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**TREATMENT OF CLASS I MALOCCLUSION WITH MILD CROWDING AND
 MIDLINE SHIFT**

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ABSTRACT

Background: The main goal of orthodontic treatment is to obtain a normal relationship of the teeth with facial structures and it is generally accepted that orthodontic treatment will have effects on facial proportion. Nowadays, facial appearance has a big influence on someone's appearance. Aesthetic facial appearance will produce a proportional, harmonious, and youthful facial profile. **Case:** this case report aims to describe that non extraction orthodontic treatment in class I malocclusion with mild crowding and midline shift is a treatment with considerable success. **Case management:** A 19 years old female came with a chief complaint of crowding in upper and lower jaw. Intraoral examination revealed bilateral Class I molar and canine relationship. Patient had crowding in upper and lower jaw, and midline shift in lower jaw. Extra oral findings included a flat profile with competent lips. Cephalometric analysis showed skeletal class I with orthognati maxilla and mandible. Patient was bonded with 0.022-inch MBT brackets orthodontic appliance without extraction. After 20 months of treatment, an ideal arch coordination was achieved, the patient felt confident and satisfied with the treatment outcome. **Conclusion:** Decision to extract a tooth has to be made, not only by considering the amount of crowding, but also the eventual influence of orthodontic tooth displacement on the soft tissue surface of the face.

Keywords: *Crowding, Midline shift, Non – extraction.*

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INTRODUCTION

The main goal of orthodontic treatment is to obtain a normal relationship of the teeth with facial structures and it is generally accepted that orthodontic treatment will have effects on facial proportions.¹ Currently, there is a decline in extraction. This may be explained by several factors, including facial esthetic concern, stability, TMJ dysfunction and versatile in technique. Moreover, trends show a preference for fuller, more prominent lips for a youthful appearance.^{2,3}

Class I malocclusion by means of comprehensive orthodontics, there are two main therapeutic approaches: extraction and non-extraction.⁴ The extraction controversy still continues from the early 20th century. Edward H. Angle was the pioneer to describe normal occlusion and classify malocclusion.⁵ He was emphasized that the

preservation of all teeth is necessary to achieve facial balance, harmony and esthetics. But, the percentage of non-extraction cases in the average orthodontic practice stands as high as 80%.⁶

Due to increased consciousness regarding facial appearance, aesthetic treatment has become very common practice these days. As anterior teeth come first during smile, aesthetic alignment of anterior teeth is very important in every orthodontic treatment. Any misplacement or irregularity in this area causes most patients pursuing orthodontic treatment.⁷ More important than the different types of procedure or the philosophies of treatment, the types and degree of malocclusion, the patient's age, the patient's desires, and the skill of the orthodontist are essential for the procedure outcome.⁸ The incident of malocclusion commonly occurs in equal or greater rate in adults than in children or adolescents. Among

all malocclusions, crowding is the most common complication in adults, and is found around 24% of female and 14% of male.⁹

It mainly happens when there is misbalance among supporting bony structures and tooth size mass. The choice of treatment for crowding depends on age, affected jaw and the severity of crowding. To achieve best results, it is important to decide how to manage each case of crowding. The problem may be solved by extracting teeth in both arches or without extraction. The degree of the malocclusion and the number of extracted teeth also affect the treatment duration.⁹

The present case report describes the non-extraction orthodontic treatment of a class I malocclusion patient who had mild maxillary and mandibular arch crowding, and midline shift in lower jaw. The patient provided informed consent for the author.

CASE REPORT

A 19 years old female came with a chief complaint of crowding in upper and lower jaw. Intraoral examination revealed bilateral Angle Class I molar and canine relationship. Patient had mild crowding in anterior and posterior upper and lower jaw. Overjet and overbite was 3 mm and 3 mm. As the arch length deficiencies were present -3 mm in the maxillary arch and -3 mm in the mandibular arch. (Figure 1)

Panoramic x-rays showed filling in lower first right molar and no pathology. All permanent teeth was present and all third molars was impacted. (Figure 3a) Cephalometric examinations showed skeletal class I relationship with SNA 82°, SNB 81°, and ANB 1°. Patient had orthognati maxilla and mandible, and normal inclination of upper and lower incisor. (Figure 3b)



Table 1 : Cephalometric analysis pre-treatment

Figure 1. Extra oral and Intra oral pre-treatment photographs



Figure 2. Pre-treatment model Analysis



Figure 3. (a) Panoramic x-ray (b.) Pre-treatment lateral cephalometry

Table 1. Pre-treatment Cephalometric Analysis

Measurement	Mean	Pre
∠SNA	82°	82°
∠SNB	80°	82°
∠ANB	2°	1°
Nasolabial Angle	100° – 110°	115°
Y – Axis	59.4°	68°
∠I-NA	22°	10°
∠I-NB	25°	24°
AO – BO (mm)	-1	4
Upper lips – E line (mm)	-2 to -3	-3
Lower lips – E line (mm)	-1 to -2	-1
Upper lips – S line (mm)	0	0
Lower lips – S line (mm)	0	-2

CASE MANAGEMENT

According to the information gathered from both clinical examination and diagnostic records, it was planned to relieve the maxillary and mandibular crowding with maxillary and mandibular fixed appliance without extraction of any erupted tooth. The maxillary and mandibular first molars were banded. The maxillary and mandibular teeth were bonded with 0,022-inch MBT brackets (Ortho Technology). The treatment was started using 0.012, 0.014, 0.016, 0.016 x 0.016, and 0.016 x 0.022 NiTi in both arches.

