

College of Dentistry Research Day

Poster Presentation 279

Abstract Title: **Parental and Patient Satisfaction Before and After Silver Diamine Fluoride Treatment: A Continuation Study**

Author(s): V. Childers, Department of Pediatric Dentistry, U of Kentucky C. Perez, Department of Pediatric Dentistry, U of Kentucky Y. Xu, Department of Statistical Analysis, U of Kentucky

Abstract: Purpose: The purpose of this continued study is to determine parental and child satisfaction before and after SDF application for patients that are going to the OR. Methods: Patients will be recruited at the University of Kentucky, Pediatric Dentistry Residency Program. Patient requirements include: patient must be a pediatric dentistry patient that is scheduled for full mouth dental rehabilitation (FMDR) in the operating room (OR), and must have at least one deep lesion. Each parent from the experimental and the control group were asked to complete two surveys. For the experimental group, the initial survey was done before the SDF application and the second was taken at the OR after all the treatment was performed. For the control group, the initial survey was done at the OR work up appointment and the second survey was completed after all treatment was completed in the OR. Statistical analysis: Chi-Square tests will be performed. Results: Preliminary results have not been completed due to the surveys not being analyzed yet. Conclusion: Preliminary conclusions are that parents are not troubled by the discoloration of their children's posterior teeth caused by SDF and are not nervous about receiving SDF as treatment.

Supported by: N/A

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College of Dentistry Research Day

Poster Presentation 280

Abstract Title: **Digital Workflow for Full Arch Maxillary Implant Rehabilitation with Monolithic Zirconia, Literature Review and a Case Report.**

Author(s): Craig D. Clayton, 3rd year student in the College of Dentistry, UofK Ahmad Kutkut, DDS, Department of Prosthodontics, College of Dentistry, UofK

Abstract: Introduction. Monolithic zirconia full-arch implant prostheses are becoming a popular choice of clinicians due to their favorable strength and ability to be produced via CAD/CAM technology. While full-arch monolithic zirconia prostheses have a great short-term performance, their performance over the long-term is still unknown due to the relatively young existence of this material, as indicated by a systematic review of the literature by Aous A. Abdulmajeed, BDS, PhD, published in The Journal of Prosthetic Dentistry. Purpose. Present a case report on a full-arch monolithic zirconia prosthesis to be followed up on for long-term success. The results of which will be a beneficial contribution to the general knowledge of monolithic zirconia performance of full-arch prostheses. Case Report. 59 year-old male patient elected full maxillary arch rehabilitation with milled monolithic zirconia prosthesis. Prosthesis is supported on 2 implant types (Brånemark and Keystone) that were placed by a previous provider. Discussion. While zirconia full arch prostheses does not appear to cause antagonistic tooth wear to natural opposing teeth, the long term effects of grinding zirconia are still unknown. Occlusal grinding may cause a phase transformation of zirconia, thus compromising its superior mechanical properties. Conclusion. The digital CAD/CAM technology offers significant benefits for the prosthodontic treatment of edentulous patients, including the benefit of a solid, single piece prosthetic made from strong fracture and chip resistant material. The failure rate, as reported by other case reports and reviews, is very low for monolithic zirconia prostheses, but currently long-term reviews do not exist.

Supported by: n/a

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College of Dentistry Research Day

Poster Presentation 281

Abstract Title: **Measuring S. mutans and S. sobrinus- before and after Silver Diamine Fluoride treatment: A continuation study**

Author(s): K. J. Dingrando, Department of Pediatric Dentistry, U of Kentucky C. Perez, Department of Pediatric Dentistry, U of Kentucky Y. Xu, Department of Statistical Analysis, U of Kentucky

Abstract: Purpose: The purpose of this continuation study is to determine the amount of Streptococcus mutans and Streptococcus sobrinus, on primary teeth via bacterial swabs. Each patient participating in the study will receive a saliva swab 3 times; prior to applying SDF (Silver Diamine Fluoride) in clinic, before completing treatment in the operating room (OR), and at a 3 month recall. If the parent declines the SDF application but agrees to participate in the study as a control then saliva samples will be obtained from those individuals at the same intervals as the research patients. Methods: Patients are recruited at the University of Kentucky College of Dentistry, Pediatric Dentistry Residency Program (UKCD) in Lexington, Kentucky. To participate in the study, the research candidate must be a pediatric dentistry patient at UKCD who is scheduled for full mouth dental rehabilitation (FMDR) in the operating room (OR). In addition, the patient must have at least one "deep" lesion to which SDF could be applied. If the patient/parent would like to be in the study but declined SDF application, they are invited to participate in the control group. The bacterial load and species present will be measured by polymerase chain reaction (PCR) determining the genomic composition and count of the Streptococcus mutans and Streptococcus sobrinus. The saliva samples will be performed before SDF application, the OR appointment prior to treatment and at a 3 month recall. Statistical analysis: Chi-square, t-tests, and One Way ANOVA will be utilized. Results: Tentative results have not been determined. All bacteria analyses will be done after all patients in the study have completed their 3 month recall. Conclusion: The hypothesis is that the levels of S.mutans and S.sobrinus will decrease after application of SDF and FMDR in OR.

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College of Dentistry Research Day

Poster Presentation 282

Abstract Title: **Clinical guidelines for soft tissue-grafting future implant sites: A systemic review**

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Abstract: Esthetic appearance and functional longevity for teeth and implants often requires conversion of unfavorable soft tissues traits to more favorable ones. Improvement of tissue quality and quantity can be accomplished with many different techniques and materials and largely depends on clinical presentation of the case and familiarity of clinicians with the procedures and materials available. Identification of casual factors, selection of appropriate surgical technique and evidence-based material selection lead to predictable success when improving soft tissue characteristics around teeth or implants. Based on this literature review, it was concluded that there are more evidences based on amount of histological keratinized tissues regenerate after using different types of soft tissue grafts after specific healing time. The results will help clinicians for better treatment planning to achieve best results for for implant esthetic appearance and functional longevity.

Supported by: No support

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College of Dentistry Research Day

Poster Presentation 283

Abstract Title: **The Effects of SDF on Pain Perception of Children Prior to Going to the Operating Room**

Author(s): M. Haggerty, Department of Pediatric Dentistry, U of Kentucky C. Perez, Department of Pediatric Dentistry, U of Kentucky Y. Xu, Department of Statistical Analysis, U of Kentucky

Abstract: Purpose: The purpose of this continued study is to determine the change in perceived pain level before and after application of SDF on deep carious lesions via a survey administered before SDF application, at the OR, and at a 3 month recall. Methods: Patients will be recruited at the University of Kentucky, Pediatric Dentistry Residency Program. Patient requirements include: patient must be a pediatric dentistry patient that is scheduled for full mouth dental rehabilitation (FMDR) in the operating room (OR), and must have at least one deep lesion. Each child's pain level will be measured using the Wong-Baker pain face scale. The faces will be presented to the child and they will be asked, "How does your tooth make you feel?" They will point to the face that indicates their pain level. Statistical analysis/Results: We have observed that most patients have a decrease in pain levels. There are only 4 patients with unchanged pain. There are 3 cases with increased pain in the research group and 4 with increased pain in the control group. -H0 (null): Pre-pain level \leq post-pain level. -HA (alternative): Pre-pain level $>$ post-pain level. The preliminary results have not been run to give statistics to accept or reject the null hypothesis. Conclusion: The application of SDF on deep carious lesions won't cause pain. SDF application to deep carious lesions will have some change in pain perception and a decrease in pain perception.

