

Reduction of Maxillary Intermolar Width in Class III Surgical-Orthodontic Treatment

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Considering the relatively high prevalence of Class III malocclusion in Oriental populations,¹⁻⁵ surgical-orthodontic treatment in Korea usually involves correction of anterior crossbite. Elimination of dental compensations generally requires retraction of the maxillary incisors, which may necessitate maxillary extractions. As the reverse overjet is increased by the presurgical orthodontic treatment, the amount of required surgical movement is also increased. Therefore, the maxillary arch width usually needs to be reduced.

If the interarch width discrepancy is small,



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it can be controlled by torqued rectangular archwires and elastics. In more severe extraction cases, a heavy labial auxiliary wire, normally used for the correction of moderate buccal crossbite in fixed appliance treatment,⁶ can accentuate the effect of the main archwire without the need for unusual patient cooperation. This article demonstrates how such a procedure can help achieve reasonable arch compatibility.

Fabrication

The auxiliary is made of .036" remanium* hard-spring steel wire (Fig. 1A,B). A small loop is added between the central incisors for stability, and the wire is inserted in the molar headgear tubes and bent down distally to avoid irritation. The wire is activated to deliver the correct level of force by bending it 3-4mm narrower than the passive arch width on each side before insertion (Fig. 1C).

Case 1

A 20-year-old female sought treatment for her mandibular asymmetry. Cephalometric analysis and clinical examination showed an

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Fig. 1 A,B. .036" remanium labial auxiliary wire. C. Wire narrowed 3-4mm per side for activation.

