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Orthodontic-surgical treatment of skeletal class II malocclusion: A case report

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Abstract:
Background: *Nowadays, patients with class II division 2 malocclusion refer to aesthetics as one of the main concerns. Sometimes, no matter how much you try to control growth and development with myofunctional appliances, the ideal results will not be obtained to modify the patient's growth pattern and orthognathic surgery will have to be performed.*
Case Report: *A 9-year-old female patient comes to the clinic with a class II division 2 malocclusion with a retrognathic jaw, with proclined upper central incisors and retroclined upper lateral incisors, where two-phase orthodontic treatment was performed.*
Results*: In the first phase, myofunctional appliances and 4x2 fixed appliances were used.*
In the second phase, decompensation and mandibular advancement orthognathic surgery were performed, achieving the established objectives: improving the facial profile, molar and canine class I relationships, providing function, occlusion, aesthetics and periodontal health.
Conclusion: *Surgical orthodontic treatment in a class II malocclusion gives us favorable aesthetic and functional changes.*
Key Word*:Class II, Malocclusion, Deep Bite, Orthodontic, Orthognathic Surgery.*

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I. Introduction

Through the period of growth and development, various malocclusions can manifest, including class II, which generally presents with skeletal, dentoalveolar, neuromuscular and joint alterations. Patients with this malocclusion are characterized by a deep bite, molars in distoclusion and retroclination of the upper incisors. [1]Class II malocclusions lead to a high percentage of orthodontic cases treated. Approximately 70% of patients have been associated with a skeletal discrepancy that is commonly the result of a retrognathic mandible. [2]

Currently, patients have stated that one of the main concerns for which they seek orthodontic treatment is facial aesthetics, since it affects their self-esteem and safety, in addition to having a high impact on their psychological health; for this reason, orthodontists seek, in these cases, to reduce the vestibularization of the incisors and improve the facial profile. The evaluation of facial balance and harmony includes studies on the relationship between the nose, lips and chin, which can be altered by the growth and development of each patient. [3]

The clinical management of this malocclusion is complex, due to its clinical characteristics and its tendency to recur. [3] Certain patients present severe skeletal discrepancies that require orthodontic and surgical treatment; where the objectives are to stabilize the facial profile and obtain a correct occlusion and function.[4]

Some class II patients can be corrected early with orthopedic appliances and later with orthodontic tooth movements, but the most severe cases can benefit from a change in skeletal relationships. Therefore, it is necessary to combine orthodontic and surgical treatment to achieve a stable result and better aesthetics.[5]

II. Case Report

A 9-year-old female patient attends to Orthodontic Specialty Clinic of the Autonomous University of Baja California (UABC) Tijuana Campus. Referring as a reason for consultation: "I don't like my teeth", she does not refer to pathological or allergic data.

On extraoral examination, she presented a mesofacial facial biotype, with apparent facial asymmetry, convex profile, and retruded lips. (Fig. 1)

Figure 1. Extraoral photographs

On intraoral examination, she presented a class II division 2 malocclusion, 100% deep bite, class II molar and canine relationship, mixed dentition, midlines that coincided with each other, deep palate, upper and lower square arch shape. (Fig. 2)

Figure 2. Intraoral photographs

The panoramic radiograph shows mixed dentition, with 10 permanent teeth and 12 temporary teeth present in the oral cavity. Presence of the germs of the 4 second molars; height of the symmetrical rami and symmetrical condyles. (Fig. 3)

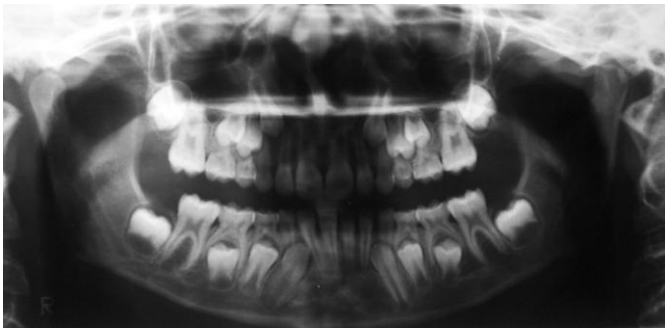


Figure 3. Initial Panoramic Radiography

Cephalometric analyzes resulted in class II skeletal pattern due to a retrognathic mandible, deep bite, retroclined upper incisors, proclined lower incisors, vertical overbite, and increased horizontal overbite. (Fig. 4)

Figure 4. Initial skull lateral X-ray

Objectives

Improve the facial profile, obtain right and left molar and canine class I, correct deep bite, provide function, occlusion, esthetics and periodontal health.

