UNILATERAL BONE ANCHORED MAXILLARY MOLAR DISTALIZER APPLIANCE – CASE REPORT

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Abstract

Distalization of upper first molar could be arranged using Mini implant from buccal or palatal side. Since palatal bone has more density and interradicular space is greater than buccal side, Palatal miniscrew could be used more easily. The Unilateral distalization of upper molar from palatal side is difficult with only one mini implant. In present article we have described a modification of the pendulum appliance used to distalize upper left first molar with two palatal interdental miniscrew anchorage without any acrylic material.

Keywords: Skeletal anchorage, Biomechanics, Molar distalization, orthodontic appliance.

Introduction

The Traditional treatment of unilateral Class II molar relationship with asymmetry in the maxillary arch is the use of asymmetric extra oral traction in patients to be treated without tooth extractions.[1,2] Although this method gives successful results in cooperating patients, the lack of cooperation results in anchorage loss and unsatisfactory treatment results.[3] to eliminate the disadvantages of extra oral appliances, many clinicians use different intraoral distalization appliances to move the maxillary molars distally on one side[4-8] but these noncompliance approaches often pose anchorage problems such as maxillary premolar mesialization, maxillary incisor protrusion, and increased overjet.[9]

Currently, skeletal anchorage, including orthodontic mini screw-assisted upper molar distalization is the standard treatment modality. Distalization of upper first molar could be arranged using Mini implant from buccal or palatal side. Since palatal bone has more density and interradicular space is greater than buccal side, Palatal miniscrew could be used more easily. utilization of mid palatal miniscrews is far from maxillary dentition and its complicate the biomechanics of miniscrew for the control of maxillary molar during distalization.[10]

In present article we have described a modification of the pendulum appliance used to distalize upper left first molar with two palatal interdental miniscrew anchorage without any acrylic material.

Case report

A The technique is demonstrated in a 23-year-old girl patient with a mild skeletal Class II malocclusion, Intra-oral examination revealed upper crowding with high buccal canine in right side. There was no space deficiency in lower arch and pre extraction of lower right second premolar was seen. Molar relationships were class I in right and class II in left side while canine relationships were class II. [Figure 1]

Figure 1.1: 23-year-old female patient with mild skeletal Class II malocclusion. Molar relationships were class I in right and class II in left side while canine relationships were class II and pre extraction of lower right second premolar was seen

Figure 1.2: OPG and Lateral Cephalometric Radiography

Treatment plan

- Extraction in upper arch (first premolar in right & third molar in left side) with distalization in left side
- Non extraction in lower arch

Since restorative treatment of upper left second molar was not quite satisfactory and the 3rd molar was in its right place we have decided to extract this second molar instead of third molar. [Figure 2]

Figure 2: Periapical Radiography of upper left second and 3rd molar

Procedure

For unilateral distalization of upper left first molar we:

1. Insert two palatal miniscrews (Jeil medical Co, Korea) (8mm in length, 1.6 mm in diameter) in the left side just mesial to the second premolar & first molar, lower 3rd apical area. [Figure 3]

Figure 3: Palatal miniscrews.

2. Impressions were obtained with the miniscrews in place. On the stone model, the spring constructed from 0.032-inch titanium molybdenum alloy (TMA) wire according to Hilgers descriptions. This spring consisted from three parts: a- Distal arm with adjustable u shaped bend b- A helix with the diameter as close as possible to the outer diameter of head of miniscrew and c- Mesial arm with adjustable u-shaped bend to fix the spring on mesial miniscrew head. [Figure 4]

Figure 4: Wire bending on the stone model

3. Distal activation of about 70 degrees, producing a force of about 150 g and mild mesial crown couple were place on the spring since the major goal was controlled tipping of that tooth.

After necessary activation bends, the spring has been put in place while the helix tied in the posterior miniscrew with ligature wire. The end of horizontal arm was bended to passes through the hole of this miniscrew. After engagement of distal arm in palatal sheath the mesial arm forced to be placed firmly in mesial miniscrew head.

