

2016 AAO Annual Session Oral Research Presentations

The Oral Research presentation will be held on Sunday, May 1 in Orange County Convention Center - West Building Room 300 from 8:00am-3:45pm with a break from 11:45am to 12:30pm. Oral Research presentations are 10 minutes long with 5 minutes for questions from the audience.

*- Denotes financial interest or visual enhancement

Moderator: Dr. Flavio Uribe- 8:00am-10:00am

ORTHODONTIC CONSIDERATIONS: SIDE EFFECTS AND CO-MORBIDITIES

8:00am-8:15am

Ariana Weissend, et al.
Minneapolis, MN, USA

Bioactive Coatings for Orthodontic Appliances to Prevent White Spot Lesions

Objective: To develop bioactive coatings for orthodontic bracket materials, which prevent white spot lesions (WSL) by attacking the causative oral microflora. Methods: Stainless steel (SS) and titanium (Ti) discs were coated with GL13K, an antimicrobial peptide of human origin, after various methods of surface preparation. *S. mutans* or *L. casei* were cultured on coated discs and colony forming units (CFU) compared to uncoated controls. Coated discs were also subjected to mechanical, hydrolytic and proteolytic challenges simulating intraoral conditions. Results: Successful coatings on SS and Ti were obtained after sandblasting, etching and plasma cleaning. CFU counts of *S. mutans* and *L. casei* were significantly reduced after culture on GL13K-coated discs. There was only minimal peptide degradation after the mechanical, hydrolytic and proteolytic challenges. Conclusion: GL13K can be used to form robust antimicrobial coatings, which may prevent WSL associated with orthodontic therapy.

8:15am-8:30am

Tingxi Wu, et al.
Los Angeles, CA, USA

Managing Orthodontic Bracket Induced Plaque Formation and Associated Oral Diseases

Dental plaques accumulating around orthodontic brackets cause decalcification of enamel surface, caries, and gingival inflammation. Brushing based mechanical removal can not effectively control bracket-induced plaque, making it a major problem in orthodontic care. The aim of this study is to develop an anti-microbial adherence/anti-biofilm chemical formula, and evaluate the safety and efficacy of the formula in vitro and in vivo. A panel of sugar and amino acids with inhibitory effects against in vitro biofilm formation has been found and formulated. The formula showed the inhibitory effects against biofilm formation in vitro bracket-plaque formation model system. A double-blinded placebo controlled pilot clinical study is currently under evaluation in vivo to evaluate the clinical efficacy of this new chemical formula on reducing bracket-induced plaque formation. This finding would have positive impacts on reducing gingivitis and white spot lesions within orthodontic patients.

8:30am-8:45am

Christina Erbe, et al.
Mainz, Germany

Plaque Removal Efficacy of Two Interdental Brushes Around Brackets: A Multicenter Study

This multicenter, randomized double-blind crossover study comprised 20 patients (age 12-18) with fixed appliances. A cylindrical shaped interdental brush (IB) (IDBG-S®) was compared with a new developed waisted shaped IB (Circum CDB-8®, both Top Caredent). The Plaque-Index (PI, mod. Silness & Løe) of 8 areas around brackets was analyzed pre- & post-cleaning at 2 visits. Main areas (MA) were the both next

to gingival bracket angles because of difficult cleaning. Both brushes showed a plaque removal effect (Mann-Whitney-Test). The overall CDB-8® PI score of all tooth surfaces had a median value by 0.68. The IDBG-S® PI was reduced by 0.43. The difference between the two IB is significant ($p=0.0015$). The CDB-8® (CDB-effect: 0.68/ IB-effect: 0.21) had a better efficacy of plaque removal, especially onto the MA. There was no indication of carry-over effect ($p=0.5920$). The waisted head of CDB-8® is able to improve the overall plaque removal and especially the difficult to clean areas.

