

A New Class II Distalizer

LUIS CARRIÈRE, DDS, MSD

The Carrière Distalizer* is a simple and efficient fixed functional appliance for Class II treatment (Fig. 1). Developed by the author with advanced computer technology, it represents an evolution of the Modular Sectional Arch.¹

The Distalizer is most effective in treating Class II malocclusions without extractions. Brachyfacial patterns respond best to treatment; dolichofacial types are less responsive. The appliance can also be used in many Class I cases with mesially positioned maxillary molars or, with caution, in Class I cases with premaxillary hypoplasia. Growing patients are ideal, but adults can be treated as well. Mixed dentition Class II cases with fully erupted first molars are candidates for first-phase treatment.

Biomechanics

The Carrière Distalizer is designed to create a Class I molar and canine relationship that I call a Class I Platform of occlusion. This allows the case to be finished with any technique preferred by the orthodontist (Fig. 2). The biomechanical objectives of the appliance are as follows:

low:

- Produce a distal rotational movement of the maxillary first molars around their palatal roots when necessary.
- Simultaneously produce a uniform force for distal molar movement.
- Independently move each posterior segment, from canine to molar, as a unit.
- Eliminate wire changes and thus the distorting collateral forces that appear with every wire activation in traditional methods.
- Minimize periodontal reactions.

The clinical evidence of the achievement of these objectives will be the appearance of interincisal diastemas and wide spaces mesial to the canines.

*ClassOne Orthodontics, Inc., 5064 50th St., Lubbock, TX 79414.



Fig. 1 Carrière Distalizer.

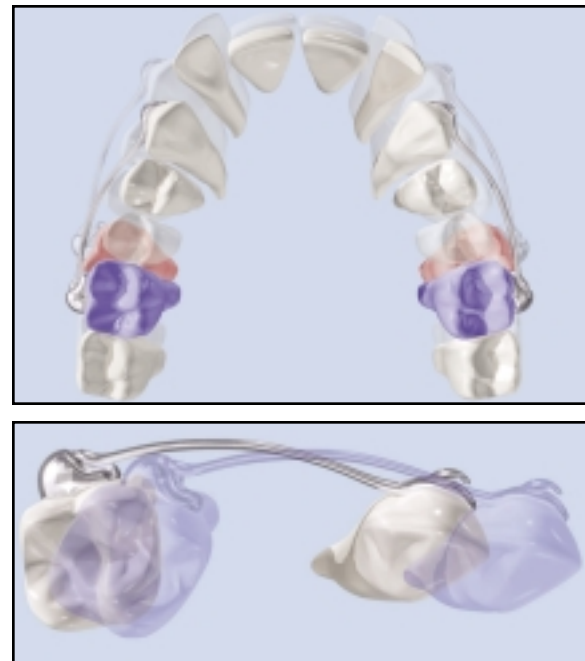


Fig. 2 Maxillary molars are distalized and rotated, providing platform for maxillary canines to occlude in Class I relationship.



Dr. Carrière is in the private practice of orthodontics at Escuelas Pías, 109, 08017 Barcelona, Spain; e-mail: luis@carriere.es. He has a financial interest in the product described in this article.

Appliance Design

The Distalizer is made of mold-injected, nickel-free stainless steel. It is bonded to the canine and first molar as follows:

The *canine pad*, which allows distal movement of the canine along the alveolar ridge without tipping, provides a hook for the attachment of Class II elastics (Fig. 3). This pad is the mesial end of an arm that runs posteriorly over the two upper premolars in a slight curve. The posterior end of the arm is a permanently attached ball that articulates in a socket on the *molar pad* (Fig. 4).

