

CORRECTION OF THE CLASS II DIV 1 MALOCCLUSION WITH ANTERIOR INCLINED PLANE : A CASE REPORT

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ABSTRACT

Presently Class II Div. 1 malocclusion is one of the major concern among the orthodontists. The choice of the most effective technique to use in the treatment of growing patients with skeletal and dental Class II malocclusions has long been the source of considerable debate. This article present a case report of a class II div 1 malocclusion treated with the conventional fixed appliance and fixed anterior inclined plane.

KEY WORDS

Fixed Functional Appliance, Anterior Inclined Plane, Class II Malocclusion.

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INTRODUCTION

The term functional appliance refers to a removable or fixed appliance designed to alter the mandibular position both sagittally and vertically, resulting in orthodontic and orthopedic changes in the jaws.¹

CASE REPORT

16-year-old female patient came to the orthodontic department with a severe Class II div. 1, deep bite and proclined anteriors in both arches. The radiographic and clinical examinations of the temporomandibular joints showed no alterations. The patient was diagnosed with a dento-skeletal Class II div. 1 malocclusion, dental deep bite and a mandibular retrusion. She reported bilateral molar and canine Class II, 6 mm of deep bite, 11mm overjet, severe proclination of the upper incisors and coincident midlines. Her facial features consisted of convex profile for an evident retrusion of mandible. FIGURE 1-10

TREATMENT OBJECTIVES:

The main treatment objectives were:

1. to correct the Class II dento-skeletal relationship;
2. to obtain an ideal overbite and overjet;
3. to promote an anterior repositioning of the mandible.

Additional treatment goals included levelling and aligning, optimizing the posterior occlusion, aiming at Class I molar and canine relationship, improving the facial profile and obtaining a natural lip position.

TREATMENT PLAN:

Fixed Begg's mechanotherapy was planned for the upper arch levelling and alignment and lower was bonded with MBT brackets for alignment. During the first phase of treatment, Class I elastics were advised in the upper arch.

After alignment and levelling, in order to allow the mandible's anterior repositioning, impression was made for the upper arch to fabricate the anterior