Supported by: NA

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College of Dentistry Research Day

Poster Presentation 284

Abstract Title: **Pre-Dental Students' Perception and Attitude Toward Digital Dentistry. A Digital Survey Study.**

Author(s): A. Kutkut, Department of Dentistry, U of Kentucky R. Abualsoud, Department of Dentistry, U of Kentucky S. Albaree, Department of Dentistry, U of Kentucky

Abstract: The field of Dentistry is on the rise, with for than 5% in dental applicants each year. A field, where you perform treatment and preventative care. With a high demand in dentists in the nation, led to expansions such as digital dentistry. Thus far, it has revolutionized the workspace in means of both, efficiency and accuracy. It has already made a strong impact in the dental field and will continue to grow. The question brought at hand is, of these 12,000 dental applicants, how many students are aware on the advances in the dental field, including digital dentistry. An observational, digital survey was conducted on a group of pre-dental students' knowledge to investigate pre-dental students' knowledge, attitude, and perception towards digital dentistry. Our survey results indicate that most of Pre-Dental students are unaware of digital dentistry. The vast majority plan to work at a private practice for profitable gain. The survey results stated that the students' inspiration mainly came from their family dentists as they were growing up. This study reflects pre-dental students' attitude and knowledge regarding digital dentistry, which may present an opportunity for admission officers to modify their recruitment methods and create more awareness on the advancements in the dental field.

Supported by: There was no support provided for this project.

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College of Dentistry Research Day

Poster Presentation 285

Abstract Title: **Restorability of Primary Teeth with Silver Diamine Fluoride on Deep Carious Lesions; A Continuation Study**

Author(s): M. B. Lucas, Department of Pediatric Dentistry, U of Kentucky C. Perez, Department of Pediatric Dentistry, U of Kentucky

Abstract: Purpose: The purpose of this continuation study is to determine the clinical response of pulpal tissue after application of SDF, in primary teeth with deep carious lesions via visual exam, tactile sensation, (when possible) radiographic exam and restorability. Methods: Patients will be recruited at the UK Pediatric Dentistry Residency Program. Patient requirements will be such that is in need of for full mouth dental rehabilitation (FMDR) in the operating room (OR). In addition, they must have at least one deep lesion (*). Approximately 50 patients will be included in this study. Each child will be examined visually and with tactile sensation; "Deep" lesions will be classified as: "25% or more of the tooth is grossly carious and has a soft and mushy consistency," and radiographs (if available) will be used as a baseline for the first visit and a rating of restorability will be treatment planed, to compare to radiographs taken in the OR the day of the procedure to determine restorability and the extent of changes that have occurred since the initial visit. The tooth will once again be given a number to rate how it was restored. Results: Using the finished research cases, results have demonstrated that application of silver diamine fluoride to deep carious lesions increases the restorability of the tooth. Within all of the finished cases tertiary dentin was laid down. Conclusion: The application of SDF on deep carious lesions appears to increase restorability of primary teeth. It seems to cause no clinical response to the pulp.

Supported by: N/A

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College of Dentistry Research Day

Poster Presentation 286

Abstract Title: **Utilizing 3-D Printed Soft and Hard Tissue Models for Simulation Implant Surgical and Prosthetic Techniques**

Author(s): Ahmad Kutkut, DDS, MS, FICOI, DICOI, College of Dentistry, U of Kentucky AnnMarie Lyon, BS, College of Dentistry, U of Kentucky

Abstract: Background: Teaching implant surgical and prosthetic techniques is a challenge for educators. Dental implants have been incorporated in dental curriculum and graduate programs. Having the new, unexperienced provider perform a surgical procedure on an actual patient is a challenge. Aim: The aim of this project was to create a pre-surgical, anatomically correct 3D printed models based on CBCT to aid in teaching various surgical and prosthetic techniques. Materials and Methods: Four 3D printed soft and hard tissue models were virtually designed based on CBCT of human skulls as educational tools in the university setting to simulate conventional surgical implant placement, guided surgical implant placement, guided bone regeneration, ridge splitting, lateral window sinus lift, crestal osteotome sinus lift, distraction osteogenesis, all-on-X, flap elevation, suturing, implant prosthetic restorations, immediate implant placement in extraction socket, and immediate provisionalization. Results: 3D printed models helped to plan and visualize the available bone in the proposed implant sites and allowed the simulation of soft tissue manipulation and osteotomy preparation as well as production of drill guides. With the help of these models, it was possible to have predoctoral and postgraduate students performed various surgical and prosthetic procedures accurately and decreased the potential for error in implant placement. Conclusion: The ability to simulate surgery on the patient's anatomic 3D model prior to the actual procedure not only decreased the operating time and potential morbidity, but provided the surgeon additional familiarity, allowing for an uneventful, accurate outcome while improving patient safety.

Supported by: GPA grant 2017-2018

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College of Dentistry Research Day

Poster Presentation 287

Abstract Title: **Evaluating Palatal Thickness in Growing Patients and Determining Factors Using CBCT-A retrospective study.**

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Abstract: The use of mini-implants for anchorage purposes is becoming a routine orthodontic practice for the appropriate cases. Multiple studies on adults suggested that the palatal bone is an ideal site for the placement of mini-implants. As the bone thickness is carrying particular importance in getting initial stability. Other studies suggested multiple factors that can affect palatal bone thickness (age, gender, and vertical growth pattern). The purpose of this study is to evaluate palatal bone thickness in growing individuals and factors that may influence the bone thickness. Material and method: This retrospective study will review 155 CBCT scans of patients who were referred for orthodontic treatment. After orientating the head scans using the transporionic plane, the Frankfort horizontal plane, and the midsagittal plane as reference planes, bone thickness measurements will be taken in twenty locations. These measurements will be taken using a well-defined protocol, at the median palatal suture between canine and first premolar, first premolar and second premolar, second premolar, first molar, and second molar. Associated factors will be evaluated after dividing the sample into groups according to their sex and growth stages. Intra-class correlation analysis will be conducted on the measurement taking process. ANOVA analysis will be used to find a significance between groups for determining factors.

Supported by: N/A

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College of Dentistry Research Day

Poster Presentation 288

Abstract Title: **Cephalometric Analysis Assessing the Validity of Ala-tragus Line While Establishing the Occlusal Plane in Edentulous Patients**

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Abstract: In complete prosthetic reconstruction the occlusal plane plays an important role in obtaining a functionally balanced occlusion. This plane should be as close as possible to natural teeth, unfortunately fully or partially edentulous patients do not present with consistent means of establishing their previous occlusal plane due to their lack of teeth. Because of this, multiple methods have addressed positioning a functional occlusal plane that also fulfills esthetic desires, but no one method has been agreed upon universally. The most common comes from positioning the occlusal plane parallel to a line that connects the tragus and the superior aspect of the ala; this is referred to as the ala-tragus method. With this method however there still exists variation, specifically with regard to the tragus. Research supports rationales for the tragus landmark to be taken at the superior, middle and inferior aspects of the soft tissue feature. Because of this, photographs and lateral cephalometric radiographs were taken of 52 patients with complete dentitions from the DMD clinic at the University of Kentucky. Each photograph was superimposed over its corresponding radiograph and analysis was conducted to establish the angle of the occlusal plane relative to the ala-tragus landmarks; these data were then grouped according to young and old age. From this analysis evidence now exists that age has a significant effect in where the approximation of the tragus should be made for complete prosthetic treatment. With this information functionality and esthetics can be more adequately addressed for patients undergoing complete prosthetic treatment.