The *ball and socket* were designed with three-dimensional virtual-reality models² to

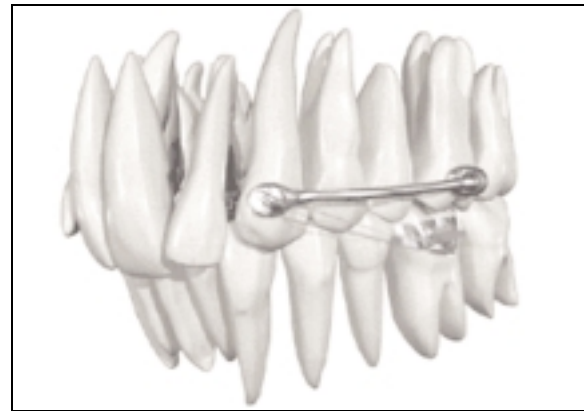


Fig. 3 Carrière Distalizer with Class II elastic attached to hook on canine pad.

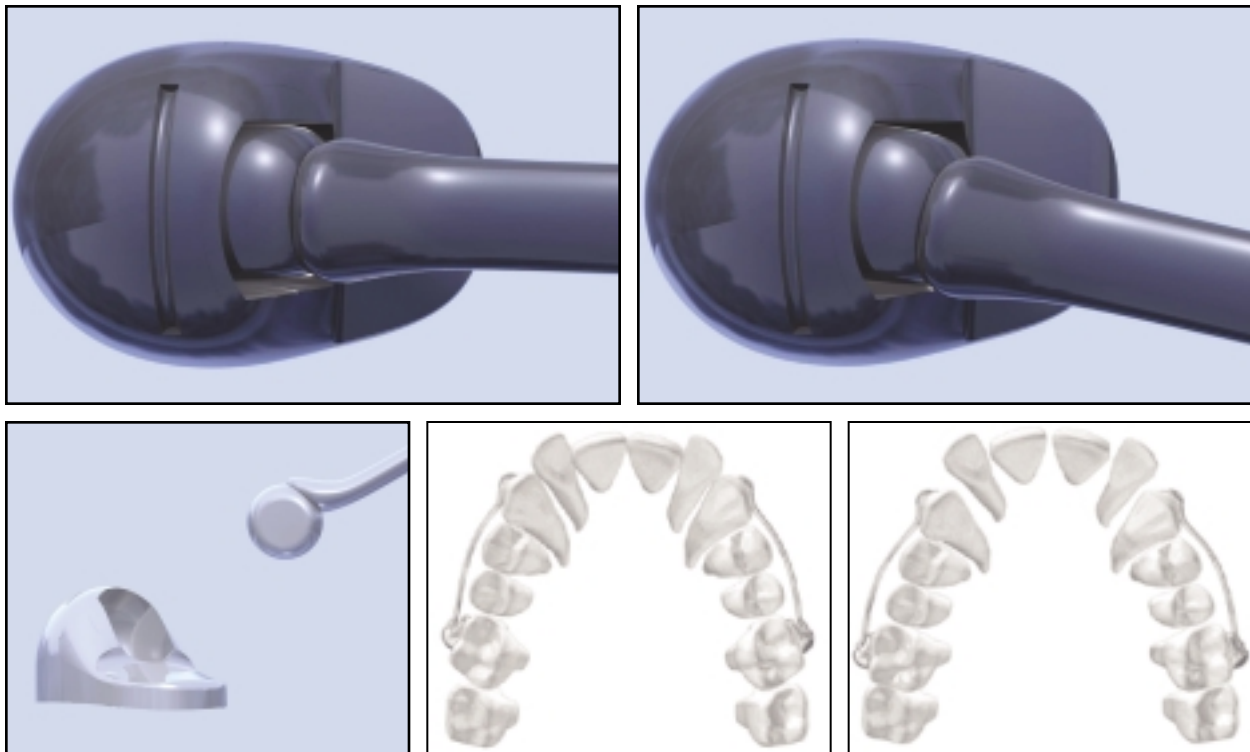


Fig. 4 Ball-and-socket joint articulates for control of molar derotation while limiting undesirable movements during distalization.

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resemble the human hip joint, providing maximum freedom of movement in the appropriate direction. Raised surfaces on the ball articulate with corresponding depressions in the socket to limit distal rotation to -15° on the longitudinal axis. The joint also provides torque control of both the canine and molar (Fig. 5).

