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C L I N I C A L C A S E S

Treatment of a severe Class III case

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INTRODUCTION

Class III malocclusions are sagittal disharmonies in the relationship of the mandible and its teeth to the maxilla and its teeth that are characterized by esthetic, skeletal, and dental deficiencies that can provoke grave psychological problems for patients who suffer from them.

Orthodontists can begin early treatment of Class III cases with orthopedic techniques aimed at modifying facial growth, with orthodontic treatment at the end of the mixed dentition and in the permanent dentation, aimed at achieving favorable dental compensations, or they can employ a joint surgical-orthodontic technique at the close of the growth period.

In this article, we present the results of our orthodontic treatment at the Faculty of Dental Medicine of Casablanca of a severe Class III malocclusion, with one-year follow-up records.

CLINICAL CASE

The 21 year-old patient H. A. consulted the dentofacial orthopedic service of Casablanca because of the unattractive facial appearance caused by his anterior cross bite and dental crowding. Our examination confirmed the patient's report that his teeth 14, 24, and 46 had been extracted when he was being treated at the age of 14 with a removable appliance.

Clinical exam

In our clinical appraisal we noted a flat profile, with a lower protrusion, with a lower lip more prominent than the upper. His bulbous lips covered his incisors in a way that seemed quasi-normal thus preventing his profile from assuming the concave contour it would otherwise have had. This one of those cases where biprochelia, fleshy lips, masks a typical Class III look. But when the patient smiles, his crowded and rotated mandibular and maxillary teeth make their unsightly appearance (Fig. 1 a to 1 c).

In an intraoral examination we found patient maintains good oral hygiene and, as we have said, is missing teeth 14, 24, and 46. From an orthodontic standpoint, the upper and lower

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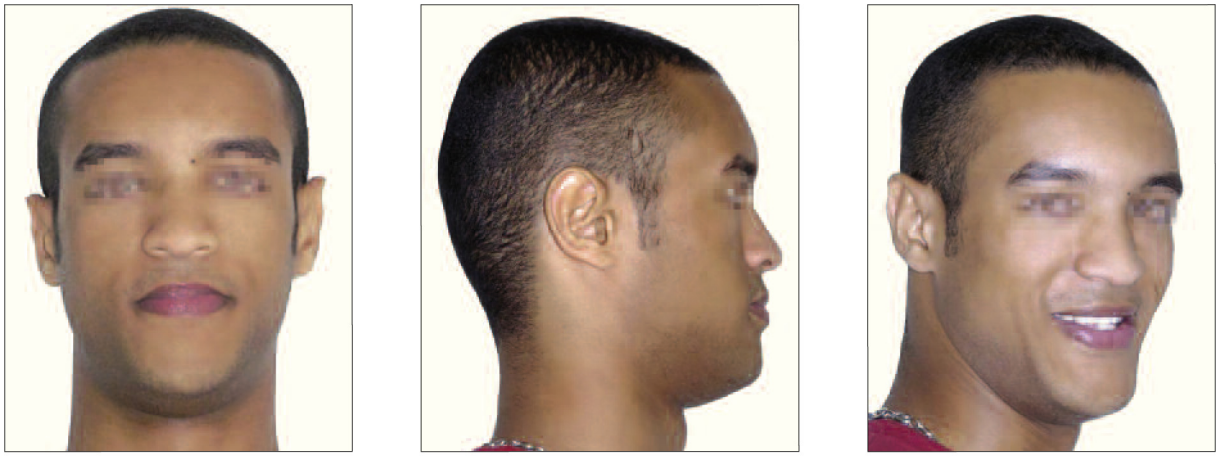


a b c

Figures 1 a to c
Full face, profile, and smiling photographs at the beginning of treatment.

anterior teeth were crowded and the lower canines were both crowded out of the arch labially. The lower anterior teeth had drifted slightly to the right causing a slight midline deviation. The anterior teeth were in cross bite the right and left canine teeth were in a Class III relationship but the left molars were in Class I, an indication of a Class III type of occlusion (Fig. 2 a to 2 c, 3 a and 3 b). Function seemed to be normal.

