

Molar Distalization with a Modified Distal Jet Appliance

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The Distal Jet* is a fixed palatal appliance that is most commonly used to distalize the maxillary molars, either unilaterally or bilaterally. Advantages of the Distal Jet include improved esthetics, minimal reliance on patient cooperation, ability to be used simultaneously with full fixed appliances, and ease of conversion to a Nance holding arch.

The appliance is activated by sliding a collar along the supporting tube to compress a coil spring, then fixing the collar in place by tightening a small set-screw.¹ This procedure is sometimes difficult because of the small size of the screw, the moisture and confined space of the intraoral environment, and food impaction in the screw head. In addition, activation requires the use of a small Allen wrench, which has the risk of being swallowed or aspirated.²

The present article describes a modification that eliminates some of these difficulties.

Appliance Design

The basis of the modification is the rear entry of the sliding section into the lingual molar

sheath, so that the appliance pulls rather than pushes the molars distally. The doubled-back wire (or "foot") is inserted into the lingual sheath from the distal (Fig. 1). The foot should be a little longer than the sheath so it can be tied back to the sliding section with an elastomeric or metal ligature. We recommend the use of a ligature wire to avoid accidental breakage and possible ingestion.

Either .030" or .032" wire is suitable for the sliding sections. Support tubes of corresponding internal diameter are embedded in the acrylic Nance button. Care must be taken when bending the distal portion of each sliding wire to allow enough clearance from the tuberosity of the palate when the wire is removed. The desired amount of activation is achieved by compressing the coil spring between the distal end of the support tube and a stop soldered to the sliding wire.

To reactivate the appliance, the safety ligature is cut, the sliding wire is pulled out distally,

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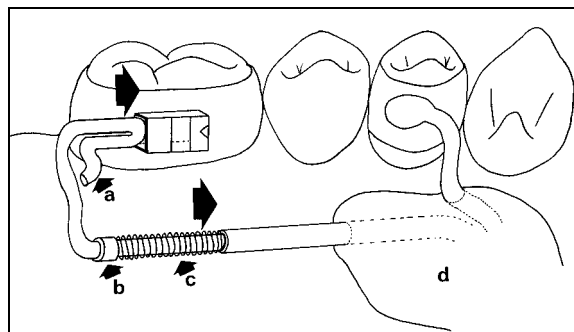


Fig. 1 Distal Jet with rear entry (large arrows) into palatal sheath on molar band. Locking arrow of palatal sheath is placed mesially, pointing distally. Wire bend (a) is used to tie "foot" to sliding section; stop collar (b) is soldered to sliding wire to compress coil spring (c). Support tube is embedded in acrylic Nance button (d).

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and a new, longer section of coil is placed over the wire. The sliding section is then reinserted as before. This process allows controlled activation of the appliance, with the coil lengthened in pre-

cise increments. In addition, no set-screws or Allen wrenches are used, simplifying the activation procedure. An alternative method of reactivation would be to add beads or sections of tub-

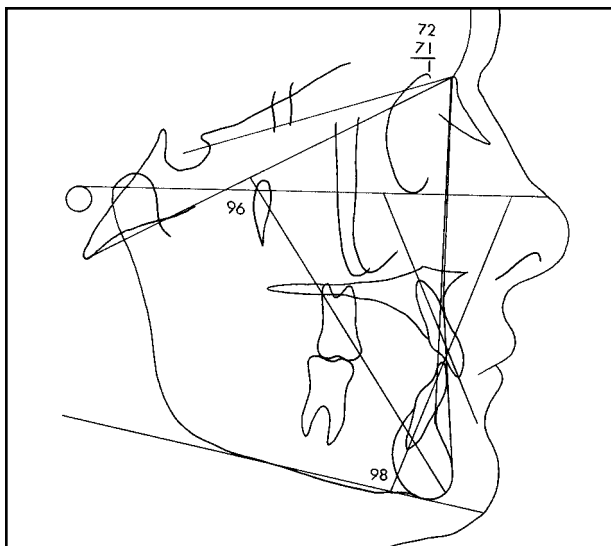


Fig. 2 17-year-old female Class II patient before treatment.

ing to reactivate the spring, instead of replacing the whole coil. Our experience, however, is that such methods increase the likelihood of patient irritation.

After molar distalization is completed, the molar positions are held by replacing the open coils with either closed coils or solid tubing to prevent anterior relapse. Alternatively, a new Nance button can be manufactured either at chairside³ or conventionally in the laboratory.

Case Report

A 17-year-old female presented with about 7mm of crowding in the maxillary arch, but only about 1mm in the mandibular arch (Fig. 2). The molar relationship was Class II on both sides, and the profile was straight, with a skeletal Class I pattern.

Treatment options included:

- Extraction of the maxillary first premolars, treating to a Class I canine and Class II molar relationship.
- Extraction of the maxillary first molars.
- Extraction of the maxillary second molars and distalization of the maxillary first molars into a Class I occlusion.

The last option was selected due to esthetic

profile considerations. After extraction of the maxillary second molars, the modified Distal Jet was placed (Fig. 3). Three and a half months later, spaces as wide as 4mm had appeared on both sides (Fig. 4). Another three months later, buccal coil springs were added to hold the molars (Fig. 5), which were then in a super-Class I relationship.

