



# Facial Remodeling of a Class II Malocclusion in 2 Teenage Patients: Clinical Results after Orthodontic Treatment

Wissam El Hazzat, Hicham Benyahia, Fatima Zaoui

Orthodontic Department, Faculty of Dentistry, University Mohamed V, Rabat, Morocco

Email: wissaam.elhazzat@gmail.com

**How to cite this paper:** El Hazzat, W., Benyahia, H. and Zaoui, F. (2024) Facial Remodeling of a Class II Malocclusion in 2 Teenage Patients: Clinical Results after Orthodontic Treatment. *Open Access Library Journal*, **11**: e11702.  
<https://doi.org/10.4236/oalib.1111702>

**Received:** May 16, 2024

**Accepted:** July 28, 2024

**Published:** July 31, 2024

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## Abstract

The improvement of facial aesthetics is one of the main reasons why patients with a Class II malocclusion seek orthodontic treatment. Skeletal Class II is a fairly common dysmorphosis in teenage patients; There are various techniques available to treat Class II malocclusions. A consultation at the appropriate moment, the biomechanical efficiency, and the quality of treatment will lead to catching up with the growth differential between the maxillary and mandibular jaws and thus harmonize profile and function as a guarantee of stability. Through this article, we will illustrate the morphological changes following orthodontic treatment of two patients with Class II malocclusions who reported to the Department of Dentofacial Orthopedics of the Dental Consultation and Treatment Center (CCTD) of the Ibn Sina University Hospital in Rabat, Morocco, and the result of the treatment in a single phase to achieve a skeletal and aesthetic effect promoting the stability of results, the social and school integration.

## Subject Areas

Orthodontics

## Keywords

Class II Malocclusion, One Phase Treatment, Teenage Patients

## 1. Introduction

In front of a Class II malocclusion, the treatment protocols can vary according to the malocclusion severity, the age and the patient compliance.

In growing patients, growth modification is obtained with different orthodontic

methods, the one-phase and two-phase treatments are two different possibilities.

Two-phase treatment consists of an early phase using a functional appliance followed by a second one while the patient seeks an orthodontic treatment, it's generally indicated in a class II div 1 with a high risk of incisor trauma [1] [2].

One-phase treatment can correct the bones and arches anomalies, choosing the right moment of intervention and reducing the duration of treatment [3].

We will present two teenagers who underwent a one-phase treatment in the cases below, both patients were treated using a one-phase treatment, and the results were satisfying after seeking an orthodontic treatment.

## 2. Case Report 1

Patient R.B presented to an orthodontic consultation at the age of 12 with the main complaint, the labio-version of maxillary incisors, clinical and radiological examination led to the following diagnosis:

- Facial diagnosis

A symmetric oval face, a labial inocclusion, a cis-frontal profile and a retrusive chin (**Figure 1**).

- Skeletal diagnosis

Hyperdivergence and Class II malocclusion (**Figure 2**).

- Alveolodental diagnosis

A 6 mm overbite, a Class II Div1, a narrow maxillary, the discrepancy is equal to 10 mm, a molar rotation and a maxillary dento-dental disharmony: long incisors.

- functional diagnosis

An atypical deglutition and the Interposition of the lower lip between lower and upper incisors.

At the end of the clinical exam, we also found an antecedent of trauma on the maxillary central incisors with a fracture of the free edge reconstructed by a composite.



**Figure 1.** Pre-treatment extraoral and intraoral photographs.



**Figure 2.** Initial radiological examination (a) panoramic radiograph, (b) profile teleroadiograph.

### Therapeutic Strategy

- Unlocking occlusion for mandibular growth and anteroposterior correction by molar derotation and maxillary expansion: expanding maxillary arches.
- Correction of overbite by incisor intrusion: effect of leveling, coronoplasty of the central incisors by grinding of the free edges (DDD).

- Class II mechanics:

After alignment, leveling and preparation of mandibular anchorage we used Class II intermaxillary tractions.

