2018 AAO Annual Session Oral Research Presentations

The Oral Research presentation will be held on Sunday, May 6 in the Walter E. Washington Convention Center Room 208 from 8:00am-3:30pm with a break from Noon 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 TREATMENT EFFECTS and CLINICAL TRIALS

8:00am-8:15am
Long-term stability of surgical-orthodontic open bite: Class III x Class II
Vinicius L. B. Silva, G Janson
Bauru, Brazil

Lecture Description
There are few consistent and specific studies comparing Angle’s Class III to Angle’s and Class II malocclusions on the long-term stability of anterior open bite ortho-surgical treatment. The main problems found in the available studies are related to small sample size, the absence of method error assessment, sample heterogeneity and absence of initial records. This lecture aims to present strong evidence, using a large sample, regarding the clinical stability of overbite when comparing Angle’s Class III to Angle’s Class II malocclusions on the long-term stability of anterior open bite ortho-surgical treatment.

Learning Objectives
• To discuss the current evidence in the literature regarding long-term stability of surgical-orthodontic open bite treatment
• To identify the ideal study design for a long-term stability open bite research
• To assess differences in overbite behavior among Angle’s Class II and Class III subjects in the long-term

8:15am-8:30am
Clinical success, stability and aesthetic acceptability of autotransplantation and orthodontic traction as treatment modalities in severely impacted anterior teeth: a randomised clinical trial
Dhaval Fadia, et al.
Mumbai, India

Lecture Description
Tooth replacement in the aesthetic zone, where achieving ideal micro-aesthetics is critical, poses a challenge to the contemporary clinician. Autotransplantation is an option for impacted teeth, where success of surgical traction may be questionable. This presentation will answer the following questions. Autotransplantation (RPA): 1. Is it a superior modality in anterior esthetic zone especially in terms of clinic success rates especially when compared for adjacent tooth root resorption, gingival and periodontal health and faster tooth movement? 2. Also, were esthetic outcomes superior with respect to emergence profile and gingival contours? 3. Stability of tooth post autotransplantation with bone levels and health?

Learning Objectives
• To show that there was no significant clinical or statistical difference when autotransplantation was compared to surgical traction (ST) in terms of stability
• To demonstrate esthetic viability of autotransplantation of impacted teeth in anterior region
• To demonstrate autotransplantation of teeth reduces the overall treatment time as compared to surgical traction (ST)

8:30am-8:45am
3D changes associated with SARPE: cranial base superimposition
Surgically Assisted Rapid Palatal Expansion (SARPE) is indicated for skeletally mature patients who need maxillary expansion, with severe maxillary transverse deficiency (unilateral or bilateral). Although, studies have been shown dental and skeletal effects caused by this procedure, the prevalence of fenestration and dehiscence (alveolar defects) in patients that received SARPE still is unknown. This presentation will answer the following question: the SARPE does influence the number dehiscences and/or fenestrations?

Learning Objectives
- To evaluate the presence of dehiscence and fenestration (alveolar defects) in patients submitted to the SARPE
- To compare the prevalence of these alveolar defects before SARPE, immediately after completion of expansion and at the end of the retention phase (6 months)

Three-dimensional analysis of maxillary molars after intrusive forces anchored in mini-implants: randomized clinical trial

Learning Objectives
- To recognize which force intensity acts more rapidly for intrusion of the maxillary molars and propose the indicated force for this orthodontic mechanic
- To identify the average amount of intrusion and its coronary effects of inclination and vestibularization
- To evaluate the changes in the anterior-inferior facial height between the studied groups.

Effect of sodium hypochlorite pre-treatment of enamel on bond failure rate of brackets bonded with RMGIC

Learning Objectives
- Identify the advantages of RMGIC over conventional composite resin
- Recognize the reduction in bond failure rate of RMGIC with the use of NaOCl enamel conditioning
9:15am-9:30am
Rapid maxillary expansion associated with laser therapy improves early bone remodeling
Patricia Maria Monteiro, et al.
Ribeirão Preto, Brazil

Lecture Description
It has been shown that low-power lasers are useful to stimulate and enhance cell function. This presentation will elucidate the effects of low-level laser therapy (LLLT) on bone healing after rapid maxillary expansion. Does it affect bone volume throughout remodeling process? Is RUNX2 gene expression altered after LLLT?

