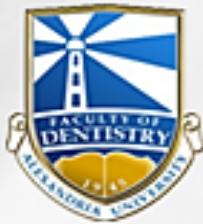


# ADJ



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## Alexandria Dental Journal

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# 22<sup>nd</sup> AIDC

## Abstracts of Oral and Poster presentations

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**AIDC-OP-1-SURG-1****Cutting bone with drills, burs and Piezotomes: a comprehensive systematic review and recommendations for the clinician.**

A. Troedhan

*Visiting Professor Faculty of Dentistry Health Science University Vientiane.**Visiting Professor Faculty of Dentistry Alexandria University.*

Mills, drills, burs and low-frequency oscillating saws were the only tools for bone-cutting for a long time and their use rarely questioned on their biological and physiological effects on bone-healing and osseointegration, especially when compared now with new technologies such as Piezotomes. The lecture will start with a short basic revision of current knowledge of bone-healing, bone-regeneration and osseointegration, followed by a detailed comparison of the basic technology and of the physical and biologic impact when drills and piezoelectric devices are used to cut bone. The major part of the lecture then will be dedicated to the presentation of newly developed minimal invasive ultrasonic surgical procedures such as sinus lifting, crest-splitting, subperiosteal tunnel technique, mandibular nerve lateralization and their advantages for both the surgeon and patients as well as their impact on the oral surgeon's everyday clinical routine in implantology and GBR.

**AIDC-OP-2-SURG-2****The non-invasive CBCT-based digital workflow for treatment planning and implant stability prediction demonstrated by an extraordinary patient case.**

A. Troedhan

*Visiting Professor Faculty of Dentistry Health Science University Vientiane.*

*Visiting Professor Faculty of Dentistry Alexandria University.*

New state of the art technologies such as digital therapy-planning and bone densitometry based on CBCT-radiography, atraumatic and minimal invasive Piezotome-surgery, and innovative biology-based bone-grafting allow the management of even "advanced" cases by dentists with less risk of failure and more predictable results. Contemporary CBCT-based diagnosis and 3D virtual therapy planning from bone augmentation, implant insertion to final prosthetic treatment, minimal invasive Piezotome-surgical execution and contemporary bone-biology based guided bone regeneration are presented, based on most recent scientific evidence. These new state-of-the-art pillars of contemporary therapy are demonstrated in an extraordinary case report starting with bone reconstruction to final implant-insertion and prosthetic treatment after a disastrous failed attempt of bone augmentation.

**AIDC-OP-3-SURG-3****Innovative techniques for immediate implant placement in the problematic posterior maxilla.**

I. P. Georgakopoulos.

*Expertise in Dental Implantology/ he is the inventor of the pioneer "IPG-DET" protocol.*

The posterior Maxilla has been known as the most difficult and problematic intraoral area for implant dentistry, requiring a maximum of attention for the achievement of successful surgery. Rehabilitation of the posterior maxilla with implants frequently presents a challenge for the oral surgeon because of the lack of bone due to alveolar ridge resorption or maxillary sinus pneumatization. To overcome these problems, different solutions were proposed over the years, such as the use of short

implants or tilted implants, with the aim of avoiding maxillary sinus floor elevation. The gold standard approach to the external sinus augmentation is the Sinus Floor Elevation developed years ago and is still touted as the best approach for creating maxillary posterior bone. However, Sinus Floor Elevation procedures are often quite traumatic, time-consuming, and costly, and they have anatomical limitations and considerable documented morbidity. Nowadays innovative techniques using minimal invasive surgery, growth factors and stem cells help to address this problem in a way that is friendly to the patient and the doctor.

#### AIDC-OP-4-SURG-4

##### **Bone regeneration in implant dentistry – How to preform it predictably?**

M. Shalash

*Associate Professor of Oral surgery, National Research Centre, Cairo, Egypt.*

Soft and hard tissue defects pose a therapeutic challenge in modern implant dentistry. According to literature, more than 50% of the cases presenting for teeth rehabilitation with dental implants have some sort of bone defect that require bone regeneration prior or simultaneously at the time of implant placement. Many surgical techniques are available and there is no one size that fits all treatment scenario. This lecture aims to highlight some of the key principles for bone regeneration in implant dentistry through a series of case presentations.

#### AIDC-OP-5-SURG-5

##### **Bone grafting at a glance -Evolution of Tissue Engineering to the Emergence of**

##### **Futuristic 3D cellular Bioprinting. The digital era of grafting is here.**

M. A. Maksoud

*Department of Oral Medicine Infection and Immunity of Harvard University School of Dental Medicine, Boston, USA*

From cartilage and bone which enables body growth, calcium storage and a range of hematopoietic functions all the way to teeth and ligaments which are elegantly structured to bear a range of functional loads in the most diverse conditions, mineralized and load-bearing tissues represent a unique category of biological materials that perform a range of critical functions in the human body. The evolution of soft and hard tissue grating excelled from autogenous harvesting in the sixties to allografts in the eighties and mesenchymal stem cells around the turn of the century. Due to recent integration of biomedical engineering and clinicians 3d printers are used to print cells and simulate tissue regeneration ready for human transplant.

#### AIDC-OP-6-SURG-6

##### **The Whole Truth or Part of it in Extraction Immediate Implantation - A Leap of Faith or is it Not?**

R. M. Abutteen.

*Lecturer at the German Board of Oral Implantology (GBOI) program in collaboration with the German Association of Dental Implantology (DGZI). Chairman of Camlog Dental Implants Study Club, Amman, Jordan.*

Teeth replacement using dental implants has proven to be a successful and predictable treatment procedure; different placement and loading protocols have evolved from the early-described procedures in order to

achieve quicker and easier surgical treatment times. It is well known that post-extraction dimensional changes resulting in the loss of contour in soft and hard tissues will have a direct impact on the clinical procedure to follow. Optimal implant placement and timing to place the implant is essential to ensure the long-term health, function and aesthetics of the restoration, with minimal morbidity. Immediate placement of a dental implant in an extraction socket was first described more than 30 years ago in 1976. Reductions in the number of surgical interventions, a shorter treatment time, the presumptive preservation of alveolar bone at the side of the tooth extraction and soft tissue aesthetics have been claimed as the potential advantages of this treatment approach. This lecture will present strategies in extraction immediate implantation to provide our patients with long lasting healthy aesthetic implant restorations. Topics inclusive of , but not limited to, natural anatomical site morphology, hard tissue thickness, tissue biotype, the need for soft tissue augmentation, ideal implant positioning, size and design of the implant, gap distance management, lack of complete soft tissue closure over the implanted extraction socket, temporization and its techniques will be presented with supportive scientific evidence.

## AIDC-OP-7-SURG-7

### **Impacted Third Molars: philosophy, surgical technique, and Future Prospects.**

Z. Noujeim.

*Clinical Professor, Senior Lecturer, and Postgraduate Tutor of Oral Surgery and Oral Pathology.*

*Director of Oral Medicine Master's Program, Lebanese University Faculty of Dental Medicine, Beirut, Lebanon.*

Third molar surgery is the most common ambulatory oral surgical procedure performed in dental practice, in the Arab world and worldwide. It is obviously the mainstay of dentoalveolar surgery, and it has very specific indications and contraindications. Surgical extraction of impacted third molars can be efficiently undertaken if operative rules are thoroughly respected and implemented. Unfortunately, many dental general practitioners are not enough trained to perform this surgical procedure properly and safely, which justifies the diversity of intra- and post-operative difficulties, mishaps, and complications that often occur. During this lecture, common approaches of third molar surgery will be addressed with a contemporary concept that will cover-through different clinical cases - its philosophy, indications, anatomical, and surgical aspects.

## AIDC-OP-8-SURG-8

### **Periodontal and Periimplantitis Tissue Regeneration – State of the Art 2022.**

R. Convissar.

*Pioneer in the field of laser dentistry.*

Soft and hard tissue regeneration has always been an ideal, yet elusive goal when treating periodontal and peri-implant disease. This course will provide the attendee with a 12-step program to achieve laser-assisted periodontal tissue regeneration. This technique is also applicable to peri-implantitis treatment. Though lasers have been used in dentistry for over 30 years, and many laser companies have made many claims about regeneration of tissue, these techniques will be proven to work via case

reviews and supported by a critical review of the peer-reviewed literature.

### AIDC-OP-9-SURG-9

#### **Indications for removal of impacted mandibular third molars: A single institutional experience in Libya.**

*H. Al-orafî, R. Elgehani, S. krishnan.*

*Professor at Benghazi dental School and hospital, Libya.*

**Aim:** to investigate the various indications for the removal of impacted lower third molars in Libya

**Methods:** The records of all patients who underwent a surgical removal of a lower third molar over a 3-year period were reviewed retrospectively. The indications for removal were classified into 10 groups. Radiographs were also studied to determine angular position as well as pathologies associated with such teeth. Age, gender, and chief complaint were recorded.

**Results:** The results were based on the data of 439 patients who had their molars removed (Male-183; Female-256). 61% of patients were in the age groups 15-24. Recurrent pericoronitis was the most common indication recorded (54%), followed by pulpitis/caries of the 3rd/2nd molar (31%). Orthodontic reasons (2%) and cysts/tumors (5%). Pain and tenderness were recorded as the most common symptom. The relative absence of prophylactic removal as an indication could be attributed to socioeconomic and logistic reasons.

**Conclusion:** Awareness of the indications for removal of impacted lower third molars will help in the management. Fear of dentistry appears to be responsible for patients reporting to the surgeon only when symptoms occur. Patients generally do not agree to

prophylactic removal of lower third molars. Removal of only symptomatic lower third molars seem to be the only logical choice.

### AIDC-OP-10-SURG-10

#### **Piezosurgery treatment between myth and reality: scientific evidence and clinical applicability. Bone atrophies and their management with a mini-invasive approach.**

M. Labanca

*International Speaker and Key Opinion Leader for many leading Dental Companies.*

During these last years the Piezosurgery has become one of the main topics in the congresses than in the clinical appliances. On this presentation we will analyze all possible applications in every day dental surgery where Piezosurgery gives to us a huge improvement of our procedures. Also, we will consider bone atrophies and their management with a mini-invasive approach. Moreover; we will face with some of the main topics about this kind of surgery, like the scientific method on which the piezo-surgery is based on, which are the potential applications and the future borders, the histological evidence and finally the right guide-lines for choosing the device to buy.

### AIDC-OP-11-SURG-11

#### **Regeneration of the Interproximal Clinical Attachment Gain: the challenge of Periodontal Plastic Regenerative Procedure.**

G. Rasperini.

*Professor in Periodontology, Department of Biomedical, Surgical and Dental Sciences, University of Milan, Italy.*

In today's dentistry the aesthetic demand from the patients has become the main challenge in Periodontology. Besides the obvious functional results is now important to achieve aesthetic success, particularly in the anterior areas, where the expectations of the patients are higher. Understanding the biology of the periodontal wound healing, will lead to respect and protect the healing phase. The New Classification of Periodontal Disease is focused on the interdental Clinical Attachment level. The Aim of Classic Periodontal reconstructive surgical techniques are the regeneration of the infrabony defects or the root coverage in case of gingival recessions. Recently the evolution of the regenerative plastic surgery makes possible to treat simultaneously both. So, the develop of regenerative clinical and biological concepts, biomaterials and new surgical techniques during the last years, makes possible to answer to the patient's demands and regenerate the interdental attachment of compromised teeth with predictable long-term results.

## AIDC-OP-12-SURG-12

**Predictable treatment work-flow for partial and complete edentulous patients to increase aesthetics and accuracy using novel digital technologies.**

M. Tallarico.

*Director and Research Project Manager of Osstem AIC Italy.*

*Assistant professor at the Department of Medicine, Surgery, and Pharmacy, University of Sassari, Italy.*

*Adjunct professor, Master of Science in Dentistry Program, Aldent University, Tirana, Albania."*

New technologies have revolutionized the diagnosis and planning of restorative treatments in dentistry. Although fully digital workflows are ever increasing, predictable accuracy, aesthetic areas, and treatment of complete edentulous cases are still a challenge. Placing implants in aesthetic zone may presents several difficulties. Combining digital patient's virtual data with the 3D restorative design allows us to precisely determine the desired restorative results, as well as the correct tridimensional implant position. Using a computer-guided approach will reduce clinician's anxiety, time, and stress during the actual surgical procedure and also during the restorative phase of the treatment. The purpose of this lecture is to present ways to achieve predictable outcomes in implant placement in esthetic zone, as well as restoration of complete edentulous patients, using OSSTEM products. Future is now.

## AIDC-OP-13-SURG-13

**Augmentation of Eminoplasty using digitally custom-made implants in the management of chronic recurrent dislocation and hypermobility of the temporomandibular joint.**

A. Medra

*Professor of Cranio-Maxillofacial, & Oral and Plastic Surgery, Alexandria University, Egypt.*

**Background:** this study is designed to project a comprehensive understanding of the management of dislodgment of the head of mandibular condyle from its normal position in the glenoid fossa. In addition, a new technique of temporomandibular joint dislocation correction by eminoplasty was also proposed.

**Aim:** this study evaluates the application of digitally custom-made implants as a method of augmentation eminoplasty in the management of chronic recurrent dislocation and hypermobility of the temporomandibular joint

**Materials and methods:** The study prospectively will include patients treated with the custom-made implants for recurrent TMG dislocation or hypermobility. Before surgery, digital templates will be designed to guide prosthesis positioning. The reconstruction outcomes are assessed by clinical examinations and accuracy analysis comparing the pre and postoperative standard panorama and panoramic TMJ view open and closed data (4 in 1) and MSCT facial bones with 3D film. All patients will be assessed clinically and radiographically using computed tomography (CT) then virtual surgical planning and custom made patient specific implant will be manufactured. Postoperative clinical evaluation will be done, and radiographic evaluation of all patients will be done by standard panorama and panoramic TMJ view open and closed data (4 in 1) and MSCT facial bones with 3D film 6 months after the procedure. Meanwhile, TMJ panoramic TMJ view open and closed data (4 in 1) will be done in the immediate postoperative period on day1.

**Results:** Data will be collected and statistically analyzed using the most appropriate statistical analysis test.

#### AIDC-OP-14-SURG-14

### The Crucial Role of Orthodontics in the Multidisciplinary Treatment of Paediatric OSAS.

D. Mahony.

*Full Face Orthodontics, Sydney NSW, Australia*

**Aim:** The current treatment for paediatric sleep apnoea is heavily focused towards CPAP therapy without a thorough understanding of alternative options such as orthopaedic development of the jaws, ENT involvement, and new emerging field of myofunctional therapy.

**Materials and Method:** This study followed 3329 children between ages of 7-9 yo, who were referred to me for an orthodontic consultation by their general dentist. The purpose was to see what combination of treatments would most reduce the impact of sleep disordered breathing (SDB), in the paediatric population. Based on the signs and symptoms of SDB problems, 3326 patients had the standard orthodontic records of study casts, X-rays/CBCTs, extra & intra oral photographs, as well as a baseline sleep study (PSG) or an overnight pulse oximetry. Sleep studies revealed mild to moderate sleep apnea, or other symptoms of SDB. 21 patients PSG studies showed no SDB. The patients were assigned to 1 of 4 treatment groups, plus a control group who did not receive any treatment (group 5): 1) ENT surgery only, or 2) ENT surgery and myofunctional therapy, with a nighttime appliance (myobrace) (MFT) or 3) ENT surgery and orthopaedics/orthodontics, and 4) ENT surgery, orthopaedics, MFT and a nighttime appliance. Sleep studies were performed for all patients at baseline and after, ENT intervention, orthopaedic treatment, and finally MFT. By comparing the results, the best outcome for RDI reduction, was obtained when ENT surgery, myofunctional therapy and orthodontic therapy were used. Complete resolution of OSAs, in children, requires appropriate orthodontic treatment, such as maxillary development, maxillary protraction, and mandibular translation.

**Results:** Preliminary results showed a 90% correlation between a child that has a malocclusion and SDB problems. Studies

suggested that multidisciplinary treatment, which involved ENT specialists, dentofacial orthopaedics, followed by myofunctional therapy gave the best outcome i.e., the lowest residual apnoea measurements. This data was correlated with follow-up sleep studies, and Bears sleep questionnaire.

**Conclusions:** Orthodontists should pay close attention to their patient's airway issues and sleep, when treating a malocclusion. Treatment options given to parents, with children who have breathing disorders should include multidisciplinary care.

### AIDC-OP-15-SURG-15

#### Management of Odontogenic Tumors and Cysts in Children.

A. Tawfik.

*Consultant Oral & Maxillofacial Surgeon and Assoc Professor; Dubai Dental Hospital, Mohammad Bin Rashid University of Medicine and Health Sciences.*

*Consultant Oral Surgeon, Hendon BMI Hospital, London.*

*Consultant Oral Surgeon, 94 Harley Street, London.*

Odontogenic tumours and cysts represent 25.9% - 32.7% of the total number of jaw neoplasms in children and adolescents. Early diagnosis of these neoplasms in children is essential to ensure timely surgical management and minimize any hindrances to the healthy development of bone and dental structures. Odontogenic tumours and cysts in children are slowly growing and tend to present in the absence of symptoms. They are usually discovered accidentally during a routine dental examination, orthodontic assessment or recall radiographic evaluation. The finding of pathology in children can be anxiety-provoking for parents, and diagnosis and successful surgical management are of

paramount importance, requiring a multidisciplinary team. This presentation aims to appraise the various surgical techniques in managing benign odontogenic lesions in children.

### AIDC-OP-16-SURG-16

#### Vertical and Horizontal Implant Site Bone Deficiency. Surgical Solutions and Challenges

M. El-Hadidy

*Tufts University School of Dental Medicine and Back Bay ORAL & Maxillofacial Surgery and Dental Implants Center, Boston, MA, USA.*

Since the pioneer work of the Swedish orthopedic surgeon Per-Ingvar Bränemark more than half a century ago, dental implant procedures have been one of the most important methods of restoration, rehabilitation and reconstruction of the orofacial structures. There are many factors necessary to achieve successful placement of dental implants. One of the most important of these factors is the availability of sufficient amount of healthy bone for adequate osseointegration. Cases with deficient bone volume in the implant site will require ridge augmentation grafting procedures before implant placement. The implant surgeon currently has a wide array of procedures and resources to help achieve that goal. That include different types of bone grafting procedures with or without biological bone formation enhancing agents. This lecture will discuss the different treatment modalities and surgical procedures as well as the challenges that are facing the implant surgeon in the process of achieving successful placement of dental implants.

### AIDC-OP-17-SURG-17

**The impact of antibiotic resistance on dentistry.**

H. A. Salam.

*BSc, MSc, DDS, PhD (McGill U.), OMFSA (U. of Toronto)*

Antibiotic therapy has revolutionized the fields of medicine and dentistry including implantology. Despite its advantages, controversies associated with the use of antibiotic therapy, among other factors, have led to antibiotic resistance, which represents a significant challenge to public health. This presentation will provide a critical overview of the controversies related to the use of antibiotic therapy in dentistry and specifically to implantology, explore antibiotic resistance and associated factors, and attempt to provide guidelines for the use of antibiotics, based on the most recent evidence-based scientific literature, therefore, contributing to improved patient care.

**AIDC-OP-18-SURG-18**

**Endodontically treated teeth: evidence-based bio-functional and aesthetic considerations to restore them.**

A. Signore

*Professor at the Department of Integrated Surgical and Diagnostic Science, University of Genoa, Italy*

The restoration of endodontically treated teeth (ETT) is a topic that is extensively studied and yet remains controversial. This presentation emphasizes the physical and mechanical characteristics of endodontically treated teeth and some clinical principles to be observed when restorations of these teeth are planned. A look is given at the contemporary restorative materials and

techniques, providing evidence based clinical hints on maximizing the potential longevity and aesthetics of post-endodontic restoration, as well as predictable results. The conclusions are that the amount of residual coronal tooth structure, functional and esthetic requirements determine the best way to restore ETT, indicating the material and technique to be used, direct or indirect restorations, associated or not to posts.

**AIDC-OP-19-SURG-19**

**Osseodensification: Optimize the Site – Optimize the Outcome.**

S. Huwais.

*Private practice limited to Periodontics and Implantology. Diplomate, The American Board of Periodontology. Diplomate, The American Board of Implantology.*

**AIDC-OP-20-SURG-20**

**Minimally invasive and self-regenerative laser implant therapy**

G. P. Chaumanet.

*President of International Institute of Laser Implantology (III)*

**AIDC-OP-21-SURG-21**

**Soft Tissue Management for Esthetic Dental Implants.**

M. Hassan.

*Diplomate, American Board of Periodontology Fellowship, Craniomandibular Dysfunction Post-Graduate Faculty, Oral Medicine, Infection & Immunity, Harvard School of Dental Medicine*

**AIDC-OP-22-CONSERV -1**

## **Minimally Invasive Approach in Modern Endodontics**

A. Iandolo

*Adjunct Professor in Endodontics at Salerno University, Italy.*

For several years, minimally invasive Endodontics has been considered as revolutionary and the road to the future of the Endodontics. unfortunately, the conservative thinking was limited only to the access cavity. The aim of this lecture is to show the how to perform the phases of: access cavity, shaping, 3D Cleaning, 3D Obturation and MicroEndodontic Surgery in a conservative way and to show how new techniques and protocols can improve using simplified techniques our work and, more importantly, our outcomes.

## **AIDC-OP-23-CONSERV-2**

### **Light therapy for pain management.**

A. Darbar

*A multi-award-winning Laser and Aesthetic Dentist.*

Pain is probably the first thought that our patients relate to when anyone mentions dentistry, and this is enough to put off a section of the general population world-wide. It is believed that only 50% of population seek dental treatment and 50% of these may become regular attenders. There may be other factors and issues involved including dental phobia, anxiety, and finances. Is there anything we can do to help our patients to achieve better outcomes with comfort and relaxation? Light based technology with lasers and LEDs can be implemented in our practices for routine and specialist treatment with protocols using the concept of

PhotoBioModulation Therapy (PBMT) or as it was known as Low Level Light Therapy (LLLT). The cells in our body are sensitive to different light sources and the mitochondrion of the cell has light absorption capacity through its photo receptors and can start a chain reaction in the electron transport system in a cell working at subnormal level and can be rejuvenated by accelerating repair, regeneration, and pain management. Lasers and LEDs available today have evolved over the last decade for use in clinical dentistry very effectively and some do offer economic solutions as well.

## **AIDC-OP-24-CONSERV-3**

### **Light-Curing Bulk-Fill Dental Composites: How it works and how you must make it work!**

D. Watts.

*Professor of Biomaterials Science in the School of Medical Sciences and the Photon Science Institute at the University of Manchester.*

Modern dentistry requires direct restorative material systems with good handling properties and ergonomic and efficient light-curing units (LCUs). Photocuring or photo-polymerization of resin-based composites (RBCs), including bulk fill (BF) types and associated restoratives, is a routine procedure in operative dentistry. However, although it is routine, there are many pitfalls such that the procedure can be inadequate or even seriously defective. Clinicians may become familiar with the rapid transformation of RBC pastes to rigid solids, but still lack understanding of how and why this happens. Efforts to learn scientifically about the interaction between light beams and resin-composites can significantly improve effective clinical

placement of restorations. First we must gain a sufficient understanding of the nature of light, with both wave and particle (photon) models - including how the energy carried by a photon relates to its frequency or wavelength - and also the definition of important units, such as Radiant Exitance and Irradiance. Secondly, we must understand how deeply these photons penetrate composite materials. Even LCUs that deliver a relatively modest irradiance, are pumping out some billion billion photons every second. However, even when these photons can penetrate composite pastes they are not all necessarily 'suitable'. To be suitable – that is, to be absorbed - depends upon their frequency or spectral wavelength and how well this matches the 'absorption spectrum' of photo-initiator molecules added to the resin-monomers. Two main 'scientific' quantities can express the extent of success in light-curing. These are the depth of cure (DoC - units mm) and the degree of conversion (DC %), together with mechanical properties such as hardness. We consider how LCUs have been developed and the corresponding materials chemistry, including the photo-initiator systems. The early 'halogen' (QTH) lights changed restorative dentistry but had several disadvantages, which were overcome by blue light emitting diode (LED) LCUs. However, clinicians now need to understand how these devices function and the key design factors in selecting and using LED-LCUs. Good equipment selection is important in making light-curing work! Devices currently available can exhibit wide variations in radiant output, spectral distribution and beam profile. They may deliver light with varied characteristics to match the absorption of different photo-initiator systems. Current questions concern ultra-rapid curing of composites - using high-irradiance LEDs - does it work and is it safe?.

#### AIDC-OP-25-CONSERV-4

##### **Overcoming Dental Color Match in 2022: New and Accessible Technology for Everyone.**

A. Kaliks

*Years of experience in digital dentistry and thousands of restorations*

The comprehension of color theory is just the starting point to overcome the eternal problem of color mismatch in dentistry. Usually subjectively performed, the use of shade tabs to determine dental color has proven to be insufficient to obtain predictable outcomes. In the digital era, new simple and accessible technologies are available for free or at low cost to perform objective color measurements and color communication. The correct integration of dental photography, smartphone/computer applications, shade tabs and color theory knowledge; may lead to a new standard of shade matching for everyone. Welcome to the Chairside Dentistry Color Matching Protocol.

#### AIDC-OP-26-CONSERV-5

##### **Preventing and managing iatrogenic mishaps during the shaping of the root canal system.**

F. Cardinali.

*Active Member and Vice-President of the Italian Society of Endodontics. Gold Member of Styleitaliano Endodontics.*

During the shaping, the original anatomy respect allows preparing the canal saving radicular dentine, creating an ideal shape for a deep cleaning and a three-dimensional obturation. The execution of shapes that fit and meet the original anatomy decreases the

risk of creating alterations of the root canal itself, such as ledges or transport, regarded by the international scientific literature as factors leading to the failure of the therapy. The respectful shaping of the root canal system is achievable using a proper shaping technique getting the benefits of the evolution of the rotary file systems: thanks to the heat treatment of the rotary files, the reduced diameter of the wire, a totally minimally invasive mechanical shaping can be safely performed by the clinician, getting high quality and original anatomy respectful shaping, even in complex anatomies and even using a reduced number of instruments. A proper and functional access is needed to get a respectful shaping of the root canal system as it's even important to reduce the stress on the NiTi rotary file, preventing separation of the file itself. Once created a ledge or a separation of the file, the clinician do face properly this situation always trying to save as much sound radicular tissue as possible. Aim of the lecture is to highlight how the knowledge of the shaping techniques are more important than the rotary files, sharing protocols and tips to manage even iatrogenic mishaps once created.

## AIDC-OP-27-CONSERV-6

### **Vital pulp therapy – Material considerations.**

J. Camilleri

*Reader and Honorary Specialty Dentist at the School of Dentistry, College of Medical and Dental Sciences, Institute of Clinical Sciences.*

Traditionally calcium hydroxide has been used as a pulp capping material and dentine replacement was performed using glass ionomers or other materials to replace the dentine in bulk. The main shortcoming with

the use of calcium hydroxide as pulp capping material is the material inherent weakness and solubility. The material is water-based and thus it cannot be etched and bonded making restoration with resin composites difficult. Newer materials have been developed which are either resin-based and thus light curable or water-based with enhanced characteristics. These materials are easier to use and are can potentially replace the calcium hydroxide as a pulp capping material. This lecture will look at the classical pulp capping methodology and the newer hydraulic calcium silicate cements used for pulp capping.

## AIDC-OP-28-CONSERV-7

### **Digitally Guided Biologically Driven Smile Makeover.**

M. Bhuvaneswaran.

*Adjunct Professor at MAHSA University, Malaysia / Accredited member of AACD.*

Smile makeovers have become common in our day to day practice these days. Today's Cosmetic Dentistry revolves around minimal prep Dentistry and unnecessary reduction of tooth structure in not warranted. Composite resin restoration are very tooth friendly, since they require only minimal tooth prep, Today the same can be done with ceramics too. Keeping the final outcome in mind and then formulating the treatment plan is the key to success. With the advent of digital dentistry, the treatment planning is become more easy and predictable. The integration of 2 D image sand 3 D scans not only gives us the final outcome well before staring the treatment but also the step by step treatment protocols for maximum tooth preservation. This prevention will in detail explain tub role of Digital Dentistry in Smile Make over cases.

**AIDC-OP-29-CONSERV-8****Management of carious pulp exposures in the calcium silicate based-material era.**

N. Taha.

*Professor in endodontics and coordinator of the postgraduate endodontic program at Jordan university of science and technology.*

*A Member of the Royal College of Ireland and a fellow of the Royal Australian College of Dental Surgeons.*

Vital pulp therapy including pulpotomy is increasingly adopted in the management of carious pulp exposures in children and adults, by virtue of the improved understanding of pulp histopathology and its response to the carious insult. The advent of MTA and other calcium silicate based-materials has considerably improved the success rates over medium and long term follow up and therefore renewed the interests in vital pulp therapy. This presentation will review available data on the clinical and histological diagnosis of irreversible pulpitis and discuss recent evidence in support of vital pulp therapy in mature permanent teeth.

**AIDC-OP-30-CONSERV-9****Strategies, Approaches and Challenges for Tooth Engineering and Dental Pulp Regeneration**

S. N. Helal.

*Assistant Professor at the Department of Oral and Craniofacial Sciences, School of Dental Medicine, University of Pittsburgh, USA.*

Without doubt, the regeneration of teeth is an alluring tooth-replacement option that has been long awaited since the engineering of

body tissues has been coined more than two decades ago. This talk will cover the strategies, approaches, and challenges for tooth engineering in general while focusing on the dental pulp regeneration in particular. Thanks to recent advances in genetic analysis technology – namely single cell RNA sequencing – we will also discuss the up-to-date understanding of the cell's populations involved in tooth development and the potential of this knowledge to participate in and boost tooth regeneration.

