ISSN: 2581-5989
PubMed - National Library of Medicine - ID: 101738774

International Journal of Dental Science and Innovative Research (IJDSIR)

IJDSIR : Dental Publication Service

Available Online at: www.ijdsir.com

Volume – 5, Issue – 5, September - 2022, Page No. : 20 - 23

Surgical Guide for Lefort I and Anterior Maxillary Osteotomy – Orthonathic Surgery-A Case Report

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Citation of this Article: Dr. Amalorpavam.V, Dr. Giri Chandramohan, Dr Kamala Shankar, Dr. Mary Sheloni Missier, Dr. Ponjayanthi, Dr. Claudia Peter, "Surgical Guide for Lefort I and Anterior Maxillary Osteotomy– Orthonathic Surgery-A Case Report ", IJDSIR- September - 2022, Vol. – 5, Issue - 5, P. No. 20 – 23.

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Severe Class II Malocclusion often treated using a multiple approach to bring significant improvement of patient facial profile. For some patients maxillary excess rectified by LeFort I osteotomy and setback, anterior segmental osteotomies and without dental extraction or This article discusses surgical splint for Orthonathic surgery primarily anterior segmental osteotomies and setback of the LeFort I osteotomized segment (more than 5 mm), as they relate to the surgical approach for Severe Class II Malocclusion.

Keywords: Surgical Splint, Lefort, Anterior Maxillary Osteotomy, Class II Malocclusion, Orthonathic Surgery, Orthonathic Surgical Splints.

Introduction

Perfect outcome of all the treatment design which enables to reproduce best esthetic and functional results[1]. Orthonathic surgery intra operatively position a mobile osteotomized jaw against the other stable jaw using preprosthetic splints made of acrylic. In case of two surgery two splints need to be fabricated. First splint is intermediate splint and Second splint named as final splint. Avoid confusions during Orthonathic surgery two splints were differentiated using color codes which helps to identify the need during the procedure.

Mock Surgery and Fabrication of Splints

Mock surgery done to establish planned surgical procedure and also helpful to explain the treatment plan to the patients .Plays major role in reorient models used in fabrication of the surgical splints for reposition

osteotomized segments. Major protocol to set in our mind that surgical splint fabrication that all movements become visible in three dimensional fashion achieved by using reference lines scribed on models before performing the movements. Splints are made of acrylic and used in orthognathic surgery to intra operatively position a mobile osteotomized jaw against the other stable jaw before an internal fixation procedure is performed. In case of two-jaw surgery two splints need to be fabricated. The first one is used after osteotomy of the first jaw as an intermediate splint, the other one after the second jaw has been osteotomized as a final splint [2]. This surgical guide splints greatly facilitates the efficiency, stability, and accuracy of Orthonathic surgery. The maxilla was more under-advanced and over-impacted anteriorly than predicted by model surgery. Inaccuracy with the face bow recording, the intermediate wafer, and auto-rotation of the mandible in the supine or anaesthetized patient would appear to be the principal reasons for errors[3]. Inaccuracies are associated with the transfer of prediction planning to model surgery planning and prediction, which should be eliminated to improve the accuracy and predictability of orthognathic surgery[3].

Case Report

Case report a 25 years female patient reported with the chief complains of Gummy smile along with Proclaimed Upper and Lower teeth (Figure 1). On clinical examination she has skeletal class II malocclusion (Figure 2) . Recreate her smile treatment plan decided to reduce her gummy smile through Orthonathic surgery followed by orthodontic management. Patient was sent prosthodontics department for facebow transfer, Mockup and splint fabrication. This case was combined approach involving Orthodontics, Prosthodontics and Oral Surgery Department. First approach done by the orthodontist in whom the patient was strapped up followed by levelling and aligning before Orthonathic surgery. CBCT, photographs and dental casts before OGS. Before starting the procedure Osteo—3D models were fabricated for reference purpose which includes both pre and post-operative 3D models (Figure 3& 4). Patient was already with orthodontic braces to prevent impression tear off due to braces, wax blackout was done and Primary Impression made using Elastomeric impression, after that cast were poured (Figure 5) . Facebow transfer was done for maxillary orientation and articulated in semi adjustable articulator[3] (Figure 6, 7,8) . This technique assures that the maxilla is properly positioned on the articulator so that model surgery more accurately reflects what will be done on the patient. This also maximizes the opportunity to obtain the surgical movements performed on the articulator in the operating room[4,5]. Articulation adjusted to 8mm anteriors & 6mm posteriors into which surgical splint were fabricated for Lefort I surgery (Figure 9). After completing the first splint, cast mockup of about 8mm for anterior maxillary osteotomy was done (Figure 10). The splitted two parts were fused using sticky wax (Figure 11,12) into which surgical splint for anterior maxillary osteotomy was fabricated (Figure 13,14). LeFort I osteotomy with segmental osteotomy was used to mobilise the maxilla. Surgical splint was used with intermaxillary wiring to form the intermediate Maxillomandibular Complex which moves according to bilateral temporomandibular joints and guides the position of maxilla. Le Fort I osteotomy was performed using osteotomy guide plates (Figure 15, 16) . The vertical position of maxilla was adjusted according to the planned movements, after which titanium bone plates and screws were used for rigid fixation of the Maxillomandibular Complex (Figure 17). Anterior Maxillary osteomy was done and stabilized

using the second splint (Figure 18, 19,20). Orthonathic surgery two-splint techniques significantly improves soft tissue symmetry and in skeletal Class II asymmetry patients. Patient was under proper review and follow up after the surgery (Figure 21), a week ((Figure 22), and a year (Figure 23) with postsurgical instructions and care.


Figure: 1


Figure: 2


Figure: 3


Figure: 4


Figure: 5


Figure: 6


Figure: 7

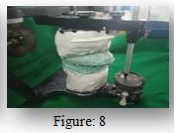
Figure: 8


Figure: 9


Figure: 10


Figure: 11


Figure: 12


Figure: 13


Figure: 14


Figure: 15


Figure: 16


Figure: 17


Figure: 18


Figure: 19


Figure: 20


Figure: 21


Figure: 22


Figure: 23

Discussion

Metzger et al. concluded in his study manufacturing splints for orthognathic surgery using a three-dimensional printer where an overlap occurs owing to the repositioning of the upper jaw, a vertical opening of the lower jaw is unavoidable. Therefore, it is possible to define a rotational axis through both mandible joints, which approximately simulates the movement of the lower jaw[6]. Face-bow transfer is an essential step in articulator-based orthognathic surgery planning .Ellis etal studied and evaluated in his study one of the most common errors in model surgery for orthognathic surgery is in the mounting of the models on the articulator[7]. The importance of locating the transverse horizontal axis (THA) was first expressed by Campionl in 1905. He emphasized that the maxillary cast should be at the same orientation on the articulator as the patient's maxillae was to the temporomandibular joints.

Conclusion

The success of orthognathic surgery is dependent on both the surgical technique and accurate treatment planning and outcome. The lack of maxillary orientation which should be eliminated to improve the accuracy and predictability of orthognathic surgery[8] . Hence it was a combination approach involving Orthodontics, Prosthodontics and Oral Surgery to provide excellent benefit for future result. Inaccuracy with the facebow recording would appear to be the principal reasons for the errors.

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