

The First Class Appliance for Rapid Molar Distalization

ARTURO FORTINI, MD, DDS
MASSIMO LUPOLI, MD, DDS
MASSIMILIANO PARRI

When the choice is made to treat a Class II case on a nonextraction basis, or with the extraction of maxillary second molars, then distalization of the maxillary first molars is often the first step in orthodontic treatment.¹⁻⁴ In the past, the primary means of distalization have been headgear and/or a sliding jig, with Class II elastics from the mandibular arch. Because these methods require a significant amount of patient cooperation, new kinds of “non-compliance” appliances have been developed, including the Wilson Jig,^{*} the K-loop,⁵ the Jones Jig,^{**6} the Gianelly jig,⁷ the Locasystem,⁸ the Pendulum appliance,^{***9} the fixed piston appliance,¹⁰ and the Distal Jet.^{**11}

Clinical results with the Distal Jet seem to indicate that the maxillary molars are distalized in a bodily manner and that minimal patient

cooperation is required.¹¹ However, in using the Distal Jet, we have observed some anchorage loss in the anterior segment as the molars are distalized.

To minimize this anchorage loss, we have developed a new type of appliance for unilateral or bilateral distalization of the maxillary first molars. This is referred to as the First Class Appliance for rapid molar distalization.[†]

Appliance Design

Bands are placed on the maxillary first molars and on either the maxillary second premolars or the second deciduous molars (Fig. 1). Impressions are taken with these bands in place, and a working cast is poured. The laboratory construction is carried out as follows:

1. *Vestibular components.* Formative screws[†] are soldered on the buccal sides of the first molar bands, occlusal to the .022" × .028" single tubes, so they will not interfere with subsequent insertion of the archwire (Fig. 2). Split rings, welded to the second premolar or second deciduous molar bands, control the vestibular screws. Stop

*RMO, Inc., P.O. Box 17085, Denver, CO 80217.

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

***Ormco/"A" Company, 1717 W. Collins Ave., Orange, CA 92867.

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

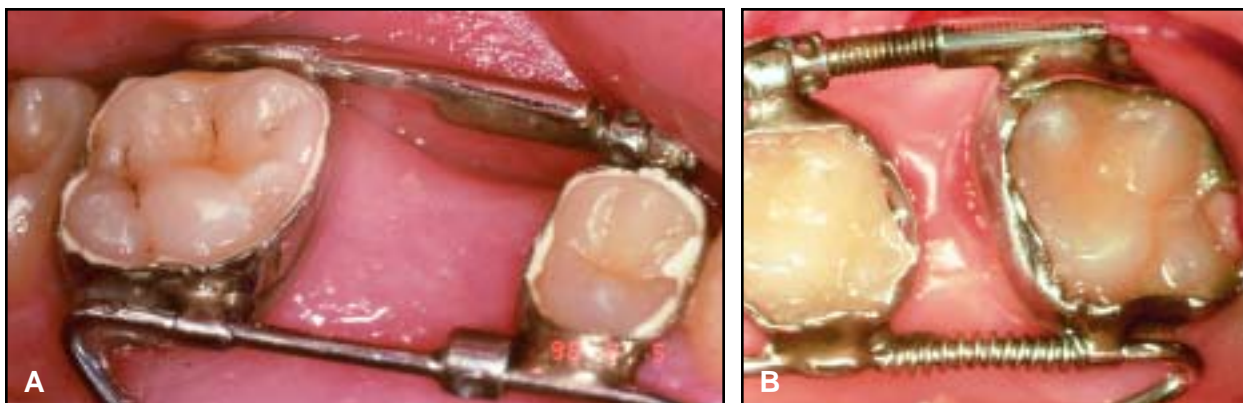


Fig. 1 A. First Class Appliance attached to bicuspids. B. First Class Appliance attached to second deciduous molars.

Dr. Fortini is in the private practice of orthodontics at Via Valentini 8/d, 59100 Prato, Italy. Dr. Lupoli is in the private practice of orthodontics in Florence, Italy. Mr. Parri is an orthodontic laboratory technician in Prato, Italy.