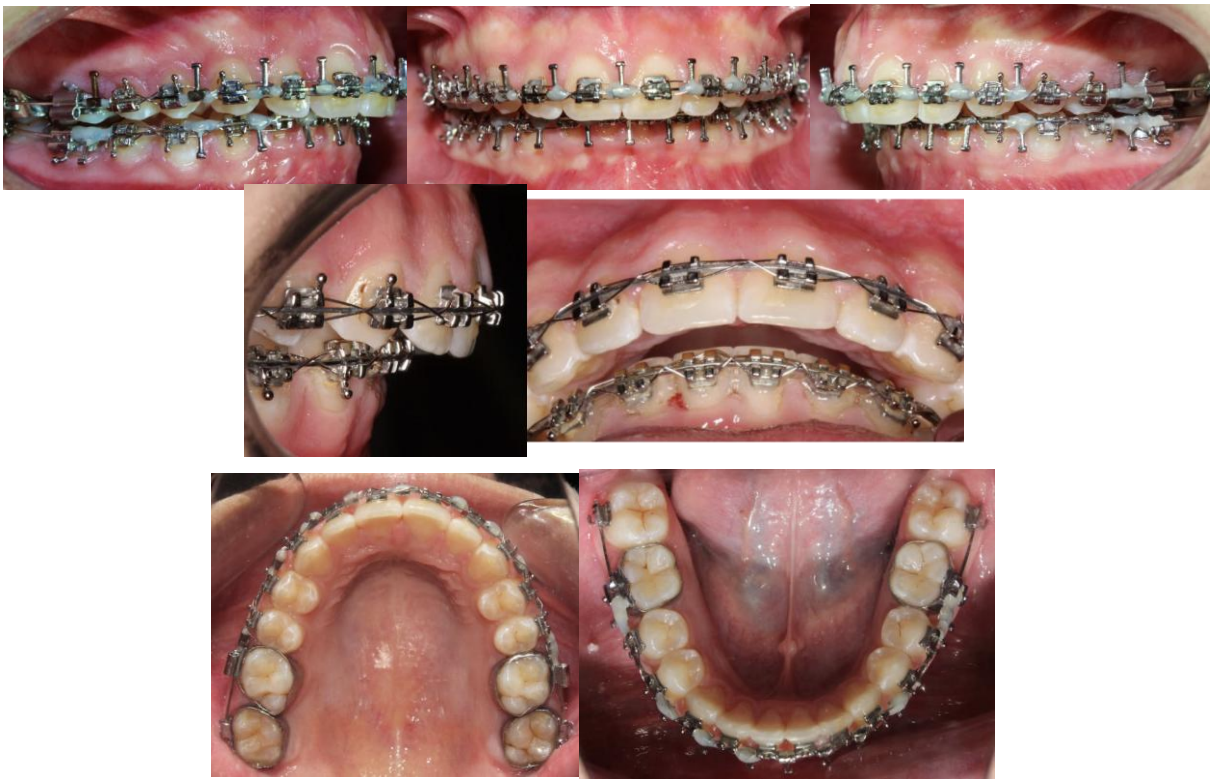
Treatment

The treatment was based on two phases:

The first phase lasted 24 months, in which a pendulum was placed to distalize the upper molars. Subsequently, upper 2x4 fixed appliances with MBT Slot 0.22 prescription. The pendulum was removed and a Nance button was cemented, as well as the lower fixed 2x4 appliance. (Fig. 5)

Figure 5. Pendulum, 4x2 Appliances and Nance Button

In the second phase, complete upper and lower MBT Slot 0.22 prescription appliances were placed, where the alignment and leveling phase was carried out. Subsequently, blocks were formed in the lower anterior sector and retraction was performed with retroligation to carry out dental decompensation with class III elastics. Prior to surgery, radiographic and photographic records and study models were taken to prepare the occlusal splint. (Fig. 6)



