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Orthodontic Treatment of Class I Malocclusion with Sever Crowding without Extraction of any Sound Erupted Tooth - A Case Report

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Abstract

This report describes treatment of a 20-year- old Iraqi male with sever maxillary and mandibular arch crowding, deep bite, anterior and posterior cross bite. The patient presented with chief complaint of irregularly placed anterior teeth and unaesthetic smile. After completing the levelling and alignment, surgical extraction of impacted left mandibular third molar was done. The mandibular anterior segment crowding was improved during the first post-operative week. The active treatment time was 11 month result in successfully alleviating the maxillary and mandibular arches crowding, correcting deep bite and cross bite without extraction of any sound erupted tooth. After treatment, all of the patient's chief complaints were relieved. Hawley retainers were placed after debonding and the patient instructed to wear them for the following two years.

Keywords: Non extraction; Class I malocclusion; Crowding

Introduction

Dental crowding can be defined as a disparity in the relationship between tooth size and jaw size which results in imbrications and rotation by the presence of third molars and mesial component of force [1]. In treating a Class I malocclusion by means of comprehensive orthodontics, there are two main therapeutic approaches: extraction and non-extraction [2]. The extraction controversy still continues from the early 20th century. Edward H. Angle was the pioneer to describe normal occlusion and classify malocclusion [3]. He was emphasized that the preservation of all dental units was necessary to achieve facial balance, harmony and esthetics. But, percentage of non-extraction cases in the average orthodontic practice, which now stands as high as 80% [4].

The main goal of orthodontic treatment is to obtain a normal relationship of the teeth with facial structures and it is generally accepted that ortho dontic treatment will ha e some sort of an effect on facial proportions [5]. 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 [6,7].

The present case report describes the non-extraction orthodontic treatment of a class I malocclusion patient who had sever maxillary and mandibular arch crowding, deep bite, anterior and posterior cross bite. The patient provided informed consent for the author.

Diagnosis

A healthy 20 year old Iraqi male presented to Department of Orthodontic, College of dentistry/University of Baghdad with the chief complaint of irregularly placed anterior teeth and unaesthetic smile. Frontal and profile facial soft tissue evaluation revealed a symmetrical and balanced facial pattern with straight profile (Figure 1). Intraoral examination (Figure 2) revealed an Angle Class I malocclusion. He presented with a reverse over jet at the left side with1 mm over jet at the right side. Overbite was of 3 mm in the right side and deep and traumatic bite in the left side. A left anterior and posterior crossbite was present. The dentition and the periodontium were in good health. Analysis of the diagnostic casts revealed mild crowding in the maxillary arch and severe in the mandibular arch (Figure 3). As the arch-length deficiencies were present 3 mm in maxillary arch and 7 mm in the mandibular arch. Panoramic evaluation (Figure 4) showed horizontally impaction of left maxillary with left and right mandibular third molars. Moreover the right maxillary third molar left maxillary second molar and left mandibular second molar were vertically impacted.

Figure 1: Frontal and profile facial soft tissue evaluation

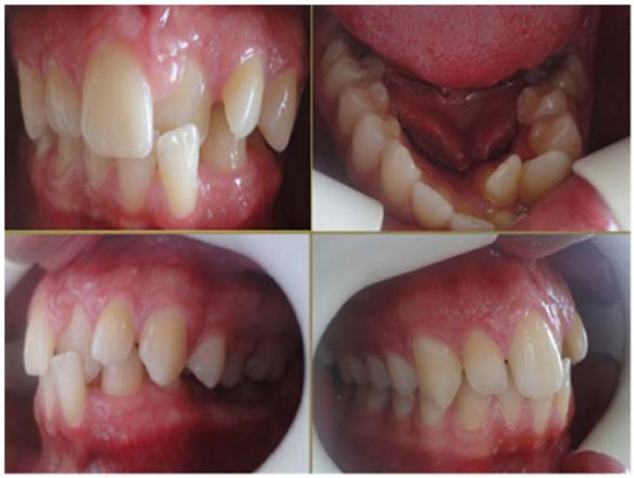

Figure 2: Intraoral examination

Figure 3: Analysis of the diagnostic casts

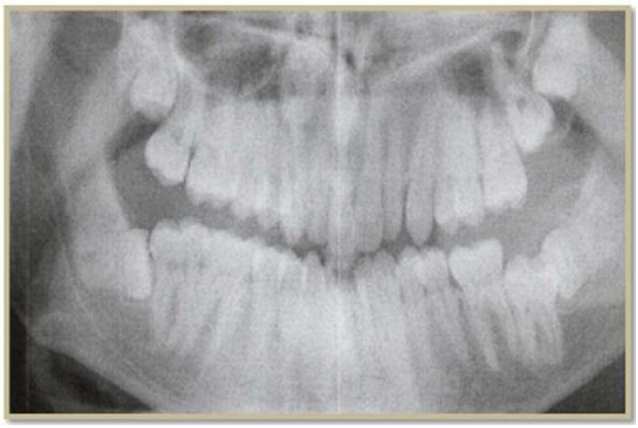

Figure 4: Panoramic evaluation

Treatment Objectives

The treatment objectives included:

- Maintaining the pleasing profile.
- Maintaining the Class I molar and canine relation bilaterally.
- Relieving of maxillary and mandibular crowding.
- Correction of anterior and posterior cross bites.
- Achieving ideal overjet /overbite.
- Achieving good and stable dentoalveolar changes.

Treatment plan

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.

Furthermore it was planned to surgically expose the left mandibular second molar with surgically extract the four impacted third molars. Because the case planned to treat without extraction so long time retention and follow-up appointments was planned and discussed with the patient.

Treatment Progress

The maxillary and mandibular first molars were banded. The maxillary and mandibular teeth were bonded with 0,022-inch Roth brackets (Ortho Technology). Treatment was started using 0.012" NiTi , 0.014" NiTi, 0.016" NiTi, then 0.018" NiTi in both arches. The patient referred for surgical exposure of the left mandibular second molar and surgically extraction of impacted left mandibular third molar.

During the operation, the surgeon noticed that there is large amount of bone above the mandibular second molar which made the exposing of it very difficult and may harm the patient. After consulting patient's parent they decide to leave it. The surgery end with extraction of third molar (Figure 5). During the first post-operative week there was a noticeable improvement in the alignment of the mandibular anterior segment (Figure 6). After the levelling and alignment phase

was complete, 0.018" x 0.022" NiTi arch wire was placed in both arches. This has been followed by placing heavy gauge (0.019" x 0.025") stainless steel wire in both arches while correcting posterior cross bite with cross elastic. Settling of occlusion was done with 0.018" x 0.022" stainless steel wire and elastic.

The case was debonded after 11 months of active treatment. Maxillary and mandibular Hawley retainers were placed after debonding (Figure 7). The patient was instructed to wear the retainers fill time for 12 months and then at night only during a progressive phase out of 12 additional months. The patient instructed to extract the impacted mandibular and maxillary third molars during retention period to prevent post orthodontic relapse (Figure 8).

Figure 5: Surgery end with extraction of third molar

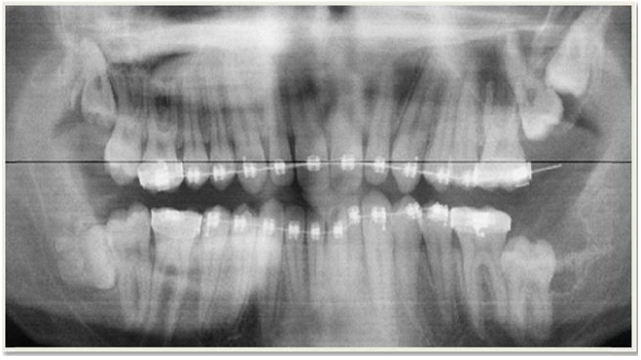

Figure 6: Mandibular anterior segment

Treatment Results

The Class I molar and canine relationship was maintained and normal overjet (2 mm) and overbite (2 mm) were achieved. Both arches showed good alignment. Anterior and posterior cross bite was corrected resulting in a good occlusion both palatally and buccally. The patient was satisfied with the tooth alignment and facial profile. In order to verify treatment stability, a follow-up appointment was scheduled after the end of treatment.

Figure 7: Maxillary and mandibular Hawley retainers were placed after debonding

Figure 8: After treatment

Advantages and possible disadvantages of the treatment plan of the present case were as follow:

Advantages

- The non-extraction of any sound erupted tooth was reduced the treatment time.
- Prevented compromised periodontal health which may be resulted from extraction.
- Prevented space reopening which may be take place after extraction.
- Maintained esthetic and harmonious profile.
- More stable results by getting root parallelism of the corrected teeth.
- Prevent post orthodontic relapse of the crowding due to the anterior pressure by horizontally impacted third molar.

Disadvantages

The only possible disadvantage of the present case was subjecting the patient to an invasive surgical extraction of the mandibular third molar. Moreover the surgical procedure was discussed with the patient and his parent. Furthermore the surgical extraction was carried out by well experienced and professional oral surgeon.