Dr. Fortini



Dr. Lupoli



Mr. Parri

screws are used to maintain the distal positions of the molars after active movement has been completed.

2. *Palatal components.* In the palatal aspect, the appliance is much like a modified Nance button, but is wider and has a butterfly shape for added stability and support during retention (Fig. 3). The embedded .045" wires should be in single sections, without welded joints, to prevent breakage. Sections of .045" tube are soldered to the palatal sides of the first molar bands for insertion of the butterfly component of the appliance.

These tubes allow the molars to be distalized without undesirable tipping. The butterfly section is soldered to the second bicuspid or deciduous molar bands.

Nickel titanium .010" × .045" coil springs, approximately 10mm each in length, are fully compressed between the bicuspid solder joints and the tubes on the deciduous molar or second bicuspid bands (Fig. 4). These springs are designed to balance the action of the vestibular screws, preventing molar rotations and development of posterior crossbites.



Fig. 2 Formative screw soldered to occlusal side of .022" × .028" molar tube.



A



B

Fig. 3 A. Palatal Nance button with butterfly shape. B. Tube section allows distal movement.

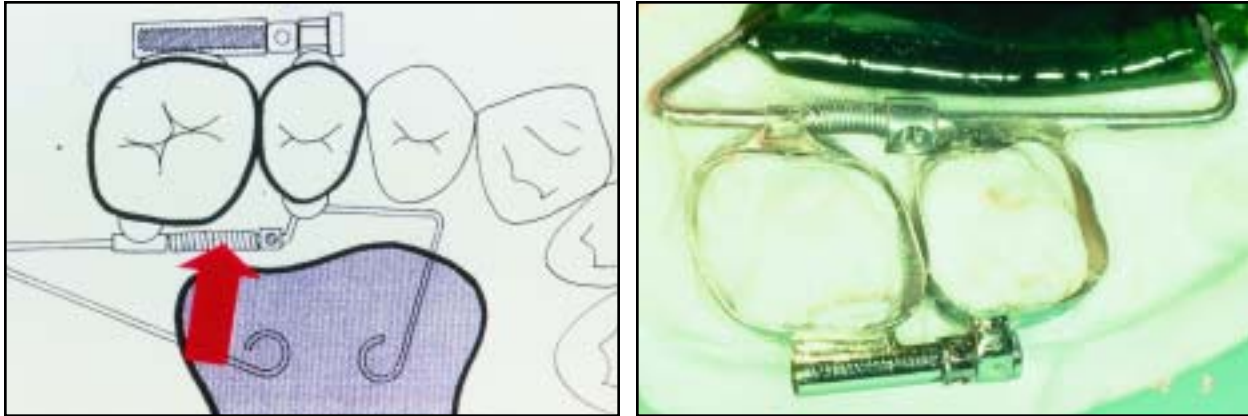


Fig. 4 Nickel titanium compressed-coil spring and stop.

Appliance Uses

The First Class Appliance distalizes the first molar bodily, even when the second molar is present. It can be used in either the permanent or the mixed dentition, in the following types of cases:

- Dental or skeletal Class II cases characterized mainly by maxillary protrusion, near the end of the patient's growth.
- Low-angle, deep-bite cases (Class II, division 2).
- Skeletal Class II cases where a lack of patient cooperation limits the effectiveness of orthopedic therapy with appliances such as bionators and twin blocks.
- Class II dental cases with a lack of maxillary arch length.
- Cases with severe crowding where space gaining is indicated.

To date, 62 Class II cases (37 females and 25 males) have been treated with the First Class Appliance. The age range of these patients was from 8.7 years to 14.5 years. The range of molar distalization was 4-8mm, with an average of 4.8mm. In the 11 cases that required more than 5mm of distalization, a new screw was placed after the initial 5mm activation had been completed. The average time for distalization was 42 days, with a range from 28 to 95 days.