This posterior portion of the Distalizer accomplishes three types of molar movement:

1. Uprighting of the crown, if it is mesially inclined (Fig. 6). Once the molar has been uprighted, the articulation of the ball with the socket prevents distal tipping.
2. Distal rotation around the palatal root. When the maxillary first molar is mesially rotated around the palatal root, the molar occlusion may appear to be Class I, while in reality it is Class II with the canines in a cusp-to-cusp relationship



Fig. 5 Ball-and-socket joint provides molar torque control.

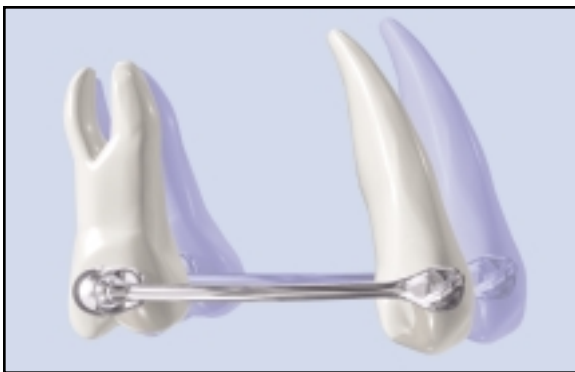


Fig. 6 Correction of mesial molar inclination.

(Fig. 7). When the molar has been derotated, the shoulder of the posterior base contacts the mesial arm to prevent overrotation.

3. Distal displacement without concurrent distal tipping of the crown (Fig. 8).

Appliance Placement

The Distalizer comes in three sizes: 23mm, 25mm, and 27mm. The appropriate size is determined by measuring from the midpoint of the maxillary first molar's buccal surface to the midpoint of the maxillary canine crown, using a caliper or the supplied "Dentometer" (Fig. 9). In



Fig. 7 With mesially rotated maxillary molars, canines cannot occlude in Class I relationship.

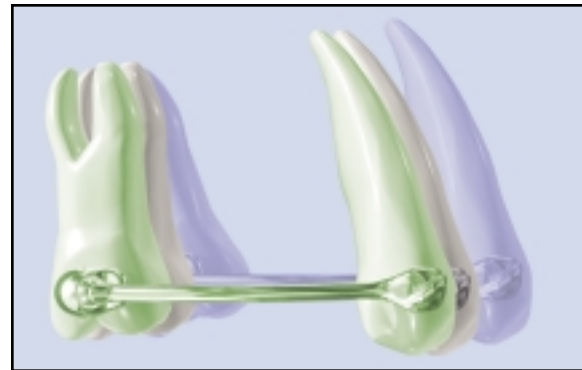


Fig. 8 Bodily distalization of molar, combined with derotation.

a case with an inaccessible high canine and the maxillary second molars present, the measurement can be taken from the midpoint of the second molar crown to the midpoint of the first premolar. The appliance is bonded to these teeth, rather than to the first molar and canine. The posterior teeth can then be distalized to provide space for the blocked-out upper canine.

After the teeth to be bonded are etched, a light-cured adhesive is placed on the two bonding pads of the Distalizer. The molar attachment is positioned in the center of the buccal surface with thumb pressure, then cured. There will be adequate time remaining to position the canine pad correctly before curing it.



Fig. 9 Distalizer size determined by measuring from midpoint of maxillary first molar's buccal surface to midpoint of maxillary canine crown.



Fig. 10 Passive .036" lingual arch.

Possible Sources of Anchorage

Anchorage must be carefully selected, depending on the patient's skeletal and neuromuscular pattern, to avoid protrusion of the lower incisors. It may include one or more of the following sources:

1. Passive Lingual Arch

A passive .036" lingual wire, completely adapted to the mandibular dental anatomy, runs from molar to molar—the second molars if they have erupted (Fig. 10).

