Case Report

Orthosurgical management of an asymmetric case with class III malocclusion and transversal problem in the maxilla

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Abstract

Class III malocclusions are considered to be one of the most difficult problems to treat. For us, the complex of these cases is the esthetic of the face and the smile because the treatment of the malocclusions without surgery produces a more retrusive face. We present a case report of an adult male patient with skeletal Class III malocclusion with compression in the maxilla and mandibular asymmetry, who has treated the orthosurgical approach. The result is acceptable in terms of occlusion-function, esthetic of the smile, and facial esthetics.

Key words: Asymmetric, case report, Class III malocclusion, orthodontics, orthognathic surgery, surgically assisted rapid palatal expansion

INTRODUCTION

Etiologically, Class III malocclusions are multifactorial which includes genetic and environmental factors. However, the genetic factors are the most important in this type of malocclusions. Usually, these skeletal malocclusions have the problem in a maxillary retrusion; if this is combined with a maxillary compression, it is possible that the mandible will grow asymmetric.

Class III malocclusions are considered to be one of the most difficult problems to treat orthodontically. This is because it is not easy to improve the occlusion and not retract the facial profile with lower extractions.

For this reason, when you can change for worse the profile in adult patients, the best alternative is orthognathic surgery.

Access this article online	
Quick Response Code:	Website: www.apospublications.com
	DOI: 10.4103/2321-1407.183155

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The case presented is a Class III in an adult patient with asymmetry, maxillary compression, and open bite. In this patient, the three planes of space, vertical dimension (open bite), transversal dimension (compression of the jaw), and anteroposterior (skeletal Class III) are altered. Therefore, he needs combined orthodontic and orthognathic surgery.[1]

DIAGNOSIS AND ETIOLOGY

The patient is an adult of 20 years presenting transversal and sagittal hypoplasia of the maxilla, skeletal open bite, and skeletal asymmetry.

Clinical frontal examination revealed an asymmetrical face. The profile assessment revealed concave profile with anterior facial divergence, flat cheekbone contour [Figures 1 and 2], and poor esthetics of the smile in the frontal and lateral views. If we analyzed in detail the smile, we could observe that the tooth exposure is decreased,[2-4]

How to cite this article: Varela JC, Sanchez BI. Orthosurgical management of an asymmetric case with class III malocclusion and transversal problem in the maxilla. APOS Trends Orthod 2016;6:160-5.

there is a lack of coordination of the midlines, and the smile width was decreased.

Intraoral examination revealed bad periodontal health with asymmetrical arches, Class III molar and canine relation on both the sides. The mandibular midline was deviated 4 mm to the left and the upper was deviated 1 mm to the right. The patient had crowding (more in the upper arch), open bite, and compression in the maxilla [Figure 3].

Temporomandibular joint (TMJ) examination did not reveal any discrepancy between centric relation and centric occlusion and the patient did not complain of pain or clicking in the joint.

Cephalometric examination revealed retrognathic maxilla, prognathic mandible, with vertical growth pattern and proclined maxillary incisors and retroclined mandibular incisors [Figure 4 and Table 1].

TREATMENT PROGRESS

Orthodontic treatment combined with orthognathic surgery consists of three phases: Presurgical orthodontic treatment, surgical treatment, and postsurgical orthodontic treatment.

Figure 1: Initial extraoral photographs

Figure 3: Initial intraoral photographs

In patients with skeletal problems in the three planes of the space, we follow this protocol:

1. We propose to the patient to use a split in upper arch, and we decompensate the lower arch to be sure which is the real transversal and sagittal problem
2. We do a cone beam computed tomography (CBCT) to measure the transversal problem
3. If the transversal discrepancy is bigger than 7 mm, we prefer to do the surgery in two steps: First the surgically assisted rapid palatal expansion (SARPE) and after the bimaxillary surgery.[5-7]

Due to the fact that the compression of the maxilla is bigger than 7 mm in this patient, we decide to do first the SARPE and after bimaxillary surgery. The patient first needs a surgery to expand the maxillary by SARPE technique before the placement of brackets in the upper arch. In our protocol, this surgery is considered ambulatory because it is performed under local anesthesia and sedation on an outpatient basis in 30 min [Figures 5 and 6].