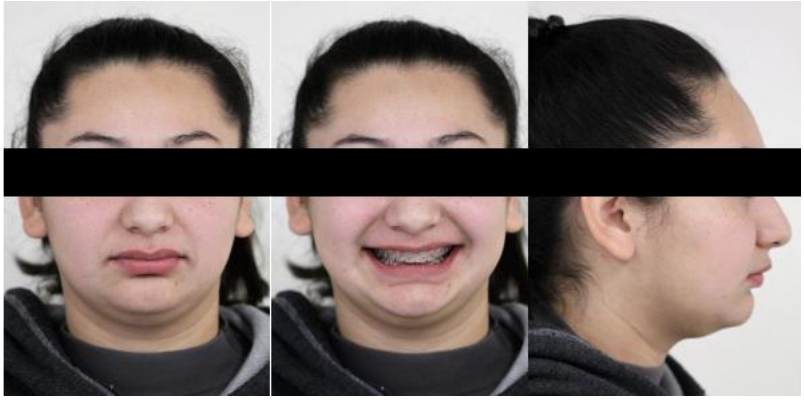


Figure 6.Lateral Skull and Panoramic Radiography, Pre-Surgical Intraoral and Extraoral Photographs and Occlusal Splint

Orthognathic surgery consisted of a 4-mm bilateral sagittal osteotomy of the mandibular ramus with rigid fixation; After surgery, the use of 4.5 oz 3/8 elastics was indicated for 1 month to consolidate ossification. After this, the splint was removed and the settling and detailing of the case continued. Finally, the fixed appliances were removed and upper and lower circumferential retainers were placed. (Fig.7)

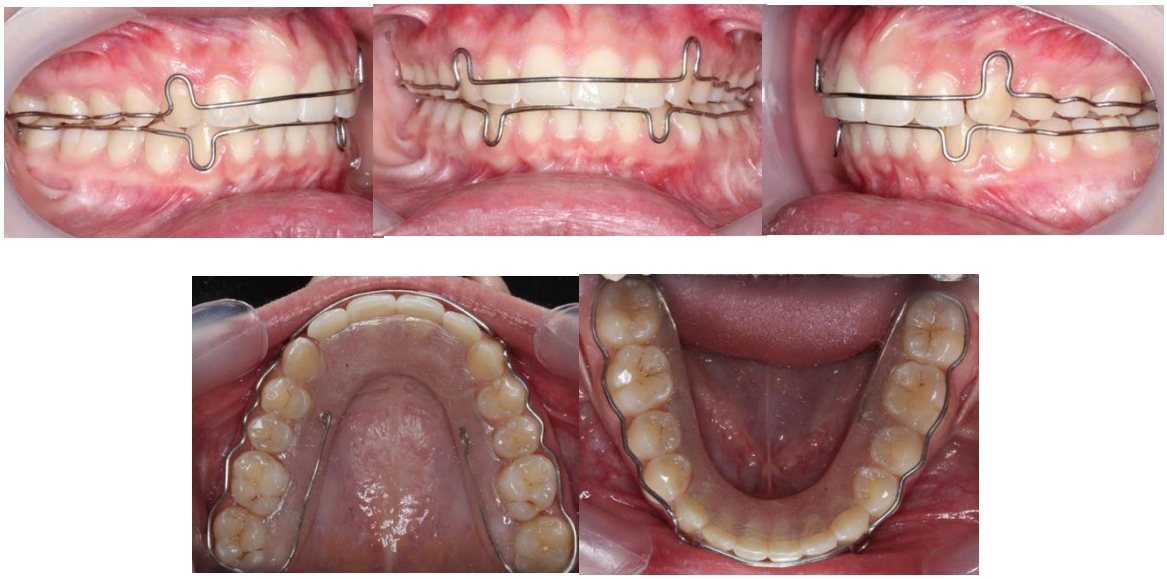


Figure 7. Upper and Lower Circumferential Retainers

III. Result

Results

In this case, the pre-established objectives were achieved: canine and molar class I, adequate horizontal and vertical overbites, which together led to facial and dental harmony. (Fig.8) (Table 1)

