

# A Mini-Maxillary Protractor for Class III Correction

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**C**lass III malocclusions may involve a variety of skeletal and dental components, including a large or protrusive mandible, a deficient or retrusive maxilla, a protrusive mandibular dentition, and a retrusive maxillary dentition.<sup>1-4</sup> In the case of a skeletal Class III patient with a retrusive maxilla, a reverse headgear can reliably produce forward movement of the maxilla and posterior rotation of the mandible.<sup>5-7</sup>

This article shows the use of a modified maxillary protractor in a patient with a severe skeletal Class III malocclusion.

## Appliance Design

The mini-maxillary protraction appliance consists of four parts (Fig. 1):

- Maxillary expander: An acrylic-splint expansion appliance is constructed with full coverage of the maxillary teeth. Hooks are embedded in the premolar and molar regions on both buccal sides. The expander is activated .25mm every day, even in the absence of posterior crossbite.
- Mandibular plate: An acrylic plate covers the entire mandibular arch.
- Chin cup: A hook is attached on each side of the acrylic chin cup for application of cervical forces.
- Lower facebow: An .051" bow is used to connect the chin cup to the mandibular plate. A horizontal bar is added 1.5-2" in front of the lips for attachment of protraction elastics to the hooks of the maxillary expander.

A protraction force of 300-400g per side,

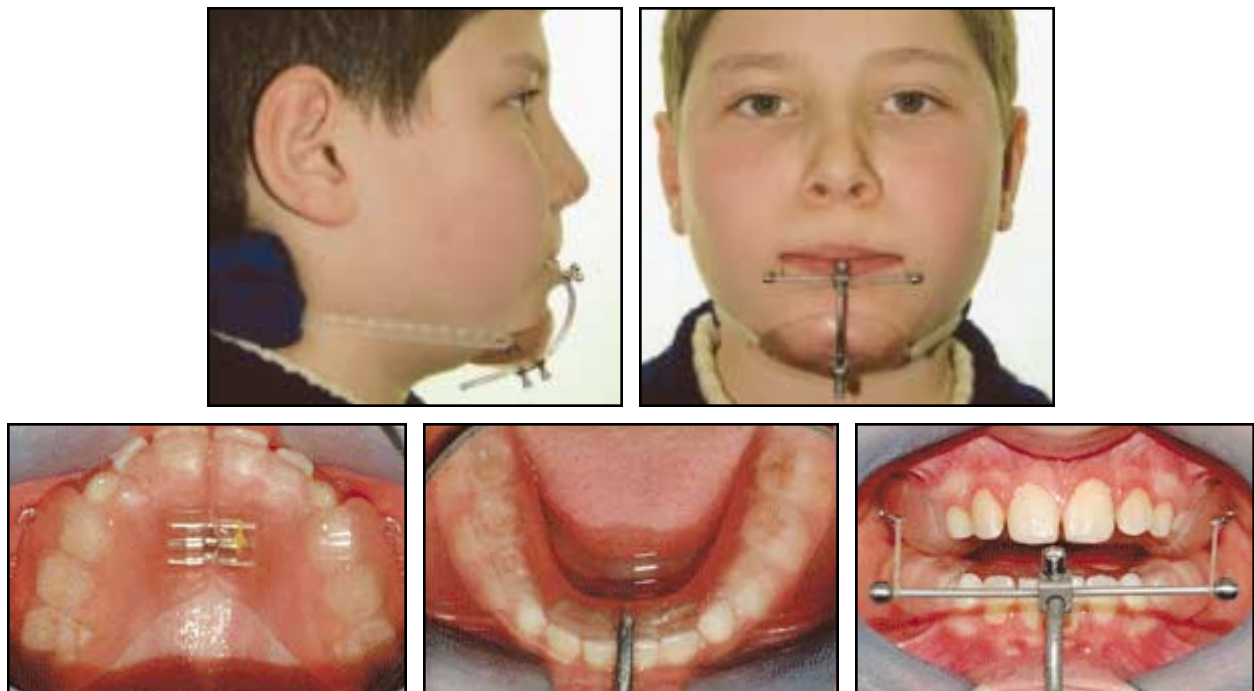


Fig. 1 Maxillary expander and mini-maxillary protractor.

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with an anteroinferior force vector of 20-30° to the occlusal plane, is applied with the elastics. The patient is instructed to wear the protractor at least 18 hours a day.

### Case Report

A 12-year-old male in the permanent dentition presented with a Class III malocclusion and mild crowding (Fig. 2). The clinical evaluation revealed a concave soft-tissue profile. The overjet was -4mm, and the overbite was 4mm. Cephalometric analysis showed a skeletal Class III malocclusion (ANB = -3.5°, SNA = 79°, SNB = 82.5°) due to both maxillary deficiency and mandibular protrusion (Table 1).