To try to avoid dental posterior inclination, we prefer to use a bone-supported expander [Figure 7].[8-11]

Figure 2: Initial extraoral photographs

Figure 4: Initial teleradiograph

One month later of the last turn of the screw, we bond the brackets in the upper arch and we are going to coordinate the dental arches to prepare the patient for the bimaxillary surgery [Figure 8].

Before the bimaxillary surgery, we usually do a presurgical study with new records (photographs, intraoral scan models, CBCT) to decide the surgical movements.

After the clinical examination and the analysis of all records, we decide this surgery [Figure 9, 9a and b]:

Figure 5: Before SARPE intraoral photographs

Figure 7: Bone-supported device

Figure 9: Intraoral photographs during the treatment

Figure 6: Afer SARPE photographs

Figure 8: Intraoral photographs during the treatment

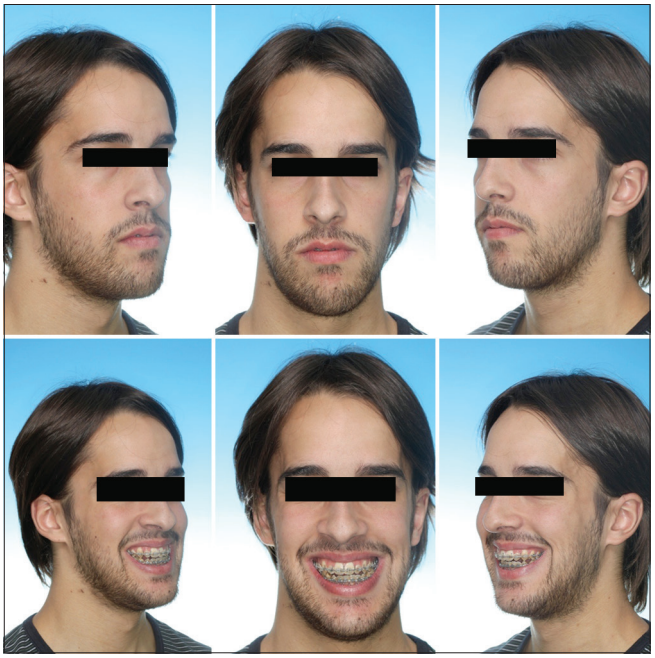

Figure 9a: Extraoral photographs during the treatment

1. Maxillary advancement 8 mm: To get malar support and increase lateral projection of the smile
2. Rotation of the maxilla to coordinate upper midline with the philtrum
3. Mandibular advancement to maxima intercuspidation: Coordination of the midlines.

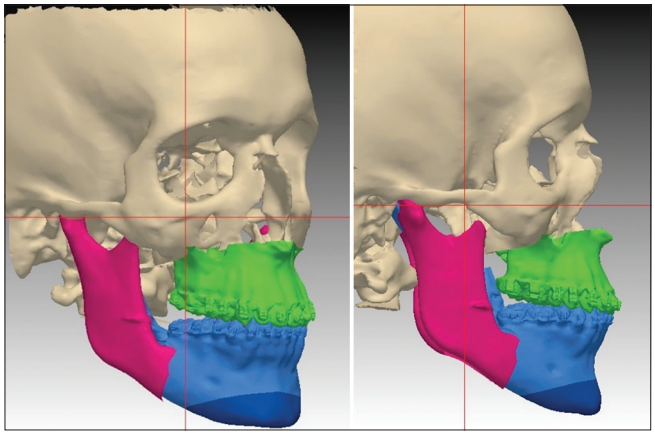

Figure 9b: Movements in the surgery

Figure 11: Intraoral photographs during the treatment

Figure 13: Final extraoral photographs

Just after surgery, dental midlines are centered and coordinated; we obtain molar and canine in Class I and we can observe a light open bite that we are going to correct with intermaxillary elastics [Figures 10 and 11].[12]

TREATMENT RESULTS

The result after surgery is acceptable. We obtained a significant improvement in alignment, occlusion-function, esthetics of

Figure 10: Intraoral photographs during the treatment

Figure 12: Final intraoral and extraoral photographs

Figure 14: Final teleradiograph

the smile in frontal and lateral view, facial esthetics, and the case is quite stable after 1 year [Figures 12 and 13].

