

CASE REPORT

Long-Term Stability of Two-Phase Class II Treatment with the Carriere Motion Appliance

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The optimal timing for treatment of Class II malocclusions remains controversial. Some clinicians believe strongly that it is advantageous to begin treatment in the mixed dentition before adolescence, while others are convinced that early treatment is often redundant.

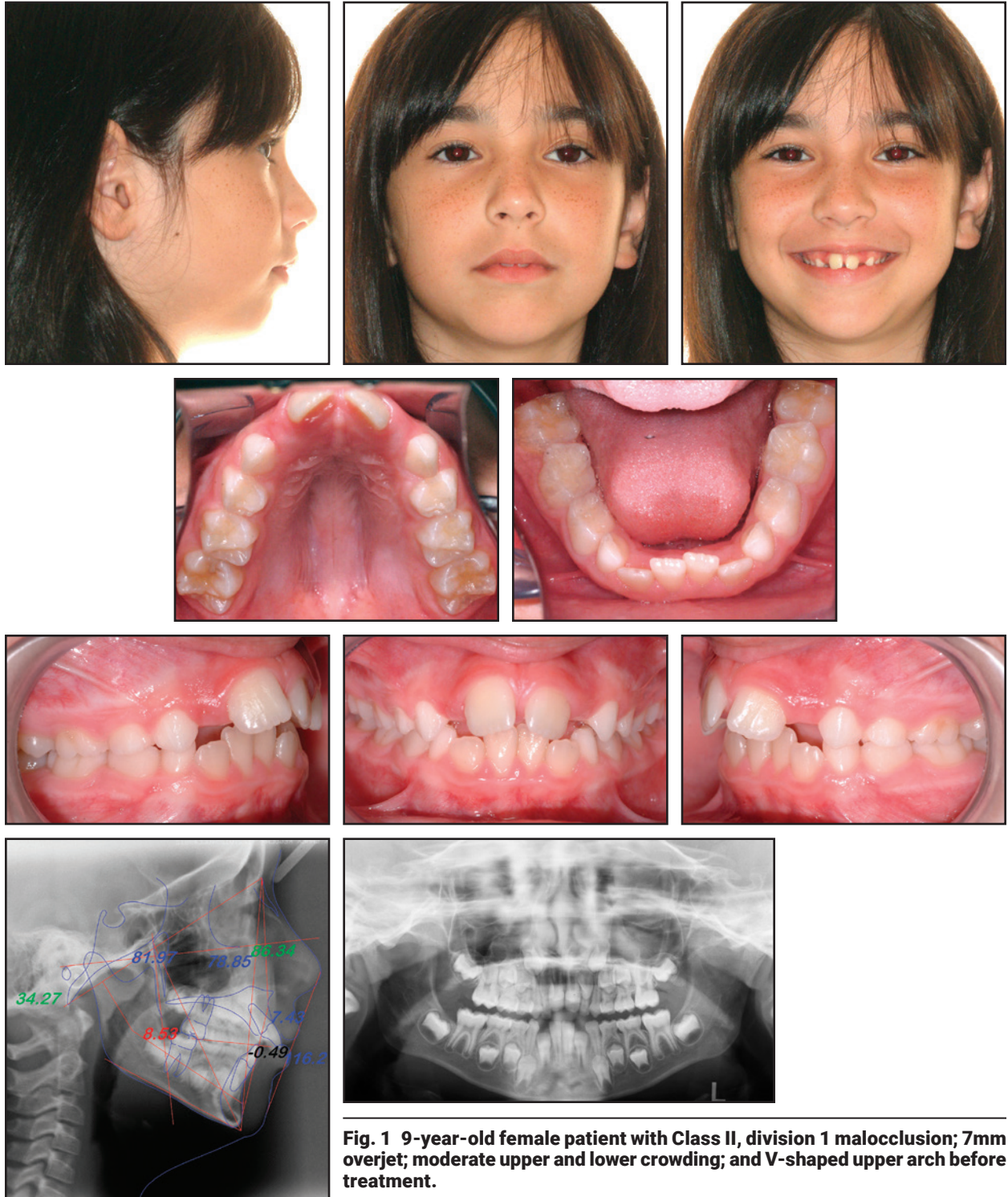
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The AAO Council on Orthodontic Education defines interceptive orthodontics as “that phase of the science and art of orthodontics employed to recognize and eliminate potential irregularities and malpositions in the developing dentofacial complex.”¹ Early interceptive treatment can be an option for correcting Class II malocclusions in growing patients, especially when skeletal discrepancies are involved. Orthopedic methods ranging from the headgear used by pioneer orthodontists in the late 1800s to modern functional appliances have been shown to be successful in improving skeletal Class II discrepancies and reducing the severity of malocclusions. Such Phase I treatment can facilitate a shorter and simpler second phase of treatment with fixed appliances.

