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**Abstracts**

**Masticatory Muscle Function - Evaluation and  
Relationship with Oral Variables**

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**SUMMARY**

The masticatory muscles play an important role in the natural function and para-functional activities of the stomatognathic system. Various techniques have been used to evaluate and objectively analyse the functional behaviour of masticatory muscles in a search for neuromuscular factors involved in the aetiology of temporomandibular disorders (TMD). The aim of this study was to review recent literature concerning the evaluation of masticatory muscle activity by means of maximum bite force recording, measuring masticatory efficiency, electromyographic recordings, endurance time while maintaining a constant force during isometric contraction, and to a certain extent, to determine the state of muscle fatigue.

Reduced bite force and chewing efficiency has been reported in patients with loss of teeth and in patients with TMD by several authors. Electromyography has been used to demonstrate muscular hyperactivity with the jaw at rest and poor or asymmetric functional activity during maximal clenching in patients with TMD. It has been shown that the duration of the silent period was longer in patients with TMD symptoms compared to healthy subjects. Additionally, it has been suggested that TMD patients may have a shorter endurance time when compared to healthy subjects. Subjects with TMD tend to indicate that their jaw-closing muscles were more susceptible to fatigue than in control subjects, but there are also results contradictory to this.

**Key Words:** Masticatory Muscles; Temporomandibular Disorders; Electromyography; Bite Force; Fatigue

## **The Effect of Luting Agent on the Fracture Strength of All-Ceramic Crowns\***

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### **SUMMARY**

Traditionally, acid-base reaction cements have been used to lute metal and ceramic crowns. However, cements based on zinc oxide are necessarily opaque due to residual powder and may have a very low pH. Resin-based composites are now used for their aesthetic and retentive potential. The aim of this study was to evaluate and compare the fracture strength of all-ceramic crowns fabricated with the Empress system, placed on standardised preparations on extracted human premolars with variations on the standard luting procedure. A total of 36 extracted sound human premolars were selected and divided in 3 groups. A further 3 premolars were selected to form the control group. The samples were loaded to failure after luting with zinc phosphate (GP1), glass-ionomer (GP2) and composite resin-based cement (GP3). The preparation was standardised. Each preparation has a shoulder width of approximately 1 mm and all internal preparation angles were rounded. Coronal compressive fracture strength was determined, using 3 unprepared teeth as the control group. The fracture strength of the 3 test groups and of the control group was tested in a universal testing machine. Each tooth restored with an all-ceramic crown was loaded to fracture and the rupture value was determined. Maximal force developed and extent and location of fractures were studied.

The mean compressive loads to failure were 464 N, 495 N and 535 N for GP1, GP 2 and GP 3, and 1340 N for the control group. The results were subjected to ANOVA to determine if significant difference between test-groups were related to the luting material used for each group. The statistical analysis using as independent variable revealed no significant difference in strength by type of luting cement ( $p>0.05$ ). All results indicated that superior fracture resistance was obtained when dentine bonding was incorporated into the luting procedure together with etching of the ceramic fitting surface, and the use of a resin-based luting material. It is concluded that when all-ceramic crowns were loaded to failure on prepared dentine surface, higher fracture strength results were obtained when a composite resin luting agent was used.

**Key Words:** All-Ceramic Crowns; Fracture Strength

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# **The Effect of a Dentin Adhesive Used in Pulp Capping: A Clinical Study**

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## **SUMMARY**

In the present study, the effect of one step bonding agent, Prime&Bond 2.1 (P&B 2.1), in pulp capping was investigated clinically. 3 types of treatments were performed on exposed pulps of 40 permanent first molar teeth: P&B 2.1 + TPH Composite (Group 1), a hard setting Ca(OH)<sub>2</sub> preparation + ZOE + Amalgam (Group 2), and a hard setting Ca(OH)<sub>2</sub> preparation + P&B 2.1 + TPH (Group 3). Ca(OH)<sub>2</sub> mixed with water was applied temporarily on the exposed pulp during the etching before the application of the bonding in Group 1. Treatments were performed on 17, 14 and 9 teeth in the groups with mean control periods of 19, 21, 19 months respectively on patients aged between 9-13 years. Postoperative findings were evaluated both radiographically and clinically. Statistical investigations were performed by  $\chi^2$  and Fisher's probability test.

