

## **Treatment of Angle class I malocclusion with severe crowding by extraction of four premolars: A case report**

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### **Abstract :**

This case report describes the treatment of a 17-year-old Male who presented with bimaxillary protrusion, crowding, proclined maxillary and mandibular anteriors, increased overjet, deep bite and incompetent lips. Treatment was initiated using fixed orthodontic appliances MBT followed by four 1st premolar extractions in both arches. Case was finished with good inter cuspsation of the upper and lower teeth. Molars were finished in a Class I relationship with canine guidance, and ideal overjet and overbite were obtained. Successful finishing of a case with beautiful smile, obtained proper overjet and overbite and the improved soft tissue profile.

**Keywords:** Class I malocclusion, Bimaxillary protrusion, extraction of four premolars

### **Introduction**

Nowadays, Orthodontic treatment are a highly prevalent technique due to growing awareness of facial appearance. Since the anterior teeth show when one smiles, every orthodontic treatment must take great care to align the anterior teeth aesthetically. Any misplacement or irregularity in this area causes most patients to pursue orthodontic treatment. More important than the different types of techniques of treatment, the types and degree of malocclusion, the patient's age, the patient's desires, and the skill of the orthodontists are the most influential in the outcome of the procedure<sup>1</sup>. Compared to children or adolescents, adults experience malocclusion incidents at a rate that is typically equal to or higher. Among all malocclusions, crowding is the most common complication in adults, and is found in around 24% of females and 14% of males<sup>2</sup>. It mostly happens when the tooth size and supporting bone structures are out of equilibrium. The age of the patient, the jaw that is impacted, and the degree of crowding all influence the treatment plan. To achieve best results, it is important to decide how we manage each case of crowding. The problem may be solved by extracting teeth in both arches<sup>3</sup> or without extraction<sup>4</sup>. The length of therapy is also influenced by the extent of malocclusion and the number of teeth extracted<sup>5</sup>. The present case describes orthodontic treatment in a patient with Class I malocclusion with severe crowding in the anterior region treated with four premolar extractions.

## **Case report**

A 17-year-old male came to the department of orthodontics and dentofacial orthopedics of Rama Dental College Hospital and Research Centre, with a chief complaint of irregular and forwardly place upper and lower teeth. The patient had no other medical history. Clinical examination showed severe crowding in both upper and lower arches in the anterior region. The patient had the bimaxillary protrusion with Class I molar relationships on both sides with increased overjet and incompetent lips (Figure 1). All the first premolars were already extracted (1 month back) as the patient intended to start the treatment before from a private clinic but decided to shift, there were no clinical signs of clicking or discomfort in the temporomandibular joints or any restriction or deviation in jaw movement. No pathologic findings were detected on the panoramic radiograph (Figure 2). Lateral cephalometric analysis revealed a skeletal Class II skeletal relationship (Figure 3).



(Figure 1)

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(Figure 2)



(Figure 3)

TABLE 1

Measurement	Pre Treatment
SNA	84 deg
SNB	78 deg
ANB	6 deg

<b>FMA</b>	25 deg
<b>IMPA</b>	99 deg
<b>Jaraback's Ratio</b>	63.71 %
<b>Lower 1 to N-B (mm)</b>	9 mm
<b>Upper 1 to N-A (mm)</b>	11 mm
<b>Interincisal angle</b>	101 deg
<b>Wits-appraisal (Ao-Bo)</b>	6 mm

## **Treatment planning**

According to the information gathered from both clinical examination and diagnostic records, it was planned to relieve the maxillary and mandibular crowding with fixed appliance

The problems list was concisely as follows:

- (1) Bimaxillary protrusion with Angle Class I molar relationship ,
- (2) moderate tooth crowding in the upper dental arch and severe tooth crowding in the lower dental arch in anterior region,
- (3) proclined maxillary and mandibular anteriors,
- (4) mesially titled 43,
- (5) Increased overjet,
- (6) Deepbite.
- (7) Incompetent lips

The patient was identified as having an angle Class I malocclusion and a skeletal Class II jaw base relationship with severe crowding in the anterior region of both arches. The treatment objectives were to correct the crowding and to improve the facial profile.

The treatment plan was suggested as follows:

- (1) alignment of the upper and lower teeth with preadjusted edgewise appliances (MBT,0.022 slots),
- (2) retention with the upper and lower removable Begg's retainers.

## **Treatment progress**

Scaling was done and an impression was taken for the study model. The treatment was started with bonding of brackets and buccal tubes using 0.022 slots preadjusted edgewise brackets, MBT prescription. Anchorage control is fundamental to successful orthodontic treatment. Orthodontic tooth movement has always been limited to action-reaction reciprocal force mechanics in anchorage control. The intramaxillary anchorage with transpalatal arch and intramandibular with lingual arch . Leveling and alignment was done using 0.014NiTi 0.016 NiTi, 0.016 SS, 0.018 SS,

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0.017x0.025 NiTi, 0.017x0.025 SS, 0.019x0.025 NiTi, 0.019 x 0.025 SS. The upper incisors were consolidated as a unit. The canine retraction was done using active tieback on 0.019x0.025 SS in both the arches. After completion of the canine retraction the canine was consolidated with the posterior segment. The retraction of the anterior segment was done by placing hook distal to lateral incisor and active tie back.

