn laatua, ei persoonalle liittyviä ominaisuuksia. Hammaslääkärin ja suuhygienistin tehtävien siirroista vaikutti suuhygienistin tehtävän suurempi kuin hammaslääkärin halukkuus siirtää niitä.

JOHTOPÄÄTÖKSET
Kyselyn tulokset heijastivat vastaajien myönteistä suhtautumista työyhteistyön kehittämiseen. Etenkin nuoremmalla suuhygienisti- ja hammaslääkärillä oli innokkuutta ja halua monipuolistaa työtehtäviä, mikä tulisi ottaa huomioon suuhygienistin ja hammaslääkärin tehtävän kehitettävä.

ENGLISH SUMMARY: DENTAL TEAMWORK – A SURVEY IN THE CITY OF HELSINKI DEPARTMENT OF DENTAL CARE

The aim of the present study was to determine the conceptions of the dentists and the hygienists in the City of Helsinki Department of Dental Care concerning dental teamwork and factors related to its current execution. Furthermore, these dental professionals were questioned about different treatment procedures that could be delegated to dental hygienists in order to promote dental teamwork.

A questionnaire containing structured questions with different alternatives was mailed to all 143 dentists working clinically and to 69 dental hygienists in the Department of Dental Care. Of the dentists 80 % and of the dental hygienists 91 % responded. The results reflected positive attitudes to dental teamwork. The significant factors that affected dentists’ willingness to refer patients to hygienists were the hygienist’s education and experience and the quality of the hygienist’s work which the dentist has verified, not personal factors. Dentists were not quite as willing to delegate different treatment procedures to hygienists as hygienists were willing to perform them.
The willingness of dental hygienists to perform different treatment procedures and their self-assessed ability to perform these procedures were not at the same level; but young hygienists, in particular, reported being willing to be versatile in their work. To facilitate the role and output of dental hygienists in municipal dental care, this should be taken into consideration.

SUMMARY IN ENGLISH: BIOMARKERS REFLECT THE SEVERITY OF PARODONTAL INFECTION

Tissue destruction associated with the progression of periodontal disease is caused by a cascade of host and microbial factors. Aberrant Ln-332, hBD, and MMP functions have been found in oral inflammatory diseases. The MMP-8 knock-out (MMP8-/-) mouse model allowed us to clarify the involvement of MMP-8 in Porphyromonas gingivalis-induced periodontitis. Increased levels of Ln-332 fragment in GCF are strongly associated with the severity of inflammation in periodontitis. P. gingivalis trypsin-like proteinase can cleave an intact Ln-332 γ2-chain into smaller fragments and eventually promote the formation of periodontal pockets. hBDs are components of an innate mucosal defense against pathogenic microbes. P. gingivalis trypsin-like proteinase can degrade hBD, thus reducing the innate immuneresponse. Increased levels and activation of Ln-332, MMP-8,
-25, -26, hBD-1, and -2 in GCF, PISF and inflamed gingival tissue are associated with the severity of periodontal/peri-implant inflammation. MMP-8 significantly attenuated P. gingivalis induced site-specific loss of alveolar bone. Systemic changes in serum immunoglobulin and lipoprotein profiles were also evaluated. P. gingivalis induced periodontitis, especially in MMP-8/- mice, is associated with severe loss of alveolar bone and with systemic inflammatory and lipoprotein changes that are likely to be involved in early atherosclerosis.

LEUKAKIRURGIAN ASEMA SUOMESSA

LINDQVIST CHRISTIAN KONTIO RISTO
Duodecim 126(6): 683-4, 2010

LEUKANIVELEN SAIRAUDET

LINDQVIST CHRISTIAN, TÖRNWALL JYRKI
Duodecim. 126(6): 687-94, 2010


ENGLISH SUMMARY: DISEASES OF THE TEMPOROMANDIBULAR JOINT
As many as one third of the population have a temporomandibular disorder, such as clicking jaw joint, occasional locking of the jaw, deviations in jaw movement, or masticatory muscle or temporomandibular joint pain. Limited mouth opening and occlusal alterations are found in approx. 5% of cases. Clinical examination is essential, in difficult cases the diagnosis can be confirmed by arthroscopy. Muscular and arthropathic symptoms can usually be treated by noninvasive and reversible means. In milder cases the treatment can be carried out arthroscopically, whereas surgical treatment is always required in severe cases of arthrosis and ankylosis.