No significant differences were found among the groups regarding their clinical success rate, which were found to be 88.3 %, 100 % and 77.8 % respectively. Clinically and radiographically, P&Bd 2.1 was found to be successful as a pulp capping agent, but further long term clinical studies are needed.

**Key Words:** Pulp Capping; Dentin Bonding

# **Coronal Leakage of Amalgam Restorations with Super-Bond D-Liner II Plus in Endodontically Treated Teeth**

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## **SUMMARY**

The aim of this study was to evaluate the effect of the bonding material on the coronal leakage of amalgam restorations in endodontically treated teeth. 30 freshly extracted intact human mandibular premolar teeth were used. Root canals were prepared using profile and filled with AH-Plus and gutta-percha using lateral condensation technique. Teeth were randomly divided into 3 groups of 10 teeth: Group 1 (control) - cavities were restored with amalgam and all the surfaces of the teeth were sealed with 2 layers of nail polish; Group 2 - cavities were restored with amalgam and all the surfaces of the teeth except occlusal surfaces were sealed with 2 layers of nail polish; Group 3 - before the cavities were restored, bonding material Super Bond D-Liner II Plus was applied to the cavity walls according to the manufacturer's instructions, then all the surfaces of the teeth except occlusal surfaces were sealed with 2 layers of nail polish.

As a result, in group 3 the mean of microleakage was lesser than in group 2, but there were no statistically significant difference among the 3 groups.

**Key Words:** Amalgam Bond; Coronal Leakage

## **Comparative Study of Root Canal Walls Prepared by 3 Systems of Rotary Nickel-Titanium Instruments**

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### **SUMMARY**

The purpose of this study was to examine root canal walls prepared by mechanically driven Ni-Ti instruments: Profile, Hero, and Flex-master, along with the use of lubricant factor, with or without the final irrigation with EDTA. 42 single root teeth were used in this study. They were kept in a solution of ethyl-alcohol and afterwards amputated at the height of the anatomic nape. They were divided into 3 groups of 14 teeth each. Each group was divided into 2 subgroups. All teeth were prepared with crown down technique. The amount of smear layer on the canal walls was rated using a 4-step scale method.

The 3 rotary techniques left similar amounts of smear layer at the coronal and middle levels of canal walls when NaOCl and Canal plus were used as irrigants. The Hero system left significant less smear layer at the apical level compared with Profile system. When EDTA was used for finally irrigation, smaller amounts of smear layer were found on the canal walls of all the subgroups. The results of this study seem to indicate that, independently of the system used, removal of the smear layer was only successfully achieved with a final irrigation with EDTA.

**Key Words:** Ni-Ti Instruments; Smear Layer

## **Evaluation of Dentinal Adaptation of New Composite Materials: A SEM Study\***

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### **SUMMARY**

The purpose of this study was to evaluate under SEM the dentinal adaptation of 2 new composite materials; a flowable composite (Arabesk, Flow Voco, Germany) and an ormocer originated composite resin (Admira, Voco, Germany). Class II cavities were prepared on 20 extracted non-carious human molars. The sample is divided into 2 groups with 10 molars each. In group 1, teeth were restored with Arabesk, and in group 2 with Admira. After restoration all teeth were sectioned mesio-distally and the specimens were coated with gold of 200Å thickness for evaluation under SEM.

There was no significant difference in dentinal adaptation on both gingival and occlusal floors of the cavity between groups.