**AIDC-OP-31-CONSERV-10****Functional and esthetic balance in different malocclusion with aesthetic medicine.**

S. Gjorgiev.

*Licensed doctor for the use of hyaluronic acid and botulinum toxin and meso threads in the facial region since 2009.*

Aesthetic Medicine comprises all medical procedures that are aimed at improving the physical appearance and satisfaction of the patient, using non-invasive to minimally invasive cosmetic procedures. Aesthetic medicine in dentistry, now days is a popular name for usage of different nonsurgical techniques in resolving some of the problems that occurs before, during and after different dental treatment protocols. Injections of neurotoxin and dermal fillers are the most used among all procedures. The aim of this study is to recognize the indication and properties of hyaluronic acid and botulinum toxin usage in lower third part of the facial region. There is a very close connection between orthodontic treatment and injectables like hyaluronic acid and botulinum toxin. The study shows that we can assist in satisfying patients' appearance by placing hyaluronic acid chin implants in class

II malocclusion, correction of lip asymmetry and incompetence, improvement in facial balance without surgery in class III patient, usage of Hyaluronic Acid, after surgery in lip cleft patient for better esthetics. Botulinum toxin injections can improve some of the conditions like treatment of gummy smile, hyperactive mentalis and lip incompetency and treatment of bruxism and TMD. These procedures are safe to be done in dental office, without general anesthesia, short time procedures where the patient can continue with its daily activities and have no discomfort.

### **AIDC-OP-32-CONSERV-11**

#### **A New Generation for Cosmetic Dentistry: Delivering the Selfie Ready Smile.**

S. McMahon.

*A Fellow of the American Society for Dental Aesthetics.*

Appearance and self-esteem have long been intertwined. So, as our social media and selfie culture continues to grow, it's no surprise that more and more people are seeking out cosmetic dentistry as a way to enhance their appearances. The dental world has taken notice and we need to respond with conservative ways to satisfy our patient's desires for ideal smiles. This course will cover treatments from ultraconservative enamel enhancements and direct composite solutions to minimal prep/no prep veneers. Discover the secrets to identifying patient's cosmetic de-sires, learn new easy but beautiful techniques and learn effective dialogue for case acceptance. Boost their Confidence and Boost your Bottomline.

### **AIDC-OP-33-CONSERV-12**

#### **Minimally Invasive Prosthodontics. Some Pearls after 40 years of prosthodontic clinical practice.**

T. Daher.

*A Board-Certified Prosthodontist, A Fellow in the American College of Prosthodontists.*

When restoring partially or completely edentulous arches, prosthodontic treatments become costly and long. Prosthodontic mechanical complications will arise creating frustrations from patients and dentists. Some of these complications will be described and a systematic approach will be outlined for their prevention with emphasis on minimally invasive alternative prosthodontic treatments such as conventional fixed, or removable prostheses. The presentation will focus on some practical clinical pearls for preventing these complications from occurring, using many clinical situations.

### **AIDC-OP-34-CONSERV-13**

#### **Endo diagnostic. Is what we have enough?**

Z. Grabliauskiene.

*Associate Professor at the same University, Department of oral and dental pathology, Lithuanian University of the Health Science.*

There are many cases in dentistry when it is essential to know the pulp status to initiate the most conservative treatment and avoid complications and expanses if a disease is not diagnosed and untreated. The newest studies indicated that pulpotomy is a conservative treatment even for permanent teeth with symptoms of irreversible pulpitis or signs of chronic apical periodontitis. Coronal pulpotomy is less invasive, cost effective, reduces pain and discomfort for patients, simple and less time consuming for patients

and the dentists. Pulpotomy helps save tooth structure and consequently increasing tooth survival. However, it should be kept in mind that there is still needs of well designed, future clinical studies about case selection and clinical procedures protocol. Diagnosis of pulpitis should be revised too as there is no still methods for determination of pulp vitality. In our days thermal and electrical tests to determine pulp vitality can give a false result, because they can determine only pulp innervation but not vascularity. The vascular supply is more important to the determination of the pulp vitality than the sensory supply. Diagnostic methods to assess the blood supply (Isotope clearance, local hydrogen-gas desaturation, labelled microspheres) are still experimental. Pulse oxymetry and laser doppler flowmetry are non-invasive completely objective tests in evaluating pulp vascularisation. Will be discussed about advantages and critical requirements of using pulse oximeter and laser doppler flowmetry in dentistry. In the lecture will be present a new developed pulse oximeter probe holder and clinical trials done at LUHS which prove its operation and effectiveness to determine the pulp vitality.

#### AIDC-OP-35-CONSERV-14

#### Bioactive adhesive system: The new era in Dentistry

A. S. Bakry.

*Professor at the Conservative Dentistry Department, Faculty of Dentistry, Alexandria University, Egypt.*

*Japan Society for promotion of science, Tokyo Medical and Dental University, Tokyo, Japan.*

Bioactive application in medical field started by the sincere efforts of Professor Larry Hench in the late 1960s. Coating of the

artificial prothesis with these bioactive materials significantly increased their success. The introduction of these bioactive materials in Dentistry was associated with their application in conjunction with bone and pulp tissues due to their unique reparative reactions when applied in contact with the bone or pulp cells. Thus, there was scant information regarding the effect of using these materials in contact with superficial dentin or enamel. 17 years ago, our research team dedicated all of its efforts to explore the potential effects of using various bioactive materials for enamel and dentin remineralization. These efforts resulted in obtaining the US patent of a newly developed bioactive adhesive system that is based on “Self-Healing” concept. This concept increases the durability of the adhesive system and break the chain of the continuous degradation associated with currently available adhesive systems. This presentation is going to discuss the journey of developing this adhesive system over the past years and the potentials of applying bioactive materials in the dental field.

#### AIDC-OP-36-CONSERV-15

#### Contemporary materials in implant dentistry.

K. Shah.

*Professor of Clinical Dentistry, Director of Residency in Advanced Prosthodontics, UCLA School of Dentistry, USA.*

This presentation will be devoted to the materials currently used for dental implants including titanium and zirconia and materials used for implant retained dental prostheses including monolithic zirconia, PMMA, Cobalt-Chromium Alloys, and Titanium. Special attention will be paid to the selection

of the appropriate occlusal materials mused for various types of implant-retained prostheses.

#### AIDC-OP-37-CONSERV-16

#### Digital Applications in Implant Dentistry.

D. Chao.

*Assistant Professor, Division of Advanced Prosthodontics, UCLA School of Dentistry.*

This presentation will be devoted to the use of digital technologies used to assess potential implant sites, the surgical placement of implants and the fabrication of implant retained prostheses. Topics to include design and fabrication of surgical templates, design and manufacture of implant connecting bars, and design and manufacture of full arch restorations.

#### AIDC-OP-38-CONSERV-17

#### Zygomatic Implant Assisted Prosthodontics.

J. Jayanetti.

*Assistant Clinical Professor, Director Maxillofacial Prosthetics, UCLA School of Dentistry.*

This presentation will be devoted to the use of zygomatic implants in the treatment of edentulous patients with severe resorption or structural deficits associated with the maxilla. Patient selection, prosthesis design including implant assisted vs implant supported designs, fixed vs removable will be discussed in detail.

#### AIDC-OP-39-CONSERV-18

#### Ceramic Veneers, the way to a befitting smile.

C. M. Zogheib.

*Professor, Saint Joseph University of Beirut, Lebanon*

Dental ceramic veneer is a simple and conservative solution to mask the imperfections of a smile. This procedure is an effective and less invasive alternative to dental prostheses such as crowns or implants. In this presentation, all the steps of the preparation will be detailed, the different techniques and the instrumentation used will be exposed with precision and the cementation will be presented step by step. Finally, a movie will summarize the whole procedure. The aim of this lecture is to highlight the fact that the veneers must be an alternative choice to give our patient an improved, beautiful, and healthy smile that befits his face and not a prefabricated and labelled star smile.

#### AIDC-OP-40-CONSERV-19

#### Ultimate Esthetics with Direct Bonding.

H. A. Ragab

*Professor of Operative and Esthetic Dentistry. Director of Conservative Dentistry Department. Faculty of Dentistry, King Salman International University, Egypt*

Composite resins still make up a large portion of esthetic dental work, even in this digital age. Composite resins provide superior esthetics with minimal invasiveness and long-term results. thanks to cutting-edge technology. Creating a seamless composite restoration in the esthetic zone necessitates a thorough understanding of the resin's optical

and physical properties, combined with artistic skills. This presentation will provide details about the art of form, color, and tints using composite resins to enhance patients' smiles and overall appearance.

#### **AIDC-OP-41-CONSERV -20**

#### **Porcelain Laminate Veneers: Try in and cementation.**

J. Sabbagh.

*Associate Professor, and the Head of Department of Restorative Dentistry and Endodontics in the Lebanese university and the Director of several research projects.*

Cementation of porcelain laminate veneers is very critical and involves many steps. During the second appointment, the veneers are bonded using composite resin cement. Many materials are available in the dental market and specific treatment is needed before bonding the veneers. Last but not least, the finishing and polishing procedures will be detailed, highlighting the most important instruments to use, in order to ensure the longevity of the restorations. Finally: the different types of failures that may be encountered when using this technique, will be exposed, highlighting the best solution for each case.

#### **AIDC-OP-42-CONSERV -21**

#### **Treatment Planning for Full Arch Implant Rehabilitation (Digitally Driven Implant Dentistry).**

M. Gebril.

*Fellow of the Royal College of Dentists of Canada.*

Full arch implant rehabilitation is one of the most challenging clinical scenarios.

Meticulous approach is crucial for the successful outcome. This process begins on day one of seeing the patient, moving forward to the planning phase, surgical execution and finally the detailed steps for the fabrication of the implant supported prosthesis. Digital Dentistry offers an extraordinary tool that can help us achieve better predictability, efficiency and creativity in implant dentistry. This lecture will discuss the fundamentals of implant treatment planning and the concepts behind full arch implant rehabilitation. More specifically, will elaborate on the application of the digital technology for planning and restoring full arch cases and the dynamics of working within an interdisciplinary team to optimize the treatment outcome.

#### **AIDC-OP-43-CONSERV-22**

#### **3D Mindset for Dentistry**

R. Salazar.

*Associate researcher at the "Renato Archer TI Center (CTI)", from the Ministry of Science & Innovation of Brazil. Research Professor at the "UNW"*

*Maxillofacial Prosthodontics professor at the "UCSUR", and "UPC" in Perú.*

From being a sympathizer to becoming a user exist a short learning curve, compared sometimes with how to press some buttons, one at a time, by a tutorial or the enterprise who sells you hardware or software. We all have to start somewhere. The user learning curve has some phases too. Becoming an advanced user requires an open mindset (and stubbornness) of a person that is learning by trial and error. Like being taught how to swim once he has been pushed into the ocean with no further instructions. Finally, when you start feeling limited by the boundaries of the actual, and probably most famous technology

systems, your 3D technological freedom is probably your next level, and becoming a developer of solutions may be a fit for you. It is a journey. In a context where there is still little formal education about technology for dentistry, everything feels innovative and special. But technology and information should always be together. Learning from a scientific perspective and not by commercial biases only.

#### **AIDC-OP-44-CONSERV-23**

#### **Computer-Aided Engineering of Complete Dentures and Implant Prostheses: Clinical Treatment Procedures and Fabrication Technology.**

C. J. Goodacre.

*Distinguished Professor Loma Linda University School of Dentistry, Loma Linda, California.*

*Editor of the International Journal of Prosthodontics.*

Advances in digital technology now make it possible to obtain conventional complete denture clinical records and use the resulting scanned data to fabricate digital complete dentures, implant overdentures, and immediately loaded implant fixed complete dentures (hybrid prostheses). In addition, it is now possible to fabricate prostheses using a monolithic design where the denture teeth and denture base comprise one unit for enhanced strength and design versatility.

#### **AIDC-OP-45-CONSERV-24**

#### **Can the laser improve our dental treatments?**

J. Arnabat.

*Associate professor, Barcelona University Dental School, Spain*

*Director of Master Laser in Dentistry, Barcelona University, Spain.*

Nowadays, almost every dental clinic has new technology, the aim is to improve the treatments that we perform in our patients. Laser is one of these technologies help us lead to better procedures and with better results. This lecture will try to summarize the advantages of using lasers in a daily basis. However, clinical experience must always be supported by research and clinical evidence, so we are going to show different clinical applications of lasers together with scientific publications that support this type of applications. As Er: YAG, Er, Cr: YSGG lasers and diodes are currently the most used in dentistry. We will try to describe some different clinical applications of these types of wavelengths that can improve the results of success in our dental treatments. The aim of this lecture is going to be a general overview of the different daily treatments that can be performed with this wavelength. Therefore, its applications in the field of conservative dentistry, endodontics (we will present clinical cases accompanied by our latest scientific work published on this topic). We will also cover the different applications in periodontics, as well as in both soft-tissue surgery and periapical surgery, and finally, we will talk about the possibility of using this type of laser in implantology.

#### **AIDC-OP-46-CONSERV-25**

#### **Laser's applications in Implantology.**

J. Arnabat.

*Associate professor, Barcelona University Dental School, Spain*

*Director of Master Laser in Dentistry, Barcelona University, Spain.*

The laser Implantology applications can be classified by the time that we are going to use it. We can use it in the first surgical phase, during the second surgical phase or on posterior phases that present some soft tissues or peri-implantitis diseases. In this lecture, we will discuss about the second surgical stage of surgery and how laser can assist in the Peri-implantitis. In the second-stage surgery of submerged healed implants Er,Cr:YSGG laser has a successful result, but implants located in aesthetic zone or in areas with insufficient surrounded by keratinized mucosa it will be a problem. In order to improve these results, we propose a new technic to improve this procedure so instead to eliminate all the keratinized mucosa, we recommend a rolling-flap, so that the keratinized mucosa in palatine zone can be moved to the buccal zone so the keratinized mucosa is preserved to the maximum. The widespread placement of dental implants throughout the world has increased even further in recent years. Although the implant success rates are very high, peri-implant diseases are gradually appearing, with a strong impact upon many implant cases. Specifically, two peri-implant disorders affect dental implants: mucositis and peri-implantitis. The prevalence of mucositis and peri-implantitis has increased in recent years. In this regard, the latest meta-analyses show mucositis to be manifest in 42.9% of the cases (95%CI 32-54%) and peri-implantitis in 21.7% (95%CI 14-30%). A number of laser systems have been used in the different phases of peri-implantitis treatment. Depending on the operating wavelength involved, lasers can be used in different phases with the aim of securing the best results. In this regard, Er,Cr:YSGG, and diode have been used for the decontamination of implant surfaces. In non-surgical peri-implantitis treatments, lasers are used to decontaminate the implant surface and also to

reduce inflammation of the peri-implant mucosa. Some laser systems are better suited for application in this phase since such procedures do not involve the raising of a tissue flap. In this regard, optical fiber lasers are the ideal choice in such situations.

#### AIDC-OP-47-CONSERV-26

#### **Workflow for Full arch screw retained prosthetics using intraoral scans: “Potentials and limitations”.**

A. Elkhadem.

*Professor-Prosthodontics, Cairo University, Diplomate/Fellow of ICOI, Regional director of GDIA, Owner of Cairo Implant Academy.*

The classical workflow of screw retained implant frameworks has always been a burden on the shoulder of the prosthodontist. The numerous clinical and lab procedures with endless sources of error were always blamed for the non-passive fit which increases the biological and prosthetic complications. With the increasing popularity of digital scanning protocols and CNC dental milling machines the skip of such steps led to a revolution in the workflow. Nowadays milled passive frameworks became a popular option with many advantages over the conventional workflow. The lecture focuses on the scanning tips, design concepts material selection and limitations of constructing such restorations using a complete digital workflow.

#### AIDC-OP-48-CONSERV-27

#### **Disinfection of the root canal System: from conventional techniques to lasers.**

S. Benedicenti.

*Professor in Restorative Dentistry and Endodontics, University of Genova, Italy.*

Debridement focusing on removal of pulp remnants, as well as microorganisms and microbial toxins from the root canal system, is considered essential for endodontic success. However, current endodontic techniques fall short of the goal to remove all infective microorganisms and debris consistently. This is mainly due to the complex anatomy of the root canal system, the type of bacteria and resistance of bacterial colonization, the limitation of rotary instrumentation to remove all tissue from the surfaces after completion of the preparation and the limited potential for commonly used irrigants to penetrate the dentin walls. This presentation will explore the ability of laser photonic radiation to enhance the efficacy of irrigants to improve the decontamination of the three-dimensional root canal system.

#### AIDC-OP-49-CONSERV-28

#### **The Emergence Room, the Den of Esthetics in Implant Dentistry.**

A. Aboul Fettouh.

*Diplomate, American Board of Periodontology, Master of Science in Periodontics, Tufts University - Boston, USA.*

*Director of the International Implantology Program at Misr International University, Cairo, Egypt.*

One of the most challenging tasks in Implant dentistry is to obtain an optimal esthetic restoration that can meet the patients' desire. The confusion occurs when the clinician has to choose between many options regarding the placement time, the emergence profile construction time, the augmentation procedure needed and its timing. This presentation will focus on different

techniques and methods to obtain optimal esthetic restorations. It will help the clinician to make the correct decision on the timing of implant placement and emergence profile construction according to the anatomical reading of the case.

#### AIDC-OP-50-CONSERV-29

#### **Clinical and Laboratory strategies for right Aesthetics and Tissue Stability around natural teeth and implants.**

S. Lombardo.

*Adjunct Professor of Fixed Prosthodontics, University of Genoa, Italy*

*Professor, Institute for Advanced Dental Studies (IADS)*

Each fixed prosthetic rehabilitation requires several important decisions to achieve long-term success: from the formulation of the ideal treatment plan to the selection of the prosthetic abutment; from the care of natural teeth to the insertion of Osseointegrated implants; from the choice of the fixture to its ideal positioning; from the different kind of surgery approach to the prosthetic development of peri-implant soft tissues; from the traditional impression to the intraoral scan up to the choice of the working method of the dental technician and the development of modern CAD-CAM protocols. Prosthetic workflows are now known to all, but the long-term biological and prosthetic success factors are many: we will analyze together the clinical and laboratory aspects from the traditional analogue point of view and from the most innovative digital point of view.

#### AIDC-OP-51-CONSERV-30

#### **The Controversy of Biomechanics: Is There Any Correlation Between**

## Cantilever Length and Pre-implant Marginal Bone Loss? A Long-term Retrospective Study.

B. Shokati.

*Assistant Professor and Course Director Prosthodontics, Biomaterials Science, Faculty of Dentistry, University of Toronto.*

The effect of biomechanical aspects on the rate of marginal bone loss around dental implants by many investigators. Misch and Bidez (1994) theorized that excessive mechanical stress/strain cause marginal bone loss. It was also speculated that cantilevered prostheses significantly amplify the forces exerted on the adjacent implants due to bending moments (Skalak, 1983). The biological response to this extra load is yet to be clarified. Therefore, the purpose of this study was to assess the complications related to implant-retained complete fixed prostheses. Patients included in this study were all treated with fixed full-arch prostheses before the year 2000 at the Implant Placement Unit (IPU), University of Toronto. In total, 270 Bränemark implants were placed for 53 patients. Four to 6 implants were placed for each patient to provide support for metal-acrylic implant-retained complete fixed dental prostheses (ICFDPs). For each prosthesis, the linear length of the cantilever segments was measured (mm) on the virtual model and the correlation between the length of the cantilever segments and the bone loss on the related distal most implants was measured. The result of this study showed that between the length of cantilever and the marginal bone loss there is only a very weak relationship (Pearson's  $r=-0.048$ ). The significance value concluded that there was no statistically significant correlation between the marginal bone loss and the length of cantilever segments ( $P = 0.61$ ). The results

of this study demonstrated that cantilevered prostheses do not impose detrimental effects on crestal bone around implants.

## AIDC-OP-52-CONSERV-31

### Key variables in evaluating novel dental materials

N. Silikas.

*Professor in Oral Biomaterials Sciences and the Dean of the Dental School at the University of Manchester, UK.*

Dental biomaterials are now encompassing a wide range of materials and techniques that are becoming increasing interdisciplinary. New materials and techniques that vary significantly from the traditional polymers, metals and ceramics triptych. Applications involving 3D printing and interaction with 2D materials like graphene are becoming increasingly popular. Appropriate characterization of these materials is challenging. To avoid confusion, such materials should be fully described on how they were manufactured and prepared rather than being under a generic umbrella of a type of material. Evaluating their performance is essential and suitable in-vitro tests should be employed. This might result in modifying existing methodology or introducing new experimental techniques.

## AIDC-OP-53-CONSERV-32

### Smile ...Teeth ...Gum .... Lips.

J. Habli.

*Professor of Laser, Faculty of Medicine, University of Genoa, Italy*

The focus of dentistry today has shifted from caring about dental health only, towards creating the most beautiful smiles. Dentists nowadays are requested to reshape not only the teeth but also all the aspects of the smile within the whole face. They are therefore demanded to perform with the best skills and technology.

#### **AIDC-OP-54-CONSERV-33**

##### **Endodontically treated teeth: evidence-based bio-functional and aesthetic considerations to restore them.**

A. Signore

*Professor at the Department of Integrated Surgical and Diagnostic Science, University of Genoa, Italy*

The restoration of endodontically treated teeth (ETT) is a topic that is extensively studied and yet remains controversial. This presentation emphasizes the physical and mechanical characteristics of endodontically treated teeth and some clinical principles to be observed when restorations of these teeth are planned. A look is given at the contemporary restorative materials and techniques, providing evidence based clinical hints on maximizing the potential longevity and aesthetics of post-endodontic restoration, as well as predictable results. The conclusions are, that the amount of residual coronal tooth structure, functional and esthetic requirements determine the best way to restore ETT, indicating the material and technique to be used, direct or indirect restorations, associated or not to posts.

#### **AIDC-OP-55-CONSERV-34**

##### **Latest Technology in Fixed Denture Designs Eliminating Screws.**

J. Massad

*Associate Professor in the Department of Prosthodontics at the University of Tennessee Health, Memphis Tennessee.*

*Adjunct Associate Professor, Department of Restorative Dentistry, Loma Linda University, School of Dentistry.*

This presentation will allow the participants to understand why new dental materials have advanced allowing the fabrication of fixed dentures allowing less bone reduction. Conditionally if you do not have an optimal ridge to face relationship bone reduction must be done to allow space for the fixed denture due to minimal bone to face recorders. This Paradigm in dentistry will allow more patients to help fix dentures without sacrificing excess bone reduction.

#### **AIDC-OP-56-CONSERV-35**

##### **The Ortho-Restorative Interface in full mouth rehabilitation cases: Going beyond our limitations!**

A. Shumbusho.

*Clinical Director and Managing Director of Smile360 dental specialists in Lagos and Abuja*

#### **AIDC-OP-57-CONSERV-36**

##### **Contemporary interdisciplinary treatment approach in dentistry.**

E. Vasilevska.

*Active member of WFO / Ambassador of the American Association of Orthodontists (AAO) in Macedonia.*

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#### **AIDC-OP-58-PEDO-1**

## **Changes in sugar intake and caries experience: A 15-year natural experiment.**

A. Arheiam

*Associate Professor in Preventive Dentistry and Dental Public Health, University of Benghazi, Libya.*

Reducing sugar consumption has received much attention in recent years as an essential preventive measure to reduce the risk of dental caries and obesity. However, most of the evidence supporting this recommendation has come from industrialized countries with fewer data published from low- and middle-income countries. In this presentation, the findings of a natural experiment linking sugar intake and caries prevalence at the population level in Libya will be presented. Over the past fifteen years, three consecutive surveys of caries experience and sugar consumption at the population level were carried out. The findings of the first two surveys conducted before and during the conflict in Libya were published and suggested decreased caries levels as sugar consumption decreased. The present study will present and compare the findings of the third survey conducted after the conflict in 2022.

## **AIDC-OP-59-PEDO-2**

### **Impact of poor oral health on frailty among older adults.**

W. Sabbah.

*Lead of Dental Public Health curriculum in BDS program at King's College London.*

Demographic transitions in the past few decades have led to rapid increase in the ageing population. One of the most important public health implications of the ageing

population is frailty. Frailty is characterized by a decline in the function across physiological systems and an increase of vulnerability against stressors. Furthermore, it is associated with many adverse health outcomes and exerts financial burdens on healthcare systems. The mechanism of frailty development is a multifactorial dynamic process. Oral health could be a potential and often neglected risk factor for frailty, which could be linked through different pathways. One of the most plausible pathways is the impact of poor oral health on nutritional status. In this presentation we will discuss evidence from different populations on the impact of oral health, namely tooth loss, periodontal diseases, and self-rated oral health on frailty among older adults. Furthermore, we will also present and discuss the available evidence on the impact of tooth loss on nutritional intake and nutritional status.

## **AIDC-OP-60-PEDO-3**

### **Laser Assisted Orthodontics: Epic role in clinical practice.**

Y. Sedky

*Assistant Professor in the Orthodontic Department.*

*Head of the Dental Laser Center in the Faculty of Dentistry, Misr International University, Cairo, Egypt.*

Dental lasers have been introduced in dentistry several decades ago. However, its integration in the daily practice is a recent modality. In orthodontics, lasers have proved to be successful tool in different treatment interventions. In the current presentation different challenges have been approached using this technology, accelerating the rate of orthodontic tooth movement using photo-

biomodulation, surgical exposure of impacted canines, recycling of orthodontic brackets and debonding of brackets. Throughout the presentations, it will be demonstrated how to optimize the treatment results using this epic technology, simplifying diverse challenges in our daily practice.

#### AIDC-OP-61-PEDO-4

**Each interdental space contains over ten billion bacteria in young adults - but removing them is easier than ever.**

D. Bourgeois.

*Professor, Department of Public Health, Dental Faculty, University Lyon I, France*

Interdental space is a main source of bacterial contamination. Tucked away and out of reach from the bristles of an ordinary toothbrush, the interdental space is the perfect breeding ground for pathogenic bacteria. Moreover, its anatomy does not allow the salivary self-cleaning mechanism found in the rest of the mouth. The use of interdental brushes still tends to be linked to treatment for periodontal disease, and they are often exclusively recommended to patients with large interdental spaces, whereas floss is recommended for narrow spaces. Author and his team were the first to provide an overview of 19 major periodontal pathogens in the interdental biofilm of young adults without periodontitis. The study's implications are clear: daily, calibrated interdental brushing is necessary in order to prevent periodontitis and systemic disease, regardless of age or oral health status. However, dental floss is no longer preferred, as its use is not supported by conclusive scientific evidence. For interdental brushes, we have that evidence. Given the association of those interdental pathogens with periodontal and systemic disease, the habit of daily interdental brushing

may be the easiest way to maintain a healthy mouth and body.

#### AIDC-OP-62-PEDO-5

**Orthodontic Contribution in Dental Esthetics: Interdisciplinary not Multidisciplinary.**

A. R. Zaher.

*Professor, Department of Orthodontics at the University of Alexandria/ International Ad-Honorem Professor, Department of Orthodontics, University Del Valle, Cali, Colombia.*

The ultimate desire of patients seeking orthodontic treatment is the excellent dental and facial esthetics. The orthodontist should be able and is responsible to deliver the best aesthetic results. It is possible to influence the gingival levels through orthodontic tooth movement. In addition, manipulation of teeth angulation can enhance the expression of the papillae. Some tips in orthodontic finishing will be presented identifying the most common aesthetic finishing factors that can enhance the looks of the surrounding gingival tissue. And explain how these can be modified to achieve an excellent finished result in adolescents as well as adults with compromised dentitions.

#### AIDC-OP-63-PEDO-6

**Multidisciplinary collaborations: the best way to serve our orthodontic patients.**

Z. Bentahar.

*Professor of Dento-Facial Orthopedics, Faculty of Dental Medicine, Hassan II University, Casablanca, Morocco.*

As a specialist, the orthodontist is obliged to collaborate with other dental specialists if he wants to succeed in his daily practice. Indeed, for each patient, the orthodontist needs the help, advice, and competency of other non-orthodontist doctors. The aim of this presentation is to analyze different clinical situations, simple and complicated, where different specialists must interact to reach the final objective.

#### AIDC-OP-64-PEDO-8

#### Dental Lessons for the Post-Pandemic Era.

A. Abdel-Moneim.

*Associate professor at university of California, San Francisco and Faculty at New York University*

Dentistry, like other professions or businesses, has been affected by the pandemic in both good and bad ways. In this presentation, we will share some of the critical lessons we have learned and implemented in our private dental practice in California. Some strategies may be applied to dental practices in Egypt, and others may not. However, this first-time-ever presentation aims to make the dentist and dental institute aware of some of the modifications we made during the pandemic that can also be carried out post-pandemic. By taking specific actions, using specific tools, and applying specific measures, you can become more efficient, achieve a higher level of performance, and increase the productivity of your future dental practice by at least a million dollars, or, in Egypt, a million pounds!

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**AIDC-PP-1-SURG-1****Biomechanical Evaluation of Double Y Shaped Titanium Miniplate and Dynamic Compression Titanium Miniplate After Induced Mandibular Fracture (An Experimental Study on Dogs).**

*N. A. Ahmed, A. A. El Ashwah, L. N. Melek, S. A. AboulGheit.*

*Oral and Maxillofacial Surgery, Faculty of Dentistry, Alexandria University.*

**Aim of the study:** comparison of two different types of titanium miniplates (Dynamic compression miniplate) and (double-Y miniplate) in terms of resistance to displacement and stability using an animal model.

**Materials and Methods:** Induced fractures were prepared on each side of the mandible of twelve dogs at the angle region. The sample was divided into two groups and randomization was done. The first group received dynamic compression titanium miniplate to repair the fracture and the second group received double Y shaped titanium miniplates. Sacrifice of the dogs was done immediately, and biomechanical evaluation was done by universal testing machine using compression and tension forces.

**Results:** Compression resistance: In the first group, the average Displacement at 900N was  $10.77 \pm 0.79$  mm. In the second group, the average Displacement at 900N was  $4.48 \pm 1.35$  mm. Resistance to Tension: In the first group, the average force which caused failure of miniplate stability was  $377.2 \pm 37.19$  N. In the second group, the average force which caused failure of miniplate stability was  $603.7 \pm 44.04$  N.

**Conclusion:** Both dynamic compression titanium miniplates and double Y-shaped miniplates provide favorable means of fixation of mandibular fractures in the angle region. However, fractures fixed with double-Y shaped titanium miniplates showed greater stability to compressive and tensile forces.

**Funding source:** none

**AIDC-PP-2-SURG-2****Piezoelectric Versus Conventional Rotary Technique for Surgical Extraction of Horizontally Impacted Mandibular Third Molar (A Randomized Controlled Clinical Trial)**

*Y. M. Ibrahim, S. El-Sheikh, R. Fliefel.*

*Oral and Maxillofacial Surgery, Faculty of Dentistry, Alexandria University.*

**Objectives:** The primary aim of this study is to assess the surgical time, soft tissue healing, pain, edema, and trismus in horizontally impacted mandibular third molar extracted by piezoelectric surgery rather than conventional rotary technique. The secondary aim of this study is to assess bone formation radiographically.