The Carriere Motion Appliance,* developed by Dr. Luis Carrière, has become a popular tool for establishing a Class I platform in any type of Class II case, from minor rotations through full-step Class II relationships.² This case report evaluates the long-term stability of two-phase skeletal Class II treatment using the Carriere Motion Appliance in Phase I.

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Diagnosis and Treatment Plan

A 9-year-old female presented with a Class II, division 1 malocclusion; 7mm of overjet; moderate upper and lower crowding; and a V-shaped upper arch (Fig. 1). Profile evaluation found a straight nasiolabial angle and a short neck-chin length.

Cephalometric analysis indicated that the Class II malocclusion was related to an antero-posterior skeletal deficiency of the mandible. The panoramic radiograph showed all permanent teeth in the process of formation and eruption, with no signs of root resorption.

A two-phase treatment plan was designed, involving Carriere Motion Appliances in Phase I and upper and lower fixed appliances in Phase II.

Treatment Progress

Bilateral 23mm Carriere Class II Motion Appliances were bonded from the upper first deciduous molars to the upper deciduous canines (Fig. 2). An .036" lower lingual arch with omega loops mesial to the lower first molars was placed for anchorage. Six-ounce Class II elastics were worn full-time for the first four weeks of treatment, followed by 8oz Class II elastics.

After seven months of Motion Appliance treatment, a bilateral Class I occlusion was achieved, the bite was opened, and the overjet was reduced (Fig. 3). By request of the patient, the lower anchorage was replaced with a standard 2 × 4 edgewise appliance to align the lower anterior teeth. Cephalometric superimpositions



Fig. 2 23mm Carriere Class II Motion Appliances* bonded from upper first deciduous molars to canines.

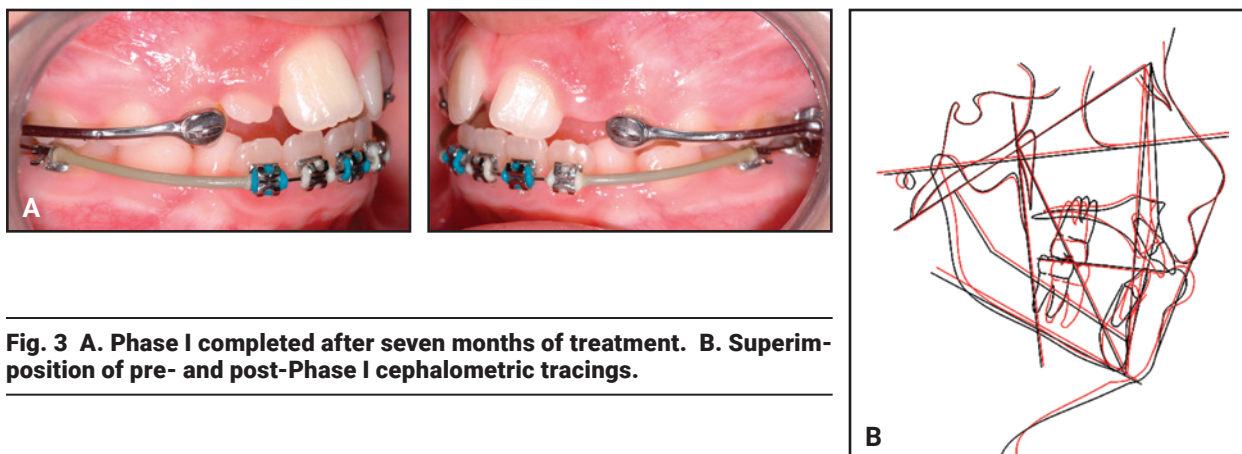


Fig. 3 A. Phase I completed after seven months of treatment. B. Superimposition of pre- and post-Phase I cephalometric tracings.

