Case Report

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Molar Distalization using Distal Jet: A Case Report

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Abstract

Correction of Class II molar relationships often require distal movement of the maxillary posterior teeth. The Distal Jet appliance is an intraoral, fixed molar distalization appliance designed to produce distal movement of the maxillary first molars while minimizing patient compliance. This article reviews the the Distal Jet appliance can be an effective fixed intraoral method for correction of maxillary molar Class II relationships. Its advantages include reduced dependence on patient compliance and the ability to produce clinically significant molar distalization.

Keywords: Class II malocclusion; Distal Jet, molar distalization, orthodontic treatment.

Introduction

Molar distalization is a term that is commonly used for posterior movement of maxillary first permanent molars which helps in achieving space for correction of crowding or proclination in the anterior segment in borderline cases. Class II malocclusion is one of the most frequent problems in orthodontics, and distalization is considered one of the conservative ways to treat such cases [1,2]. Certain borderline cases with bilateral Endon molar with crowding may also require distalization of molars. In this article we present the method of correction of crowding with molar distalization using distal jet appliance.

Case Report

A 13-year-old growing female patient by name Thanaya visited the Department of Orthodontics with a chief complaint of irregularly placed upper front teeth. On extra orally with orthognathic profile and divergence with average growth pattern. Intraoral examination reveals bilateral End-on molar relation and end-on canine relation. Cross bite wrt 25,35 and labially placed 23 and crowding in maxillary and mandibular anterior with maxillary midline shift to left by 3mm and lower midline is shifted to right by 1mm on a Class II skeletal base with an overjet of 4mm and overbite of 2mm (Figure 1). A non-extraction orthodontic treatment plan was selected. Maxillary molar distalization was planned using a Distal Jet appliance. The Distal Jet was selected because it provides a fixed source of distalizing force and does not require active patient cooperation for activation. Following molar distalization, fixed orthodontic appliances were planned for comprehensive alignment and finishing.

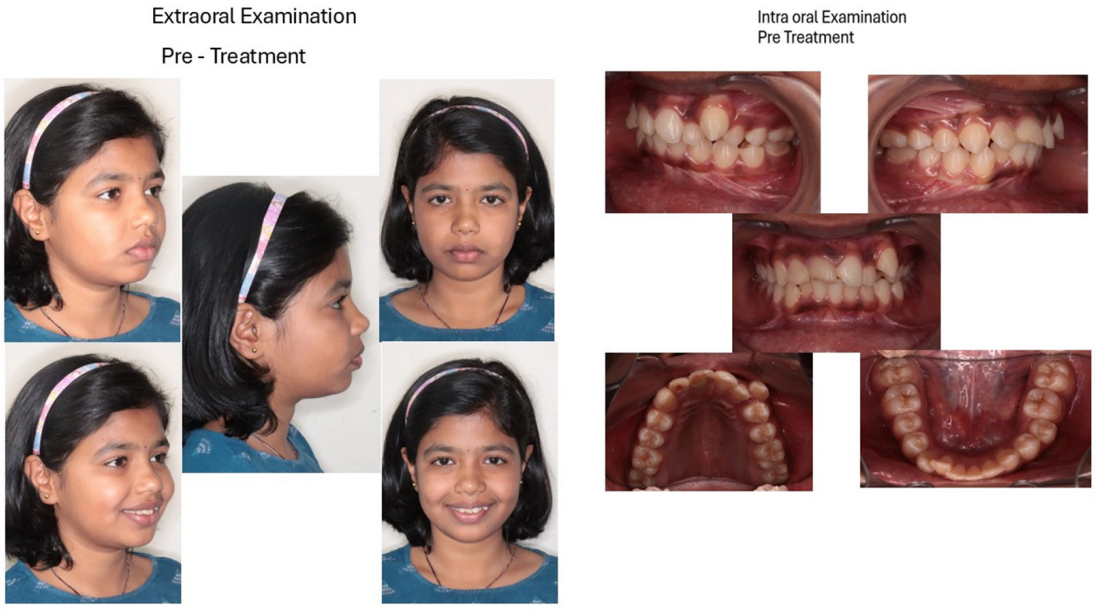


Figure 1: *Pre-treatment Photographs (Extra and Intra Oral Photographs).*

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Appliance Design and Placement:

The Distal Jet appliance consisted of:

- Acrylic palatal button.
- Bilateral telescopic distalizing mechanisms.
- NiTi compression coil springs.
- Molar bands.
- Premolar anchorage units.

The appliance was fabricated on the patient's maxillary working model. The first molars were banded and connected to the distalizing mechanism. The anterior anchorage component was secured to the premolars and incorporated into the palatal acrylic button. After cementation, the appliance was activated to deliver distal force per side. The patient was reviewed at regular intervals of approximately [3–4 weeks] to evaluate appliance integrity, oral hygiene, molar movement, and progress toward the planned distal relationship. Design of the appliance:

Dr. Carano and Dr. Testa [8] in the year 1996 developed distal jet appliance. This was developed to overcome the disadvantages of another appliance. It is a fixed lingual appliance that can produce unilateral or bilateral molar distalization typically in 6-9 months without relying on patient cooperation. The appliance permits simultaneous use of Preadjusted Edgewise appliance to achieve levelling and alignment, thus avoiding the need for two phase treatment.