2. Hamula Lingual Arch

This .045" round stainless steel lingual wire is attached with Hamula First Fit* molar bands, which come with mesial and distal occlusal stops. Two segments of .021" × .025" wire are soldered occlusally to the stops and are bonded to the occlusal surfaces of the premolars and molars once the bands have been cemented. The edgewise wire rests on the occlusal surfaces without any interference (Fig. 11).

3. Full Mandibular Fixed Appliance

In a nonextraction case with a severe curve

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Fig. 11 Hamula Lingual Arch.

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of Spee or mild crowding in the mandibular arch, it is advisable to bond lower brackets and prepare anchorage to support the Class II elastic traction.

4. Lower Essix Appliance

An Essix** appliance is another option for elastic attachment. The material used should be .040" Essix type A. For optimum stability of the elastics and mechanical retention, the appliance should be fabricated with small composite wedges bonded to the buccal surfaces of the lower molars and premolars. Hooks for elastic attachment are placed in the lower molar region.

5. Miniscrews

These implants can be used for a short period at the beginning of orthodontic treatment. Because they are not osseointegrated, they can be easily inserted and removed. In the mandibular arch, for attachment of Class II elastics, they are best placed through the attached gingiva between the first and second molars. In the maxillary arch, miniscrews placed in the zygomatic buttress offer an alternative for elastic attachment in maximum anchorage cases for non-compliant patients.

Patient Instructions

Heavy, 6½oz, ¼" Class II elastics should be worn 24 hours a day, except during meals, in low-angle cases with good perioral muscular strength. Elastic wear can be limited to 14 hours a day, including sleeping hours, in high-angle cases with lighter perioral musculature. The elastics should not be worn while chewing because of the vertical force vector produced by these movements. A predominantly vertical vector may be expressed in a mild extrusion of the canines during distalization, which can easily be compensated for in the following stages of treatment. Night-time wear provides a more horizon-

tal vector of traction, but will prolong the distalization period.

The patient should be instructed not to use the tongue to interfere with the Distalizer's horizontal arm, because this could result in a lingual inclination of the upper premolars. Another habit to avoid is placing the tip of the tongue in the spaces created between the upper lateral incisors and canines during distalization. This will be indicated by a mild redness at the mesio gingival border of the upper canines, and may result in a widening of the spaces mesial to the canines in relation to the interincisal diastema.

Patient acceptance of the Distalizer has been gratifying, probably because the upper incisors are left free of appliances and the mandibular anterior region contains only an invisible lingual arch or Essix appliance. Additionally, the Distalizer is relatively comfortable and is used in the first three to six months of treatment, when compliance is best. The patient's morale is boosted by the immediate appearance of a diastema between the upper incisors, showing the progress of distalization. Avoidance of premolar extractions is a good bargain for a few months of cooperation with elastic wear.

Case Reports

These cases were treated with the Carrière Distalizer. All three displayed wide interincisal diastemas after three or four months of distalization (Figs. 12-14). The panoramic x-rays demonstrate the preserved axial parallelism of the maxillary cuspids, premolars, and first molars after their distal displacement. Cephalometric tracings show the distalization of the buccal segments and the response of the other dentofacial structures during these short treatment periods.

REFERENCES

1. Carrière, J.: *The Inverse Anchorage Technique in Fixed Orthodontic Treatment*, Quintessence Publishing Co., Chicago, 1991.
2. Carrière, J. and Carrière, L.: Softlanding treatment through inverse anchorage and virtual reality, *J. Clin. Orthod.* 29:479-486, 1995.