Learning Objectives
• To demonstrate that LLLT improved bone formation, with higher bone volume at days 7 and 14
• To show that LLLT stimulated RUNX2 gene expression

9:30am-9:45am
Bactericidal effectiveness of different lasers under acrylic cap splint maxillary expanders
Gulsah Unal Kundakcioglu, et al.
Istanbul, Turkey

Lecture Description
Orthodontic treatment plan may include upper jaw expansion, often made with appliances containing acrylic. Since the appliances are bonded, the patients cannot clean the underneath area. This would lead to the formation of an anaerobic environment permitting growth of Porphyromonas gingivalis and Streptococcus mutans and many other bacterial species. The aim of this study is to determine the effective wavelength and application parameters of laser beam to decrease the number of Streptococcus mutans and Porphyromonas gingivalis applied to an anaerobic medium across the acrylic surface.

Learning Objectives
• To discuss and compare the antibacterial effectiveness of different laser beams
• To define the effective wavelength and application parameters for this specific procedure

9:45am-10:00am
Treatment of Class III malocclusion using miniscrew-anchored inverted Forsus FRD
Osama Eissa, et al.
Edmonton, AB, Canada

Lecture Description
Class III malocclusion is considered one of the most challenging orthodontic problems in diagnosis and treatment. The use of functional appliances has been reported in the literature as an effective treatment option for treatment of Class III malocclusion. This presentation will address the effectiveness of a novel method in Class III malocclusion treatment implying the use of miniscrew-anchored inverted Forsus Fatigue Resistant Device (FRD).

Learning Objectives
• To show the newly introduced mechanics in correction of Class III malocclusion using miniscrew-anchored inverted Forsus Fatigue Resistant Device (FRD)
• To demonstrate that the use of miniscrows anchored inverted FRD could effectively increase maxillary forward growth and minimize mesial movement of maxillary dentition, but it could not prevent lower incisors retroclination

Moderator: Dr. Dina Stappert - 10:00am-Noon

FACIAL GROWTH, TOOTH DEVELOPMENT and TOOTH MOVEMENT
10:00am-10:15am
The role of autophagy during orthodontic tooth movement
Yina Li, et al.
Chapel Hill, NC, USA

Lecture Description
Orthodontic tooth movement depends on efficient remodeling of surrounding alveolar bone. While a well-controlled inflammatory response is essential during such biological processes, the precise mechanism by which how inflammation is tightly regulated hasn’t been fully understood. Autophagy, a conserved catabolic pathway, has been shown to protect cells from excessive long lasting inflammation in nervous systems and disease conditions. We set out to test the role autophagy may play a critical role in regulating inflammation during OTM.

Learning Objectives
• To establish correlation of autophagy and inflammation in mice at different time points during tooth movement after spring loading
• To examine alteration of inflammation and tooth movement upon administration of autophagy modifying drug, rapamycin

10:15am-10:30am
The effect of Piezocision corticotomy on en-mass retraction: a randomized clinical trial
Abdulkarim Hatrom, et al.
Jeddah, Saudi Arabia

Lecture Description
Although it has been shown that corticotomy accelerates tooth movements, the effect of Piezocision corticotomy on en-mass retraction has not been previously investigated. This presentation will attempt to answer the following questions: 1) Is orthodontic tooth movements affected by Piezocision corticotomy? 2) Is piezocision corticotomy a safe procedure for the periodontium and roots of anterior teeth.