Appliance Design:

Appliance consists of bilateral tubes of 0.036" internal diameter which are attached to an acrylic Nance button. A coil spring and a screw clamp are slide over each tube. The wire extending from the acrylic button through each tube ends in a bayonet bend that is inserted into the lingual sheath of the 1st molar band. An anchor wire from the Nance button is soldered to bands on the second premolars (Figure 2). The distal jet is reactivated by sliding the clamp closer to the 1st molar once a month. Once distalization is complete, the appliance can be converted to a Nance retainer simply by replacing the clamp spring assemblies with light cured/ cold cure acrylic and cutting the arms of the premolar.

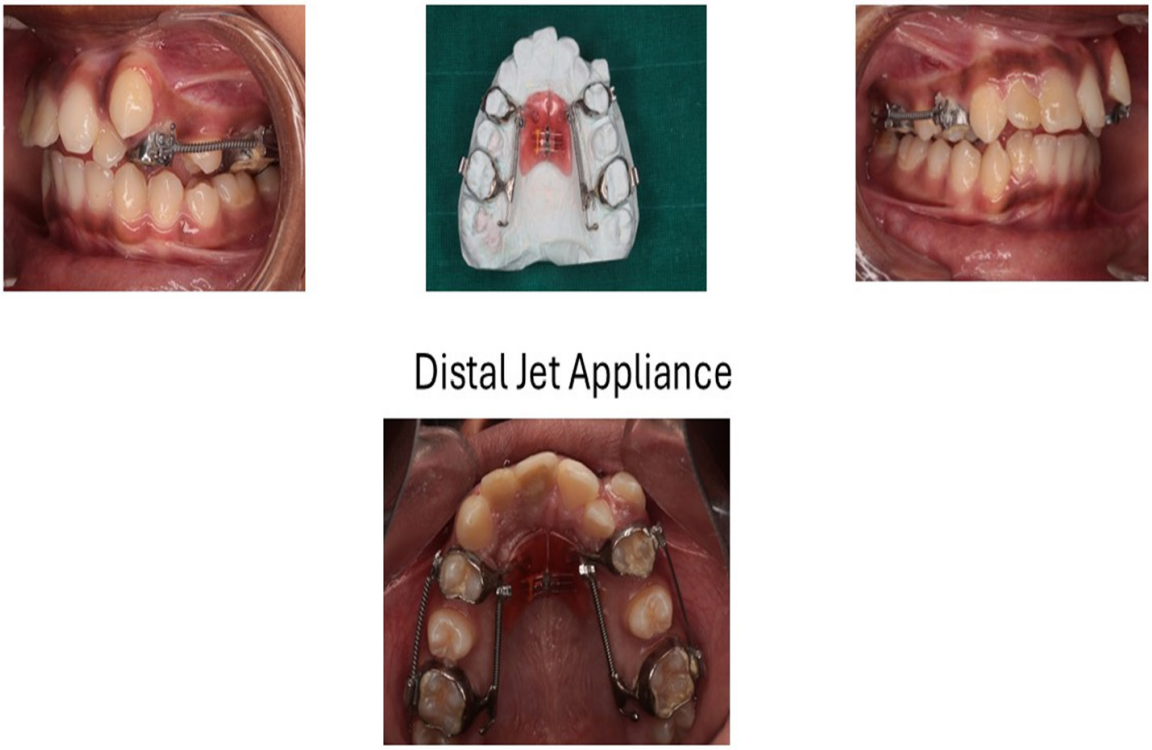


Figure 2: *Appliance Design and Insertion.*

The Treatment Objectives were to:

1. Correction of proclination both in the upper and lower anteriors,
2. Correction of crowding in maxillary anterior teeth,
3. Correction of molar relation.
4. To Achieve appropriate overjet and overbite. To eliminate crowding and achieve Class I occlusion bilaterlally, distalization of the maxillary molars and with the space created utilize for correction of crowding in the upper arch. The appliance used for distalization is the distal jet appliance (Figure 2)

Treatment Progress

During the initial phase of treatment, distal movement of the maxillary first molars was observed. The molars gradually moved distally toward a Class I relationship. The active distalization phase lasted approximately 9 months. At the completion of distalization, the maxillary first molars had moved approximately 4 mm distally, from the clinical point of view. A bilateral Class I molar relationship was achieved. After adequate molar distalization, the distalizing appliance was removed/converted to a stabilization appliance], and comprehensive fixed orthodontic treatment was initiated.

Treatment Sequence

Phase I: Distal Jet appliance placement and activation.
Phase II: Maxillary molar distalization until a Class I molar relationship was obtained.
Phase III: Removal of/transition from the distalization appliance and placement of fixed orthodontic appliances.
Phase IV: Alignment, leveling, space closure and finishing.
Phase V: Retention.