Supplementary examinations

The panoramic X-Ray confirmed the absence of the three teeth we had already noted and showed that the lower third molars were horizontally impacted, wedged against the second molars. The upper left central incisor was slightly extruded and the upper right central was slightly intruded (Fig. 4).

We made Steiner and Tweed analyses of the profile cephalogram (Fig. 5 to 7), presenting the measurements we recorded in tables 1 and 2. An inspection of the profile head plate shows that the Class III malocclusion is just on the borderline of requiring surgical correction. The film shows that, basically, the upper and lower incisors are well positioned on basal bone but with a Steiner box ''problem'' of a 3/6/5 reading compared to the Class III chevron limit of 1/7/3.25, of course with strong Class III compensations.

Diagnosis

Inspecting the patient, we noted his full-face view showed vertical excess with an elongated nose-lip-menton relationship.

Skeletally, the patient's type deviated slightly from the norm, in what we would describe as a Class III typology on the borderline of requiring surgery.

Dentally, the patient had an anterior cross bite, with a midline deviation. He had a Class III malocclusion with compensatory upper proalveolus and lower compensatory retro alveolus.

a b c

Figures 2 a to c
Right, frontal, and left intraoral photos at the beginning of treatment.

a b

Figures 3 a and b
Upper and lower occlusal intraoral photos at the beginning of treatment.

Figure 4
Panoramic X-ray film at the beginning of treatment.

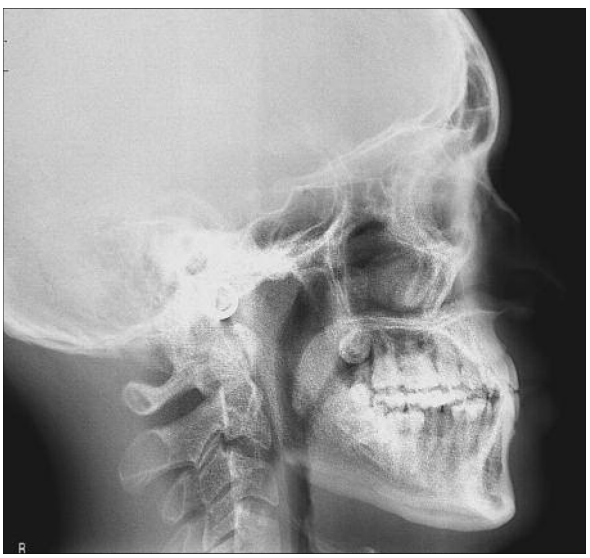


Figure 5
Profile cephalogram at the beginning of treatment.

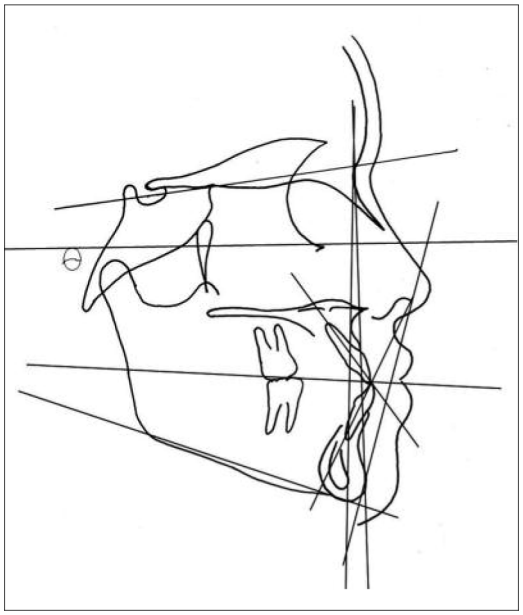


Figure 6
Cephalometric tracing at the beginning of treatment.