Supported by: The project described was supported by the University of Kentucky College of Dentistry, Departments of Prosthodontics and Orthodontics.

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College of Dentistry Research Day

Poster Presentation 289

Abstract Title: **Assessment of the Quality and Quantity of Bone Regeneration in the Maxillary Sinus Using Osteocel with Scaffold or Allograft Materials: A Radiographic and Histomorphometric Randomized Controlled Clinical Study.**

Author(s): J. Whitt, Division of Periodontology, U of Kentucky College of Dentistry A. Kutkut, Division of Restorative Dentistry, U of Kentucky College of Dentistry M. Al-Sabbagh, Division of Periodontology, U of Kentucky College of Dentistry D. Dawson, Division of Periodontology, U of Kentucky College of Dentistry M. Housley-Smith, Division of Oral Pathology, U of Kentucky College of Dentistry

Abstract: Background: Over the past decade, tissue engineering has become an increasingly important consideration in implant dentistry. Recent systematic reviews of human studies show higher bone regeneration when applying mesenchymal stem cells compared to that of controls. The purpose of this study is to histologically and radiographically evaluate, then analyze, bone volume and density with reference to percentage of vital bone after maxillary sinus grafted with Osteocel Plus (a stem cell product), and a conventional cortical-cancellous allograft. Research Hypothesis: Maxillary sinuses grafted with Osteocel will have denser and higher percentage of vital bone compare to sinuses grafted with conventional allograft after four months of healing. Specific Aims: 1. Augment maxillary sinus region to allow restoration with dental implants and subsequent restorations. 2. Radiographically compare density, through the use pre-op and 4-month post-op CBCT, the use of Osteocel with a biomimetic scaffold material to conventional cortical-cancellous allograft material. 3. Histomorphometric analysis to evaluate the quality and the quantity of the new bone regeneration using these different graft materials. Materials and Methods: Patients who agreed to take part in this study were randomly received lateral window maxillary sinus augmentation using Osteocel Plus or cortical-cancellous allograft. Cores were retrieved from anterior and posterior sites of both test and control sinuses. Core samples were placed immediately in formalin for histomorphometric analysis. Results: Preliminary results showed higher percentage of vital bone formed in test group compare to control group with no statistical significant difference.

Supported by: Project Supported by IDREF Grant # 3048113648. No conflict of interest reported by author.

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Poster Presentation 290

Abstract Title: Epac Contributes to Orofacial Pain after Trigeminal Nerve Injury in Mice

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Abstract: Traumatic injury to the trigeminal system often leads to chronic orofacial neuropathic pain, a debilitating condition that is refractory to currently available treatments. The development of novel treatments requires a better understanding of underlying molecular mechanisms. A promising new target gene is a receptor for cyclic adenosine monophosphate (cAMP): exchange protein activated by cAMP (Epac). Although Epac inhibitors inhibit inflammatory nociception, their effects on orofacial neuropathic pain are unknown. To address this gap, we administered the Epac1/2 specific inhibitor ESI-09 either by systemic (intraperitoneal) or local brainstem (intracisternal) routes in a mouse model of trigeminal inflammatory compression (TIC) injury. The sensory pain component (whisker pad mechanical hypersensitivity) was tested with application of graded von Frey filaments, while the affective pain component was assessed using a conditioned place preference (CPP) paradigm. TIC injury produced a robust mechanical hypersensitivity at the affected whisker pad and persisted for many weeks. This was associated with increased expression of a neuronal activation marker -phosphorylated extracellular signal-regulated kinases (pERK) in spinal trigeminal subnucleus caudalis (SP5c). Systemic administration of ESI-09 dose-dependently attenuated mechanical hypersensitivity and produced CPP in TIC injury mice, not sham controls. We also found that intracisternal administration of ESI-09 dose-dependently attenuated mechanical hypersensitivity of the whisker pad ipsilateral to injury. Ongoing studies are evaluating the effects of systemic and intracisternal administrations of ESI-09 on pERK expression in the SP5c. In summary, our data point to Epac as a potential target gene for the development of a new non-opioid pharmacotherapy for chronic orofacial neuropathic pain.

Supported by: College of Dentistry Student Research Fellowship Awards (CD), RO1NS62306 (BKT), RO1NS45954 (BKT), R01DA37621 (BKT), and the University of Kentucky / University of Pittsburgh Collaborative Center for Analgesia Research Excellence (BNS), NIH COBRE grant 2P2

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College of Dentistry Research Day

Poster Presentation 291

Abstract Title: **Open Barrier Ridge Preservation with Leukocyte Platelet Rich Fibrin Plug: A Clinical, Radiographic, and Histomorphometric Study**

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Abstract: Background: Alveolar ridge preservation has been shown to effectively limit the loss of alveolar ridge dimensions following tooth extraction. Leukocyte-Platelet Rich Fibrin (L-PRF) can be used for ridge preservation with comparable outcomes to those obtained with xenografts or allografts bone graft particulates. The purpose of this randomized clinical study is to investigate the effect of L-PRF plug on the quality of newly formed bone in the preserved socket using non-resorbable membrane (d-PTFE) as an open barrier. Null hypothesis: The use of L-PRF plug in combination with non-resorbable membrane as an open barrier technique to preserve the alveolar ridge will have no effect on the quality of the newly formed bone nor on the dimensional changes of the ridge. Specific Aims: The primary aim is to compare the histologic quality of the newly formed bone using histomorphometric analysis in the L-PRF + membrane group to the membrane only group. The second aim is to compare the horizontal and vertical changes of the ridge between the two groups using CBCT analysis. Results: To date, 10 patients (5 control and 5 Test) have completed the study and preliminary data for the histomorphometric and CBCT analysis are available.

Supported by: No funding sources.

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College of Dentistry Research Day

Poster Presentation 292

Abstract Title: **Touchscreen Interaction Provides Increased Retention for Children Receiving Oral Hygiene Instruction**

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Abstract: Receiving proper oral hygiene instruction (OHI) is fundamental for successful treatment in the pediatric setting. In the past this education has generally yielded poor retention and the resulting oral hygiene can suffer as a consequence. However, developments in educational computer software have shown promise specifically when it comes to the retention of this information. With the recent ubiquity of mobile devices, much of early childhood entertainment is delivered through touchscreen devices. Many children are now spending multiple hours each day interacting with these devices and regularly obtain a significant amount of information from them. Due to the increase of technology in early education, studies have been conducted to assess the comprehension of OHI from computer delivered tutorials. Unfortunately, no studies have identified OHI retention on interactive devices that children are in regular contact with. Because of this an interactive OHI program was delivered to children via an Apple iPad which was then followed by a short questionnaire on important information within the tutorial. This was compared to a non-interactive verbal delivery of the same information and a negative control of OHI delivered by clinic staff, a total of 150 children participated. It was found that there was a significant increase of immediately retained OHI data across all collected metrics of children ages 4-15 who received the instruction by the interactive tutorial. From these data it can be concluded that interactive tutorials can be helpful to pediatric dentists by increasing a child's retention of information vital to their oral health.