Unilateral distalization was completed after only one month of treatment [Figure 5]

Figure 5: Unilateral distalization with spring activation

Discussion

Currently, skeletal anchorage, including orthodontic mini screw-assisted upper molar distalization is the standard treatment modality. It is not limited by patient compliance, and it can prevent dental anchor loss.[11] There are numerous clinical skeletal anchorage options available for upper molar distalization. One method utilizes miniplates inserted into the buccal maxillary, zygomatic, and palatal bones.[12-14] and the other utilize miniscrews into the buccal interdental alveolar bone, maxillary tuberosity, and palatal area for the distalization of upper molars.[15-17] Furthermore, combinations of conventional maxillary molar distalizing appliances and skeletal anchorages such as miniscrew-assisted pendulum appliances have been proposed.[18] In one type we have The acrylic plate that was connected to the screw head using cold-curing acrylic resin and on the other type acrylic plate was removed and pendulum arm connected to screw directly, the second type maybe is more hygienic than the other. All of these treatment modalities produce similar but different dental effects, with potentially varying levels of convenience for both clinicians and patients. Placement of mini-screws, as compared with mini-plates, needs less invasive traumatic procedure and in recent studies Maxillary molar distalization can be performed with two mid palatal miniscrews by lingual arch or pendulum type appliance.[11] The result of lingual arch showed almost bodily distal movement. however, it is only be applied in bilateral distalizing cases and its complex design which can increase patient discomfort. pendulum type appliance produced significant distal tipping of the maxillary molars during distalization but it can be used in bilateral and unilateral case.[11] utilization of mid palatal miniscrews is not as popular as interdental miniscrews because the mid palatal area is far from maxillary dentition and its

complicate the biomechanics of miniscrew for the control of maxillary molar during distalization. In this case report we present the pendulum type of two lateral –palatally miniscrew supported maxillary molar distalizer without any acrylic plate.

Conclusion

This spring with small size and without any acrylic part makes it hygienic and readily tolerable for the patient. Utilization of mid palatal miniscrews far from maxillary dentition would complicate the biomechanics of miniscrew for the control of unilateral maxillary molar distalization. Two palatal interdental miniscrew make biomechanics feature of this movement more efficient. Total treatment time was 17 months. [Figure 6]

Figure 6.1: Final photography

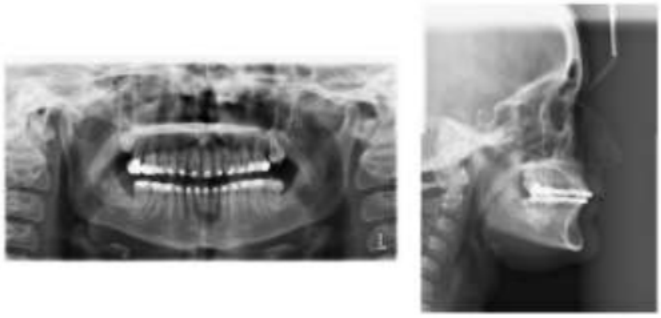

Figure 6.2: Final OPG and Cephalometric Radiography

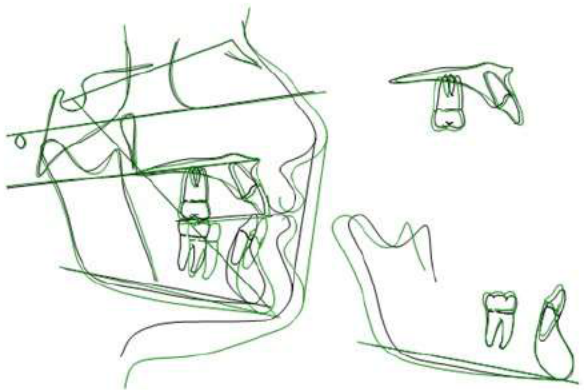

Figure 6.3: Cephalometric tracing

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