8:45am-9:00am

Sachin Agarwal, Madhur Upadhyay
Carlton, Australia

Long Term Comparison of Microbial Colonization and Periodontal Status Between Clear Aligners, Self-Ligating Brackets and Conventional Brackets - A Randomised Clinical Trial

Intro: To compare the total bacterial (TB), Strep. Mutans (SM) and periodontal health (Plaque, Bleeding & Gingival indices) in patients treated with clear aligners (CL), self-ligating (SL) and conventional brackets (CB). Method: 59 patients underwent stratified randomization into G1 (N= 24) CL, G2 (N=16) SL and G3 (N=19) CB groups. Bacterial swabs and indices were taken from max lateral incisor and 2nd premolar at initiation (T0) & 18 months after (T2). Results: In premolar region, no difference was found in TB, PI & BI. SM count (T2-T0) was greater in G3 as compared to G2 and G1 ($p = 0.05$; 0.017). GI (T2-T0) was smaller in G1 as compared to G2 and G3 ($p = 0.024$; 0.0). In lateral incisor region, no difference was found regarding TB, SM, PI. GI (T2-T0) was smaller in G1 as compared to G2 and G3 ($p = 0.0$; 0.022). BI (T2-T0) was smaller in G1 as compared to G2 ($p= 0.009$). Conclusion: There is no difference in bacterial count between the three appliances tested. GI was better in CL group.

9:00am-9:15am

Federico Perrini, et al.
Ferrara, Italy

Caries Prevention in Orthodontics – High-Fluoride Varnish Performance In Vivo in Preventing White Spots Lesions

Objective: To evaluate the efficacy of a fluoridated varnish in preventing white spot lesions in fixed orthodontics patients via a laser-induced fluorescence device. Methods: A split-mouth study was performed on 24 orthodontic patients, allocated randomly to two subgroups with differing frequencies of a fluoridated varnish application. The degree of demineralization was registered on the vestibular surface of 12 teeth (6 varnished and 6 controls). Results: Statistical analysis showed a difference in the degree of demineralization between treated and untreated teeth, but this was not statistically significant in terms of time point, frequency of application or specific tooth site. Only the varnished anterior teeth showed a significant reduction in demineralization. Conclusions: Periodic application of fluoride varnishes can offer some protection against white spot onset, but not to a statistically significant degree if patients have excellent oral hygiene control

9:15am-9:30am

Angela Arreghini, et al.
Ferrara, Italy

Correlations Between Sleep Bruxism, Psychological Factors and Dental Wear in a Group of Dental Professionals and Laypeople - A Clinical Study

Objective: To answer the question: 1. Is sleep bruxism (SB) correlated with any psychological features? 2. Are there any differences in such parameters between a group of orthodontists and matched laypeople? Methods: 22 orthodontists and 19 laypeople, underwent an in-home evaluation with a portable device combining EMG and ECG recordings for SB diagnosis. They were administered questionnaires for state/trait anxiety levels and coping strategies. Dental wear was evaluated on digital casts. Results: SB index was not correlated with any of the psychological scales, with minor exceptions. SB index,

analyzed with t-test, was not statistically different between the two groups. Dental wear does not have any relationships with SB index and psychological traits. Conclusions: Findings suggest that there is an absence of clear-cut relationship between sleep bruxism, psyche and dental wear. In addition, the dental profession does not have a strong influence on SB and the level of stress

CLASS II AND CLASS III TREATMENT

9:30am-9:45am

Mohammed Elnagar, et al.
Chicago, IL, USA

Miniplate Protocols for Maxillary Protraction

The aim of this study was to investigate the success of miniplate anchorage in two protocols for maxillary protraction. Methods: Thirty growing Class III subjects were included in the study. In group 1 (n=10) facemasks were anchored with miniplates placed at the zygomatic buttress. In group 2 (n=10) miniplates were placed in the maxilla and mandible connected by Class III elastics. Group 3 (n=10) was an untreated control group. Results: The maxilla moved forward significantly in groups 1 and 2 as compared to the untreated controlled group (4.5 mm in group 1 and 5.5 mm in group 2); overjet and molar relationship were improved as well as soft-tissue harmony. However group 1 showed more posterior repositioning and opening rotation of the mandible than group 2. Conclusions: The miniplate protocols for maxillary protraction provide effective treatments for growing Class III patients. However, vertical changes can be better controlled by miniplates connected by Class III elastics.