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Poster Presentation 293

Abstract Title: **Post-Operative Bleeding Associated with Antiplatelet and Anticoagulant Drugs: A Retrospective Study**

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Abstract: OBJECTIVE: To examine post-operative bleeding in patients taking antiplatelet and anticoagulant medications following invasive periodontal procedures. SUBJECTS AND METHODS: This 6-year retrospective study collected data from electronic health records of patients who underwent invasive periodontal procedures at a College of Dentistry from January 1, 2011 through April 1, 2017. Records were included when the medical history was current, an invasive periodontal procedure was performed, an antiplatelet or anticoagulant medication was taken, and a post-operative visit was documented. RESULTS: Four hundred fifty six patients [range 22-89 years, mean 66.06 years, 58.02% male) met the inclusion criteria. Antiplatelet medications, warfarin, a direct oral anticoagulant or a combination of these drugs were taken during 867 invasive procedures [484 scale and root planings, 218 implant placements, 53 open flap debridements, 16 gingival grafts, 15 lateral windows; 71 other). Medications were continued in 99.6% of patients during the procedure. Post-operative bleeding occurred after three procedures (0.35%) and resolved with local hemostatic measures. Medications were temporarily discontinued in four instances [range of 1-5 days) and none of these patients experienced post-operative bleeding. CONCLUSIONS: Postoperative bleeding was infrequent in patients who underwent an invasive periodontal procedure while taking an antiplatelet or anticoagulant drug.

Supported by: N/A

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Poster Presentation 294

Abstract Title: Association Analysis of Genetic Markers near or within the Transcription Factor FOXO6 and Human Facial Growth during Puberty

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Abstract: Introduction: The specific aim of this study is to determine whether four genetic variations within or near the FOXO6 gene are associated with differences in human facial growth during the Pubertal Growth Spurt (PGS). Methods: IRB oversight for this study is provided by Indiana University and the University of Kentucky. All subject information and DNA samples are part of a IRB-approved database of ~1,450 orthodontic patients from Northern Indiana. Cervical Vertebral Maturation Staging (CVMS) have been assessed on the cephalometric radiographs of 418 Caucasian subjects by three independent orthodontists (ARBM, CB, JH); agreement of two orthodontists designated the patients' initial and final CVMS. Only subjects with an initial CVMS of 3 (98 Female, 84 Male) were included in the study. Facial features on the initial and final treatment cephalometric radiographs were traced in Dolphin Imaging software (ARBM). Changes in growth were annualized over the treatment period for each subject. Data distributions were assessed by Shapiro Wilk W test for normality and were transformed with the Johnson Su, as needed. Genotyping data is currently being gathered for the FOXO6-associated SNPs: rs2154319, rs4660527, rs4660192, and rs10889961 (AEA). In the end, a stepwise multiple regression (JMP®, SAS Institute Inc, Cary, NC) will be performed to determine association between any of the genetic variations and any facial measurements. Results and Conclusions: Research for this project is still ongoing. What we hope to see is that variability in facial growth will be associated with one or more genetic markers near or within the FOXO6 gene.

Supported by: This project was funded in part by: UKCD research start-up funds (LAM), Southern Association of Orthodontist (SAO) Resident Research Grant Award (ARBM); University of Kentucky College of Dentistry DMD Student Research Fellowship (ARBM); University of Kent

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Poster Presentation **295**

Abstract Title: **Developing and evaluating piezoelectric scaffold for alveolar bone regeneration**

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Abstract: Aim: Several clinical conditions demand alveolar bone regeneration. This research attempted to develop a biodegradable bone regeneration scaffold using poly L-lactic acid (PLLA), a biocompatible and electroactive polymer with piezoelectric properties. Methods: Fiber size of 150um and the pore-size of 300um scaffolds were designed using Autodesk® software and PLLA scaffolds were printed using a Prusa i3 MK3® printer. The surface morphology of the scaffold was analyzed using an Atomic force microscopy (AFM). The microarchitectural analysis of the scaffold, the pore size and its distribution was studied using MicroCT. Microstructural-crystallographic characterization was done by Electron backscatter diffraction (EBSD) using FEI Helios Nanolab 660. Elasticity modulus was calculated by mechanical properties obtained by an electromechanical testing system, Bose ELF 3300. The piezoelectric constant upon mechanical distortion was characterized using a bench-top digital multimeter (DMM or DVOM). Hydrolytic degradation of the scaffold was studied by immersing the scaffold in the DMEM and percentage weight loss was calculated at the interval of 4, 8 and 12 weeks. Conclusions: A successful scaffold was developed and tested. The test results suggest that PLLA can make a suitable scaffold for bone regeneration since its mechanical and electrical properties are similar to that of bone. 3D printed PLLA scaffold is worth investigating as it is a promising material for bone regeneration.

Supported by: Pilot funding from UK Center for Clinical and Translational Science. Partly funded by Southern Association of Orthodontics Partly Funded by Division of orthodontics, UK College of Dentistry.

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College of Dentistry Research Day

Poster Presentation 296

Abstract Title: **Mandibular Orthognathic Surgery with Invisalign and Temporary Anchorage Devices: A Case Report**

Author(s): A.H. Nguyen, Division of Oral and Maxillofacial Surgery, U of Kentucky J. Van Sickels, Division of Oral and Maxillofacial Surgery, U of Kentucky

Abstract: Very often dental treatment such as veneers poses a challenge to the use of traditional orthodontic appliances. The advent and popularity of non-bonded orthodontics such as Invisalign has circumvented this issue in select cases. However, their use in preoperative orthodontics for orthognathic surgery poses a special challenge. In this case, a 51-year old female was referred by her orthodontist for surgical correction of her skeletal class II malocclusion, 100% deep bite, and significant overjet. The patient's 2 year course of pre-operative orthodontics were completed using Invisalign retainers to avoid damaging her anterior veneers with bonded orthodontic brackets. After clinical and radiographic exam, she was planned for a mandibular bilateral sagittal split osteotomy (BSSO) with mandibular advancement using temporary skeletal anchorage devices (TADs). The patient was taken to the OR and underwent the planned surgery without complication. A standard BSSO was performed, however without dental brackets to use, Synthes WAVE system screws were inserted into the maxilla and mandible bilaterally. These screws were used to facilitate temporarily positioning the teeth into the surgical splint intraoperatively as well as to facilitate elastic guidance post-operatively. Her post-operative course was uneventful and her WAVE screws were removed at 3 months post-op. This case illustrates a novel use of TADs in orthognathic surgery, both intra-operatively as well as post-operatively, further adding to the ever-growing armamentarium of the oral and maxillofacial surgeon.