Learning Objectives
• Compare the rate and amount of en-masse retraction with or without Piezocision corticotomy
• Assess the safety of both methods on the quality of surrounding periodontium and on roots
• Evaluate postoperative pain

10:30am-10:45am
Rate of tooth movement with different acceleration modalities –a meta analysis
Meghna J Vandekar, et al.
Navi Mumbai, India

Lecture Description
This meta-analysis aims to analyse current literature for evidence on rate of tooth movement using conventional and non conventional methods for accelerated tooth movement. Literature survey of articles was performed. A Meta analysis was attempted by using the Random Effect Model (REM); heterogeneous & sensitivity analysis were also done. The methodological soundness of original studies affecting data acquisition of this meta analysis will be discussed

Learning Objectives
• Identify the specific rate of tooth movement with LLLT, Corticotomy, Piezzocision and MOPs
• Understand the methodological soundness of literature on acceleration
• Make informed decisions regarding efficacy of various acceleration modalities
10:45am-11:00am
Role of PAX9 (rs12881240) and MSX1 (rs12532) gene polymorphisms in human tooth agenesis
Dharma R.M (Mallikarjunaiah), M. Hegde
Bangalore, India

Lecture Description
Agenesis of one or more teeth is the most common anomaly observed in the human craniofacial development. The aim is to test the association between PAX9 (rs12881240) and MSX1 (rs12532) polymorphisms and tooth agenesis in local population. The sample included 25 patients with non syndromic tooth agenesis and 25 unaffected individuals with full complement of permanent dentition including third molars as controls. The findings of this study suggest that PAX9 gene variant rs12881240 and MSX1 gene variant rs12532 can be considered as genetic markers for Non syndromic Tooth Agenesis in local population.

Learning Objectives
• Recognize the association between PAX9 (rs12881240) and MSX1 (rs12532) polymorphisms and tooth agenesis in local population
• Determine whether PAX9 (rs12881240) and MSX1 (rs12532) genes can act as genetic markers for tooth agenesis in local population

11:00am-11:15am
The molecular basis of primary molar ankylosis
Annie Tong, et al.
Keysborough, Australia

Lecture Description
Primary molar ankylosis can cause severe consequences in the growing child. However, its etiology and pathogenesis are poorly understood. This presentation describes the results of a pilot study that sequenced the RNA of bone around primary molars to find differences in gene expression between normal and infraoccluded primary molars. It makes a significant contribution to answering the following questions: Is ankylosis characterized by a specific pattern of gene expression? What downstream biological functions are affected in ankylosis, and how might this relate to pathogenesis?

Learning Objectives
• Describe differences in the pattern of gene expression between normal and ankylosed primary molars
• Discuss the downstream effects of differential gene expression in ankylosis
• Formulate a hypothesis of the etiology and pathogenesis of primary molar ankylosis

11:15am-11:30am
Effect of botulinum administration in masticatory muscles on mandibular length following application of functional appliances in rats
Massoud Seifi, et al.
Tehran, Iran

Lecture Description
The purpose of this study is to determine the effect of botulinum administration in masticatory muscles on mandibular length following application of functional appliances for mandibular advancement in rats and its comparison to the control group. Mean of Mandibular Length in botulinum injection group with functional appliance was significantly higher than other groups i.e. negative-control, positive control, and neurotoxin-injection-only (p<0.05). Also there was a significant difference in mean of Mandibular Length between negative control group and functional appliance with normal Saline. It was concluded that administration of botulinum with functional appliance can significantly increase the amount of the mandibular length.

Learning Objectives
• To define the role of muscular function and functional appliances in development of the bone and in specific the mandible
• To describe the effect of Botulinum neurotoxin on the masticatory muscle paralysis; • to compare the effect of functional appliance on two groups of control and neurotoxin intervention

11:30am-11:45am
Effect of low level laser therapy (LLLT) on pain and rate of tooth movement during fixed orthodontic treatment
Priyank Rai, T. Tripathi
Delhi, India

Lecture Description
The two major concerns that usually make a patient neglect their orthodontic treatment are pain and the long treatment duration of fixed orthodontic therapy. Low level laser therapy and its bio-stimulatory effects have been well known since the 1960’s, however, the exact protocol of application to achieve the desired effects is variable and inconclusive in the literature. Thus, there is a need for a study to assess and evaluate the effectiveness of lasers on pain and tooth movement and establish a protocol so as to improve the patient’s comfort and compliance as well as possibly reduce the treatment time. This presentation will address the above mentioned grey areas.