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confirmed substantial anterior repositioning of the mandible.

The Motion Appliances were removed, and the normal eruption process continued. The 2 × 4 appliance remained in place between phases to guide eruption; in the traditional mixed dentition protocol with the Motion Appliance, the lingual arch would have remained. Phase II was initiated

at the age of 10 years, 6 months, following a typical nonextraction approach with upper and lower MBT-prescription .018" Mini Uni-Twin** brackets (Fig. 4). The archwire sequence began with .014" nickel titanium and finished with .016" × .022" stainless steel. Class II elastics were prescribed to maintain the Class I relationship obtained during Phase I.

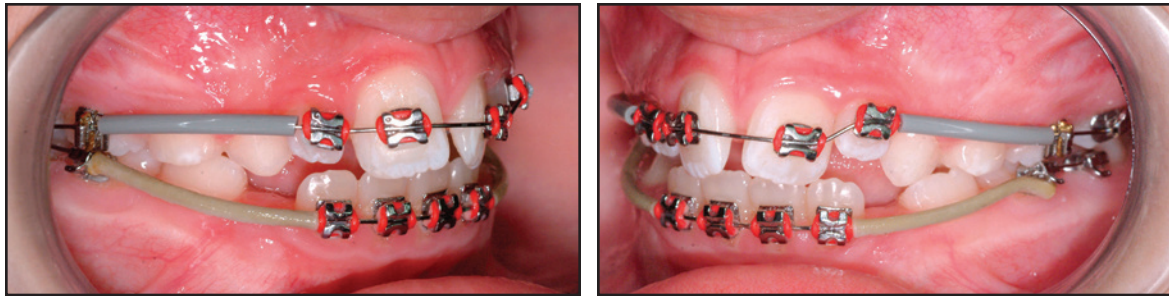


Fig. 4 Phase II started with fixed appliances after eruption of permanent teeth.



Fig. 5 Patient after 18 months of Phase II treatment.



Fig. 6 Patient three years after treatment.

Treatment Results

After 18 months of Phase II treatment, the fixed appliances were removed (Fig. 5). The patient exhibited a solid Class I occlusion with excellent interdigitation and a pleasant smile. An upper Essix*** retainer was delivered, and a lower 3-3 fixed retainer was bonded. Total treatment time was 36 months, with an interval of 11 months between phases.

The occlusion remained stable three years after debonding, especially in the sagittal relationship (Fig. 6). Five years after treatment, the sagittal relationship continued to be stable (Fig. 7).

Discussion

More than 85% of Class II malocclusions involve some mesiopalatal rotation of the upper first-molar crowns,^{3,4} a situation that exacerbates the Class II relationship by locking the mandible

in a retrusive position.⁵ The Carriere Motion Appliance generates a distal rotational movement around the upper first molars' palatal roots, allowing the mandible to advance forward as the upper first molars are derotated. This explains how the Class II correction can reduce the overjet by promoting a change in the occlusal plane.

One of the advantages of treating a Class II malocclusion in two phases is the ability to divide the treatment objectives. Sagittal correction can be accomplished in Phase I, and dental discrepancies can be addressed with fixed appliances during Phase II.