**Key Words:** Flowable Composites; Dentinal Adaptation; Ormocers

# **Evaluation of Dentinal Adaptation and Apical Leakage of System B and Schilder Warm Vertical Condensation Techniques**

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## **SUMMARY**

The aim of this study was to evaluate the dentinal adaptation and apical leakage after Schilder technique and System B technique. 34 extracted human maxillary anterior teeth were used in this study. The root canals were prepared by using step-back technique. Prior to obturation, each canal was irrigated with 17% EDTA and 5.25% NaOCl solutions to remove the smear layer. Finally, the roots were randomly divided into 2 groups of 15 roots each. In both of the groups Sealapex was used as a root canal sealer. In group 1 the canals were obturated with Schilder technique using non-standardized gutta-percha, in group 2 the canals were obturated with System B technique using non-standardized gutta-percha. 5 specimens from each group were selected for investigation of dentinal adaptation by using scanning electron microscope (SEM). Remaining 10 specimens were immersed in 2% methylene blue dye solutions for 7 days at 37°C for apical leakage test. The roots were split longitudinally and leakage measurements were made from apical to coronal direction using a stereomicroscope. Data were analyzed statistically using the Mann Whitney U test.

Significantly less average apical leakage ( $p<0.01$ ) occurred with System B ( $2.93\pm 0.83\text{mm}$ ) technique than Schilder technique ( $5.14\pm 1.19\text{mm}$ ). SEM analysis showed that System B technique revealed better adaptation to the dentinal wall than Schilder technique.

**Key Words:** System B; Vertical Condensation; Apical Leakage; SEM

# **Scanning Electron Microscopic Analysis of the Sealing Ability of 3 Endodontic Sealers**

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## **SUMMARY**

The aim of this study was to examine sealing ability of 3 endodontic sealers to dentinal walls and gutta-percha using scanning electron microscopic analysis (SEM). The sealing ability of endodontic sealers to dentinal walls of the root canal was assessed in recently extracted human anterior teeth. 18 teeth were prepared with step back technique and irrigated with 2.5% NaOCl and 3% hydrogen peroxide. Teeth were divided into 3 groups in accordance to the sealer used for root canal obturation: AH 26 (Dentsply, De Trey, Germany), Sankin Type II (Sankin Industry, Japan) and Sealapex (Kerr, USA). The sealing ability and adhesion properties on the sealer-dentin interface were studied using SEM. Results were rated from 1 to 3: 1 - extremely good adhesion; 2 - good adhesion; 3 - relatively good adhesion.

The results showed extremely good adhesion on the AH 26-dentin interface and good adhesion of AH 26 to the gutta-percha cones. Sankin Type II showed a good adhesion to the dentinal walls and gutta-percha cones, and Sealapex showed a relatively good adhesion to the canal walls and also a relatively good adhesion to the gutta-percha cones.

**Key Words:** Endodontic Sealers; Sealing Ability; SEM

## **Antibacterial Activity of Cavity Disinfectants**

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### **SUMMARY**

The purpose of this study was to compare the antibacterial activity of different disinfectant solutions in order to determine their probable use as cavity disinfectants. Tested disinfectants were benzalkonium chloride based Tubulicid red and Tubulicid plus, iodine-potassium iodide based Ora-5, chlorhexidine gluconate based Consepsis and Savlex, and hydrogen peroxide. Sodium hypochlorite and saline were used as positive and negative controls, respectively. The antibacterial effects of the disinfectants were tested on *Streptococcus mutans* (CCUG 6519), *Lactobacillus acidophilus* (LA-CH-5 DVS) and *Staphylococcus aureus* (ATCC 6538). In the first part of the study, the disinfectant solutions were placed in the prepared wells in the seeded agar plates. In the second part, the enamel-dentin discs treated with disinfectant solutions were placed in the prepared wells. After 48 hours of incubation, the zones of microbial inhibition were measured in millimetres.

