

Anterior Segmental Maxillary Osteotomy and Genioplasty: Case Report of 2 Cases

Vaibhav Shah*, Krishna Shama Rao, Ganapathy KP, Murali Mohan, Harish Kumar, Pavan, Hemanth and Abhinav Jain

Consultant Nonsurgical Facial Cosmetologist, Consultant Maxillofacial Surgeon, Certified Endodontist, India

***Corresponding Author:** Vaibhav Shah, Consultant Nonsurgical Facial Cosmetologist, Consultant Maxillofacial Surgeon, Certified Endodontist, India.

DOI: 10.31080/ASOL.2023.05.0546

Received: February 15, 2023

Published: March 03, 2023

© All rights are reserved by **Vaibhav Shah, et al.**

Abstract

24 year old male patients reported to our institution with Angle class II division 1 subdivision malocclusion, canine class II, gummy smile and Retruded chin. Lateral cephalogram demonstrated vertical and horizontal maxillary excess.

Genioplasty to correct Retruded chin and anterior maxillary osteotomy through palatal approach was performed to treat maxillary protrusive skeletal Class II. The treatment results show that the procedure exhibited large upward and backward movements of the anterior maxillary segment and desirable facial profile, with a reduction of the deep overbite after the treatment.

Keywords: Anterior Maxillary Osteotomy; Lower Lip; Genioplasty

Introduction

Anterior maxillary osteotomy is usually performed in skeletal Class II malocclusion along with maxillary protrusion. Additionally the antero posterior problems are often accompanied with incisal display of teeth and gingiva during smiling. During anterior maxillary osteotomy in such patients, it is necessary to move the anterior maxillary segment upwards as well as backwards.

The goal for correction of chin deformities is achieving aesthetic objectives without significant functional changes. In this way, Genioplasty is a versatile technique, most of the times used to correct chin deformities in different planes.

This article reports a case of maxillary protrusive skeletal Class II patient with deep overbite, vertical maxillary excess and Retruded chin treated with Anterior Segmental Osteotomy and Advancement Genioplasty.

Case History

Pts of age 24 year old male patient reported with a complaint of inability to cover front teeth with lips and forwardly placed upper front teeth. On examination he had Angle class II division 1 subdivision malocclusion, canine class II, gummy smile and Retruded chin. His profile demonstrated protrusion of the maxilla and upper lip. The frontal facial appearance showed a large vertical height and display of an entire incisor crown with a few millimeters of gingiva on smile. Intraoral examination showed significant proclination of maxillary incisors and increased anterior overjet and overbite. Lateral cephalogram demonstrated vertical and horizontal maxillary excess. The most significant problems were the protrusion and excessive vertical height of the maxilla. Therefore, the treatment plan was to move the anterior maxillary segment

Upward and backward by anterior maxillary osteotomy under and superior reposition and advancement of chin. Presurgical orthodontics was carried out to level and align both arches.

Surgical procedure

Under GA, with Nasotracheal intubation standard preparation was done. Two vertical incisions were given on the buccal aspects on right and left first premolar region (Figure 1). Mucoperiosteal reflections were carried out to expose the underlying bone. Osteotomy cuts were made and the first premolars were extracted. Osteotomy cuts were made through the sockets extending to the ipsilateral piriform apertures. Transpalatal incision was made at the canine region. Transverse osteotomy cut joining palatal aspects of both the extraction sockets were made (Figure 2). Nasal septum was osteotomized using guarded nasal osteotome. The anterior maxillary segment was down fractured, mobilized and moved backward and upward after removal of bony interferences. Fixation was done with miniplate (Figure 3). Surgical wound was closed in layers with 3-0 vicryl.

For Genioplasty, a degloving vestibular incision was placed extending from canine to canine.

To reduce the tension after advancement digastric muscles were separated from the mandible. The horizontal osteotomy cut was made through the buccal cortex. The osteotomy was completed using an osteotome and the segment was mobilized inferiorly and forwards. This mobilized segment is pedicled over geniohyoid muscle and some amount of lingual periosteal attachment. Bony interferences were removed under direct vision. The mobilized segments advanced into desired position, external facial contour was checked, fragment positioned into the final desired level. It was then fixed with one X shaped miniplate (Figure 4). Suturing was done with 3-0 vicryl.