Supported by: N/A

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Poster Presentation 297

Abstract Title: **Stress Perception and Bruxism Prevalence in Chilean Professional Soccer Player: A Pilot Study.**

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Abstract: Aim of Investigation: The aim of this study was to evaluate the prevalence of probable sleep bruxism in professional soccer players and determine if the levels of stress/anxiety the subjects are exposed to would have an effect in the sleep bruxism prevalence. Methods: 26 professional male soccer players were given a questionnaire to evaluate their levels of depression, anxiety and stress (DASS-21), the AASM questionnaire to evaluate probable sleep bruxism, in addition to questions regarding co-morbidities and daytime parafunctions. 2 calibrated examiners performed a physical examination. Subjects were screened for TMD following the DC-TMD criteria. Results: The prevalence of probable sleep bruxism was of 46.15%. On the other hand, reported awake bruxism prevalence was of 34.61%. According to DC/TMD criteria 84% of the subjects presented with a TMD diagnosis of which: 27.27% presented with local myalgia, 36.36% with TMJ disc displacement with reduction and 68.18% with TMJ subluxation. No significant difference was seen between reported bruxism, awake bruxism or probable sleep bruxism and the perception of stress or DASS score. Even though no statistical significance was achieved, a trend towards higher prevalence among the participants with higher stress was seen. Conclusions: The level of stress the professional soccer players are exposed to did not affect the prevalence of sleep bruxism. Joint disorders were seen in higher frequency among the players.

Supported by: None

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Poster Presentation 298

Abstract Title: **Combining Temporomandibular Joint Replacement and Orthognathic Surgery: A Case Report**

Author(s): K. Brown, Department of Oral and Maxillofacial Surgery, U of Kentucky L. Cunningham,
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Abstract: Objective: The purpose of this case report is to present the course of treatment for a 38-year-old female with a history of bilateral posterior open bite and right temporomandibular osteoarthritis with internal derangement. The course of treatment involved a combination of orthognathic and joint replacement surgery. Virtual surgical planning was utilized in order to complete a right temporomandibular joint replacement and left sagittal split osteotomies to resolve the patient's symptoms. Case Report: The patient initially experienced symptoms associated with bilateral temporomandibular joints in 2003. The patient was initially treated with conservative therapy including multiple occlusal guards, physical therapy and orthodontics. The patient was first treated in the orofacial pain clinic in 2015 where surgical consult was warranted due to no improvement of symptoms with conservative management. The patient was then examined by Dr. Cunningham in 2018 who utilized orthodontic therapy along with virtual surgical planning for right temporomandibular joint replacement with left sagittal split osteotomy. The surgery was completed in December 2018 and has been followed since. The patient has been having improvement of previous symptoms since the surgery with stable occlusion. Conclusion: After the right temporomandibular joint replacement and left sagittal split osteotomy surgeries, the patient has been healing well without major complication. For patients with both temporomandibular joint derangement and skeletal malocclusion, this treatment combining TMJ replacement and orthognathic surgery proves to be an adequate option.

Supported by: None-case report

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Poster Presentation 299

Abstract Title: **PLA2-IIA is Associated with Oral Dysbiosis and Gingival Transcriptome changes**

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Abstract: Objective: Modulation of gingival antimicrobial responses by oral pathogens could contribute to oral dysbiosis and inflammatory disease. We demonstrated in vitro that *P. gingivalis* (Pg) modulates oral epithelial cell innate responses through up-regulation of the antimicrobial enzyme phospholipase A2-IIA (PLA2-IIA). Here, we sought to test the hypothesis that PLA2-IIA expression in vivo is associated with oral dysbiosis and impaired gingival innate responses. Methods: Transgenic mice overexpressing the human PLA2-IIA (Tg-hPLA2-IIA) and their corresponding wild type (WT) littermates were co-caged for 24 weeks. PLA2-IIA expression levels and enzymatic activity were evaluated in gingival tissues by immunohistochemistry and ELISA respectively. Oral swab samples and gingival tissues were assessed using 16S sequencing and nanostring respectively to determine oral microbiome and gingival immunoinflammatory transcriptome changes. Results: Gingival PLA2-IIA expression and activity were significantly higher in Tg-hPLA2-IIA compared with WT littermates. Bacterial species of Firmicutes were reduced and bacterial species of Proteobacteria were enriched in Tg-hPLA2-IIA vs. WT. Increased expression of genes associated with bacterial sensing and cell proliferation/differentiation (NOD2 and Notch-1) was observed in Tg-PLA2-IIA vs WT. Conversely, genes involved in antimicrobial (S100a8, DEFB1, B2m, CXCL13) and chemokine responses (RANTES, MCP-1, MCP-3, MCP-5, CCL24) showed lower expression in Tg-hPLA2-IIA. Conclusion: Increased levels/activity of gingival PLA2-IIA are associated with oral dysbiosis and host transcriptional changes that may impair the ability of gingival tissues to maintain homeostatic interactions with the oral microbiome probably leading to unresolved inflammation and periodontal disease. Pg-induced PLA2-IIA could contribute to enhance oral dysbiosis, inflammation, and bone loss.

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Poster Presentation 300

Abstract Title: **Rhino-Orbital Mucormycosis: Presentation in an Uncontrolled Diabetic**

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Abstract: Mucormycosis is a rare but potentially deadly fungal infection that generally affects uncontrolled diabetics and immunocompromised patients. Although it may invade various areas of the body, the oral and maxillofacial region is generally the most commonly affected. A 45-year-old female with significant past medical history of type II diabetes mellitus, congestive heart failure and hyperlipidemia presented to an outside hospital with complaints of left facial hemiparesis and edema. The following day the patient reported loss of vision in the left eye. CT orbit scan findings showed a left infraorbital subcutaneous abscess extending into the maxillary and ethmoid sinuses. The patient was transferred to UK Chandler Hospital for further work-up. HbA1C on admission was 13% with blood glucose above 300. The patient was immediately taken to the OR for debridement of necrotic tissue and nasal endoscopy. The patient was started on amphotericin B due to concern for acute fungal sinusitis related to her uncontrolled diabetes. Further MRI scans confirmed fungal sinusitis involving the orbit and extending into the dura and left cavernous sinus thrombosis. The patient was taken to the OR for left facial soft tissue excision, hemi-maxillectomy, and orbital exenteration. The patient was monitored for one month postoperatively and discharged with instructions to pack surgical site with Amphotericin B soaked gauze. Patient has required multiple follow-ups to date. This case illustrates the debilitating effects of Mucormycosis in an uncontrolled diabetic. A quick work-up and treatment followed by long-term therapy is imperative in order to minimize the extent of disease progression.

Supported by: None

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Poster Presentation 301

Abstract Title: **Genetic Association of FOXO3 SNPs with Facial Growth during the Pubertal Growth Spurt**

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Abstract: Introduction: Most comprehensive orthodontic care is provided to patients who are transitioning from childhood into adolescence. Since this timing of treatment coincides with the patient's pubertal growth spurt (PGS) and their peak height velocity of growth, accurate growth predications become paramount in correctly diagnosing and treating these patients. There has long been interest in identifying genetic factors that may predict the growth potential of patients. Recent investigations at the University of Iowa have identified FOXO3 as playing a role in the overall growth/size of the craniofacial region. This study was designed to evaluate single nucleotide polymorphisms (SNPs) within the FOXO3 gene and assess correlations between genotype, pre-treatment jaw relationship and/or the annualized jaw growth for patients who transitioned through the PGS during orthodontic treatment. Methods: IRB oversight was provided by Indiana University and the University of Kentucky. Subjects were consented, and DNA collected in a Northern Indiana Orthodontic practice. The pre-treatment cephalometric radiographs of 418 Caucasian patients were analyzed for Cervical Vertebral Maturation Staging (CVMS). Patients primed to enter the PGS were identified with a CVMS of 3 at the start of treatment (84 males/98 females). Pre- and post-treatment Cephalometric analyses were used to determine skeletal relationship and jaw growth. Genotyping of rs4946932 and rs2764264 were completed with standard methodology. Statistical Analysis (JMP software) will assess data normality and multi-variable logistic regression for association testing between the SNPs, pre-treatment jaw relationship and/or annualized jaw growth during treatment. Results: Collected data is undergoing statistical analysis, and our finding will be presented.