**Material & Methods:** Sixteen patients with horizontally impacted lower third molars in class II position B indicated for surgical extraction were treated randomly using either the piezo-surgery or the conventional bur technique. Duration of the procedure, soft tissue healing, postoperative edema, trismus, pain, and bone density were evaluated.

**Results:** All patients were clinically evaluated starting from the first postoperative day till the seventh postoperative day. Study and control groups were compared using paired t-test. They showed soft tissue healing with absence of any signs of infection. There was statistical significance in reduction of pain, trismus and swelling in study group, where the time of the procedure was statistically increased in study group. For bone density, statistical difference was found where study group showed better results.

**Conclusion:** With the limitations of this study, it can be concluded that piezo-surgery reduces postoperative pain, trismus, and swelling and improves the postsurgical soft tissue healing and bone formation. Also, it may play an important role in increasing bone density within the extraction socket and decreasing the amount of bone loss during operation. The only

disadvantage encountered in the study is the elongation of surgical time.

### AIDC-PP-3-SURG-3

#### **Mandibular reconstruction by vascularized fibula flap: A case report**

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Modern microvascular methods have changed the challenging procedure of mandibular reconstruction for oral and maxillofacial surgeons. This report aims to describe a clinical case which expressed the osseointegrated implant in vascularized fibula flap after two years of loading. A 41-year-old female was come to my clinic after five years of gunshot injury. She underwent three previous surgeries, and all grafts were resorbed. On clinical and radiographic exam, massive lost in the mandible as displayed on CT. Reconstruction of the mandible were performed by vascularized fibula flap. After one year of vascularized fibula graft, four implants were placed in anterior regions. The patient's 24-month follow-up revealed favorable results of normal healing arounds implants.

### AIDC-PP-4-SURG-4

#### **Fatal Opportunistic Mucormycosis in post-COVID-19 patient: A case report**

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**Background:** Mucormycosis is a rare, opportunistic fulminant, rapidly spreading which usually affects patients with underlying immune deficiency.

**Aim:** To study the effect of early management of Mucormycosis involving paranasal sinuses as

life-threatening maxillofacial fungal coinfections in post covid patients. If not managed promptly, the disease is characterized by progressive necrosis and is often fatal.

**Materials and methods:** A 61-year-old controlled diabetic patient suffered from covid-19 five months ago. He presented to the Oral and maxillofacial surgery department-October 6 University complaining of facial swelling, headache, vestibular tenderness, and facial pain. Surgical debridement of maxillary sinus with massive antifungal therapy after surgical biopsy was performed involving resection of necrotic infected tissues. The tissues were prepared for proper histopathological examination.

**Results:** Surgical debridement of left maxillary sinus revealed necrotic friable dark mucosal lining. Histopathological features of mucormycosis like angioinvasion, perineural invasion, severe fungal load, and large areas of necrosis were detected.

**Conclusions:** Recently, a significant increase in invasive fungal infection propagation is a new evident entity in immunocompromised post - COVID- 19 patients. CT radiological signs of aggressive fungal sinusitis that complicated COVID-19 infection and proper histopathological examination aid in the diagnosis. Felicitous timely management of this fatal disease following clinical suspicion of acute invasive fungal sinusitis in previously infected COVID-19 patients by early surgical debridement with massive antifungal therapy is essential for higher survival rate and better outcomes.

**Keywords:** Mucormycosis, Post-COVID-19, Fungal Infections, C.T-Histopathology.

### AIDC-PP-5-SURG-5

#### **Mandibular Ridge Augmentation Using Three- Dimensional Printed Model for Customization of Titanium Mesh (Controlled Clinical Trial)**

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**Introduction:** Titanium Mesh (TiMe) is widely used in ridge augmentation. Digital and computer guided surgery now plays an important role to improve the techniques and results in ridge augmentation procedures.

**Objectives:** are to evaluate the use of mandibular three-dimensional (3D) printed model for prebending and customization of TiMe to be used in mandibular ridge augmentation compared to the conventional technique.

**Materials and methods:** This study included 14 patients divided equally into a study and control group treated by conventional method. In the study group, the 3D virtually created model was used to contour the TiMe according to the needed amount of augmentation which helped in contouring the graft material. CBCT was performed immediately postoperatively and six months later to evaluate the outcome of the procedure.

**Results:** The mean of the operation time in the study group was  $66.43 \pm 14.35$  minutes opposite to the control group in which the mean of the operation time was recorded  $122.9 \pm 9.94$  minutes. Immediately after the surgery, the mean of vertical dimension in the study group was  $6.14 \pm 0.48$  mm while Six-months radiographic follow-up showed that the mean of the gained vertical dimension in the study group was  $5.36 \pm 0.51$  mm. the mean of vertical dimension in the control group was  $4.81 \pm 0.73$  mm while the gained vertical dimension within the control group was  $1.64 \pm 1.25$  mm.

**Conclusion:** This study reveals the efficiency of the pre-customized TiMe in increasing the vertical bone height and decreasing the operation time.

**Keywords:** Ridge Augmentation, Three-dimensional, Titanium Mesh, Bone Graft, Precustomized, 3D printing.

## AIDC-PP-6-SURG-6

### The Efficacy of Custom-Made Computer Assisted Polyether Ether Ketone (Peek) Osteosynthesis Plates in Pediatric

### Mandibular Fracture Treatment (A Randomized Controlled Clinical Trial).

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**Objectives:** To compare the efficacy of custom-made computer-assisted polyether ether ketone (PEEK) plates versus titanium mini-plates in the fixation of pediatric mandibular fractures.

**Materials and Methods:** A randomized, controlled clinical trial was conducted on fourteen pediatric patients with recent displaced mandibular fractures, seven for each group. Preoperative virtual surgical planning and computer-assisted PEEK plate fabrication were done for the study group, considering the protection of the developing tooth buds. The study group received custom-made computer-assisted PEEK plate fixation while the control group received titanium mini-plate fixation. Each patient was followed up for three months and assessed clinically in terms of operative time, postoperative complications, and radiographically by an immediately postoperative orthopantomogram and a three-month postoperative computed tomography scan (CT) to assess bone healing, screw positioning and bone density.

**Results:** The mean operative time in the study group was significantly less than in the control group. The difference in overall postoperative complications was statistically insignificant. Radiographically, the immediate postoperative orthopantomogram showed an accurate reduction in both groups. After three months, postoperative CTs revealed proper bony union in all directions in both groups, with more safe positioning of the screws concerning the developing tooth buds

among the study group, and the mean bone density was statistically higher within the study group than in the control group.

**Conclusions:** Custom-made computer-assisted PEEK plates offer superior efficacy to the titanium mini-plates in the fixation of pediatric mandibular fractures in terms of shorter operative time, greater accuracy, safer screw placement regarding the developing tooth buds, and higher bone density.

#### AIDC-PP-9-SURG-7

#### Intralesional Injection of Ethanolamine Oleate with or Without Local Anesthetic Agent to Assess Postoperative Pain In Oral Venous Malformations (A Randomized Controlled Clinical Trial).

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**Introduction:** Sclerotherapy is an established treatment modality for oral vascular anomalies. A sclerosing agent such as Ethanolamine Oleate has been widely used for oral vascular malformation, especially low-flow venous lesions, however, pain is one of the most common postoperative complications. Therefore, Ethanolamine Oleate with an anesthetic agent may help in reducing postoperative pain in cases of oral venous malformation.

**Aim of the study:** To compare the effect of Ethanolamine Oleate as a sclerosing agent for oral venous malformation with and without an anesthetic agent in reducing postoperative pain and resolution of the lesion.

**Materials and Methods:** 16 patients with oral venous malformation were recruited and randomly allocated into two equal groups. Sclerotherapy with Ethanolamine Oleate was performed for all patients in Group A (Control Group) eight patients were injected with Ethanolamine Oleate alone and for Group B (Study Group) eight patients were injected with Ethanolamine Oleate mixed with Lidocaine.

**Results:** There was a statistically significant decrease between the two studied groups.

**Conclusion:** This study confirmed the positive effect of intralesional injection of EO and Lidocaine in OVMs regarding postoperative pain and resolution of the lesion.

#### AIDC-PP-8-SURG-8

#### Comparison Of N-2-Butyl Cyanoacrylate (Histoacryl) Versus Micro-Plates in The Healing of Zygomatico-Maxillary Complex FRACTURES (An Experimental Study).

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**Objective of the work:** Aim To compare the clinical and histological healing performance of histoacryl versus conventional microplates in ZMC fracture in rabbit.

**Material and methods:** Twelve New Zealand white rabbits weighing 3.5–4.5 kg was chosen. Unilateral ZMC fracture was done. Animals were divided randomly into Group A (control group); six ZMC fractures were fixed by microplates, and Group B (study group); six ZMC fractures were fixed by histoacryl. The treatment sites were evaluated Clinically, Histologically, and Histomorphometrical after one and four weeks.

**Results:** Clinical results showed no infection or mobility in any animals of both groups. Histological results, by the end of the first week, the histoacryl group showed less granulation tissue and mild inflammation compared to the control with woven bone formation. Microplate group showed more granulation tissue with finely woven bone spicules at the side of the fracture area. In the fourth week, the control group showed mature bone formation at the fracture site's border while the center was still full of granulation tissue. The histoacryl group exhibited complete closure

of the fracture site with mature lamellar bone. These results were confirmed by histomorphometric analysis, there was significantly increase in the percentage of bone surface area in the histoacryl the mean was (49.55 and 65.04) in 1,4 weeks respectively while in control group was (46.40 and 56.40).

**Conclusion:** The application of histoacryl to bone defects shows easy and adequate rigid fixation to allow bone healing and maintain the original contour of the zygomatic bone comparable to the conventional microplates.

#### AIDC-PP-9-SURG-9

**COVID-19 precautions perception among dental students: Impact on their practice.**  
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**Objective:** It is important to evaluate dental students' knowledge, attitudes, perception toward COVID-19 infection control guidelines and its impact on their work.

**Methods:** A cross-sectional study using an online-questionnaire included fifteen statements to assess awareness and knowledge about COVID-19 clinical manifestations and infection control practice

protocols among dental students at Sinai University, Egypt. The response of participants to each statement was collected using Likert scale.

**Results:** 486 participants completed the questionnaire-based survey. 75.72% of them had knowledge about the disease contagiousness, 85.98% knew about the symptoms of COVID-19, 91.77% recognized

the actual incubation period of the disease, and 47.41% could identify those wild mammals like bats are the possible source of COVID-19, while 68.67% were aware of the spread of virus transmission through interpersonal contacts.

432(88.9%) responders were aware of the infection control guidelines, moreover, they know the ways to prevent the spreading of the virus. 423(87%) responders perceived that dentists are at higher risk than other healthcare professionals. 79.38% of participants gained their information about COVID-19 through social media.

**Conclusion:** North Sinai dental students had a correctitude amount of knowledge, with positive awareness about COVID-19. Government must emphasize the role of social media to spread accurate COVID-19 awareness campaigns.

#### AIDC-PP-10-SURG-10

**Developing a biofunctionalised membrane to promote periodontal ligament regeneration.**

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**Objectives:** To develop a bio-resorbable guided tissue regeneration (GTR) membrane composed of aligned electrospun fibers and modified with amine groups followed by non-covalent sequential binding of heparin and heparin-binding growth factors to stimulate periodontal tissue regeneration.

**Materials and methods:** Electrospun poly(*e*-caprolactone) (PCL) random and aligned fibrous membranes were fabricated and their fibrous surfaces were modified with amine groups by using cold plasma deposition of allylamine, followed by sequential binding of heparin. Then, samples were treated with either Transforming Growth Factor (TGF $\beta$ )1 or 3 or fibroblast growth factor (FGF). The size and morphology of the fibres in the membranes were assessed by scanning electron microscopy (SEM). Commercially obtained human periodontal ligament cells (HPDLF) were cultured on the membranes for up to 35 days in the presence or absence of 10% foetal calf serum; the cell viability was assessed using PrestoBlue<sup>TM</sup>. Live-Dead fluorescein diacetate stain (CMFDA) and Propidium Iodide (PI) dyes

was carried out. Total DNA, protein and collagen deposition were determined respectively using PicoGreen, bicinchoninic acid, and measuring the hydroxyproline content.

**Results and Discussion:** Both random and aligned scaffolds functionalised with TGF- $\beta$ 1, TGF- $\beta$ 3 or FGF supported the attachment and viability of HPDLF cells and promoted collagen deposition in serum-free medium for at least 5 weeks. The aligned-fibre membranes produced significantly more DNA, total protein and collagen ( $P \leq 0.05$ ) than membranes with randomly distributed fibres.

**Conclusion:** The biofunctionalised membranes hold promise for developing into GTR membranes for regeneration of the periodontal ligament.

**Acknowledgements:** This work was funded by Government of the State of Kuwait.

## AIDC-PP-11-SURG-11

### Studying The Apoptotic and Necrotic Cell Outcomes Upon Targeting Oral Squamous Cell Carcinoma with Toll Like Receptor 7 Agonist (Imiquimod) (In- vitro and In-vivo Study)

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**Objectives:** The study aimed to detect the apoptotic and necrotic cell populations as an

immunotherapeutic effect of Imiquimod in Oral Squamous Cell carcinoma, both in- vitro and in-vivo.

**Material and Methods:** Human oral squamous cell carcinoma (SCC-4) cell line was seeded with a density of 300,000 cells per well in one 6-wells plate. After 24 hours, duplicates of wells were treated for 6 hours: control (2 mL culture media), Cisplatin (7uM), and Imiquimod (80 ug/ml). Cells were stained with Annexin V-FITC/PI Apoptosis Detection Kit, then assessed by FACScan flow cytometer. Fifteen Syrian golden male hamsters underwent cancer induction in their left buccal pouches. After developing cancerous lesions, animals were randomized into 3 groups (5 per group) and treated for 4 weeks: control (0.2 mL saline); Cisplatin (7mg/kg body wt. intraperitoneal, once per week), and imiquimod (topical 50 mg Aldara 5% cream, 3 times per week). Biopsies were extracted and analyzed for histopathology and apoptosis (Annexin V-FITC/PI Apoptosis Detection Kit.).

**Results:** Imiquimod treated SCC-4 cells demonstrated significantly increased percentages of apoptosis (37.63%) and necrosis (62.95%) compared to Cisplatin (14.18% apoptosis and 50.35% necrosis) and control (0.5 % apoptosis and 21.03 % necrosis). In hamsters, the drug reduced the tumor size by 21%. Moreover, specimens from tumors treated with Imiquimod showed evident Annexin V and PI stains located on cell membranes and nuclei respectively.

**Conclusion:** Imiquimod induces apoptosis and necrosis in OSCC, both in- vitro and in-vivo. This suggests a strong immunotherapeutic effect of this drug on OSCC in an off-label pattern.

## AIDC-PP-12-SURG-12

### Imiquimod And Autophagy; A Novel, Off-Label Pattern of Treatment in Oral Squamous Cell Carcinoma

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**Aim:** This study was designed to assess the off-label effect of the immunotherapeutic agent, Imiquimod, on oral squamous cell carcinoma (OSCC), effectuated through autophagy-mediated cell death in comparison with chemotherapy *in vitro*.

**Materials And Methods:** SCC-4 cell line was screened following Imiquimod administration for TLR-7 protein expression using confocal microscopy. SCC-4 cell line was then divided into 3 groups. Group 1 was treated with the TLR-7 agonist, Imiquimod, group 2 with the chemotherapeutic drug, Cisplatin while group 3 received no treatment. Flow cytometry was conducted to quantify LC3B -a universal marker for the canonical pathway of autophagy- in the three groups.

**Results:** TLR-7 expression in Imiquimod-treated cells was confirmed. There was a statistically significant difference among the three groups favoring TLR-7 agonist Imiquimod over the gold standard stress inducer, Cisplatin in regard to autophagy-mediated cell death.

**Conclusion:** One core hallmark of cancer cells is their ability to evade the immune system. This led to the emergence of immunotherapy as a promising weapon in the fight against cancer. Our study demonstrated that autophagy -responsible for stress-accommodation as well as being a mediator of cell death- occurred downstream of TLR activation via Imiquimod. We also showed that Imiquimod surpassed traditional chemotherapy in inducing autophagy thus demonstrating a novel, off-label pattern in OSCC treatment. Further insight into these mechanisms and complexities could present enormous potential in paving the way for the success of immunotherapy.

**Acknowledgment And Funding:** This work was supported by the Science and Technology Development Fund (30036).

## AIDC-PP-13-SURG-13

### Therapy-Induced Senescence: A Promising Treatment Modality Using Imiquimod in Oral Squamous Cell Carcinoma (An Invitro Study)

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**Objectives:** To investigate the therapy-induced senescence effect of Imiquimod as an immunotherapeutic drug in comparison to chemotherapy on Oral Squamous Cell Carcinoma cell line (*in vitro* study).

**Material and Methods:** Cytotoxicity assay was first done for the establishment of the optimum sub- IC50 working dose. Various concentrations of Imiquimod were tested using CCK-8 reagent on Human OSCC cells (SCC-4). Finally, the data were processed with reader at wavelength 450nm. Senescence detection was conducted using flow cytometer. SCC-4 cells were grouped and treated with either; chemotherapy using Cisplatin, the sub- IC50 Imiquimod drug concentration or received no treatment (negative control). Staining with the canonical senescence marker, SPiDER- $\beta$ Gal antibody was done after adding the drugs. Finally, stained cells were collected and analyzed

using FACS caliber flow cytometer with 488 nm excitation laser. Data were assessed using the Flow Jo software.

**Results:** Cytotoxicity assay revealed that all the doses showed more than 50% cell viability. However, Imiquimod 80 ug/ml was the highest. Thus, this dose was used as it represented the least lethal sub- IC50 dose. Regarding senescence assessment, all groups expressed positive beta gal-stained cells. However, Imiquimod showed the highest percentage of positively stained senescent cells. Furthermore, the differences were statistically significant between Imiquimod and both, the negative control and Cisplatin groups.

**Conclusion:** The therapy induced senescence of Imiquimod outperforms the effect of the golden standard Cisplatin. As immunotherapeutics provide less cytotoxic side effects, this could introduce it as a favorable possible alternative to the traditional cytotoxic chemotherapy.

#### AIDC-PP-14-SURG-14

#### The prevalence of Odontogenic cysts in Libya

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**Background / Aims:** Odontogenic cysts (OCs) are commonly encountered lesions affecting the human jaws; these lesions can have similar clinical, radiographic pictures. Understanding the clinicopathologic features of these lesions is essential for early diagnosis and accurate management. The aim of this study was to determine the prevalence of odontogenic jaw cysts in a Libyan population in Benghazi and to compare these data with previously published reports from Libyan and other geographic areas.

**Materials & Methods:** This is a descriptive study where screening of 2189 biopsies (retrieved from the archives of The Department of Oral Pathology / University of Benghazi, Libya) was done for the

sake of recognizing the three cysts chosen for the purpose of this study.

**Results:** Out of the screened lesions, 276 cases (12.6%) were diagnosed as odontogenic cysts in the period from (2006-2019). Of those 67.39% were inflammatory and 32.61% were developmental in nature. Radicular cysts (60.5%) were the most frequent cysts followed by dentigerous cysts (14.8%) and keratocysts (14.5%). The mean ages of the patients were 32.3, 29.7 and 33.2 years, respectively. Occurrence of the cysts was noticed more in the maxilla than in the mandible (1.3:1). The overall male to female ratio was 1.1:1.

**Conclusions:** The prevalence of odontogenic cysts was similar to that reported in previous study in Libya and other countries irrespective to WHO (2017) classification of odontogenic cysts. Analytical and immunohistochemical expression of certain surface markers will be investigated in subsequent studies.

#### AIDC-PP-15-SURG-15

#### Clinical use of Platelet concentrates injections for symptomatic lichen planus treatment: systematic review.

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**Objective:** Oral lichen planus (OLP) is a chronic immune-mediated disease that affects the oral cavity. The topical corticosteroids are most commonly used to manage it; but due to its side effects, researchers targeted a new clinical approach using platelet concentrate. Platelet concentrate (PA) is autologous -blood product differs according to fibrin and leucocyte content with huge amount of growth factors. The present systematic review aimed at evaluating if platelet concentrate may improve management of symptomatic oral Lichen planus or used as alternative to corticosteroids.

**Methods:** We searched published literature on Pubmed, Scopus, web of science, google scholar

and prequest. This research strategy was used with no filters applied ("Lichen Rubra Planus" OR "Mucosal Lichen Planus" OR "Lichen Planopilaris" OR "Cutaneous Lichen Planus" OR "Oral Lichen Planus") AND ("Fibrin, Platelet-Rich" OR "Platelet Rich Fibrin" OR "Leukocyte Platelet-Rich Fibrin"). Confirmed OLP clinically and histo-pathologically, intervention include platelets concentrate, randomized clinical trials and Case series or case report that concerned with efficacy and safety of Platelet concentrate for OLP treatment were included.

**Results:** Eight studies with a total of 80 patients diagnosed with symptomatic oral Lichen planus were included. Three RCTs used PRP while Four clinical trials used PRF and only a cases series study for PRGF. Heterogeneity was found regarding number of female patients, treatment duration, follow-up duration, type of PC, outcomes adopted to evaluate treatment success.

**Conclusion:** Although, PC cannot yet be considered a first-choice treatment option, it showed promising alternative therapy choice with an added advantage of having less recurrence and no adverse effects.

## AIDC-PP-16-CONSERV-1

### A Comparative Study of The Effect of Apple Cider Vinegar and Ethylenediaminetetraacetic Acid Chelating Solutions on Root Dentin Microhardness (An In Vitro Study)

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**Aim:** To compare the effect of root canal irrigation with apple cider vinegar (ACV) and ethylenediaminetetraacetic acid (EDTA) on human root dentin microhardness using Vickers microhardness tester.

**Methodology:** Fourteen single-canaled mandibular premolars were decoronated to a standardized tooth length of 15 mm. After chemomechanical preparation of root canals,

roots were sectioned longitudinally into halves which were embedded into acrylic blocks with dentin surface left exposed. Specimens were randomly distributed into two groups ( $n = 14$ ) according to the final irrigant in which they were immersed: Group I: 10 mL of 5% ACV and Group II: 10 mL of 17% EDTA. Vickers microhardness test was performed on dentin surface at coronal, middle, and apical thirds of each specimen at 0.5 mm lateral to canal lumen. The Vickers diamond indenter was applied with a 25-gram load and a dwell time of 10 s. The test was repeated for each specimen after immersion in the tested irrigant for 3 min. The coronoapical distance between each pre- and post-treatment measurement points was limited to 1 mm.

**Results:** Along the complete canal length, ACV showed significantly less median percent reduction in dentin microhardness than EDTA ( $P = 0.015$ ).

**Conclusions:** Apple cider vinegar is a promising natural product that can be used as a final rinse in RCT owing to its relatively moderate effect on root dentin microhardness.

## AIDC-PP-17-CONSERV-2

### Regenerative Endodontic Treatment of Mature Necrotic Permanent Teeth Using Hyaluronic Acid Gel: A Case Report.

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**Introduction:** Regenerative endodontic procedures (REPs) have been used to successfully treat mature necrotic teeth with apical periodontitis. Most reported cases induce a blood clot however, insufficient bleeding and the lack of regeneration of true dentin/pulp like tissue has stemmed the search for novel scaffolds. Hyaluronic Acid-based injectable filler (Restylane) is an FDA approved facial dermal filler. Furthermore, Hyaluronic acid is biocompatible and biodegradable making it a potential scaffold for dental pulp regeneration.

**Materials and methods:** A 20-year-old female patient presented with a history of swelling at the upper left central incisor. The tooth responded negatively to electric and thermal pulp testing. Diagnosis was necrotic pulp with asymptomatic apical periodontitis. On the first visit, access opening and canal instrumentation were performed up till X3 protaper next files. Calcium hydroxide was delivered, and the tooth was sealed. After 2 weeks calcium hydroxide was flushed out with 1.5 % NaOCl followed by final rinse with 20 ml 17 % EDTA. Bleeding was induced into the apical third of the canal by over-instrumenting using a precurved K-file #25 at 2 mm past the apical foramen. Then Hyaluronic acid hydrogel (Restylane) was injected into the canal and Biodentine was used as the capping material. Clinical and periapical radiographic assessment was done after 12 months. 3D volumetric analysis of the lesion was also done using CBCT.

**Results:** Resolution of signs and symptoms was observed during the follow-up period. Periapical healing was evident with decreased lesion volume. The tooth showed delayed response to electric pulp and cold testing.

**Conclusion:** Hyaluronic acid gel (Restylane) can be a promising scaffold for regenerative endodontic treatment of mature necrotic teeth with apical periodontitis.

**Keywords:** Mature permanent necrotic teeth; Regenerative endodontic procedures; Hyaluronic acid gel; Dentin/pulp regeneration; Restylane.

### AIDC-PP-18-CONSERV-3

#### Histological Evaluation of FDA-Approved Hyaluronic Acid Based Scaffold in Revascularization of Necrotic Mature Permanent Teeth with Apical Periodontitis in Dogs.

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**Objectives:** Histological evaluation of the regenerative potential of FDA-approved hyaluronic acid-based (HA) injectable scaffold with and without blood clot induction for revascularization of necrotic mature permanent teeth with apical periodontitis in dogs.

**Materials and Methods:** Twenty mature permanent incisors of two healthy adult mongrel dogs were selected. Under general anesthesia, pulp necrosis and apical periodontitis were experimentally induced by extirpating the pulp tissue and leaving the access cavities opened for three weeks. Disinfection protocol was applied using 1.5% sodium hypochlorite irrigation and calcium hydroxide paste, then access cavities were sealed. After two weeks, teeth were assigned into two groups. In group 1 (n=10) revascularization was carried out using hyaluronic acid scaffold combined with induced blood clot. In group 2 (n=10) hyaluronic acid scaffold was used alone. MTA was applied and teeth were sealed with resin reinforced glass ionomer cement. A sound tooth served as negative control. After three months, dogs were sacrificed and teeth with supporting periapical tissues were carefully dissected out, processed, and stained with Hematoxylin and Eosin stain for histological examination.

**Results:** Histologic examination showed ingrowth of newly formed vital pulp-like tissues including fibrous connective tissue and hard tissue depositions in the revascularized teeth. Revascularization using hyaluronic acid scaffolds with induced blood clot enhanced tissue formation with better corono-apical extension than using hyaluronic acid scaffolds alone.

**Conclusions:** Injectable, FDA-approved, hyaluronic acid hydrogel filler combined with blood clot is a promising approach for revascularization of necrotic mature permanent teeth with apical periodontitis.

**AIDC-PP-19-CONSERV-4****Influence Of Treatment Modalities of NITI  
Rotary Files on Flexibility and Cyclic  
Fatigue Resistance (In Vitro Study)**

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**Aim of the study:** This study aims to evaluate the influence of T-wire NiTi rotary files on flexibility and cyclic fatigue resistance in comparison to conventional wire NiTi files.

**Materials and methods:** Forty-eight (# 25) files were divided into two equal groups according to their type: Group I: Treated 2Shape (Micro-Mega SA, France). Group II: Non-treated ProTaper Universal (DENTSPLY Tulsa Dental Specialties, Tulsa, OK.) Groups were further divided into 2 subgroups according to the type of test conducted. Flexibility test was performed in subgroups I. and II. A by means of a 3-point bending test using a Universal Testing Machine. The load necessary to maintain a constant feed rate of (1min/mm) was recorded every 0.1 seconds with a specified maximum force of 10N. In subgroups, I.B and II.B cyclic fatigue resistance was tested using a custom-made dynamic device with a 60-degree stainless-steel artificial canal. Number of Cycles to Fracture (NCF) and Time to Fracture (TTF) were recorded. All data were tabulated and statistically analyzed using SPSS for Windows version 23.

**Results:** Regarding the flexibility test, no statistically significant difference between both groups was observed. However, concerning NCF and TTF, a statistically significant difference was found between the tested groups ( $P \leq 0.05$ ). Accordingly, 2Shape had superior cyclic fatigue resistance.

**Conclusion:** T-Wire heat treatment significantly improved cyclic fatigue resistance while it did not affect flexibility.

**AIDC-PP-20-CONSERV-5****Metal - Ceramic Bond Strength Analysis of  
Cobalt-Chromium Dental Alloy  
Fabricated by Three Different Techniques  
(In-Vitro Study).**

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**Introduction:** Cobalt-chromium alloy is used widely for fabrication of dental fixed prostheses. The metal framework of the restorations can be fabricated by different techniques including, conventional lost wax, subtractive (CAD-CAM milling) and additive (selective laser sintering) manufacturing technologies.

Aim of the study was to compare the bond strength of porcelain to cobalt-chromium metal alloy fabricated by three different techniques and investigation of the failure mode by scanning electron microscope.

**Materials and Methods:** Forty-two Co-Cr specimens (25mmx3mmx0.5mm) were prepared according to ISO 9693:1999 standards using three different techniques: selective laser sintering (group1, n=14), CAD-CAM milling (group2, n=14) and lost wax technique (group3, n=14). The metal bars were veneered by firing a porcelain layer on the center of each specimen (8mm length x3mm width x1.1mm thickness), metal ceramic bond strength was evaluated by a three-point bending test then each specimen was examined by Scanning electron microscope to evaluate the failure mode.

**Results:** The statistical analysis of the results showed the highest bond strength values were associated with laser sintering group 1, with a

Mean of 232.8 Mpa which was statistically highly significant at  $P < 0.001$  than the other two test groups. CAD-CAM milled group 2 (milling technique), gave a Mean bond strength 117.6 Mpa while group 3 (lost wax technique) showed the lowest bond strength values with a Mean value 93.1 Mpa. There was no statistical-significant difference between group 2 and 3 at  $p>0.05$ .

**Conclusion:** The alloy fabricated by the Selective laser sintering technique provided the best metal-ceramic bond strength when compared to CAD-CAM milling and traditional lost wax techniques.