9:45am-10:00am

Camille Guez
Carpentras, France

Factors Affecting the Extraction Decision: A Contemporary Perspective at UNC

The decision to extract teeth for orthodontic purposes is one of the most complex and debated topics in the specialty. This retrospective data analysis investigated changes in orthodontic extraction rates at the University of North Carolina from 2000 to 2011. Pre- and post-treatment records were analyzed, and different clinical factors (Angle classification, skeletal relationship, use of self-ligation, etc.) were investigated to evaluate their potential impact on the extraction decision. The sample consisted of 2,184 patients. Student t-test and chi-square were used to explore the bivariate association between extraction and diagnostic and treatment factors. The extraction rate decreased significantly from 2000 (40%) to 2005 (20%). After 2005, it remained stable around 27%. Eight of thirteen clinical variables were found to significantly influence the overall extraction decision ($p < 0.05$).

Moderator: Dr. Nan Hatch - 10:00am-11:45am

10:00am-10:15am

Vincenzo D'Antò, et al.
Italy, Italy

Morphologic Predictors of Mandibular Changes Induced by Sander II Bite Jumping Appliance

Objective: to identify possible predictors of the mandibular length increase in Class II patients treated by means of the Sander II Bite Jumping Appliance (BJA). Materials and Methods: The study was performed on 43 subjects (21 females, 22 males) with Class II malocclusion due to mandibular retrusion, treated by BJA. The following mandibular structural features were measured on lateral cephalograms: the ratio between width and height of the mandibular symphysis, the ratio between width and height of the mandibular ramus, the antegonial notch depth and the Co-Go-Me angle. The increases in mandibular length were assessed by measuring Pg/OLp+Co/OLp. A regression statistical model was used to test the association between morphologic variables and mandibular length changes. Results: A significant

association between pretreatment Co-Go-Me° and mandibular length change was found ($p < 0.0001$).
Conclusion: Class II individuals with smaller Co-Go-Me° may respond better to the treatment with BJA.

10:15am-10:30am
Sonia Plaza Ruiz, et al.
Bogota, Colombia

Comparison of Effectiveness of Two Class II Correctors in Adolescents: A Systematic Review and Meta-Analysis

Objective: To compare the clinical effectiveness of Forsus against twin-block in the treatment of class II,1 in adolescents. **Methods:** A literature survey was performed using, Cochrane Oral Health Group's Trials Register, CENTRAL, MEDLINE (NCBI), LILACS and EMBASE. Meta-analysis were conducted using random-effects models. **Results:** Four studies qualified for the meta-analysis. Overjet correction was greater ($p < 0.02$) in the twin-block group by -2.16 mm [CI: $-3.91, 0.41$]. SNB increased more ($p < 0.009$) in the twin-block group by 1.22° [CI: $0.30, 2.14$]. SNA decreased more ($p < 0.0001$) with Forsus 0.40° [CI: $0.20, 0.60$]. ANB decreased more in the group of twin-block ($p < 0.00001$), on average -0.71° [CI: $-0.89, -0.54$]. Mandibular length increased more in the twin-block group ($p < 0.002$) by 3.14 mm [CI: $1.18, 5.10$]. **Conclusions:** The quality of the evidence found was low. This evidence suggests that twin-block is more effective in class II,1 correction in adolescents compared against Forsus.

