

erative mandible resulting in the hard tissue difference.

To investigate the soft tissue changes, the preoperative and one year postoperative 3D photographs were registered using surface based registration. The preoperative surface could now be subtracted from the postoperative surface, resulting in the overall volumetric difference.

Furthermore, the soft tissue changes at different anatomical regions as well as the labio-mental fold were investigated.

Results: A mean overall volume increase in bony tissue of 7853 mm³ was found. For the soft tissues, a mean volume increase of 10,029 mm³ was found. Looking at the labio-mental fold, a mean preoperative curvature of 3.57 (radius in cm) was found in contrast to a postoperative mean value of 5.24 (radius in cm). In almost all patients, the labio-mental fold stretches significantly after surgery.

Conclusion: Using 3D imaging techniques it is possible to accurately and objectively document surgical changes. This study provides real 3D, volumetric, information about the changes of a patients face after orthognathic surgery.

Conflict of interest: None declared.

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Facial morphology of adult Dutch, Egyptian and Texan white population using 3D stereophotogrammetry

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To date, little work has been done with 3D imaging tools in the analysis of the facial morphologies of various populations. This study investigates the facial morphologies of subjects from three different populations.

Methods: Three uniquely distinct groups of each 100 subjects (Dutch, Egyptian and Texan) were included in this study. A questionnaire was used to determine racial type, age, gender, weight and length.

3D photographs (3D stereophotogrammetry) were collected for 100 subjects per group. After acquisition, all faces per subgroup were superimposed on top of each other and a male and female average face was computed for each subgroup. Different average faces could be compared by calcu-

lating color histograms of the differences. These were analyzed and linear mean differences were computed.

Results: Absolute linear differences among average faces of the subgroups ranged from 0.55 mm (between the average Dutch and Texan female faces) to 1.39 mm (between the average Dutch male and female faces). Similarities between the subgroups ranged from 21.38% between Texan male and female face to 58.22% between the Dutch and Texan female average faces. The variation between the male and female average faces was mainly visible in the area of the malar bones and the nose.

Conclusion: Average faces can be efficiently and effectively created from a sample of three-dimensional faces. Studies such as this one, can help to formulate a normative database for different populations. Such a database can be used in the planning of orthognathic surgery as well as orthodontic treatment.

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Assessment of complaints and their relationship with facial profiles in patients undergoing orthognathic surgery

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Objective: The choice of the patient to perform orthognathic surgery is dependent on a number of reasons, voiced in their chief complaints. The aim of this study was to identify the most common complaints reported by patients during preoperative evaluation and relate them to their facial profiles.

Materials and methods: Questionnaires of 92 patients who underwent orthognathic surgery were evaluated, concerning their chief complaints, grouped into 10 categories (aesthetics, occlusion, TMJ problems, headaches, breathing, chewing, speech, shorten orthodontics, prevention, and without complaint). Then, complaints were related to patients facial profiles (class II, class III or vertical). Chi-square test was performed for statistical analyses.

Results: A total of 144 complaints were catalogued. The most common complaints were aesthetics ($n=49$), occlusion ($n=33$) and TMJ problems ($n=20$). Among the complaints with sufficient sample for test-

ing, occlusion and TMJ problems were significantly related to Class II profile ($p<0.001$).

Conclusions: The identification of patients' complaints is of paramount importance during orthognathic surgery planning. In this sample complaints about aesthetics, occlusion and TMJ problems were the most cited ones. Complaints regarding occlusion and TMJ problems were significantly related to class II profiles.

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Biodegradable versus titanium osteosynthesis in maxillofacial surgery. Results of a multicenter randomized clinical trial

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Objectives: The aim of this study was to compare the effectiveness and complications of biodegradable osteosynthesis versus titanium osteosynthesis in maxillofacial surgery.

Material and method: After power analysis 230 consecutive patients in 4 different centers were randomized to titanium (KLS Martin) or biodegradable osteosynthesis (Inion). Included were healthy patients with fractures of maxilla, mandible and zygomatic complex as well as Le Fort I osteotomies and bilateral sagittal split osteotomies. Primary outcome was bone healing, and secondary outcomes were handling-properties and complications. Patients were evaluated until 52 weeks postoperative.

Results: 7 protocol-violating-patients were excluded from analysis. In 25 biodegradable-randomized patients it was preoperatively decided to switch to titanium for different reasons. After 8 weeks there was inadequate bone healing in 1 patient in the titanium group and in 5 patients in the biodegradable group (intention-to-treat: $p=0.11$). The handling

properties of titanium on a 1-10 scale were about 1.5 point higher as compared to Inion (significant differences). Until 52 weeks postoperative plates were removed in 11 of the 123 patients treated with titanium and in 18 of the 71 patients treated with Inion because of inflammation ($p=0.002$). 29 patients were lost-to-follow-up.