Case 1

A 10½-year-old male presented with a high-angle Class II malocclusion and severe mandibular retrusion (Fig. 5A). A 3mm Class II dental relationship was present bilaterally, and the maxillary cuspids were crowded.

The First Class Appliance was placed with anterior support on the maxillary second bicuspids (Fig. 5B,C). Superimposition of beginning and progress cephalometric tracings showed 5mm of distal molar movement with no undesirable anchorage loss. The maxillary incisor position was unchanged (Fig. 5D,E).

Case 2

A 12½-year-old female presented with a slight maxillary retrusion (SNA 77.5°) and a mandibular retrusion (Fig. 6A). This resulted in a Class II skeletal pattern with a long vertical dimension. The maxillary right molar was in a 5mm Class II relationship, and there was maxillary crowding with a deep overbite.

The First Class Appliance was designed with anterior anchorage on the second bicuspid (Fig. 6B), and was advanced at home by the

(text continued on p. 327)

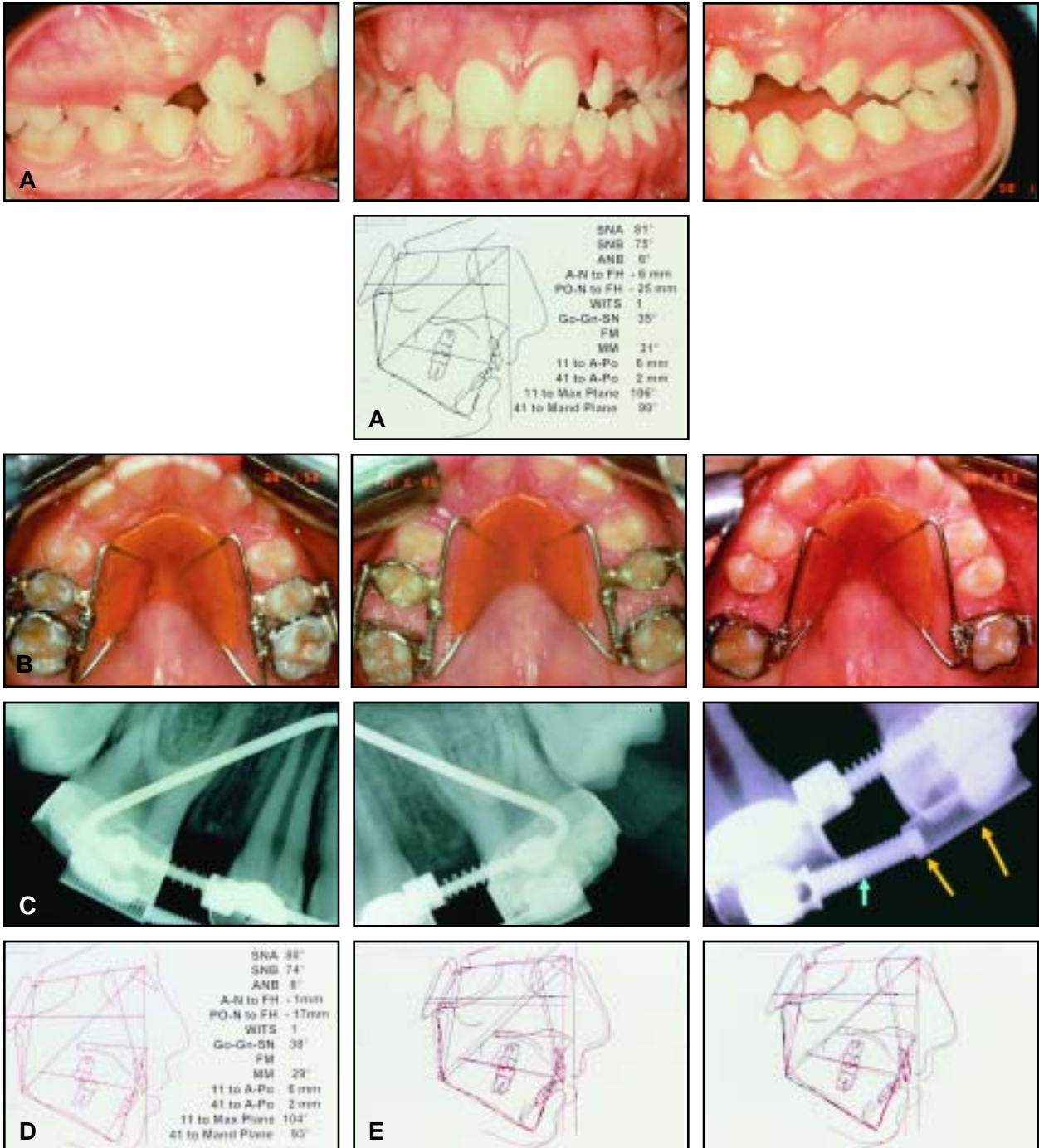


Fig. 5 Case 1. A. 10½-year-old male Class II patient before treatment. B. Occlusal views of appliance action, followed by passive use for anchorage support. C. Bodily distalization of first molars on both sides; detail of formative screw at end of activation. D. After five months of treatment. E. Superimpositions of cephalometric tracings before and after treatment.