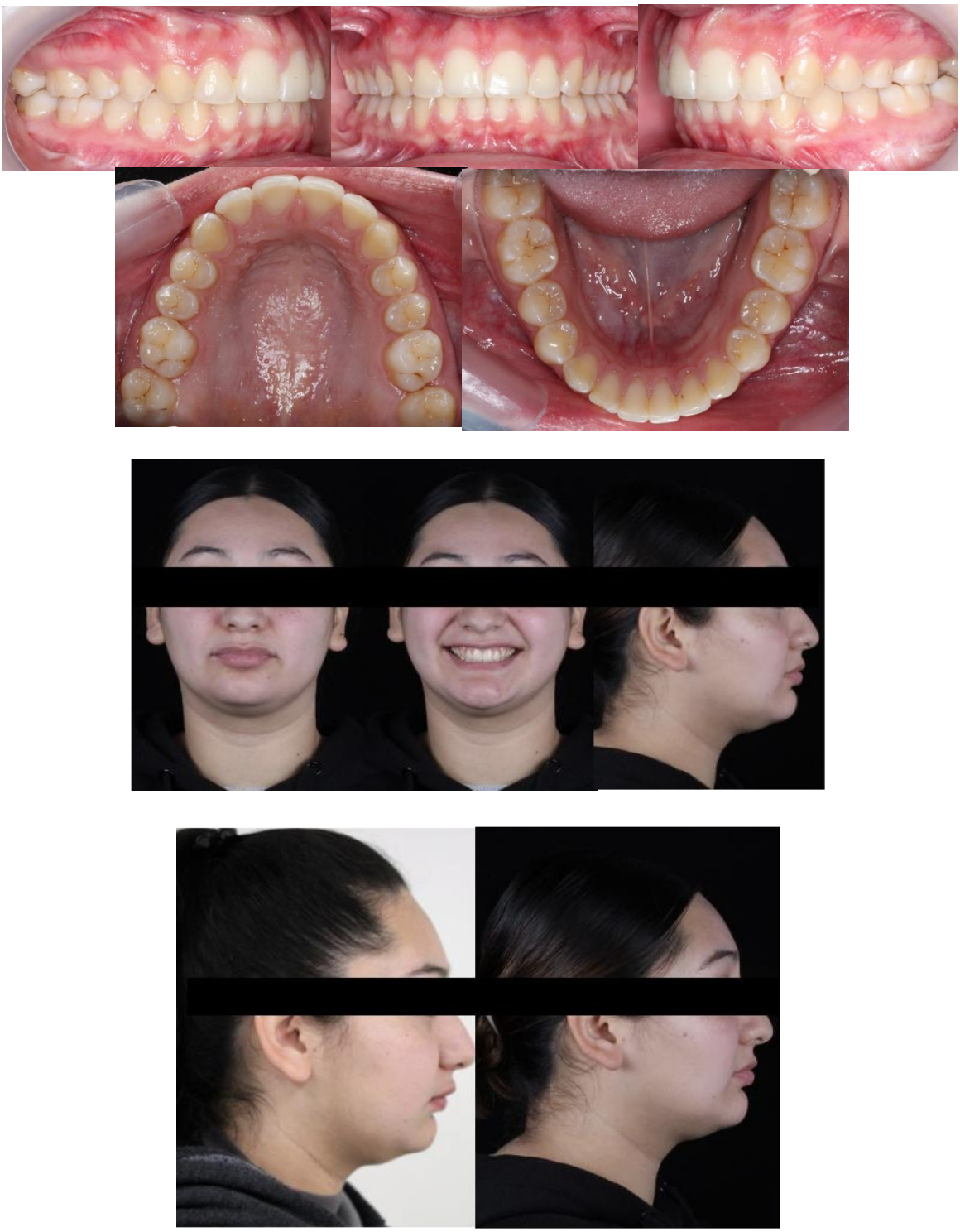


Figure 8. Post-Surgical Intraoral and Extraoral Photographs and Pre-Surgical and Post-Surgical Extraoral Photography.

Table 1. Summary of cephalometric analysis.

	Norma	Pre-Quirúrgico	Post-Quirúrgico
SNA	82° ± 2	83	81
SNB	80° ± 2	72	77
ANB	2° ± 2	11	4
Ang. 1s / SN	104° ± 2	89	94
1i / Go-Gn	90° ± 2	94	94
Ang. Go-Gn / SN	32° ± 2	36	40
Witts	0mm	6mm	5mm

IV. Discussion

The multidisciplinary treatment will be important during the planning of the orthodontic-surgical treatment to meet the established objectives.Compensation and pre-surgical orthodontic treatment determine success in obtaining these dental and facial changes. [6,7]

On certain occasions, the patient should be given an opportunity since she is growing and developing. In patients with skeletal class II malocclusion who will be treated with orthognathic surgery, it is important to assess facial and dental harmony, since it also has an effect on the patient's profile. Although profile changes are subjective because each person varies in their perception of beauty, it is still important to balance dental and facial proportions. [5]

Coinciding with the literature review according to Rodriguez and Padilla, the treatment of class II division 2 malocclusion initially seeks to expand the maxilla to allow correction of the alteration in the axial inclination of the upper incisors, so that in most cases patients are taken to a class II division 1 malocclusion, to then perform mandibular advancement without interference from the central incisors,[6] as in the present case.

V. Conclusion

Surgical orthodontic treatment in a Class II malocclusion provides better bone, dentoalveolar and facial changes. Early treatment is of great importance to try to avoid surgery but sometimes surgery is necessary for successful treatment.

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