TWO DIMENSIONAL AND THREE DIMENSIONAL ANALYSES OF CRANIOFACIAL ANATOMY

10:30am-10:45am
Leonardo Koerich de Paula, et al.
Richmond, VA, USA

Rapid Three-Dimensional Maxillary and Mandibular Regional Superimposition Using CBCT: A Validity Study

OBJECTIVE: To validate a novel method for fast 3D regional superimposition (SI) of CBCT with small FOV taken to reduce radiation dose. **METHODS:** 2 scans of 2 dry skulls and of 15 adult patients (34 total) were used retrospectively. 2 observers tested 2 types (maxilla & mandible) of voxel-based SI using OnDemand 3D. The registration took 15 seconds. 3D surface models of the jaws were created by threshold segmentation. Accuracy and reproducibility of the SIs were assessed using the closest point method to measure root square mean (RSM) distance between the models. 5 areas were measured and a $RSM \leq 0.25$ was considered successful. ICC was also calculated. **RESULTS:** Intraobserver ICC was ≥ 0.98 for all variables and the highest RSM was 0.24. Interobserver reproducibility was assessed case-by-case and it was ideal ($RSM=0$) for 67% of SI and $RSM \leq 0.25$ for the other 33%. **CONCLUSION:** The method was fast, accurate, and reproducible and is a viable alternative or addition to cranial base SI.

10:45am-11:00am
Mohamed Bazina, et al.
Cleveland, OH, USA

Accuracy and Reliability of Dolphin 3D Voxel-Based Superimposition

Aim: to evaluate the accuracy and reliability of Dolphin 3D voxel based superimposition. **Methods:** The existing pre (T1) and post treatment (T2) CBCT volumes of 31 surgical patients were used to compare voxel-based superimposition methods from Dolphin Imaging Systems to the accepted method used by Cevitanes et al. T2 volumes were superimposed on the cranial base on top of T1 volumes. T2 registrations for Dolphin and Cevitanes' methods were compared using closest point color map, with emphasis on 7 regions (Nasion, A point, B point, bilateral zygomatic arches and bilateral gonial angles). **Results:** Intraclass correlation of 10 cases showed reliability greater than 0.96. The mean differences between registered T2's were less than 0.21mm. The least difference was found in the Nasion region with

an average of $0.09\text{mm} \pm 0.07$, and the largest in Right Gonial Angle with $0.21\text{mm} \pm 0.13$. Conclusions: Dolphin 3D voxel based superimposition, a fast and user-friendly method, is accurate and reliable.

11:00am-11:15am
Osama Basri, et al.
Pittsburgh, PA, USA

Relationship of Velopharyngeal Insufficiency and Face Mask Therapy in Patient with Cleft Lip and Palate

The aim of this study is to determine if the amount of maxillary advancement with facemask in cleft palate patients increased perceptual symptoms of velopharyngeal insufficiency. Retrospective record review of cleft palate patients seen at the Children's Hospital of Pittsburgh. 42 patients completed facemask therapy; treatment included a bonded expander/ facemask for 6-9 months. Pre and post-facemask overjet, Pittsburgh Weighted Speech Score PWSS and pre and post-cephalometrics were measured. The average amount of advancement was 5.25 mm, there is a statistically significant increase after facemask therapy on PWSS for patients with 0 score but for patients with >0 PWSS before treatment, the PWSS remained about the same after treatment. Results suggest that there is no statistically significant association between amount of advancement and change in PWSS before and after facemask therapy. Patients should be aware of an increased risk of developing symptoms of VPI after facemask therapy.

11:15am-11:30am
Hans Wellens, Annemarie Kuijpers-Jagtman
Nijmegen, Netherlands

Connecting the New with the Old: Modifying the Combined Application of Procrustes Superimposition and Principal Component Analysis, to Allow for Comparison with Traditional Lateral Cephalometric Variables

This study introduced a method for directly relating geometric morphometric shape space coordinates to traditional measures of lateral cephalometry. The aim was to provide a statistically grounded, objective way for classifying and selecting patients, using these traditional measures. The digitized landmark coordinates of 200 patients were subjected to generalized Procrustes superimposition and principal component analysis, after which the sample mean shape was systematically deformed along or parallel to PC1 and PC2, recording the associated ANB, Wits and GoGnSN values at each location. This allowed us to calculate and plot trajectories through the PC1-PC2 space connecting locations with the same aforementioned values, thereby defining those regions of the PC1-PC2 shape space which would be regarded as hypo-, normo- or hyperdivergent and Class I, II or III in traditional cephalometry. The method is based upon the statistically grounded GM framework, and prevents geometric distortion.