The First Class Appliance for Rapid Molar Distalization

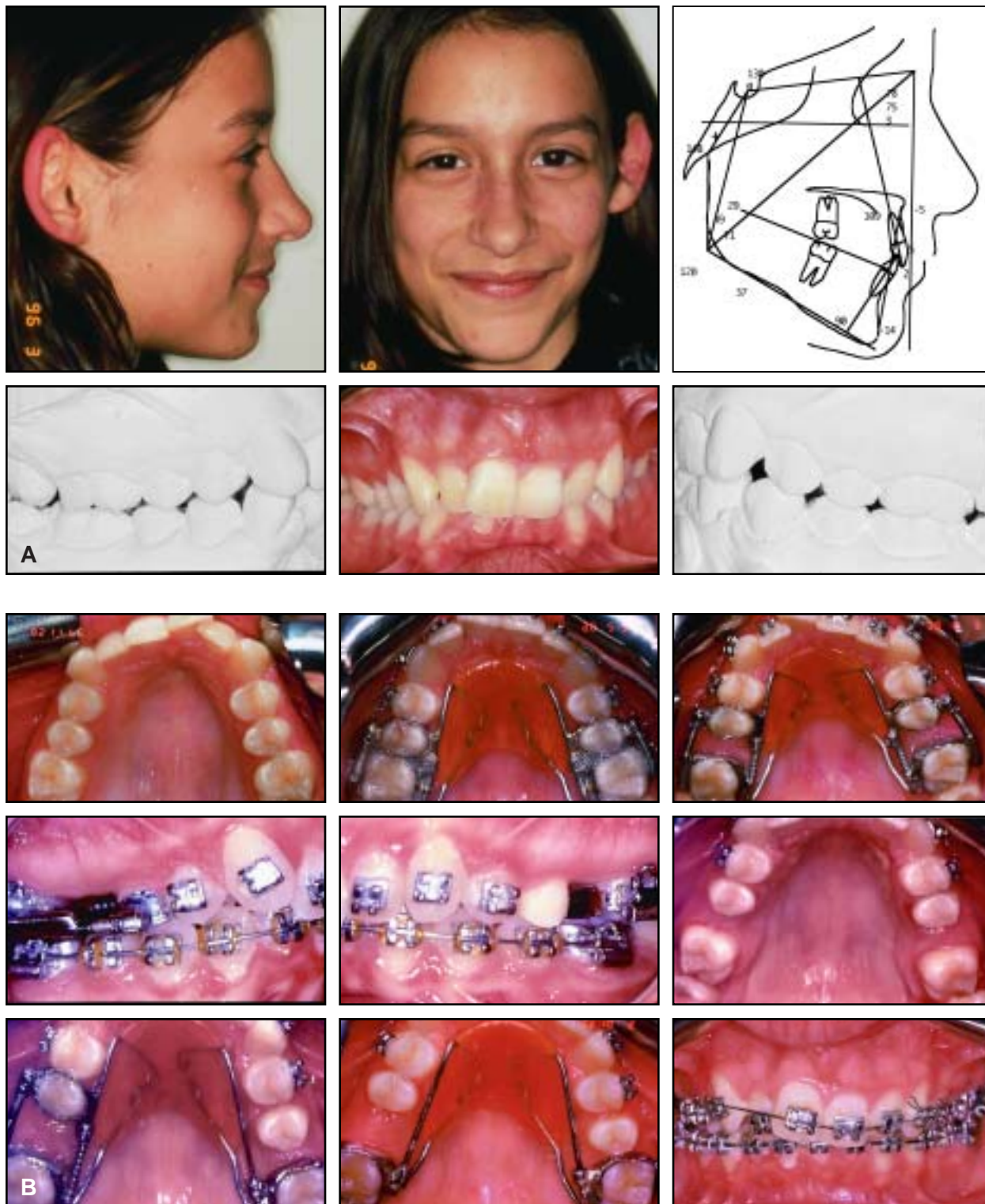


Fig. 6 Case 2. A. 12 1/2-year-old female Class II patient before treatment. B. Bilateral appliance action during treatment (continued on next page).

patient. The desired distalization of the molars was achieved in 98 days (Fig. 6C). Superimposition of beginning and progress cephalometric

x-rays revealed distal molar movement of approximately 4mm and no loss of anterior anchorage (Fig. 6D).