FIGURE 1-3: PRE TREATMENT EXTRA ORAL PHOTOGRAPHS



FIGURE 4-8: PRE TREATMENT INTRA ORAL PHOTOGRAPHS

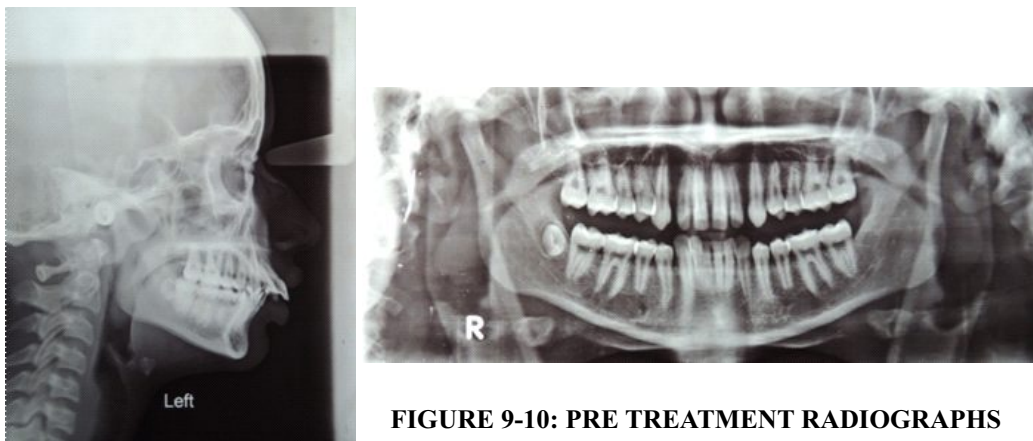


FIGURE 9-10: PRE TREATMENT RADIOGRAPHS

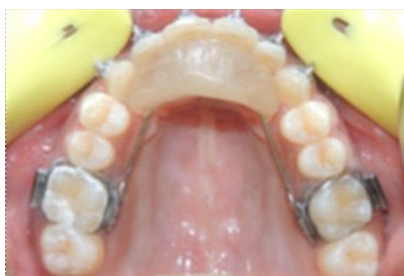


FIGURE 11: UPPER OCCLUSAL SHOWING ANTERIOR INCLINED PLANE



FIGURE 12-14: POST TREATMENT EXTRA ORAL PHOTOGRAPHS



FIGURE 15-19: POST TREATMENT INTRA ORAL PHOTOGRAPHS

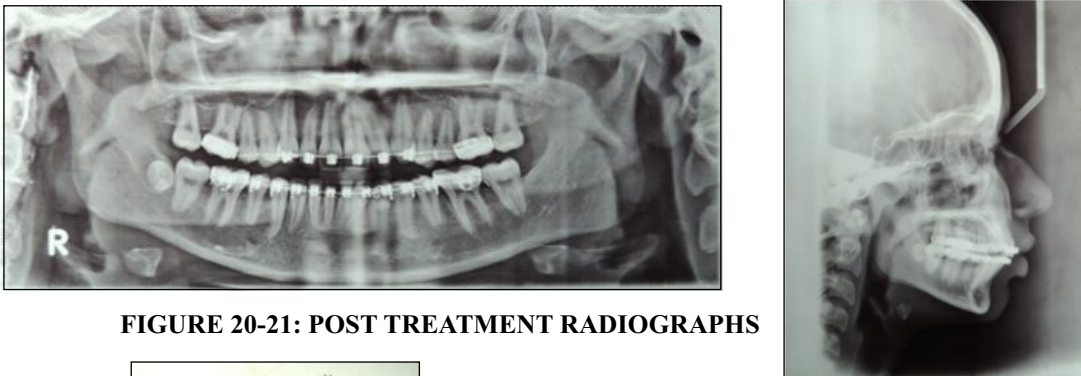


FIGURE 20-21: POST TREATMENT RADIOGRAPHS

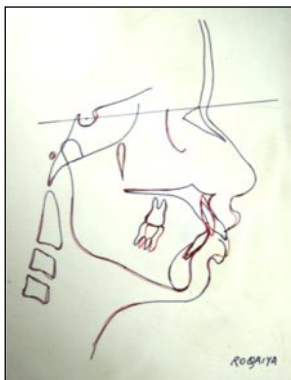


FIGURE 22: CEPHALOMETRIC SUPERIMPOSITION

inclined plane which was then fixed in the slot welded on the first molar palatally. Class II elastics were used simultaneously. FIGURE 11

TREATMENT RESULTS

After 13 months of therapy, treatment objectives set in the pretreatment plan were achieved. The Class II malocclusion had been completely corrected; proper overbite and overjet were achieved. In particular, the overbite was reduced from 2 mm. The extraoral records show improvement of the profile. FIGURE 12-19

The pre and post treatment cephalometric superimposition shows an evident change of the upper incisors' torque, the maxillary incisors' inclination on the SN plane changed from 119° to 97° and the mandibular incisors' inclination on Go-Gn increased from 99° to 103°. The Interincisal Angle changed from 110° to 128°. Such dental movement resulted in a mandibular anterior repositioning, mainly responsible for the correction of the Class II malocclusion as the pre and post-cephalometric superimposition shows. The mandibular position Pog to Na perp. changed from -5mm to -9mm and the N-A/Pg sagittal jaw relationship was modified from 4° to 1°. The facial growth was favourable and contributed to the correction of the malocclusion. (FIGURE 20-22).

