

Non extraction treatment of a patient with low angle, Class II malocclusion

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Abstract

The aim of this article was to report a clinical case of orthodontic treatment in a patient with Class II malocclusion which was managed by distalization with distal jet appliance. Bodily distalization was obtained but there was little loss of anchorage during retractions. The results were satisfactory and smile was significantly improved.

Introduction

Camouflaging the skeletal class II malocclusions can be effective in non growing patients if it is mild to moderately severe, crowding or protrusions minimal and vertically proportionate. Class II camouflage can be done with or without extractions. Non-extraction treatment can be carried out by distalizing the maxillary buccal segment in relatively normal to low angle cases. Distalization can be accomplished by various distalizing appliances which could be extra or intra oral. Extra oral appliances need compliance while intra oral appliances can be used in non compliant adult patients. Intra oral appliances include intra maxillary and inter maxillary appliances. Intra maxillary appliances could be buccal or palatal distalizers. Buccally, we can use open coil spring, Jones jig etc while palatal distalizers include distal jet, Pendulum appliance, Keleş slider and others.^{1,8-9} Distal jet is one of the effective appliances for distalization as force passes through the centre of resistance to distalize molars. Therefore resulting in bodily movement with minimal tipping while most of the other appliances have more tipping movement and relatively less bodily movement.²

Diagnosis and Etiology

A female patient, 18 years of age presented with a complaint that her upper front teeth were irregular and forward. Her previous medical and dental history was insignificant. She had strong internal and external motivation with realistic expectations for the treatment. On clinical examination (Figure 1) patient had mildly convex profile, slight incompetence of lips, class II div 1 malocclusion and hypodivergent. 4mm overjet and almost 50% overbite with lower anterior Bolton excess was 2.1mm (Figure 2). Cephalometric analysis showed (Figure 3), SNA 90°, SNB 83°, SNMP 23°, ANB 7°, UI-SN 105°, IMPA 107°, UI-NA distance 2mm, UI-NB distance 8mm. Patient was diagnosed as moderate Skeletal Class II, low angle with normal upper and lower incisors. Soft tissue balance was adequate.

Treatment Objectives

Specified treatment objectives included 1) maintain maxilla, 2) maintain mandible, 3) relieve upper and lower crowding, 4) leveling the curve of spee, 5) correction of overjet and overbite and 6) improve lip incompetence and facial convexity.

Treatment Alternatives

As the patient was an adult female and growth had seized, we had two options. One was camouflage and other was surgical. Patient was with mild to moderate class II, low angle and unwilling for surgery so we opted camouflage with non extraction treatment. The appliance we chose was distal jet for distalization.

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Figure 1. Pretreatment extra oral photographs



Figure 2. Pre-treatment intra oral oral photographs.