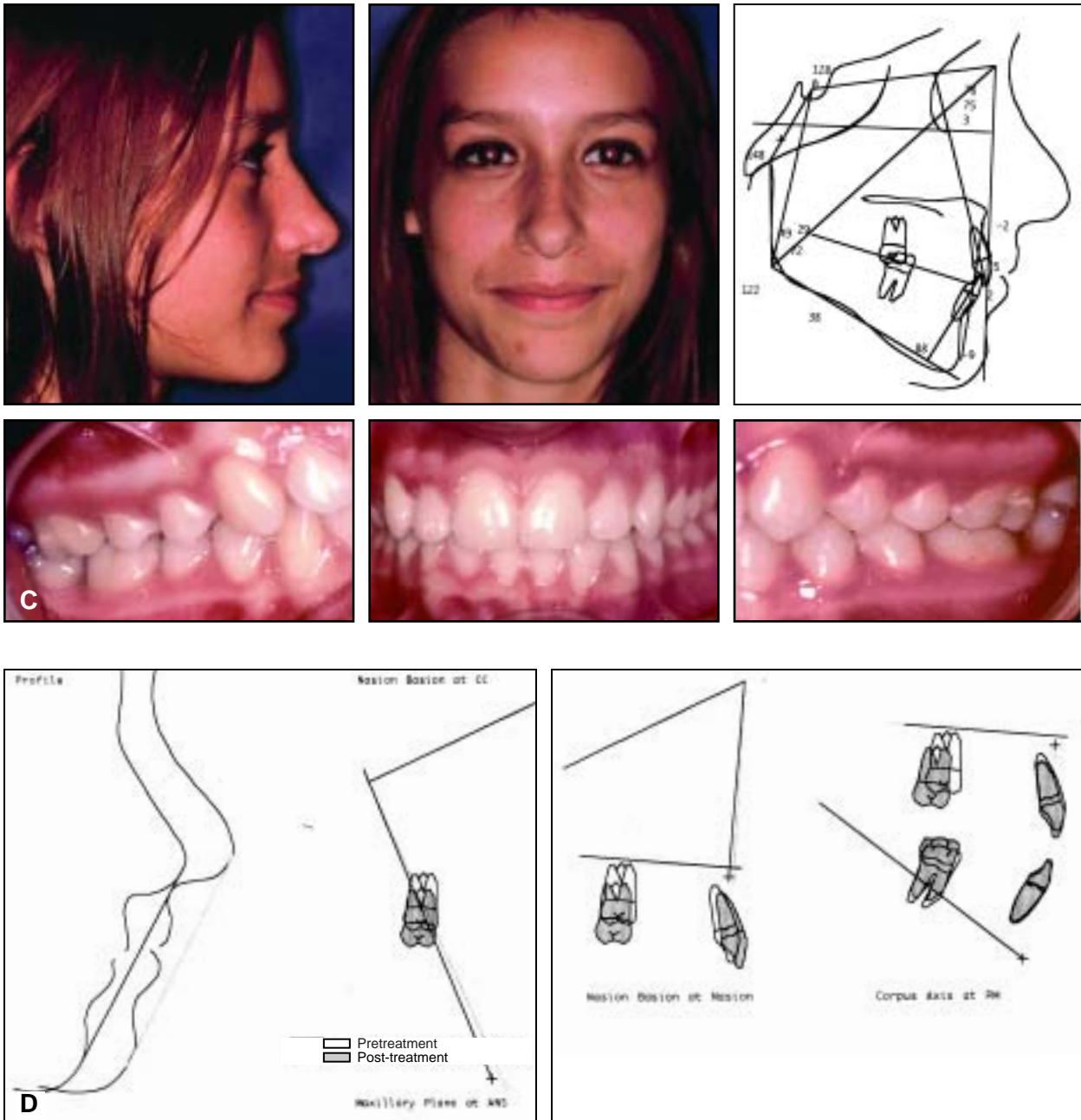


Fig. 6 (cont.) Case 2. C. After six months of treatment. D. Superimpositions of cephalometric tracings before and after treatment.

Conclusion

The First Class Appliance has the following advantages:

- It produces rapid distalization of the maxillary first and second molars, even when the second molars are completely erupted.
- It reduces treatment time in Class II cases being treated on a nonextraction basis.
- It can be used in the deciduous as well as the permanent dentition.
- It distalizes molars bodily, without a tipping effect.
- It doesn't cause anterior anchorage loss or changes in the vertical dimension.
- After distalization, it can be left in place as an anchorage unit to maintain the space.

ACKNOWLEDGMENT: The formative screw was developed by Philip J. Nord, CDT, of Link Industries, 8196 S.W. Hall Blvd., Suite 330, Beaverton, OR 97008.

REFERENCES

1. Gianelly, A.: One-phase versus two-phase treatment, *Am. J. Orthod.* 108:556-559, 1995.
2. Cetlin, N.M. and Ten Hoeve, A.: Nonextraction treatment, *J. Clin. Orthod.* 17:396-403, 1983.