11:30am-11:45am
Aisha Khoja, et al.
Karachi, Pakistan

Morphological Types of Soft Palate and Their Association with Need's Ratio in Different Skeletal Malocclusions: A Lateral Cephalometric Study

This study aims to investigate the relationship between pharyngeal depth and soft palate length (Need's ratio) in different skeletal malocclusions and to see if this ratio is affected by variation in soft palate morphology. Digital lateral cephalograms of 186 adult subjects having skeletal class I, II and III malocclusions were examined to see velar morphology, pharyngeal depth and velar dimensions. Statistical analyses were undertaken using Kruskal Wallis test. Intergroup comparisons were made using Chi-square and Mann Whitney U-test with Bonferroni corrections ($p \leq 0.05$). Most frequent soft palate was rat-tail in skeletal class I and leaf-shaped in skeletal class II and III malocclusions. Significant differences were found for velar width ($p=0.008$) and Need's ratio ($p=0.035$) amongst different malocclusions. Between different velar types, differences were significant for velar length ($p<0.001$), width ($p<0.001$) and pharyngeal depth ($p=0.025$) but insignificant for Need's ratio ($p=0.280$).

Moderator: Dr. Shannon Owens - 12:30pm-2:00pm

ORTHODONTIC TREATMENT - MECHANICS

12:30pm-12:45pm

Meenakshi Vishwanath, et al.
Farmington, CT, USA

Theoretical Framework and Mechanics of a 2 X 4 Appliance with a V Bend in an Elastic Arch Wire: A Three-Dimensional Analysis

Normally the Force/Moment (F/M) system of a two-dimensional (2D) two-bracket segment has been used to explain the appliances that have a three-dimensional (3D) configuration, which may not reveal the actual nature of the appliance. Objectives: To quantify forces and moments in a two bracket set up mimicking a 2x4 appliance with bends at specific locations. Methods: 150°V bends were placed on β -titanium archwires of various sizes. Load cells with sensors measuring forces and moments in x, y, z planes simulating the clinical setup of a 2x4 appliance were employed. Results: Fz and Mx increased at the two brackets ($P < 0.05$) with increasing wire size. Moving the bend towards the center of the interbracket distance reduced the forces & moments generated at the individual brackets ($P < 0.05$). Torsional & bending moments created unique F/M systems at each bracket. Conclusions: The 3D analysis of a 2x4 appliance resulted in a F/M system that was significantly different from the previous 2D interpretation.

12:45pm-1:00pm

Julio Gurgel, et al.
São Luis, Brazil

Effectiveness of Alignment of Two Orthodontic NiTi Archwire Sequences Based on Different Austenitic Finish Temperatures: A Randomized Clinical Trial

Introduction: The aim of the present study was to compare the effectiveness of two alignment sequences using nickel-titan (NiTi) thermal activated archwires with different austenite finish (AF) temperatures (35°C and 37°C) applied for the correction of mandibular anterior crowding. Methods: A parallel randomized clinical trial was conducted involving 42 patients ages 15 to 25 years who required orthodontic treatment including the correction of mandibular anterior crowding. Results: The patients were randomized 1:1 ratio among 2 groups. The mandibular anterior crowding was reduced from baseline to 6 month treatment in similar ratio for both sequences with different AF temperatures. The data were analyzed and showed no differences in the between groups (log-rank test; $p = 0.89$). Conclusion: The NiTi thermal activated archwires at 35°C and 37°C achieved similar results in the correction of mandibular anterior crowding.