**Keywords:** CAD/CAM, SLS, lost wax, metal-ceramic restoration, bond strength, mode of failure.

## AIDC-PP-21-CONSERV-6

### Evaluation Of Retrograde Root Canal Preparation Following the Use of Controlled Memory Files Versus Ultrasonic Tips on Crack Formation Using Stereomicroscope. (An In-Vitro Study).

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**Objective:** This study aimed to evaluate retrograde root canal preparation and compare the incidence of crack formation produced by controlled memory rotary files and ultrasonic retrotips using stereomicroscope.

**Materials and Methods:** Thirty-six human maxillary anterior teeth were divided into three groups ( $n=12$ ) following root end resection. Group I: prepared using controlled memory rotary files (Hyflex EDM), Group II: prepared using ultrasonic surgical retrotips (Acteon/Setalec), and Group III: Control group without retrograde preparation. Following retrograde preparation under the operating dental microscope the specimens were horizontally sectioned at 3, 6, and

9mm from the apex with a microtome precision cut-off machine and the stereomicroscope was used to detect any development of dentinal cracks. Microcracks were recorded according to number, type and location. Data were collected and statistical analysis was performed using Pearson Chi Square test with Monte Carlo simulation test. Significance level was set at  $p$  value 0.05.

**Results:** Greatest number of cracks was found in the ultrasonic group. No significant difference was found when groups I and II were compared at 0, 6, and 9mm sections while a significant difference was found between the two groups at the 3 mm dentin level ( $p<0.009$ ). The control group showed the least number of cracks. No significant difference between the three groups regarding type and location of cracks.

**Conclusion:** With the limitations of this novel technique this study showed that controlled memory files are safer to use on intact roots than ultrasonics tips in retrograde root canal preparation.

## AIDC-PP-22-CONSERV-7

### Regenerative Endodontic Procedures Using Blood Clot in Conjunction with Autologous Platelet Rich Fibrin in Mature Necrotic Teeth with Apical Periodontitis in Dogs (An Experimental Histological Study).

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**Objectives:** The aim of this study is to evaluate histologically the regenerated tissue following regenerative endodontic procedures (REPs) in necrotic mature single rooted permanent teeth, with

apical periodontitis, in dogs using two different scaffolds: Induced blood clot and autologous platelet rich fibrin (PRF) together with induced blood clot.

**Materials and Methods:** Thirty mature permanent incisors from 3 male dogs were included in this study. Pulpal necrosis and apical periodontitis were experimentally induced by removing the pulpal

tissue and leaving the access opened for three weeks until evidence of apical periodontitis was detected radiographically. REPs were carried out in two visits. In Group I, (n= 15 incisors), REPs were performed using blood clot as a scaffold alone. In Group II, (n= 15 incisors), REPs were performed using PRF together with blood clot as a scaffold. Three months later, dogs were euthanized and bone blocks containing incisors were processed and stained with Hematoxylin & Eosin. Histological sections were observed to evaluate the nature of the regenerated tissues following REPs using both scaffolds.

**Results:** Histological observations revealed that in group I (Blood clot) more mineralized tissues, bone-like tissues, were detected embedded in a vascular dense fibrous tissue, periodontal ligament like. While in group II (PRF + Blood Clot), the regenerated tissue was a highly vascularized loose fibrous tissue that looks more closely to the normal pulpal tissue.

**Conclusion:** Based on our preliminary results, it appears that using PRF in conjunction with blood clot

in REPs regenerate tissues that looks, histologically, more closely to the structure of the normal pulp, but with no odontoblasts.

**Funding Source and Acknowledgement:** No Funding was obtained for this research.

## AIDC-PP-23-CONSERV-8

**Effect of Injectable-Platelet Rich Fibrin on marginal adaptation of Bioactive Materials Used as Direct Pulp Capping; An Experimental Animal Study.**

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**Objective:** Vital pulp therapy has been known as one of the treatment options to preserve pulp vitality after being exposed by trauma or caries.

**Aim:** This experiment explored the effect of injectable-Platelet Rich Fibrin on marginal adaptation of two pulp capping agents (Mineral Trioxide Aggregate and Bioactive Bone Graft).

**Materials and methods:** A total of 64 teeth were used out of 8 healthy male beagle dogs. The teeth were randomly assigned into four groups, they were exposed and capped with different capping agents. Group A; capped with Mineral Trioxide Aggregate (MTA), Group B; capped with MTA+i-PRF, Group C; capped with Bioactive Bone Graft (BBG), Group D; capped with BBG+i-PRF. Finally, the access cavity was restored with Intermediate Restorative Material (IRM). At each predetermined interval, the dogs were sacrificed (1 month, and 3 months). The samples were then prepared for electron microscopic scanning evaluation. To compare between the gap percentage of four groups at each interval, Kruskal-Wallis test; was used. Mann-Whitney U test; was used to pair-wise comparison when Kruskal-Wallis test is significant. Bonferroni's correction was utilized for the pair-wise comparisons. Statistical significance was considered at P < .05.

**Results:** The data revealed that after one and three months the best values were recorded in groups B (MTA+i-PRF) and D (BBG+i-PRF), in relation to the lowest gap area between the capping materials and dentin, followed by group C (BBG), with the least value recorded in group A (MTA).

**Conclusions:** the findings from the current study suggested that i-PRF provided a better marginal adaptation of either MTA or BBG to the pulp and dentin, which improved with time from one month to three months.

**Keywords:** Bioactive Bone Graft, Injectable-Platelet Rich Fibrin, Mineral Trioxide Aggregate, Scanning Electron Microscope.

## AIDC- PP-24-CONSERV-9

### Prosthetic Rehabilitation of A 14-Year-Old Child with Ectodermal Dysplasia and Its Impact on Quality of Life: A Case Report with A 2-Year Follow Up.

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**Objective:** Ectodermal dysplasia (ED) is a rare genetic disorder of the skin, skin appendages, and teeth. Partial anodontia, manifested in patients with ED, has a negative effect on the patient's quality of life. This case report describes a 14-year-old female patient with ED who received a prosthodontic treatment to restore function, esthetics as well as emotional health; where the impact of treatment was assessed by Child Oral Health Impact Profile - Short Form 19 (COHIPSF 19) with a 2 year follow up.

**Materials And Methods:** The patient was treated with maxillary and mandibular flexible dentures. Assessment of the child's quality of life was done by the COHIP-SF 19 before the treatment and 1-week post treatment. Follow up of the patient was done up to 2 years.

**Results:** COHIP-SF 19 score was 11 before treatment; 8 points in the oral-health subscale, 3 points in the functional well-being subscale, and 0 points in the socio-emotional well-being subscale while 1-week post treatment, COHIP-SF 19 score was 47 with 26 points in the socio-emotional wellbeing

subscale indicating a positive impact on the patient's quality of life.

**Conclusions:** Flexible dentures could be considered an efficient non-surgical treatment option for an ED patient as it is durable with excellent esthetics. Furthermore, the treatment not only improves the function and esthetics, but also it has a positive impact on the self-esteem of the young patient among her Peers.

## AIDC- PP-25-CONSERV-10

### Accuracy of digital face scans obtained from two different 3D scanners: A comparative clinical study.

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**Aim of the work:** The objective of the present study was to evaluate the accuracy of 3D face scans performed by 2 facial scanners compared to manual measurements to enhance the predictive outcome of prosthetic rehabilitation.

**Methods:** Twenty dentate participants were selected, and triangular stickers were applied on their faces in 9 landmarks. Facial measurements were done by 2 methods: clinically on the face of each participant (manual group) then digitally on the computerized 3D facial reconstruction of each participant (Mobile app. group and Carestream (CS) group). Trueness between manual and digital groups was measured as well as the precision of each facial scanner. In addition, the inter-examiner reliability was calculated for each group.

**Results:** When comparing the trueness of each facial scan, there was no statistically significant difference between the manual and Mobile app. groups in all inter-landmark distances ( $P>.005$ ). However, there was a statistically significant difference between the manual and CS groups in 8 inter-landmark distances ( $P\le.005$ ). Moreover, there was no statistically significant difference among 5 scans for 1 participant by either Mobile app. or CS ( $P=.090, .057$  respectively). The inter-examiner reliability between the 2 examiners was 0.99.

**Conclusion:** Mobile 3D face scan application is a precise and reliable method of scanning in

comparison to the static face scanner (CS) which is precise but not reliable.

## AIDC- PP-26-CONSERV-11

### **Multi-Disciplinary Treatment for Gummy Smile Cases.**

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**Objectives:** The aim of this study is to elucidate methods of diagnosis and therapeutic options of gummy smile cases. Gummy smile occurs when 3 mm or more from the gingival band appear during smile or speech above the cemento-enamel junction of teeth. Etiology of gummy smile is always multifactorial, it may result from excessive vertical maxillary grow up, excessive labial contraction, short upper lip, passive eruption of teeth and extrusion of anterior teeth. The treatment is mostly multidisciplinary dependent on the proper diagnosis. Tools like digital smile design and cone beam computed tomography enable proper and complete planning of gummy smile cases. The present case aimed to present a gummy smile case of multiple etiology which has been treated with multidisciplinary approach to achieve predictable and safe treatment.

**Materials:** A 30-year-old female patient has attended the clinic of Department of Prosthodontics, Faculty of Dentistry, Alexandria University complaining of gummy smile, disproportion of crown size of incisors and enamel hypocalcification after orthodontic treatment. Gingival excess analysis was done via crown height and width using Chu's gauge, muscle analysis (lip length and muscle tone), computed tomography to evaluate the anatomical crown and biological width and digital smile design were performed. After proper planning, surgical crown lengthening was done followed by application of botulinum toxin (Allergen Botox by MEDI SILK) and then the teeth were restored by veneers restorations (IPS E.max (Ivoclar VIvadent)).

**Results:** After proper clinical & periodontal examination, a predictable and safer multidisciplinary treatment option was performed, and the patient has reported satisfaction with her new smile.

**Conclusion:** When it comes to gummy smile, proper diagnosis is essential. Digital smile design and cone beam computed tomography are considered as a mandatory method to evaluate gummy smile cases. Multidisciplinary treatment always gives safer, satisfactory, and accurate results.

**Acknowledgment:** I would like to extend my sincere thanks to Ahmed Ashraf assistant lecturer department of periodontist for performing the crown lengthening surgery.

## AIDC-PP-27-CONSERV-12

### **Digital implant planning from virtual to reality “Fully digital immediate placement and loading of prefabricated implant supported restoration”**

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**Aim of the work:** The present work aimed to perform a fully digital, single visit, immediate placement and loading of a prefabricated implant supported restoration

**Methods:** Data acquisition includes intraoral scan of the dental arches using omnican intraoral scanner as well as Cone beam computed tomography (CBCT) of both arches. The Digital Imaging and Communications in Medicine (DICOM) file from the CBCT examination and the Standard Tessellation Language (STL) file of the intraoral scan were imported and merged into an implant-planning software (Blue Sky Bio) for prosthetically-driven virtual implant planning and surgical guide **designing**. According to the virtual implant plan, a fully guided tooth supported surgical guide with a slot to adjust the implant hex orientation was fabricated from a photopolymer resin using a 3D printer (formlabs2). A

compatible virtual scan body was attached to the planned implant and the STL file was exported to the prosthesis-designing software (Exocad Dental CAD software (Exocad GmbH)) for designing a screw retained crown on Ti-base. On the day of surgery, dental implant (Neodent) was placed with a fully guided flapless surgical protocol following the company guidelines of the drilling sequence with a fully guided surgical kit. The implant insertion torque was more than 30 Ncm as well as ISQ (Implant Stability Quotient) value was above 70 so the implant was ready for immediate loading. After the guided implant placement, the prefabricated crown was screw-retained in its place.

**Results:** Accurate fit of the prefabricated crown in its place with acceptable contacts, esthetics, and occlusion.

**Conclusion:** A fully digital workflow of a prefabricated single implant restoration is a predictable treatment approach that satisfies the patient's need for immediate restoration of aesthetics and function.

### AIDC-PP-28-CONSERV-13

#### Gingival melanin depigmentation with 4 different laser wavelengths 445, 940, 1064 and 2940 nm: a case report.

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**Objectives:** Gingival melanin hyperpigmentation is an esthetic concern for many individuals; especially if visible during speech and smiling. Gingival pigmentation can be either physiological due to ethnic pigmentation or can be a result of various pathological processes. Different surgical techniques have been used in management of gingival pigmentation. Lasers have been reported as a successful, noninvasive treatment method with several benefits including less postoperative pain, swelling and discomfort and better wound healing. This case report describes gingival

depigmentation using 4 different laser wavelengths 445, 940, 1064 and 2940 nm for the purpose of comparing between these wavelengths in reducing gingival pigmentation.

**Material and Methods:** 4 different laser wavelengths were used in this clinical report in one session. Nd:YAG 1064 nm (Fotona LightWalker, Fotona) in upper right quadrant, Er:YAG 2940 nm (Fotona LightWalker, Fotona) in lower right quadrant, Diode 940 nm (EpicX, Biolase) in lower left quadrant and Diode 445 nm (SiroLaser Blue, Dentsply Sirona) in upper left quadrant. Pain during surgery by Visual Analogue Scale, bleeding during surgery, color improvement by comparing digital photographs of the patient taken at baseline and 3 weeks after treatment using gingival pigmentation index and patient satisfaction after 3 weeks.

**Results:** The patient reported pain during surgery with all wavelengths except 2940 nm. However, no postoperative pain or swelling with all the wavelengths. The patient was reviewed after 3 weeks with no signs of gingival melanin pigmentation.

**Conclusions:** All 4 wavelengths were effective in melanin depigmentation similarly with high patient satisfaction.

### AIDC- PP-29-CONSERV-14

#### Evaluation of Retention and Release Period in labially Inclined Implant Retained Mandibular Overdentures with Titanium-Silicone Snap Attachments (Comparative In-Vitro Study).

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**Objective:** The objective was to evaluate retention and release period of two implants retained mandibular overdentures with different degrees of labial inclination 0°, 17.5° and 35°, and

different types of Titanium Silicon snap attachments before and after cyclic loading.

**Materials and Methods:** This study was conducted on three Duplicate mandibular epoxy models with two dummy implants in the canine regions using the following degrees of labial inclination. Group A (control); 0 °, group B (study); 17.5°, and group C (study); 35°. Thirty-six mandibular overdentures were constructed over the three models (twelve for each model), and connected to the models with Ti-Si snap attachments with retention Silicone 400 g/ 4 Newton (n=6) and 600 g/ 6 Newton (n=6). Retention and release period of all overdentures with different attachments concept was performed using universal testing machine before, after 540 cycles (6 months) and 1080 cycles (1 year) of insertion and removal on a chewing simulator with artificial saliva. Then compared with control group.

**Results:** In each group, repeated measures analysis showed a statistically significant change in the retention among the different cycle measurements. Pairwise comparisons revealed that the retention and release period were statistically significantly lower in the inclination 35 degrees group ( $p<.001$ ) compared with the inclination zero-degree group in both retention silicone types.

**Conclusion:** By using TiSi snap attachments in overdentures, the retention and release period decreases

gradually as insertion and removal cycles increase. As labial angulation between the implants increases, retention and release period of attachments markedly decreases. Retention silicone resilient liners cannot be used to permanently retain a mandibular overdenture; however, they have a high success rate for short- and medium-term maintenance.

## AIDC- PP-30-CONSERV-15

### The Effect of Early Versus Delayed Loading on The Stability of Implants placed by Transalveolar Augmentation Using PRGF In Partially Edentulous Maxilla.

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**Objectives:** The aim of this study was to compare the effect of early and delayed loading protocols on the stability of implants placed after transalveolar augmentation with PRGF mixed with bone graft in partially edentulous maxilla unilateral free end saddles.

**Materials and methods:** Twenty-four patients were selected and rehabilitated with maxillary implant-supported removable partial overdenture on implants placed with trans-alveolar sinus lifting and bone grafted with PRGF mixed with bone grafts. The patients were randomly divided into two equal groups according to the loading time in Group I: which consists of twelve patients who received the prosthesis after six weeks following the early loading protocol. Group II: consists of twelve patients who received the final prosthesis after 24 weeks following delayed loading protocol. Implant stability was measured using Osstell.

**Results:** The mean of implant stability at the time of loading six weeks in group I was 68.25 ISQ  $\pm 3.10$ . However, for group II at 24 weeks, it was 75.25 ISQ  $\pm 4.86$ . This difference was statistically significant as p-value was 0.05. Three months after loading the mean of implant stability in group I was 73.5 ISQ  $\pm 5.8$ . However, for group II, it was 76.75 ISQ  $\pm 3.59$ . While the mean of implant stability 6 months after loading in group I was 74.5 ISQ  $\pm 4.8$ . However, for group II, it was 77.25 ISQ  $\pm 2.5$ .

**Conclusion:** An early loading protocol showed comparable clinical efficacy to the commonly used delayed protocol with great emphasis on restoring the posterior maxilla with implant-supported partial overdenture.

**Keywords:** dental implants, loading protocol, early loading, partial edentulism, posterior maxilla

**AIDC-PP-31-CONSERV-16**

**Digitally empowered esthetic dentistry  
“Functionally and biologically driven  
digital smile design”**

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M. M. Khamis.*

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**Aim of the work:** The present work aimed to perform biologically and functionally enhanced aesthetic rehabilitation using digital technology.

**Methods:** Intraoral and extraoral photographs, mounted diagnostic casts, physical examination, and radiographs were the diagnostic modalities. The gathered information served as a starting point for a digital wax-up and intraoral mock-up to allow the patient to visualize the outcome of the proposed treatment plan.

The digital models were attached to the virtual articulator using facebow oriented maxillary cast on a semi adjustable analogue articulator. Protrusive and lateral angles were transferred to the virtual articulator based on its analogue equivalent. After that, all the mandibular movements necessary to create an occlusally harmonized prosthesis could be simulated by the virtual articulator.

The extent of gingival recontouring while respecting biological width was estimated by DSD

in accordance with CBCT analysis. Vacuum formed sheet was fabricated on a 3D printed waxup model to guide the erbium laser-assisted gingival recontouring procedure.

The designed prosthesis was 3d printed using a castable resin to transform the virtual design to reality. It was then tested intraorally for fit, contacts, and harmony before being pressed into a lithium disilicate fixed restoration.

**Results:** Accurate fit of the fixed prosthesis in its place with acceptable contacts, esthetics, occlusion and recontoured healthy gingiva.

**Conclusion:** The predictability of esthetic rehabilitation along with biological and functional essentials could be improved by digital dentistry.

**AIDC- PP-32-CONSERV-17**

**The challenge of Mucormycosis: A one year follow up (Case report).**

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**Objectives:** To assess the quality of life of patients who survived post-COVID-19 mucormycosis rehabilitated with removable obturators.

**Material and Methods:** 78 years old debilitated patient was referred to the outpatient clinic of Prosthodontics Department, Faculty of Dentistry, Tanta University with hemi maxillectomy after mucormycosis infection. A conventional obturator was made, and the quality of life and extent of the lesion was assessed and followed up for a year.

**Results:** After one year follow up it was found that the quality of life of the patient was extremely improved, and the use of the conventional obturator helped the patient to survive the consequences of post-COVID-19 mucormycosis.

**Conclusion:** The use of conventional acrylic obturators could be of great importance to rehabilitate post-COVID-19 patients who had to remove part of the palate due to mucormycosis infection.

**AIDC- PP-33-CONSERV-18**

**3D-Printing and Physical Characterization of Calcium Phosphate Based Scaffolds.**

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**Aim:** 3D-printing techniques can fully control the design of scaffolds to achieve repeatable and accurate structures. In this work we have investigated the feasibility of a specially-designed-locally-manufactured 3D-printer to fabricate scaffolds based on Biphasic calcium phosphate (BCP). We have also studied physical properties of the scaffolds before being used in bone tissue engineering applications.

**Materials and Methods:** BCP was synthesized using sol-gel technique, and characterized with XRD, TEM and FTIR. Four groups of scaffolds were fabricated through pellet-melt-extrusion, Polylactic acid (PLA) and Poly (L-lactide-co-trimethylene carbonate) (PLA-TMC) (with or without BCP (10 wt/wt %)), and were compared for their chemical, thermal, and morphological properties. 3D-CAD model of the scaffold was designed using Blender software to produce 500  $\mu\text{m}$  strand width and 350  $\mu\text{m}$  pore diameter.

**Results:** Successful synthesis of BCP was confirmed after the comparison of XRD patterns to the standard PDF numbers: 74-0566 and 70-2065. Rietveld analysis revealed an 80:20 ratio between hydroxyapatite and  $\beta$ -tricalcium phosphate phases. TEM analysis showed a particle size of  $33 \pm 2$  nm. The printing temperature varied from 165°C to 200°C for PLA and PLA-TMC, respectively. At the same other printing parameters, the strand size in PLA and PLA-TMC was  $702 \pm 45$   $\mu\text{m}$ , and PLA/BCP and PLA-TMC/BCP was  $825 \pm 41$   $\mu\text{m}$ , while the pore size in PLA and PLA-TMC was  $725 \pm 61$   $\mu\text{m}$  and PLA/BCP and PLA-TMC/BCP was  $671 \pm 62$   $\mu\text{m}$ .

**Conclusion:** The 3D-printing of PLA/BCP and PLA-TMC/BCP using our customized technique is feasible, with some morphological variations based on BCP contents. Further mechanical and biological studies are being implemented to validate the printed BCP-based scaffolds for bone tissue engineering applications.

## AIDC- PP-34-CONSERV-19

### 3D Printed Hydroxyapatite-Based Templates for Bone Tissue Regeneration.

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**Objectives:** The aim of the present study is to design, fabricate, and evaluate bone tissue regeneration scaffolds using Three-Dimensional Printing technology. Polycaprolactone-Nano Hydroxyapatite composites will be prepared and processed via 3DP technology to fabricate designed porous scaffolds. In addition, the fabricated scaffolds will be tested in terms of morphology, thermal behavior, and mechanical properties.

**Materials and Methods:** First, the synthetic Nano-Hydroxyapatite (NHA) powder was prepared and characterized to be further added to polycaprolactone (PCL) polymer in different concentrations. Then PCL-NHA composites were prepared using a solvent casting technique. A custom-made melt extrusion 3D printer with a syringe-based extrusion unit was manufactured and used to produce the material. The morphology of 3D printed PCL scaffolds with the incorporation of synthetic NHA in different concentrations was evaluated. The fabricated scaffolds were further investigated regarding their thermal and mechanical properties.

**Results:** The 3D printed PCL-NHA scaffolds were found to have a porous interconnected

network structure similar to the designed 3D model. This porosity could be very beneficial to the scaffolds as bone grafts. The addition of NHA decreased the thermal stability and melting temperatures of PCL scaffolds. However, the mechanical properties of the PCL scaffolds were not significantly altered by the presence of the hydroxyapatite powder.

**Conclusions:** Three-dimensional printing technology offered control over the design of scaffolds to fabricate a porous framework that is essential for cell adhesion and proliferation in bone tissue regeneration. The processing of PCL by melt extrusion 3D printers is promising, and it will not be prejudiced by the presence of up to 10 wt % bioactive synthetic NHA. Furthermore, PCL-NHA composite scaffolds can be used for bone regeneration due to their akin to the mechanical characteristics of various target tissues and a superior combination of biocompatibility and bioactivity.

#### AIDC PP-35-CONSERV-20

#### Effect of abrasive tooth materials and devices on enamel.

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*PUA intern students*

**Aim of the study:** The aim was to compare in vitro the effect of whitening toothpaste, enamel air abrasion, cavitron and pumice on treating enamel tea stains by scanning electron microscope (SEM), energy dispersive x-ray spectrometry (EDX) and visual shading then evaluate which method has the least abrasive effect on enamel.

**Materials and methods:** 28 extracted human teeth were collected and gone through a staining process. Teeth were sectioned into two halves to use one for obtaining the before measurements and the other half for the after measurements. We divided the teeth into four groups, each group will undergo a different treatment for the stains removal. First group was treated by ultrasonic

scaler or cavitron. Second group was treated by tooth polishing using pumice (i-faste). Third group was treated using signal whitening fluoride containing toothpaste. Fourth and final group was treated by air abrasion (Aqua care). We used Electronmicroscope, EDX, and spectrophotometer to evaluate the effects of each group's different treatment on enamel and we used a visual shading system to compare the difference in shades.

**Results:** The results of each measurement method for each single tooth were collected in statistical tables and graphs to evaluate the abrasive effect of each method on enamel surface.

**Conclusion:** Based on the results of this study, it seems that cavitron and Air abrasion are the most abrasive devices, and the toothbrush is the least abrasive one.

#### AIDC- PP-36-PEDO-1

#### Age Estimation in Libyan Children Based on Dental Panoramic Radiography

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**Background:** Age estimation plays a key role in human identification process, and guiding police investigations. Tooth development is widely used in determining age and state of maturity. Dental age is of high importance in forensic and pediatric dentistry and also orthodontic treatment planning.

**Aims:** The aim of this study was to assess the accuracy of the Cameriere method on estimating chronological age of a Libyan sample of 6-year-old up to 13-year-old children through analysis of panoramic radiographs on teeth, considering the relationship between age and measurements of open apices teeth.

**Materials and methods:** Orthopantomographic images of 156 radiographs were selected for the study of which 76 were belonging to boys and 80 girls children. Dental age of the subjects was determined through Cameriere method. Differences and correlations between chronological and dental ages were assessed by paired t-tests and Pearson's correlation analysis,

respectively. Multiple regression analysis was used to predict chronologic age in Libyan from 6-13 years children population.

**Results:** High positive correlation was found between chronologic age and dental age (as assessed by Cameriere's formula) with r values 0.882, 0.975, and 0.758 for total, girls and boys study population respectively. The mean dental age assessed by Cameriere's method was significantly lower than chronologic age in the Libyan population with boys and the total study population ( $p < 0.05$ ). Six out of nine parameters were significantly associated with chronologic age ( $R^2=0.996$ ,  $F(6,155) = 2792.023$ ,  $p<0.01$ ).

**Conclusion:** Our findings indicated that Cameriere's method is a powerful tool in age estimation. These results highlight the great accuracy and significance of developing teeth for more accurate estimation of age. According to the results of this research, it may be concluded that Cameriere's method is suitable for dental age estimation in Libyan children.

**Acknowledgment:** This work would not have been possible without the constant support, guidance, and invaluable assistance of my supervisor Professor Fowziya Alzawi. I also thank Dr. Osama Ahmadi who was always ready to help with any questions that I had, their levels of patience, knowledge, and ingenuity is something I will always keep aspiring to.

## AIDC- PP-37-PEDO-2

### Impact of covid-19 on dental education: Case of the Faculty of Dental Medicine of Monastir (Tunisia).

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**Introduction.** Coronavirus disease 2019 (COVID-19) pandemic might have an

unprecedented impact on dental education. The main aim of this study was to investigate the impact of COVID-19 among Tunisian dental students.

**Methods.** This was a cross-sectional carried out from January to March 2022, at the Faculty of Dental Medicine of Monastir (FDMM), Tunisia. The population consisted of the 3rd, 4th, 5th and 6th year dental students registered for the academic year 2021/2022 at the FDMM. The potential number of participants was 881 according to the administration of the faculty. Incomplete answers were applied as exclusion criteria. The applied questionnaire was made of 17 questions adapted to the Tunisian context.

**Results.** A total of 446 students responded to the survey giving an overall response rate of 50.6%. The study revealed that the FDMM was not doing its best to solve the challenges associated with the COVID-19 pandemic for 88.8% of the responders. Dental students were concerned about the impact of COVID-19 pandemic on their dental education (69.6%) especially about graduating on time (63.0%) since, changes made in dental education due to the pandemic were stressful for 61.1% of them. They reached emotional support from their family and friends (46.5%) whereas only 9.8% of them requested assistance from faculty's staff.

**Conclusion.** This study provides important information about the impact of the COVID-19 pandemic in dental education. These findings may sensitize officials in the FDMM to take measures in order to deliver quality education to dental students.



# Egyptian IADR

## Abstracts of Oral and Poster presentations

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**IADR-OP-1-SURG-1  
3796570****Ultrasound-Guided Regenerative Injection for Management of Irreducible Temporomandibular Disk Displacement**

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**Objectives:** This clinical study was done to assess the role of ultrasound-guided intra-articular injection of liquid phase concentrated growth factors (LPCGF), the latest generation of platelet rich plasma, in patients with limited mouth opening associated with disc displacement without reduction (DDwR).

**Methods:** Twelve patients with DDwR and limited mouth opening diagnosed clinically and by magnetic resonance imaging were enrolled in the study. Patients received an ultrasound-guided intra-articular injection of 2ml LPCGF and a maxillary 3D printed stabilization appliance. The patients' symptoms were assessed clinically through Helkimo Anamnestic dysfunction index (Ai) and the maximum mouth opening (MMO) was measured at baseline as well as 1 week, 1 month and 3 months after the intervention.

**Results:** There was a significant relief in symptoms at the 1 month, and 3months follow-up periods ( $p = 0.001$ ,  $p < 0.001$  respectively). The mean of MMO at the baseline was 31.75 mm (range, 28– 37 mm; SD, 4.0), while 1 week after the injection it was significantly increased to be 33.50 mm (range, 30– 40 mm; SD, 3.78;  $p < 0.001$ ). Similarly, a significant positive effect was found after 1 month (range, 32– 42 mm; mean, 35.50 mm; SD, 3.42;  $p < 0.001$ ), and 3 months (range, 35– 43 mm; mean, 37.50 mm; SD, 2.54;  $p < 0.001$ ).

**Conclusions:** Intra-articular injection of LPCGF and stabilization appliance could be

considered a treatment protocol in patients with DDwR as it was effective in terms of relieving symptoms with improvement in the MMO.

**IADR-OP-2-SURG-2  
3800410****Socket Shield Technique with Guided Root Sectioning and Its Effect on The Alveolar Ridge Dimensional Stability in Defective Sockets: A Clinical Trial**

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**Objectives:** The purpose of this study is to digitally evaluate the dimensional changes of the labial alveolar ridge after the socket shield technique performed with a computer designed root sectioning guide.

**Methods:** Ten hopeless teeth in the esthetic zone were replaced by implants using the socket shield technique. A computer guide was used to section the root. Linear changes at 1,3 and 5 mm from the gingival margin and mean linear changes in a specified Area of Interest (AOI) were measured using a computer software after 5 months of healing.

