

## CASE REPORT

# Non-extraction Orthodontic Treatment with Molar Distalization

Vikas Malik, Puneet Yadav, Seema Grover, Girish Chaudhary

## ABSTRACT

A case report of 16 years female who reported to department with chief complaint of irregularly placed front teeth and an unpleasant smile. Patient was diagnosed with class II div 2 malocclusion with arch length discrepancy of 8.5 mm in maxilla with buccally placed maxillary canines. Molar distalization technique was planned using pendulum appliance. Molars were distalized by 5 mm in the right, 6 mm in left maxillary arch. Crowding was relieved effectively utilizing space created by molar distalization. Class I molar and canine relation was achieved and maxillary arch was aligned in 7 months.

**Keywords:** Non-extraction, Molar distalization, Pendulum appliance.

**How to cite this article:** Malik V, Yadav P, Grover S, Chaudhary G. Non-extraction Orthodontic Treatment with Molar Distalization. *J Orofac Res* 2012;2(2):99-103.

**Source of support:** Nil

**Conflict of interest:** None declared

## INTRODUCTION

To extract or not to extract has been a key question in planning orthodontic treatment for past 100 years. It has always been and still remains one of the longest running controversies in orthodontics.

Extraction in orthodontics is undertaken in severe crowding, protrusion and severe arch discrepancy cases to provide space to align the remaining teeth. The advances in mechanotherapy and changes in treatment concepts have decreased the need for extraction in mild-to-moderate arch discrepancies. Recently the orthodontists are opting for the non-extraction approach in many related cases.

Leonard Bernsteine (1969)<sup>1</sup> used the ACOO (acrylic cervical occipital anchorage) appliance a removable acrylic appliance which is used in conjunction with a northwest headgear for mass distal movement of buccal segments. Gianelly et al<sup>2</sup> (1988) used intra-arch repelling magnets to distalize the maxillary molars to gain space.

The molar distalization is a more prominent and non compliance method for the correction of malocclusion in orthodontics. It is often used to create space in the maxillary dental arch and to correct a class II relationship in deciduous as well as permanent dentition. This is especially desirable in cases with arch discrepancy not more than 8 mm with limited dental protrusion. The moderate class II div 2 and impacted canine cases fall best in this category.

The other indications for molar distalization include an end-on or full class II molar relationship due to maxillary protrusion, an end-on or full class II molar relationship due to maxillary cuspids being either impacted, unerupted or erupted labially and high in the vestibule or due to the ectopic eruption of either the first or second bicuspid.

The pendulum appliance was introduced by Dr Hilgers<sup>3</sup> in 1992, is a hybrid appliance that uses a large Nance acrylic button in the palate for anchorage, along with 0.032" TMA spring that delivers light, continuous force to the upper 1st molars. The spring can also be adjusted to expand and rotate the maxillary 1st molars.

The following case is presented to show nonextraction treatment strategy utilizing pendulum appliance.

## DIAGNOSIS

### Case Report

A 16-year-female reported to the Department of Orthodontics and Dentofacial Orthopedics with chief complaint of irregularly placed upper and lower front teeth. She had a mesocephalic head, euryprosopic face and competent lips. She presented with convex facial profile and straight facial divergence. The molar relationship was class II on both the sides with decreased overjet and 7 to 8 mm of overbite with buccally placed canine. The upper and lower anteriors were retroclined with 2 mm discrepancy in upper arch and 7.5 mm discrepancy in lower arch (Figs 1 to 3).

Cephalometric analysis revealed protrusive maxilla and retruded mandible having class II skeletal bases with an ANB angle of 6°. Convergent jaw bases indicated a normal growth pattern having mandibular plane angle of 30°.

### Treatment Plan

For this case, initially molar distalization with pendulum appliance, holding maxilla molars with nance palatal button for alignment of crowded arch was planned. Following this the fixed mechanotherapy for correction of overjet and overbite was decided.

In this case (Figs 4 to 6) maxillary molar distalization was achieved in 7 months. Cephalometric analysis evaluation was done after molar distalization (Table 1). It showed bodily movement of maxillary molar by 5.5 mm.



