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CASE REPORT

Mandible-first sequence approach in bimaxillary orthognathic surgery using 3D printed surgical templates for facial asymmetry

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Abstract
Bimaxillary orthognathic surgery has been widely performed to achieve optimal functional and aesthetic outcomes in patients with maxillofacial deformity. Although Le Fort I osteotomy is generally performs before bilateral sagittal split osteotomy (BSSO) in the surgery, in several situations BSSO should be performed first.
The aim of this study to present the case of a 22 years old female patient with class III malocclusion and facial asymmetry.The desired movements were planned in 3D virtual planning on the computer with Nemofab software.Any complication was observed in the postoperative follow-up of the patient.
Conclusion: The maxillofacial deformities are treated with orthodontics and maxillofacial surgery co-operation. Traditional model surgery is generally used for surgical planning but computer aided virtual planning and printed surgical templates from 3D printers is a good alternative for surgical planning nowadays.

Keywords: Mandible-first,virtual planning,orthognathic surgery

Introduction

Dentofacial deformities are defined as hard and soft tissue abnormalities affecting jaws. The teeth located in the alveolar process of the affected bones will frequently present with malocclusion, crowding, dental compensations and rotations. Orthodontic treatment may be sufficient to manage mild dentoskeletal deformity, but as the magnitude and severity of the deformity increases, treatment with combined orthodontics and orthognathic surgery will be required. [1]

Case Report

Twenty five years old female patient was consulted to our clinic with facial asymmetry. After the patient's clinical and radiological evaluation, the indication for bimaxillary surgery was determined. 3D planning was performed because it was difficult to perform with conventional model surgery. Virtual surgery was performed with Nemofab software (Nemotec,Spain).

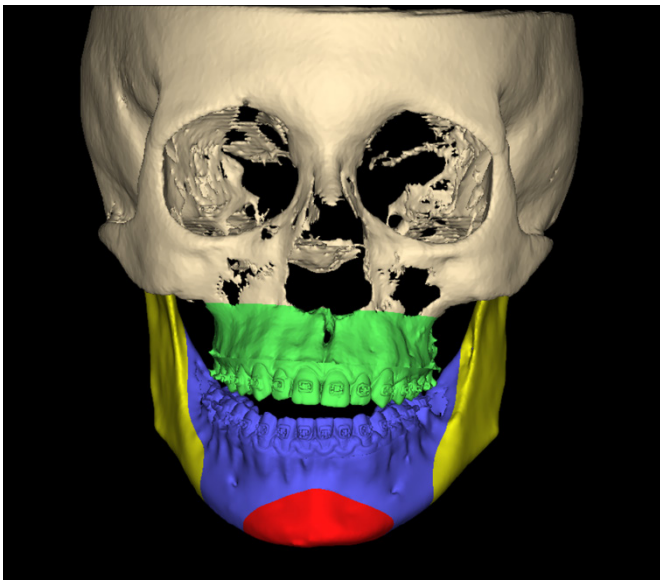

Fig.1:Pre-operative view.

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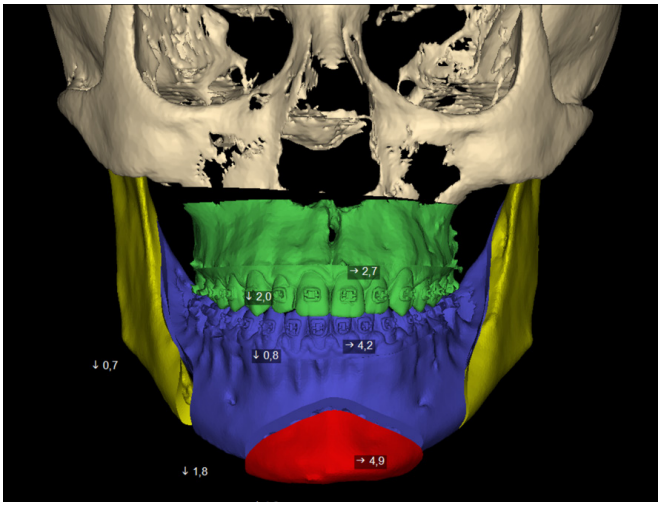

Fig.2: Segmental movement amounts after the completion of 3D planning.

Discussion

In relation to accuracy of orthognathic surgery, the traditional maxilla-first procedure offers variable but well-documented results with acceptable outcomes.[2] While the maxilla-first sequence is generally preferred, mandible-first would be favoured in situations such as counterclockwise rotation of the occlusal plane thus avoiding an intraoperative anterior open bite, inaccuracy of interocclusal records and uncertainly in precise condylar positioning, concomitant Temporomandibular joint surgery, or an expected difficulty in maxillary fixation as seen in segmental maxillary osteotomies.[3] In our case, we chose the mandible first approach because we planned counterclockwise rotation of occlusal plane, virtual planning and 3D printed surgical templates were facilitated our operation.

Conclusion

With the rising popularity of virtual surgical planning, there has been increased interest in "mandible-first surgery" Traditional model surgery is generally used for surgical planning but computer aided virtual planning is a good alternative and facilitating factor for surgical planning nowadays.The literature on the mandible first provides little outcomes data, and its use is currently supported only by the opinion of authors and a single retrospective case series. While there appear to be significant theoretical advantages to support the use of the mandible-first approach, future prospective studies on its reliability, accuracy, short and long-term outcomes are required.

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