**Results:** The accuracy of the sectioning guide was confirmed with periapical radiographs taken after the surgical drill was advanced through the guide sleeve. The tip of the drill was found to be superimposed on the radiographic apex. The extracted palatal fragments were always associated with the root apices. Mean preoperative thickness of the labial plates of bone was  $0.99 \pm 0.65$  mm. In 6 cases, the labial plate of bone was thinner than 1 mm ( $0.54 \pm 0.27$  mm). 4 cases had apical perforations and 1 case had a crestal dehiscence. Mean linear change in AOI was  $-0.44 \pm 0.23$  mm. Mean linear change at 1,3 and 5 mm apical to the gingival margin was  $-0.44 \pm 0.23$  mm.

$0.64 \pm 0.32$  mm,  $-0.33 \pm 0.19$  mm and  $-0.23 \pm 0.18$  mm, respectively.

**Conclusions:** The socket shield technique is associated with minimal changes of the labial alveolar contour even in the presence of perforated, dehisced, and thin labial bony plates. Guided root sectioning is a potential solution to the technique sensitivity of the socket shield.

#### IADR-OP-3-SURG-3

3800219

#### Piezosurgical buccal plate repositioning technique for horizontal augmentation of atrophied mandible: (A Randomized clinical trial)

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**Objectives:** Ridge splitting technique is successfully used to increase the width of the alveolar ridge. However, in the mandible, the risk of fracture of the osteotomized segment is great. autogenous grafting is considered the gold standard for ridge augmentation. However, secondary site morbidity is a drawback. In the present study we demonstrate a novel modified alveolar ridge split technique; the buccal plate repositioning technique (BRT). The clinical success of the BRT is evaluated using different graft materials.

**Methods:** This randomized clinical trial included 18 patients requiring horizontal alveolar ridge augmentation. Patients were equally assigned to one of two groups; Group A was treated with the buccal plate repositioning technique and grafted with silica-calcium phosphate nanocomposite

(SCPC) graft, Group B was similarly managed and grafted using freeze-dried bone allograft (FDBA). A piezosurgical four-sided osteotomy was performed, 2mm apical to the alveolar crest. The buccal plate was totally detached and refixed in a favorable horizontal position using fixing screws. The horizontal width of the reconstructed ridge was controlled by the length of the fixing screws. The remaining space between bony plates was filled with either SCPC, or FDBA graft material, and covered with platelet rich fibrin membrane. The flap was sutured. Cone-bean computed tomography (CBCT) was performed immediately after surgery and at 6 months post-operatively.

**Results:** Buccal plate repositioning technique resulted in successful horizontal augmentation with a mean of  $(4.30 \pm 0.94)$  for the SCPC group,  $(4.98 \pm 1.13)$  for the allograft group with no statistically significant difference between groups. All augmented ridges allowed for successful implant placement with good primary stability.

**Conclusions:** The buccal plate repositioning technique is a promising technique for horizontal alveolar ridge augmentation in deficient posterior mandible, providing an adequate volume to insert implants. It allows free movement of the buccal plate and avoids a secondary surgical site with decreased patients' morbidity.

#### IADR-OP-4-SURG-4

3779005

#### Growth factor versus natural model as an antidiabetic prophylactic agent

N. Bakr.

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**Objectives:** The objective of this study was to evaluate the anticipated effect of growth

factor versus Zamzam water as natural model on oral mucosal tissues of diabetic albino rats

**Methods:** Eighteen male albino rats were selected and divided into four groups. Group I

(control group) received no drugs, while rats of group II (diabetic group) received a single dose of alloxan intraperitoneal injection, rats of group III diabetic and received Zamzam water, group IV receiving epidermal growth factor injection. All rats were sacrificed oral mucosa was dissected and processed for hematoxylin & eosin and transmission electron microscopy evaluation.

**Results:** The diabetic group showed histological & ultrastructural changes in the oral epithelium and underlying lamina propria, a condition which almost restored to normal in Zamzam treated group. and nearly restored in epidermal growth factor group.

**Conclusions:** Zamzam water provides safer alternative nutritional strategy in restoring the integrity of the damaged epithelium of the oral mucosal tissues after degenerative effect of DM. causing improvement of the damaged epithelium and lamina propria rather than epidermal growth factor administration.

#### IADR-OP-5-SURG-5

3772011

#### Effect of Enterococcus faecalis on osteoclastogenesis in vitro under cobalt-mimicked hypoxia

F. zhou.

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**Objectives:** The bone destruction in persistent apical periodontitis associated with infection and periapical hypoxia microenvironment has not been well known. We aim to investigate the effects of Enterococcus faecalis on osteoclastogenesis under cobalt-mimicked hypoxia.

**Methods:** Mouse bone marrow-derived macrophages (BMMs) were isolated as osteoclast precursors and stimulated by heat-killed E. faecalis under cobalt-mimicked hypoxia environment. The cell viability and apoptosis were detected using CCK-8 and Flow cytometry, respectively. Osteoclast differentiation was determined via tartrate-resistant acid phosphatase staining (TRAP) and immunofluorescence staining. The osteoclastogenic protein and gene expressions were measured by Western blot and real-time PCR.

**Results:** Under cobalt-mimicked hypoxia, E. faecalis inhibited markedly the proliferation of BMMs, while E. faecalis promoted significantly apoptosis of BMMs. Differentiation of BMMs into osteoclasts was enhanced in the presence of E. faecalis under hypoxia, and the expression of Blimp, c-fos and NFATc1 was up-regulated, while the expression of RBP-J was inhibited.

**Conclusions:** E. faecalis markedly promoted osteoclast differentiation under cobalt-mimicked hypoxia.

#### IADR-OP-6-SURG-6 3789824

#### Bone Repair by Human Demineralized Dentin Matrix Scaffold and Concentrated Growth Factor

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**Objectives:** New materials introduced in regenerative dentistry new technique for enhancement of bone repair.

**Methods:** Ten adult male rabbits (weight 2 to 2.5 kg) were used in this study. In each rabbit two holes were created (one in each tibia). In rabbits, one hole was left empty as control

and the second was packed with HDDM and CGF.

**Results:** Bone repair occurred faster in the graft group when compared to the control group. Osteoid tissue formation was seen at the bone defect at one week in the graft group, and osseous tissue formation was seen filling the bone defects at 6 weeks. the new bone showed better organization than control group and most of the formed osteons were fully compacted.

**Conclusions:** Combining Human Demineralized Dentin Scaffold (HDDS) with concentrated growth factor (CGF) improved graft biomaterial when used as xenograft and it became more effective by inducing a high level of new bone formation.

#### IADR-OP-7-CONSERV-1 3802131

#### Two Years Clinical Evaluation of Dimethyl-Sulfoxide Application Prior to Etch-Rinse Adhesives

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**Objectives:** This randomized clinical trial assessed the effect of Dimethyl-Sulfoxide (DMSO) dentin pre-treatment on the clinical durability of an etch-rinse adhesive used to bond composite restorations to non-carious cervical lesions (NCCLs).

**Methods:** After power analysis calculation, 82 NCCLs were etched with 37% phosphoric acid for 15s and randomly distributed into two groups. Control-group bonded with (Single bond-plus, 3M ESPE) and restored

with a nanohybrid composite (Z350 XT, 3M ESPE) under rubber dam isolation. Experimental group 1%DMSO was applied for 60s then blot dried after etching and before adhesive application. Composite Restorations were placed in 2mm increments and light-cured for 20s. The restorations were evaluated at baseline, 6, 18, and 24 months using FDI criteria for evaluation of the restoration. For the statistical analyses, Friedman repeated-measures analysis of variance and the Wilcoxon test ( $P=0.05$ ) were used.

**Results:** The recall rate after 6m was 97.5% and after 24 months, 70 restorations (85.4% recall rate) were evaluated. The 6m/24m overall retention rates% were 100/85.7 for Control and 100/91.4 for Experimental with no statistical difference between the two groups. Biological (Caries adjacent to the restoration) for all restoration did not change statistically from baseline to 24 months; however, marginal staining at the enamel margins was statistically worse ( $p>.05$ ) at 24 months than at baseline for the control group. The Experimental group showed less marginal discoloration at 24m compared to the control ( $p>0.05$ ).

**Conclusions:** Although 24-month retention was similar for both groups, marginal discoloration was more prevalent for the control group. Longer follow-up and higher concentrations of DMSO pretreatment should be evaluated in the future.

#### IADR-OP-8-CONSERV-2 3799116

#### Trueness and precision of stereophotogrammetry scanning method for prepared teeth (an Invitro study).

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**Objectives:** To assess the accuracy in terms of trueness and precision of stereophotogrammetry two-dimensional image-based scanning method for prepared teeth compared to extraoral scanner.

**Methods:** Anatomically prepared maxillary central incisor was scanned using reference extraoral scanner as a control for the study. Stereophotogrammetry scanning custom made setup was constructed based on digital single reflex camera (DSLR) for capturing photos. Standardization of the stereophotogrammetry scanning technique was accomplished by constructing a computer-controlled Arduino based device that has wireless communication with the camera, producing photos that fulfil the requirements of this technique ensuring repeatable and overlapping photography. Produced photos were processed using a dedicated stereophotogrammetry software and produced three dimensional models has been exported as standard tessellar language files (STL). Another extraoral desktop scanner was used to compare scanning accuracy with. Scanning has been repeated 5 times for both methods. Accuracy has been assessed in terms of trueness and precision has been assessed by overlapping produced STL files using surface matching software.

**Results:** Stereophotogrammetry scanning has shown a mean of trueness of (39+1 microns) and precision mean (2.8+1.3 microns), while professional extraoral scanner has shown trueness mean of (23+3 microns) and precision of (17.5+6 microns).

**Conclusions:** Stereophotogrammetry scanning method has a reliable accuracy for scanning prepared teeth and can be used as an affordable technique for dental applications with comparable results to commercially available extraoral scanners.

**IADR-OP-9-CONSERV-3  
3798350:**

## The use of Virtual Planning to Evaluate the Effect of Nasoalveolar Molding on Infants with complete Bilateral Cleft Lip and Palate

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**Objectives:** The aim of the study is to use virtual planning to assess the efficacy of Nasoalveolar molding (NAM) appliance which was fabricated by CAD/CAM additive manufacturing in complete Bilateral Cleft Lip and Palate (BCLP).

**Methods:** Ten infants with non-syndromic BCLP were involved in the study. Each of the infants received a NAM appliance, fabricated by CAD/CAM additive manufacturing. Impressions of the maxilla of the infants with BCLP were made. The maxillary casts were scanned using a 3D laser scanner. Virtual planning was completed on the initial cast. Designing and 3D printing of the appliances were completed. Impressions were obtained after four months of the treatment. Evaluation was done in two phases, Phase I: quantitative 3D maxillary geometric analysis, Phase II: Comparison with its corresponding virtual plan. Data were collected and statistically analyzed.

**Results:** By the end of CAD-NAM treatment, there was a significant decrease in middle cleft width. The appliance resulted in significant decrease in cleft widths which was close to the virtual plan. The NAM appliance showed a decrease in the protrusion and significant reduction in angular deviation of

the premaxilla. In the vertical dimensions, NAM resulted in a significant decrease in the bilateral canine regions, but no significant difference in the incisor region.

**Conclusions:** By using CAD/CAM to create NAM appliances, chairside clinical modifications have been decreased while the process of designing and fabricating the appliances with high accuracy has been simplified. Virtual planning was utilized in evaluating the effectiveness of NAM used in infants with complete BCLP. The transverse and vertical expansion of the alveolar segments, however, could not be predicted by the software utilized in this study for virtual planning. NAM appliance improved the maxillary geometry by decreasing the cleft widths on both sides and improving the deviation of the premaxilla in addition to reducing its protrusion in infants with complete BCLP.

#### IADR-OP-10-CONSERV-4 3802957

#### Stress analysis and fracture resistance of reprocessed Polyetheretherketone (PEEK) crowns on single implants compared to non-reprocessed PEEK & zirconia

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**Objectives:** The objective of this study was to evaluate the effect of repeated heat pressing on strain measurements and fracture resistance of partially and totally reprocessed Polyetheretherketone PEEK crowns for dental implants compared to non-reprocessed PEEK & zirconia crowns.

**Methods:** A total of 20 crowns (N=20) were fabricated. Fifteen from pressed PEEK and

five from zirconia. The PEEK specimens were divided into 3 groups 5 specimens each (n=5) according to the weight percentage of new and reprocessed material used as following: the first group was 100% new PEEK. The second group was partially reprocessed PEEK, in which 50% new and 50% reprocessed PEEK were used. The third group was 100% reprocessed PEEK. Self cure epoxy resin was used for model construction to simulate the bone for placement of the implant. The implant was placed in the second premolar region. Strain gauges were bonded to the surface of the epoxy resin model on the mesial and distal around the implant and load was applied. 100N load was applied with 0.5 mm/min. The strain data were collected using software during load application. Finally, all specimens of tested groups were loaded compressively in a universal testing machine (Instron Model 3345, England) at cross head speed 1 mm/min and load at failure was recorded in Newton. One-way Analysis of Variance (ANOVA) was used to compare between different PEEK conditions. Post-hoc test was used for pair-wise comparisons when ANOVA test is significant.

**Results:** There was no statistically significant difference between all four groups regarding strain analysis with zirconia showing the lowest strain  $142.83 \pm 29.71$  and partially processed PEEK the highest strain values  $163.33 \pm 10.34$ . There was statistically significant difference regarding the fracture resistance and intergroups comparisons showed that zirconia showed the highest significant fracture load  $4333.92 \pm 608.51$  with all PEEK groups that showed no statistical difference with each other's with all falling below average biting forces in the posterior region.

**Conclusions:** Reprocessed PEEK shows promising results regarding strain analysis compared to non-reprocessed PEEK and zirconia. Both PEEK and zirconia can be used

in crown restorations of single implants in the posterior region.

### **IADR-OP-11-CONSERV-5 3807751**

#### **Regenerative Potential of Platelet-Rich Fibrin Used as a Pulpotomy Scaffold in Treating Patients with Irreversibly Inflamed Permanent Mature Molars.**

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**Objectives:** Evaluation of the clinical/radiographic success of novel regenerative coronal pulpotomy technique using Platelet-Rich Fibrin (PRF) compared to conventional pulpotomy using MTA and the assessment of the sensibility and the vitality after the pulpotomy procedure in both groups.

**Methods:** Thirty patients with irreversibly inflamed permanent molars were selected for this study. For each patient, pulpotomy procedure was done. After hemostasis, radicular pulps were covered according to the grouping. Group I (n=15) was covered with MTA, while Group II (n=15) was covered with PRF+MTA. Patients in all groups returned to the clinic for clinical and radiographic examination at follow up period of one, three, six, 12 and 18 months. Cone beam computed tomography (CBCT) was used to assess the outcome of the treatments at the end of the study period. Pulse oximeter device and electric pulp tester were used to evaluate pulp vitality and sensibility throughout the study period.

**Results:** During the follow-up period, no statistically significant differences were found in the clinical and radiographic success rates between all groups. CBCT evaluation showed no statistically significant difference

in the treatment outcomes for all groups. Pulse oximetry and electric pulp tester evaluation showed that the regenerative pulpotomy procedure using PRF+MTA was able to regain the vitality and sensibility of pulpotomized teeth.

**Conclusions:** Regenerative pulpotomy and conventional coronal pulpotomy were able to treat patient with signs and symptoms indicative of irreversible pulpitis showing high success rates. Moreover, Regenerative pulpotomies using PRF+MTA were able to regain the vitality and the sensibilty of the pulpotomized teeth.

### **IADR-OP-12-CONSERV-6 3799983**

#### **Prosthetic Rehabilitation of Complete Unilateral Cleft Lip and Palate Using Two Different Approaches**

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**Objectives:** The Aim of this study is to evaluate the prosthetic rehabilitation in neonates with complete unilateral cleft lip and palate using digital technology in comparison with the conventional method.

**Methods:** Twenty newborn infants with non-syndromic unilateral complete cleft lip and palate were included in our study. the infants were randomly distributed into two groups, the first group received the conventional nasoalveolar molding appliance , the second group received the digitally designed and printed nasoalveolar molding appliance and both groups were followed up for 3-4 months until primary cheiloplasty was performed .intraoral evaluation of anterior intersegmental width and posterior alveolar width was done. Also extraoral measurements of the nose was evaluated before and after treatment with nasoalveolar

molding appliances either conventionally or digitally produced. Intraoral and extra oral data were collected, tabulated and statistically analyzed using SPSS software.

**Results:** There was no statistically significant difference between the use of the conventional and digital appliances in the rehabilitation of neonates with complete unilateral cleft lip and palate, and both reduced the cleft gap and modified the nasal structures.( $p<0.05$ ).

**Conclusions:** The use of the 3D technology limited the efforts of the clinician and reduced the number of visits for the parents specially those living far away from clinical support, however the conventional appliance proved clinical significance and more adaptability for use.

#### IADR-OP-13-CONSERV-7 3799703

#### Prevalence of bruxism and its association with other sleep disorders in an Egyptian population: A cross- sectional study

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**Objectives:** The aim of this study was to quantify the prevalence of bruxism in a sample of the Egyptian population and to identify associations between sleep bruxism (SB), obstructive sleep apnea (OSA) and gastro-esophageal reflux disease (GERD).

**Methods:** This cross-sectional study was conducted on 991 subjects within the age range of 18-70. A questionnaire based on the diagnostic criteria of the American Academy of Sleep Medicine and dental clinical examinations were carried out to diagnose bruxism. The STOP-Bang assessment tool

was used to identify the risk of OSA; and the GERDQ questionnaire was used to assess the GERD score of individuals. Statistical analysis was performed to compare the risk and severity of OSA and GERD in bruxers versus in non-bruxers.

**Results:** Within the surveyed population, the prevalence of bruxism was found to be 25.6%, 62.2% of which suffering from sleep bruxism. There was no statistically significant difference between mean OSA scores in subjects with SB and subjects without. The mean (SD) values were 1.43 (1.56) and 1.35 (1.49) for the two groups, respectively ( $p$ -value = 0.484). Bruxers showed significantly higher mean GERD scores than non-bruxers. The mean (SD) values were 7.14 (2.26) and 6.63 (1.7) for the two groups, respectively ( $p$ -value <0.001).

**Conclusions:** Associations between SB and different categories of OSA and GERD seem to exist. More research is needed to prove their direct/indirect effects on the pathophysiology of bruxism.

#### IADR-OP-14-CONSERV-8 3810366

#### Potential Bioactive Properties of Pulp Derived Extracellular Matrix Hydrogels

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**Objectives:** The objective of this study was to prepare and characterize pulp derived Extracellular Matrix (P-ECM) hydrogels for regenerative endodontic applications.

**Methods:** Thirty Freshly extracted bovine molar teeth were used to prepare P-ECM; Bovine dental pulp tissues were harvested. For decellularization, pulp tissues were treated by trypsin/EDTA for 24 hours, washed by deionized water, treated with DNase, then washed with phosphate-buffered saline. Evaluation of the decellularization process was done using DNA quantification and histological examination compared to native tissues. This was followed by fabrication of extracellular matrix hydrogel scaffold and optimization of its concentration. The prepared scaffolds were evaluated for their protein content using BCA kit, protein release at 0,1 and 3 days, as well as MTT cell viability assay using Rabbit dental pulp stem cells (rDPSCs).

**Results:** Bovine pulp tissues were successfully decellularized. DNA was found to be below the cut-off point (50 ng/mg tissue) using Nanodrop spectrophotometer ( $32 \pm 2.4$  ng/mg tissue) and using Quantifluor fluorescent dye ( $21.18 \pm 1.8$  ng/mg tissue). Histological evaluation using H&E, Alcian Blue and Masson's trichome revealed absence of nuclei, retention of glycosaminoglycans (GAGs) and collagen content, respectively. P-ECM hydrogels were fabricated with a final concentration of 3.00 mg/ml. Total protein content was found to be 493.12 µg/µl. Protein release was detected at time 0 showing burst release (109.6 µg/µl) followed by declined release at 24 hours (70.4 µg/µl) then increased release at 72 hours (102.7 µg/µl). P-ECM hydrogel-maintained viability of rDPSCs as compared to cells cultured under controlled conditions.

**Conclusions:** The extracellular matrix pulp hydrogel scaffold retained its bioactive properties demonstrating a potential role as a scaffold for regenerative endodontic procedures.

#### IADR-OP-15-CONSERV-9

#### 3806672

#### Microbiological Evaluation of Single Versus Multiple Visit Regeneration Using MALDI-TOF-Mass- Spectrometry.

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**Objectives:** This study compared single-visit and multiple-visit regeneration protocols microbiologically using matrix-assisted-laser-desorption-ionization-time-of-flight-mass-spectrometry (MALDI-TOF-MS), clinically and radiographically using cone beam computed tomography (CBCT).

**Methods:** A randomized controlled clinical trial was performed recruiting 35 patients, 8-13 years with traumatized immature permanent teeth showing periapical lesions. They were randomly divided in two groups before induction of bleeding, Biodentine cervical plug application, and sealing. Group (1) (n=5) single-visit and Group (2) (n=11) multiple-visit. Field decontamination and negative control samples were performed before collecting samples using a file. For both groups, the first visit included access-cavity-preparation and first sample collection (A). Minimal instrumentation, irrigation with 20ml 2.5% sodium-hypochlorite, 10ml saline were done for group (2) or further irrigation with 20ml 17%EDTA, 10ml saline for group (1). Then sample (B) was collected, bleeding was induced, and the tooth sealed. For group

(2) calcium hydroxide was placed for 1-2 weeks then removed and irrigation was done with 20ml 17% EDTA, 10ml saline, and finally sample (C) was collected before bleeding induction. Collected dentin-debris were placed in thioglycolate-broth, cultured, and examined by MALDI-TOF-MS. Cases were followed for 12months. Microbial reduction, absence of signs and symptoms, resolution of lesions and root development presented successful microbiological, clinical, and radiographic outcomes, respectively. The outcomes of both groups were compared statistically ( $p < 0.05$ ).  
**Results:** No statistically significant difference existed between the two protocols in clinical and microbial outcomes. Radiographically, group2 showed statistically significant decrease in lesions, increase in bone density, root development, and intracanal calcification presence. Group1 did not show complete lesion resolution. The clinical trial was prematurely terminated due to the COVID-19 pandemic. The post hoc power was 94.17% regarding decrease in lesion size.

**Conclusions:** Single-visit-regeneration-protocol showed similar clinical and microbiological outcomes as multiple-visit however, it failed to show complete healing of the periapical lesions.

#### IADR-OP-16-CONSERV-10 3798617

#### Metal - Ceramic Bond Strength Analysis of Cobalt Chromium Dental Alloy Fabricated By Three Different Techniques (In-Vitro Study)

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**Objectives:** was to compare the bond strength of porcelain to cobalt-chromium

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metal alloy fabricated by three different techniques and investigation of the failure mode by scanning electron microscope

**Methods:** Forty-two Co-Cr specimens (25mmx3mmx0.5mm) were prepared according to ISO 9693:1999 standards using three different techniques: selective laser sintering (group1, n=14), CAD-CAM milling (group2, n=14) and lost wax technique (group3, n=14). The metal bars were veneered by firing a porcelain layer on the center of each specimen (8mm length x3mm width x1.1mm thickness), metal ceramic bond strength was evaluated by a three-point bending test then each specimen was examined by Scanning electron microscope to evaluate the failure mode.

**Results:** The statistical analysis of the results showed highest bond strength values associated with laser sintering group 1 with Mean  $\pm$  SD of  $61.79 \pm 9.40$  which was statistically highly significant at  $P < 0.001$ . For CAD-CAM milled group 2, moderate bond strength values with Mean  $\pm$  SD of  $31.21 \pm 3.40$  which was statistically significant at  $P < 0.05$ . The specimens that were manufactured by casting technology group 3 showed the lowest bond strength values with Mean  $\pm$  SD of  $24.71 \pm 3.43$  which was statistically non-significant at  $p> 0.05$ .

**Conclusions:** The alloy fabricated by the Selective laser sintering technique can provide an acceptable metal– ceramic bond strength for clinical applications, comparable to CAD-CAM milling and traditional lost wax techniques.

#### IADR-OP-17-CONSERV-11 3799014

#### Marginal Integrity of Different Bulk Fill Application Techniques

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**Objectives:** The bulk fill resin based composite are claimed to offer clinical advantages as it offers a higher depth of cure 4mm or 5mm due to their high reactivity to light and at the same time shows a decline in internal stresses, and consequently leads to precise and accurate adaptation to the tooth substrate. This study is aimed at evaluating marginal integrity of different application techniques of posterior bulkfill composite resin by using scanning electron microscope before & after thermocycling.

**Methods:** Using a calibrated diamond bur under water cooling high-speed handpiece, class II cavities were prepared with parallel walls in forty non-carious extracted upper premolars. The overall dimensions were standardized as follows: 4 mm wide & 4 mm deep at the occlusal box, 4 mm wide & 2 mm axial depth at the proximal box & 5mm occluso-cervical length. Divided into 4 groups, corresponding to the different bulkfill application technique used ( $n = 10$ ). Test Group 1: 10 teeth were restored with sonicfill2 composite using sonic activation. Test Group 2: 10 teeth were restored with Tetric N Ceram bulk-fill composite utilizing the bulk fill technique. Test Group 3: 10 teeth were restored with Surefill SDR flow bulk composite + Tetric N Ceram capping material. Control Group 4: 10 teeth were restored with Tetric N Ceram composite utilizing the conventional layering technique. After the restorative procedures, finishing & polishing, the cavity margins were evaluated before and after Thermocycling by scanning electron microscopy.

**Results:** The marginal integrity of each wall (the mean & the median values) before and after thermocycling in the four groups were statistically analyzed using Kruskal Wallis test and multiple pairwise comparisons using Bonferroni adjusted significance

**Conclusions:** Sonically activated bulkfill composite restorations have better marginal

sealing in comparison with other bulkfill composites.

## IADR-OP-18-CONSERV-12 3809507

### In Vitro Evaluation of Filling Material Removal and Debris Extrusion after Retreatment Using Reciproc Blue, Hyflex EDM and ProTaper Retreatment Files

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**Objectives:** to evaluate the amount of remaining filing material and apical debris extrusion after retreatment using Reciproc Blue, Hyflex EDM and ProTaper Retreatment Files.

**Methods:** Thirty-six extracted permanent mandibular first molars with moderately curved mesial roots were selected. The mesiobuccal canal of each tooth was prepared using the ProTaper Next system up to size X2 and filled using gutta percha and ADseal sealer via cold lateral compaction. After two weeks, teeth were randomly divided into three equal groups ( $n=12$ ): Group 1: Reciproc Blue(RB)(VDW, Germany), Group 2: Hyflex EDM (HEDM)(Coltene/Whaledent, Switzerland), Group 3 : ProTaper Universal Retreatment file system+ ProTaper Next file system (PTUR+PTN)( Dentsply Maillefer, Switzerland). Pre-weighed eppendorf tubes were used to collect the apically extruded debris. Cone-beam computed tomographic scans were taken before and after retreatment

and the volume of remaining filling material was assessed at the coronal, middle and apical levels. Statistical analysis was performed using the Kruskal-Wallis test, Friedman's test and Wilcoxon Sign Rank test. Significance level was set at p value 0.05.

**Results:** There were no statistically significant differences among the three groups in the reduction of the volume of the filling material nor in the amount of apically extruded debris. Although there were no significant differences, the highest amount of residual filling material was found at the apical third with RB and HEDM and at the coronal third with PTUR+PTN whereas the middle third showed the least amount of filling material in all groups.

**Conclusions:** All the tested filing systems showed similar efficacy in removing the filling material, however, none of them was capable of achieving its complete removal. Apical extrusion of debris occurred with all the used systems with no significant difference between the three groups.

### IADR-OP-19-CONSERV-13 3800066

#### Immediate Loading of Four Interforaminal Implants Supporting Cantilevered Fixed Detachable Restoration with Either Axial or Tilted Distal Inclination Opposing Maxillary Complete Denture: Two-Year

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**Objectives:** To assess the radiographic and clinical outcomes of immediately loaded 4 axial implants versus 2 axial anterior and 2 tilted posterior implants placed in the mandibular interforaminal area to support fixed detachable restorations.

**Methods:** Adopting 80% power of the study in calculating sample size, 32 edentulous participants were randomly allocated to 2 equal groups. The control group received 2 anterior axial and 2 distal tilted implants while the test group received 4 axial implants in the mandibular interforaminal area. On the same day of surgery conversion technique for immediate loading was accomplished. Three months later, all participants received a screw-retained metal resin cantilevered mandibular restoration. A follow-up protocol of 12, and 24 months was scheduled to evaluate marginal bone level changes, modified gingival index, modified plaque index, peri-implant probing depth, and clinical attachment level.

**Results:** Implants were evaluated throughout 2 years. The clinical results revealed no statistically significant difference ( $P > .05$ ) between the studied groups regarding the marginal bone level changes, modified gingival index, modified plaque index scores, peri-implant probing depth, and clinical attachment level over the follow-up period.

**Conclusions:** Flapless guided surgery together with immediate loading of 4 implants, supporting a full-arch cantilevered screw-retained prosthesis in the edentulous mandible is a feasible treatment option, whether the distal implants are inclined or axially placed.

### IADR-OP-20-CONSERV-14 3803261

#### Evaluation of The Accuracy of Conventional and Digital Implant

## **Impression Techniques in Bilateral Distal Extension Cases.**

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**Objectives:** Objective; To compare the accuracy of conventional and digital implant level impression techniques using three-dimensional superimposition analysis for partially edentulous patients.

**Methods:** Methods; Eight patients who had missing all mandibular posterior teeth except first premolars were included in this study. In each patient, 4 implants were placed, 2 in each side to support 3 units screw retained zirconia restorations. Three months after implant placement, each patient underwent two implant level impression techniques ( $n=8$ ) for each technique: Conventional implant impressions CII (pick-up, splinted transfer), and digital implant impressions DII were taken with TRIOS 3 Shape intraoral optical scanner (IOS). After multiple verification procedures, master models obtained from conventional impressions were digitized using laboratory scanner. Standard tessellation language (STL) datasets obtained from conventional and digital workflow were imported to reverse engineering software (Geomagic control X, version 2018.1.1). Best fit algorithm was used for surface superimpositions, to assess the three-dimensional deviations of scan bodies in color coding map in  $\mu\text{m}$ . Inter-implant distances between centers of scan bodies were recorded in mm. Data were collected and statistically analyzed using independent t-test.

