

Case Report:

Custom made modified distal jet appliance – an effective and economic appliance.

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ABSTRACT

For over a decade, various modified appliances have been described which are placed intraorally. They remain fixed temporarily to make a treatment successful independent of patient compliance. In the present article, one of these appliance is the “Custom made Modified Distal Jet Appliance” which can be an alternative to the commercially available Distal jet appliance, and is more economic, prepared easily in laboratory and effectively distalizing the molar bodily with no significant undesired movements.

Key words: Distal Jet Appliance, Molar distalization, NiTi coil spring

INTRODUCTION

In the recent year non- extraction treatment approaches and non compliance therapies have become more popular in the correction of space discrepancies. Molar distalization in the maxillary arch is an important part of the therapeutic option in the everyday orthodontic practice and one of the conventional approaches for space gaining in the arches without patient compliance. However, it is done by using certain intraoral appliances. Among the aforementioned appliances, the distal jet, a lingual distalization appliance, is said to feature several distinct advantages^{1,2} The maxillary molars are distalized with less distal tipping and without the lingual movement that is typically seen with other distalizing mechanics, such as the Wilson modular technique, repelling magnets,^{3,4} Jones jig,⁵⁻

⁷and the pendulum etc.^{8,9,10} The Custom made modified Distal Jet consists of a bilateral Bayonet and Directors and tube arrangement, with the tube embedded in an acrylic Nance button in the palate, supported by attachments on the first or second premolars. A bayonet wire is inserted into the lingual sheath of each first molar band and the free end is inserted into the tubes, much like a piston. Compressing the open coil spring generates a distally directed force. Ideally, they result in lines of force running close to the center of resistance of the molars. Anchorage is obtained from 1st bicuspid, 2nd bicuspid, short labial bow and Nance Button.

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APPLIANCE FABRICATION AND KEY ELEMENTS