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AMFOTERISIINI B-TABLETEJA ERITYISLUVALLA HIVAINFEKTION HOITOON

MEURMAN JUKKA H.
Suomen hammaslääkärilehti. N.s. XVII(11): 27, 2010


ÄKILLISET SUUN JA NIELUN EI-ALLERGISET TURVOTUSREAKTIOT

MEURMAN JUKKA H.
Suomen hammaslääkärilehti. N.s. XVII (13): 36, 2010

Suomen Lääkärilehdessä (SLL 2010; 65: 2956-7) LT Vesa Lund kirjoitti otsikolla "Mikä turvotti kielen" tapauksista, joissa henkilö saa äkillisen ei-allergisen turvotusreaktion johtuen verenpainetaudin ja sydämen vajaatoiminnan hoitoon käytetystä ACE-estäjälääkityksestä.

GERIATRIA: VANHUS JA SUU

MEURMAN JUKKA H.
HUOMIO SUUSYÖVÄN VARHAISDIAGNOSTIIKKAAN

MEURMAN JUKKA H.
Suomen hammaslääkärilehti. N.s. XVII (9): 36, 2010

Euroopan suukirurgian ja suulääketieteen tutkijoiden kerma (ja minä) kokoontui kesäkuun alussa Lontoossa järjestettyyn kutsuseminaariin, jossa valotettiin suusyövän merkitystä niin varhaisdiagnostiikan kuin syöpähoidot läpikäyneen potilaan kannalta.

LÄÄKITYKSESTÄ JOHTUVA KUIVA SUU - MITÄ HUOMIOITAVA HAMMASHOIDOSSA?

MEURMAN JUKKA H.
Suomen hammaslääkärilehti. N.s. XVII (15): 27, 2010


PÄÄTTYYKÖ MAREVAN-AIKAKAUSI?

MEURMAN JUKKA H.
Suomen hammaslääkärilehti. N.s. XVII( 8): 44, 2010

Antikoagulantti varfariinia on käytetty 1950-luvulta alkaen estämään veritulppien muodostusta ainoana aikakautena avohoidon lääkkeenä tässä indikaatiossa. Suomessa Orionin valmistama ja kauppanimellä Marevan® myytävä valmiste on varmasti kaikille tuttu.

SOKERITAUDIN ARVIOININ YKSIKÖ MUUTTUI

MEURMAN JUKKA H.
Suomen hammaslääkärilehti. N.s. XVII (5): 35, 2010

Kuten edellisen Hammaslääkärilehden pikku-uutisessa mainittiin, otettiin maassamme maaliskuussa käyttöön uusi veren pitkäaikaissokerin arviointiysikkö, glykohemo-
globiinin (HbA1c) entisen prosenttiyksikön muuttuessa SI-järjestelmän mukaiseksi yksiköksi mmol/mol. Terveyportin lääkärin tietokantaan on lisätty laskuri vanhojen ja uusien yksiköiden muuntamiseksi toinen toisikseen, vanhat uusiksi tai uudet vanhoiksi.

