Asymmetric Distalization with a TMA Transpalatal Arch

MASSIMILIANO MANDURINO, DDS
LAURA BALDUCCI, DDS

Many devices have been developed for distalizing the maxillary molars in Class II cases without requiring additional patient cooperation. These include repelling magnets,[1-4] stainless steel[5-7] and nickel titanium[2,8,9] coil springs, the Distal Jet,*[10,11] the Jones Jig,*[7,12,13] the Jasper Jumper,*[14] looped nickel titanium archwires,[15,16] titanium molybdenum springs[17] (the Pendulum appliance**[18-20]), and sagittal screws (First Class Appliance***[21]).

These methods can all produce bodily distal movement of the maxillary molars, but can also cause a mesial movement of the maxillary premolars and canines, or a proclination of the mandibular incisors when Class II elastics are used. In addition, the loss of anterior anchorage often leads to relapse of the maxillary molars during the correction of the canine relationship, overbite, and overjet.

Maxillary molars can be distalized unilaterally by using a Goshgarian transpalatal arch in conjunction with extraoral traction, according to Cetlin's method.[22] A toe-in bend in the transpalatal arch applies a mesiobuccal rotation to the maxillary molar on the side of the bend and a distally directed force against the molar on the opposite side. This procedure does not cause a loss of anterior anchorage, but can be time-consuming. We have modified Cetlin's technique to reduce treatment time and improve the efficiency of unilateral maxillary molar distalization.

Appliance Design

The transpalatal arch is made from the same .032" TMA** bars used to construct Pendulum springs. TMA is more elastic and resilient than the stainless steel used in the conventional Goshgarian arch.

The direction of insertion of the transpalatal arch into the occlusal molar tubes is also dif-

*American Orthodontics, 1714 Cambridge Ave., Sheboygan, WI 53082.

**Ormco/"A" Company, 1717 W. Collins Ave., Orange, CA 92867. TMA is a registered trademark.

***LeoneAmerica, 1200 Stellar Drive, Oxnard, CA 93033.

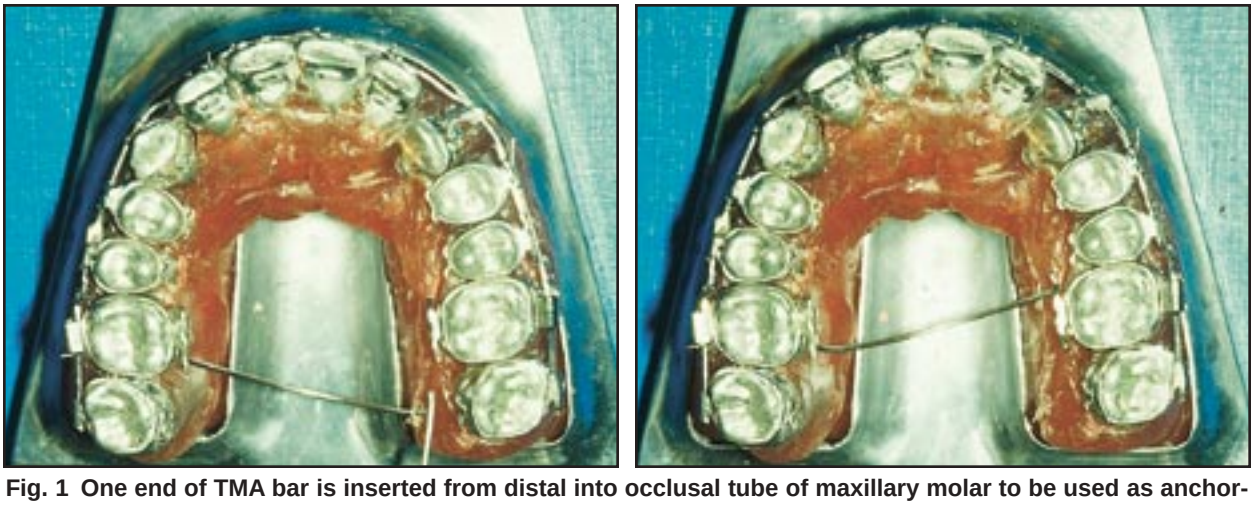

Fig. 1 One end of TMA bar is inserted from distal into occlusal tube of maxillary molar to be used as anchorage; other end is inserted from mesial into occlusal tube of molar to be distalized.