Discussion

The first reported case of an anterior segmental anterior maxillary osteotomy (ASMO) was by Cohn Stock in 1921. After a transverse incision in the palatal mucosa, a wedge shaped osteotomy palatal to the anterior teeth was made.

Anterior maxilla was retracted after a green stick fracture was created at the osteotomy site. The anterior segment, relapsed within 4 weeks. After which technique was developed and refined. Anterior maxillary osteotomy is usually carried out in cases of maxillary excess. Accompanied by skeletal Class II malocclusion with maxillary protrusion, proclined maxillary incisors during smiling. Apart from Anteroposterior problems, excessive vertical growth of the maxilla also seen. This vertical excess causes a long

midfacial appearance and the display of incisors and gingiva during smiling. To treat these patients it is necessary to move the anterior maxillary segments upward as well as backward by anterior maxillary osteotomy.

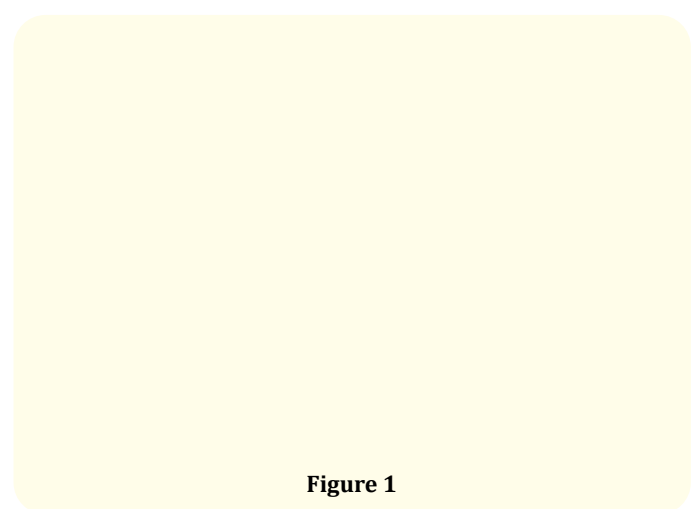


Figure 1

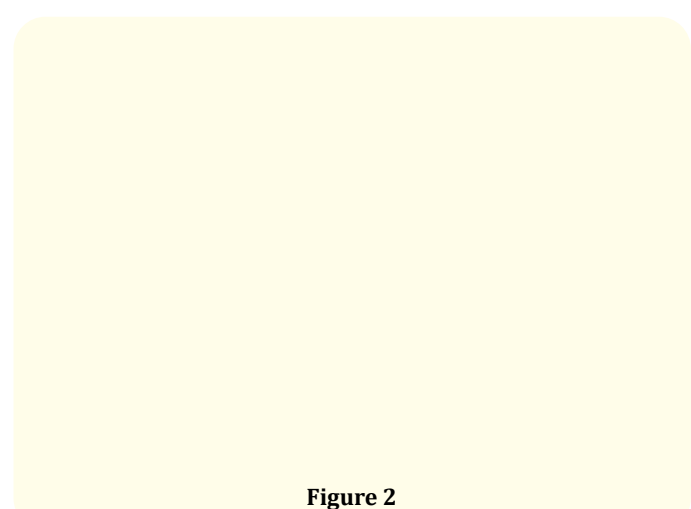


Figure 2

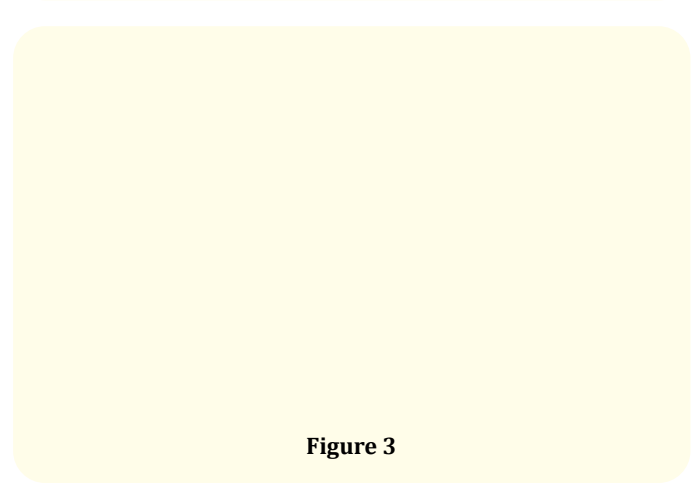


Figure 3

Figure 4

Variations of Anterior Maxillary Osteotomy is done by the Wassmund, Wunderer, and Down fracture methods.