Learning Objectives
• To show that patients exposed to low level laser therapy had lesser pain perception than the patients without
• To demonstrate that the females had more pain perception than the males
• To show that low level laser therapy accelerated the rate of orthodontic tooth movement

11:45am-Noon
Bone specific alkaline phosphatase (BALP) and serum IGF-1: potential biomarkers for skeletal growth assessment
Tulika Tripathi, P. Rai
Delhi, India

Lecture Description
Bone growth and remodeling are controlled by biochemical markers but assessment of BALP and comparing with IGF-1 and CVMI stages has not been previously investigated. This presentation is aimed to answer the following questions : Does serum BALP follow the growth curve? Is there any correlation between the levels of serum BALP, serum IGF-1 and CVMI stages? Are the marker levels between the two genders in different CVMI stages significant? Can BALP be used as a biochemical marker for residual growth assessment?

Learning Objectives
• To evaluate the levels of BALP and IGF-1 at different CVMI stages
• To determine the significance of the marker levels between the two genders in different CVMI stages
• To recognize BALP as a potential biochemical marker for growth assessment

Moderator: Dr. Sylvia Frazier-Bowers - 12:30pm-2:00pm

CLINICAL ORTHODONTICS: TREATMENT MODALITIES and OUTCOMES

12:30pm-12:45pm
Miniplate versus miniscrew anchored fixed functional appliances in Class II patients - systematic review
Samira Diar-Bakirly, et al.
Edmonton, AB, Canada

Lecture Description
Functional appliances are used for the correction of Class II malocclusion. Their disadvantage is that they cause dentoalveolar movement rather than the desired skeletal correction. Skeletally anchored fixed functional appliances have been recently used to minimize dentoalveolar effects and promote skeletal changes. This lecture will present a systematic review of the literature and present the treatment outcomes of miniplate versus miniscrew anchored fixed functional appliances. Six electronic databases were systematically and unrestrictedly surveyed, out come data gathered, and risk of bias assessed.

Learning Objectives
- To assess the quality of evidence and risk of bias in the papers that uses miniplate anchored functional appliances and miniscrews anchored functional appliances in class II patients
- To identify the dentoalveolar and skeletal effects of miniplate anchored functional appliances and miniscrews anchored functional appliances in class II patients

12:45pm-1:00pm
Impact of piezo-corticisions on root resorptions and alveolar bone
Julien Strippoli, et al.
Montreal, QC, Canada

Lecture Description
Literature revealed that there is no significant periodontal damage after an orthodontic treatment combined with piezo-corticision (OT-PC). However, its impact on human bone tissue has not been previously investigated and the conclusions on root resorptions are debated. This presentation will complete the lack of evidence by comparing a pre- and post-treatment CBCT of twelve adult patients that underwent OT-PC. The audience will also know when and where bone graft should be performed.

Learning Objectives
- To show that apical root resorptions after OT-PC are generalized, mild and higher in both anterior sextants
- To demonstrate that OT-PC with no bone graft induces significant buccal bone height decrease on lower incisors
- To show that a high majority of dehiscence occurred on the buccal mid-root mandibular tooth especially if the pre-value thickness is equal or less than 0.3mm

1:00pm-1:15pm
Evaluation of stability after surgical counterclockwise rotation of the maxillomandibular complex
Daniela Lupini, et al.
Giulianova, Italy

Lecture Description
The correction of the high occlusal plane in hyperdivergent patients by means of surgical counterclockwise rotation of the maxilla-mandibular complex (MMC) has traditionally been considered an unstable and unpredictable procedure. This study evaluates the long-term stability in a group of high occlusal plane facial type patients who underwent orthodontic treatment and double jaw orthognathic surgery to decrease the occlusal plane angulation.