	+	–
Crowding		7
Position of i		4
Curve of Spee		1
E space		
Sub-total		12
Extraction	12	
Total	0	

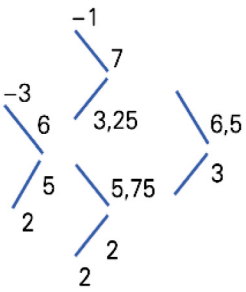


Figure 7
Chevrons and Steiner box.

FMIA	67°
FMA	24°
IMPA	89°
SNA	81°
SNB	84°
ANB	– 3°
AO-BO	3,5 mm
Plan occ.	6°
Angle Z	77°
Upper Lip	13 mm
Total Chin	11 mm
Ht facial post.	53 mm
Ht facial ant.	70 mm
Index post./ant.	0,74

Table I
Tweed analysis at the beginning of treatment.

SNA	81°
SNB	84°
ANB	– 3°
SND	77°
I to NA	26°
I to NA (mm)	6 mm
I to NB	22°
I to NB (mm)	5 mm
Po to NB (mm)	2 mm
I to I	132°
Occl to SN	10°
GoGn to SN	30°
SL (mm)	58 mm
25 mm	SE (mm)

Table II
Steiner analysis at the beginning of treatment.

A tendency to maccrodontia contributed to the severe anterior crowding.

Treatment objectives

We decided on these treatment goals:

- respond to the patient's principal complaint, his unsatisfactory facial appearance;
- correct the crowding;
- correct the anterior cross bite;
- obtain anterior guidance that would be esthetic as well as functional;
- re-center the anterior midline;
- obtain Class I canine and molar relationships;
- assure long-term stability of the corrections.

Treatment plan

Taking into account the ensemble of elements outlined in our diagnosis, we determined to treat this case with extraction of the lower first bicuspids as well as all four wisdom teeth. We would employ a full banded and bonded Edgewise technique (Fig. 8 a to 8 c, 9 a and 9 b). To stabilize our results we planned to use a lateral to lateral upper wire lingual retainer and a cuspid to cuspid lower lingual wire retainer that would be bonded in place

a b c

Figures 8 a to c
Right, frontal, and left intraoral photos during treatment.

a b

Figures 9 a and b
Upper and lower occlusal views during treatment.

a b c

Figures 10 a to c
Full face, profile, and smiling photos at the close of treatment.

at the band and bracket removal appointment. The missing lower left molar would be replaced prosthetically as soon as possible.

Treatment stages

- Arch preparation:
  - tooth alignment and leveling;
  - canine retraction;
  - anchorage preparation.
- Arch correction:
  - retraction of the lower incisors;
  - detailed finishing and achievement of good intercuspation;
  - prosthetic rehabilitation.

End of treatment

Active treatment lasted 25 months. The patient's cooperation was good and helped us to obtain the treatment objectives we had initially formulated.

The general form of the patient's face had changed very little but his profile had improved substantially with his lips assuming a natural relationship with each other. His smile had become natural and harmonious (Fig. 10 a to 10 c).

We had obtained a satisfactory occlusion with both canines and molars in Class I relationship, the midline was centered, the overbite was normal, and anterior guidance was

a b c

Figures 11 a to c
Right, frontal, and left intraoral views at the end of treatment.

a b

Figures 12 a and b
Upper and lower occlusal views at the end of active treatment.

effective and satisfactory (Fig. 11 a to 11 c, 12 a and 12 b). The wisdom teeth were extracted during treatment. After debanding the missing lower molar was replaced with a metal-ceramic bridge (Fig. 18 a and 19 b).

The principal change noted cephalometrically was the retraction and slight extrusion of the lower incisor teeth. This is confirmed by the cephalometric values shown in tables III and IV and the superimpositioning of the before and after cephalometric tracings shown in Figures 14 to 17 (a and b).

The progressive improvement of the patient's facial appearance reaffirmed the correctness of the non-surgical plan we had adopted.

