

CFAO Graduate Student Posterboard Abstracts

Université de Montréal

EFFECTS OF SARPE ON UPPER AIRWAY VOLUME AND SHAPE: A CBCT EVALUATION

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Introduction: Surgically assisted rapid palatal expansion (SARPE) is a treatment of choice for patients who have reached skeletal maturity and present a maxillary transverse deficiency. It is often mentioned that SARPE has the benefit to improve respiratory function, however, only a few research projects have investigated the effects of SARPE on the upper airways. The objective of this clinical prospective comparative study was to evaluate the three-dimensional effects of SARPE on the nasal cavity, the nasopharynx and the oropharynx using computed tomography.

Materials and Methods: The sample consisted of 14 subjects (5 males, 9 females) whose mean age was 23.0 ± 1.9 years (range: 16 y. 4 mo. to 39 y. 7 mo.). All patients were treated using a bonded Hyrax expander and the mean expansion was 9.82 mm (7.5-12.0 mm). A one-year retention period was undertaken before the beginning of any other orthodontic treatment. A cone-beam computed tomography (CBCT) evaluation was performed at T0 (initial), T1 (6 months post-expansion) and T2 (1 year post-expansion), and then the nasal cavity, nasopharyngeal and oropharyngeal volumes and the oropharyngeal minimal cross-sectional area were measured on the three-dimensional volumes that were obtained.

Results: Radiological results have demonstrated a significant increase of the nasal and nasopharyngeal volumes and also an increase of the oropharyngeal minimal cross-sectional area at 6 months post-expansion. At one year post-SARPE, for these three parameters, a part of the gain was lost but did not return to the initial values. No significant effect on oropharyngeal volume was found. No significant correlation between expansion screw activation and radiological parameters were noted. Intra-class correlation analysis showed excellent intra-examiner reliability.

Conclusions: SARPE causes significant changes of the nasal cavity and nasopharyngeal volumes. SARPE does not modify the oropharyngeal volume, but induces significant changes of the oropharyngeal minimal cross-sectional area. The observed effects do not have a correlation with the amount of expansion screw activation.

Keywords: SARPE, upper airways, cone-beam computed tomography

THE ACCURACY AND RELIABILITY OF PLASTER VS DIGITAL STUDY MODELS: A COMPARISON OF THREE DIFFERENT IMPRESSION MATERIALS

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Introduction: The purpose of this study was to examine the effects of different impression materials on the accuracy and reliability of digital models.

Methods: Models from 25 patients selected at random from the files of the Department of Orthodontics at the University of Montreal were used in this study. One alginate (Kromopan 100 alginate, Italy), 1 alginate alternative (Alginot, Kerr Dentistry, Orange, CA), and 1 PVS (Aquasil, Dentsply Caulk, Milford, DE) impression was taken of both arches of each patient and sent to Orthobyte (Orthobyte Digital Technology inc., Calgary, AB) for fabrication of a plaster model and scanning for production of a digital model. The Bolton 6 and 12 analyses and their constituent measurements, overbite, overjet, and arch length were used for the comparison.

Results: The repeatability of measurements using both the plaster and digital methods was good to excellent, with the plaster measurements tending to be more reliable. There were statistically significant differences in the Bolton 12 and mandibular arch length and spacing measurements for all impression materials, with the plaster models tending to give a smaller measurement for the Bolton 12 and a higher measurement for the mandibular arch length and spacing. Although statistically significant differences in some measurements were found for the reliability and validity of digital models, none was clinically significant.

Conclusions: The accuracy and reliability of the software for comprehensive cast analysis is clinically acceptable and reproducible when compared with traditional plaster study model analysis.

Keywords: Digital models; Impression materials; Orthodontics