Learning Objectives
- To recognize the potentialities of a peculiar surgical strategy as counterclockwise rotation of the occlusal plane (CCROP)
- To manage an orthodontic-surgical case suited for the CCROP; • To distinguish the rules to be respected to avoid relapse

1:15pm-1:30pm
Sensitivity and specificity of measures for diagnosis of sagittal-skeletal malocclusion in children
Diana Barbosa, et al.
Medellin, Colombia
Lecture Description
An accurate diagnosis and an effective, easy and precise classification of skeletal malocclusions are essential topics in orthodontics. Taking into account the limited information available in scientific papers regarding the evaluation of the accuracy of the different cephalometric measures for the sagittal diagnosis of malocclusions and considering that the published results are contradictory, this presentation includes the evaluation and comparison of cephalometric measures as ANB, Wits, APDI and AF-BF for the sagittal diagnosis of class I, II and III malocclusions in children 6-12 years old using ROC curves.

Learning Objectives
• To show that the receiver operator characteristic (ROC) curves are a precise method for the analysis and evaluation of a diagnostic test
• To describe ROC curves the ANB, Wits, APDI and AF-BF measures in children
• To compare sensibility and specificity of different tests and to show which one is better for Class II and Class III diagnosis

OTHER

1:30pm-1:45pm
Patterns of utilization of the nine AAOF Craniofacial Growth Legacy Collections
Thikriat Al-Jewair
Buffalo, NY, USA

Lecture Description
Multiples centers and universities in North America have conducted longitudinal craniofacial growth studies in attempts to understand craniofacial development and growth. In 2009, the AAOF launched a project to digitize, combine, and preserve records from these studies in one database, now known as the AAOF Craniofacial Growth Legacy Collection. This presentation will describe the utilization of each of the nine AAOF Craniofacial Growth Legacy Collections in the orthodontic literature over the years. It will also highlight areas of future research for effective utilization of these collections.

Learning Objectives
• Analyze trends in collection utilization among comparative and follow-up studies
• Compare trends pre and post AAOF legacy project testing/launch in 2009

1:45pm-2:00pm
Orthodontic literacy and oral health literacy correlated with oral health status
V. Wallace McCarlie, et al.
Greenville, NC, USA

Lecture Description
Studies show that low oral health literacy (OHL) is a barrier to optimal patient care and may result in suboptimal oral health outcomes. This study set out to understand if lower OHL and orthodontic literacy (OrthoL) were correlated to lower oral health status in an Eastern North Carolina population. Studies have also found that patients may not be obtaining as much oral health knowledge from dental visits as is assumed. This presentation answers the question of whether or not OHL and OrthoL are correlated to oral health outcomes. It will also reveal whether regular dental visits improve OHL or OrthoL.

Learning Objectives
• Define oral health literacy (OHL) and orthodontic literacy (OrthoL)
• Describe what a health coach is how an oral health coach might function
• Recognize how OHL and OrthoL correlate with oral health status

Moderator: Dr. Steven Marshall - 2:00pm-3:30pm
Ten Years of Experience with TADs in an Orthodontic Residency Programs
Micaela Zaverdinos, et al.
Cleveland, OH, USA

Lecture Description
Insertion sites and types of mechanics used are important factors in the success of TADs. This presentation will answer the following questions: What are the most successful insertion sites for TADs? What type of mechanics (direct or indirect anchorage) has a greater success rate with TADs? What is the rate of success of TADs placed by orthodontic residents?

Learning Objectives
• To show the success rates of TADs placed by orthodontic residents
• To demonstrate the best insertion sites for TAD placement
• To evaluate the success rate of TADs with different type of mechanics

CRANIOFACIAL MORPHOLOGY ANALYSES and AIRWAY MANAGEMENT

Can orthodontists improve sleep disordered breathing - a prospective study
Padma M. Mukherjee, et al.
Newark, NJ, USA

Lecture Description
Sleep disordered breathing (SDB) constitutes a wide spectrum of disorders ranging from snoring to severe sleep apnea that can be life threatening. Maxillary constriction is a known risk factor for SDB. In children SDB can result in lack of focus and attention in school as well as several behavioral problems as well that may require drug or surgical intervention. This lecture will highlight the role orthodontists can play in the management of SDB and the effects of maxillary expansion on airway.