The results of this study indicated that all test solutions demonstrated inhibitory activity against the bacteria tested, except saline. The zones of microbial inhibition measured in the first part were greater than those obtained in the second part. In the first part, hydrogen peroxide was found to be superior to the other tested disinfectants against all 3 strains ( $p<0.05$ ). In the second part, chlorhexidine gluconate based Savlex showed more effective antibacterial activity than the other disinfectants against all 3 strains ( $p<0.05$ ).

**Key Words:** Antibacterial Activity; Benzalkonium Chloride; Chlorhexidine Gluconate; Hydrogen Peroxide; Iodine-Potassium Iodide; Sodium Hypochlorite

## **Species of Microorganisms Isolated from Enamel Surface at a Given Time**

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### **SUMMARY**

The aim of this study was to identify species of microorganisms isolated from the samples taken from the enamel surface of the teeth. This examination was carried out on 80 examinees of both sexes, aged from 18 to 30. The examinees were divided in 2 groups. Group 1 consisted of 60 patients with carious non-treated teeth, while the group 2 was the control group of 20 examinees with healthy, treated teeth. The samples were taken on the Clinic for Conservative Dentistry and Endodontics at the Faculty of Dentistry in Skopje, while the microbiological researches were performed at the Institute of Microbiology and Parasitology at the Faculty of Medicine in Skopje. There were 720 samples taken from the vestibular enamel surface of intact teeth immediately after thorough cleaning and washing of the enamel surface with 3% H<sub>2</sub>O<sub>2</sub> and 75% alcohol, and after 4 and 24 hours, respectively.

Out of the taken samples (60 + 20), 19 species of microorganisms were isolated. In both groups of examinees Streptococci of the Viridans group were predominant, as well as micro-aerophylic and anaerobic Gram+ bacilli. However, the percentage of isolated bacteria species in the examinees of the group 1, was higher compared to the examinees from group 2.

**Key Words:** Enamel; Bacteria, oral; Str. Mutans; Lactobacillus

# Interaction of Metal Alloys Used in Crown and Bridge Prosthesis with Co-60 Ray Therapy Beams

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## SUMMARY

**Objectives.** Soft tissue damage adjacent to the metallic dental restorations is a deleterious side effect of radiotherapy which is associated with low-energy scatter from dental alloys having high atomic numbers. The purpose of this investigation was to measure the interaction of 3 different metal alloys used in crown and bridge prosthesis with Co-60 therapy beams and to determine the possible effects of the type of metal alloy used, metal alloy width and thickness and the application of the ceramic material to the Co-60 therapy side-effects..

**Study design.** 6 groups of 3 specimens were prepared for 3 different metal alloys - precious, semi-precious, and non-precious, used in metal ceramic restorations. In 3 groups, each casted from different type of metal alloy, ceramic was applied. Tin was used in order to evaluate the effect of the metal thickness and width on the radiation dose. Absorbed and back-scattered measurements of metal and metal-ceramic samples at different distances were performed using ion chamber and densitometric methods, whereas for the tin samples ion chamber method determined the results.

**Results.** The highest back-scattering was measured in precious metal alloy as 63%. Back-scattering was found to be effective within 2 mm distance in metal alloys, and within 1 mm distance in metal-ceramic samples. The highest radiation absorption value was measured as 23% in semi-precious alloy group.

**Conclusions.** Metal alloys resulted with an increase in the radiation dose, which was directly proportional to the atomic number of the alloy. The application of ceramics on the metal samples significantly reduced the back-scattering by absorbing the secondary electrons. The thickness and width of the alloys had no effect on the dose of the back-scattering beam, whereas metal thickness had an effect on the forward scattering beam due to the absorption of the alloy.

Key Words: Radiotherapy; Side-Effects; Metal Alloys; Back-Scattering

## **Self-Report Measure of Dental Fear with Children from the Town of Plovdiv**

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### **SUMMARY**

The self-report measure of fear of children dental patients is an important point in screening and determining strategies of behaviour's management. The object of the study included 312 children at the ages 12-14, coming from the town of Plovdiv, including 161 girls and 151 boys. They have completed a Children Fear Survey Schedule - Dental Subscale. 15 personalities, objects and circumstances have been given estimation points varying from 1 to 5.

