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Non–Extraction Treatment in a Borderline Case: A Case Report

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Abstract

The following case presents the effective non-extraction orthodontic treatment of a 15-year-old female patient with severe crowding in both upper and lower arches and deep bite. The chief complaint was irregularly placed upper front teeth. The active treatment duration lasted for 9 months, which resulted in the successful correction of crowding in maxillary and mandibular arches and correction of the deep bite without the extraction of any sound erupted tooth. Posttreatment, all of the patient's chief complaints were relieved. Fixed spiral retainers were given post-debonding. This case highlights the efficacy of non-extraction orthodontic strategies in addressing crowding and deep overbite issues, drawing the importance of individualized treatment plans to achieve optimal outcomes.

Keywords: Class I molar crowding, Class II canine, non-extraction, borderline, severe crowding, IPR.

Introduction

Malocclusion is a discrepancy between maxillary and mandibular arches in any of the dimensions or the existence of irregularities in tooth position [1]. In malocclusion oral health and periodontal health are affected due to lack of functional inefficiency and structural balance. It raises concerns related to facial esthetic and psychosocial problems and can cause clicking and pain in the temporomandibular joint or other serious risks to overall oral health [1,2]. In the last decade, orthodontic corrections for esthetic purposes have risen

significantly. The alignment of the anterior teeth is specifically important as they are the first to be noticed in a smile. Proper orthodontic treatment enhances occlusion and facial esthetics. Thus, the majority of people look for orthodontic treatment [3]. Malocclusions are classified into Classes I, II, and III according to the molar relationship and was given first by Angle [4]. Because of the presence of Angle Class I malocclusion, around 61% of children in the age group 13-15 years need orthodontic correction [5]. Angle's Class I malocclusion was described as occlusion of the mesiobuccal cusp of the upper first molar with the mesiobuccal groove of the lower first molar[6]. The characteristics of Class I malocclusion could be a deep bite, crowding, spacing, crossbite (unilateral or bilateral), scissor bite and an anterior open bite. Among all these features, crowding is frequently seen in Class I malocclusion [7]. Arch and teeth sizes disproportion can lead to crowding [8]. In a crowded malocclusion, teeth tend to erupt labial or lingual to the line of the arch [7].

The treatment for crowding is either resolved by extraction of teeth in both arches or by no extraction [9]. Both of these approaches have their own set of benefits and setbacks, which is why choosing a favorable option depending on the age of the patient, the degree of crowding, and the jaw that is impacted can influence the treatment outcome [9]. The conflict of choosing either of the methods has been going on for the longest time. In various case studies, it is mentioned that if extraction of teeth is opted, then there is a high chance that it will disrupt the facial harmony and alteration in arch width and form post-extraction and can cause abnormal function[10]. Nonextraction approach can provide facial harmony, it is a less invasive procedure, and the treatment and recovery time is significantly reduced. With a non-extraction approach, crowding can be resolved by the advancement of anterior teeth, posterior teeth distalization, and arch expansion transversely or proximal stripping [11,12].

This case narrates the orthodontic treatment without extraction of a healthy tooth in an Angle's Class I malocclusion in which the patient complains of upper arch crowding.

Case Report

A healthy 16-year-old female patient with mesoprosopic face, straight profile, with apparently symmetrical face reported to the Department of Orthodontics with a chief complaint of crowding in upper and lower front teeth. An extraoral examination revealed competent lips, mesocephalic head shape, mildly protrusive upper lip and normal speech function [fig: 2]. An intraoral examination revealed Angle's Class I molars on both the left and right sides with Class II canines. In the maxilla, there was proclination of the central incisors and canines. The crowding of 9mm in the anterior teeth was measured. The palatal vault was deep with a midline deviation of upper dentition by 3mm. In the mandible, crowding of 6mm was seen in the anterior teeth. The canines on either side were slightly rotated. The overbite was 4 mm, and the overjet was 8 mm. The overall health of the teeth and periodontium was satisfactory. Analysis of the dental cast revealed crowding in both arches. [Fig: 1]

Figure: 1: Pre Treatment Intra Oral Photographs

Figure 2: Pre Treatment Extraoral Photographs

In panoramic radiographs, all third molars were observed in developmental stages. No pathological finding was detected (fig: 3). Lateral cephalometric analysis was done using Down's, Steiner's, Mc. Namara's, Holdaway's, Witt's and Jarabak's and Tweed's analysis. It revealed proclined maxillary anterior with 1-NA value to be 9 mm and an angle of 40°. Lower incisors were mildly retroclined with the 1-NB value of 3.5 mm and an angle of 20°. The value of the Y axis was 58°and Jarabak's ratio was 71% depicting a horizontal growth pattern.

Diagnosis

A 16-year-old female patient with Angle's class I molar relation on class I skeletal base with crowding both in maxillary and mandibular arches with mildly protrusive upper lip.