Post treatment follow-up

These photos taken one year after the removal of appliances show the stability of the result obtained. (fig. 18 a to 18 c, 19 a and 19 b).

Figure 13
Panoramic X-ray taken at the end of treatment.

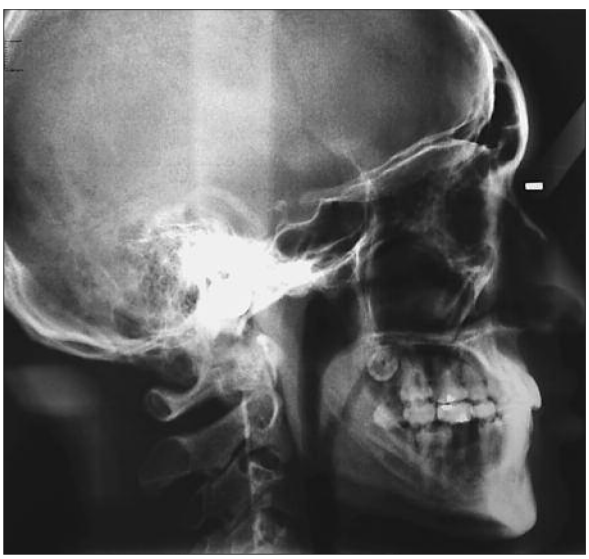


Figure 14
Cephalometric profile film taken at the end of treatment.

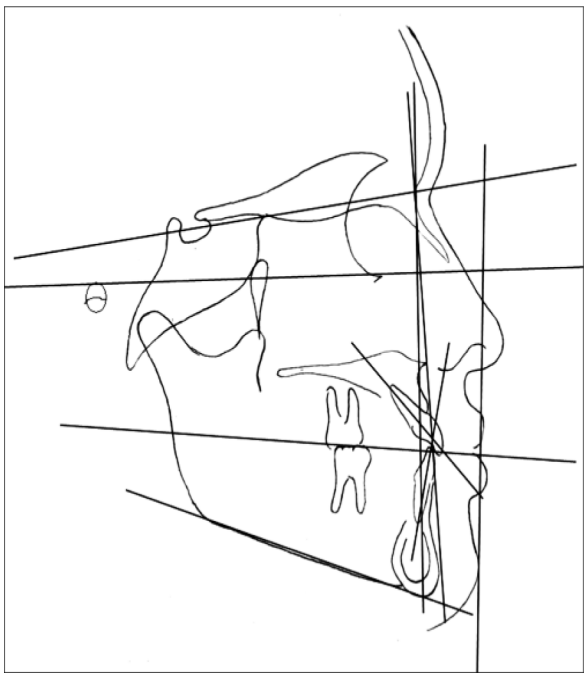


Figure 15
Cephalometric tracing made at the end of treatment.