The results showed that the average level of the reported fear amounted to  $32.04 \pm 9.8$  with girls, and to  $22.56 \pm 7.6$  with boys. Fear of choking was the most frequently reported fear, followed by the fear of the dental drilling. The conclusion was that most of children at the age 12-14 report quite of fear respect to dental treatment. As a result, their oral health gets worse and requires working out of strategies to overcome fear.

**Key Words:** Dental Fear; Fear Provoking Factors; Assessment.

## **Distribution of T-Cell Subsets, Immunoglobulins A, G, M and Complement Components in Oral Lichen Planus Lesions**

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### **SUMMARY**

**Objective:** The purpose of this study was to investigate the distribution and features of cells involved in the pathogenesis of oral lichen planus and to characterize the nature of the immune response.

**Material and Methods:** For this purpose biopsies from 17 patients with erosive oral lichen planus and 14 age and sex matched controls were obtained and processed for immunohistochemical staining and immunofluorescence. Immunohistochemical staining of the sections was performed using the indirect immunoperoxidase avidin-biotin method. The monoclonal antibodies used were CD3, CD4, CD8 and CD20.

**Results:** CD3+ cells were the prominent population compared to CD20+ cells and they were mainly distributed in the upper lamina propria; however, in small numbers they were localized intraepithelially near the basement membrane. T-cells were consisting mainly of CD4+, and in a lesser degree of CD8+ cells. Deposits of immunoglobulins A, G and M, as well complement C3 component, were found along the basement membrane.

**Conclusions:** These findings are consistent with the aspect that cell-mediated immune reactions play an essential role in the pathogenesis of oral lichen planus. The increased numbers of CD4+ cells (helper/inducer) suggest that there is an immunologic response against exogenous antigens that may be present in the oral cavity.

**Key Words:** Oral Lichen Planus; T-cell Subsets; Immunoglobulins

## **Serum and Saliva Levels of IL-2 in Children with Insulin-Dependent Diabetes Mellitus**

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### **SUMMARY**

The aim of this study was to investigate the IL-2 cytokine levels in saliva and serum samples of children with type 1, Insulin-Dependent Diabetes Mellitus (IDDM), to compare these findings with values from a healthy group of children and to evaluate the significance of determination of IL-2 saliva levels in children and in clinical research to an extent. A total of 20 newly diagnosed diabetic children (12 boys and 8 girls), mean age  $8\pm 3$  years, were selected from the Department of Diabetic Clinic of Hippokration Hospital of Thessaloniki, Greece. 20 healthy children, matched for sex and age, served as controls. IL-2 saliva and serum levels were determined in saliva and serum samples by a commercial human ELISA method.

Statistical difference between the 2 study groups was observed only in serum samples: IL-2 serum levels were significantly lower in diabetic children compared to controls ( $p < 0.011$ ). Saliva samples did not reveal any significance ( $p > 0.05$ ). The findings in serum samples revealed that the early stages of the IDDM are characterized by Th2 driven responses which predominate over Th1, but further investigation is necessary in order to clarify the specific role of cytokines in the etiopathogenesis of the IDDM. Detection of cytokines in saliva samples did not show, at this stage, any important correlation.

**Key Words:** Cytokines; Saliva; Serum; Diabetes Mellitus

## **Determination of Saliva Components in Children with Acute Lymphoblastic Leukaemia**

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### **SUMMARY**

Chemotherapy may adversely affect the salivary glands in children with acute leukaemia, resulting in alteration of the quality and quantity of saliva. Furthermore, it weakens the oral mucosa, creating an increased susceptibility to infections. Based on this fact, the aim of this study was to investigate the effect of chemotherapy on the salivary components, such as the flow rate, and the levels of secretory IgA, salivary peroxidase system, protein and thiocyanate concentrations. A cohort study was carried out prospectively, in the second Paediatric Clinic, Department of Haematology-Oncology, the Aristotle University of Thessaloniki. 36 children with acute lymphoblastic leukaemia (ALL), receiving induction chemotherapy, were followed up for 3 months. The control group consisted of 35 healthy children. Stimulated saliva was collected at the time of diagnosis and longitudinally during the induction chemotherapy (3 months) to determine saliva components.