**Results:** Results; For conventional impressions, the mean differences of inter-implant distances for right and left side were  $15.83 \pm 2.59$  mm and  $14.45 \pm 1.46$  mm respectively, while for digital impressions

were  $15.74 \pm 2.59$  mm and  $14.37 \pm 1.55$  mm respectively. Mean of 3D deviation of scan bodies comparing CII and DII was  $13 \pm 0.02$   $\mu\text{m}$ . There is no significant differences were detected between them ( $P \geq 0.05$ ).

**Conclusions:** Conclusion; Within the limitations of this study, there is no significant difference in the accuracy between conventional and digital implant impressions.

## **IADR-OP-21-CONSERV-15 3800276**

### **Evaluation of Chemical Components Changes in Radicular Dentin After Different Final Surface**

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**Objectives:** After post-space preparation, a thick smear layer covers the dentin walls, which might interfere with the bonding of root-canal dentin. As a result, the post-space should be debrided before cementation. Some irrigants' by-products interfere with the polymerization of adhesive and dentin mineral content, while others stabilize mineral content without compromising the bulk of dentin properties. This study aimed to evaluate the effect of varying post-space dentin surface treatment methods by using sodium ascorbate SA, citric acid CA, and 970 diode laser DL on the EDX energy-dispersive X-ray spectroscopy of dentin composition after surface treatments.

**Methods:** Thirty-six mandibular second premolars were selected; endodontically treated and post-spaces were prepared. The root specimens were divided into four groups n=9/gp according to post-space dentin surface treatments performed; Control group (CL) received 5ml saline; Group (CA) was treated for 15s with 10%CA then 30s with distilled water; Group (SA) was treated with 20ml 10%SA for 10min then washed 30s with distilled water; Group (DL) 970 nm were irradiated to the specimens in continuous mode for 20s:1.5W output power, 20 Hz frequency, 238.85 J/cm<sup>2</sup>. Each specimen was sectioned longitudinally in a buccolingual direction into two halves. For each half, the elemental analysis of the following elements: C, O, Mg, Ca, and P were conducted on three points along the root canal, coronal, middle, and apical regions. The statistical analysis consisted of one-way ANOVA with post hoc Tukey honest significant differences test (P<0.05).

**Results:** Group CA showed significant mineral loss and changes in Ca, P, O, and Mg contents of root dentin (P<0.05) and an increase in C content compared with Groups CL, SA, and DL (P<0.05). SA and DL groups showed no significant changes in mineral content of Ca, P, O, and Mg (P>0.05) compared with the CL. Different root canal regions showed no difference in mineral content along the groups.

**Conclusions:** The chelation agent citric acid affected the mineral content of dentin. Antioxidant sodium ascorbate and diode laser did not affect dentin chemical composition.

**IADR-OP-22-CONSERV-16  
3810461**

**Accuracy of Cone Beam Computed Tomography and Digital Radiography Versus Clearing Technique in Detection of Confluent Canals In Mandibular Molars (In-Vitro Study)**

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**Objectives:** To compare the accuracy of digital periapical radiography (DPR) and cone beam computed tomography (CBCT) in detecting confluent canals in mandibular first and second molars versus the gold standard clearing technique.

**Methods:** This study was conducted on thirty-three extracted humans first and second mandibular molars (for periodontal reasons). All samples were inserted into a human cadaver's mandible, the teeth were mounted in the prepared alveolar sockets in the molar region to simulate a natural alignment and were fixed in the socket by wax. The teeth were scanned by CBCT and DPR from 0° and 20°mesial- and distal-tube shifts, then cleared and stained. All interpreted Data from DPR and CBCT were statistically compared with clearing technique by using Receiver operating curve analysis test (MedCalc Software Ltd. Version 20.115) and the statistical significance was set at (p<0.05).

**Results:** The statistical analysis showed that there was no significant difference between CBCT and the clearing technique (p= 0.12), while DPR with a statistically significant difference from the clearing technique (p <0.001). The overall diagnostic accuracy outcomes were significantly higher for CBCT than DPR (p <0.001). Sensitivity, specificity, Youden index, and AUC values were higher for CBCT than DPR. Sensitivity was 0.95 for CBCT compared to only 0.63 in case of DPR, and specificity was 0.98 and 0.87, for CBCT and DPR, respectively. DPR was able to correctly distinguish confluent canals in 63.2% of those identified by clearing method, compared to 94.7% correctly distinguished by CBCT.

**Conclusions:** CBCT has a greater accuracy in detection of confluent canals than DPR in mandibular molar teeth

**IADR-OP-23-CONSERV-17  
3806969**

**Comparative In-Vitro Study of the Effect of Different Mouthwashes on Color Stability of Class V Restorative Materials**

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**Objectives:** The aim of this study was to assess the effect of currently available mouthwashes on the color stability of esthetic restorative materials recommended for restoring Class V tooth defects (Activa Bioactive restorative material, resin composite, and resin-modified glass ionomer).

**Methods:** These materials (Activa Bioactive restorative material, resin composite, and resin-modified glass ionomer), along with natural teeth control, were exposed to four different types of mouthwash: Charcoal-whitening, 0.12% chlorhexidine, fluoride-containing, and alcohol-free essential oil. Ninety-six cylindrical specimens were prepared from the three restorative materials tested ( $n= 32$ ). Specimens and natural teeth were immersed in the different tested mouthwashes for 24 and 72 hours. The color change was assessed using both the CIELAB ( $\Delta E_{ab}$ ) and the CIEDE2000 ( $\Delta E_{00}$ ) formulas. Comparing the color coordinates and color change of the restorative materials and teeth control after immersion in the different mouthwashes was done using One-way ANOVA followed by multiple pairwise comparisons using Tukey post-hoc test. Comparison between color change at 24 and 72 hours for each material was done using

paired t-test. Data were analyzed using IBM SPSS software for Windows at  $p$ -value  $<0.05$ .

**Results:** In all the groups of mouthwashes tested, immersion for both 24 hours and 72 hours had a significant effect on the color change of the tested restorative materials and natural teeth ( $p=0.01$ -  $p<0.001$ ). The charcoal containing mouth wash demonstrated the most discoloration effect on the bioactive restorative and the resin-modified glass ionomer materials.

**Conclusions:** Following natural teeth, the resin-modified glass ionomer and the bioactive restorative materials showed the most color instability compared to the other tested esthetic restorative materials.

**IADR-OP-24-CONSERV-18  
3792517**

**Dentin Tubules Occlusion and Remineralization Potential of Eggshell and Seashell Nanoparticles as Monotherapy and Combined with Nd: YAG Laser.**

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**Objectives:** There is an interest in developing materials with a bioactive potential that could block the exposed dentinal tubules. This study compared the effects of eggshell and seashell nanoparticles individually or combined with ND:YAG laser on dentinal tubules occlusion and remineralization

**Methods:** Fifty radicular dentin discs were prepared from freshly extracted human premolars. The smear layer created by cutting was removed using 37% phosphoric acid gel for 15 sec. Discs were randomly divided into five groups according to the applied treatment ( $n=10$  each). Group (A1), received no surface treatment (control), group (A2): Eggshell, group (A3), Seashell, group (A4); Eggshell+ Neodymium-doped Yttrium Aluminum

Garnet Laser (Nd:YAG laser), group (A5); Seashell+Nd:YAG laser. Each specimen was evaluated for tubular patency and minerals content before and after each therapy using ESEM-EDXA energy dispersive spectroscopy for assessment of tubules occlusion and remineralization.

**Results:** ESEM results revealed a statistical significant decrease in the mean percent changes of dentinal tubules number after treatment with the experimental groups compared to the control. The greatest percent decrease recorded with Eggshell combined with Nd:YAG laser group, followed with combined therapy of Seashell and Nd:YAG laser, then monotherapy of Seashell, while the least decrease recorded with Eggshell group. EDXA revealed that, the greatest percentage increase in Ca wt % and Ca/P % was recorded in Eggshell+ Nd:YAG laser, followed by Eggshell only, then Seashell only, then Seashell NPs+ Nd:YAG laser, while the lowest percent increase was recorded in the control.

**Conclusions:** Both eggshell and seashell nanoparticles are effective in occluding and remineralization of dentinal tubules. The combined treatments with Nd:YAG laser had no benefits when compared to the effect of treatments alone.

## IADR-OP-25-CONSERV-19 3800489

### Effect of Thermal Tempering on the Marginal Adaptation of Heat Pressed Lithium Disilicates Crowns

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**Objectives:** To Evaluate the effect of two thermal tempering temperatures on marginal adaptation of different lithium silicate/disilicate crowns.

**Methods:** A prototype tooth was prepared using a computerized numerical control (CNC) milling machine to receive a full coverage all ceramic crown. Fifty-six wax patterns were milled and randomly allocated to four groups fourteen pattern each( $n=14$ ). Each group was heat pressed of a different all ceramic material. Lithium disilicates are (IPS e.max Press, Ivoclar Vivadent), High Density Micronization (HDM),(GC initial LiSi Press, GC), Zirconia reinforced lithium silicate/disilicate are (Celtra Press, Dentsply Sirona),(VITA Ambria, VITA Zahnfabrik). Each group was divided into two subgroups according to temperature of tempering cycle,-5%and-9%thermal tempering. The vertical marginal gap was evaluated by stereomicroscope. Three-way ANOVA test was used to study the effect of ceramic type,tempering, tempering procedures and their interactions on marginal gap distance. Bonferroni's post-hoc test was used for pairwise comparisons when ANOVA test is significant. The significance level was set at  $P\leq 0.05$ .Statistical analysis was performed.

**Results:** The results showed that ceramic type(regardless of tempering temperature and tempering procedures)had a statistically significant effect on mean marginal gap distance( $P$ -value<0.001,Effect size=0.974).Tempering temperature(regardless of ceramic type and tempering procedures) had a statistically significant effect on mean marginal gap distance( $P$ -value<0.001,Effect size=0.932).tempering procedures(regardless of ceramic type and tempering temperature)had a statistically significant effect on mean marginal gap distance( $P$ -value<0.001,Effect size=0.94).The interaction between the three variables had a statistically significant effect on mean marginal gap distance( $P$ -value<0.001,Effect size=0.976).

**Conclusions:** All groups showed clinically acceptable marginal gap<120 $\mu$ m except

Zirconia reinforced lithium silicate with -5%tempering. Zirconia reinforced lithium silicate showed the statistically significantly highest mean marginal gap distance after -5%tempering. 5%tempering cycle showed statistically significantly higher mean marginal gap distance than -9%tempering in all groups. All groups showed a statistically significant increase in mean marginal gap distance after tempering.

#### IADR-OP-26-CONSERV-20 3804687

#### Evaluating errors in the perception of minor translucency differences

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**Objectives:** To calculate the percentage of errors in ordering translucency samples with minor translucency differences

**Methods:** Seventeen translucent samples were fabricated with 4 translucency degrees (1,2,3, and 4) divided into four groups. The difference of translucency parameter between samples was (TP)= 2. Thirty participants were given the translucent samples and were asked to order them for each translucency pattern group according to the translucency degree. The samples in each group were randomly presented and each sample was marked with a specific letter. The participants were asked to order the samples using the marked letters from the one with highest translucency to the one of the lowest translucency. Error assessment was evaluated by calculating the total percentage of error among participants considering ordering translucency degrees. Then the percentage of error was calculated for each translucency degree.

**Results:** Percentage of error in ordering the samples according to translucency degree

was 57.4%. In regard to the translucency degree, the majority of errors was between adjacent degrees with a percentage of 47.1%. The percentage of inaccuracy in ranking non-adjacent degrees was 10.3%.

**Conclusions:** It was found that participants who were asked to order the tabs from highest to lowest translucency could clearly differentiate between higher translucency degrees (1,2) and lower translucency degrees (3,4). However, evaluating translucency degrees with smaller differences in the range of TP =2 was more confusing

#### IADR-OP-27-PEDO-1 3799865

#### Quantifying Clear Aligner Treatment Effects: Does the Digital Model Registration Software Make a Difference?

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**Objectives:** To compare the agreement of three digital model registration software packages in measuring angular and linear tooth movements obtained with Clear Aligner Treatment Therapy.

**Methods:** Thirty-two maxillary and mandibular intraoral pre-treatment (T1) and progress (T2) scans of patients undergoing clear aligner therapy were randomly selected, converted to STL files and exported to Geomagic, OrthoAnalyzer, and Compare model registration software packages. The amount of tooth movement of all maxillary and mandibular teeth was calculated in six degrees of freedom.

**Results:** The angular and linear change in tooth position between T1 and T2 was compared using three different digital model registration software packages. Continuous data was expressed as mean and standard deviation. Intra class Correlation Coefficient for agreement between software's was used. Significance of the obtained results was expressed at  $p \leq 0.01$ . Excellent agreement was found between Geomagic and Compare group for all movements except for good agreements for torque and occlusogingival movements. Both Geomagic and Compare versus OrthoAnalyzer groups showed good agreements for most movements, and poor agreements for mandibular torque and occlusogingival movements. Differences larger than 0.5 mm for linear measurements and 2 degrees for angular measurements were considered clinically relevant.

**Conclusions:** Geomagic and Compare group showed excellent to good agreements with each other, for all movements in comparison to the other groups evaluated which showed good to moderate or moderate to poor agreements. Torque and occluso-gingival movements were the only movements with poor agreements, exceeding the clinical threshold in the groups involving OrthoAnalyzer software.

## IADR-OP-28-PEDO-2

3798125

### Alt-RAMEC Protocol and Face-Mask for Treatment of Class 3 non-growing patients: Prospective clinical radiographic study

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**Objectives:** Treatment of Class 3 malocclusion is a challenge. It is best to treat it at growing stage. The objective of this study

is to evaluate the efficient of Maxillary protraction after the use of Alt-Ramec protocol for treatment of skeletal Class 3 non-growing patients.

**Methods:** Materials and methods: The sample consisted of 10 patients treated with alternate rapid maxillary expansions and constrictions (Alt-RAMEC) protocol and face-mask. CBCT assessment of skeletal changes analyzed at T0 (before the treatment) and T1 (after the treatment). The significant differences between T0 and T1 were assessed with paired t test ( $p < 0.05$ ).

**Results:** Results: Sagittal measurements of the maxilla SNA, ANB and Co-A showed significant improvements ( $p < 0.01$ ) with protraction of A-point. Significant improvements were recorded at overjet. Measures of the horizontal dimensions sutural, intermolar and intermaxillary widths recorded significant variations ( $p < 0.001$ ).

**Conclusions:** Conclusion: It is possible to open the circum-maxillary sutures with alternate palatal expansions and constrictions of the maxilla. Alt-RAMEC protocol induces an adequate distraction of sutures and to protract the midface complex in class 3 non-growing patients.

## IADR-OP-29-PEDO-3

3800375

### Class 2 treatment with fixed functional appliances; Are they orthopedic or camouflaging?

R. Abu-Shahba.

Orthodontics, Al-Azhar University, Egypt.

**Objectives:** This study aimed to compare skeletal and dental effects produced by MPA, Twin-Force and Powerscope fixed functional appliances in patients with class II malocclusion.

**Methods:** The study was conducted on 30 orthodontic patients with a mean age of  $15.39 \pm 1.25$  years old. They were randomly divided into 3 equal groups; Group 1: MPA group. Group 2: Twin-Force group. Group 3: Powerscope group. The patients had skeletal Class 2 of ANB angle greater than  $4^\circ$  due to the retrognathic mandible. Lateral cephalograms made before (T1) and after (T2) installation of the appliances. Paired t-test was used to study the changes after treatment. Intergroup comparison was performed with one-way ANOVA.

**Results:** The treated groups had similar dentoskeletal changes: backward rotation of the mandible; increase in lower anterior facial height; labial tipping and intrusion of the lower incisors; improvements of the maxillomandibular relationship, overjet, overbite, and molar relationship; and retrusion of the upper lip. The mandibular incisors exhibited greater protrusion in group 1 compared to the other groups. Twin-Force group presented mild protrusion of the lower lip, where groups 1 and 3 showed more protrusion.

**Conclusions:** (1) Fixed functional appliances provides an effective tool and showed similar changes in the treatment of Class II malocclusion. (2) the changes regarding three appliances were mainly dental with lesser skeletal effects. (3) The fixed functional appliances promote restriction of anterior maxillary displacement with significant forward mandibular repositioning that reduces skeletal convexity.

**IADR-OP-30-PEDO-4  
3800493**

**Comparison of The Effect of Two Skeletally Anchored Force Mechanics for Correction of Skeletal Class II Malocclusion in Growing Patients (A Randomized Controlled Clinical Trial)**

*Y. Mahmoud*

*Orthodontics, Alexandria University, Faculty of Dentistry, Alexandria, Egypt.*

**Objectives:** The purpose of this study is to evaluate the dental and skeletal growth changes in two groups of growing skeletal Class II patients treated by either pushing or pulling mechanics applied to bone anchored miniplates and compare the treatment effects to a matched control patient.

**Methods:** Thirty-nine growing patients (17 females, 22 males; mean age  $11.59 \pm 0.56$  years) with skeletal Class II malocclusion due to mandibular retrognathism were equally and randomly allocated into one of three groups. Group A, patients were treated by pushing force mechanics using Sabbagh Advanced Repositioning Appliance (SARA). Group B, patients were treated by pulling force mechanics using CS 2000 Class II correction spring (CS). In both groups (A and B), forces were applied to bimaxillary miniplates along the treatment time and stopped if the patient reached an edge-to-edge incisor relationship or after 9 months, whichever happened first. Group C (control) was observed with no interventions for 9 months to detect the natural growth changes. Pretreatment (T0) and posttreatment (T1) cone beam computed tomography scans (CBCT) were used for skeletal and dental measurements. Treatment changes were evaluated within each group, compared between the two groups (A and B) and in relation to the natural growth changes observed in group C.

**Results:** Relative to the control group, the effective mandibular length significantly increased by a mean difference of ( $5.38 \pm 2.5$  mm) and ( $7.31 \pm 2.5$  mm) in group A and B, respectively. A significant improvement in the skeletal sagittal relation was observed in both groups as the ANB angle decreased by ( $2.69$  degree) in group A and by ( $1.92$  degree) in group B. No significant changes were

observed in the axial inclination of the mandibular incisors in both groups.

**Conclusions:** The use of either pushing or pulling skeletally anchored force mechanics was effective in enhancing the effective mandibular length in growing Class II malocclusion patients with negligible dentoalveolar side effects.

#### IADR-OP-31-PEDO-5

3809283

#### Dental anxiety in cleft lip and palate patients

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<sup>1</sup> Cleft and Paediatric OMFS, Queen Elizabeth University Hospital, Glasgow, United Kingdom.

<sup>2</sup> Clinical Psychology, Glasgow Royal Infirmary, Glasgow, United Kingdom.

**Objectives:** Cleft lip and palate (CLP) patients may experience a number of health-related issues, including feeding, speech and hearing difficulties, dental and orthodontic problems. As a result, more dental treatment may be indicated, and psychological support may be required to help with dental anxiety. The literature was reviewed to determine whether a correlation exists between CLP patients and increased levels of dental anxiety and to establish the etiology.

**Methods:** Cochrane, Medline and PsycInfo databases were searched between 1999 and 2022 using the terms 'dental phobia', 'dental anxiety' and 'cleft lip and palate'. The search included articles that were freely accessible and published in English. Additional information was gained from the Cleft Lip and Palate Association (CLAPA) website.

**Results:** CLAPA recognizes the need for ongoing emotional support for CLP patients and addresses the possibility of this patient cohort suffering dental phobia. Studies show higher levels of dental anxiety in children with CLP

attributing this to increased exposure to medical interventions at an early age. A further study found a high proportion of CLP patients had anxiety over visiting a dentist. Dental anxiety in CLP patients was related to feelings of 'uncontrollability and unpredictability during dental procedures'. Interestingly, findings suggest levels of dental anxiety may gradually decline over time. Conversely, there is evidence to suggest the significant amount of treatment undergone by CLP patients may have a positive effect on dental anxiety as they become acclimatized to the environment. This finding was true for many patients who underwent orthodontic treatment. A questionnaire-based study found no significant differences in dental anxiety levels between adults with CLP and adults without.

**Conclusions:** Multiple studies have found the presence of dental anxiety in CLP patients, with varying opinions on the extent and etiology of it. Further studies are warranted to examine levels of dental anxiety in this group.

#### IADR-OP-32-PEDO-6

3799181:

#### Effect of low-level laser therapy on orthodontic miniscrew displacement (A randomized controlled clinical trial)

M. Elzoheiry.

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**Objectives:** Evaluating the effect of low-level laser therapy (LLLT) on miniscrew displacement and gingival inflammation around miniscrew.

**Methods:** Twenty-four buccal intra-alveolar miniscrews were inserted on right and left sides for maxillary canine retraction after 1st premolar extraction. The sides were

randomly allocated into experimental side; which received low level laser (LLL) application after miniscrew insertion and a control side which received no Laser application. Miniscrews on both sides were loaded with 150gm of force, 14 days after their insertion. Gingival inflammation around miniscrew was assessed using gingival index throughout the study period and miniscrew displacement was evaluated using CBCT after six months of active canine retraction.

**Results:** miniscrews showed displacement with no significant difference between control and experimental sides. LLLT successfully reduced gingival inflammation at miniscrew site, as evidenced by gingival index.

**Conclusions:** LLLT can be proposed as clinical procedures to add in success of miniscrews , however LLLT does not decrease miniscrew displacement .

## IADR-PP-1-SURG-1

3762807

### Botox injection For Gummy Smile Treatment using a standardized protocol: A 1-year Follow-up Study

N. Adel.

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**Objectives:** The present study was performed to evaluate the effect of repeated botulinum toxin injections and their long-term effects, using a customized injection point and dosage technique in the treatment of excessive gingival display.

**Methods:** Twenty women who had gummy smile due to hypermobility of the upper lip or excessive gingival display (4 - 6 mm ) were included in the study. All patients were injected with Botox injections at different injection points according to the type of smile. Pre- and postoperative measurements

were taken by measuring digitally the gingival display at smiling, using Adobe Photoshop software via standardized digital photographs. Patients were followed up at 14 days, 4 months, 8 months, and 12 months.

**Results:** Postoperative measurements showed marked improvement at 14-day follow-up, with a significant reduction in the amount of gingival display. Relapse, however, occurred at 4 months and later.

**Conclusions:** For excessive gingival display, Botox is an effective treatment that lasts for 2–3 months, with almost complete relapse at 4 months. We concluded from the results of our study that, despite repeated Botox injections at two follow-up intervals (4 and 8 months), the theory that repeated Botox injections may offer a permanent effect is still questionable.

## IADR-PP-2-CONSERV-1

3799975

### 3D Pulpal Cell Cultures Response to Silver Diamine Fluoride Therapy: An In Vitro Study.

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<sup>3</sup> Institute of Public Health and Clinical Nutrition, School of Medicine, University of Eastern Finland, Kuopio, Finland.

**Objectives:** Silver diamine fluoride is a non-invasive topically applied solution. It is an alkaline solution with a high concentration of fluoride and silver ions. SDF is easily applied, inexpensive, and highly effective in halting active carious lesions and preventing new ones from forming. This resulted in an increased interest in SDF and made it a trending treatment modality for the

management of carious lesions. Although SDF has an excellent safety record since it was introduced in the 1950s, recently many concerns have been raised regarding its safety and effect on dental pulp. Several in vitro studies have been published recently, in which SDF's cytotoxicity was tested and they showed that SDF is a highly toxic solution. The problem with these studies is that they have been performed in a 2D environment unlike the 3D environment in the human body. Moreover, the results of these studies contradict the results of the in vivo and ex vivo studies performed using SDF, which did not report any adverse side effects of SDF on the dental pulp cells. This study aimed to evaluate the effect of SDF treatment on dental pulp cells in a 3D culture in vitro model.

**Methods:** 3D spheres of dental pulp stem cells (DPSC) and human umbilical vein endothelial cells (HUVEC) with a ratio of 3:1 were formed using a low attachment agarose mold. Different concentrations of SDF were used (0.1%, 0.05%, 0.02%, 0.01%, 0.001%). Vitality was evaluated using a live/dead assay and CCK-8 assay. Quantitative evaluation of the levels of bone sialoprotein (BSP) and dentine sialophosphoprotein (DSPP) genes was done using real-time PCR.

**Results:** The results showed that the vitality increases in a linear trend following the decrease in concentrations with values similar to the control group.

**Conclusions:** 3D pulpal cell cultures are more suitable for evaluating the effect of SDF compared to conventional 2D cultures.

**IADR-PP-3-CONSERV-2  
3798721**

### **Can a Toxin Treat Temporomandibular Disorders? A Randomized clinical Trial**

*M. M. Bahgat, N. A. Rady, A. M. Abdel-Hamid*

*Alexandria University, Alexandria, Egypt.*

**Objectives:** This clinical study was done to investigate the effect of intra-muscular injection of Botulinum toxin type A (BTX-A) in the lateral pterygoid muscle (LPM) as a promising treatment modality in comparison to anterior repositioning appliance (ARA) in the management of patients with painful click of the temporomandibular joint (TMJ) associated with symptomatic disc displacement with reduction (DDR).

**Methods:** Eighteen patients diagnosed as RDC/TMD Axis I group IIa indicating DDR and confirmed by MRI were enrolled in the study. Patients were randomly assigned into two groups; 9 patients in each. Control group received ARA while the study group received BTX-A. Clinical evaluation of symptoms was done through Helkimo Anamnestic index (Ai), and visual analogue scale (VAS) to assess pain level. LPM activity was measured by electromyography (EMG). The evaluation was done before as well as 3 months after the treatment. Time needed for relief of symptoms was noted in days.

**Results:** At 3 months follow-up, a significant relief in symptoms was observed and recorded by Ai in both groups ( $P=0.006$ ). Moreover, both groups showed a significant reduction in pain assessed by VAS ( $P=0.007$ ). Although, there was no significant difference between the studied groups regarding Ai and VAS ( $P=0.436$  and  $P=0.160$ , respectively), a significant difference was noted in the reduction of LPM activity ( $P=0.001$ ). Furthermore, the time needed for recovery was less in BTX-A group (mean, 6.1; SD, 4.6) than that in ARA group (mean, 14.1; SD, 2.8) with a significant difference ( $p<0.001$ ).

**Conclusions:** BTX-A could be considered an effective modality in managing patients with symptomatic DDR as it renders a quick relief in symptoms with reduction in TMJ pain and clicking.



# 5<sup>th</sup> International Congress of the EPDA

## Abstracts of Oral and Poster presentations

**EPDA-OP-1****The Un-Approached dimension of behavior management**

*M. Zayed*

*Lecturer of Pediatric Dentistry - Ain shams University.*

*Member of The International Association of Pediatric Dentistry.*

What literature narrates about behavior management has always been revolving around the kids, parents, and the environment. The pediatric dentist has always been missing in the formula. Our research/presentation will highlight the importance of a dentist's psychological well-being and the importance of this in the success of behavior management.

**EPDA-OP-2****New Answers for an old Question: Can we save abscessed primary Teeth?**

*A. F. Rady*

*BDS, MSc, PhD*

*Consultant pediatric dentist*

*Lecturer at pediatric dentistry, faculty of dentistry, ERU, Egypt*

*Secretary general & board member of the Egyptian society for pediatric dentistry & children with special needs ESPSN*

One of the most common challenges faced daily by the pediatric dentists in the clinic is when trying to save and manage carious primary teeth with severe coronal destruction and non-vital pulps with an abscess. Treating those primary teeth is a debatable issue between dentists over years. Many dentists follow the old myths in the practice suggesting that such badly decayed and abscessed primary teeth should be prematurely lost and extracted. However, due to

improvements and new levels of innovations in dentistry, new facts and realities have been raised in the practice aimed to save and restore those teeth to its previous function and esthetics. Many authors have reported the clinical success of non-vital primary pulp therapy techniques. The success of a pulpectomy procedure mainly depends upon proper cleaning and removal of necrotic tissues by mechanical preparation of the root canal systems and chemical irrigation. The unpredictability and difficulty of root canal morphology adds to a clinician's challenge. The introduction of rotary endodontics in pediatric dentistry nowadays allows faster procedures with more predictable uniformed results.

**EPDA-OP-3****Caries prevention , detection, and management in patients with ectodermal dysplasia**

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<sup>1</sup> Senior consultant in Meyer Children Hospital, Florence Italy.

<sup>2</sup> Pediatric Dentistry Department- Pharos University in Alexandria (PUA) , Alexandria, Egypt.

Ectodermal dysplasia (ED) syndromes are a heterogenous group of inherited diseases characterized by abnormal development of tissues of ectodermal origin. X linked hypohidrotic ED (HED) is the most commonly occurring form of EDs that is characterized by the triad of oligo/anodontia, hypotrichosis and hypo-anhydrosis. Oligo/anodontia leads to compromised chewing and swallowing abilities, esthetics, speech and social relations . Prosthetic rehabilitation at an early age is essential to improve oral functions and reduce social impairment.

**EPDA-OP-4**

## Prefabricated zirconia crowns as a new modality for treatment of permanent hypomineralized molars in children and adolescent

*J. Sabbarini.*

*Lecturer in Jordan University of Science and Technology (JUST) Irbid-Jordan.*

The presence of carious lesions in permanent molars of children and adolescence associated with developmental defects of enamel is frequently observed, restoring these affected teeth can be a challenge for the clinician. Teeth with enamel defects may have poor or limited resin adhesion and some may require repeated restoration. Molar-incisor hypomineralization is defined as a demarcated qualitative defect of the enamel affecting the first permanent molars and often the permanent incisors. The clinical features of MIH in molars are enamel lesions with severe mineral deficit and rapid posteruptive enamel breakdown (PEB) can occur. Prefabricated zirconia permanent molar crowns were recently introduced as an option for restoring severely decayed and broken down young permanent molars. These new restorations offer an efficient, esthetic, and economic option to restore severely broken down carious permanent molars that may be associated with enamel defects in partially or fully erupted molars.