Fig. 1: Pretreatment extraoral photographs



Fig. 2: Pretreatment intraoral photographs



Fig. 3: Pretreatment occlusal photographs

Table 1: Cephalometrics analysis		
Parameters	Pretreatment	Posttreatment
SNA	84°	82°
SNB	78°	77°
ANB	6°	5°
SN-GoGn	30°	30°
PtV (Pterygoid vertical) to A6	26 mm	20.5 mm
IMPA	93°	105°
FMA	26°	25°

Molar relation was greatly improved from class II to I due to maxillary molar distalization. There was no change in mandibular plane angle which showed no anchorage loss in lower arch.

During the treatment, anchorage control was achieved in lower arch using lingual holding appliance. It had a discrepancy of 7.5 mm which was resolved by reproximation of the lower anteriors keeping in mind the Bolton's ratio. Upper arch was well aligned with pendulum appliance by



Fig. 4: Intraoral photographs showing pendulum appliance



Fig. 5: Intraoral postmolar distalization photographs



Fig. 6: Postmolar distalization occlusal photographs

regaining space. There was no change in profile of patient. Lip strain decreased in due course of treatment. Class I canine and molar relation were achieved. Cephalometric pretreatment and posttreatment tracings have been shown in Figures 7A and B. Radiographic evaluation has been shown in OPG in Figures 8A and B.

#### Treatment Progress/Protocol

Pendulum appliance consists of wire made of beta titanium alloy (TMA) springs exerting a force of 230 gm when the springs were activated 90°. In mandibular arch roth 0.022 slot preadjusted brackets were bonded. Initial leveling and alignment were achieved with 0.014 inch nickel-titanium

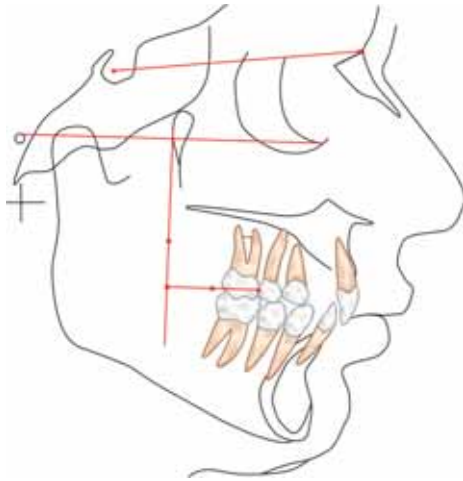


Fig. 7A: Pretreatment cephalometric analysis

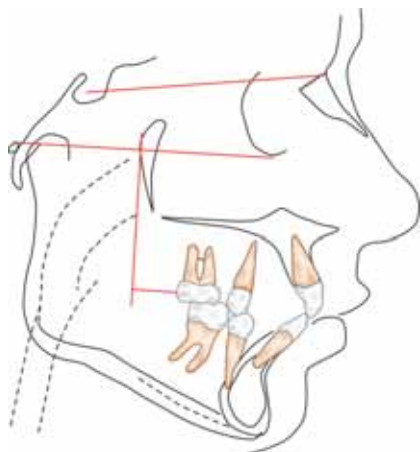


Fig. 7B: Posttreatment cephalometric analysis



Fig. 8A: Pretreatment OPG



Fig. 8B: Posttreatment OPG

wires. Because only a modest amount of alignment was needed, this phase was completed with  $0.017 \times 0.025$  inch nickel-titanium and  $0.019 \times 0.025$  inch stainless steel wires.

The case is still under progress and requires stabilization phase of 3 months followed by settling of occlusion before debonding.

## DISCUSSION

Orthodontists have long sought the methods of correcting class II malocclusion without straining the lower arch and without the need for strict patient compliance. In the 1990's, noncompliance therapies in various forms have become more prominent than ever before. Using intraoral appliances, maxillary molars can routinely be moved distally with little or no patient cooperation.

The literature enumerates various appliances available for molar distalization, such as Pendulum,<sup>3</sup> Jones-Jig appliances,<sup>4</sup> Distal Jet,<sup>5</sup> Jasper Jumper,<sup>6</sup> Wilson distalization<sup>7</sup> mechanism and microimplants.<sup>8</sup>

Pendulum is a hybrid appliance that uses a large nance acrylic button in the palate for anchorage. Along with conservation of anchorage it produces light continuous force on maxillary first molar with  $0.032$ " TMA spring, without affecting palatal button which is the main advantage of this appliance. The advantages of this appliance were esthetics, function, minimal need for patient compliance and less chair side time for placement and reactivations.