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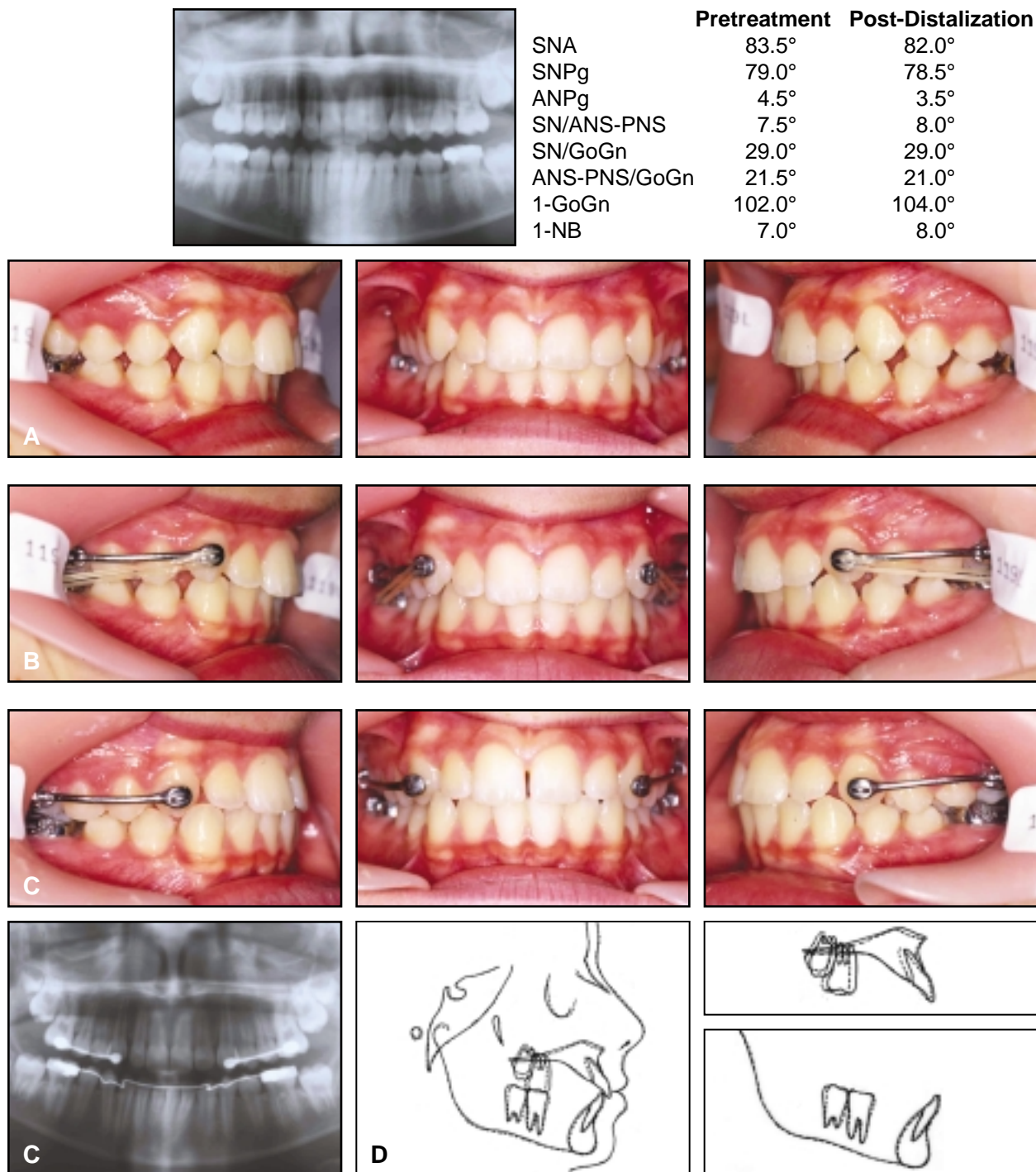


Fig. 12 Case 1. A. 12-year-old female Class II, division 1 patient before treatment. B. Placement of Carrière Distalizer. C. After three months of distalization. D. Superimposition of cephalometric tracings before and after distalization.