In Wassmund method as no flaps are raised so anterior maxillary segment derives its blood supply from both the facial and palatal gingiva.

The planned osteotomy is performed by tunneling under the mucoperiosteum.

Wunderer method involves palatal flap raising by giving a transverse incision in the palatal flap region, anterior osteotomy is made after tunneling, preserving the buccal blood supply intact.

In the down fracture method, buccal flap is raised, palatal osteotomy performed after tunneling, palatal blood supply preserved.

The usual indications for ASMO are excessive vertical or antero posterior development of the maxillary alveolar process in patients where the relationships between the posterior teeth are acceptable. When superior repositioning of the anterior part of the maxilla is the primary objective, the down fracture method is usually recommended, while the Wunderer method is more practical for posterior repositioning.

Genioplasty means a plastic procedure on chin that involves both bony component i.e. anterior portion of the base of the mandible and the soft tissue component. The procedure can be performed either alone or as an adjunctive to other orthognathic and facial

plastic surgery procedures to achieve acceptable facial esthetics by means of balance, form, symmetry and functional outcome, like balance of the muscular activity around oral commissure. The motive of patients undergoing Genioplasty is very diverse and complex.

Most important primary reason is aesthetic enlargement or reduction of width of lower border, soft tissue correction or implantation of an alloplastic Genioplasty followed by compensation of functional defect as well as social and psychological reasons; however, Genioplasty can be performed as direct osteoplasty (sliding advancement, sliding set back, double sliding advancement, vertical reduction, cranially convex osteotomy, with interpositional graft, tenon method, vertical strip excision, material/cartilage/bone. Different Genioplasty surgical methods are used to treat patients having maxillofacial deformity. Patients planning to have Genioplasty go through surgery with the expectation of improvements in functional, social, and psychological aspects. The face is balanced when the superior, middle and inferior thirds are approximately equal in size and the structures within each segment are proportional in size and prominence. The lips and the chin should be in harmony with one another as well as with the structures in the middle third of the face. Since anatomically the chin is the area below the labio mental fold. This is also true clinically when the patient is viewed from lateral aspect. However, when viewing the face from the frontal aspect, it becomes difficult to separate the chin from the lower lip area. Consequently the eye assesses the whole complex from the labial angle to soft-tissue gnathion, the "lower lip-chin complex", which consists of the lower lip, labiomental fold, and chin, rather than simply the chin.

Amount of change in hard tissues leads to variable amounts of aesthetic changes in profile. Purpose of Genioplasty is achieving correction in the abnormal function such as mastication, pronunciations in achieving superior aesthetic results and surgical stability.

The predictable changes in the maxillofacial profile can be achieved since planning of the treatment was done, changes in facial soft tissues during surgery leads to change in the maxillofacial profile. Computer programs predicting the maxillofacial change after surgery have recently provided numerous incentives to patients.