Dr. Mandurino is in the private practice of orthodontics at 3, Leopardi Square, 60131 Osimo, Italy. Dr. Balducci is an orthodontist in Dr. Mandurino's office.

Dr. Mandurino

Dr. Balducci

ferent: the arch is inserted from distal into the tube of the maxillary molar used as anchorage, and from the mesial into that of the maxillary molar to be distalized (Fig. 1). This makes the TMA arch more effective, because the end inserted from the distal is more posterior than the end inserted from the mesial. When activated, the arch applies a mesiobuccal rotation to the anchor molar and a distally directed force to the opposite molar (Fig. 2).

The transpalatal arch can be constructed by a laboratory or in the office using a Weingart or similar plier (Fig. 3). The central omega loop is not needed because the TMA arch is not being used for palatal expansion. If expansion is required, it should be carried out in advance using a traditional transpalatal arch or other method.

The TMA arch is reactivated monthly by bending the end inserted from the distal about 30° (Fig. 4).

Case Report

A 12-year-old male presented with Class II molar and canine relationships on the right side and a Class I occlusion on the left, after about two years of therapy with a combination headgear and fixed orthodontic appliances (Fig. 5).

A TMA transpalatal arch was placed as

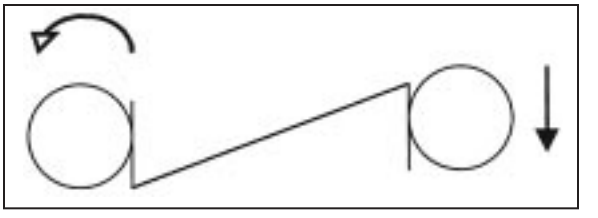

Fig. 2 TMA arch produces distally directed force against molar to be distalized and mesiobuccal rotation of anchor molar.

Fig. 3 Construction of TMA arch, using Weingart or similar plier. A. Ends of TMA bar doubled back. B. Doubled ends bent at 90° angles. C. Arch bent carefully into final form.

Fig. 4 Reactivation of TMA arch by bending anchor end about 30°.

Fig. 5 TMA transpalatal arch placed in 12-year-old male patient with Class II molar and canine relationships on right side and Class I on left.

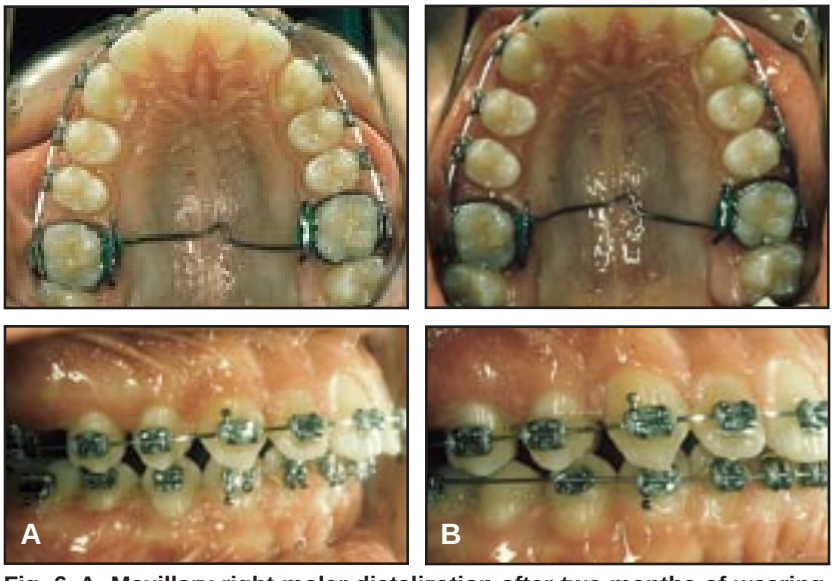

Fig. 6 A. Maxillary right molar distalization after two months of wearing TMA arch. B. After four months of treatment, note distal drift of maxillary right premolars.