JOHTAMISOPPIA JA IHMISSUHDETAITOJA

MURTOMAA HEIKKI
Suomen hammaslääkärilehti. N.s. XVII (9): 40-41, 2010


MIELENTERVEYSPOTILAIDEN SUUN TERVEYDENHUOLLOSTA KEHITTÄMISEHDOTUKSET

MURTOMAA HEIKKI, HAAVIO M.
Suomen hammaslääkärilehti. N.s. XVII (15): 30-31, 2010


IMPLANTTIEN YLLÄPITOHOITO JA PERI-implanttisairaudet

NIEMINEN ANJA, JOKELA-HIETAMÄKI MARJATTA, UITTO VELI-JUKKA
Suomen hammaslääkärilehti. N.s. XVII (4): 42-51, 2010

Säännöllinen ylläpitohoito vähentää implanttihoidon komplikaatioita

Vaikka asianmukaisesti asetettujen hammasimplantaattien voidaan odottaa säilyvän toiminnallisena pitkään, lähes 40 %:lla implanttipotilaista on osoitettu esiintyvän erilaisia komplikaatioita jo ensimmäisten viiden vuoden aikana. Peri-implanttikudosten terveyden säilyttämiseksi ja komplikaatioiden ehkäisemiseksi potilaskohtaiset riskitekijät tulee ottaa huomioon jo hoidon suunnitteluluvauheessa. Tulehduskelliset peri-implanttisairaudet ovat seurausta bakteeripeitteiden kertymisestä implanttirakenteiden pinnoille. Implanttien säilyminen onkin suuresti riippuvainen sekä potilaan ylläpitämästä riittävästä suuhygiene-niatsastä että säännöllisestä ylläpitohoidosta.
Implanttien ylläpitohoidon ensisijaisena tarkoituksena on ehkäistä peri-implantisairauksien kehittymisen tai hoitaa ne varhaisvaiheessa sekä korjata implantirakenteissa ilmenevät tekniset viat. Vaikka implanttien optimaisesta ylläpitohoidosta ei ole tutkimuksellista näyttöä, on syytä olettaa, että samat periaatteet, joita on saatu parodontiitin ylläpitohoidosta tehdyistä tutkimuksista, pätevät myös implanttien ylläpitohoitoon. Implanttirakenteiden pitkäaikaisennusteen takaamiseksi kaikille implanttipotilille tulisi laatia yksilöllinen ylläpito-ohjelma painottaen potilaan omaa vastuuta niin suuhygienian, tupakointitottumusten kuin ylläpitohoitoon hakeutumisen osalta.

ENGLISH SUMMARY: SUPPORTIVE IMPLANT TREATMENT AND PERI-IMPLANT DISEASES

Properly placed tooth implants can be expected to last functionally for a long time. However, research has shown that nearly 40% of implant patients have some sort of biological or mechanical complications already during the first five years. Inflammatory peri-implant disease, peri-implant mucositis and peri-implantitis, result from the formation of bacterial deposits on implant structures. In peri-implant mucositis inflammation is restricted to soft tissues, while in peri-implantitis also the surrounding bone has been lost. Only recently we have learned that the preservation of implants depends greatly on both the appropriate oral hygiene of the patient and on regular maintenance care. According to recent studies, patients who have yearly control appointments have fewer inflammatory complications than those who have undergone treatment only after the occurrence of complications. The primary goals of maintenance treatment are prevention of the formation of peri-implant diseases or their treatment at early stages, as well as correction of technical flaws in the implants. Even though there is no scientific evidence for optimal peri-implant maintenance care, it can be assumed that the same principles that have been obtained from studies on periodontal maintenance care apply to implant maintenance as well. During each maintenance care appointment, the depth of peri-implant pockets and bleeding/suppuration on probing are measured and registered. If the pocket depth is increased compared to the previous appointment, the diagnosis has to be verified by radiographs. Depending on the extension of tissue destruction peri-implant diseases are treated by mechanical cleaning and local disinfection, and when required, by systemic antibiotic treatment and/or surgical therapy. In order to maintain peri-implant health and to prevent complications, the individual risk factors connected to implant therapy should be considered already when planning the treatment. To guarantee a long-term positive outcome for implant structures an individual maintenance program should be planned for all implant patients. This should stress the responsibility of the patient to keep up proper oral hygiene, attend maintenance appointments and to limit smoking.
SAMMANFATTNING PÅ SVENSKA: STÖDBEHANDLING AV TANDIMPLANTAT OCH BEHANDLING AV PERI-IMPLANTATSJUKDOMAR