Furthermore, prefabricated zirconia permanent molar crowns provide an esthetic, full-coverage solution to using stainless steel crowns for (MIH). Patients have an esthetically pleasing option considering the sensitive nature of children, and low self-esteem problems. It's also built to last throughout their developmental stages of life from early childhood to growing up as young adults. Moreover, introduction of prefabricated permanent zirconia crowns and adhesive systems in dentistry offers a new reconstructive alternative for severely destroyed teeth. Providing pleasing esthetics and a comfortable functional restoration that increases the confidence of both children and parents in dental management. Prefabricated zirconia crowns hold promise as a clinically and economically viable alternative for restoring

permanent molars affected by enamel defects, tooth decay, and molar incisor hypomineralization.

## EPDA-OP-5

### What should we know before we treat children with ASD

*E. Murshid.*

*Professor and Consultant of Pediatric Dentistry at King Saud University, Riyadh. Kingdom of Saudi Arabia*

Autism Spectrum Disorder (ASD) is a broad term used to define a multiple neuro-developmental disorder that affects children as early as 2-3 years of age. Children and young people with ASD frequently experience a range of cognitive (thinking), learning, emotional and behavioral disorders. The majority, they have attention deficit hyperactivity disorder (ADHD), anxiety, seizures, mental and social deficiencies with extremely poor Oral Hygiene and underserved dental services. Treating patients with ASD considered one of the greatest challenges for dentists in general and pediatric dentists in specific. This lecture will provide the general practitioner in Dentistry, the undergraduate, post graduate students, dental assistant, and other health care providers guidelines in preparing the dental team and children with ASD to the dental visits.

## EPDA-OP-6

### Changes in Sugar Intake and Caries Experience: A 15 Year Natural Experiment

*A. Arheiam.*

*Associate Professor in Preventive Dentistry and Dental Public Health, University of Benghazi, Libya*

Reducing sugar consumption has received much attention in recent years as an essential preventive measure to reduce the risk of dental caries and

obesity. However, most of the evidence supporting this recommendation has come from industrialised countries with fewer data published from low- and middle-income countries. In this presentation, the findings of a natural experiment linking sugar intake and caries prevalence at the population level in Libya will be presented. Over the past fifteen years, three consecutive surveys of caries experience and sugar consumption at the population level were carried out. The findings of the first two surveys conducted before and during the conflict in Libya were published and suggested decreased caries levels as sugar consumption decreased. The present study will present and compare the findings of the third survey conducted after the conflict in 2022.

#### **EPDA-OP-7**

#### **Management of Impacted Teeth Made Easy, Thinking Outside the Box**

*N. M. Helal.*

*BDS, CAGS(ortho), CAGS (pedo), FRCDC, MPH, ABO, FAAPD, Consultant of Orthodontics, Consultant of pediatric Dentistry, Assistant Professor in Pediatric Dentistry, King Abdulaziz University.*

The developing dentition is of a great importance on the well-being of children. One of the main reasons of impactions is the presence of supernumerary teeth which can affect the developing teeth greatly like preventing timely eruption of primary or permanent teeth. In this lecture we will discuss management of supernumeraries and different reasons of impaction. Furthermore, cases of variable types of impactions will be displayed and their management in the mixed dentition.

#### **EPDA-OP-8**

#### **Super-composite: Welcome to the future!**

*G.Y. Bhadila.*

*BDS, CAGS, MS, PhD, Diplomate, American Board of Pediatric Dentistry, Assistant Professor*

*and Consultant in Pediatric Dentistry, King Abdulaziz University*

Recurrent dental caries is one of the main reasons for resin composite restoration failures. Besides, polymerization shrinkage stress may lead to marginal damage, microleakage and subsequently failure of composite restorations. It is highly desirable to design new dental composites with antibacterial and remineralizing agents aiming to protect tooth structure. In this lecture, we will discuss a newly developed bioactive nanocomposite with strong antibacterial and ion-recharge capabilities and evaluate its long-term Ca and P ion recharge; and a low-shrinkage-stress (LSS) nanocomposite with antibacterial and remineralization capabilities to reduce marginal enamel and dentin demineralization under recurrent caries biofilm-model. We will also discuss the effects of the new composites on biofilm inhibition, mechanical properties, shrinkage stress, degree of conversion, and Ca and P ion releases. These two newly developed nanocomposites are promising to inhibit recurrent caries and protect tooth structure. The novel combination of LSS with remineralization and antibacterial properties are promising to have a wide applicability in other dental materials such fissure sealants and flowable composites to decrease the shrinkage stress associated with marginal gaps, inhibit biofilms, remineralize tooth lesions, and thereby minimize secondary caries.

#### **EPDA-OP-9**

#### **Oral rehabilitation for Iraqi children affected with ectodermal dysplasia**

*D. A. Aldulayme<sup>1</sup>, M. R. Alkhannaq<sup>2</sup>.*

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Ectodermal dysplasia (ED) represented a group of inherited conditions characterized by aplasia or dysplasia of two or more ectodermal derived anatomical structures such as hair, nails, teeth, sebaceous, and sweat glands. Two clinical forms have been described Hypohidrotic and hidrotic type, depending upon the function of the sweat gland. Also, Trichosis or hypotrichosis, heat intolerance, and dystrophic nails are observed. This medical illness is with psychosocial impact on children and parents. The oral findings of ED are often significant and can include multiple tooth anomalies (such as anodontia and hypodontia) and lack of normal alveolar ridge development. In many cases, individuals affected with ED shows severe dental abnormalities, that require the consultation of the orthodontist and the prosthodontist in the clinical management. In this lecture, we will demonstrate the descriptive statistics of about (25) clinical cases of Iraqi children from Baghdad city diagnosed affected by ectodermal dysplasia with different treatment approaches either by orthodontic or prosthodontic appliances. The importance of early pedodontics, orthodontic and prosthetic managements to rehabilitate these children with ectodermal dysplasia provides a considerable improvement in their oral functions as well as psychological conditions.

## **EPDA-OP-10**

### **Clinical Outcomes of Vital Pulp Therapy: An Interplay Across Inflammation and Regeneration**

*Y. Elhamouly*

*BDS, MSc, PhD, Faculty of Dentistry, Alexandria University, Egypt*

*Lecturer of Pediatric Dentistry, Department of Pediatric and Community Dentistry, Faculty of Dentistry, Pharos University in Alexandria, Egypt*

Dental pulp is a unique tissue and its importance in the long-term prognosis of the tooth is often ignored by clinicians. The pulp initially responds to caries and irritation by becoming inflamed and,

if left untreated, this will progress to pulp necrosis and infection. Over the past decade, there has been an alteration in the conception of executing the inflamed pulp. Advancement in the regenerative materials have made preservation of the pulp a paramount conception of the routine vital pulp therapy strategies. However, the fact that the dental pulp has a restrict regeneration capacity by being engaged within the rigid mineralized tissue bounces numerous challenges. This is further complicated by the anatomical, physiological, and biological differences between the primary and the permanent dental pulps. Clinicians must have a thorough understanding of the physiological and pathological features of the dental pulp as well as the biological consequences of treatment intervention. This presentation will provide an overview of: a) the current status of the vital pulp therapy, b) the role of inflammation in dentin-pulp complex healing and repair, c) how pulp capping materials can modulate the balance between inflammation and regeneration by promoting an anti-inflammatory environment conducive to a regenerative process.

## **EPDA-OP-11**

### **KISS interceptive orthodontics!!! Keep it simple and smart**

*A. A. Elkhatib<sup>1</sup>, A. M. Gad<sup>2</sup>.*

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<sup>2</sup> *Lecturer of orthodontics, faculty of oral and dental medicine, Kafrelsheikh University.*

Developing malocclusions are like mathematics; a simple problem but it might get complicated. Successful orthodontic care starts by assessing the developing occlusion during routine dental visit and address intervention at early stages. The role of pediatric dentistry begins during the late deciduous dentition phase, since skeletal and functional discrepancies could be identified. Pediatric dentists must weigh between the relative merits and demerits of early treatment in the management of malocclusion and growth-related

issues considering the long-term subsequence of cases left untreated. The best timing of orthodontic intervention has always been a contentious debate for many years. It is either early as interceptive procedures or late as corrective procedures. Interceptive orthodontics aims to address a developing malocclusion while preventing skeletal discrepancies and crowding. One of the crucial roles of pediatric dentists is to interevent early about orthodontic problems to avoid incorrect craniofacial development and minimize the complexity and shorten the duration of corrective orthodontic treatment if further required.

### **EPDA-PP-1**

#### **Comparison of the Remineralizing Effect of Brushing with Aloe Vera Versus Fluoride Toothpaste**

*T. El Haddad.*

*Master of Science in Pediatric Dentistry from Saint Joseph University, Lebanon.*

**Objectives:** Recently, some controversies on Fluoride (F) administration started to occur, and natural alternatives seem essential. Aloe Vera (A.V) is proposed. Studies have suggested its ability to prevent cariogenic bacteria. But so far, none has proven its effect on dental remineralization. The objective of this study is to compare *in vitro* the remineralizing effect of manual brushing with three toothpastes and the A.V gel.

**Methods:** Forty sound extracted teeth were collected and placed in demineralizing solution for 4 days to produce lesions. The samples were randomly assigned to four groups: Group A: 1450 ppm F toothpaste, Group B: Aloe Vera toothpaste non-fluoridated, Group C: 1000 ppm F, A.V toothpaste, Group D: A.V gel. A pH-cycling for 12 days was done. Each included a three minutes' application, twice a day with one of the four treatments. Specimens were analyzed before and after by scanning electron microscopy. The percentage of Calcium (Ca) and Phosphorus (P) were evaluated as well as Ca/P ratio.

**Results:** Following remineralization, the Ca:P ratio increased in all groups. The difference of the Ca:P ratio was not significant between groups C, D and A. The mean ratio was significantly lower in group B (-p-value = 0.026).

**Conclusion/Discussion:** A.V gel demonstrated a remineralization capacity equal to that of the 1,450-ppm fluoride toothpaste, apart from its benefits in reducing the overexposure of the public to fluoride and its side effects. In contrast, fluoride-free AV toothpaste showed a lower remineralization efficiency. Further studies are required to understand its mechanism.

**Keywords:** Aloe Vera, preventive dentistry, fluoride, remineralization, toothpaste, SEM-EDX

### **EPDA-PP-2**

#### **The Finite Element Method and its Application in Dentistry**

*M. A. Bayoumi.*

*Lecturer at Pediatric Dentistry Department, Faculty of Dentistry, PUA*

**Background:** The finite Element Method (FEM) is a numerical method that is used to solve problems in engineering and mathematical physics. It has been introduced to the dental field and has been used in different dental specialties for the reason of scientific research.

**Purpose:** The purpose of this presentation will be to understand the FEM and how it is used in different research fields including its application in dentistry.

### **EPDA-PP-3**

#### **Effect of Toothpaste Containing Novamin on Streptococcus Mutans Count In Dental Plaque Of High Caries Risk Children (Randomized Controlled Clinical Trial)**

*B. E. Mohamed<sup>1</sup>, A. A. Sharaf<sup>1</sup>, D. M. Talaat<sup>1</sup>, A. S. Zakaria<sup>2</sup>.*

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<sup>2</sup> *Microbiology and Immunology, Microbiology and Immunology Department, Faculty of Pharmacy, Alexandria University, Egypt.*

**Introduction:** Inhibition of *Streptococcus mutans* (*S.mutans*) can be effective in preventing caries in high caries risk children. Therefore, new materials such as Novamin, with antibacterial properties and remineralizing effects, have been introduced to promote remineralization and decrease the incidence of dental caries in children.

**OBJECTIVE:** To evaluate the antibacterial effect of toothpaste containing Novamin on *S.mutans* counts in the plaque of high caries risk children compared to that containing Fluoride.

**Materials And Methods:** Thirty-four high caries risk children, aged 3 to 6 years, were randomly divided into two groups. Test group (children used Novamin-containing toothpaste), and control group (children used Fluoride-containing toothpaste). Teeth were brushed twice daily. Plaque samples were collected at baseline and at intervals of 1, 2, and 4 weeks, and cultured on Mitis Salivarius Agar. The percent change in *S.mutans* counts was calculated for each group. Comparisons between the groups were done using the Mann-Whitney U test

**Results:** Data showed a statistically significant reduction in *S.mutans* counts in the two study groups when compared to baseline, with the most significant reduction recorded after four weeks of using the toothpaste ( $P < 0.0001$ ). However, when the two groups were compared, the test group exhibited a higher percent reduction in *S.mutans* levels than the control group (50.71% and 36.18%, respectively).

**Conclusion:** Novamin-containing toothpaste was shown to be an effective antimicrobial agent, with a better effect than Fluoride-containing toothpaste in *S.mutans* counts reduction.

**Keywords:** Novamin, *Streptococcus mutans*, high caries risk.

**EPDA-PP-4**

## **Management of Subluxation in Mixed Dentition and Avulsion of primary tooth: A five-year follow-up**

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*North Jeddah Specialty Dental Centre, Jeddah, Saudi Arabia*

**Abstract:** Traumatic Dental injuries occur in a wide range affecting school-aged children with increasing incidence. Luxation injuries was reported to be the second most common dental trauma for permanent dentition. An 8-year-old male patient presented in our clinic with trauma in upper maxillary anterior teeth. Examination and clinical evaluation revealed intrusive luxation, subluxation and avulsion of primary lateral with laceration in the mucosa. First visit examination, radiographic evaluation, photos and splint was placed. After one week patient came back only for follow up and to check the healing of mucosa. 3 week follow up, removal of splint, radiographic evaluation and cold test was preformed and thereafter follow up for five years.

**Objective:** The aim of this case report is to display the long-term approach in management and evaluation of a traumatic dental injury with a follow up of five years.

**Introduction:** Traumatic Dental injuries occur in a wide range affecting school-aged children with increasing incidence. Luxation injuries was reported to be the second most common dental trauma for permanent dentition. (1)

Management of this age group differ then others, due to continuation of growth and presence of immature teeth Dentoalveolar fraction increases the risk of pulp necrosis and infection especially in teeth that were subjected to concussion or subluxation injury with immature root development. (2,3)

The intrusive luxation causes severe damage to the tooth, periodontium and pulp tissue. Recovery of the tooth and healing usually include pulp canal obliteration, ankylosis, bone loss, root resorption and pulp necrosis.

**Materials and Methods:** 8-year-old healthy male patient presented to our clinic after a dentoalveolar trauma. Father stated that he fell on

his teeth three hours ago while playing. Parent came immediately to our clinic after being notified. Emergency treatment was preformed, evaluation of soft tissue and hard tissue revealed laceration of mucosa related to tooth #22. Hard tissue evaluation showed #11 intrusive luxation, #21 subluxation and avulsion of #62. Radiograph confirmed intrusion. Flexible splint was placed. Two week follow up: Removal of splint, Occlusal radiograph was taken all was in normal limit. Three month follow up: Radiographic and clinical evaluation reveled spontaneous re-eruption of tooth #11 and continuous eruption of tooth #22. Six-month evaluation showed normal Radiographic finding of Teeth #11,21. Diagnostic testing using percussion showed normal results on teeth #11,21 and fully erupted tooth #22. After one year, Clinical and radiographic assessment showed: Teeth #11,21,22 showed to have a +ve cold test response. Radiographically teeth #11,21 had continuation of root formation.

Five year follow up. Clinically teeth #11,21 pulp test was preformed and showed +ve response with cold test. Radiographically: PA and occlusal x-ray taken and showed closure and complete root formation of teeth #11,21,22. CT cone beam x-ray was also taken to make sure that tooth #11 did not need any root canal treatment, all was in normal limits

**Result:** Continuous re-eruption of tooth #11, Complete root formation of teeth #11,21, Positive pulp response of teeth #11,21, and Due to parent and patient cooperation proper treatment and follow up were conducted.

**Conclusion:** The highest incident of trauma occurred in boys more than girls, more commonly affecting upper anterior teeth. This case showed that Intrusive subluxation and luxation type of trauma will not usually end up having pulpal necrosis and with proper followed up in timely manner, early diagnosis and treatment it will favor a good prognosis.

## EPDA-PP-5

### Case report of Scleroderma in Saudi Arabia with dental follow up

H. Bangar.

**Objectives:** Introduction Scleroderma, or systemic sclerosis, is a chronic connective tissue disease generally classified as one of the autoimmune rheumatic diseases. The word "scleroderma" comes from two Greek words: "sclero" meaning hard, and "derma" meaning skin. Hardening of the skin is one of the most visible manifestations of the disease. This case just to raise up some dental and medical conditions associated with Scleroderma since its rare condition.

**Methods:** 5 years old Saudi girls present to my clinic referred from Tabuk diagnose with scleroderma ,she is on chemotherapy monthly (Methotrexate) complaining of multiple dental problems . Patient was referred back to paediatric dermatologist for evaluation, clearance and admission under their care for dental rehabilitation under general anaesthesia.

**Results:** The symptoms of scleroderma depend on the type of scleroderma present and the extent of external and internal involvement in the individual affected. Because scleroderma can involve the skin, esophagus, blood vessels, kidneys, lungs, blood pressure, and bowels.

**Conclusion/Discussion:** People living with scleroderma face unique challenges while trying to maintain their oral health. They are more likely to be affected by dental conditions such as small mouth, dry mouth, jaw pain, gum disease, and dietary issues. Many people living with scleroderma have hand involvement, making it difficult to brush and floss.

**Keywords:** Scleroderma, dental management

## EPDA-PP-6

### Cone-Beam Computed Tomography study of the root canal morphology of Tunisian permanent molars

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University of Monastir

**Objectives:** To investigate the number of roots and the canal morphology of maxillary and

mandibular molars in a Tunisian subpopulation by retrospective analysis of cone-beam computed tomography (CBCT) images.

**Methods:** A total of 400 between maxillary and mandibular permanent molars were examined. The number of roots, the number of canals per root and the canal configuration were recorded. Vertucci's classification for root-canal configurations was utilized.

**Results:** The majority of first and second maxillary molars showed 3 roots (99%, 86% respectively). In maxillary molars with 3 roots, all distobuccal and palatal roots had Vertucci Type I configurations, except one distobuccal root with 2 canals. However, mesiobuccal root of the maxillary first and second molars which had more than one root canal were found in 46.5% and 25.6% of the cases, respectively. At the mandible, the majority of first and second molars showed two roots (99%, 90%). In mandibular molars with 2 roots, mesial roots with more than one canal were present in 96% of the first molars and 71% of the second molars (Vertucci Type IV configurations was the most common) and distal roots presented in most cases a single canal. All mandibular molars with a single root were second molars and had a single canal. Radix entomolaris and paramolaris were rare occurrences (3%) and the additional root had a single canal.

**Conclusion/Discussion:** A greater variability in root canal configuration was found in the maxillary and mandibular second molar. Prior knowledge of these anatomic variations is beneficial for the success of root canal treatment.

**Keywords:** Cone-Beam Computed Tomography, Anatomy, Morphology, Root Canal, Root Canal Morphology, Canal Configuration, Root Canal Treatment, Number of Root Canals, Number of Roots

## EPDA-PP-7

### Clinical Evaluation of Complete Digital Workflow Ceramic Overlays in Treatment of Children with Molar Incisor Hypomineralization

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## Tanta University

**Objectives:** Pediatric Dentists frequently encounter challenges in management of first permanent molars with MIH such as PEB, active growth phase, inconclusive occlusal contacts and wide pulp chambers with prominent pulp horns. The previous led to poor compliance, defective anesthesia and restoration adhesion problems.  
**Objectives:** Evaluation of complete digital workflow lithium disilicate glass ceramic overlay in treatment of MIH molars in children.

**Methods:** This split mouth randomized clinical trial compared full digital workflow lithium disilicate glass ceramic overlay to the same workflow indirect CAD-CAM resin overlay in treatment of MIH molars in 12 children aged between 8-13 years with total of 24 first permanent molars into two groups. These MIH vital molars fell in the array of index 2 and 4 where the entire carious and hypomineralized enamel was removed with uniform reduction with final shoulder margin on sound enamel to receive the overlays.

**Results:** Both groups were assessed according to USPHS criteria of evaluation on 3 months interval for 9 months where the lithium disilicate glass ceramic overlay group showed 100% cumulative survival with consistent retention and anatomic form results as well as complete absence of pain and hypersensitivity at 9 months. No significant difference between both groups except for the anatomic form where significant difference was found in favor of lithium disilicate glass ceramic group.

**Conclusion/Discussion:** Overlays serve as esthetic, conservative and long-term treatment option with digital dentistry incorporation in every aspect of dentistry nowadays to obtain accurate and quick delivery of the restorations with both groups behaved in a clinically acceptable performance

**Keywords:** Molar Incisor Hypomineralization, MIH, Post eruptive breakdowns, PEB, United states Public Health Services, USPHS

## EPDA-PP-8

**Effectiveness of nanofilled glass ionomer cement in class II restorations in primary molars (a randomized controlled clinical trial)**

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<sup>2</sup> pediatric dentistry and dental public health, Alexandria University.

**Objectives:** To evaluate clinically the effectiveness of nanofilled glass ionomer cement (glass carbomer, ketac N) in class II restorations in primary molars in comparison to conventional glass ionomer Equia fill

**Methods:** This randomized controlled clinical trial included a sample of 117 children where selected having class II carious primary molars scoring 3,4 or 5 using ICDAS II, 3 groups randomly allocated and clinical evaluation was performed at baseline, 6 and 12 months

**Results:** Nano filled GICs showed significant higher retention rate and durability than conventional GIC, regarding the effect of restorations on periodontal health there were statistically significant difference between the three study groups at baseline and 6 months  $p<0.0001$ .

**Conclusion/Discussion:** \*Nanofilled GICs were more effective than conventional GIC Equia fill in restoring class II cavities in primary molars when followed up for 12 months \*Ketac N GIC showed better durability than glass carbomer cement after 12 months follow up in restoring class II cavities in primary molars \*Nano filled GICs showed better effect on periodontal health than conventional GIC at baseline and 6 months follow up.

**Keywords:** Glass carbomer cement, fluoroapatite, conventional glass ionomer wear, retention, periodontium, nanofillers

**EPDA-PP-9**

**Evaluation Of Fluoride Release and Uptake Ability Of Bioactive Restorations In Primary Dentition (In Vitro Study)**

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<sup>1</sup> Pharos University(Alexandria).

<sup>2</sup> Alexandria University.

**Background:** Fluoride-releasing restorative materials act as fluoride reservoirs, releasing fluoride to surrounding tooth structures and absorbing fluoride from the environment.

**Objective:** To evaluate Calcium(Ca) and Phosphorus(P) elemental content, fluoride release and uptake ability of Activa bioactive (Pulpdent).

**Methods:** Materials and methods: Forty-four non-caries deciduous canines were included in the study and pH -cycled for 15 days. Teeth were divided into two subgroups (n=22 each) Group I: Teeth were restored using Activa bioactive, Group II: Teeth were restored using Fuji II LC. Each group was divided into two subgroups. Subgroup A (n=11) where Fluoride release of each restoration was recorded on 1st,2nd,7th and 15th day using ion selective fluorine electrode and elemental analysis was measured using Energy Dispersive X-ray (EDX). Subgroup B (n=11) where enamel fluoride uptake before and after restoration using acid etch biopsies was recorded.

**Results:** Results: Fuji II LC released more fluoride than ACTIVA™ with a statistically significant difference ( $P\leq 0.0001$ ). EDX analysis showed statistically significant higher Ca and P elemental content in ACTIVA™ subgroup. Fluoride uptake showed a statistically significant difference between the 2 subgroups where group Fuji II LC showed higher fluoride uptake( $P\leq 0.0001$ ).

**Conclusion/Discussion:** Conclusion: The Fuji II LC was considered to be the material with highest fluoride release and uptake potential while ACTIVA™ showed higher Ca and P elemental content

**Keywords:** Fluoride, Bioactive glass, Resin-modified glass-ionomer, Energy dispersive x-ray, fluoride release , flouride uptake

**EPDA-PP-10**

**Comparative effect of Nanosilver fluoride and silver diamine fluoride on the ultrastructure of demineralized dentin (in-vitro study)**

*Y. M. Anwar, A. G. Hanno, K. M. L. Dowidar, S. S. Omar.*

*Alexandria University*

**Objectives:** To evaluate and compare the surface topographic changes of the residual carious dentin treated with nano-silver fluoride (NSF) and silver diamine fluoride (SDF) in primary molars.

**Methods:** Standardized Class V cavities were prepared on the buccal surface of 40 extracted or exfoliated caries free primary molars. The buccal surface of teeth was coated with nail varnish except the inside of the cavities. Teeth were randomly divided into 5 groups and all groups were subjected to pH cycles for 14 days to induce dentin demineralization except group I. The randomly divided groups were group I (normal dentin), group II (demineralized dentin), group III: (5% NSF cavity treatment and restored with glass ionomer restoration (GIC), group IV (38% SDF cavity treatment and restored with GIC) and group V (GIC restoration without cavity treatment). Cavity treatment and restoration were done for groups III, IV and V, and were separately stored in artificial saliva for 14 days. The teeth in all groups were prepared for scanning electron microscope analysis of the surface topography of dentin. 4 specimens from each group were cut longitudinally and 4 specimens were cut transversely to study the cross-sectional features of dentinal tubules.

**Results:** NSF and GIC caused mild to moderate changes in dentin ultrastructure whereas SDF caused distortion of dentin ultrastructure.

**Conclusion/Discussion:** NSF could be an alternative to SDF without causing the black staining of dental tissue.

**Keywords:** Nanosilver Fluoride, Silver Diamine fluoride, Glass ionomer cement, Atraumatic restorative treatment, Dentin

**EPDA-PP-11**

**Oral Manifestation and Treatment of Congenital Insensitivity to Pain with Anhidrosis, A Case Report**

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**Introduction:** Congenital insensitivity to pain with anhidrosis (CIPA) is a rare autosomal recessive disorder. The affected individuals are characterized by inability to feel pain, inability to sweat, as well as by developmental delay.

**Methods:** The purpose of this report is to expand the current knowledge and understanding of the oral manifestations encountered in patient with CIPA, and the necessity of early intervention and conservative treatment.

**Results:** Case description: 11 years old girl, was referred to the pediatric dental clinic for multiple traumatic injuries in lower lip and oral cavity. Extra-oral examination of the patient revealed biting marks on fingers, and nail-biting habits. Upon intra-oral examination, ulceration and crusting in the lower lip can be noticed. In addition, multiple extensive traumatic ulcers in the tongue, buccal mucosa are found. Limited mouth opening, and multiple missing teeth is also seen.

**Conclusion:** Early diagnosis and specific dental care treatment plan for patients with CIPA can be very helpful in prevention of the finger\nail biting and orofacial manifestations as a result of self-inflicted trauma.

**Keywords:** Congenital, insensitivity to pain , anhidrosis, oral manifestation

**EPDA-PP-12**

**Effectiveness Of Two Generations Of Rotary Files Versus Manual Files In Pulpectomy Of Primary Molars (Randomized Controlled Clinical Trial)**

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**Objectives:** To determine instrumentation time and anxiety level exhibited by children undergoing endodontic treatment using Pediatric rotary files and Conventional H-files.

**Methods:** This randomized controlled clinical trial comprised of 93 children aged 4 - 6 years. Children were randomly allocated to three groups, group I was shaped by P1 Kedo S Square rotary file (n=31), Group II was shaped by D1 and E1 Kedo SG blue rotary files (n=31), and group III was shaped by Stainless steel H-files (n=31). EDTA gel 17% and normal saline were used for lubrication and irrigation of debris through all the pulpectomy steps. Root canal instrumentation time was calculated using stopwatch and anxiety during root canal instrumentation were assessed using Venham's Clinical anxiety Rating Scale (VCRS). One Way ANOVA and Kruskal Wallis test were performed.

**Results:** The mean instrumentation time for groups I, II, and III were  $81.58 \pm 4.47$  seconds,  $137.32 \pm 17.10$  seconds, and  $155.48 \pm 8.77$  seconds, respectively ( $P<0.0001$ ). Children treated with rotary files had lower anxiety levels and the children in group I experienced significantly less anxiety than children in groups II and III ( $P=0.010$ ).

**Conclusion/Discussion:** Rotary files groups demonstrated significant reduction in the instrumentation time that consequently lowered the anxiety levels in children compared to children treated with the manual file system.

**Keywords:** Pulpectomy, Kedo S files, Kedo SG blue, Kedo S square, Hand H files, Hand instrumentation, Primary molars, Endodontics, Rotary files, Time of instrumentation, Venham's Clinical Anxiety Rating Scale

## EPDA-PP-13

### Evaluation of the capacity of Fluoride Uptake by Enamel from Bio-active Restorative Materials in Primary Molars

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**Objectives:** Background: Cention-N, TMR-Z Fill 10 universal, and Fuji II LC, are fluoride-containing bio-active restorative materials that can promote fluoride release and recharge capacity after treatment with topical fluoride. Objectives: Evaluate and compare the restorative materials, Cention N, TMR-Z Fill 10, and resin modified glass ionomer cement (Fuji II LC), regarding the capacity of fluoride uptake by enamel in restoration of primary molars.

**Methods:** 27 freshly extracted sound primary molars were collected, class V cavities were prepared. After that, the teeth were randomly allocated into three groups: Group I: (n= 9) teeth were restored with Cention N, Group II: (n= 9) teeth were restored with TMR-Z Fill 10 universal, Group III (n=9) teeth were restored with Fuji II LC. Fluoride uptake by enamel was evaluated for all teeth before and after restoration using enamel acid-etch biopsy.

**Results:** 1.By comparing the median fluoride ion concentration in the enamel within each group, it showed a statistically significant difference before and after restoration in the three groups.2.After a 21-days interval, there was a statistically significant difference between the three groups in median fluoride uptake by enamel ( $P$  value = 0.022\*).

**Conclusion/Discussion:** 1.There was a statistically significant increase in fluoride concentration after restoration in the three groups. 2.Enamel acquired significantly higher amount of fluoride (uptake) from Cention N compared to Fuji II LC and TMR-Z Fill respectively after a 21-days interval. 3.All the three restorative materials could be considered suitable for class V restorations of primary teeth in high caries risk children.

**Keywords:** Enamel biopsy, Fluoride uptake, Secondary Caries, Alkaline fillers, resin modified glass ionomer, Cention-N, TMR-Z Fill 10.