After leveling and aligning were done, the next treatment was enamel stripping in central and lateral upper incisor. Space closing was done with power chain and stainless steel wire 0.016 x 0.022. Finishing and detailing were used stainless steel wire 0.016 x 0.022 and 0.017 x 0.025 both arches with elastic.

For retention, wrapround retainers were placed above upper and lower and the patient was instructed to wear them full time for one year.

RESULTS

After approximately 20 months of active treatment, the results are class I canine and molar relation with good interdigitation. The crowding correction of anterior and posterior in both arches, overjet, overbite and ideal shape of the arch were achieved, patient felt satisfied with the treatment. Esthetic of the face and smile was improved.

Patient felt confident with the condition of the teeth after the treatment. The treatment of malocclusion class I aims to correct crowding, local deviation, buccal segment relation, and the midline shift in lower jaw. Cephalometrically, there was no significant change in SNA, SNB, and ANB (Table 1 & table 2). The relation between upper and lower incisor was normal at the end of treatment.



Figure 4. Extra oral and Intra oral post-treatment photographs

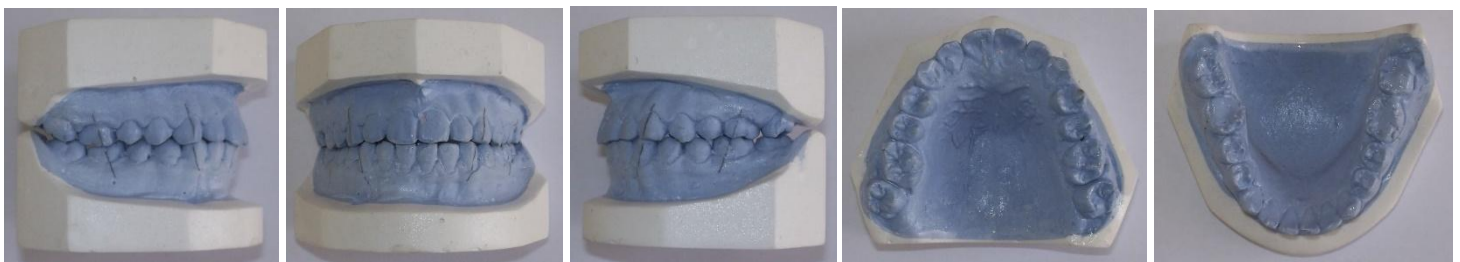


Figure 5. Post-treatment model analysis

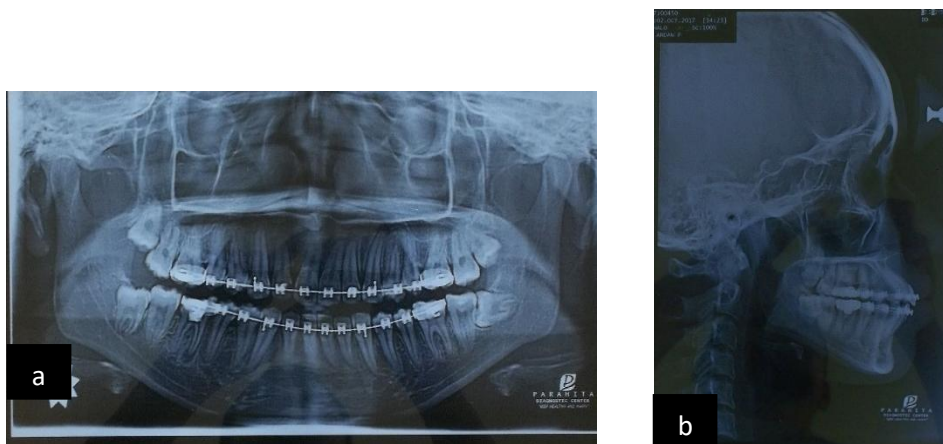


Figure 6. (a) Panoramic x-ray (b.) Post-treatment lateral cephalometry

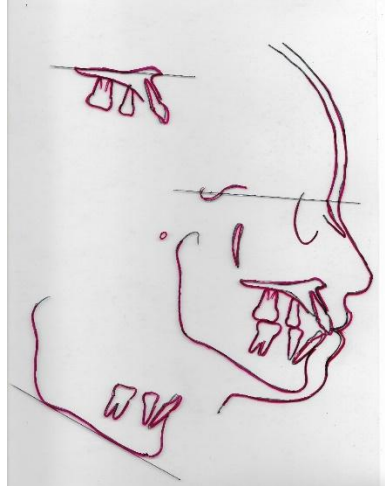


Figure 7. Superimpost

Table 2. Pre and post-treatment cephalometric analysis

Measurement	Mean	Pre	Post
\angle SNA	82°	82°	81°
\angle SNB	80°	82°	81°
\angle ANB	2°	1°	1°
Nasolabial Angle	100° – 110°	115°	113°
Y – Axis	59.4°	68°	69°
\angle I-NA	22°	10°	18°
\angle I-NB	25°	24°	33°
AO – BO (mm)	-1	4	3
Upper lips – E line (mm)	-2 to -3	-3	-1
Lower lips – E line (mm)	-1 to -2	-1	+2
Upper lips – S line (mm)	0	0	+1
Lower lips – S line (mm)	0	-2	+3

DISCUSSION

After the orthodontic treatment, good intercuspation 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. The crowding was corrected in both dental arches. The inclinations of the upper and lower canines and midline deviation were corrected, resulting in a good inter-incisal angle. Soft tissue profile of the patient was enhanced. The occlusion and the facial profile were virtually steady during the retention phase (figure 4,5). Figure 3,4,5 shows the extra and intra oral post treatment 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 treatment. Various studies of orthodontics have been done to estimate the stability of occlusion. Stability of treatment depends on the treatment approach, type of malocclusion, patient cooperation and growth and flexibility of the hard and soft tissues.¹⁰

For the current case, orthodontic diagnosis and treatment planning were based on the aesthetics. This treatment was focused on improving the position of the patient's crowding in upper and lower arches, in relation to the soft tissue profile. Because of patient presenting, there was argumentation about which treatment method (extraction or non-extraction) was the most effective in attaining long-term stability. To

