Case Report

Molar Distalization – An Easy, Effective and Economical Approach

Maheshwari G, Arora R, Verma VK, Sachan A

Abstract: Class II malocclusion is reported as most common problem in orthodontic practice. In recent years, non-extraction and non-compliance therapies have gained much popularity for correction of space discrepancies. Molar distalization is one such conventional approach for space gaining in class II malocclusion. In the present case report, a 13 year female patient with class II malocclusion was treated with Nickel-Titanium (NiTi) coil spring to distalize maxillary molars. NiTi springs are simple and effective non-compliance approaches that apply constant and light continuous forces, easy to place, hygienic, comfortable for patient and low cost.

Keywords: Class II malocclusion; Molar distalization; NiTi coil spring.

INTRODUCTION

Class II malocclusion represent the most common problem in orthodontic clinical practice.[1,2] Various treatment modalities are available for correction of class II malocclusion these includes growth modification procedure, extraction and orthodontic camouflage; and maxillary molar distalization.[3]

One of the conventional approaches for space gaining in the arches is molar distalization procedure by using certain extra oral appliances or intraoral appliance. Unfortunately extraoral procedures require patient compliance to be effective, to overcome this problem various alternative intraoral methods are available in the literature.[4]

Gianelly et al have developed distalization system consisting of 100g nickel-titanium superelastic coil spring placed on a passive 0.016" * 0.025" wire between first molar and first premolar. In addition a Nance type appliance is cemented onto the first premolar to enhance anchorage.[5] NiTi spring was found to have greater springback properties than stainless steel coil. Furthermore, most important reason for their implementation is their ability to exert very long range of constant and light continuous forces.[6] Additional advantages are it is simple and efficient in use, easy placement, hygienic, comfortable for the patient and low cost.[7]

Case report

A 13 year old female patient reported with the chief complaint of irregular teeth in both upper and lower front tooth region. In extraoral examination patient presented with convex facial profile with straight divergence, competent lips and no gross asymmetry diagnosed (Figure1). In an intraoral examination patient presented with an end-on molar relation, crowding in relation to both upper and lower arches, retained 53,74 ; crossbite in relation to 12, overjet of 4mm and overbite was 100% (Figure 2). There was Bolton's discrepancy with 4.5mm of overall mandibular excess.

Figure 1: Pre treatment extraoral photographs

Figure 2: Pre treatment intraoral photographs

Radiographic examination revealed impacted 13, unerupted 37,47 and tooth bud in relation to 18,28,38,48. Cephalometric analysis show mild class II skeletal base relationship with ANB:4°, SNA:84°, SNB:80°, U1 to NA:23°,5mm ; L1 to NB:26°,6mm ; Sn-GoGn:29° (Figure 3,4).

Figure 3: Pre treatment lateral cephalogram

Figure 4 – Pre treatment OPG

Treatment objective

1. Correction of crowding.
2. To align impacted canine in the arch.
3. To achieve class I molar relation.
4. To correct overbite.
5. Retention of correction achieved.

Treatment progress

Treatment was initiated with the distalization of molars with banding done in relation to upper 1st molars and 1st premolars using nickel-titanium superelastic coil spring on 0.016 * 0.025" stainless steel wire between 1st molars and 1st premolars. Nance holding arch was cemented on 1st premolar and class II elastics were given to prevent proclination of upper anteriors and enhance anchorage (Figure 5). Distalization was achieved in 6 months. After this a new nance holding arch was cemented on distalized molar, simultaneously followed by bonding of upper arch with 0.022" slot MBT appliance. The space gained with distalization was utilized for alignment in upper arch. In lower arch extraction of 44 was done as there was crowding and overall excessive tooth material in lower arch, followed by cementation of lingual arch and bonding was done. After initial alignment, extraction of 53 was done followed by exposure of 13 which was bought into the arch with 0.014" auxillary wire (Figure 6).

Figure 5: Distalization with Nickel-Titanium coil spring

Figure 6- Canine exposure and bonding lingual button to exposed canine

Figure 7- Post treatment extraoral photographs

Figure 8- Post treatment intraoral photographs

After 20 months of treatment, the upper and lower arches were well aligned with class I molar relation on both sides, but canine relation was class I on left side and class II on right side with 50% overbite and 3mm overjet. There was good intercuspation established between upper and lower arches. Debonding was done and upper and lower Hawley's retainers were given to patient (Figure 7 and 8).

DISCUSSION

In the recent years, nonextraction treatment approaches and noncompliance therapies have become more popular in the correction of space discrepancies.[8]Non-extraction treatment of Class II malocclusion frequently requires upper molar distalization into a final Class I relationship. To achieve this, a variety of treatment modalities have been suggested. For more than a century, the most common procedure has been the headgear applied to upper molars, and its performance has been reliable.[9,10]

Unfortunately, headgear requires patient compliance to be effective. Often, the patient is not willing to wear the headgear for the recommended 12–14 h per day. Recently, many noncompliance appliances and approaches have been presented to overcome the problem of compliance and correct Class II malocclusion efficiently. However, when noncompliance distalization appliances are used to correct Class II malocclusion, three other problems are usually evident:

1. Anchorage loss of the anterior dental unit expressed as forward movement and proclination of the anterior teeth.
2. Distal tipping of the molars during active maxillary molar distalization.

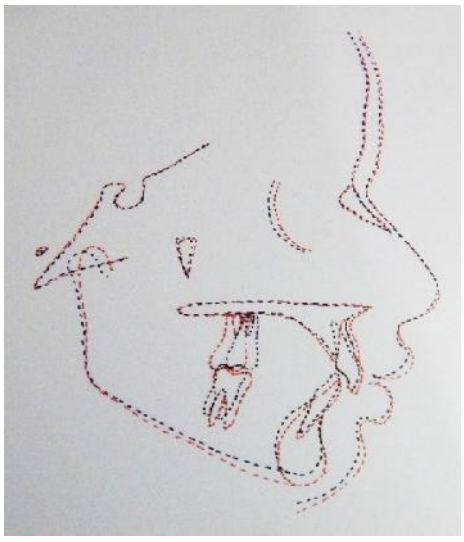

Figure 9: Superimposition of pre treatment and post treatment cephalometric tracing

3. Anchorage loss of the posterior dental unit also in the forward direction that takes place after distalization during the subsequent stage of anterior tooth retraction and final alignment of the dental arches.[11,12]

In this case distalization of molar was done with Ni–Ti superelastic coil springs that exert long range of light and continuous forces. However minimum amount of anchorage loss was observed it may be due to the support taken from a wide acrylic button and inclusion of class II elastics.

Superimposition of pretreatment and post treatment cephalometric tracing reveal that satisfactory molar distalization by 3 mm has occurred. In the sagittal plane, molar distalization occurred at the expense of the mild proclination of the maxillary anterior teeth due to reciprocal mesial force, thus causing anchorage loss which is favourable in this case as the patient was having deepbite and retroclined upper and lower anteriors. Slight mesial movement of lower molar and proclination of lower anteriors is also seen. In the vertical plane, this appliance extruded the maxillary molar, thus increasing the mandibular plane angle to a mild degree which caused the downward and backward rotation of the mandible (figure 9). White spots were observed after appliance removal for which patient was instructed to use fluoride mouthwash.

CONCLUSION: Molar distalization with open coil spring has advantages of being simple yet efficient, easy to place, hygienic and comfortable for the patient, requires minimal patient cooperation and low cost

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