Supported by: Funding in part from: UKCD research start-up funds (LAM), Southern Association of Orthodontist (SAO) Resident Research Grant Award (JP, ARBM); University of Kentucky College of Dentistry DMD Student Research Fellowship (ARBM); University of Kentucky Centre

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Poster Presentation 302

Abstract Title: **CBCT Imaging in Orthodontics: A New Standard of Care?**

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Abstract: The use of CBCT in the dental profession has increased significantly in the past 5 years. Current recommendations from the American Association of Orthodontists (AAO) do not provide specific indications for its use. Three-dimensional radiographs undoubtedly provide more information compared to traditional two-dimensional imaging, but the clinical relevance of this information is disputed. As with any new technology, it is important to establish protocols based on patient centered treatment outcomes. Current diagnostic radiographs for orthodontic imaging include panoramic film, lateral cephalometric film, and selected periapicals. All of these images can be extracted from a CBCT image, in addition to full three-dimensional renderings. Advantages of CBCT for orthodontic diagnosis include visualization of impacted and supernumerary teeth, evaluation of facial asymmetry, digital orthognathic surgery planning, evaluation of root angulation and morphology, and visualization of airway volume. Disadvantages include increased radiation dose, increased cost to patient and provider, and other practical challenges to adopting new technology. Other rapidly evolving 3D imaging modalities can be used in conjunction with CBCTs to expand the scope of treatment. The purpose of this presentation is to outline absolute indications for the use of CBCT currently supported in the orthodontic literature and identify possible applications for future use of CBCT imaging to determine if it should be considered the new standard of care.

Supported by: Bjerklin K, Ericson S. How a computerized tomography examination changed the treatment plans of 80 children with retained and ectopically positioned maxillary canines. Angle Orthod 2006 Jan;76(1):43-51. Haney E, Gansky SA, Lee JS, Johnson E, Maki K, Mi

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Poster Presentation 303

Abstract Title: **The Effect of Nicotine in the Systemic Blood on Inflammatory Cytokines in the Saliva of Women During Pregnancy**

Author(s): Dr. A. Zegeer, Department of Periodontology, U of Kentucky Dr. D. Dawson, Department of Periodontology, U of Kentucky Dr. M. Al-Sabbagh, Department of Periodontology, U of Kentucky Dr. K. Ashford, College of Nursing, U of Kentucky

Abstract: The effects of nicotine on the periodontium has been well documented in the dental literature. Nicotine alters normal gingival blood flow, neutrophil function, cytokine production, as well as connective tissue regeneration and maintenance. [1] This hampering of the body's innate ability to repair and defend the periodontal tissues is directly responsible for the destruction seen in smokers. In this study, we looked to address the gap in current dental literature by comparing a group of current smokers and a control group of non-smoking pregnant women, in terms of inflammatory cytokine expression in the saliva. The comparison will be defined by the levels of cytokines IL-1A, IL-1B, IL-6, IL-8, IL-10, TNF-A, MMP-8 and CRP present in saliva samples of the two groups. The results could show a direct correlation between urinary cotinine levels, and therefore systemic nicotine exposure, to the overexpression of inflammatory cytokines in the oral cavity.

Supported by: All support provided by the University of Kentucky, College of Dentistry, Department of Periodontology.

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Poster Presentation 304

Abstract Title: **Evaluation of Highly Selective mPGES-1 Inhibitor, UK4b, as a Non-addictive Pain Medication for Orofacial Pain**

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Abstract: Orofacial pain affects more than 39 million people in the United States. It is a common and costly problem with a profound impact on the quality of life. Pain is refractory to currently available treatments; an estimated 2 million Americans are addicted to opioids. Opioid overdose and addiction is an ongoing and rapidly evolving public health crisis. Non-opioid pain medications are urgently needed as alternative effective pain management. Clinically available nonsteroidal anti-inflammatory drugs (NSAIDs) that inhibit cyclooxygenase 1/2 (COX1/2) block all the prostaglandin H2 (PGH2) downstream productions with serious cardiovascular, cerebrovascular and gastrointestinal side effects. Targeting the prostaglandin E synthase (PGES) pathway—the downstream of COX1/2, will minimize the deleterious effects of NSAIDs while maintaining the therapeutic benefits. Using an innovative structure based design approach; Dr. Zhan's lab recently developed a novel inhibitor for microsomal prostaglandin E synthase-1 (mPGES-1), UK4b that is potent for both human and mouse's mPGES-1 allowing for the requisite preclinical studies. By inhibiting mPGES-1 blocks only the conversion of PGH2 to prostaglandin E2 (PGE2), it preserves the beneficial PGs derived from PGH2, reducing side effects substantially. To evaluate the efficacy of UK4b, we employed two orofacial pain animal (mouse) models. The orofacial formalin pain model - pain induced by the injection of diluted formalin solution is robust, persistent and comprises neurogenic and inflammatory components. The orofacial neuropathic pain model – pain induced by trigeminal nerve inflammatory compression (TIC) injury. Our study concluded that UK4b, in a dose-dependent manner, attenuated the whisker pad hypersensitization induced by formalin injection or TIC injury.

Supported by: NIH COBRE grant 5P30GM 110788 (RJD); the National Science Foundation (NSF) grant CHE-1111761 (CGZ); NIH COBRE grant 2P20RR020145.

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Poster Presentation 305

Abstract Title: **Comparison of oral salivary and cervicovaginal fluid inflammatory cytokines throughout pregnancy**

Author(s): Lucinda Belcher, Resident Department of Periodontology, U of Kentucky Dolphus Dawson, Department of Periodontology, U of Kentucky Kristin Ashford, Department of Nursing, U of Kentucky Mohanad Al-Sabbagh, Department of Periodontology, U of Kentucky

Abstract: Immune responses vary during the gestation cycle dependent upon amount of proinflammatory and anti-inflammatory cytokines present. Host response are derived from the generation of different inflammatory cytokines and immune cells. Cervicovaginal (CVF) inflammatory cytokines and oral salivary cytokines in periodontitis have been shown to play a role in adverse pregnancy outcomes. An increase in the concentration of inflammatory markers are seen in pregnant women with periodontitis and evaluation of these marker levels may be used as a non-invasive test to determine possible inflammatory diseases. It would be beneficial to identify trimester specific cytokines levels in cervico-vaginal and oral salivary fluid to help identify biomarkers related to adverse pregnancy outcomes which may correlate to inflammatory diseases such as periodontitis. Importantly, there is a lack of trimester-specific correlation of oral and systemic (CVF) immune responses during pregnancy. In this study, we look to evaluate pro-inflammatory and anti-inflammatory cytokine levels in oral saliva through-out the three pregnancy trimesters and to compare changes in pro-inflammatory and anti-inflammatory cytokine levels in CVF per trimester to oral salivary cytokine profiles.