DISCUSSION

Functional appliances continue to be a controversial topic. Their use, effectiveness, and mode of action have been discussed by many authors. Advocates of functional appliances cite stimulation of mandibular growth caused by forward positioning of the mandible.^{2,3} Histologic studies shows a significant increase in cellular activity when the mandible is hyperpropulsed,^{4,5,6} thus aiding in the correction of Class II malocclusions. However, some investigators disagree with these findings, claiming that the changes might be only those expected with normal growth or conventional fixed therapy.^{7,8} The Class II correction observed with functional appliances was due headgear effect restraining maxillary growth^{7,9,10} along with a combination of dental changes, such as retroclination of the maxillary incisors and proclination of the mandibular incisors as reported by many.^{8,9} Anterior glenoid fossa remodeling and spontaneous anterior mandibular displacement that occurs after elimination of a functional retrusion also have been accredited to Class II correction.^{10,11}

While the lack of success with myofunctional appliance treatment has been attributed to a lack of patient compliance and the inability to control the amount and direction of mandibular growth,¹² a simple fixed functional appliance like inclined plane that eliminate this compliance factor can be used.

CONCLUSION

- Anterior inclined Plane is an acceptable substitute for Class II elastics for patients who appear to be noncompliant.
- Dentoalveolar changes is the predominant factor contributing to success when treating Class II patients with either Class II elastics or the anterior inclined plane appliance.

REFERENCES

1. Bishara S. Functional appliances: a review. *Am J Orthod Dentofacial Orthop.* 1989;95:250–258.
2. Meikle MC. Remodelling the dentofacial skeleton: the biological basis of orthodontics and dentofacial orthopedics. *J Dent Res.* 2007;86:12–24.
3. Ha'gg U, Du X, Rabie A. Initial and late treatment effects of headgear-Herbst appliance with mandibular step-by-step advancement. *Am J Orthod Dentofacial Orthop.* 2002;122: 477–485.
4. Charlier JP, Petrovic A, Stutzman J. Effects of mandibular hyperpropulsion on the prechondroblastic zone of rat condyle. *Am J Orthod.* 1969;55:71–74.
5. Elgoygen JC, Moyers RE, McNamara JA Jr, Riolo ML. Craniofacial adaptation to protrusive function in young rhesus monkeys. *Am J Orthod.* 1972;62:469–480.
6. McNamara JA Jr, Bryan FA. Long-term mandibular adaptations to protrusive function: an experimental study in *Macaca mulatta*. *Am J Orthod Dentofacial Orthop.* 1987;92: 98–108.
7. Creekmore TD, Radney LJ. Frankel appliance therapy: orthopedic or orthodontic? *Am J Orthod.* 1983;83:89–108.
8. Schulof RJ, Engel GA. Results of Class II functional appliance treatment. *J Clin Orthod.* 1982;16:587–599.22. Bendeus M, Ha'gg U, Rabie B. Growth and treatment changes in patients treated with a headgear-activator appliance. *Am J Orthod Dentofacial Orthop.* 2002;121: 376–384.
9. Mills JRE. Clinical control of craniofacial growth: a skeptic's viewpoint. In: McNamara JA Jr, ed. *Clinical Alteration of the Growing Face. Monograph number 14, Craniofacial Growth Series.* Ann Arbor, Mich: Center for Human Growth and Development, University of Michigan; 1983:17–39.
10. Barnouti ZP, Owtad P, Shen G, Petocz P, Darendeliler MA. The biological mechanisms of PCNA and BMP in TMJ adaptive remodeling. *Angle Orthod.* 2011;81:91–99.
11. Graber T. Functional appliances. In: Graber, Vanarsdall, Vig, eds. *Orthodontics: Current Principles and Techniques.* 4th ed. St. Louis, MO: Elsevier Mosby. 2005:493–542.
12. Pangrazio-Kulbersh V, Berger J, Chermak D, Kaczynski R, Simon E, Haerian H. Treatment effect of the mandibular anterior repositioning appliance on patient with class II malocclusion. *Am J Orthod Dentofacial Orthop.* 2003;123: 286–295.