A Simple, Efficient and Effective method of Molar Distalization using NiTi coil springs
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Abstract
Angle’s Class II malocclusion forms a major part of orthodontic practice. Over the past few years, non-extraction treatment and non-compliance therapies have become popular in the correction of dental Class II malocclusion. One of the methods to correct Class II malocclusion is to distalize upper molars. This report describe the fabrication of an appliance to distalize maxillary molars using NiTi coil springs buccally as well palatally without the use of complicated piston assembly for the management of Class II, Division 1 malocclusion with minimal crowding in a 21 year old female patient.

Key Words: Distalization; Molar; NiTi Coil

Introduction
In recent years, various intraoral techniques have been found to be successful for maxillary molar distalization.(1-6) Hilger (1) designed Pendulum appliance to achieve simultaneous bilateral molar distalization. Gianelly et al.(2) reported distalization of maxillary molars using repelling magnets along with a modified Nance appliance for anchorage control. Gianelly et al.(3) also used Japanese NiTi open coil springs in continuous arch wires and reported a mean molar movement of 1 to 1.5 mm/month. Jones and White (4) used a Sectional Jig assembly with open coil Nitinol springs and reported correction of Class II molar relationship to Class I in 120 to 180 days. K-loop distalizer prepared using 0.017×0.025” TMA wire by Kalra(5) is also one of the effective methods of distalizing molar. Greenfield(6) fabricated a fixed piston appliance to achieve bodily distalization of maxillary molar using Japanese NiTi coils spring on buccal & palatal aspects. This report describe the fabrication of an appliance to distalize maxillary molars using NiTi coil springs buccally as well palatally without the use of complicated piston assembly.

Appliance Design
Components of the appliance:
• Maxillary first molar and first bicuspid bands.
• .032” stainless steel wires.
• Nance button, reinforced with an .034” stainless steel wire (for control of anterior anchorage)
• Superelastic nickel titanium open-coil springs.
• 0.036” Internal diameter round buccal tubes.

Procedure: Upper molars were banded and buccal triple tubes (0.022×0.28” MBT) were welded. Similarly 0.036” round buccal tubes were welded on palatal aspect, keeping them parallel to buccal tubes. Upper first premolars were banded and (0.022×0.28” MBT) brackets were welded. 0.032” stainless steel was adapted around the palatal aspect of first premolars (point of soldering) and its distal end was straightened so that it can be passed passively through palatal round tubes. The mesial end of the same wire acts as retentive components around which Nance palatal button was fabricated. (Figure 1a & 1b) Molar bands were removed from the cast and the desired length of NiTi coil spring was placed and tied using ligature wire. The bands were replaced and the distal ends of 0.034” stainless steel wire were kept 5mm distally beyond the tube and cinched palatally to prevent any soft tissue injury. (Figure 1c)

Case Report
A 21 year old female patient presented with Class II, Division 1 malocclusion with minimal crowding. Cephalometric analysis revealed Skeletal Class I maxilla-mandibular relationship (ANB 3°), hypo-divergent growth pattern (FMA 20°) and upper (U1-SN 112°) and lower (IMPA 105°) incisors proclination. Patient exhibited orthognathic profile (figure 2).

Fig 2 Pre-operative View

Treatment objectives were to, a) correct Class II molar relationship by molar distalization and b) achieve proper placement of maxillary and mandibular incisors.
In first stage, 0.022×0.28” MBT prescription (3M Unitek) brackets were bonded and the distalization appliance was cemented on first premolars and molars using glass ionomer cement. The palatal coil springs were intact with ligature wire and were not activated.

Initially, alignment was carried out using 0.016” NiTi wire for 4 weeks followed by 0.016” stainless steel wire for subsequent 4 weeks, which was replaced by 0.018” stainless steel wire with open coil springs placed between first premolar and molar buccally. The palatal coil springs were activated by cutting the ligature tie. Overcorrected Class I molar relationship was achieved bilaterally in the meantime duration of four months. During second stage, springs similar to those prepared by Hilger(1) were constructed using 0.032” stainless steel wire, which were reinforced anteriorly by Nance palatal button and the distal ends of wire were inserted into palatal round tubes. This functions as a retainer resisting mesial movement of distalized molars.

Entire retraction phase took seven months for completion with minimal amount of patient cooperation required.

Finishing: Finishing was carried out by an average time duration of four months, using 0.21” x 0.025” stainless steel braided arch wires with settling elastics. Canine to canine fixed retainers were bonded in both maxillary and mandibular arches and an additional upper arch Begg’s wrap around removable retainer was delivered. (Figure 3).

**Conclusion**

This molar distalizing appliance has these advantages: a) simple yet efficient, b) easy to fabricate and place, c) hygienic and comfortable for the patient, d) requires minimal patient cooperation and e) low cost.

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**References**

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Source of Support: Nil, Conflict of Interest: None Declared