VÄITÖSKATSUUS: PAIKKAUSHOIDON TOTEUTMINEN VAIHTELEE
HAMMASLÄÄKÄRIN MUKAAN 27.11.2009

PALOTIE ULLA

LYHYESTI
Tutkimuksella kartoitettiin paikkaussyitä. Uusintapaikkauskia, materiaaleja, paikkojen kestävyyttä ja puudutuksen käyttöä paikkauksen yhteydessä. Tulokset olivat yhteneväisiä aiempien tutkimustulosten kanssa. Pääasialliset syyt paikkaushoitoon olivat primaari-
karies ja paikkojen uusiminen. Paikkauhoidon toteutuminen vaihteli hammaslääkärin iän, sukupuolen ja työskentelysektorin mukaan.

**ENGLISH SUMMARY: RESTORATIVE TREATMENT PRACTICES AND DENTIST-RELATED FACTORS**

The aim of this study was to elucidate real-life aspects of restorative treatment practices. In addition, dentists' views and perceptions of and variation in restorative treatment practices with respect to dentist-related factors were evaluated. The factors assessed were reasons for placement and replacement of restoration, material selection, longevity of posterior restoration, and use of local anesthesia. Data from the Helsinki Public Dental Service (PDS) included details on 3057 restorations, and the other PDS data from Vantaa were based on 205 patient records. In addition, a nationwide questionnaire investigated dentists' personal views on these factors. All data sets included some background information on dentists such as gender, year of birth or year of graduation from dental school, and working sector. Primary caries was more often the reason for placement of restoration among patients aged under 19 years than among older patients. Among patients over 36 years of age, the majority of treatments were replacements. The mean age of replaced posterior restoration among young adults was 8.9 (SD 5.2) years for amalgam and 2.4 (SD 1.4) years for tooth-colored restorations. Of all restorative materials used, a clear majority (69%) were composites. Local anesthesia was used in 48% of these cases and more frequently for older patients (55%) than for patients under 13 years of age (35%). The replacement rate for posterior restorations was higher among female dentists than among male dentists, especially for amalgams. Younger dentists more frequently used local anesthesia and replaced restorations than older dentists did. Public sector dentists reported using local anesthesia more often than private sector dentists did. Private sector dentists gave longer estimates of posterior composite longevity than public sector dentists did. The results regarding restorative practices and use of local anesthesia are in line with those reported previously. Primary caries and replacement of restorations were the major reasons for restorative treatment. Variation exists in the reasons for placement and replacement of restorations and in the use of local anesthesia according to dentist-related factors.

**VÄITÖSKATSAUS: PURENTAELIMISTÖN TOIMINTAHÄIRIOIHIN LIITTYVÄ PSYKOSOSIAALISIA TEKIOITÄ 18.06.2010**

RANTALA MIKKO
Suomen hammaslääkärilehti. N.s. XVII(12): 47

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KANDIDOOSI ELI HIVATAUTI

RICHARDSON RIINA
IN: Autoimmune polyendocrine diseases APS I and APS II. Nurmela A., Lahti V. (eds.). Invalidiliiton Lahden Kuntoutuskeskus (Invalidiliiton julkaisuja; 0,42), 2010

KANDIDOOSI ELI HIVATAUTI JA SUUN JA RUOKATORVEN LIMAKALVON SYÖPÄ: HARVINAISET-OPASSARJA

RICHARDSON RIINA M. K.
Harvinaiset-opassarja. p. 21-22, 2010

SIENILÄÄKERESISTENSSI LISÄÄNTYY – SYYNÄ ATSOLEIDEN KÄYTTÖ MAATALOUDESSA?: PÄÄKIRJOITUS

RICHARDSON RIINA M. K.
Duodecim. 126(16):1873-1874, 2010

SUUN JA RUOKATORVEN LIMAKALVON SYÖPÄ

RICHARDSON RIINA
IN: Autoimmune polyendocrine diseases APS I and APS II. Nurmela A., Lahti V. (eds.). Invalidiliiton Lahden Kuntoutuskeskus (Invalidiliiton julkaisuja; 0,42), 2010