Fig. 7 Retraction of maxillary incisors and space closure after eight months of treatment.

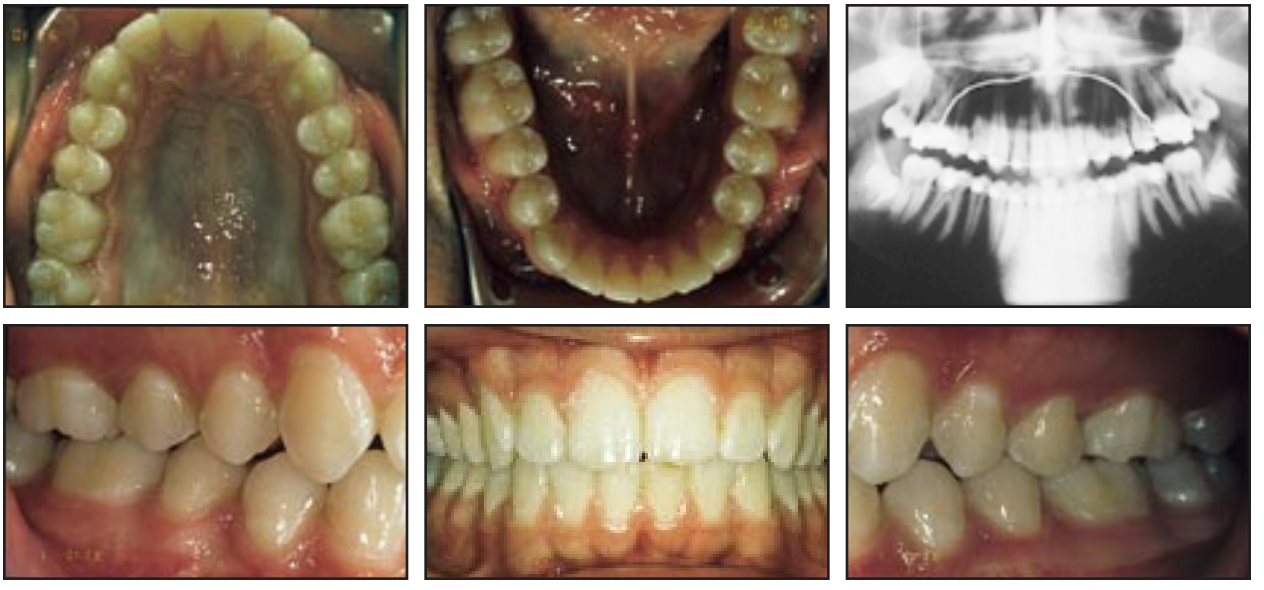

Fig. 8 Bilateral Class I molar and canine relationships after treatment.

described above, and the patient was instructed to wear extraoral traction only at night. Within six months, the maxillary right first molar had moved distally, and the maxillary premolars had followed it spontaneously (Fig. 6).

Spaces were closed and the maxillary incisors were retracted within eight months using sliding mechanics, with closed-coil springs between the first molars and hooks soldered distally to the lateral incisors (Fig. 7).

A bilateral Class I molar and canine relationship and a correct overjet and overbite were achieved (Fig. 8). The third molars were to be extracted later.

Discussion

This method of unilateral maxillary molar distalization has several advantages:

- TMA has better shape memory and resilience than stainless steel.
- The arch is simple to construct.
- The system is hygienic and economic.
- There is no anterior anchorage loss; the premolars and canines spontaneously follow the molar distally.

Important clinical considerations include:

- Because TMA is more fragile than stainless steel, the arch must be bent carefully, and fractures in the mouth are more common.
- Since the TMA arch rotates the anchor molar more mesiobuccally than a conventional arch does, it should be combined with a fixed orthodontic appliance using a rectangular archwire or a passive stainless steel wire segment between the second molar and canine on the anchor side.
- The system can only distalize one molar at a time, and therefore is recommended for use with unilateral or slight bilateral Class II molar relationships.
- An extraoral appliance should be worn at night to reinforce anchorage.

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