Summary: There is no significant difference between Inion and titanium in effectiveness (bone healing) for treatment of maxillofacial fractures and osteotomies. The handling properties of Inion are inferior and complications until 52 weeks postoperative are higher.

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Modified Turkish delight—"morcellized polyethylene dorsal graft" for rhinoplasty

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Object of study: To determine the effectiveness of finely diced medpor (polyethylene) implant material wrapped in surgical and mixed with 1 ml of the patient's blood for dorsal augmentation during Rhinoplasty.

Method: We modified the Turkish delight graft by using finely diced chips of high density porous polyethylene (medpor) implant material within the oxidized cellulose (surgical) mesh and used it for dorsal augmentation. We have found this procedure to be quite satisfactory with respect to its feasibility and effectiveness. Also, patient compliance is more due to the reduction of a second surgical site and its associated complications. It was used on 24 patients over a one year follow up.

Results: We have had satisfactory results so far with this technique. We have used it in cosmetic as well as cleft rhinoplasties. It has a distinct advantage over strut grafting using medpor. In our experience, the strut has to be properly and precisely shaped to achieve good results and still carries the risk of being perceptible after tissue resolution. However, modified Turkish delight when used on the dorsum can even be molded after 3 weeks and hence minor modifications of contour are possible post-operatively. Hence, there is ease of operating while using morcellized medpor graft. Also we have not

encountered any significant complication with this technique. A minor complication in a single patient was slight tenderness on the dorsum while wearing spectacles. On palpation, we felt a small nodule which we thought was a medpor particle which must have broken off from the morcellized graft. The patient was given an antibiotic challenge and advised avoiding the use of spectacles for a week and was advised re-exploration in case the symptoms did not subside. However, the patient was lost to follow-up. This complication can be easily avoided by delineating and limiting the boundaries of the surgical pocket. So also, while placing the modified Turkish delight graft, care should be taken to maintain the integrity of the surgical and avoiding any loose pieces from spreading out of the surgical. We have not encountered any other significant complication.

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A new time saving, precise orthognathic surgery simulating instrument

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Introduction: Achieving good results in orthognathic surgery depends largely on precise and accurate model surgery, which in turn depends on the type of the articulator used. Standard model surgery has inherent drawbacks; there is inaccuracy and time consuming. There have been many trials to introduce special articulators for model surgery planning but none of them reached the popularity to be used routinely. I am introducing an orthognathic surgery simulating instrument (OSSSI) which is a new device that allows free movement of the dental casts in all three planes of space without detaching the model from the articulator. Both linear and rotational movements could be achieved and measured.

Patients and methods: The appliance has been used in ten patients planned to have bimaxillary surgery in the form of Le fort I and sagittal split osteotomy. The time needed for model surgery was estimated using OSSSI and compared with, the same model surgery movements using dental casts mounted on Hanau semi-adjustable articulator for the same patients. To assess the accuracy of the new instrument, the postoperative cephalometry was compared with the prediction tracing.

Results and conclusions: In all cases, intra-operative occlusion was achieved exactly as in preoperative planning. The time needed for model surgery was shorter in OSSSI group. Furthermore, statistical analysis revealed no significant difference between the planned (prediction tracing) and the post-operative cephalometry for all the measured points. The appliance carries the following advantages over the standard model surgery; it is time saving, precise, easy to use and cost saving.

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Changes in the pharyngeal airway space based on cephalometric study after orthognathic surgery

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Purpose: To evaluate the changes in the pharyngeal airway space after different procedures in orthognathic surgery based on cephalometric study analysis in patients with dentofacial anomalies Class II and Class III, who underwent orthognathic surgery between years 2008 and 2010 in the Police Central Hospital, Bogota-Colombia.

Method: Evaluation of 42 lateral cephalograms preoperatively and postoperatively divided in four groups, Group A: 11 patients underwent surgery by mandibular advancement with genioplasty, Group B: 8 patients underwent surgery by bilateral sagittal splits ramus osteotomy, Le Fort I osteotomy and genioplasty; Group C: 13 patients underwent surgery by bilateral sagittal splits ramus osteotomy and Le Fort I osteotomy, Group D: 10 patients underwent surgery by mandibular setback and genioplasty. We did a cephalometric analysis taking as parameters anterior-posterior landmarks and lineal measurements of the pharyngeal airway space in three places: nasopharynx, oropharynx and hypopharynx.