- Finishing and intercuspatation.
- Maxillary and mandibular retainer.

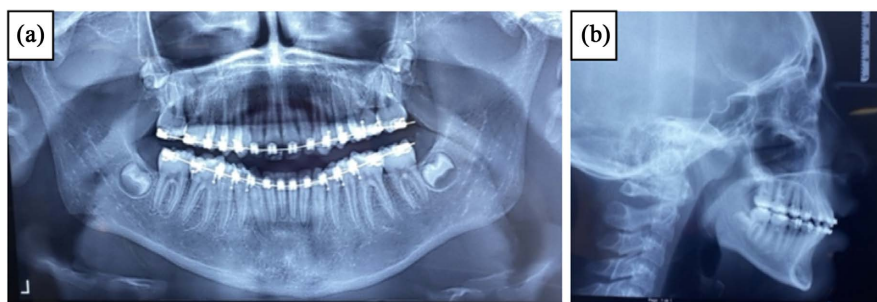
Equipment type: pre-informed braces 022 × 028 slot.

Duration of treatment: 19 months.

Contention: Bonded 3-3 to the mandible and maxilla + removable maxillary contention splint (**Figures 3-5** and **Table 1**).



**Figure 3.** Post-treatment extraoral and intraoral photographs.



**Figure 4.** Post-treatment radiographs (a) Panoramic radiograph, (b) Profile telerradiograph.



**Figure 5.** Facial and cephalometric superimposition of the profile (black: pre-treatment, red: after orthodontics treatment).

**Table 1.** The evolution of cephalometric values for patient 1 (before and after treatment according to Steiner and Tweed analysis).

Parameters	Normal values	Initial patient values	Post-treatment patient values
SNA	82	78	80
SNB	80	72	75
ANB	2	6	5
AoBo	3	2	2
SND	76	74	74
I/to NA	4	30	16
I/to NA	24	6	0
i/ to NB	6	32	35
i/ to NB	24	6	7
Po to NB		0	0
I/ to /i	131	110	122
Occl to SN	14	15	16
GoGnSN	32	40	40
SL	51	47	47

**Continued**

SE	22	17	17
FMA	25	36	33
IMPA	90	99	101
FMIA	65	47	46

**3. Case Report 2**

The patient M.Y presented for an orthodontic consultation at the age of 12, the reason for consultation was the gummy smile and a significant vestibule version of the lateral incisors. The clinical and radiological examination made it possible to make the following diagnosis:

- Facial diagnosis  
Symmetrical square face, labial occlusion at rest and convex facial profile.
- Skeletal diagnosis  
Class II malocclusion and Hypo divergence.
- Alveolodental diagnosis  
Incisor overbite, a Class II Div 2, a birectroalveolie, and discrepancy equal to 2 mm.

The interrogation objectified the significant psychological impact of this dysmorphosis on the adolescent's schooling (**Figure 6** & **Figure 7**).

**Therapeutic Strategy**

- Motivation for oral hygiene.
- Alignment and leveling.



**Figure 6.** Pre-treatment extraoral and intraoral photographs.



**Figure 7.** Initial radiological examination (a) Panoramic radiograph, (b) Profile teleroadiograph.

- Creation of space for the maxillary laterals.
- Correction of overbite by: the effect of anterior pseudo-intrusion leveling and the egression of the posterior sectors given that the hypodivergent facial pattern allows it.
- Stripping of the lower incisors.
- Torque adjustment of the maxillary lateral incisors.
- Finishing and intercuspatation.
- Maxillary and mandibular retention.