The maxillary second premolars were retracted using push-coil springs to the first premolars. The Distal Jet was then removed and replaced by a Nance holding arch. The mandibular arch was bonded, and maxillary spaces were closed using sectional arches to the first premolars and canines. Eighteen months into treatment, the rest of the maxillary teeth were bonded for



Fig. 3 Modified Distal Jet appliance shortly after placement. Note compressed coil spring and double tie (metal and elastomeric ligatures) around mesial extension of foot.



Fig. 4 After three and a half months of treatment.



Fig. 5 Buccal coil springs added to help control molar rotations.

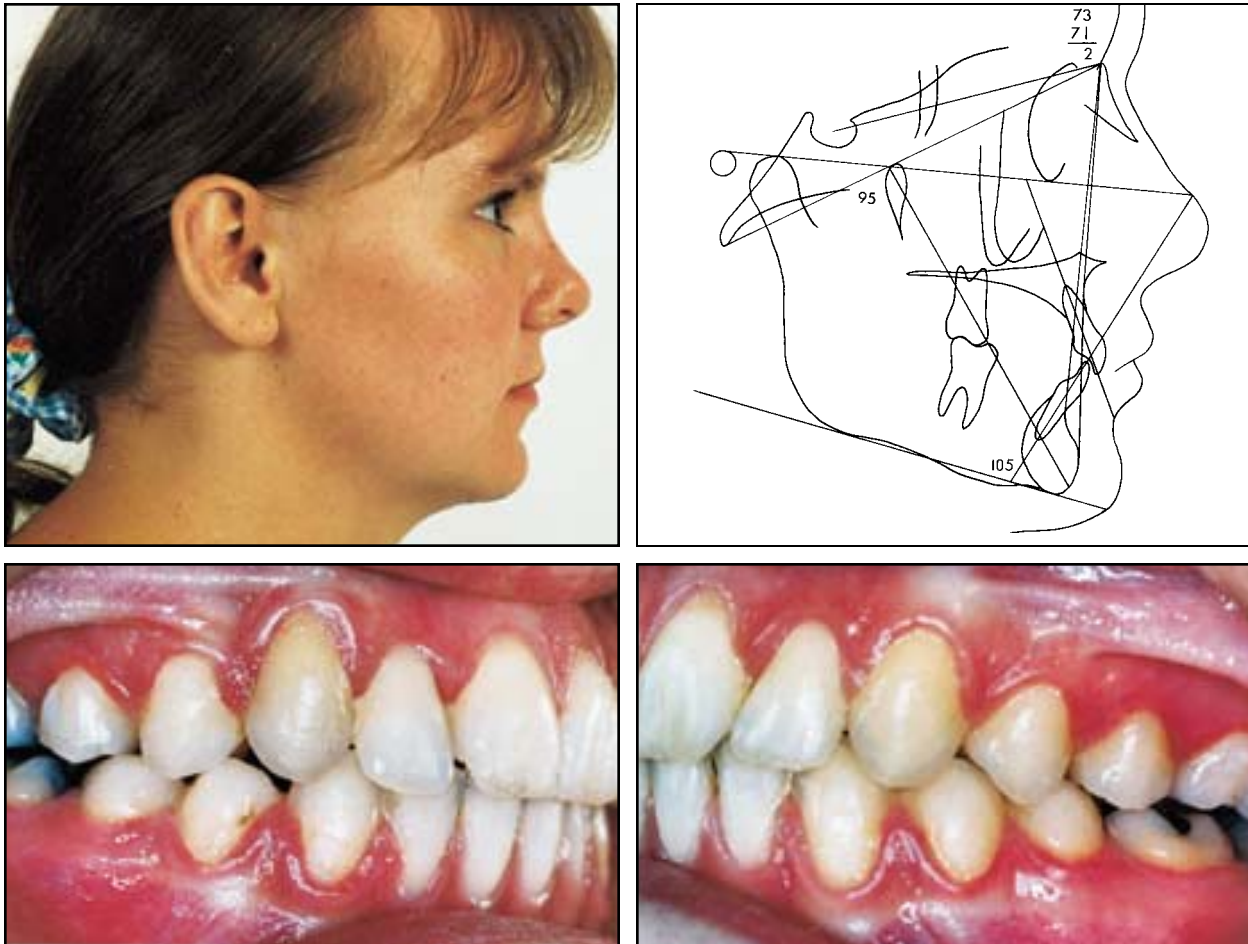


Fig. 6 After 24 months of treatment.

space closure. Class II elastics were used to maintain the molar correction.

Treatment was completed in 24 months. Class I molar and canine relationships were achieved on both sides, and the profile was esthetically pleasing (Fig. 6).

Discussion

Molar tipping was evident in the maxillary superimposition (Fig. 7), but it is unclear which mechanics were responsible—the modified Distal Jet or the buccal coil springs, or both. The use of buccal coil springs has been shown to



Fig. 7 Superimposition of cephalometric tracings before (black) and after (red or dashed line) treatment.

cause some degree of molar tipping,⁴ while the Distal Jet seems to produce more bodily movement.¹ In the case shown here, molar rotations were corrected, and incisor protrusion was negligible. At the seven-month retention visit, the buccal occlusion remained in a stable Class I relationship.

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