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CLASS II CORRECTION BY UNILATERAL MOLAR DISTALIZATION WITH A PENDULUM APPLIANCE - A CASE REPORT

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ABSTRACT:

14-year male presented with skeletal Class I jaw base with unilateral Class II molar relationship with well aligned lower arch and lower incisors upright over basal bone. Distalization was planned in upper arch to correct unilateral Class II molar relation and upper incisor proclination. Pendulum appliance was used to distalize upper left molar. Molars were distalized by 5 mm in a span of 4 months. Post treatment Class I molar relationship was achieved bilaterally and incisor proclination reduced. Post treatment cephalogram showed minimal changes in the vertical dimension of face at the end of treatment. The total treatment ended in 19 months.

Keywords : Molar Distalization, pendulum appliance.

INTRODUCTION

Crowding and loss of space in the maxilla and the mandible, caused by mesially drifted molars and disproportion between tooth and jaw size, are problems frequently encountered in orthodontics. Correction of Class II malocclusion has always been a challenge for the orthodontist. Extraction and non extraction methodologies have been used to correct the same condition.1 Molar distalization can be initiated when extraction of maxillary teeth is not indicated and mandibular tooth size/ arch perimeter does not permit mesial movement of lower molars.2 With extra oral mechanisms implementing molar distalization, the success of the treatment depends upon patient's compliance.2 Since the early 1980s, therapeutic approaches and devices have been focused increasingly on options for correcting malocclusions in which patient compliance could be almost ignored. As a main approach of noncompliance appliances, intra arch devices for molar distalization have been introduced. Various Distalization appliances are headgear 3, cetlin appliance 4, TPA5,ACCO appliance 6, Pendulum appliance7, Wilson biometric distalizing arch 8-9, fixed functional appliance10,11, distal jet12,13, first class appliance14, repelling magnets15, NiTi coil spring16, superelastic NiTi wires17, K loop18. However, many of these methods can also cause mesial movement of the maxillary premolars and anterior. In addition, the loss of anterior anchorage often leads to relapse of the maxillary molars during the correction of the canine relationship, overbite, and overjet19. Many of the distalization techniques use Nance palatal arch to avoid anterior anchorage loss during molar Distalization.

CASE REPORT:

This case report describes unilateral distalization of maxillary molar with Pendulum appliance in Class II subdivision malocclusion. 14-year male presented with the chief complaint of forwardly placed upper front teeth. No relevant medical history was present. On clinical appraisal, no abnormality was detected with tempromandibular joint. Facial form was mesoprosopic and mild convex soft tissue profile. (Fig 1) Intraorally, Class II molar relation on the left side and a Class I molar relation on the right side, 5 mm over jet and 40 % overbite. Lower incisors were ideally aligned and upright over basal bone. Upper midline was shifted to right side by 3 mm in relation to facial midline. (Fig 2) Panoramic radiograph showed third molars were in their eruptive stage. The lateral cephalogram revealed ANB of 2° and Wits appraisal of -1 mm, indicative of a Class I skeletal relation. The skeletal pattern was horizontal as evidenced by the SN-MP angle of 31°. The patient had proclined maxillary incisors with U1-SN 109°, normally inclined lower incisors with L1-MP 97°. (Fig 3) The distance between Ricketts' PTV line and distal surface of maxillary first molar was 18 mm.

TREATMENT OBJECTIVES:

Treatment objectives were to correct Class II molar and canine relation on left side, dental midline correction in

relation to facial midline, to reduce incisor proclination. Other objectives were to correct overjet, overbite and maintain Class I molar and canine relation on right side.

TREATMENT PLAN:

Unilateral Distalization of maxillary left molar using a Pendulum appliance. The distance between Ricketts' PTV line and distal surface of maxillary first molar was 18 mm. According to Ricketts', minimum distance required for 14 year male patient is 17 mm. So adequate space was available which made distalization possible without producing crowding in posterior segment. Later, the patient was treated by fixed appliance therapy.

TREATMENT PROGRESS:

Pendulum appliance was fabricated and inserted onto the banded maxillary first molars. (Fig 4) The appliance was activated by 90°, which delivered approximately 240 grams of force. The molar started showing distal movement, the molars showed a distalization of 5 mm by the end of four months. (Fig 5) After the desired distalization was achieved, 0.022×0.028" MBT brackets were bonded.

Fig 1: Pre treatment extra oral photographs

Fig 2: Pre treatment intra oral photographs

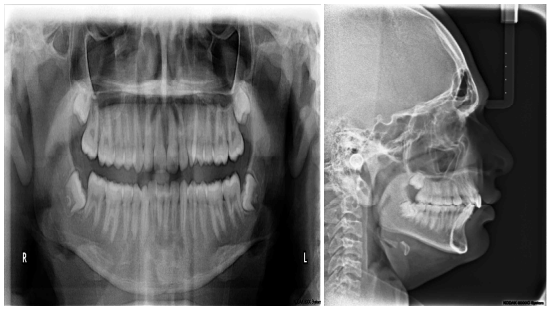

Fig. 3: Pre treatment panoramic and lateral cephalometric radiographs

Fig 4: Pendulum appliance

Fig.5: Post distalization

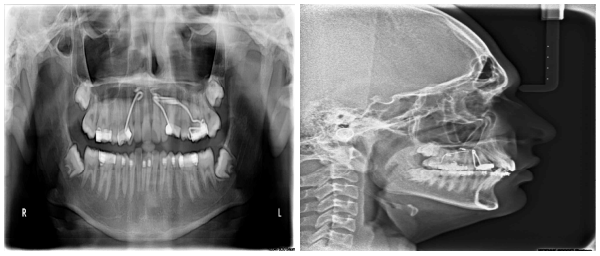

Fig. 6: Post distalization panoramic and lateral cephalometric radiographs

TREATMENT RESULT:

A good occlusion was established resulting in bilateral Class I molar and canine relationships along with normal over jet and overbite. Maxillary first molar was distalized by 5 mm in 4 months. Upper dental midline was coinciding with facial midline. Position and inclination of the upper and lower incisors were normalized. Nasolabial angle presented within the normal range.

DISCUSSION

Unilateral Class II molar was successfully treated with Pendulum appliance. Unilateral distalization had the advantage of stronger anchorage because the contralateral side was utilized as a anchorage unit as well we fabricated helical spring with stainless steel wire in right quadrant. Unilateral distalization seems to be associated with less anchorage loss and less tipping of the molar than bilateral distalization.20, 21 Scutzey showed an effective distal molar movement and less anchorage loss of front teeth are advantages of unilateral distalization.22

Influence of second molar on the distal movement of the first molar remains a matter of debate. Some authors reported that presence of second molars increases treatment duration, produces more tipping of molars,17 and more anterior anchorage loss.23 On the contrary, some authors have reported that presence and position of

second molars does not affect the amount and type of maxillary first molar distal movement.24, 25.

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