LEUKOJEN ALUEEN SYVÄT INFEKTIOT

RICHARDSON RIINA M. K., SEPPÄNEN L.
Duodecim. 126(6): 695–701, 2010

Valtaosa leukojen alueen syvistä infektiosta on lähtöisin hampaiston kroonisista tulehduksesta. Hoitamattomana ne voivat komplisoida useita yleissairauksia, kuten huvonontaa diabeteksen tasapainoa tai lisätä riskiä sairastua kardiovaskulaari-sairauksiin. Infektiio saattaa myös levitä aiheuttaen yleistyneitä infektiointeita tai etä-infektiointeita. Akutisoitussaantumisaan hammaasperäiset infektiot voivat levitä paikallisesti ja aiheuttaa sellulitiittejä tai absesseja. Kirurginen interventio yhdessä oikean ja mahdollisimman varhaisen aloitteen mikrobiiliateonten kanssa on hammasperäisten infektiojen hoidon kulmakivi. Jos infektiio tai siihen liittyvä reaktiivinen turvatas on uhkaa levitä ilmetä ilmeellisesti tai potilaalla on korkea kuume, tulee hänet lähetettää sairaalaan jatkohoidoon.

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ENGLISH SUMMARY: DEEP MAXILLO-FACIAL INFECTIONS

Deep maxillo-facial infections typically originate from chronically infected teeth. The chronic infection flares up and spreads locally causing cellulitis and abscesses. Chronic dental infections may also disseminate and cause metastatic infections as well as complicate medical conditions such as diabetes and cardio-vascular diseases. Medically compromised patients seem to be more susceptible to systemic rather than local infection complications. Surgical intervention in combination with effective antibiotic treatment is the corner stone of the treatment of deep maxillo-facial infections. Urgent hospital referral is required if the swelling results in a risk of airway compromise or if the patient has fever and sepsis.

SUUN HIIVAINFEKTIOIDEN DIAGNOSTIIKKA JA HOITOPERIAATTEET

RICHARDSON RIINA, ANTTILA V. A.


ENGLISH SUMMARY: DIAGNOSIS AND TREATMENT OF ORAL CANDIDOSIS

Oral candidosis is a mixed yeast-bacterial biofilm infection. Candida albicans is the most common causative agent although other Candida species are seen in medically compromised patients with a history of liberal azole usage. C. albicans is usually susceptible to all commonly used antifungals when tested in vitro. However, candida biofilms are highly resistant to most antifungals. Therefore, treatment of oral candidosis requires mechanical breakage of the biofilm in combination with topical polyenes. Azoles should be avoided in cases of recurrent infections due to risk of selection of resistant strains. Occasionally oral thrush is a symptom of an undiagnosed systemic disease.
JUURIKANAVIEN MIKROBILÖYDÖKSET SUOMESSA JA NIIDEN MERKITYS

RIHTNIEMI LEENA, TJÄDERHANE LEO, KOTIRANTA ANJA, LAUHIO R. A., RICHARDSON RIINA M. K.
Suomen hammaslääkärilehti. N.s. XVII (1): 18-26, 2010

HUSLAB kliinisen mikrobiologian laboratorion endodonttiset löydökset vuosilta 2002-2006

LÄHTÖKOHDAT
Tietomme juurikanavainfektioiden mikrobiologiasta perustuu pitkälti erikoishammaslääkäreiden optimaalisissa olosuhteissa tekemiin tutkimuksiin. Terveydenhuollon potilaiden endodonttisten infektioiden mikrobikirjoa on tutkittu varsin vähän.

MENETELMÄT
Analysimme kaikki HUSLABin oraalimikrobiologian yksikössä vuosina 2002-2006 tutkittujen endodonttisten viljelyden mikrobilöydökset, antibioottiherkkyydet ja lahteetiedot. Aineisto kerättiin tietokantahauilla.