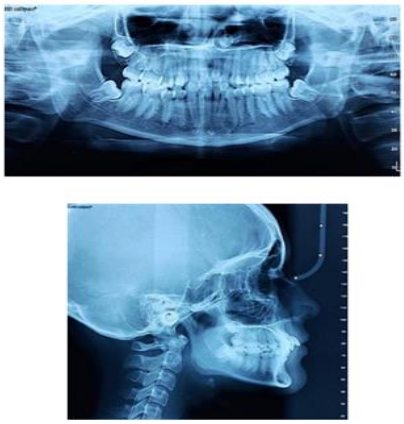

Figure 3: Pre Treatment Orthopantomogram and Lateral Cephalogram

Treatment Objectives

The treatment objectives were to level and align the arches, mild arch expansion in both arches, correcting the rotations along with mild interproximal stripping in both arches, obtain positive overjet and overbite, and settle the arches in well-inter cuspated occlusion. To achieve these treatment objectives, non-invasive orthodontic treatment was proposed without extracting any healthy teeth.

Fixed retention was planned.

Treatment Progress

Patient was treated with fixed mechanotherapy using Pre-Adjusted Edgewise MBT 0.022 Slot Brackets, and alignment with 0.014 inch NiTi archwires followed by .016 inch, .019x.025 inch NiTi and .019x.025 inch stainless steel archwires. Mild interproximal reduction and arch expansion and finally consolidation and closure of existing spaces was done with the help of Elastomeric chains delivering light continuous forces and replaced after every 8 weeks due to force decay and reduction in its activity. Class I molar with Class I canine relations with proper overjet and overbite was achieved. Fixed retainer was given after the completion of treatment with fixed spiral retainer [Fig : 4]

Figure 4: Mid Treatment Intraoral Photographs

Treatment Results

Post-treatment evaluation showed that patient's complaints had been addressed successfully. Teeth were esthetically pleasing while smiling. Upper lip protrusion was improved and soft tissue profile changed favorably due to the correction of lip position. Upper and lower arches were well aligned with consonant smile arc. All spaces were closed successfully. Posterior occlusion had good overall intercuspation and was well settled in a Class I relationship. Normal overjet and overbite were achieved. Upper and lower dental midlines were compatible with facial midline (Fig: 5). Treatment duration was 9 months. Post treatment orthopantomogram shows root parallelism [Fig: 7]

Figure 5: Post Treatment Intraoral Photographs

Figure 6: Post Treatment Extraoral Photographs

Figure 7: Post Treatment Orthopantomogram and Lateral Cephalogram

Parameter	Pre treatment	Post treatment
SNA	79°	80°
SNB	80°	80°
ANB	-1°	0°
Wit`s Appraisal	0.05mm	1mm
Upper CI to NA (linear/angular)	09mm/40°	4.5mm/23°
Lower CI to NB (linear/angular)	3.5mm/20°	4mm/25]
IMPA (Tweed)	90°	92°
F M A	23°	23°
Y (growth) axis	58°	58°
Jarabak's ratio	71.43%	71.71%
ANS-Me	56mm	56mm
Nasolabial angle	95°	103°
Ricket's E line U/L	-2mm/-2mm	-4mm/-2mm

Table 1: Comparison between Pre and Post Treatment Analyses

Discussion

It has been reported that the most frequently seen feature of malocclusion is crowding [14]. Crowding or irregularly aligned teeth as stated by the patient occurs in the

majority of the malocclusion patients[15]. Crowding affects the overall health of the oral cavity causing dental caries, periodontal problems, traumatic occlusion, etc., but among all of these, esthetics is something that every individual is concerned about in today's era. Crowding causes an unpleasant appearance for the patient while smiling. This reduces their confidence, which ultimately leads to psychosocial problems. This is the reason people look for orthodontic treatment [16,17]. Various methods by which crowding can be corrected are arch expansion transversely, interproximal stripping, posterior teeth distalization, anterior teeth proclination, and extraction. In patients where crowding is mild, about 0-4 mm and moderate about 4-8 mm [18], interproximal stripping is done, and extraction and arch expansion are standard treatment modalities [19-21].

In this case, we opted for a non-extraction approach for the alignment and leveling of the teeth. There are various cases where treatment of crowding is done without extraction. A case of severe crowding was treated with the help of a self-ligating appliance. These appliances help in the correction of crowding without extraction but are costly. This case was treated with simple MBT 0.022' slots brackets and shows with MBT brackets also non extraction approach can be accomplished satisfactorily. Arch expansion can also be used as one of the treatment modalities for correction of crowding. This can be gained by the use of mini screw-assisted rapid maxillary expansion.

Hence, it can be said that, in every crowding case, it is not always necessary to go for extraction. The above mentioned non-extraction approach can be used to obtain the best possible results.

Conclusions

The case was diagnosed as Angle's Class I with Dewey's type 1 modification. The patient clinically presented with crowding in both the arches with increased overjet and deep overbite. The malocclusion was treated with a non-extraction approach. The crowding in both the upper and lower arches was corrected. A pre adjusted edgewise appliance was used, followed by an SS wire for settling the occlusion. Post treatment patient was advised to a regular follow-up plan with fixed flexible spiral retainer in both upper and lower arches over one year. The patient was satisfied with the course of treatment and its outcome.