correct the crowded arch, premolar extraction is considered to be more practical. But even with retraction in extraction treatment, teeth may return to their 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 prefer to carry out treatment plans without extraction. Different studies have found that relapse of anterior crowding is common in patients who are treated with extraction method. Moreover, it is similarly shown that patients treated without extraction also experience relapse. Rather than relapse, there are also evidences in successful orthodontic treatment to correct the crowding using extraction and non-extraction methods. A retrospective study of Angle Class I malocclusions has been done where crowding treated with non-extraction method. A long-term follow up study stated that patient with severe anterior crowding treated without any extraction showed stable results.¹¹ On the other hand, there is also evidence of orthodontic treatment to correct crowding, wherein both extraction and non-extraction methods led to no relapse. Likewise, 30 subjects of class I malocclusion with mild crowding treated without extractions method also showed similar stability. In the present case, the decision was made not to extract both the upper and lower first premolar because the consideration of minimum anchorage and to maintain Class I molar relationships.¹¹

Crowding and severe overjet can interfere with social relations. Moreover, dissatisfaction with one's appearance is the main reason why people need an orthodontic treatment.¹² Selection of an appropriate treatment approach may depend upon which factors influence the observed crowding. Extractions are routinely used to address dental crowding. However, some would say that teeth are an irreplaceable gift from our parents. Decisions to extract teeth have to be made not only by considering the amount of crowding but also the eventual influence of orthodontic tooth displacement on the soft tissue surface of the face. The non-extraction dental orthodontics is an expanding field, and the avoidance of extraction with the potential trauma to the patient and irreversible consequences, is seen to be of great value and benefit. One of the reasons for non-extraction therapy is that very little, apart from time, has been lost if it is not successful. Teeth can still be extracted in the future. However, once they are extracted then the process is virtually irreversible.¹³

The first decision in planning orthodontic biomechanical care is the selection of a midline treatment. This midline represents the final goal. The midline treatment may coincide with either the upper

or lower dental midlines or in sudden instances both upper and lower midlines may have to be moved to make them parallel with the facial midline. If the dental midlines are correlate while the upper and lower soft tissue/ skeletal midlines are not, this may occurs due to growth pathology or trauma; the determination of a midline treatment should be assessed along with surgical alternatives.¹⁴ Alexander advocates the use of a heavy anterior diagonal elastic supported by a Class II or Class III elastic, depending on whether the original malocclusion was a Class II or Class III. This is conducted during the finishing stages, except in an extraction case which it may be performed during space closure if there is a significant midline discrepancy. The anterior diagonal elastic is subsequently attached to the closing loops.¹⁵ Based on the results of the treatment, it could be withdrawn a conclusion that decisions to extract the tooth have to be made not only by considering the amount of crowding but also the eventual influence of orthodontic tooth displacement on the soft tissue surface of the face.

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