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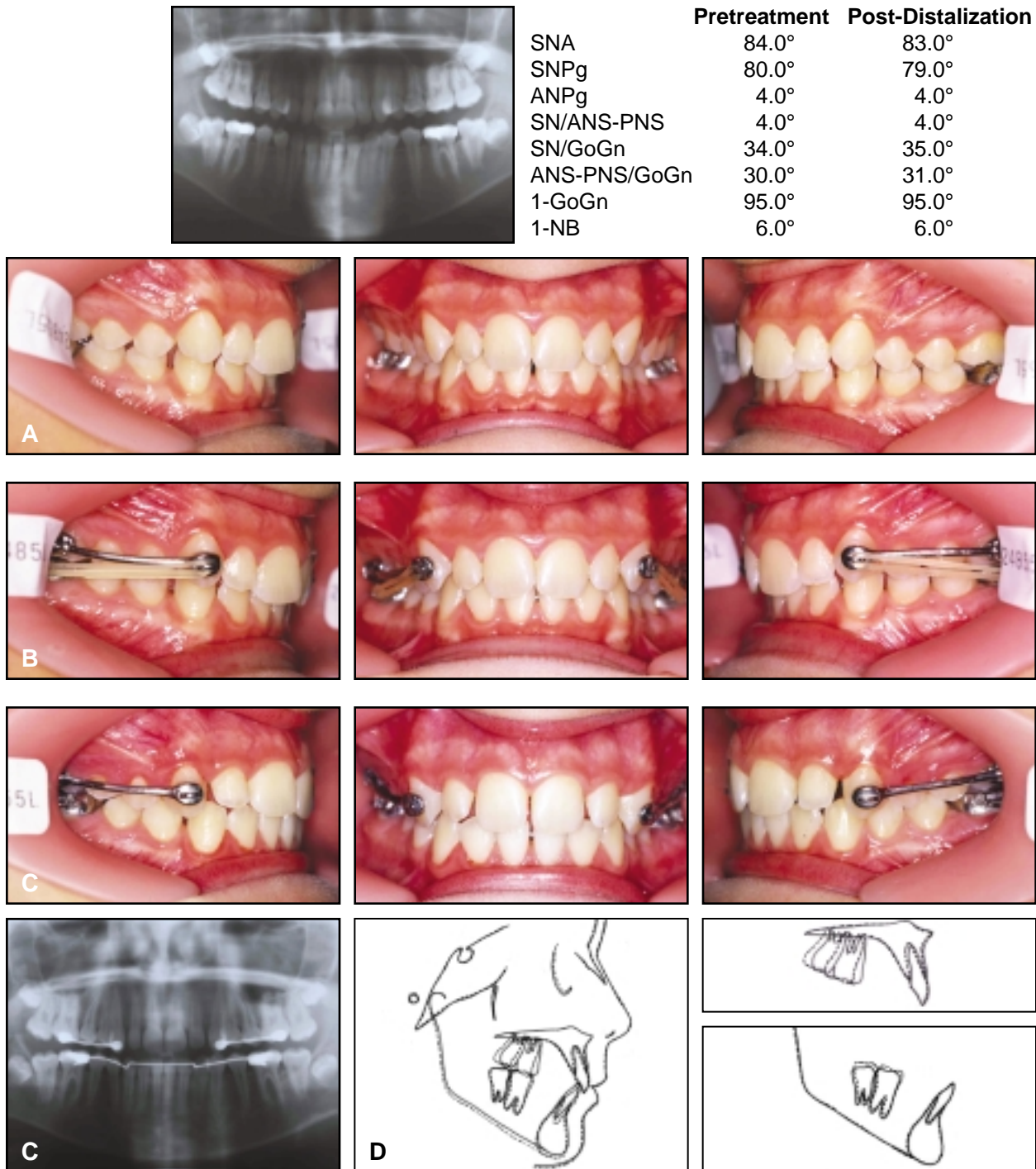


Fig. 13 Case 2. A. 12-year-old female Class II, division 2 patient before treatment. **B.** Placement of Carrière Distalizer. **C.** After four months of distalization. **D.** Superimposition of cephalometric tracings before and after distalization.

