

ORTHODONTIC CAMOUFLAGE OF CLASS II DIVISION I WITH EXTRACTION OF UPPER PREMOLARS

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Abstract:

Class II Division I is the commonest malocclusion found in orthodontic population and a deep overbite is frequently encountered along with it. Many protocols have been utilised in treating such type of malocclusion from removable to fixed appliances with or without extractions. This case report is about a 15-year-old female patient who came to the Department of Orthodontics with a prognathic maxilla and a retrognathic mandible with 11 mm overjet. The patient refused fixed functional treatment thus a upper premolar extraction camouflage treatment was done. The chief complaint of the patient was successfully addressed and overall good treatment results were obtained with improved facial profile and reduced overjet.

Keywords: Class II Division I malocclusion, Deep bite, Camouflage

INTRODUCTION

Class II Division I is the commonest malocclusion found in orthodontic population and a deep overbite is frequently encountered along with it. It creates a skeletal disharmony and a significant motive for the patients to seek orthodontic intervention.¹⁻³ Teeth that are properly aligned not only benefit the oral cavity and the stomatognathic system, but they also have an impact on a person's personality. Many protocols have been utilised in treating such type of malocclusion from removable to fixed appliances with or without extractions.^{4,5} During the growing stage, the 2-phase treatment, growth modification followed by fixed appliance therapy demonstrated a modest effect on jaw growth.⁶ But a decision should be made by proper evaluation through a clinical examination as well as the radiographic records.⁷ The decision of extraction for treatment of Class II Division I cases has been discussed for a long period and today extraction of premolars is the treatment of choice for many orthodontists.^{1,8} It includes extraction of 2 maxillary and 2 mandibular premolars. Extraction of 4 premolars is done in case of a crowded mandibular arch otherwise 2 maxillary premolars can be extracted.^{9,10} Bishara et al⁷ observed that the extraction of 4 premolars resulted in more retrusive position of the upper and lower lips as compared to the non-extraction groups. They also observed that the upper and lower incisors were retracted and uprighted more among the subjects treated with four first premolar extractions than in the non-extraction group.¹¹ Janson et al in 2004 observed that the treatment with the 2-premolar extraction protocol provided a better occlusal success rate than that with 4 premolar extractions.¹⁰ Janson et al in 2006 also observed that the treatment time with the 2-premolar-extraction protocol was significantly shorter than

treatment time with the 4-premolar-extraction protocol.¹² Recent research has found that camouflage line of treatment provided results as good as the surgical line of treatment and the patient satisfaction was very high, and that treatment with extractions of two maxillary premolars produces a better occlusal result than treatment with four premolar extractions.^{13,14} In order to understand its pathophysiology, the complex microbial community fostered in dental biofilms of damaged teeth and intra-bony pockets accompanied by the clinical complexity of periodontal disease have necessitated the classification of particular microorganisms linked to the disease.¹

Many studies have related periodontal disease to specific bacteria in the subgingival plaque in the 1960s and 70s that activate the immune and inflammatory responses of the host that cause tissue and bone loss. These particular bacteria have virulence factors that help them penetrate and avoid disease-causing host defence mechanisms. Bacterial infection cannot be isolated from host reaction because much of the damage to the tissue occurs from the host that reacts to the infection site, and often the reaction is too extreme for tissues to tear down, causing resistant bacteria to proliferate.²

CASE REPORT DIAGNOSIS

This case report is about a 15-year-old female patient who came to the Department of Orthodontics with a chief complaint of forwardly placed front teeth of the upper jaw and an inability to completely close the lips. Extra oral examination revealed a mesocephalic and mesoprosopic form with convex profile with no gross facial asymmetry (Fig 1). Intraoral assessment Class II molar

relation with class II canine relationship. The maxillary and mandibular arches were U shaped and slight crowding was seen in lower anterior region. The maxillary incisors were proclined with an overjet of 11 mm and an increased overbite (Fig 1 & 3). No relevant history on TMJ examination. Cephalometric analysis showed that the maxilla was prognathic and the mandible was retrognathic (Fig 2). Developing third molars were seen in the panoramic radiographs.

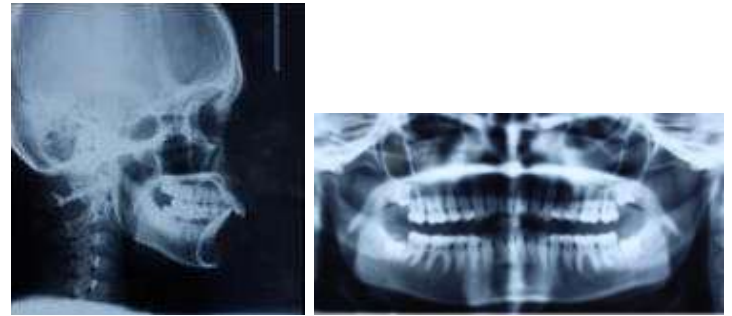


Figure 2. Pre-treatment x-rays



Figure 3. Pre-treatment models



Figure 1. Pre-treatment photographs

TREATMENT GOALS

1. To create a more balanced esthetic face by correcting protrusive maxilla and facial profile.
2. To create ideal overbite and overjet relationships with functional occlusion.
3. To maintain stability of the treatment results.