3. Castaldo, A.; Blasi, S.; Piano, S.; and Gianelly, A.: Distalizzazione dei molari superiori: Un nuovo approccio (ricerca clinica), *Mondo Ortod.* 16:163-169, 1991.
4. Castaldo, A.; Blasi, S.; and Gianelly, A.: Distalizzazione dei molari superiori: Un nuovo approccio (casi clinici), *Mondo Ortod.* 16:171-181, 1991.
5. Kalra, V.: The K-loop molar distalizing appliance, *J. Clin. Orthod.* 29:298-301, 1995.
6. Jones, R.D. and White, M.J.: Rapid Class II molar correction with an open-coil jig, *J. Clin. Orthod.* 26:661-664, 1992.
7. Locatelli, R.; Bednar, J.; Dietz, V.; and Gianelly, A.A.: Molar distalization with superelastic NiTi wire, *J. Clin. Orthod.* 26:277-279, 1992.
8. Locatelli, R.: Tecnica bidimensionale: "arco di fase unica" secondo Locatelli, *Ortognatodonzia Italiana*, vol. 4, Maggio 1995.
9. Hilgers, J.J.: The Pendulum appliance for Class II non-compliance therapy, *J. Clin. Orthod.* 26:706-714, 1992.
10. Greenfield, R.L.: Fixed piston appliance for rapid Class II correction, *J. Clin. Orthod.* 29:174-183, 1995.
11. Carano, A. and Testa, M.: The Distal Jet for upper molar distalization, *J. Clin. Orthod.* 30:374-380, 1996.