1:00pm-1:15pm

Ana Claudia Conti, et al.
Bauru, Brazil

Dentoalveolar Changes in Digital Models in Patients with Anterior Open Bite Treated with Two Protocols: Spur And Chin Cup

The objective of this study was to evaluate the dentoalveolar changes in digital models in patients with anterior open bite, treated with two protocols: spur and chin cup. The sample consisted of 41 patients (27 girls and 14 boys) aged 7-10 years, with anterior open bite (mean -3,43mm) treated for one year. The groups were divided in G1 (23), lingual spur and G2 (18) prefabricated chincup. Digital Plaster models were used to perform the measurements at T1 (before treatment) and T2 (one year after treatment). Transverse changes, length and perimeter of the upper and lower dental arches, horizontal and vertical overlap as well as the inclination of the incisors were evaluated. The intraclass correlation coefficient (ICC) and Bland Altman were employed to verify the intra-examiner error. 't' test with 5% significance

analyzed the results. At T2, all variables were statistically altered, but the changes were similar between groups. It was concluded that both protocols were effective.

1:15pm-1:30pm
Amr El-Beialy, et al.
Cairo, Egypt

The Unexpected Behavior of the Canine Root During Canine Retraction Using Low Level Laser Therapy or Corticotomy Versus Control: A Randomized Control Trial

Aim: Investigate behavior of canine root and apex during canine retraction using low level laser therapy or corticotomy versus control sample. Two synchronized RCT's, the first RCT involved 20 patients received LLLT on side during canine retraction, while other side served as control. The other RCT utilized 20 patients underwent corticotomy on one side versus LLLT on other side. LLLT applied every week for first 4 weeks then every 2 weeks till end of 4 months. Randomization done by concealed allocation of computer generated sequence in opaque sealed envelopes. Results: Canine cusp tip moved 3.37 ± 2.62 , 3.92 ± 1.63 , 3.75 ± 1.81 on control, corticotomy and pooled laser side respectively. Canine apex moved 0.16 ± 1.49 , 0.54 ± 1.16 , 0.01 ± 1.04 on control, corticotomy and pooled laser side respectively. In 77.5% of the 160 canines inspected including pre and post retraction positions, the root apex up to middle of the canine root either pierced or was embedded into overlying cortical bone.

1:30pm-1:45pm
Owais Durrani
Islamabad, Pakistan

Comparison of In-Vivo Failure of Single Thread Orthodontic Implant with that of a Dual Thread Implant over an 18 Month Period: A Split Mouth Triple Blinded Randomized Clinical Control Trial

INTRODUCTION: Objective was to compare single thread implant with a .85mm pitch throughout the length and a dual thread implant with 2mm micro-thread of .25mm pitch on the part that contacts the cortical bone. METHODS: Maxillary arches of 30 patients were randomly distributed to receive 60 implants by a single operator which were fabricated using Ti-6Al-4V alloy that were exact replicas of each other in width (2mm), length (10mm) and head shape except for the micro-thread part. Main outcome measure was the loosening of the implant after the placement and immediately loading by a 150g NiTi coil spring for retraction of anterior segment. RESULTS: 4 implants failed in the single thread group (13.3%) while 6 implants (20%) failed in the dual thread group, there was statistically insignificant difference between the two groups ($p=0.49$). CONCLUSION: The premise based on the previous in-vitro studies that the dual thread implant should have more stability in the maxillary arch seems incorrect.

1:45pm-2:00pm
Tania Siddiqui, et al.
Rawalpindi, Pakistan

Prediction of Successful Treatment Outcome with Clarks Twin Block Appliance

The purpose of our study was to identify the pretreatment variables which lead to successful treatment outcome in mandibular length, reduced overjet and ANB. A retrospective cohort study using purposive sampling was conducted on patient record from January 2002 to June 2013. Complete records of patients treated only with twin block therapy were included into the study. Data collected were analyzed using binary logistic regression analysis. Binary logistic regression analysis was done to examine the association between outcome and independent variable with p -value ≤ 0.2 in the univariate analysis. The independent variables were examined in the multivariate analysis and treatment duration (OR- 1.202, 95%CI- 1.07- 1.34, p -value- 0.001) for mandibular length and corrected ANB (OR- 0.13, 95%CI- 0.02- 0.74, p -value- 0.021) for ANB was independently associated. Successful prediction for CTB can be done with increased treatment duration for compliant patients and corrected ANB.