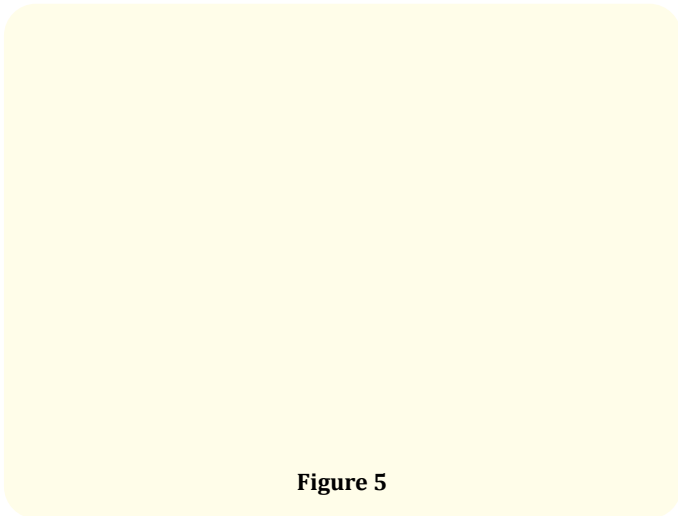


Figure 5

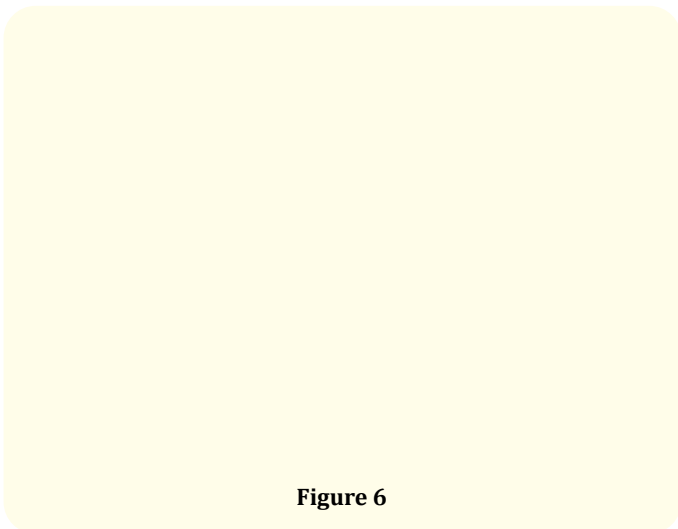


Figure 6

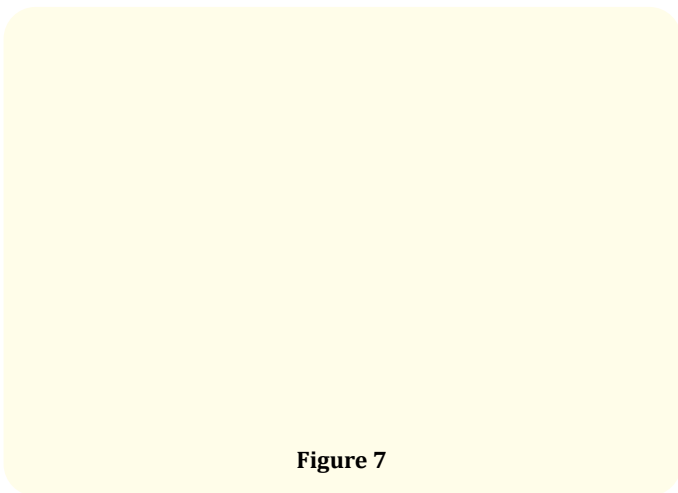


Figure 7

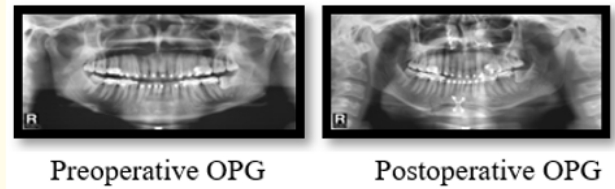


Figure 8

Conclusions

It is necessary to have a combined surgical and orthodontic treatment.

Planning for skeletal malocclusions in adults for best results.

Associating the literature and the case operated it was concluded:

- ASMO and Genioplasty is a technique used to achieve good facial balance.
- Genioplasty is versatile and permits three dimensional corrections of chin deformities.
- The internal rigid fixation produces more stable results in Long time.
- Adequate suturing in planes prevents esthetics complications like soft tissue ptosis and lip incompetence.

Bibliography

1. Naoto Suda., *et al.* "Three cases of anterior maxillary osteotomy under orotracheal intubation". *International Journal of Adult Orthodontics and Orthognathic Surgery* 17.4 (2002).
2. Maria J Troulis., *et al.* "Extended Genioplasty: long-term cephalometric, morphometry and sensory results". *International Journal of Oral and Maxillofacial Surgery* 29 (2000): 167-175.
3. David Waring., *et al.* "Three-part bi-maxillary osteotomy: aCase report involving Resorbable plates". *Journal of Orthodontics* 32 (2005): 75-84.
4. "Correction of Anterior Open Bite And Sagittal Deficiency With Simultaneously Performed Anterior Segmental Osteotomy And Genioplasty". *International Journal of Dental Case Reports* 1.1 (2011): 11-18.

5. "Osteoplasty and advancement Genioplasty for widening of chin". *Journal of Oral and Maxillofacial Surgery* 55 (1997): 1493-1497.
6. "Surgical technique for Genioplasty and yours implications to esthetic in orthognathic surgery - literature review and clinical-surgical cases presentations - Revista ATO Genioplasty".
7. "Analysis of Soft Tissue Changes after Genioplasty".