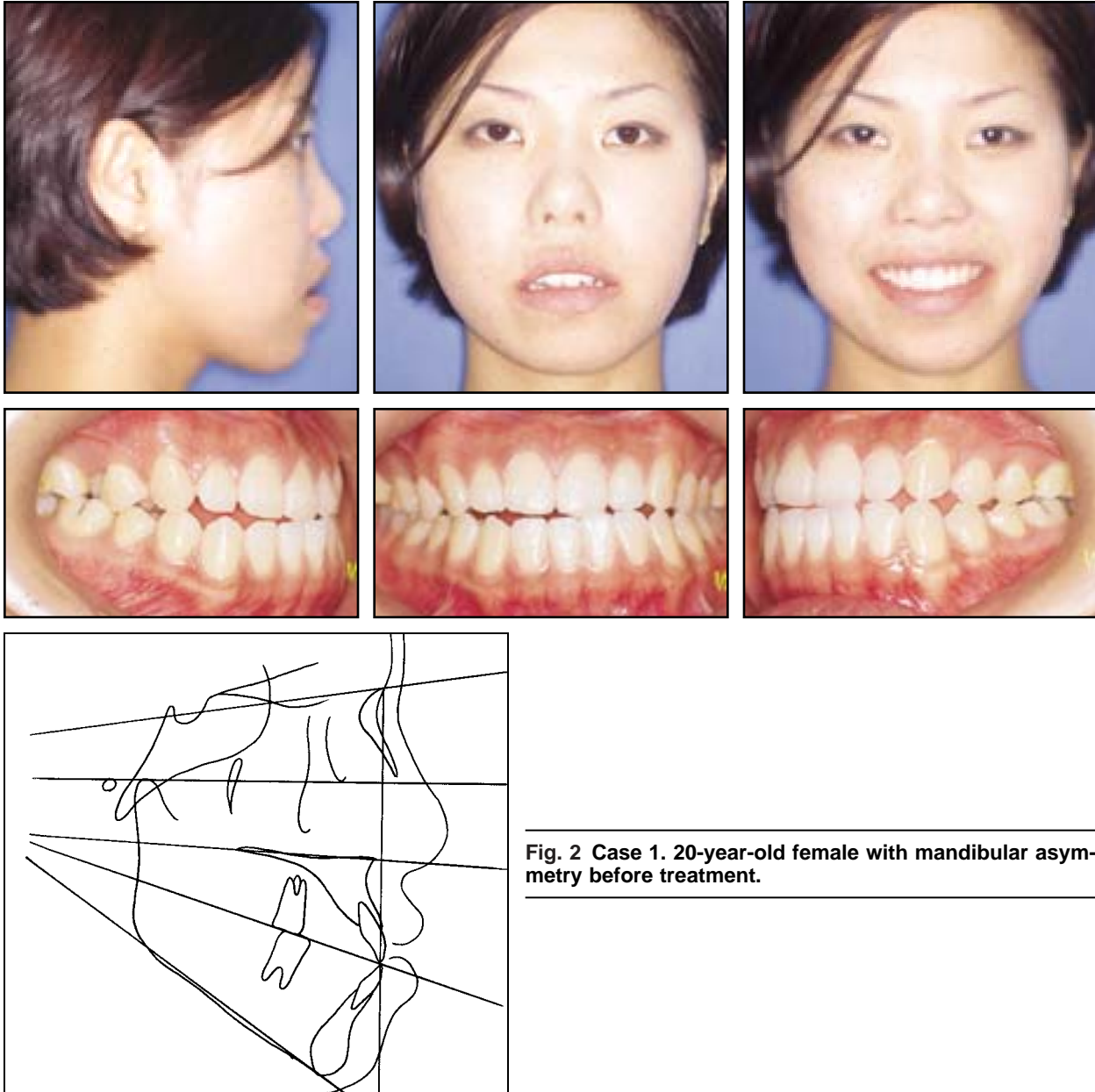


Fig. 2 Case 1. 20-year-old female with mandibular asymmetry before treatment.

asymmetric mandible with no canting of the occlusal plane (Fig. 2). The maxillary incisors were protruded, and a space deficiency was noted in the maxillary arch.

The treatment plan involved extraction of the maxillary second premolars only, followed

by presurgical orthodontic treatment and a bilateral sagittal split ramus osteotomy.

After closure of the extraction spaces, the .036" labial auxiliary wire was inserted in the headgear tubes to reduce the intermolar width. A 5mm width reduction was achieved in five