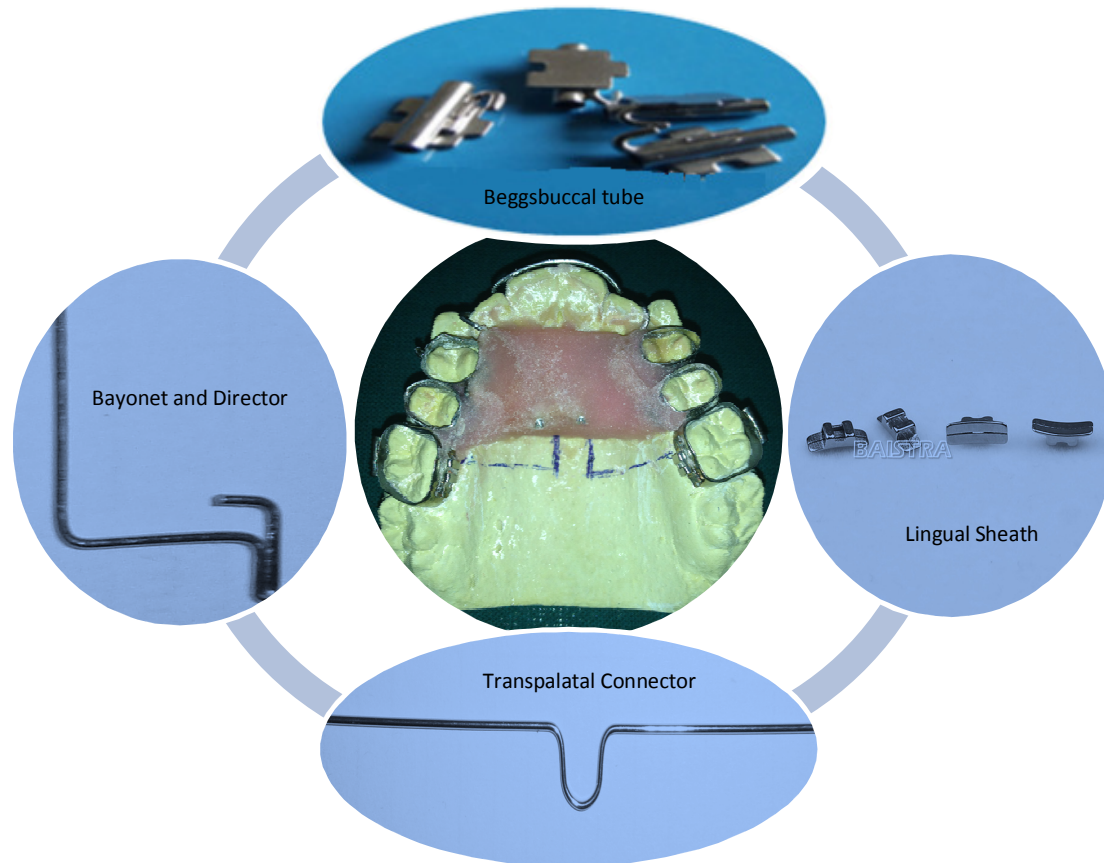


Fig 1: Custom Made Modified Distal Jet Appliance and Key Elements.

Lingual Sheaths: Position with entry as close as possible to the center of resistance (CR) of molar.

Transpalatal Connector: Made with 0.9 mm stainless steel wire, extend anteriorly to contact the middle of the cuspid or slightly beyond. Maintain a 1mm clearance from the palate for acrylic.

Bayonet and Directors: Made with 0.7 mm stainless steel wire, parallel as close as possible, to the arch form at the level of the centers of resistance of the posterior teeth. When viewed from the occlusal aspect, the bayonet assembly (bayonets and bayonet directors) should be positioned towards the palatal midline with a 5° offset away from the arch form to avoid buccal tipping of the molar during distalization. Incorporate the maximum tube

length and extend as anteriorly as possible, not crossing the connector.

Begg's buccal tube: Round Begg's buccal tube with 0.036 inch inner diameter and 6 mm length.

Nance Button: Extends anteriorly to the distal surface of lateral incisor and ends at the distal of the second bicuspid or deciduous second molar. It should be as smooth and thin as possible to provide maximum comfort.

Short labial bow: Made with 0.7mm stainless steel wire from lateral incisor to lateral incisor to prevent labial tipping of anteriors.

NiTi open coil spring:

The precalibrated spring of about 180 gm of force should be used in mixed dentition, and the 240 gm of force spring if second molars have erupted. (Table 1)

Table-1 Spring A- 240gm

Compression (mm)	1	2	3	4	5	6	7
Maximum force	32	62	101	140	172	205	240
Minimum force	21	55	90	125	158	195	

STEP-BY-STEP PROCEDURE:

- Bands are fabricated on 1st, 2nd bicuspid and 1st molars (lingual sheath is attached with molar bands).
- Impression is taken, bands are transferred to the impression and impression is poured.
- Transpalatal connector is formed on the premolar bands, Soldered and Repositioned on the model.
- Acrylic Nance button with Begg's buccal tube and short labial bow is prepared and polished.
- Insert Bayonet Bend and director in lingual sheath. Adjust and cut to length as necessary. Cut ends of the bayonets and directors, check for smooth finish and free sliding movement without friction.
- All elements follow natural anatomical contours, connect together passively, and do not impinge the soft tissues at any time.
- *Anchorage is obtained from 1st bicuspid, 2nd bicuspid, short labial bow and Nance Button*

APPLIANCE PLACEMENT AND ACTIVATION

- Remove separators and seat the appliance completely, check for the passive fit of directors and bayonets — adjust as necessary prior to cementation.
- Mix GI luting cement, load bands and cement the appliance as a single unit, in the customary manner.
- Open NiTi coil spring is placed in the horizontal arm of bayonet and director. Length of the coil spring is approximately same as the length of horizontal arm length of bayonet and director.
- The appliance is activated initially after cementation and by complete compression of coil spring, approx 7 mm with force of 180 to 200 grams.



Fig : Pre & Post distillation appliances

- The case was treated with a Modified Custom Made Distal Jet appliance for a duration of 11 months and a bodily distalization of 10 mm were achieved on both the side with rate of 0.8 to 1mm per month.
- There was minimal loss of anchorage and distal tipping of molar as evaluated by radiograph, without mesiopalatal rotation of molar, bite opening, buccal flaring of posterior and no any worsening of profile.
- It is recommended to reactivate the appliance by fabricating new Bayonet and Directors with more horizontal length of director resulting in increased NiTi coil spring length to achieve desired force magnitude for further distalization

AFTER MOLAR DISTALIZATION AND ALIGNMENT



Fig-5: Right side view Fig-6: Occlusal view Fig-7: Left side view

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