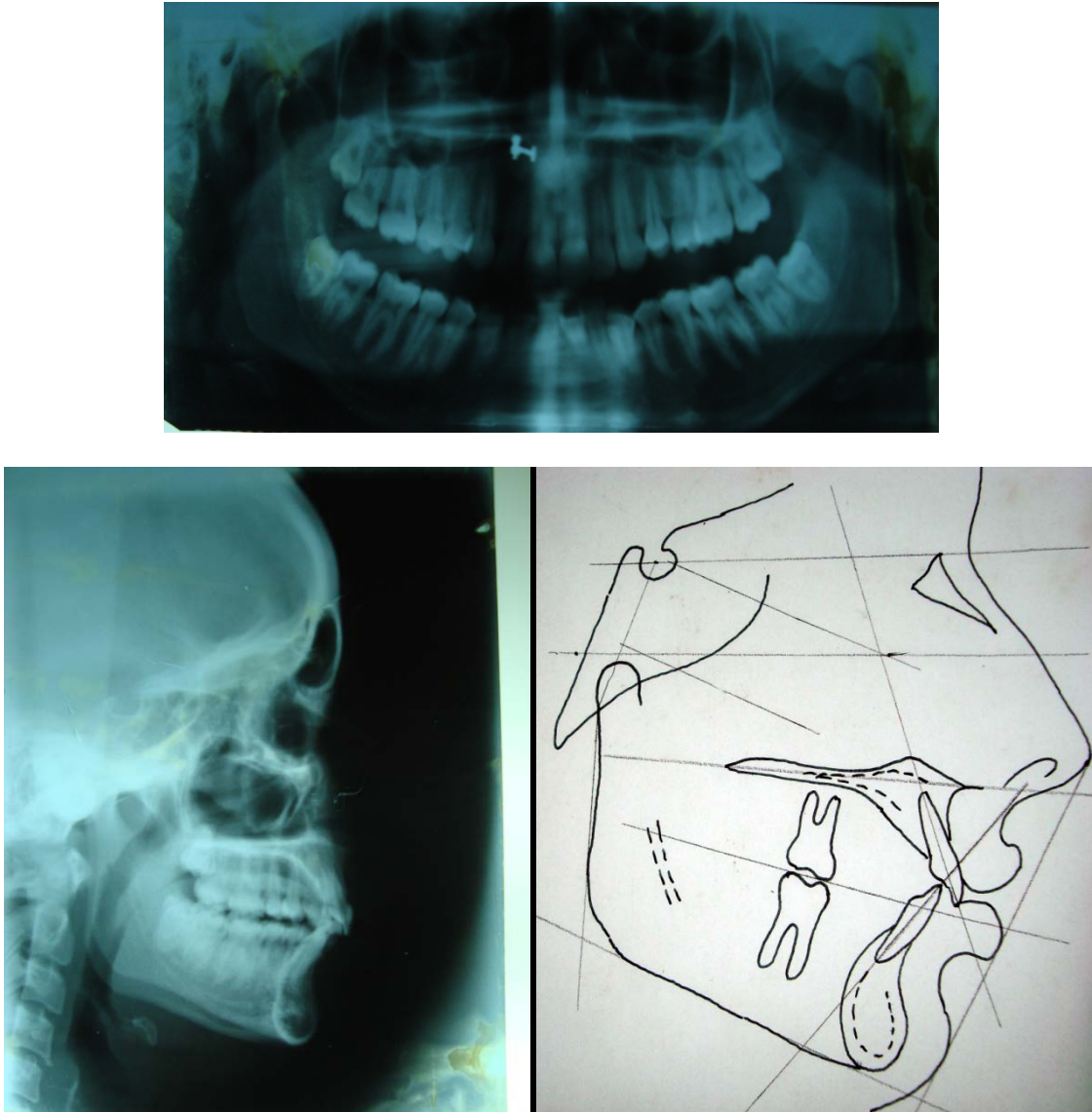


Figure 3. Pre-treatment radiographs

Treatment Progress

We started the treatment by distal jet appliance that was in place for 6 months. After we achieved distalization of 4.5 mm and molar was in supra class I. We stopped it and cut the nance from 1st premolar band. This allowed drifting of maxillary first premolar after second premolar. When the premolars were seated in Class I we bonded upper and

lower arches with 0.022" pre-adjusted edgewise (Roth) brackets. We retracted canines into a class I relationship. Leveling was done with reverse curve of spee 0.016" Niti wire and finishing was performed by giving finishing bends at certain areas. At the end occlusion was settled with serpentine elastics (Figure 4).



Figure 4. Appliance in place after distalization is complete along with settling elastics.



Figure 5. Post treatment extra oral photographs



Figure 6. Post treatment intra oral photographs

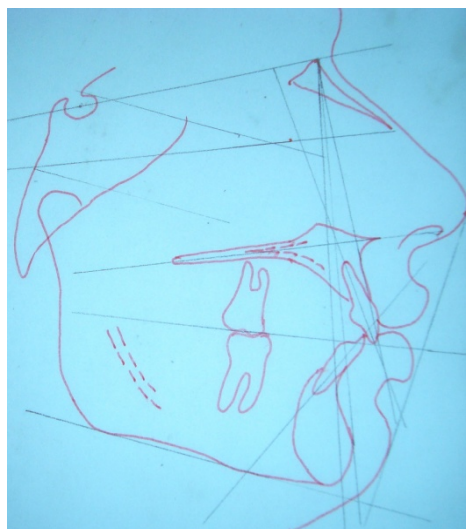
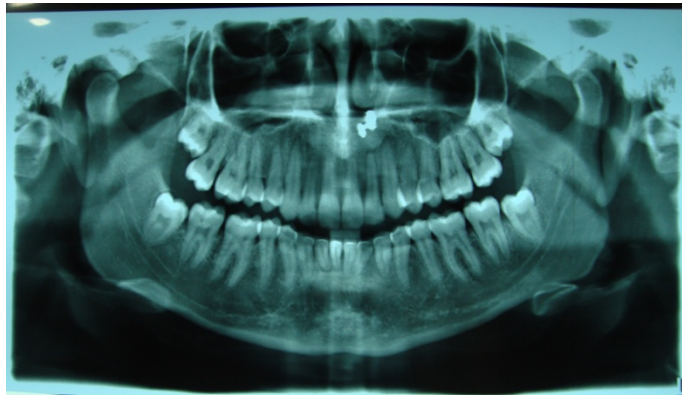


Figure 7. Post treatment cephalogram

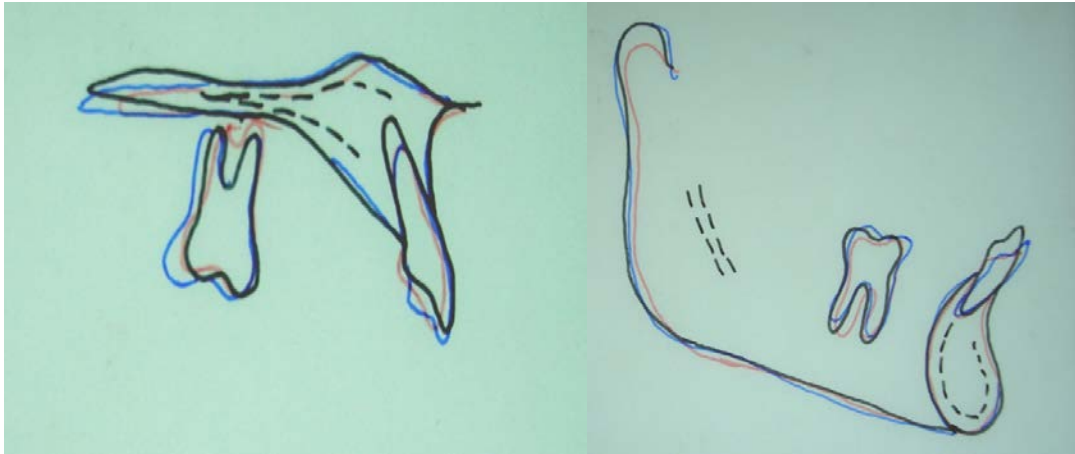


Figure 8. Pre and post treatment cephalometric superimpositions for maxillary and mandibular dentition