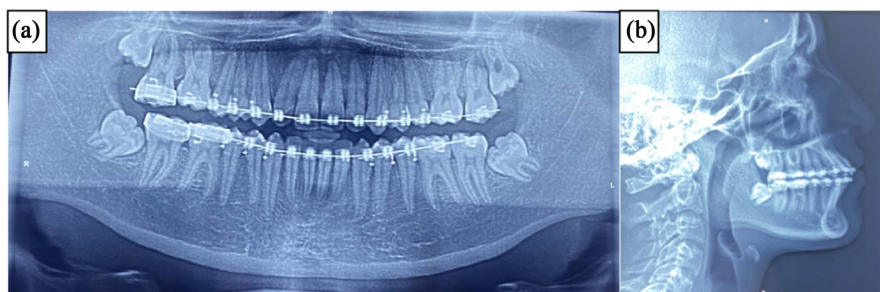
Type of appliance: pre-informed braces 022 × 028 slot.

Treatment duration: 20 months.

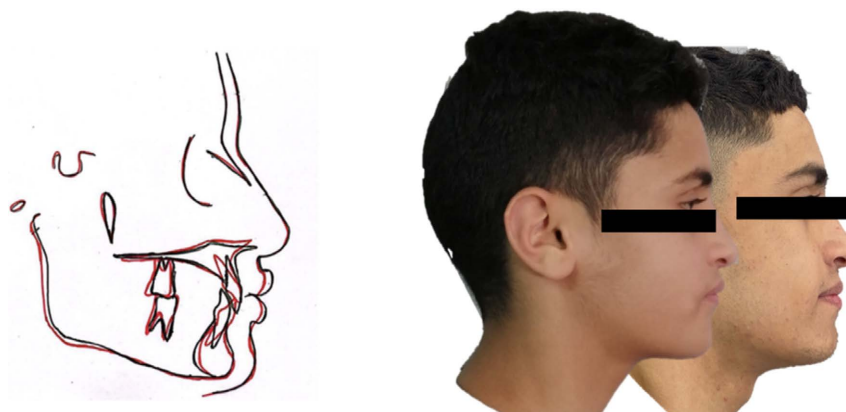
Retention: Bonded 3-3 to the mandible and maxilla + removable maxillary retention splint (**Figures 8-10** and **Table 2**).



**Figure 8.** Post-treatment extraoral and intraoral photographs.



**Figure 9.** Post-treatment radiographs (a) Panoramic radiograph, (b) Profile teleroadiograph.



**Figure 10.** Facial and cephalometric superimposition of the profile (black: pre-treatment, red: after orthodontics treatment)

**Table 2.** The evolution of cephalometric values for patient 2 (before and after treatment according to Steiner and Tweed analysis).

Parameters	Normal values	Initial patient values	Post-treatment patient values
SNA	82	81	81
SNB	80	77	78
ANB	2	4	2
AoBo	3	0	1
SND	76	77	77
I/to NA	4	-1	7
I/to NA	24	3	30
i/ to NB	6	-3	4
i/ to NB	24	9	30
Po to NB		2	2
I/ to /i	131	164	120
Oocl to SN	14	26	28
GoGnSN	32	26	28
SE	22	17	17

**Continued**

SL	51	57	57
FMA	25	16	19
IMPA	90	82	107
FMIA	65	83	107

**4. Discussion**

A Class II malocclusion is one of the most prevalent malocclusions in children and adolescents. Division 1 dominates and is almost nine times more frequent than Division 2 [4].

Careful considerations towards facial esthetics, occlusion, and underlying skeletal discrepancy are essential to successfully treat class II malocclusion, multiple treatment options have been presented to treat class II malocclusions.

In children and adolescents, orthodontists can choose between early treatment (two-phase) with functional appliances or late (one-phase) treatment in adolescents with any type of orthodontic braces.

Functional appliances are indicated at an early age when the patient has a risk of incisal trauma, the incidence of this risk seems to be reduced compared with the patients who undergo late treatment [5].

In the literature, Class II treatments should be indicated around the growth peak, reducing the duration of treatment and ensuring patient cooperation [6].

The morphology of the cervical vertebrae is a useful indicator of skeletal age and can assist orthodontists in determining the remaining body growth space of patients. CVM cervical spine maturity staging divides cervical spine maturity into 6 stages, the pic of growth is situated between Cervical stages 3 and 4 [7].