Supported by: Support for the project was provided via the University of Kentucky Department of Periodontology.

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Poster Presentation **306**

Abstract Title: **TGF- β 1-Induced Phenotypic Changes on Oral Epithelial Keratinocytes**

Author(s): F. Bazina. Department of Oral Health Research, U of Kentucky S. Brouxhon. Department of Surgery, U of Kentucky S. Kyrkanides. Department of Oral Health Science, U of Kentucky

Abstract: Transforming growth factor- β 1 (TGF- β 1) is a pluripotent growth factor that activates diverse cellular responses during growth, differentiation and specification of cell fate during morphogenesis. Moreover, TGF- β 1 has been reported to regulate and maintain pluripotency markers (e.g. Oct4, Sox2, Nanog etc.), cell-type-specific stem-cell markers, and the reprogramming of cell identity during organ regeneration. TGF- β 1 further drives epithelial-mesenchymal transition (EMT), which in turn, is an essential process linked to this reprogramming of differentiated cells into induced pluripotent stem cells. However, whether TGF- β 1 induces oral epithelial cells to undergo EMT and express these master pluripotent transcription factors or other pluripotency genes has yet to be fully elucidated. Our results demonstrated that chronic TGF- β 1 treatment of immortalized oral epithelial keratinocyte (IMOK) cells induced EMT together with the expression of Oct4, Sox2, and Nanog in vitro. Other TGF- β 1-induced stem cell markers and specific homeobox, GATA and Pax gene-family members, clearly linked with pluripotency and/or the maintenance and regulation of stem-cell self-renewal, were further upregulated. More importantly, we found that this TGF- β 1-induced increase in pluripotency markers was inhibited using a small molecule inhibitor of TGF- β RI, suggesting that TGF- β 1 may signal via this receptor to induce this intermediary stem cell-like phenotype. Taken together, chronic TGF- β 1 treatment of IMOK cells induces a phenotypic changes associated an EMT-like event and up-regulation of key pluripotency markers (e.g. Oct4, Nanog and nestin) that localize to the nucleus.

Supported by: Center for Oral Health Research Natural Enamel. LLC.

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Poster Presentation 307

Abstract Title: **Localized Aggressive Periodontal Disease Patterns in Families**

Author(s): Mostafa Tabaa, Division of Periodontology, Collage of Dentistry, U of Kentucky Luciana M. Shaddox, Division of Periodontology, Collage of Dentistry, U of Kentucky

Abstract: Localized aggressive Periodontitis (LAP) is a rare disease, but it has a rapid periodontium destruction in early life. It has been reported to affect young individuals and result in premature tooth loss if untreated timely. There is good evidence on the family aggregation of LAP and that the common pattern of the disease is around first molars and/or incisors. However, there is no evidence on the pattern of distribution of this disease among siblings of LAP affected families. LAP has been associated with a high LPS inflammatory response, and there is a possibility of a genetic linkage of this hyper-responsive phenotype. However, whether this inflammatory response affects disease distribution in the mouth of healthy sibling is not yet known. In this study, we will determine the clinical pattern of LAP in affected families by looking into the distribution of the disease in siblings and evaluating affected teeth, sites, symmetry, and bone loss patterns among family members. We aim to correlate the inflammatory response to bacterial Lipopolysaccharides in the subjects and their siblings and to evaluate the influence of LPS responsiveness in the clinical distribution of the disease. We will look into the levels of 14 inflammatory markers in whole blood and correlate with extent and severity of breakdown in LAP siblings. We expect to end resulting that siblings affected with Localized Aggressive Periodontitis show similar anatomical and distribution patterns of disease, and the inflammatory response of the affected families dictates the extent and the severity of the clinical distribution patterns.

Supported by: NIH study R01DE019456

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Poster Presentation **308**

Abstract Title: **Regulation of oral bacteria-induced CCL20 secretion in epithelial cells involves miRNAs**

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Abstract: Objective: CCL20 plays a role in innate and adaptive immunity due to its antimicrobial properties and ability to modulate Th17 responses. Increased CCL20 expression has been associated with periodontal inflammation. The effect of oral bacterial species in CCL20 expression/regulation in oral epithelial cells (OEC) remain undefined. We sought to evaluate the effect of oral bacteria in CCL20 expression and secretion by OEC and the potential regulatory role of microRNAs (miRNAs). Methods: OECs (OKF6) were challenged with *S. gordonii* (Sg), *S. sanguinis* (Ss), *V. parvula* (Vp); *A. naeslundii* (An); *C. sputigena* (Cs), and *N. mucosa* (Nm). CCL20 mRNA and protein levels were determined by qPCR, Luminex, and ELISA. *F. nucleatum* was used as a positive control. Expression of miR663a and miR4516 previously validated as regulators of chemokine-associated pathways, and up-regulated by Sg in OECs were evaluated by qPCR. Effect of corresponding miRNA mimics in CCL20 secretion was tested. Results: All oral bacterial species increased CCL20 mRNA consistent with protein elevations in cell lysates, except Cs. However, An, Fn, and Vp induced higher CCL20 secretion into supernatants in comparison to Sg, Ss, and Nm. Decreased bacteria-induced CCL20 secretion correlated with up-regulation of miR4516 and miR663a, whereas bacteria-induced downregulation of these miRNAs was associated with higher CCL20 levels in supernatants. Both miR4516 and miR663 mimics decreased Fn- and An-induced CCL20 secretion. Conclusion: CCL20 secretion by OECs is differentially modulated by oral bacterial species in a mechanism that seems to involve miR-4516 and miR663a. These miRNAs are new candidates for regulating epithelial CCL20-mediated responses.

Supported by: NIH/NIDCR: DE024586 The project described was supported by the National Institutes of Health (NIH)/National Institute of Dental and Craniofacial Research (NIDCR), through Grant DE024586. The content is solely the responsibility of the authors and does no

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Poster Presentation 309

Abstract Title: **Association Analysis of Activin/Inhibin Pathway Genes with Human Hypodontia**

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Abstract: Introduction: This prospective study was designed to test for significant associations between patients with hypodontia and novel genetic markers within or near the Activin β -A gene (also termed Inhibin β -A, INHBA), the Activin β -B gene (also termed Inhibin β -B, IHNBB), the inhibin- α gene (INHA) and/or the Activin Receptor-II gene (ACVR2A). Methods: With oversight of the University of Kentucky IRB, we enrolled 46 individuals with hypodontia* and 79 individuals with a complete dentition excluding 3rd molars (controls) into our study. All subjects provided a 3-generation family medical and dental history and saliva for genetic testing. The occurrence of hypodontia was verified by radiographs, oral examination and/or dental records, and the *phenotype spectrum included naturally missing, small and peg-shaped teeth. Syndromic and cleft lip/palate patients were excluded. Taqman[®]-based SNP genotyping was used to assess 6 variations: INHBA (rs2877098, rs3801158), IHNBB (rs7576183), INHA (rs2059693, rs6729914) and ACVR2A (rs7582403). Statistical testing for association is being completed using JMP[®] software. Results: In this report, the maxillary lateral incisors were the most common tooth affected by hypodontia (24-agenic, 24-peg), followed by the mandibular second premolars (29-agenic). We identified a genotypic shift near the IHNBB gene at rs7576183 such that the G-allele and GG-genotype occurred at higher frequencies in cases compared to controls. Genotypic shifts were also noted with hypodontia patients and INHBA SNPs rs3801158 (increased G-allele and GG-genotype occurrence) and rs2877098 (increased TT-genotype occurrence). Conclusion: SNPs rs7576183 and rs3801158 may reside in linkage disequilibrium with causative mutations of hypodontia. We are continuing to recruit patients to improve our study power.