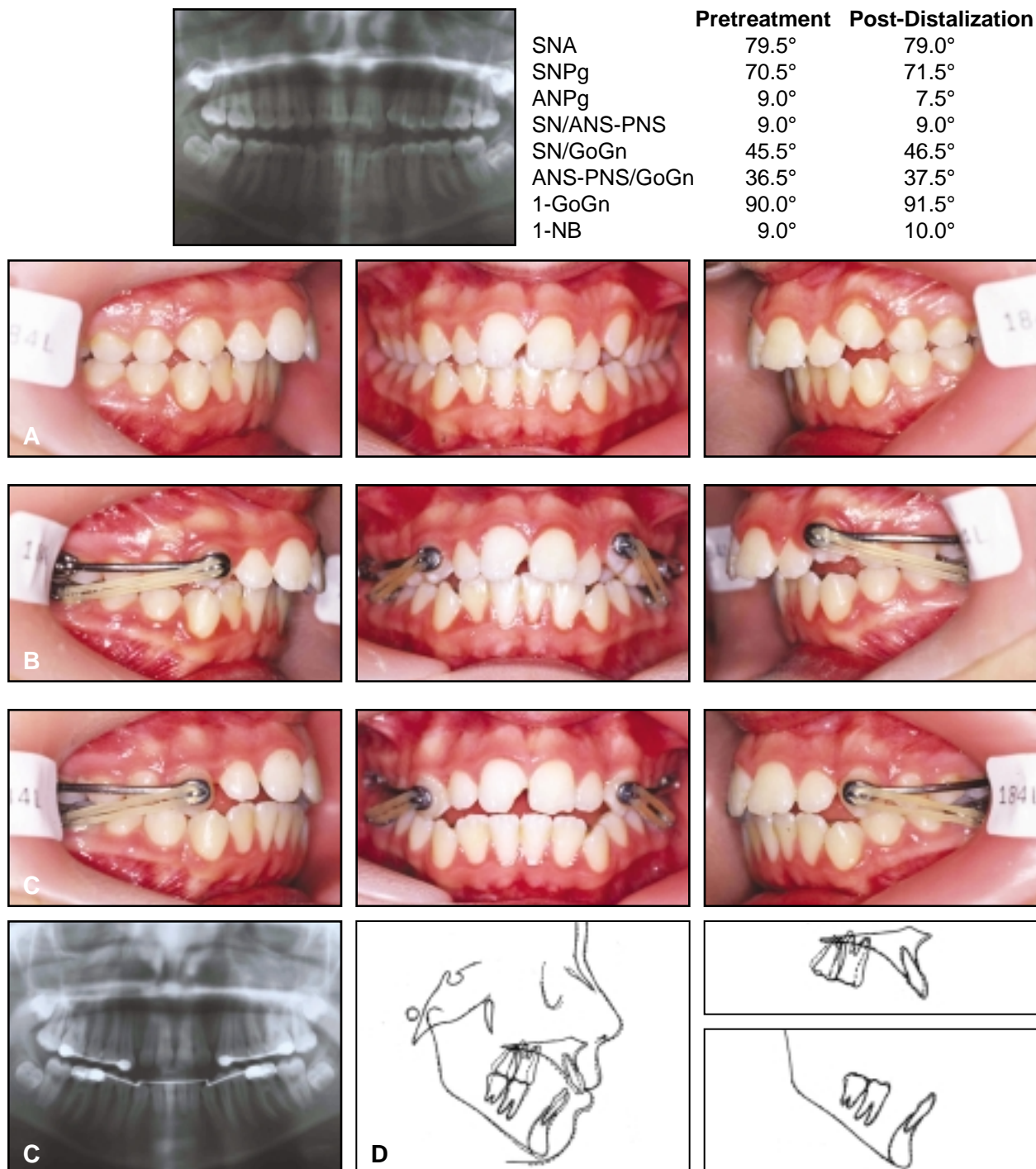


Fig. 14 Case 3. A. 11-year-old female Class II, division 1 patient with dolichocephalic pattern before treatment. B. Placement of Carrière Distalizer. C. After three months of distalization. D. Superimposition of cephalometric tracings before and after distalization.