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Tomographic Analysis of the Volume and Area of the Pharyngeal Airspace of Patients Undergoing Orthognathic Surgery



E. S. Gonçalves: Bauru Dental School - São Paulo University, A. G. Gonçalves, V. Tieghi Neto, C. F. Palmieri Jr., G. E. Ghali

Orthognathic surgery is the elective procedure for the treatment of facial skeletal deformities, where an increase of the pharyngeal airway space (PAS) in maxillomandibular advancement and a decrease of the dimensions of the pharyngeal airway space in mandibular setback are expected. The aim of the present study was to evaluate through a 3D retrospective cone beam computed tomographic (CBCT) analysis, changes in the pharyngeal airway space after isolated maxillary advancement, isolated mandibular advancement, maxillomandibular advancement, maxillary advancement, mandibular setback and isolated mandibular setback. The present study analyzed pre and postoperative CBCTs of 141 patients who underwent orthognathic surgery by measuring the volume (mm³), area (mm²) and the greater pharyngeal constriction (mm²) with the use of the Dolphin Imaging 11.7 software. PAS was divided into Total Pharynx, Nasopharynx, Oropharynx, Upper Oropharynx and Lower Oropharynx by the demarcation of anatomical points in sagittal CBCTs images. There was a statistically significant increase of area and volume of the PAS of individuals undergoing isolated maxillary advancement (Group I) and isolated mandibular advancement (Group II), while in the isolated mandibular setback (Group III), there was no statistically significant reduction in the volume of the PAS only in the upper oropharynx. Group IV (maxillary advancement by Le Fort I osteotomy associated to mandibular advancement by bilateral sagittal split osteotomy) showed statistically significant increase in all PAS parameters studied, while Group V (maxillary advancement by Le Fort I osteotomy associated to mandibular setback by intra oral vertical ramus osteotomy) showed no statistically significant increase in all PAS parameters studied. Orthognathic surgery produces effects on the PAS dimensions (area and volume) that can be increased or decreased according to bone movement.

Key words: Orthognathic Surgery. Maxillomandibular advancement. Pharyngeal airway space.

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TAD Retained Acrylic Palatal Expander for Sarpe



M. F. Caminiti: Assistant Professor, University of Toronto, J. V. Marko, A. Metaxas

The TAD retainer acrylic Palatal Expander (TAPE) is presented as a method of distracting cases for patients undergoing Surgically Assisted Rapid Palatal Expansion (SARPE). It is simple to fabricate, applies forces entirely to the alveolus, avoids direct dental expansion, and is well tolerated by patients as it is easy to clean and its low profile is comfortable. Surgically, it shares the advantage with Bone Borne Devices that the appliance is not in place while the maxilla is cut and segmented; thereby this allows the surgeon control that the maxillae are separated and moving equally. Orthodontic therapy can also be started at any time unlike tooth bone appliances.

Thirty patents requiring SARPE for the management of maxillary transverse discrepancy where consecutively treated. The first 10 were using a Hyrax device (Group H). The second group (Group B) of 10 patients had a bone borne device placed (TPD Synthes™). The final 10 patients had the TAPE device applied (Group T). Preoperative photos, models, radiographs and measurements were identically recorded for all cases. Intraoperatively the only variables recorded were operating time (Incision to final suture) and blood loss. Follow up included radiographs at 2 weeks and final records models photographs and radiographs one year after debanding. Most patients (25) required a further orthognathic surgical correction but none required further expansion of the maxilla via a LeFort. The final outcome was measured by recording if a crossbite was present in any of the posterior segments, recorded as either: none, mild (an end on occlusal cusp relation), or complete (a true crossbite).

Results showed no significant difference between the 3 groups preoperatively with respect to transverse measurement discrepancy. Outcomes also showed no significant difference with only one case in group B and one case in Group H demonstrating a mild crossbite. Complications included reentry into one of the Hyrax groups as expansion was not equal and removal of a bone borne device in group B due to chronic tissue irritation with an episode of significant bleeding. Overall treatment time was significantly longer in the Hyrax group as compared to Group B or T. Surgical time was similar for Group H and Group T but significantly lower than Group B. There were no significant blood loss differences between the

3 groups. The cost of group T was also significantly lower than group H followed by group B.

