CFAO Graduate Student Posterboard Abstracts

University of Alberta

IN VIVO MODEL OF ORTHODONTIC TOOTH MOVEMENT USING MINI-IMPLANTS IN RATS

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Introduction: This study is part of ongoing research to investigate the bone burden effect of bisphosphonate drugs during orthodontic tooth movement.

Aim: The aim of this *in vivo* animal study is to develop a new model of orthodontic tooth movement using mini-implants as anchorage.

Methods: Six-month-old SD rats were used with approval from University of Alberta animal care committee. A Stryker 1x3 mm (Stryker Canada, Hamilton, Ontario) self-threading mini-implant was placed in the right maxilla 10 mm from the gingival margin of the right incisor under sterile conditions. The mini-implant was used to protract the right first molar mesially using a 9 mm NITI closed coil spring for 8 weeks. Linear measurements of the position of the first molar and the amount of tooth movement was measured using µCT imaging (SkyScan 1076, Kotich, Belgium) at baseline, 4 and 8 weeks. Qualitative and quantitative histology was performed to compare the inflammatory response, bone resorption and osteoclast numbers with untreated left side control.

Results: Results showed 0.75 ±0.01 mm of protraction at 4 weeks and 1.68±0.24 mm at 8 weeks with a statistical significance from baseline at $\alpha > 0.05$. Although the tooth movement was substantially greater than previous studies in the literature, it was accompanied by mesial tipping of the crown along with intrusion of the mesial and the mesio-palatal roots, more pronounced at 8 weeks in comparison to 4 weeks.

Conclusions: The results showed that protracted tooth movement could be achieved in small animals using mini-implants.

CEPHALOMETRIC COMPARISON BETWEEN PEDIATRIC OSA PATIENTS ON nCPAP THERAPY AND UNTREATED CONTROLS

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Introduction: Investigation is required to discern whether any specific craniofacial differences are attributable to long term CPAP use.

Aim: The purpose of this study is to compare craniofacial features between pediatric patients with Obstructive Sleep Apnea (OSA) being treated with nasal Continuous Positive Airway Pressure (nCPAP) and comparable patients not receiving nCPAP.

Methods: A sample of 34 pediatric patients with a polysomnogram-confirmed diagnosis of Obstructive Sleep Apnea (OSA) was identified. The sample was divided into two groups: A nCPAP group consisting of children currently receiving nCPAP therapy (n=20), and a Control group of not yet nCPAP- treated (n=14). CBCT scans were obtained on all study patients and 2-D cephalogram-like images were generated from the 3-D volumes following a standardized method. These images were then traced and a series of cephalometric variables were selected for comparison between the two groups.

Results: Both groups showed significantly shorter Anterior Cranial Base length measurements (SN) compared to normative data. Although SNA values were not significantly different between the two groups and compared to normative data; the nCPAP group was significantly different from both the Control group and normative data with regards to ANperp. The Control group ANperp values were not significantly different from normative data. No mandibular dimensions were considered.

Discussion: There appears to be some differences, between OSA patients with and without nCPAP treatment.

Conclusions: Pediatric patients with a history of OSA have distinct craniofacial features compared to normative data.