References

1. Tikar NN, Reche A, Jadhav V, Madhu PP, Chhabra KG, Dadgal KV, Pathekar JM: Assessment of efficacy of novel method of quantifying and grading class II malocclusion in vidarbha population. J Pharm Res Int. 2021, 33:230-4. 10.9734/JPRI/ 2021/ v33i47 A33008
2. Shivakumar KM, Chandu GN, Subba Reddy VV, Shafiulla MD: Prevalence of malocclusion and orthodontic treatment needs among middle and high school children of Davangere city, India by using dental aesthetic index. J Indian Soc Pedod Prev Dent. 2009, 27:211-8. 10.4103/0970-4388.57655
3. Quaglio CL, de Freitas KM, de Freitas MR, Janson G, Henriques JF: Stability and relapse of maxillary anterior crowding treatment in class I and class II Division 1 malocclusions. Am J Orthod Dentofacial Orthop. 2011, 139:768-74.
4. Mageet AO: Classification of skeletal and dental malocclusion: revisited. Stoma Edu J. 2016, 3:205-11. 10.25241/stomaeduj.2016.3(3-4).art.11
5. Utari TR, Putri MK: Orthodontic treatment needs in adolescents aged 13-15 years using orthodontic treatment needs indicators. J Dent Indones. 2019, 2:49-55. 10.32793/jida.v2i2.402

6. Abela S: An introduction to orthodontics. Eur J Orthod. 2013, 35:551-2. 10.1093/ejo/cjt018
7. Narmada IB, Ramadhani V, Pratiknjo IS, Prastiwi W: Treatment of a patient with class I malocclusion with moderate crowding and missing first molar: a case report. Acta Med. 2023, 57:74-9. 10.47895/ amp. vi0.4054
8. Das PJ, Dkhar W, Pradhan A: An evaluation of dental crowding in relation to the mesiodistal crown widths and arch dimensions in southern Indian population. J Clin Diagn Res. 2017, 11:TC10-3. 10.7860/JCDR/2017/29642.10554
9. Cai B, Zhao XG, Xiang LS: Orthodontic decompensation and correction of skeletal Class III malocclusion with gradual dentoalveolar remodeling in a growing patient. Am J Orthod Dentofacial Orthop. 2014, 145:367-80. 10.1016/ j.ajodo.2013. 04.026
10. Ileri Z, Basciftci FA, Malkoc S, Ramoglu SI: Comparison of the outcomes of the lower incisor extraction, premolar extraction and non-extraction treatments. Eur J Orthod. 2012, 34:681-5. 10.1093/ ejo/cjr064
11. Garcia R: Leveling the curve of Spee: a new prediction formula. J Charles H. Tweed Int Found. 1985, 13:65-72.
12. Germane N, Lindauer SJ, Rubenstein LK, Revere JH, Isaacson RJ: Increase in arch perimeter due to orthodontic expansion. Am J Orthod Dentofacial Orthop. 1991, 100:421-7.
13. Kapadia RM, Shah AP, Diyora SD, Rathva VJ: Non-surgical treatment of skeletal class III malocclusion. Jha A (ed): Reed Elsevier India Pvt. Ltd, India; 2014.
14. Alam M, Nowrin S, Shahid F, et al.: Treatment of angle class I malocclusion with severe crowding by extraction of four premolars: a case report. Bangladesh Med J. 2018, 17:683-7. 10.3329/ bjms. v17i4.38339
15. Turk T: Orthodontics: principles and practice. Gill D, Naini FB (ed): John Wiley & Sons Limited, Chichester, West Sussex, UK; 2013.
16. Bittencourt MA, Farias AC, Barbosa MD: Conservative treatment of a class I malocclusion with 12 mm overjet, overbite and severe mandibular crowding. Dental Press J Orthod . 2012, 17:43-52. 10.1590/S2176-94512012000500007
17. Jaswani M, Jaiswal P, Reche A: Wilckodontics: a multidisciplinary approach for orthodontic treatment. Cureus. 2023, 15:10.7759/cureus.47590
18. Lapenaite E, Lopatiene K: Interproximal enamel reduction as a part of orthodontic treatment. Stomatologija. 2016, 14:19-24.
19. Pindoria J, Fleming PS, Sharma PK: Inter-proximal enamel reduction in contemporary orthodontics. Br Dent J. 2016, 221:757-63. 10.1038/sj.bdj.2016.945
20. Luppanapornlarp S, Johnston LE Jr: The effects of premolar-extraction: a long-term comparison of outcomes in "clear-cut" extraction and nonextraction Class II patients. Angle Orthod. 1993, 63:257-72. 10.1043/0003-3219(1993) 063<0257: TEOPAL> 2.0.CO;2
21. Howe RP, McNamara JA, O'Connor KA: An examination of dental crowding and its relationship to tooth size and arch dimension. Am J Orthod. 1983, 83:363-73. 10.1016/00029416(83)90320-2