Moderator: Dr. David Covell - 2:00pm-3:45pm

BIOLOGY AND MANAGEMENT OF TOOTH MOVEMENT AND FACIAL GROWTH

2:00pm-2:15pm

Alison Quach, et al.
Los Angeles, CA, USA

Systemic Versus Local Delivery of Bisphosphonate Treatment in Alveolar Bone Grafting

Alveolar bone graft resorption often occurs in cleft lip and palate patients leading to poor treatment outcomes. We compare the effects of a single systemic injection versus local delivery of Bisphosphonate (BP) on alveolar bone grafting in rats. Surgically created alveolar defects were grafted with iliac crest bone from Inbred donors in 24 rats (n=8 per group). Control and systemic groups were injected subcutaneously with saline and 0.1mg/kg Zoledronate, respectively, 1 week post-surgery. The local group received BP at the time of surgery through pre-soaking of the bone graft (0.05mg/kg). Micro-CT and histological analysis were performed. Both BP groups showed significantly increased bone volumes relative to control with the local group being the greatest. Increased osteogenic activity and bone healing were also seen in BP groups. Conclusion: Local BP delivery significantly increases the bone volume in grafted alveolar defects and may offer several advantages over systemic delivery.

2:15pm-2:30pm

Ildeu Andrade, et al.
Belo Horizonte, Brazil

The Effects of Angiotensin II Type I Receptor Blocker Losartan in Orthodontic Tooth Movement

Drugs that block the renin-angiotensin system (RAS) are widely used for treating hypertension, heart and kidney failure, and harmful effects of diabetes. We evaluated whether the blockage of the RAS influences the orthodontic tooth movement (OTM). A coil spring was placed in mice randomly divided into 2 groups: VH (vehicle treated mice) and LOS (losartan, angiotensin (ANG) II receptor blocker). OTM and the osteoclast number were determined histopathologically. The expression of mediators involved in bone remodeling was evaluated by q-PCR. OTM and osteoclasts were significantly reduced in LOS when compared with VH. mRNA levels of osteoclast markers (RANK, RANKL, cathepsin K and MMP13) were lower in LOS than in the VH, while the expression of osteoblast markers (periostin, DMP, ALP, COL1A1, SEM3A3, MMP2 and OPG) were higher in the VH. This study suggested that the blockage of the RAS system decreases osteoclast differentiation and activity and, consequently, results in decreased OTM.

2:30pm-2:45pm

Doreen Ng, et al.
Sydney, Australia

The Effects of Low-Level Laser Therapy (LLLT) on Orthodontic Root Resorption and Pain Management: A Pilot Study

Aim: To investigate the effect of LLLT on orthodontically induced root-resorption and pain. This is also the first study to investigate the amount of laser energy transmitted to the tooth socket. Method: 20 patients requiring extraction of maxillary first premolars were selected for this split-mouth study. 150 grams of buccal tipping force was applied bilaterally to the maxillary first premolars for 28 days. Each patient's right and left premolars were randomly assigned a 'laser' and 'sham-laser' side. The experimental side received 808nm laser therapy on days 0, 1, 2, 3, 7, 14 and 21. Premolars were extracted on day 28, and the extracted premolars were scanned using Micro-CT for root resorption volume analyses. The pain of the buccal tipping force was assessed with visual analog scales on days 0, 1, 2, 3, 7, 14 and 21. Results: LLLT reduced the volume of root resorption by 23% (p=0.026). LLLT was also effective at reducing orthodontic pain compared to the sham-laser.