For the timing, the patients both were in the pic of growth, based on the analysis of the lateral radiograph which showed that the maturation of the cervical vertebrae was around the stage CS3, considered as the optimal moment to seek a Class II treatment.

For both cases, we started by unlocking occlusion to allow the mandibular growth which consisted of a molar derotation and a maxillary expansion in the first case and lifting of the overbite in the second.

Due to the growth potential, and after leveling the dental arches, we reduced the overjet and for the second patient we did a stripping to have a better alignment of teeth, the coordination of arches and occlusion was obtained with the use of Class II elastics.

The duration of treatments was about 20 months, management of time and the quality of results are thanks to the choice of the right moment and response to the different problems diagnosed after consultation.

Orthodontic treatment in a single phase in Class II can have a notable effect on the facial and psychological development of the patient by adopting a correct therapeutic strategy allowing to act at the ideal time, to remove occlusal locks and to harmonize the growth of the maxilla and mandible if the facial typology

and direction of growth are favorable, the aesthetic results are there and the morphological changes are harmonious [8].

## 5. Conclusion

Morphological changes following single-phase orthodontic treatment of patients with class II anomalies provide a skeletal and aesthetic effect, thus promoting the stability of results and the social and educational integration of adolescents.

## Acknowledgements

Special thanks to the Department of Orthodontics of the Faculty of Dentistry of the University Mohamed V of Rabat.

## Conflicts of Interest

The authors declare no conflicts of interest.

## References

- [1] Barber, S.K., Forde, K.E. and Spencer, R.J. (2015) Class II Division 1: An Evidence-Based Review of Management and Treatment Timing in the Growing Patient. *Dental Update*, **42**, 632-642. <https://doi.org/10.12968/denu.2015.42.7.632>
- [2] Thiruvengkatachari, B., Harrison, J., Worthington, H. and O'Brien, K. (2015) Early Orthodontic Treatment for Class II Malocclusion Reduces the Chance of Incisal Trauma: Results of a Cochrane Systematic Review. *American Journal of Orthodontics and Dentofacial Orthopedics*, **148**, 47-59. <https://doi.org/10.1016/j.ajodo.2015.01.030>
- [3] Dolce, C., McGorray, S.P., Brazeau, L., King, G.J. and Wheeler, T.T. (2007) Timing of Class II Treatment: Skeletal Changes Comparing 1-Phase and 2-Phase Treatment. *American Journal of Orthodontics and Dentofacial Orthopedics*, **132**, 481-489. <https://doi.org/10.1016/j.ajodo.2005.08.046>
- [4] Thilander, B. and Myrberg, N. (1973) The Prevalence of Malocclusion in Swedish Schoolchildren. *European Journal of Oral Sciences*, **81**, 12-20. <https://doi.org/10.1111/j.1600-0722.1973.tb01489.x>
- [5] Veitz-Keenan, A. and Liu, N. (2019) One Phase or Two Phase Orthodontic Treatment for Class II Division 1 Malocclusion? *Evidence-Based Dentistry*, **20**, 72-73. <https://doi.org/10.1038/s41432-019-0049-y>
- [6] Fan, X., Fang, S., Chen, Z. and Mo, S. (2023) Two-Phase Orthodontic Treatment of a Patient with a Low-Angle Skeletal Class II Malocclusion: A 7-Year Follow-Up. *Journal of Clinical Pediatric Dentistry*, **47**, 178-184.
- [7] Baccetti, T., Franchi, L., Cameron, C.G. and McNamara Jr., J.A. (2001) Treatment Timing for Rapid Maxillary Expansion. *The Angle Orthodontist*, **71**, 343-350.
- [8] Sehra, J., Newton, J.T. and DiBiase, A.T. (2011) Bullying in Schoolchildren—Its Relationship to Dental Appearance and Psychosocial Implications: An Update for GDPs. *British Dental Journal*, **210**, 411-415. <https://doi.org/10.1038/sj.bdj.2011.339>