TULOKSET
Oraalimikrobiologian yksikössä oli viiden vuoden aikana tutkittu yhteensä 526 juurikanavista otettua näytettä. Näytteistä 73% oli positiivisia ja näistä oli vastattu keskimäärin 2,6 (1-6) lajia/näyte. Erilaisia löydösnimikkeitä oli 75. Yleisin yksittäinen löydös oli Viridans-ryhmän streptokokit (43% näytteistä). Stafylokokkien osuus oli melko suuri (8 %). Anaerobibakteereja oli vastattu 61% näytteistä. Antibioottiherkkyymääritykset olivat tehty 40%:ssa löydöksistä.

JOHTOPÄÄTÖKSET
Tulosten perusteella amoksisilliini, amoksisilliinin ja klavulaanihapon yhdistelmä, kefa-leksiinin ja metronidatsolin yhdistelmä sekä klindamysiini voisivat soveltua levävän juurikanavaperäisen infektion empiriseen hoitoon.

ENGLISH SUMMARY: ENDodontic MICROBIAL FINDINGS IN FINLAND DURING 2002-2006 – ANALYSIS OF 526 CASES
Our knowledge of endodontic infections is based mainly on controlled studies in specialist care settings. Practice-based research in endodontic microbiology is limited. The Oral Microbiology Unit of Helsinki University Central Hospital Laboratory Diagnostics (HUSLAB) is the only laboratory in Finland analysing clinical oral microbial samples thus serving a population of 5.2 million. The aim of the study was to analyse endodontic bacteriological findings from primary and secondary dental care units in Finland over a five-year period. Amoxicillin (±clavulanic acid), cefalexin+metronidazole or clindamycin could be suitable for empiric treatment when needed. Diagnostic microbiology may help to determine the aetiology of infection.
and enables selection of optimized antimicrobial treatment. Nevertheless, successful endodontic treatment is based on careful instrumentation of the root canal system and abundant rinsing.

**VÄITÖSKATSAUS: PROBIOOTTISISTA JUGURTTILAKTOBASILLEISTA APUA SUUNTERVEYTEEN. 24.3.2009**

STAMATOVA IVA
Suomen hammaslääkärilehti. N.s. XVII(8): 34-35

**LYHYESTI**

**IMPLANTTIHOIDON HYVÄ ESTEETTINEN LOPPUTULOS EDELLYTÄÄ HUOLELLISTA SUUNNITTELUA**

STOOR PATRICIA, LAINE PEKKA
Suomen hammaslääkärilehti. N.s. XVII(4): 30-35, 2010

ENGLISH SUMMARY: ESTHETICS AND IMPLANT TREATMENT

Dental implants are widely used to replace lost teeth. The demand today is not only to restore the occlusion, but also to provide the patient with an esthetic outcome. The esthetics in implant therapy consists of many small details that must be understood by the planning and executing team. Implant treatment is team work in which the goal is to obtain functional, long-lasting dentures with a highly esthetic outcome. In this review article we describe the basic principles of implant therapy planning in terms of esthetics. It is important to consider different esthetic risk factors already at the planning stage of implant therapy.

SAMMANFATTNING PÅ SVENSKA: IMPLANTATBEHANDLING OCH DESS ESTETISKA ASPEKTER

Tandimplantat används i stor utsträckning för att ersätta förlorade tänder. I rehabiliteringen av bettet uppmärksammar man i dag förutom själva bettet även ett gott estetiskt slutresultat. I denna översiktsartikel beskrivs grundprinciperna för implantbehandling och särskilt de olika estetiska riskfaktorerna vid behandling av estetiskt krävande käkregioner med tandluckor.