TREATMENT OBJECTIVES

1. Correction of proclined upper anteriors.
2. To achieve an ideal overjet and overbite.
3. To obtain competent lips.
4. To obtain an optimal functional occlusion.
5. Obtain Class II molar and a Class I canine relationship.

TREATMENT ALTERNATIVES

1. Growth modification followed by fixed appliance therapy.
2. Extraction of all 4 premolars and finishing the case in Class I molar relation

TREATMENT PROGRESS

The patient opted for extraction line of treatment. The extraction of upper first premolars were carried out initially (Fig 5) & fixed appliance therapy was carried out using 0.022" slot (MBT) mechanics. Since only the upper premolars were extracted a trans palatal arch was given for anchorage purpose after banding and bonding of the teeth. The initial levelling and alignment were carried out by 0.012" NiTi period.

The extraction space was utilised for correction of proclination of upper incisors. The wire used for this purpose was 0.019" × 0.025" stainless steel with active tiebacks. After retraction of incisors in the upper arch, lower arch was banded and bonded along with placement of 0.016" NiTi followed by placement of 0.016" S.S wire. A round 0.016" A.J Wilcock wire was used in upper & lower arch along with Class II elastics for detailing of occlusion. Satisfactory results were achieved in a period of 18 months. Debonding was done and fixed retainers were given in both the arches.

TREATMENT RESULTS

The post treatment records of the patients show that all the intended objectives have been achieved with good functional and esthetic needs (Fig 4 & 6). The SNA angle reduced from 85° to 84°. (Fig 5) The proclination of upper incisors was corrected along with the deep overbite (U1 to A pog was 9.5 mm which reduced to 5mm). Adequate lip seal was achieved. A Class II molar relationship was maintained on the right side and was achieved on the left side. A Class I canine relationship was obtained on both sides since only the upper premolars were extracted. The post treatment cephalometric records (Fig 5) and values are shown in the table (Tab 1).

VARIABLE	PRE-TREATMENT	POST TREATMENT
SNA	85°	83°
SNB	77°	79°
ANB	7°	4°
N ⊥ Pt A	2.5 mm	0.5 mm
N ⊥ Pog	-2 mm	0 mm
U1 – A Pog	9.5 mm	5 mm
L1 – A Pog	0 mm	2 mm
Interincisal angle	108°	123°
WIT'S Appraisal	7 mm	6 mm
UI-SN Plane	115°	108°
IMPA	105°	99°
FMA	18°	21°
Overjet	11 mm	2 mm

Table 1. Cephalometric values



Figure 4. Post treatment photographs



Figure 5. Post treatment x-rays



Figure 6. Post treatment models

DISCUSSION

The aim of any orthodontic treatment is to establish function, aesthetics and stability which can be achieved by meeting all the keys to normal occlusion at the end of active treatment.¹ Patient cooperation is one of the major factors affecting the success rate of orthodontic treatment.¹⁰

The treatment of choice in this case was growth modification with fixed functional appliance. Patient wanted a short-term dental treatment. The alternative treatments for this patient included moving the teeth relative to their supporting bone and compensating for the underlying jaw discrepancy. So the best possible option was extraction of upper premolars and retraction of the anteriors to improve the patient's profile and achieve a proper functional occlusion. The need for premolar extraction in the management of class 2 div 1 malocclusion has been controversial.⁸ Premolars are teeth of choice for extraction since they are located between the anterior and posterior segments and so provided with better and faster results.⁹ Furthermore the extraction criteria is divided into 2 maxillary premolar extraction or 2 maxillary and 2 mandibular premolar extraction.⁸ Thus, an individualised treatment plan is one of the most important aspects of orthodontics.¹⁵

Dental camouflage aims to resolve skeletal relationships by orthodontically repositioning teeth in the jaws, resulting in an improved dental occlusion and a pleasing facial appearance. Also, extraction in the upper arch only demands for high anchorage control since any mesial drift of the molars would result in the loss of extraction space and create difficulties in managing the excess overjet. Thus, a trans palatal arch was given to the patient to reinforce anchorage.

The ideal way to treat this type of malocclusion would have been a 4 premolar extraction or growth modification to provide occlusal stability and functional harmony. But we also need to address patient's requirements in this case being a short term dental treatment.

CONCLUSION

The camouflage treatment of Class II malocclusion is difficult and needs high quality personalised technique. Premolar extractions, when performed after a thorough diagnosis, result in significant profile changes and pleasing facial aesthetics. The most reliable way to achieve predictable results with minimal side effects is to use a well-chosen individualised treatment plan that is carried out using proper technique and appropriate control of the orthodontic mechanics. The malocclusion was resolved, and the patient's appearance and self-esteem improved significantly.

DECLARATION OF PATIENT CONSENT

The author certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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How to cite this article: Shaha K, Sharma M, Yadav E, Abrar Md, Agarwal Y. Orthodontic camouflage of Class II Division I with extraction of upper premolars. *TMU J Dent* 2022;9(1):38-42.