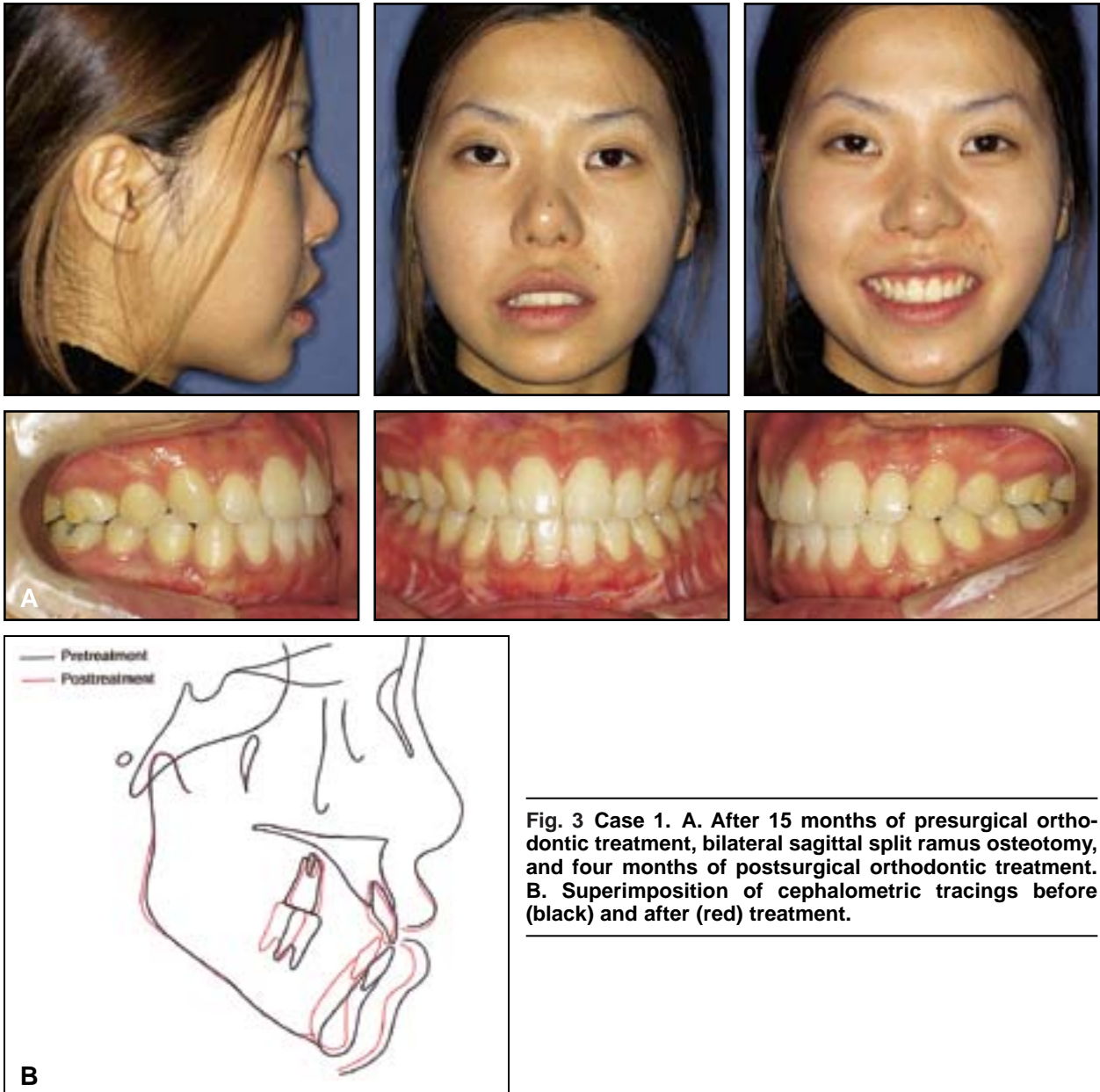


Fig. 3 Case 1. A. After 15 months of presurgical orthodontic treatment, bilateral sagittal split ramus osteotomy, and four months of postsurgical orthodontic treatment. **B.** Superimposition of cephalometric tracings before (black) and after (red) treatment.

months without expansion of the mandibular molars.

The surgery was performed after 15 months of presurgical orthodontic treatment. Because of the reduction in arch width before surgery, only

four months of postsurgical orthodontic treatment was needed. Considerable improvement in the occlusal and skeletal relationships could be seen after the removal of fixed appliances (Fig. 3).



Fig. 4 Case 2. 24-year-old female with severe mandibular prognathism before treatment.

Case 2

A 24-year-old female presented with the chief complaint of an unesthetic facial appearance due to severe mandibular prognathism. Clinical examination and cephalometric analysis

showed a concave profile and proclined maxillary incisors (Fig. 4).

The maxillary first premolars were extracted to reduce the dental compensation, and one-piece Le Fort I and bilateral sagittal split ramus osteotomies were planned.