With present case report findings, class II molar relation was changed to class I molar relation due to distal molar movement. The maxillary incisors proclined to obtain ideal overjet and overbite. Joseph and Chris Butchart<sup>9</sup> studied the effects of the pendulum appliance on molar distalization. Vertical dimension and anchorage loss were measured at the incisor and molar teeth, and it was found out that distalization occurred quite rapidly and class I molar relationship was achieved in an average time of 3 to 4 months. Caprioglio et al<sup>10</sup> compared the dentoalveolar and skeletal effects produced by two different molar intraoral distalization appliances, pendulum and fast-back, both followed by fixed appliances, in the treatment of class II malocclusion. During molar distalization the pendulum subjects showed greater distal molar movement and less anchorage loss at both the premolars and maxillary incisors than the fast-back subjects.

## CONCLUSION

The proper diagnosis in selection of patient is key to success in pendulum appliance. The pendulum appliance drives the upper molars distally quite rapidly. Hence, there is tendency to anterior bite to open. This can be a problem in

dolicocephalic patients especially those with tongue thrust habits. Therefore, patient selected in this case was mesocephalic where bite opening was not a problem. The anchorage was maintained and there was no mandibular molar mesialization. The upper arch was properly aligned by gaining space after distalization of maxillary molars with no anchorage loss.

## REFERENCES

- Bernstein L. The ACOO appliance. *J Clin Orthod* 1969;3: 461-68.
- Gianelly AA, Vaitas AS, Thomas WM, Berger DG. Distalization of molars with repelling magnets. *J Clin Orthod* 1988;22: 40-44.
- Hilgers JJ. The pendulum appliance for class II noncompliance therapy. *J Clin Orthod* 1992;26:706-14.
- Jones RD, White JM. Rapid class II molar correction with an open-coil jig. *J Clin Orthod* 1992;26:661-64.
- Carano A, Testa M. The distal jet for upper molar distalization. *J Clin Orthod* 1996;30:374-80.
- Jasper JJ, Mcnamara JA Jr. The correction of interarch malocclusion using a fixed force module. *Am J Orthod Dentofacial Orthop* 1995;108:641-50.
- Wilson WL, Wilson RC. Multidirectional 3D functional class II treatment. *J Clin Orthod* 1987;21:186-89.
- Hyo-Sang Park, Tae-Geon Kwon, Jae-Hyun Sung. Non-extraction treatment with microscrew implants. *Angle Orthod* 2004;74:539-49.
- Abu A Joseph, Chris J Butchart. An evaluation of the pendulum distalizing appliance. *Semin Orthod* 2000;6:129-35.
- Caprioglio A, Beretta M, Lanteri C. Maxillary molar distalization: Pendulum and fast-back, comparison between two approaches for class II malocclusion. *Prog Orthod* 2011;12:8-16.

## ABOUT THE AUTHORS

### Vikas Malik

Senior Lecturer, Department of Orthodontics and Dentofacial Orthopedics, SGT Dental College and Research Institute, Gurgaon Haryana, India

### Puneet Yadav

Senior Lecturer, Department of Orthodontics and Dentofacial Orthopedics, SGT Dental College and Research Institute, Gurgaon Haryana, India

### Seema Grover

Professor, Department of Orthodontics and Dentofacial Orthopedics SGT Dental College and Research Institute, Gurgaon, Haryana, India

### Girish Chaudhary

Postgraduate Student, Department of Orthodontics and Dentofacial Orthopedics, SGT Dental College and Research Institute, Gurgaon Haryana, India

## CORRESPONDING AUTHOR

Vikas Malik, Senior Lecturer, Department of Orthodontics and Dentofacial Orthopedics, F-401, Alaknanda Apartment GH-45 Sector 56, Gurgaon-122002, Haryana, India, Phone: 09871444077 0124-2386401, e-mail: vikasortho@gmail.com