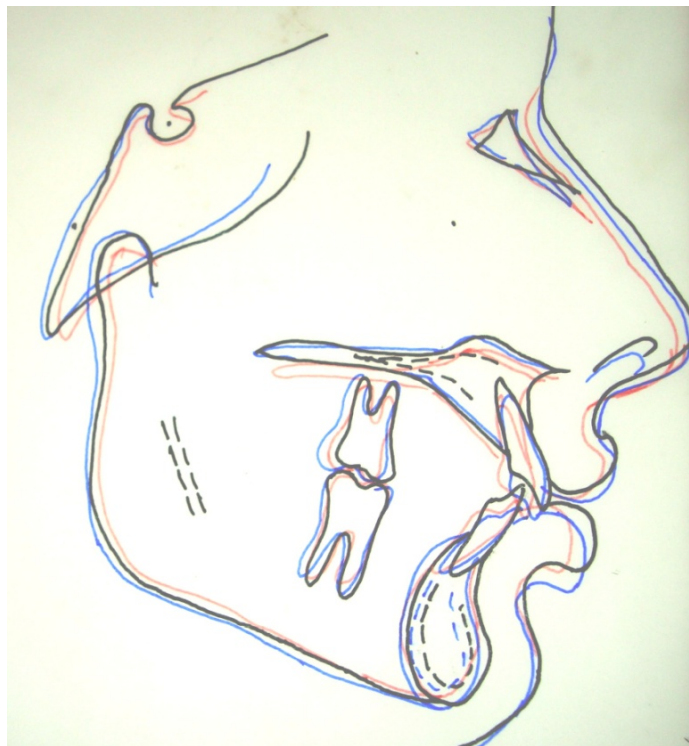


Figure 9. Pre, progress and post treatment cephalometric superimpositions.

Results and Discussion

Patient's smile was greatly improved (Figure 5). Orthodontic treatment produced Class I Molar and canine relationships. Over jet and overbite was corrected and crowding was settled (Figure 6-9).

Skeletal Class II is more prevalent in our population and could be due to hereditary or

environmental factors. Patient can be treated effectively with functional appliance or headgears, if growing. In non growing patients we are limited with two options; camouflage or orthognathic surgery. Best camouflage cases are those with little residual growth in sagittal and vertical planes. Mild to moderate Class II and mild Class III patients

are best candidates to undergo camouflage. Severe Class II and Moderate to severe class III could best be managed by orthognathic surgery.

Camouflage can be better accomplished in low angle cases with distalization of maxillary buccal segments. Various appliances have variable effects when used for distalization like, bodily molar distal movement, distal tipping, extrusion of molar, buccal tipping of molars or palatal tipping depending upon the fact that it is buccal or palatal appliance and distance of force application from the centre of resistance.

Antonarakis and Kiliaridis³ found in a systematic review that, noncompliance intramaxillary molar distalization appliances all act by distalizing molars with a concomitant and unavoidable loss of anchorage. Buccal and palatal acting appliances demonstrate almost similar results with palatal acting appliances showing less tipping. Friction-free palatal acting appliances appear to produce better molar distalizing effects but with a concomitant notable loss of anchorage. Kinzinger⁴ described similar results in another literature review. In this case, loss of anchorage was observed during retraction of incisors.

A randomized controlled trial was carried out by Papadopoulos⁵ on First Class Appliance in mixed dentition cases. They found it to be an efficient noncompliant appliance to distalize molars in the mixed dentition without distal rotations. However, these movements are associated with distal molar tipping and anchorage loss of the anterior teeth. Since no proclination of anterior segment was observed in this case which could be due to the presence of acrylic nance on the palate.

Recently in order to prevent anchorage loss implants have been incorporated in orthodontics and numerous studies have been done by using these distalizers with implants. Polat-Ozsoy⁶ compared the effects of bone anchored with conventional anchorage pendulum appliances and concluded that the amount of distal molar movement was similar

between the Bone Anchored Pendulum Appliance and the Conventional Pendulum Appliance.

Distal jet is the appliance which can distalize molars with minimal side effects if fabricated adequately. Studies have shown that it shows more bodily movement, minimal tipping and even shows vertical control.²

Conclusions

Distal Jet is an effective appliance for distalization in mild/moderate Class II adult cases. Post distalization retractions should be carried out with caution to prevent anchorage loss. Segmental retractions could be an efficient means to control anchorage loss.

References

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