Flow rate and IgA concentration were significantly reduced by the cytotoxic treatment. SCN<sup>-</sup> concentration was significantly lower through the total period of treatment. Total peroxidase activity and the protein concentration were significantly higher during chemotherapy. Accordingly, this study provides evidence that chemotherapy alters the composition of saliva, which may be a contributing factor to oral complications.

**Key words:** Chemotherapy; Leukaemia; Saliva, components

# **The Effect of Preoperative Etodolac Administration on Postoperative Pain Following Periodontal Surgery**

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## **SUMMARY**

A single-blind, single-dose and cross-over trial was designed to evaluate the analgesic efficacy of preoperative 600 mg etodolac administration on postoperative pain following periodontal flap surgery. 15 periodontitis patients requiring periodontal flap surgery were included in this cross-over study. In each patient, 2 quadrants with probing pocket depth of  $\geq 6$ mm and clinical attachment level of  $\geq 4$ mm were divided into test and control groups. One group received 600 mg etodolac 30 minutes prior to surgery, and the other group received placebo tablets. All patients used Visual Analogue Scale (VAS) to report levels of pain hourly for the first 8 hours starting from the 2nd hour postoperatively. Timing and dose of rescue analgesic re-medication were recorded.

It was observed that postoperative pain from the 2nd to 5th hours was significantly higher in the control group compared to the test group ( $p < 0.05$ ). Rescue analgesics were needed by 80% (12/15) of the patients in the control group, while this ratio was 46.6% (7/15) in the test group. This requirement occurred at postoperative 2nd and 3rd hours in the control group, but it was not necessary until the 6th hour in the test group.

It may be concluded that preoperative etodolac administration significantly reduced initial pain intensity and delayed the onset of postoperative pain as compared to placebo. The administration of 600 mg etodolac 30 minutes prior to periodontal surgery may be much more helpful in providing a painless and more comfortable post-surgical period for the patients.

**Key Words:** Etodolac; Postoperative Pain; Visual Analogue Scale; Periodontal Surgery

# **Primary Central Salivary Duct Carcinoma of the Mandible**

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## **SUMMARY**

Salivary duct carcinoma is a rare neoplasm of the salivary gland. It has a marked predilection to occur in the parotid gland. An intraosseous salivary duct carcinoma occurring within the body of the mandible of a 47-year-old woman is described. Histologically, the tumour presented cribriform and papillary patterns, together with comedo-necrosis. This is probably the first documented case of salivary duct carcinoma arising from intrabony salivary gland tissue. Awareness of possible malignant alteration of ectopic salivary gland tissue is essential.

**Key Words:** Salivary Duct Carcinoma; Jaw; Ectopic Salivary Gland Tissue

## **Ameloblastic Fibro-Odontoma of the Maxilla: Report of a Case**

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### **SUMMARY**

Ameloblastic fibro-odontoma is a rare odontogenic tumour generally occurring in childhood and young adulthood. The tumour is usually located in the posterior region of the jaws, most frequently in the mandible. The diagnosis of the tumour may be apparent from its typical radiographic and clinical appearance, but in the literature the nature and the behaviour of the lesion is considerably debated.

This paper documents an interesting case of a maxillary ameloblastic fibro-odontoma in a 6-year-old girl. The tumour was presented as a partially ossified mass, occupying the whole right maxillary sinus and expanding its walls. The 2-year follow-up, after complete enucleation of the tumour and excision of the impacted tooth, shows no evidence of recurrence.

**Key Words:** Ameloblastic Fibro-Odontoma; Mixed Odontogenic Tumour