Treatment Results

At the end of active treatment, the patient demonstrated:

1. Bilateral Class I molar relationship.
2. Improved canine relationship.
3. Normal Overjet and overbite.

4. Maxillary crowding corrected.
5. Improved dental alignment.
6. Improved intercuspation.
7. Acceptable facial aesthetics.

The total active treatment duration was approximately 26 months. Figure 3

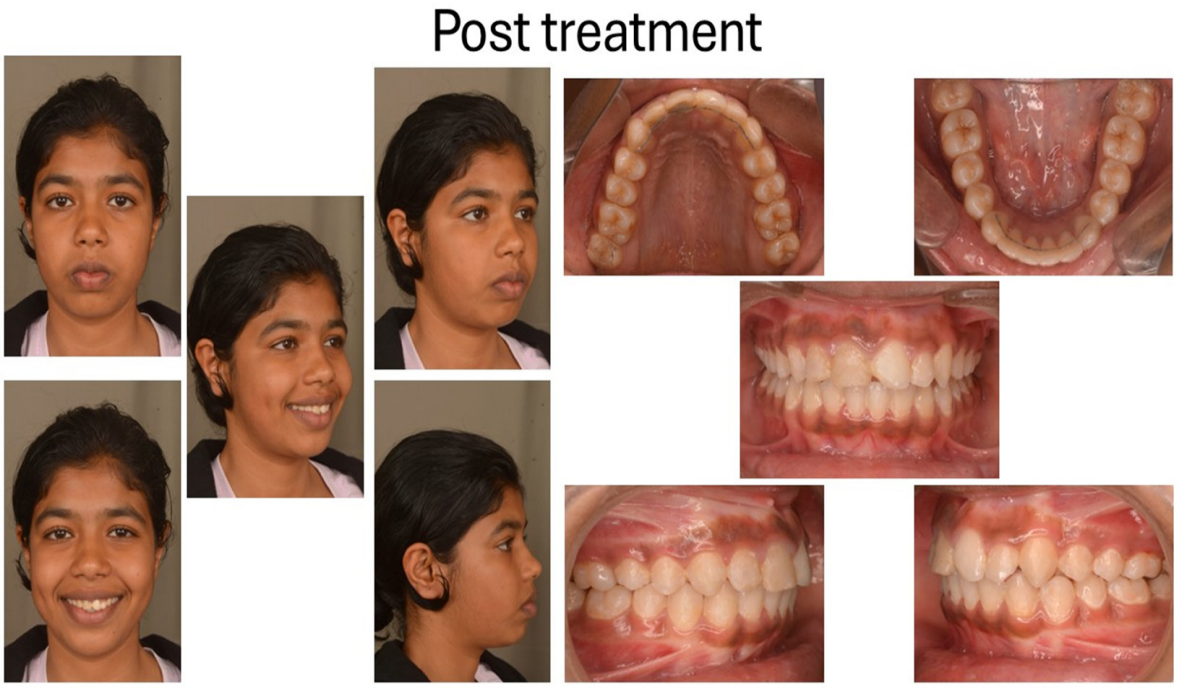


Figure 3: *Post Treatment Photographs (Extra Oral and Intra Oral Photographs).*

Cephalometric comparison demonstrated [describe changes in molar position, incisor inclination, skeletal parameters, and vertical dimensions].

Discussion

Maxillary molar distalization is an important treatment option in selected patients with Class II malocclusion. Extraoral appliances such as cervical-pull or high-pull headgear can provide effective distalization but depend substantially on patient cooperation. Consequently, fixed intraoral distalization appliances have gained popularity. The Distal Jet appliance provides continuous distal force through compressed coil springs. Its intraoral design eliminates the need for visible extraoral components and reduces dependence on patient compliance. One important consideration during distalization is the anchorage requirement. Because the distalizing force is accompanied by an anterior reciprocal force, unwanted mesial movement of the anchorage teeth can occur. Incorporation of the premolars and palatal acrylic button provides additional anchorage. Nevertheless, careful monitoring of anchorage loss and molar tipping is important. Another consideration is the type of molar movement achieved. Depending on appliance design, force magnitude, point of force application, and individual patient characteristics, distal movement may involve a combination of bodily movement and distal tipping. Therefore, post-treatment radiographic and model evaluation is useful for determining the actual nature of molar movement. The unique design of the distal jet , as a device that could be converted to a modified Nance Holding arch while seated in the mouth during fixed appliance therapy [3-5].In the present case, the Distal Jet appliance successfully produced the planned distalization of the maxillary molars and facilitated correction of the Class II molar relationship without extraction of premolars.

Conclusion

The present case demonstrates that the Distal Jet appliance can be an effective fixed intraoral approach for maxillary molar distalization in appropriately selected Class II patients. It offers the advantages of reduced dependence on patient compliance, continuous force application, and relatively straightforward clinical management. However, careful diagnosis and treatment planning are essential because the amount and nature of molar movement, anchorage loss, molar tipping, and vertical changes may vary between patients. Long-term stability should also be evaluated before considering the technique universally applicable.

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