**EPDA-PP-14****Are Dental Emergencies in Children Urgent? A parents' perspective. Parents' Attitudes towards the Dental Emergencies of Their Children.**

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*3 Conservative Dentistry Department, Faculty of Dentistry, University of Sciences and Technologies, Khartoum, Sudan.*

**Background:** Dental emergencies are a common occurrence in pediatric dentistry practices, they carry high risk of mortality and morbidity. However manageable, they have very serious consequences if not properly managed on time. Parents' attitude towards dental emergencies can make a great difference on both outcome and prognosis.

**Objectives:** This study aimed to evaluate parents' attitudes toward dental emergencies encountered by their children.

**Methods:** A cross sectional prospective hospital-based study. All 288 children attended to Khartoum Teaching Dental Hospital (KTDH) with dental emergencies in a 3 months period were examined. Information regarding parents' attitudes were collected, plotted and submitted to a descriptive statistical analysis.

**Results:** During the study period; despite the urgency of their conditions; only 22.9% of children were brought to KTDH within the first 48 hours, while 77.1% attended after more than 3 days of dental emergency occurrence. Medications were used before seeking dental care, without consulting a dentist or a physician in 43.8% of children. Of those children; 58.7%, had been given analgesic/anti-inflammatory drugs, 9.5% had antibiotics and 27% had been given both analgesics and antibiotics combined.

**Conclusion/Discussion:** Significantly high number of children attended to KTDH with emergencies. Large number of children were brought with complaints that had started long before seeking dental care, for which medications had been used without a doctor's advice. This highlights the need for health education programs for parents about the urgency of seeking dental care for young children and the risks of using antibiotics haphazardly.

**Keywords:** dental emergency, parents' attitudes, urgency of seeking treatment, antibiotics use

**EPDA-PP-15****Dental Management of a Tunisian Child with Sanjad-Sakati Syndrome**

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**Objectives:** Sanjad Sakati Syndrome (SSS) is a rare autosomal recessive congenital disorder. The present case report is aimed at describing the orofacial manifestations and dental management of a 4-year seven-month-old Tunisian boy with SSS

**Methods:** The patient has typical dysmorphic facial features and growth retardation. Intraoral examination revealed micrognathia mandible and maxilla, an arched palate, and small dental arches with an open bite. All the maxillary and mandibular teeth were decayed due to the poor oral hygiene, plaque accumulation, and enamel hypoplasia

**Results:** Oral rehabilitation involved pulpotomies and root canal therapies on decayed teeth. Resin composite restorations were performed on maxillary and mandibular incisors, and stainless steel crowns were placed on maxillary and mandibular first and second primary molars.

**Conclusion/Discussion:** Dental treatment of children with SSS should improve their quality of life and their general health. Undeveloped dental

arches associated with dental anomalies as well as learning deficit make very difficult of the oral rehabilitation of such patients.

**Keywords:** Sanjad-Sakati Syndrome, Seizure Disorder, Dental Health Care, Hypoparathyroidism, Mental Retardation, Dental Management, Dental Manifestations, Anesthesia

## EPDA-PP-16

### Effect Of Sodium Bicarbonate Buffered Articaine In Accelerating The Onset Time Of Anaesthesia In Children: A Randomised Controlled Clinical Trial

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**Objectives:** Duration of dental treatment is a very important factor for success of dental work especially in children, Thus the demand for faster onset of anesthetic solution is a great concern for pediatric dentists to maintain the cooperation of children. Buffered anesthetic solutions(BAS)create pH nearly close to that of normal tissue resulting in more rapid drug diffusion and quicker onset of nerve blocking. To evaluate the effectiveness of adding 8.4%SodiumBicarbonate to 4%Articane with ratio1:19 in accelerating the onset time of anesthesia compared to conventional unbuffered anesthesia (UBAS)

**Methods:** This study is a triple blinded randomized controlled clinical trial, split mouth design, that includes 27children,aged 5-7 with at least one lower molar in both sides indicated for pulpotomy. They were randomly allocated to two groups;(Test and control groups)according to local anesthetic solution where each patient randomly received BAS in one side(Test group)and UBAS on the other side(Control group).The onset time of anesthesia was recorded using Transcutaneous electric nerve

stimulator(TENS)on the lips of the child, where the lowest intensity at which patient first reported feeling stimulus was recorded before administration of anesthesia, then immediately after injection the intensity was recorded every 30seconds starting by the lowest intensity which was measured and increased gradually until full lip numbness was declared.

**Results:** Onset time showed significant faster time in BAS group( $p<0.001$ ),where mean(SD) of BAS was 99.55(23.40)seconds while that of UBAS was 237.33(23.89)seconds.

**Conclusion/Discussion:** Buffered Anesthetic solutions are more effective in accelerating the onset time of the anesthesia compared to unbuffered conventional solutions. This could be particularly useful in infected body sites with low tissue buffering capacity.

**Keywords:** sodium bicarbonate, soft tissue anesthesia, articaine, buffering, pain

## EPDA-PP-17

### Evaluation of Microleakage and Shear Bond Strength of Zirconia Reinforced Glass Ionomer Restorative in Primary Molars (in-vitro study)

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<sup>2</sup> Dental Material, Dental Material Department, Faculty of Dentistry, Alexandria University, Egypt.

**Introduction:** Assessment of microleakage and shear bond strength (SBS) is essential for evaluation of efficiency of new restorative materials.

**Objectives:** Evaluate microleakage and dentin SBS of zirconia reinforced glass ionomer restorative (zirconomer improved) (ZI) compared to resin modified glass ionomer cement (RMGIC) (Fuji II LC).

**Methods:** Twenty-eight sound extracted primary molars were collected. For microleakage test,

class V cavities were prepared on buccal surfaces of fourteen primary molars. Group I (n=7): ZI was applied. Group II (n=7): RMGIC was applied. Teeth were thermo-cycled, immersed into methylene blue dye, sectioned longitudinally and examined under stereomicroscope for qualitative and quantitative microleakage assessment. Fourteen primary molars were assigned for SBS test. Group III (n=7): ZI was applied. Group IV (n=7): RMGIC was applied. SBS was measured using a Universal Test Machine. Debonded areas were examined under stereomicroscope to assess failure modes. Data were subjected to independent t test, Mann Whitney U test and Chi square test.

**Results:** 1- Difference in median microleakage scores between the two groups was not statistically significant using Mann Whitney U test ( $p=0.06$ ). The results of qualitative microleakage assessment showed that ZI demonstrated higher median of dye penetration percentage than RMGIC with high significant difference at ( $P=0.01$ ) using independent t test. 2- Median SBS scores of ZI was significantly lower than RMGIC at ( $P=0.04$ ) using independent t test. Regarding failure modes, there was no significant difference between the two groups according to chi square test ( $PMC=0.59$ ).

**Conclusion/Discussion:** Zirconomer Improved demonstrated higher leaking and less retention than RMGIC in restoration of primary molars.

**Keywords:** Microleakage, resin modified glass ionomer, shear bond strength, stereomicroscope, Zirconomer Improved

## EPDA-PP-18

### Short term clinical and radiographic outcomes of regenerative endodontic in necrotic primary molars: a randomized controlled trial

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Ain Shams University

**Objectives:** to evaluate the regenerative endodontic procedure (REP) in comparison to zinc oxide eugenol (ZOE) pulpectomy in necrotic

primary molars clinically and radiographically at 6 and 12 months.

**Methods:** A double-blinded randomized controlled clinical trial with three parallel arms and 1:1:1 allocation ratio was conducted. Fifty-four necrotic primary molars in 39 healthy children aged 4-7 years old were randomly allocated as follows Group A - control group, in which ZOE pulpectomy was performed. Group B and C - experimental groups, in which REP was performed. Modified triple antibiotic paste (mTAP) and MetapexTM were used as intracanal medicaments in groups B and C, respectively. A co-investigator recorded the Clinical and radiographic evaluations at baseline, 6, and 12 months. Chi-square and Fisher's Exact tests were used to compare the qualitative data, while Friedman's test was used to study the changes by time within each group. As well as Kaplan-Meier survival curve was used to calculate the estimated mean clinical survival

**Results:** Non statistically significant differences were reported between the three groups at the 6 as well as 12 months follow ups regarding the clinical or radiographic evaluation ( $p$ -value=0.327, Effect size= 0.22), ( $p$ -value= 0.055, Effect size= 0.118) respectively.

**Conclusion/Discussion:** REP could be considered a biological alternative to pulpectomy, which restores innate immunity and provides a pulp-like tissue obturation material.

**Keywords:** pulpectomy, intacanal medications, non-vital deciduous molars , stem cells

## EPDA-PP-19

### Adverse Childhood Experiences and Oral Health Status of children living in Rural Areas of Alexandria, Egypt: A household Survey

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**Objectives:** Scarce research assessed the link between Adverse childhood experiences (ACE) and oral health status of Egyptian children. This study aims to investigate the association between

ACE and the oral health status of children living in rural areas in Alexandria, Egypt

**Methods:** A household survey in Northwestern Delta, including 300 children 6-18 years old, where Children were examined for dental caries and gingival condition then questioned about their oral hygiene habits and sugar consumption. Mothers answered the ACE questionnaire. Three linear regression models assessed the relationship between dependent variables (primary caries experience, permanent caries experience, gingival score) and exposure (ACE) in comparison to oral health status (sugar consumption, plaque accumulation, dental visits)

**Results:** Most children were females (57.2%), mean age was 9.81, SD= 3.06. 68.6% children had caries experience in their primary teeth (dft mean  $\pm$  SD)  $3.03 \pm 3.14$  and 27.9% had caries experience in their permanent teeth (DMFT mean  $\pm$  SD)  $0.60 \pm 1.16$  with gingival index score (mean  $\pm$  SD)  $1.14 \pm 0.37$ . When comparing adjusted "R<sup>2</sup>" of ACE models and oral health status models, dft model of both had an identical value of 0.44. However, adjusted "R<sup>2</sup>" of ACE models (DMFT=0.20, and gingival score=0.03) were different than those in oral health behaviors models (DMFT =0.22, gingival score =0.45)

**Conclusion/Discussion:** ACEs showed the same amount of variation in primary caries experience as oral health behaviors. Yet, it doesn't have the same effect on permanent caries experience or the gingival condition. Further research is needed to evaluate if a dose-response relationship is present.

**Keywords:** Oral health, Dental caries, Gingivitis, Rural population, Children, Egypt, Adverse Childhood Experience.

## EPDA-PP-20

### Clinical management of a pre-eruptive intracoronal resorption defect on a maxillary second premolar

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**Objectives:** Pre-eruptive intracoronal resorption (PEIR) is an asymptomatic anomaly presenting an abnormal, well-circumscribed, radiolucent area, occurring within the coronal dentinal tissue close to the enamel-dentine junction of unerupted teeth. This poster presents the case of an 11 year, 5-month-old girl diagnosed with a pre-eruptive intracoronal resorption on her maxillary right second premolar.

**Methods:** The patient's chief complaint was discomfort on the right side of the maxilla caused by the mobility of tooth 55. Radiological examination showed the complete radicular resorption of the tooth and an intracoronal radiolucency on tooth 15. Based on clinical and radiographic aspects, the lesion was presumed to be a PEIR and the extraction of tooth 55 was decided. One month after the extraction, the PEIR-affected tooth had partially erupted. Preventive treatment was initiated immediately since it presented non cavitated enamel defect. A resin sealant (concise light cure, 3M ESPE) was applied to the affected premolar after obtaining proper isolation.

**Results:** A follow-up was scheduled every 6 months to monitor the tooth clinically and radiologically. 6, 12, 18, and 48-month recall checkups revealed that the tooth remained vital, and asymptomatic with no evidence of caries. Upon radiological examination, no changes were detected regarding the extent of the lesion. The root development was uninterrupted.

**Conclusion/Discussion:** Further investigation is required to understand the etiology and pathogenesis of PEIR defects. Increased awareness among pediatric dentists is crucial to improve diagnosis and providing early treatment.

**Keywords:** Intracoronal radiolucency, Intracoronal resorption, Occult caries, Pre-eruptive.

## EPDA-PP-21

### Interceptive orthodontic correction of ectopically erupting permanent maxillary first molars: Three cases report.

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**Introduction:** Ectopic eruption of permanent first molars occurs due to the molar's abnormal mesioangular eruption path, resulting in an impaction at the distal prominence of the primary second molar crown.

**Background:** This poster presents the case of three eight-year-old patients with irreversible bilateral ectopic eruption of the permanent maxillary first molars (PMFs).

**Case Report:** A modified Croll's appliance was placed for these patients to distalize the permanent maxillary first molars. It is a fixed appliance with bands cemented on maxillary first primary molars connected by a transpalatal bar with an incorporated acrylic button. An orthodontic wire was used to fabricate bilateral loops welded buccally and palatally to the bands and extended 2-3 mm distally to PMFs. Small hooks were placed on the distal aspect of these loops. Chain elastics are adapted on buttons bonded on the mesio-occlusal surface of the PMFs and placed over the hooks to provide distal pressure on both permanent molars.

The activation of the appliance was done every two weeks by shortening the elastic chain.

**Follow Up:** Four and six weeks later, clinical and radiological exams revealed that the first molars displayed a favorable position. Each patient was scheduled for a follow -up every six months.

**Conclusion:** Clinicians should establish a proper diagnosis and choose the best appliance that will satisfy the clinical aspect of the treatment and the patient's well-being.

## EPDA-PP-22

### Comparison of remineralization with surface pre-reacted glass ionomer filler, CPP-ACPF, and fluoride varnishes in primary teeth

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**Introduction:** Giomer technology is a recently promising innovation in dentistry. Surface pre-reacted glass-ionomer (s-PRG) filler is a giomer bioactive filler varnish.

**Aim:** To investigate the remineralizing potential of s-PRG filler varnish, in comparison to 5% NaF varnish and casein phosphopeptide amorphous calcium phosphate-fluoride (CPP-ACPF) varnish on white spot lesions (WSLs) in primary teeth.

**Methods:** Thirty-three caries-free primary incisors were selected. Enamel window of 4x4 mm was prepared on their labial surfaces. Baseline mineral content was recorded by energy dispersive X-ray (EDX) and surface topography was evaluated by scanning electron micrograph (SEM). After the 4 day artificial caries system, teeth were randomly assigned into 3 groups (n=11): Group I received s-PRG filler varnish, Group II received CPP-ACPF varnish, and Group III received FV. Teeth were sectioned labiolingually to form mesial half (subgroup A) that received the varnish, and distal half (subgroup B) that served as the control. After a pH cycling model of 10 days, second evaluation by EDX and SEM was recorded. Data were analyzed using One Way ANOVA followed by Tukey's post hoc test with Bonferroni correction.

**Results:** Ca, P, and Ca/P ratio of subgroup A (remineralized specimens) in the three experimental groups were significantly superior to those of subgroup B (their negative controls), ( $P < 0.005$ ), while the difference between the experimental groups was statistically insignificant, ( $P > 0.05$ ). The three experimental groups were similar in re-establishment of the enamel surface integrity.

**Conclusion:** S-PRG filler varnish exhibited a remineralizing potential of WSLs in primary teeth similar to 5% NaF varnish and CPP-ACPF varnish.

**Keywords:** S-PRG filler varnish, Giomer, CPP-ACPF, Fluoride, White spot lesions, Remineralization

**EPDA-PP-23****Effect of Dual rinse HEDP and Curcumin on Periodontal stem cells (invitro study)***S. Magdy, N. E. Metwalli, H. F. Khalil.**British University in Egypt*

**Objectives:** In an attempt to find ideal biocompatible irrigant, sample cytotoxicity and cell proliferation were tested on cells after exposure to three irrigants: Dual rinse HEDP, curcumin and sodium hypochlorite and for observation periods

**Methods:** Determination of sample cytotoxicity on cells: Irrigation solutions were divided in four groups according to material used : Control group , Group I HEDP, Group II Curcumin, Group III Sodium Hypochlorite. Each group was subdivided into Subgroups according to observation periods: Control subgroup,1,5,15 minutes. Determination of cell proliferation: Irrigation solutions were tested in four groups according to material used: Control group, Group I HEDP, Group II Curcumin, Group III Sodium Hypochlorite. Each group was subdivided into Subgroups according to observation periods: Control subgroup,1, 5, 15 minutes

**Results:** Determination of sample cytotoxicity on cells: All groups at all observation periods showed significant differences. At 1 and 5 minutes group (I) HEDP recorded the highest value, followed by group (II) Curcumin .But at 15 minutes, the highest value was recorded by group (II), followed by group (I). Group III recorded the lowest values at 5 and 15 minutes. Determination of cell proliferation: All groups showed a significant difference at all observation periods. The highest value was found in group (I) HEDP, followed by group (II) Curcumin in all periods.

**Conclusion/Discussion:** HEDP and curcumin were less toxic than Sodium Hypochlorite. Cytotoxicity of any irrigant is time dependent.

**Keywords:** HEDP , Periodontal stem cells, Curcumin, regenerative endodontics, viability of stem cells, sodium hypolchlorite, irrigants, root

canal treatment, incomplete root formation, biocompatible irrigant

**EPDA-PP-24****Polarized Light Microscopic Evaluation of Bioactive Pit and Fissure Sealant on Demineralized Enamel of Permanent Molars (In-Vitro Study)***N. H. Abou Wafia, R. S. Soliman, S. A. Hamza, K. M. L. Dowidar.**Alexandria University*

**Objectives:** This study was conducted to assess the effect of Bioactive resin-based sealant with microcapsules on inhibition of enamel demineralization in permanent molars in comparison to resin-based fluoride releasing sealant and resin-based non-fluoride releasing sealant.

**Methods:** Thirty nine caries free third molars were selected. Standardized cavities were prepared on the buccal surface and the molars were randomly allocated into 3 groups, 13 teeth each group. Group1 (test group) received BioCoat™ Bioactive sealant (Premier®) with microcapsules, Group2 (test group) received fluoride releasing ClinproTM sealant (3M ESPE) and Group3 (positive control) received non-fluoride releasing Helioseal® Clear sealant (Ivoclar Vivadent). Acid-resistant varnish covered the teeth excluding 1mm of bare enamel around sealant for caries formation. The teeth were thermocycled and exposed to artificial caries medium for 6 weeks to produce caries-like lesions in bare enamel area. Transverse ground sections of specimen were inspected using polarized light microscope and photomicrographs of the specimens were taken with a digital camera attached to the microscope and assessed histologically to evaluate the changes in enamel features and compare the extent of carious lesion between the study groups.

**Results:** The photomicrographs of both group1 (BioCoat Bioactive) and group2 (Clinpro) showed marked lesion depth reduction and substantial negative birefringence with a broad

remineralizing surface. Photomicrographs of group3 (Helioseal Clear) exhibited a dramatic thick dark demineralization band with loss of the typical enamel structure within the body lesion.

**Conclusion/Discussion:** BioCoat Bioactive and Clinpro sealants have a significant inhibiting effect on enamel demineralization in contrast to Helioseal . BioCoat Bioactive showed the most remineralizing capability.

**Keywords:** Demineralization, Bioactive, Pit and fissure sealant, Polarized light microscope

#### EPDA-PP-25

#### **Effectiveness Of Self-Assembling Peptide (P11-4) In Conjunction With Fluoride Varnish In The Management Of White Spot Lesions In Primary Teeth (Randomized Controlled Clinical Trial)**

*C. M. Guirguis , K. M. L. Dowidar, R. S. Soliman.*

*Alexandria University*

**Objectives:** Clinically assess the effect of self-assembling peptide P11-4 with 5% sodium fluoride varnish versus 5% sodium fluoride varnish only on remineralization of white spot lesions in primary teeth

**Methods:** This trial was conducted on children aged 3 to 6 years with visible active white spot lesions on primary teeth. The patients were randomly allocated into 2 groups, where the study group (n=12) were treated with self-assembling peptide P11-4 (CURODONTM REPAIR), and with 5% sodium fluoride varnish (DURAFLOR), while the control group (n=12) were treated with fluoride varnish only. At the baseline visit the lesions were assessed before treatment by visio-tactile examination (ICDAS score ) and DIAGNODent measurements, followed by the application of the materials in compliance with the manufacturer's instructions. In the test group, CURODONTM REPAIR was applied followed by DURAFLOR, whereas the control group received only the DURAFLOR . Oral health instructions were given and patients were recalled after 3 months for lesion assessment. The groups were compared using mann Whitney U test.

**Results:** Both groups showed a decrease in the mean diagnodent readings when compared to baseline, although the decrease was greater in the study group yet not statistically significant. When comparing the mean percentage reduction in diagnodent readings from baseline to 3 month between the 2 groups, a statistically significant difference ( p=0.026) was found in the study group .

**Conclusion/Discussion:** Self assembling peptide P11-4 with 5% sodium fluoride varnish is superior to 5% sodium fluoride varnish in the remineralization of white spot lesion.

**Keywords:** White Spot Lesions WSLs, Self-Assembling Peptide P11-4, CURODONTM REPAIR, Duraflor Fluoride Varnish, 5%soduim fluoride varnish

#### EPDA-PP-26

#### **Continuing Challenges and Current Issues of Philadelphia Chromosome-Positive Acute Lymphoblastic Leukemia: Case Report**

*S. AlHaidar*

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**Objectives:** Philadelphia chromosome-positive acute lymphoblastic leukemia (Ph+ ALL) in children and adolescents has, until recently, been considered one of the poorest-risk subgroups of ALL. ALL is the most common pediatric malignancy and accounts for nearly 75% of all newly diagnosed leukemia and 25% of all malignancies in childhood. Ph+ ALL survival rate is 30% and ALL survival rate is 79%. Children receive various forms of treatments including chemotherapeutic agents and stem cell transplants. Significant orofacial complications include mucositis, opportunistic infections, gingival inflammation / bleeding, xerostomia, and carious lesions.

**Methods:** A 12-years-old Saudi female diagnosed with Ph+ ALL presented to the dental clinic saying "I got teasing at school because of my teeth". Medical history revealed hospitalization for intrathecal administration,

bone marrow aspiration, and Hickman line insertion. Patient received allogeneic stem cell transplantation from her brother (Haploididential). Clinical and radiographic examination showed poor oral hygiene, carious teeth and anterior crossbite.

**Results:** Consultation with her hematologist who advised platelets and Hgb counts checking before the treatment. No objection to give PO antibiotic after or before the procedure. All restorative / preventive treatment was completed. Orthodontic consultation and treatment of the anterior crossbite.

**Conclusion/Discussion:** This report presented a comprehensive treatment of a 12-years-old girl diagnosed with Ph+ ALL. It is important to consider the impact of the treatments on the developing dentition and on orofacial growth in children. It is critical to address the oral complications and the methods of prevention and treatment including orthodontic management. A prompt diagnosis of orofacial complications could lead to early intervention.

**Keywords:** Leukemia, ALL, Stem cells, mucositis, Chemotherapeutic , stem cell transplantation, interceptive orthodontics, Comprehensive Dental Treatment

## EPDA-PP-27

### The Effect of Silver Diamine Fluoride Pretreatment with Different Time Intervals on The Shear Bond Strength of Universal Adhesive to Dentin of Primary Teeth (In vitro study)

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**Objectives:** To investigate the impact of time lapse between caries pretreatment with 38% silver diamine fluoride (SDF) and application of final restoration on shear bond strength (SBS) of universal adhesives to primary dentin.

**Methods:** 66 extracted sound primary teeth were randomly allocated into three groups according to SDF pretreatment .Group I: Was assigned for immediate final restoration application after pretreatment. Group II: Was assigned for one week time lapse after 38% SDF dentin pretreatment. Group III (control group): Was assigned for final restoration application without pretreatment .Each main group was subdivided into two subgroups according to the adhesive technique used: Subgroup A: received composite resin using total etch technique. Subgroup B: received composite resin using self-etch technique.Composite was applied to flattened buccal dentine surface. SBS test was done using Universal Testing Machine.

**Results:** There was a statistically significant difference in mean SBS between subgroups A and B of group I ( $39.88 \pm 27.35$ ) and the control group ( $85.17 \pm 40.43$ ) P=0.76. There was a statistically significant difference in mean SBS between subgroup IIA ( $52.23 \pm 30.13$ ) and IIB ( $27.53 \pm 18.11$ ) P= 0.03.

**Conclusion/Discussion:** Bonding composite to primary dentin one week after 38% SDF pretreatment will eliminate the negative impact of SDF on SBS of the final restoration.

**Keywords:** Silver diamine fluoride, Shear bond strength, Universal adhesive, Etch-and-rinse, Self-etch , Time lapse .

## EPDA-PP-28

### Evaluation of children's anxiety with three different injection techniques of local anesthesia in children at dental clinic : A Randomized clinical trial

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**Objectives:** The standard concealed injection technique is the most technique used by the dentists with children, in which the dental syringe is completely kept out from the child vision, but actually some children still experience an anxiety with this techniqueThe camouflage technique is another technique used in which the syringe

camouflaged by special sleeves. Another technique was described by authors including showing the dental syringe before injection while the needle guard in its place. the previous techniques were claimed to have a success and reducing the child fear and anxiety. **Objectives :** Evaluation of children's anxiety with three different injection techniques of local anesthesia including the standard concealment technique, showing the dental syringe before injection and camouflaging by sleeves.

**Material and method:** 60 patients, ranging from 7 -12 years old, require infiltration anesthesia in the upper arch were selected for this study. They were randomly allocated into 3 groups ( n=20) according to the technique used for local anesthesia. Group (1) the standard concealed injection technique was used. In group (2) the technique used was showing the dental syringe ,while in group (3) the technique was camouflaging the syringe in a sleeves . The child anxiety was evaluated using the Venham Anxiety Scale picture test before and after injection.

**Results:** the results showed there is no significant difference between the three techniques, after injection ( $p>0.05$ ).

**Conclusion:** there is no technique superior to other can be used for injection for local anesthesia in children regarding reducing anxiety.

**Keywords:** local anesthesia, standard concealment injection technique, child behavior, child anxiety, camouflage, dental syringe

## EPDA-PP-29

### Effect of Oral Health Education on Knowledge and Self-Reported Practice of Teachers Towards Managing Traumatic Dental Injuries

S. Elzieary

*Kasr El-Aini, master's degree candidate at Kasr el Ainy.*

**Objectives:** Aims to evaluate the effect of oral health educational on the knowledge and self-reported practice of school teachers towards traumatic dental injuries(TDIs)

**Methods:** A total of 254 schoolteachers from 11 schools in Egypt participated in a 4 month long study. Baseline data collected using previously validated self-administrated close ended questionnaires (Alluqmani and Omar, 2018; Razeghi and Mohebbi, 2019). Oral health educational program including an oral presentation, pamphlet and poster using the recent evidence and guidelines. Final assessment made with the same questionnaire. Data management and statistical analysis were performed using the statistical package for social sciences2 (SPSS) software package Version 26 for Microsoft windows. Numerical data were presented as mean, standard deviation (SD) values. Categorical data were presented as frequencies and percentages and were analyzed using Fisher's exact test. The significance level was set at  $p \leq 0.05$  within all tests and p-values were corrected for multiple comparisons utilizing Bonferroni correction. Correlations were performed using Fisher's exact test, the results were significant when the p-value  $\leq 0.05$

**Results:** The percentage of good knowledge improved from 29.9% to 68.9% after the program, while the percentage of poor knowledge declined from 35.8% to 10.6%. The percentage of good self-reported improved from 35.8% to 10.6%, while the percentage of poor self-reported practice declined from 9.1% to 0.8%.

**Conclusion/Discussion:** School teachers exhibit clear lack of knowledge and self-reported practice regarding first-aid management of traumatic dental injuries. Oral presentations, pamphlets and posters are effective enough to provide the required information to teachers.

**Keywords:** dental trauma, knowledge, self-reported practice

## EPDA-PP-30

### Remineralizing Effect of Tricalcium Phosphate On Caries-Like Lesion In Enamel Of Primary Teeth (In Vitro Study)

Alshaymaa.

**Objectives:** Dental caries is one of the most common chronic diseases that can result from

chemical interaction. Minimum intervention dentistry is the modern therapeutic approach to the management of caries. This study aimed to evaluate and compare *in vitro* the effect of tricalcium phosphate (TCP), 38% silver diamine fluoride (SDF) and 5% sodium fluoride (NaF) on the remineralization of enamel caries-like lesions of primary teeth.

**Methods:** Forty-eight extracted or exfoliated caries free primary teeth were included in the study. Teeth were covered with nail varnish leaving a standardized window and were immersed in a demineralizing solution for four days to initiate caries like lesions on their enamel surface. Then, they were divided randomly into four groups of 12 teeth each. Group I: teeth were treated using TCP, group II: teeth were treated using SDF, group III: teeth were treated using NaF and group IV: teeth were left untreated. After pH cycling for ten days, teeth they were evaluated quantitatively using energy dispersive X-ray spectrometer (EDX) and qualitatively using scanning electron microscope (SEM).

**Results:** After analysis, quantitative evaluation showed a statistically significant difference among the study groups in the Calcium(Ca), Phosphorous(P) and Ca/P ratio in favor of group I ( $P<0.002$ ). Moreover, qualitative evaluation showed different levels of enamel remineralization and an outstanding decrease in the porosities of enamel in group I as compared to the other three groups.

**Conclusion/Discussion:** Tricalcium phosphate has a highest remineralization potential of the initial carious enamel of primary teeth.

**Keywords:** Tricalcium phosphate, Silver diamine fluoride, Remineralization, Primary teeth.

## EPDA-PP-31

### Dental Crowding in Relation to Body Mass Index and Dietary Status In School Aged Children (A Cross-Sectional Study)

**Background:** There is lack of evidence about the possible etiological factors of dental crowding in school aged children. However, it is clearly

understood that those factors are divided into environmental and genetic.

**Objective:** To assess the relation between BMI, dietary status, and dental crowding in school aged children.

**Materials and methods:** A cross-sectional study was conducted on 74 patients who were attending the clinic of the Department of Pediatric Dentistry and Dental Public Health, Alexandria University whose mandibular anterior teeth were crowded. Impressions for study casts were taken for arch length analysis. Diet analysis and calculation of BMI were collected from each child.

**Results:** The study found that maxillary and mandibular arch differences were more common in children who were underweight. Also, the way people eat may have an effect on these differences. Even though it was not statistically significant.

**Conclusion:** Although the current study found that low protein and underweight cases had higher arch discrepancies and these differences were not particularly significant. However, placing more emphasis on implementing health campaigns that promote healthy eating and lifestyle choices may help to reduce the probability of arch discrepancies occurrence among school-aged children.

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