Teleradiology shown in the upper and lower incisors has a position and correct inclination. In the CBCT, we can observe that the roots are in the middle of the alveolar bone and there is not root resorption [Figures 14, 15a and Table 2].

The lingual occlusion is acceptable, and we can see it with the dental scan [Figure 16 and 17].

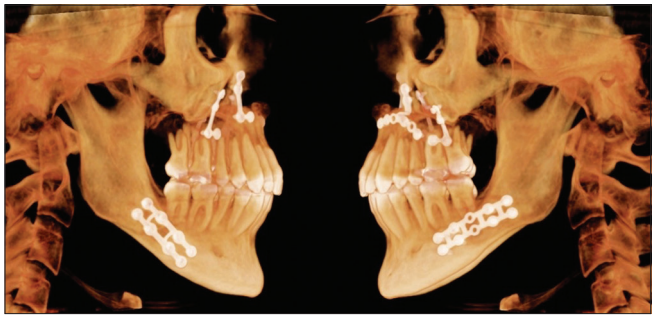

Figure 15: Final CONE-BEAN

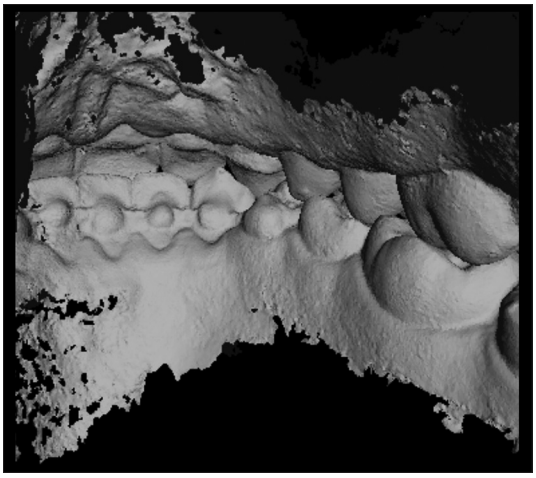

Figure 17: Intraoral scan

Figure 19: Retention extraoral photographs

One year later, the occlusion function is stable. The esthetic of the smile is acceptable. The patient does not have TMJ problems [Figures 18-20].[13-16]

CONCLUSION

In cases where there is a severe skeletal discrepancy, it is necessary to perform a combined orthodontic treatment and orthognathic surgery.

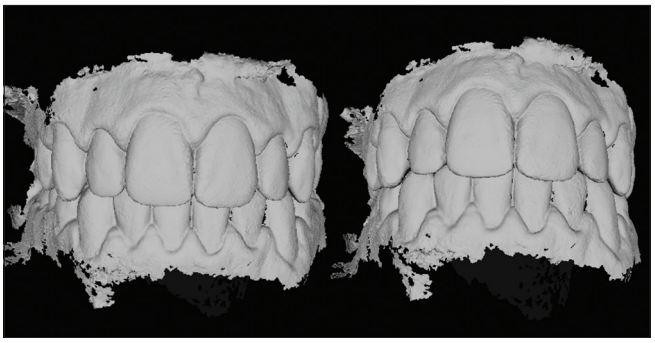

Figure 16: Intraoral scan

Figure 18: Retention extraoral photographs

Figure 20: Retention intraoral photographs

Table 1: Initial cephalometric values

	Norma	Initial
SNA	82°±2	74°
SNB	80°±2	74°
ANB	2°±1	0°
Inc. Upper Incisor	110°±6	109°
Inc. Lower Incisor	90°	82°
Wits	2mm	-5 mm
Go-Gn/S-N	33°±2,5	44°
A. Interincisor	131°±6	136°

Table 2: Final cephalometric values

	Norma	Initial	Final
SNA	82°±2	74°	85°
SNB	80°±2	74°	83°
ANB	2°±1	0°	2°
Inc. Upper Incisor	110°±6	109°	112°
Inc. Lower Incisor	90°	82°	89°
Wits	2mm	-5 mm	1mm
Go-Gn/S-N	33°±2,5	44°	36°
A. Interincisor	131°±6	136°	132°

If we tried to make the case with extractions, patient esthetic goals would not have been met such as the esthetics of the smile; we would not have improved considerably the asymmetry of the mandible and we would have made the profile worse.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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