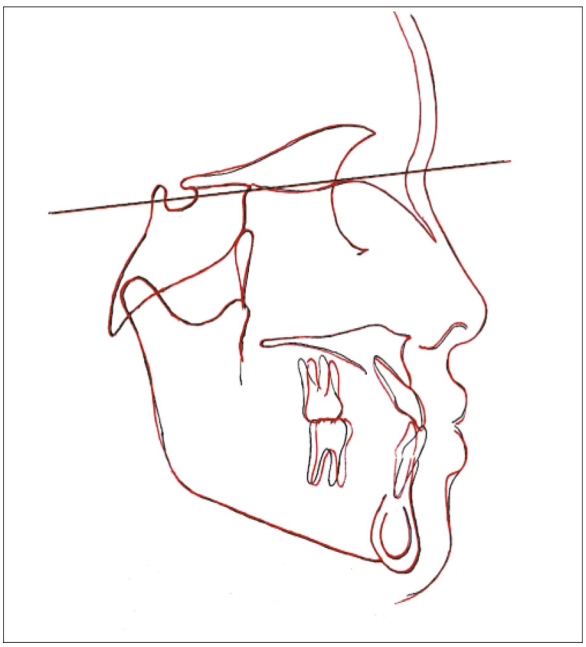
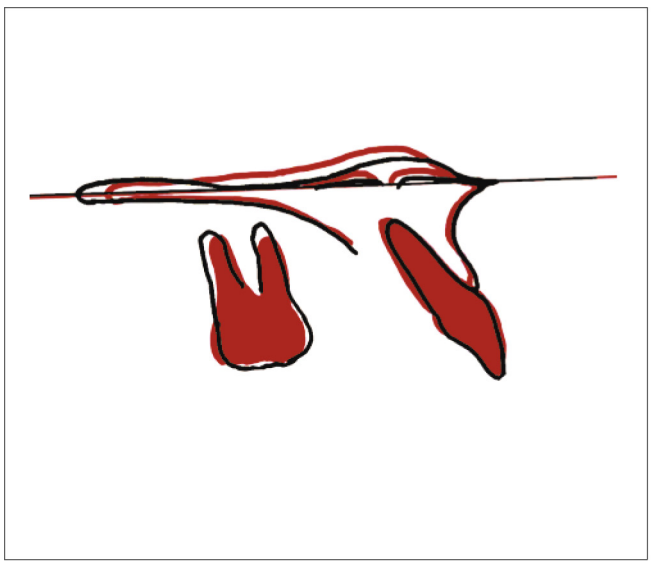
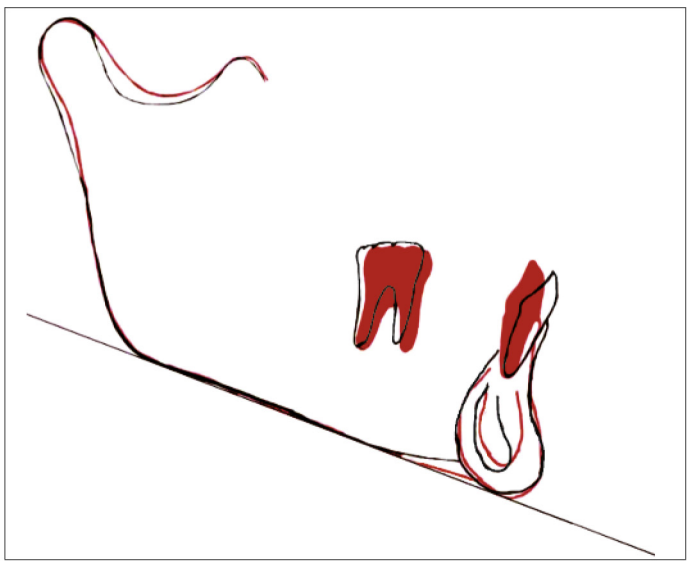


Figure 16
Superimpositions showing correction in harmony with Tweed recommendations.



a



b

Figures 17 a and b
Superimpositions of key teeth showing their placement in Tweed's recommended position.

FMIA	71°
FMA	25°
IMPA	84°
SNA	83°
SNB	80°
ANB	−3°
AO-BO	−3,5 mm
Plan occ.	5°
Angle Z	76°
Upper Lip	14 mm
Total Chin	13 mm
Ht faciale post.	51 mm
Ht facial ant.	69 mm
Index post./ant.	0,73

Table III
Tweed analysis at the close of treatment.

SNA	80°
SNB	83°
ANB	−3°
SND	76°
I to NA	30°
I to NA (mm)	6 mm
I to NB	15°
I to NB (mm)	2,5 mm
Po to NB (mm)	2 mm
I to I	133°
Occl to SN	11°
GoGn to SN	32°
SL (mm)	60 mm
SE (mm)	24 mm

Table IV
Steiner *analysis at the end of treatment.*

a b c

Figures 18 a to c
Right, frontal, and left intraoral photos taken one year after the close of treatment.

a b

Figures 19 a and b
Upper and lower occlusal views taken one year after the end of treatment.