Discussion

Crowding and severe overjet can interfere with social relations. Moreover, dissatisfaction with one's appearance is the main reason why people seek orthodontic treatment [8]. Selection of an appropriate treatment approach may depend upon which factors influence the observed Crowding [9]. Extractions are routinely used to address dental crowding. However, some would say that teeth are an irreplaceable gift from our parents [10]. Extraction decisions 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 [11]. 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.

The effect of third molar retention on incisor crowding has been investigated for over 140 years [12]. In this patient, the panoramic radiograph showed the horizontally impaction of the left maxillary left and right mandibular third molars. Therefore the treatment plan was to remove all these impacted teeth. Moreover the treatment was carried out extraction of any sound tooth like premolar. This is because premolar extractions can lead to a 'dishing in' of the profile and premature aging. On the other hand short non-destructive approach was accomplished.

Class I malocclusion cases with crowding treated by Singla et al., 2013; Barbosa, 2013; Zawawi, 2014 and Ogura et al., 2014 were either premolar or mandibular incisor extraction cases. By comparing the treatment results of these cases with the present case we found that the overall treatment period is less in the present case. On the other hand both the anteroposterior position of the mandibular incisors and patient profile were not changed. Moreover some of these cases like those treated by Zawawi, 2014 and Ogura et al., 2014, were used Invisalign in combination with extraction and this was both cost and time consuming procedure[13-15].

Conclusion

Proper treatment plan that based on sound diagnosis is the key for success and stable orthodontic treatment results. In the present case, surgical removal of the impacted molar with the application of light, controlled forces resulted in significant improvement in the occlusal relationship as well as in the patient's dental and facial aesthetics. Ethically no extraction of sound tooth should be embarked upon unless a demonstrable benefit to the patient is feasible. Even with border line cases were tooth extraction is inevitable, orthodontist should delay the extraction after leveling and alignment phase of treatment. because space may be gained and the extraction plan may be banned or even modified to extract another tooth which is less affect the esthetic and peridontium health.

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References

1. Prasad K, Hassan S (2011) Influence of third molars on anterior crowding - Revisited. J Int Oral Health 3: 37-40.
2. Konstantonis D, Anthopoulou C, Makou M (2013) Extraction decision and identification of treatment predictors in Class I malocclusions. Prog Orthod 19: 14–47.
3. Wahl N (2005) Orthodontics in 3 millenia. Chapter 1: Antiquity to the mid- 19th century. Am J Orthod Dentofacial Orthop 127: 255-259.
4. Singla R, Madhumita N, Singla N (2013) Management of Class I malocclusion with unilateral first premolar extractions – A Case Report. journalofdentofacialsciences 2: 51-54.
5. Melgaço CA, Araújo MTS (2012) Asymmetric extractions in orthodontics. Dental Press J Orthod 17: 151.
6. Murphy CC, Magness WB, English JD, Frazier-Bowers SA, Salas AM (2003) A longitudinal study of incremental expansion using a mandibular lip bumper. Angle Orthod 73: 396-400.
7. Proffit W, Fields H, Sarver D (2013) Contemporary orthodontics, 5th edition Mosby Inc.
8. Bittencourt MA, Farias A, Castellucci BM (2012) Conservative of a Class I malocclusion with 12 mm overjet, overbite and severe mandibular crowding, Dental Press J Orthod 17: 43-52.
9. Howe RP, McNamara JA, O'Connor KA (1983) An examination of dental crowding and its relationship to tooth size and arch dimension. Am J Orthod 83: 363-383.
10. Ávila G, Galindo-Moreno P, Soehren S, Misch CE, Morelli T (2009) A novel decision-making process for tooth retention or extraction. J Periodontol 80: 476-491.
11. Saelens NA, De Smit AA (1998) Therapeutic changes in extraction versus nonextraction orthodontic treatment. Eur J Orthod 20: 225-236.
12. Niedzielska I (2005) Third molar infl uence on dental arch crowding. Eur J Orthod 27: 518-523.
13. Ogura Y, Yanagisawa W, Sugiura M, Fujita Y, Yamaguchi T (2014) Treatment of a Patient with Class I Malocclusion and Severe Tooth Crowding Using Invisalign and Fixed Appliances. Dental Medicine Research 34: 36-40.
14. Barbosa VLT (2013) Angle Class I malocclusion treated with lower incisor extraction. Dental Press J Orthod 18: 150-158.
15. Zawawi KH (2014) Orthodontic Treatment of a Mandibular Incisor Extraction Case with Invisalign. Case Reports in Dentistry 1-4.