ORTHOGNATHIC ABSTRACT/HOW I DO IT SESSION

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Soft Tissue Evaluation After Bimaxillary Orthognathic Surgery with 3D Cone Beam Computed Tomography Sumperimposition: Preliminary results

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Facial soft tissues may change after skeletal movements in orthognathic surgery. The proportion between hard and soft tissues changes was constantly discussed, especially in two-dimensional analysis of the facial profile with lateral cephalograms superimposition. Recently, with the introduction of the cone beam computed tomography (CBCT), a new era of three-dimensional (3D) analysis has arised. However, these studies are frequently associated with a variety of different software's which demands several file format conversions and computers with high processing capacity.

The purpose of this study was to evaluate and compare the differences and correlation between hard and soft tissues after skeletal movements in skeletal Class III subjects who underwent double-jaw surgery. Preoperative (T0) and 6-months postoperative (T1) DICOM images of Cone Beam CT (CBCT) scans were superimposed using Ondemand3D (CyberMed, Seoul, Korea) and after assessed three dimensionally using Dolphin3D (Dolphin Imaging & Management Solutions, Chatsworth, Calif). These were CBCTs of a sample of 10 non-consecutive skeletal Class III subjects. Skeletal movements were recorded at Point A and Point B. Eight soft tissue points in the median sagittal plane and others 38 soft tissue points in parasagittal planes in the middle and lower thirds of the face were evaluated. Significance of differences between the time intervals and significance of correlation existing between these points were assessed.

Proportions between hard and-soft tissues in the median sagittal plane were similar to those reported in two-dimensional studies. This ratio decreased to points further from the midline. Correlation between hard and soft tissues in the mandible was greater than in the maxilla. Similarly, correlations only between soft tissues, an aspect that has rarely been discussed in published articles, presented a greater correlation in the mandible. Results were similar to those found in studies on single-jaw surgery for both the maxilla and the mandible. The absence of the need to convert file formats between different computer programs allows surgeons to use the analysis presented to evaluate their cases in their clinical routine using user-friendly programs.

Further research will benefit from the constant technological developments in computed tomography scans and computer programs, especially in the field of facial evaluation after orthognathic surgery.

References:

1. Lee JY, Kim YI, Hwang DS, Park SB. Effect of setback Le Fort I osteotomy on midfacial soft- tissue changes as evaluated by cone-beam computed tomography superimposition for cases of skeletal Class III malocclusion. Int J Oral Maxillofac Surg 42:790, 2013
2. Kim BR, Oh KM, Cevidanes LHS, Park JE, Sim HS, Seo SK, et al. Analysis of 3D Soft Tissue Changes After 1- and 2-Jaw Orthognathic Surgery in Mandibular Prognathism Patients. J Oral Maxillofac Surg 18:151, 2012

Comparison of 3D Computer-Assisted Virtual Planning and Articulated Model Planning for Bimaxillary Orthognathic Surgery

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Statement of the Problem: Articulated model surgery has been the established method for planning bimaxillary orthognathic surgery. However, computer-assisted virtual planning is gaining popularity[1,2]. The purpose of this study was to perform a side-by-side comparison of these two methods to assess if there is a clinically significant difference in three-dimensional (3D) dental movements between them. Our hypothesis was that there would be no significant difference.

Materials and Methods: Surgical records for this retrospective study were gathered for ten patients who previously underwent bimaxillary orthognathic surgery at our institution. Standard records included intra- and extraoral photos, cone beam computed tomogram (CBCT), and two-dimensional virtual treatment objective using Dolphin Imaging®. Also, two sets of dental models were mounted on a semi-adjustable articulator using a facebow transfer and centric relation (CR) record obtained by the principle investigator. A standard mounting protocol was used that ensured accurate capture of the occlusal plane angle. Model surgery was performed for surgical splint fabrication. Subsequent to surgery, the cut and uncut models were remounted on the same articulator to create a new CR record, and an intermediate and final splint for each case. These records were made using polyvinylsiloxane bite registration material. Maxilla-first surgery was always performed. The 3D changes in the molar, canine and incisor positions for the maxilla and mandible were measured using an Erickson model block. The principle