VÄITÖSKATSAUS: MATRIKSIN METALLOPROTEINAASIEN INHIBITTORIT JA UUSI IMMUNOMODULAATTORI KYKENEVÄT ESTÄMÄÄN KIELISYÖVÄN KASVUA 26.6.2009

SUOJANEN JUHA
Suomen hammaslääkärilehti. N.s. XVII(3): 64-65

LYHYESTI

LYHYESTI
Tutkimuksessa arvioitiin KKTT-tutkimuksen hyödyllisyyttä hammaslääkärin kliinisessä työssä, mittaustarkkuutta hammasimplanttihoidon suunnittelussa, käyttökelpoisuutta alaleuan viisaudenhampaan kuvantamisessa, samoin kuin KKTT-laitteiden sädeannoksia sekä kuvan laatua verrattuna monileike- TTruttimukseen.
KKTT-tutkimuksen avulla oli selvitettävää hampaiston ja leukojen kuvantamisen kannalta tärkeät tarkastelut ja luotettavasti KKTT:lla. Laitteiden kuvantaannostat odotettiin riittäviksi hampaiston ja leukojen alueen kuvantamiseen, ja käytöstä osoittautui tarkaksi ja luotettavaksi menetelmänä hammasimplanttihoidon suunnittelussa.

ENGLISH SUMMARY: CONE BEAM COMPUTED TOMOGRAPHY IN ORAL RADIOLOGY
Cone beam computed tomography (CBCT) is a radiographic imaging method that allows accurate 3D imaging of hard tissues. CBCT has been used for dental and maxillofacial imaging for more than ten years and its availability and use are increasing continuously. However, at present, only "best practice" guidelines are available for its use, and the need for evidence-based guidelines on the use of CBCT in dentistry is widely recognized.

We evaluated (i) retrospectively the use of CBCT in a dental practice, (ii) the accuracy and reproducibility of pre-implant linear measurements in CBCT and multislice CT (MSCT) in a cadaver study, (iii) prospectively the clinical reliability of CBCT as a preoperative imaging method for complicated impacted lower third molars, and (iv) the tissue and effective radiation doses and image quality of dental CBCT scanners in comparison with MSCT scanners in a phantom study.

Using CBCT, subjective identification of anatomy and pathology relevant in dental practice can be readily achieved, but dental restorations may cause disturbing artefacts, CBCT examination offered additional radiographic information when compared with intraoral and panoramic radiographs. In terms of the accuracy and reliability of linear measurements in the posterior mandible, CBCT is comparable to MSCT. CBCT is a
reliable means of determining the location of the interior alveolar canal and its relationship to the roots of the lower third molar. CBCT scanners provided adequate image quality for dental and maxillofacial imaging while delivering considerably smaller effective doses to the patient than MSCT. The observed variations in patient dose and image quality emphasize the importance of optimizing the imaging parameters in both CBCT and MSCT.

INFektioden torjunta suunhoitoysiköissä

VÄlimaa H., Merne M., Richardson Riina M.

VÄtöskatsaus: Ikääntyneiden suunhoito ja suunterveys Liettuassa — ehkäisyn näkökulma. 11.12.2009

Vyšniauskaitė Sonata
Suomen hammaslääkärilehti. N.s. XVII(6): 32-33

Lyhyesti
Tutkimus selvitti omahoidon ja saadun hammashoidon sekä neuvonnan merkitystä ikääntyneiden suunterveydelle ja painottui ehkäisevän hoidon roolinti. Tutkitut olivat 60 vuotta täyttäneitä hampaallisia potilaita Liettuassa. Kaikilla 174 henkeä täyttää kyselylomakeen, heistä 100 kutsuttiin kliiniseen tutkimukseen.

Ikääntyneiden suunterveystavat ja suunterveys ovat Liettuassa selvästi teollistuneita maailman etenkin hampaan hoidon, sokerin käyttötavoissa ja hammastarkastuksissa käynnissä. Ilahduttava havainto oli hammashoidossa saadun neuvonnan merkitys omahoidon tietotason ja toteutukseen sekä paremmän omahoidon yhteys parempaan suunterveyteen.

Lasten panoraamatutkimukset - miten pienille?

Waltilmo-Siren Janna C.
In: Suomen radiologiyhdistys: XXXIII Sädeturpaiväät Abstraktit 55-59, 2010
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