Learning Objectives
• Understand the causes of sleep disordered breathing
• Learn the effects of palatal expansion on airway volume
• Learn the role of orthodontists in management of sleep disordered breathing

Antero-Posterior mandibular position at different vertical levels for mandibular advancing device design
Edmonton, AB, Canada

Lecture Description
Mandibular Advancement Devices (MAD) have been reported to be an alternative treatment to CPAP in moderate to severe obstructive sleep apnea (OSA) cases. The design of MAD has a major influence on its success rate on the patient, and design features that have an influence on efficacy, tolerance, and compliance. The aim of this study was to determine the range of mandibular protrusion at different vertical points; 2, 5, 8 and 11 mm in a young adult population.

Learning Objectives
• Recognize differences in vertical mandibular positions and its effect on mandibular protrusion
• Assess the vertical position effect of the mandible and use it to design the MAD

Dental changes from traditional Hyrax expansion vs Damon system using CBCT
Andre Chiconelli Gomes, M. Lagravere
São Paulo, Brazil
Lecture Description
The rapid maxillary expansion (RME) is the main treatment choice of maxillary constriction, nowadays clinical studies have sought to verify the effectiveness and stability of maxillary transverse dimension changes obtained through the combination of self-ligating brackets (SLB) and specific sequences of expanded archwires, more specifically the changes suggested by the Damon System this presentation will show the transverse dental changes observed through CBCT of 64 patients treated with RME or Damon system after the first 6 months of expansion and the effectiveness of two treatment approaches.

Learning Objectives
To identify that the treatment with Hyrax group obtained larger gains than those for the Damon group, especially at upper molars and premolars level.
To show that a translational teeth movement and real skeletal gain was observed in the Hyrax group and more uncontrolled inclination occurred in the Damon group.
To verify that both treatments (Hyrax x Damon System) increase the maxillary teeth widths Careful consideration to the dental and bone side effects should be encouraged.

3:00pm-3:15pm
Comparison of voxel based 3D superimposition in two software programs
Tarek Elshebiny, et al.
Cleveland, OH, USA

Lecture Description
Several software packages report ability to perform different procedures, but results are sometimes inconsistent among software, making it difficult for a practitioner to communicate and compare values. This presentation will answer the following questions: Are different software packages can deliver the same outcome when doing voxel based superimpositions? Are there any technical differences between different software packages in the procedure of performing voxel based superimposition?

Learning Objectives
• To show that voxel based superimposition using different programs is similar
• To demonstrate the methods of voxel based superimpositions using different programs
• To identify any differences of superimpositions in adult or teenagers

3:15pm-3:30pm
3D analysis of pharyngeal airway in children with different anteroposterior skeletal patterns using CBCT
Anuraj Singh Kochhar, R. Bhasin
New Delhi, India

Lecture Description
Accurate volumetric determination of 3D pharyngeal airway is possible in children by using CBCT scans. Pharyngeal airway structures were studied in 20 healthy children (11 boys, 9 girls) who reported in the department for orthodontic treatment. Those who had symptoms of upper respiratory infection, pharyngeal pathology such as adenoid hypertrophy and tonsillitis or a history of adenoidectomy or tonsillectomy were excluded. CBCT volume scans of all subjects were obtained by using the L-Cat CBCT (imaging sciences Hattfield, PA) unit, and the imaging protocol used a 13X16 cm field of view to include the entire craniofacial anatomy. Landmark identifications and physical measurements were performed by the same investigator. Using the software Downs, Steiner, Jarabak, McNamara and Tweed Merrifield analysis were done in order to classify patients. Results: The mean total airway volume, extending from the anterior nasal cavity and the nasopharynx to the epiglottis, of retrognathic patients was significantly smaller than that of patients with a normal anteroposterior skeletal relationship. On the other hand, differences in volume measurements of the 4 sub-regions of the airway were not found to be significantly different between the 2 groups. In preadolescents, volumetric measurements of the airway are correlated to anteroposterior and vertical cephalometric variables, mainly ANB angle. Total airway volume of the subjects is positively correlated with nasal, upper, middle and lower pharyngeal airway

Learning Objectives
• To discuss the comparison of the 3D pharyngeal airway volumes in children with differential ANB angles.
• To investigate possible significant relationships and correlations among the studied cephalometric variables and the airway morphology in these children.