Finishing and Settling was done using 0.014 NiTi. After getting satisfactory overbite and overjet, class I molar and canine relationship had been attained.

Almost one and a half years later, all the fixed appliances were removed (Figure 4). The case was deboned after 18 months of active treatment. Beggs retainer in both upper and lower arch was given for both arches.

## **Results and discussion**

After the orthodontic treatment, good inter cuspsation of the upper and lower teeth was attained. Class I molar and canine relationships were achieved in both sides along with proper overbite and overjet. Crowding was fixed in both the dental arches. The inclinations of the upper and lower canines and lip competency were corrected, resulting in a good inter incisal angle. Soft tissue profile of the patient was enhanced. Figure 7 shows the superimposition of the pre and post treatment cephalogram. During the retention period, the occlusion and the facial profile were almost constant. Figure 4 shows the post treatment extra and intra oral photographs. Since ancient times, orthodontic treatment has been striving to systematically and scientifically obtain special goals. One of the main goals of orthodontic treatment is to maintain the stability of occlusion after the orthodontic treatment. Various studies of orthodontics have been done to estimate the stability of occlusion<sup>7,8</sup>. Stability of treatment depends on the treatment approach, type of malocclusion, patient cooperation and growth and flexibility of the hard and soft tissues<sup>9</sup>. For this patient, orthodontic treatment planning and diagnosis based on the aesthetics. We focused on improving the position of the patient's upper and lower arch crowding in relation to the soft tissue profile. For patients presenting with a crowded arch, there is debate as to which treatment method (extraction or non-extraction) is the most effective in attaining long-term stability. To correct the crowded arch, premolar extraction has been a recognized practice. However, even if the tooth is retracted during tooth extraction treatment, it is possible for the tooth to return to its pre-treatment position. As now-a-days the aesthetic of soft tissue profile and growth changes are becoming main factors during treatment planning, orthodontic treatment methods are favoring non-extraction with that in mind<sup>10</sup>.



(Figure 4)

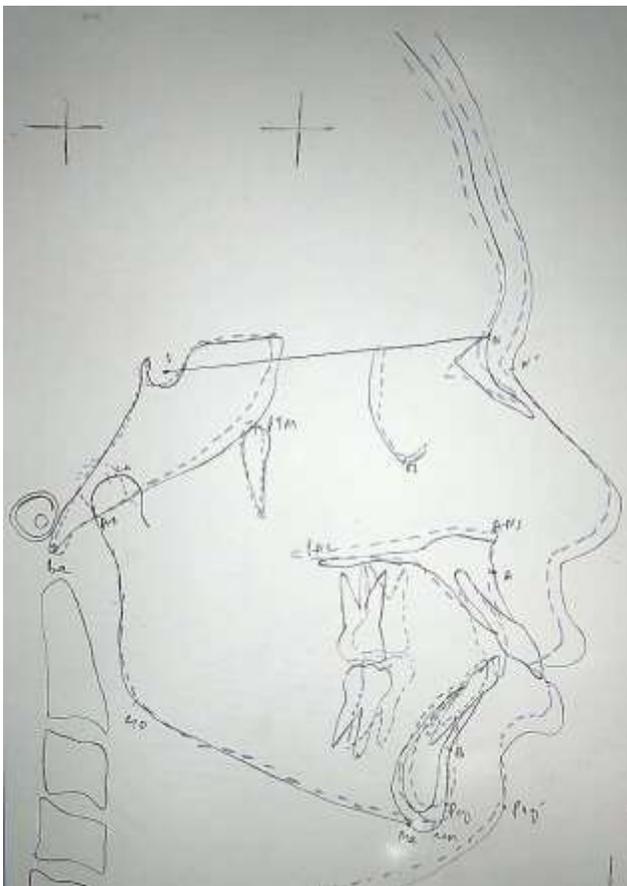


(Figure 5)

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(Figure 6)



(Figure 7)

TABLE 2

Measurement	Post Treatment
<b>SNA</b>	83 deg
<b>SNB</b>	78 deg
<b>ANB</b>	5 deg
<b>FMA</b>	22 deg
<b>IMPA</b>	98 deg
<b>Jaraback's Ratio</b>	67.6 %
<b>Lower 1 to N-B (mm)</b>	6 mm
<b>Upper 1 to N-A (mm)</b>	3 mm
<b>Interincisal angle</b>	126 deg
<b>Wits-appraisal (Ao-Bo)</b>	4 mm

## **Conclusion**

Proper treatment plan that is based on sound diagnosis is the key for success and stable orthodontic treatment results. Consequently, we succeeded in attaining the desirable esthetics and occlusion. Timely management of a case and regular review ensures successful completion in a minimal span of time. Relative proportions of tooth size in upper and lower arches are fundamental to achieve maximum intercuspitation and desired functional occlusion. Finally, patient finished the treatment with beautiful smile, obtained proper overjet and overbite.

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