Supported by: Southern Association of Orthodontists (SAO) Resident Research Grant Awards, COBRE Grant NIH P30GM110788, American Association of Women Dentists/Proctor & Gamble Grant Award, National Center for Advancing Translational Sciences UL1TR000117, E. Preston Hic

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College of Dentistry Research Day

Poster Presentation 311

Abstract Title: **Trigeminal Neuralgia in a 32-Year-Old-Female with Chiari Malformation: A Case Report**

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Abstract: Aim of investigation: In this case report we describe a case of Trigeminal Neuralgia (TN) secondary to Chiari malformation. TN is usually related to vascular compression of the fifth cranial nerve, but it maybe a result of central lesions such as arteriovenous malformations, aneurysms, multiple sclerosis, tumors and brainstem infarcts. A 32-year-old female, diagnosed with Chiari Malformation Type I presented with paroxysmal episodes of severe pain that radiated from the right pre-auricular area to the chin, and right side of her tongue lasting from 30 seconds to few minutes. In January 2016, she underwent a suboccipital decompression for Chiari malformation that relieved her pain for approximately 10 months. Methods: A detailed examination of head and neck revealed a scar in the center of suboccipital region, and bilateral tightness during rotation, flexion and extension. Upon palpation, a very repeatable non-painful opening clicking at 26 mm was noted on both sides. Post-op brain MRI report was reviewed. Patient was diagnosed with TN secondary to Chiari Malformation. Results: It is important for orofacial pain practitioner to recognize Chiari Malformation as a rare cause of TN. MRI evaluation of patients is necessary to detect these lesions.

Supported by: Not applicable

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Poster Presentation 312

Abstract Title: **Genetic Profile Associated with Response to Treatment in Localized Aggressive Periodontitis**

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Abstract: Localized Aggressive Periodontitis (LAP) is a rare inflammatory condition affecting the tissues surrounding the teeth, particularly seen in children and adolescent. The disease is characterized by a rapid rate of destruction in otherwise healthy individuals. Although bacteria present in plaque plays a major role, both environmental and genetic factors might be involved in the onset and progression of the disease shown by recent studies, characterizing this disease as a complex trait. Single nucleotide polymorphism (SNP) is a single nucleotide variation at a specific location in the genome that is by definition found in more than 1% of the population. SNPs are highly utilized genetic markers for studies seeking to link DNA sequence variations to disease phenotypes, since it's the most common type of genetic variation among people. Researchers have found SNPs that may help predict an individual's response to certain drugs, susceptibility to environmental factors such as toxins, and risk of developing particular diseases, such as type 2 diabetes and autoimmune disease. A few SNPs and some epigenetic modifications have been recently associated with LAP disease. Therefore, in this study, we will evaluate the association of single nucleotide polymorphisms (SNPs) profiles with LAP response to conventional periodontal treatment in the long term. We will also evaluate the association of this profile with the degree of LPS inflammatory response in this patients, also shown to be high in LAP by recent studies. Genotype and allele frequencies will be examined for correlation with response to periodontal treatment in a population of African-Americans with LAP and the SNP profile associated with LAP phenotype will then be correlated with in vitro cytokine levels after LPS stimulation in this individuals. We hope that the results of this study will show that a genetic profile may be able to predict treatment response and therefore individualized treatment and maintenance protocol may be applied in certain cases.

Supported by: NIH RO1DE019456

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College of Dentistry Research Day

Poster Presentation 313

Abstract Title: **Title: Use of CBD Oil for Pain Management in Trigeminal Neuralgia: A Case Report**

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Abstract: Aim of Investigation: In this abstract we illustrate a case of trigeminal neuralgia successfully managed with CBD (cannabidiol) oil. A 71 year old female patient presented to the Orofacial Pain Clinic with a chief complaint of severe paroxysmal episodes of pain along the right V2 distribution that lasted between 1-10 seconds. She described several attacks of pain in an hour triggered by light touch, tooth brushing, wind and application of makeup. Reportedly, she was diagnosed with trigeminal neuralgia over 10 years ago by her neurologist and underwent the following surgical treatments: gamma knife procedure, percutaneous balloon compression, and glycerol rhizotomy with no improvement of her symptoms. Furthermore, she underwent a microvascular decompression procedure that resulted in transient pain relief for a few months. Additionally, she tried pharmacotherapy including: gabapentin, pregabalin, baclofen, carbamazepine and oxcarbazepine, however she was not able to tolerate them due to severe cognitive impairment. Methods: Detailed head and neck exam was performed. Patient had pain to light touch on the right side - V2. Additionally she also experienced unprovoked paroxysms of pain during clinical exam. Results: Patient applied CBD oil on affected areas with a dropper and experienced pain relief in a few minutes. Pain relief reportedly lasted about an hour. No side effects were reported. Conclusions: This is a particularly recalcitrant case of TN that did not respond favorably to any of the standard treatments. CBD oil application was conservative and effective therapy.

Supported by: None

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College of Dentistry Research Day

Poster Presentation 314

Abstract Title: **Determination of Lateral Cephalometric Hispanic Soft Tissue Norms and Comparison to Caucasian Soft Tissue Data**

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Abstract: Objective: Recent studies have demonstrated soft tissue differences between Hispanic and Caucasian populations, however, comprehensive age-specific soft tissue norms for the ages 6-18 have not been studied. This retrospective study was designed to measure and compare the soft-tissue profiles of Hispanic and Caucasian orthodontic patients at the University of Kentucky (UK) between 2000-2014. Our study findings will establish a comprehensive set of Hispanic soft-tissue norms for clinical diagnosis and treatment planning. Methods: Approval for this study was obtained from the UK IRB. A total of 274 patients between the ages of 6-18 were identified for the study in archived records (58 Hispanic females, 52 Hispanic males, 96 Caucasian females, and 68 Caucasian males). Only patients diagnosed with dental class I first permanent molars were included in the study. Patients with dental class II or III malocclusions, six or more missing teeth, skeletal asymmetries, craniofacial syndromes or deformities were excluded. Soft-tissue features were traced on pre-treatment lateral cephalograms using Dolphin Imaging software version 11.9. The 21 soft-tissue measurements selected for comparison are derived from the Legan/Burstone, Holdaway, Ricketts and Arnett analyses. Stepwise logistic regression in a forward direction with p-value threshold of .05 to enter and .1 to leave was done for sex, ethnicity, and interaction between sex and ethnicity (JMP® Genomics 9.0). Results and Conclusions: Results indicated that many Hispanic patients had increased soft tissue thickness, more protrusive lips and increased convexity compared to Caucasian controls. Caucasian normative data is not appropriate for evaluating Hispanic soft tissue profiles.

Supported by: NA

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