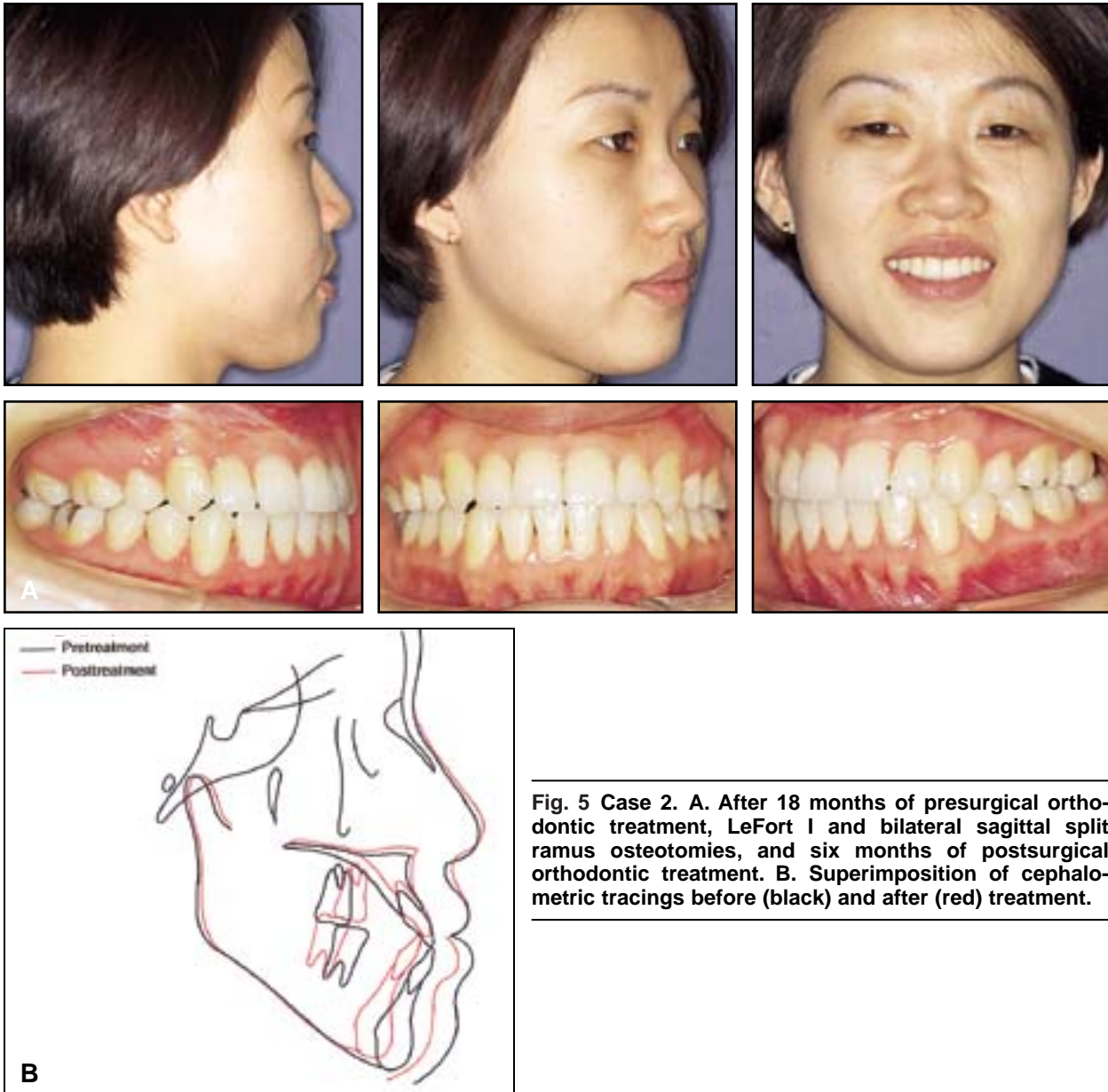


Fig. 5 Case 2. A. After 18 months of presurgical orthodontic treatment, LeFort I and bilateral sagittal split ramus osteotomies, and six months of postsurgical orthodontic treatment. **B.** Superimposition of cephalometric tracings before (black) and after (red) treatment.

After space closure, an .036" labial auxiliary wire was used for six months, producing a 5mm reduction in maxillary intermolar width. This procedure helped limit the postsurgical

orthodontic treatment to six months. Total treatment time was 24 months, and the patient was pleased with the final result (Fig. 5).

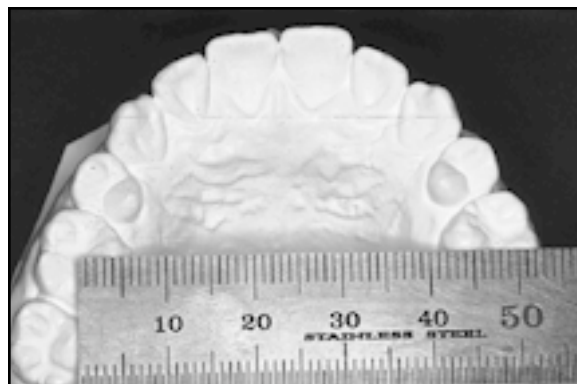
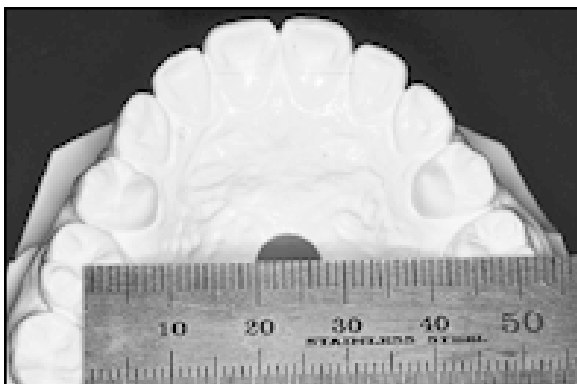
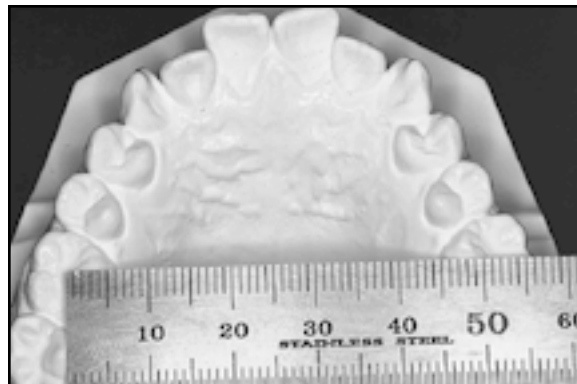


Fig. 6 Case 1. Comparison of intermolar widths before and after five months' use of labial auxiliary wire.

Fig. 7 Case 2. Comparison of intermolar widths before and after six months' use of labial auxiliary wire.

Discussion

The aims of presurgical orthodontic treatment are to eliminate dental compensations and space problems and to provide archforms whose widths and midlines will be compatible after surgery. Because splints are used in surgery, perfect transverse compatibility of the arches may not be necessary.

In Class III patients, however, the extraction of only maxillary premolars can lead to incompatibility between the intermolar widths of the two arches. The dental compensation of the maxillary buccal teeth for the transverse skeletal discrepancy will usually dictate a reduction in maxillary intermolar width as opposed to mandibular expansion.

The need for transverse correction should be assessed before sending a surgical-orthodontic patient to the surgeon. Because the mandible cannot be postured to approximate the surgical correction as in Class II patients, there is no way to evaluate the dental relationships other than with progress study casts (Figs. 6,7).

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