2:45pm-3:00pm
Mridula Trehan
Jaipur, India

Assessment of Alkaline Phosphatase Activity in Gingival Crevicular Fluid as an Indicator of Skeletal Maturity

Introduction- The objective of this study was to evaluate gingival crevicular fluid (GCF) Alkaline Phosphatase (ALP) activity in growing subjects in relation to stages of skeletal maturation, i.e. prepubertal, pubertal and postpubertal. **Methods:** 60 healthy growing subjects (28 girls and 32 boys; age range 7 - 18 years) were enrolled in this study that followed a double - blind, prospective, cross-sectional design. Collection of GCF was performed at the mesial and distal sites of both maxillary and mandibular central incisors. Growth phase was assessed through the Hand Wrist radiographs. GCF parameter of total ALP activity was evaluated. **Results:** The total GCF ALP activity showed a peak for the pubertal growth phase for both maxillary and mandibular sites ($p=0.00$). No difference was seen between the sexes. **Conclusion:** GCF ALP activity might prove to be a valuable skeletal maturity indicator.

3:00pm-3:15pm
Pramod Mohan, Akshai Shetty
Bangalore, India

Association of FGFR1 and FGF 10 Gene Variants with Non-Syndromic Cleft Lip - Palate in Local Population

Introduction: The objective of the study was to evaluate the association of FGFR 1 and FGF10 gene variants with non-syndromic cleft lip and palate (NSCLP). **Method:** Blood samples of 25 subjects with NSCLP and 25 unrelated controls were collected for the study. The extracted DNA samples were subjected to Polymerase chain reaction followed by DNA Sequencing. Results were documented in form of electropherograms and computed after statistical analysis. **Results:** The results indicated that for FGFR1 gene(rs13317), genotype CC ($P=0.02$) was statistically significant and FGF 10 gene(rs1448037), genotype AA ($P<0.001$) was highly statistically significant. Thus suggesting a strong association between FGFR1 and FGF10 with NSCLP **Conclusion:** FGFR1(rs13317) and FGF10(rs1448037) gene variants can be considered as genetic markers for NSCLP in our population.

3:15pm-3:30pm
Dinesh Ramu, Dharma Mallikarjunaiah
Bangalore, India

Association of TGF β 3 Gene Variants (rs 2268625,rs 3917201) in Non-Syndromic Cleft Lip/Palate

INTRODUCTION: Non-syndromic oral clefts are the most common craniofacial-deformities. This study attempts to determine whether TGF β 3 gene is involved in non-syndromic cleft lip and palate (NSCLP) patients in south Indian population. **METHOD:** In this study, 2ml venous blood was collected from 50 subjects consisting of Group A (1-25) with NSCLP and Group B (26-50) as unrelated controls. The extracted DNA was subjected to Polymerase Chain Reaction (PCR) test followed by DNA Sequencing. The results were documented in the form of electropherogram and computed after statistical analysis. **RESULTS:** The results indicated that for TGF β 3 (rs2268625), genotype AA ($P=0.007$), AG ($p=0.02$), GG($P=0.03$) was statistically significant and TGF β 3 (rs3917201), genotype AA ($p= 0.008$) was statistically significant. **CONCLUSION:** Thus, TGF β 3 (rs2268625), (rs3917201) can be considered as genetic markers for NSCLP in our population.

3:30pm-3:45pm
Faizan Ali, Rabia Aziz
Lahore, Pakistan

Comparison of Ibuprofen with Chewing Gum on Pain Reduction after Initial Arch Wire Placement in Orthodontic Patients

The objective of this study was to ascertain whether chewing gum provide pain relief of equivalent or greater magnitude to ibuprofen after initial arch wire placement in orthodontic patients. This randomized clinical trial study included 42 patients, 21 girls and 21 boys, between the ages of 12 and 17 years classified into 3 groups of 14 each: group A (placebo treated). Group B (ibuprofen treated) and group C (given chewing gum). The patients in each group were treated after placement of the initial arch wire and every 8 hours if they experienced pain. Visual analog scale was used to record pain perception at 2 hours, 6 hours, bedtime, 24 hours, 2 days, 3 days, and 7 days after arch wire placement during chewing, biting, fitting front and posterior teeth. ANOVA and Tukey tests were used for data analysis. There were significant decrease in pain perception of chewing function between the placebo group and the chewing-gum group at 6 hours. Chewing Gum can be used as suitable Substitute.