Post-treatment maintenance of a normal or "ideal" occlusion that is morphologically stable and esthetically and functionally well adjusted

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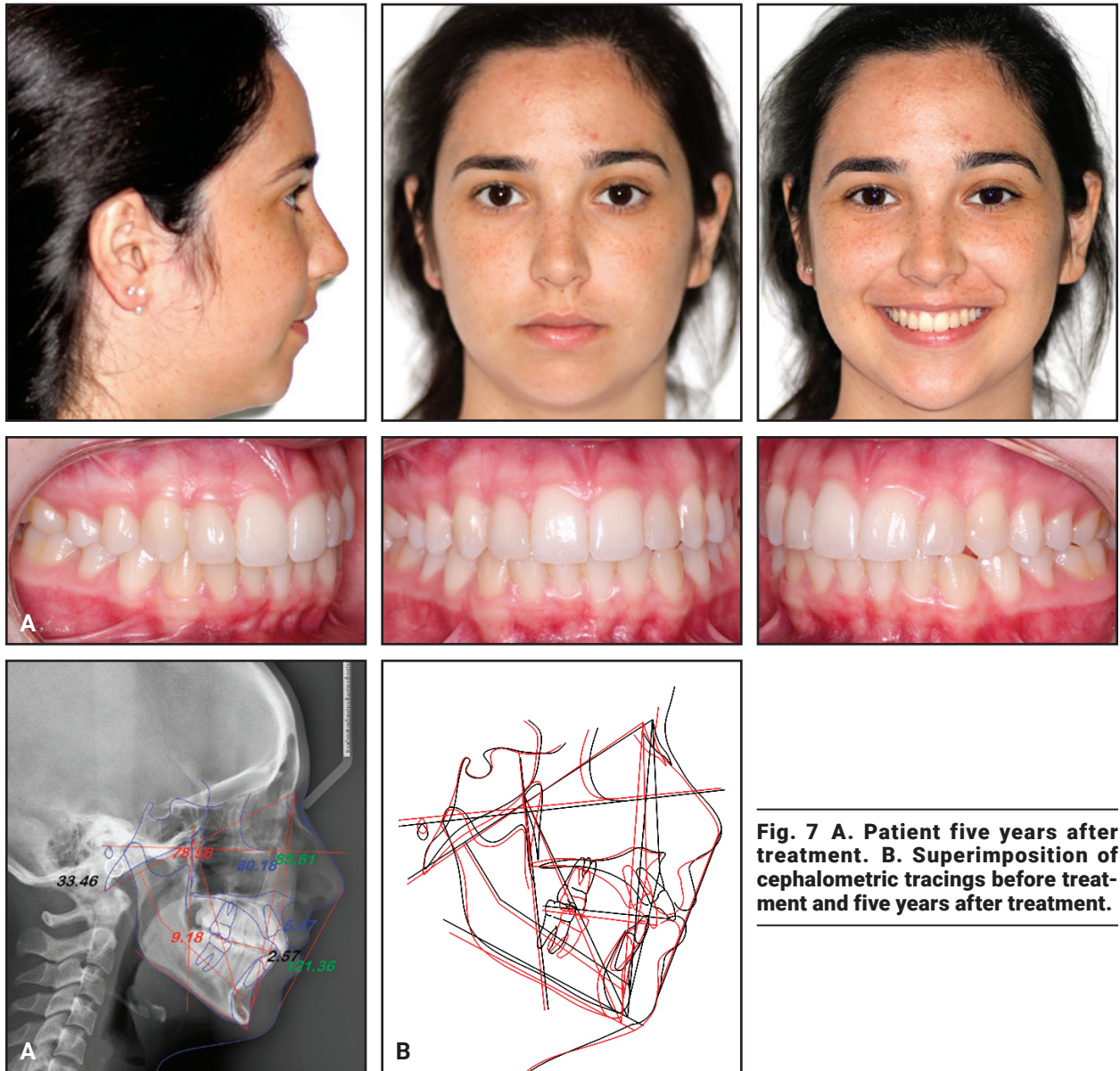


Fig. 7 A. Patient five years after treatment. B. Superimposition of cephalometric tracings before treatment and five years after treatment.

continues to be a challenge to the orthodontic profession.⁶ Although investigations into the factors contributing to sagittal stability following Class II treatment have been limited,⁷ the case presented here provides clinical evidence of sagittal stability at least five years after treatment.

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