Conclusions: The use of the TAPE provides for good expansion with similar outcomes with other devices but it also offers many advantages including: the ease of application, confidence that the maxillary halves are separated; lower cost and good patient acceptance, cleansability and reduced treatment times. Surgeons should look into and consider the use of this device and educate orthodontists as to other benefits including early orthodontic manipulation thereby reducing overall treatment time.

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Accuracy of Virtual Orthognathic Surgical Planning with Bilateral Inverted-L Osteotomies



P. Kupfer: Oregon Health and Science University,
T. Kramcha, B. B. Farrell, R. B. Bell

Purpose: The purpose of this retrospective multicenter study was to assess the accuracy of virtual surgical planning (VSP) for orthognathic surgery utilizing inverted-L osteotomies (ILO), with or without maxillary surgery.

Materials and Methods: The accuracy of the VSP for bilateral ILOs was evaluated by comparing planned 3-dimensional (3D) virtual images with the actual final postoperative outcome in a series of consecutive patients treated at two different centers. VSP was performed using Dolphin 3D software via a web meeting facilitated by a software engineer from a third party service provider (3D Systems). Computer generated surgical splints were utilized for all cases. Chin templates were used for all genioplasties. A skeletal reference pin was employed to establish vertical incisor position at the time of surgery. The primary outcome variables were the linear and angular difference between the planned and postoperative 3D CT models.

Results: The records from 20 consecutive patients who underwent ILO at two different surgical centers between 2009 and 2017 were identified and reviewed. 9 patients were excluded because they either had a unilateral Inverted-L osteotomy or an incomplete data set. The

remaining 11 were split into two groups: Group 1) patients who obtained postoperative CT scans within 20 days of surgery (N=9) and group 2) patients who obtained CT scans more than 150 days postoperatively (N=4). Angular and linear measurements were obtained from both the planned and the post-operative 3D CT images. There were minimal differences between the planned and the actual angular positions achieved in group 1 (mean difference: SNA=1.52° (SD 1.2); SNB=1.45° (SD 0.7); ANB=1.44° (SD 0.9); Occlusal plane 2.99° (SD 2.3). Likewise, only modest linear differences were observed between the planned and actual outcome of group 1 patients in the horizontal dimension (mean=2.08mm), vertical dimension (mean=1.19mm), and transverse dimension (mean=1.07mm). The difference between the planned and the actual outcomes in group 2 were similar to those of group 1 (mean SNA=2.00° (SD 1.2), SNB=0.68° (SD 0.6), ANB=2.26° (SD 1.5), Occlusal plane=2.22° (SD 3.24). The mean linear differences in group 2 were: horizontal=1.51mm; vertical=2.31mm; and transverse=2.01mm.

Conclusion: VSP can accurately predict final skeletal position following orthognathic surgery utilizing intermediate splints and a vertical reference pin when performing bilateral inverted-L osteotomies, the position of which appears to be stable over time.

Influence of PRE-Procedure Multimedia Information on Anxiety Levels of Patients Who Will Undergo an Orthognathic Surgery



A. N. Tanidir: Recep Tayyip Erdogan University, School of Dentistry, M. S. Atac, E. Tuncay

Patients are reported to have a better psychological preparation by combining different information methods like verbal and/or written with multimedia^{1,2}. Nevertheless, in some studies, multimedia tools have failed to reduce patient anxiety and failed to improve short-term outcomes, patients' satisfaction and understanding of their medical procedure.

This prospective, randomized trial aimed to evaluate the effect of multimedia information on patient anxiety in orthognathic surgery at pre- and post-operative settings.

A total of 27 consecutive patients operated for orthognathic pathology in Department of Oral and Maxillofacial Surgery in Gazi University between February 2014 and July 2014 were randomized into three groups according to the information method: by a dubbed video (n=9) (Group 1), by a subtitled, silent video (n=9) (Group 2), by verbal information without any video (n=9) (Group 3). Patients were assessed on four time settings with the State-Trait Anxiety Inventory (STAI), Modified and Dental