A modified protraction appliance was fabri-

**TABLE 1**  
**CEPHALOMETRIC DATA**

	Pretreatment	After Protraction Treatment	Post-treatment
SNA	79.0°	81.0°	82.5°
SNB	82.5°	81.0°	81.5°
ANB	-3.5°	0.0°	1.0°
1-NA	3.0mm	5.0mm	5.0mm
1-NA	24.0°	32.0°	29.0°
$\bar{1}$ -NB	4.0mm	2.5mm	3.5mm
$\bar{1}$ -NB	23.5°	19.5°	19.0°
Interincisal	136.5°	130.5°	131.0°
Occlusal plane	19.5°	16.0°	11.5°
Mandibular plane	35.5°	36.5°	36.5°



Fig. 2 12-year-old male patient with skeletal Class III malocclusion before treatment.

cated as described above. Positive overjet was obtained in four months (Fig. 3), and cephalometric analysis indicated an improvement in the sagittal jaw relationship ( $ANB = 0^\circ$ ).

The appliance was worn at night only for about six months of retention. Full fixed appliances were then bonded, and Class III elastics were used for another 12 months of active treatment (Fig. 4). The chin cup and removable plates were used for retention.

### Conclusion

We have been using this mini-maxillary protractor for the past few years to correct skeletal Class III malocclusions in growing patients. It has the following advantages:

- Does not require expensive lab work.
- Eliminates the facial mask, improving patient cooperation.
- Not only corrects the malocclusion, but has a

beneficial effect on the soft-tissue profile.

- Produces consistent treatment results in a relatively short period.

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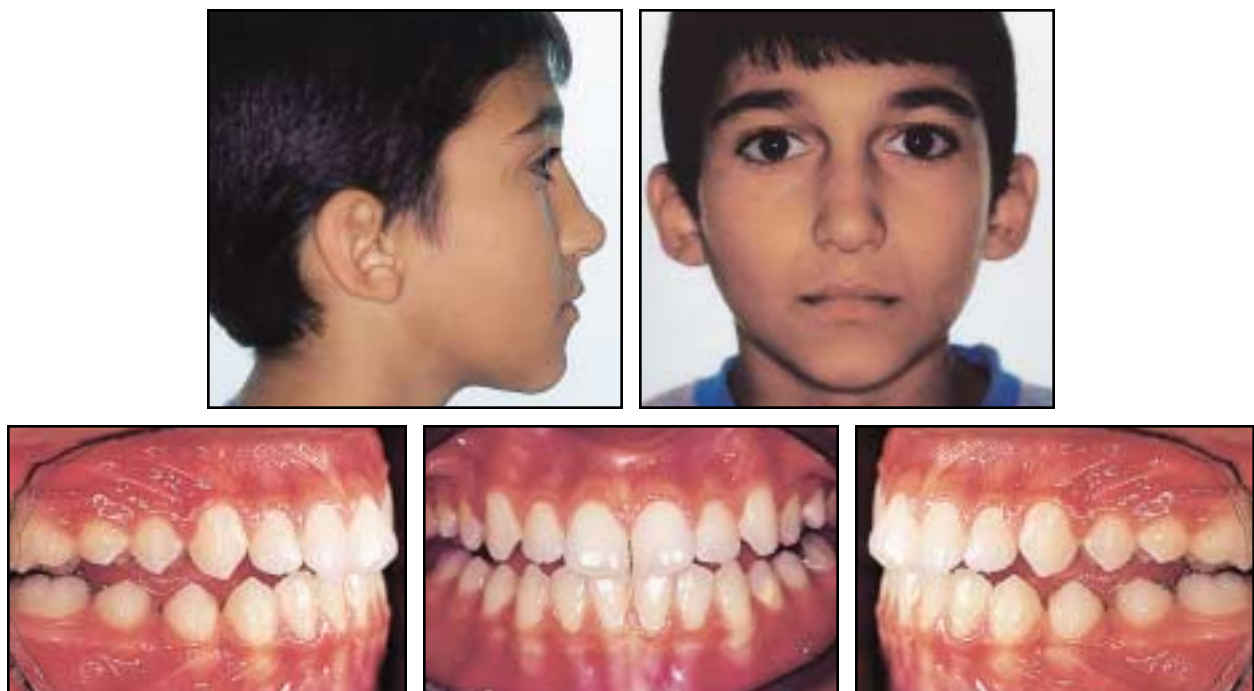


Fig. 3 After four months of maxillary protraction.

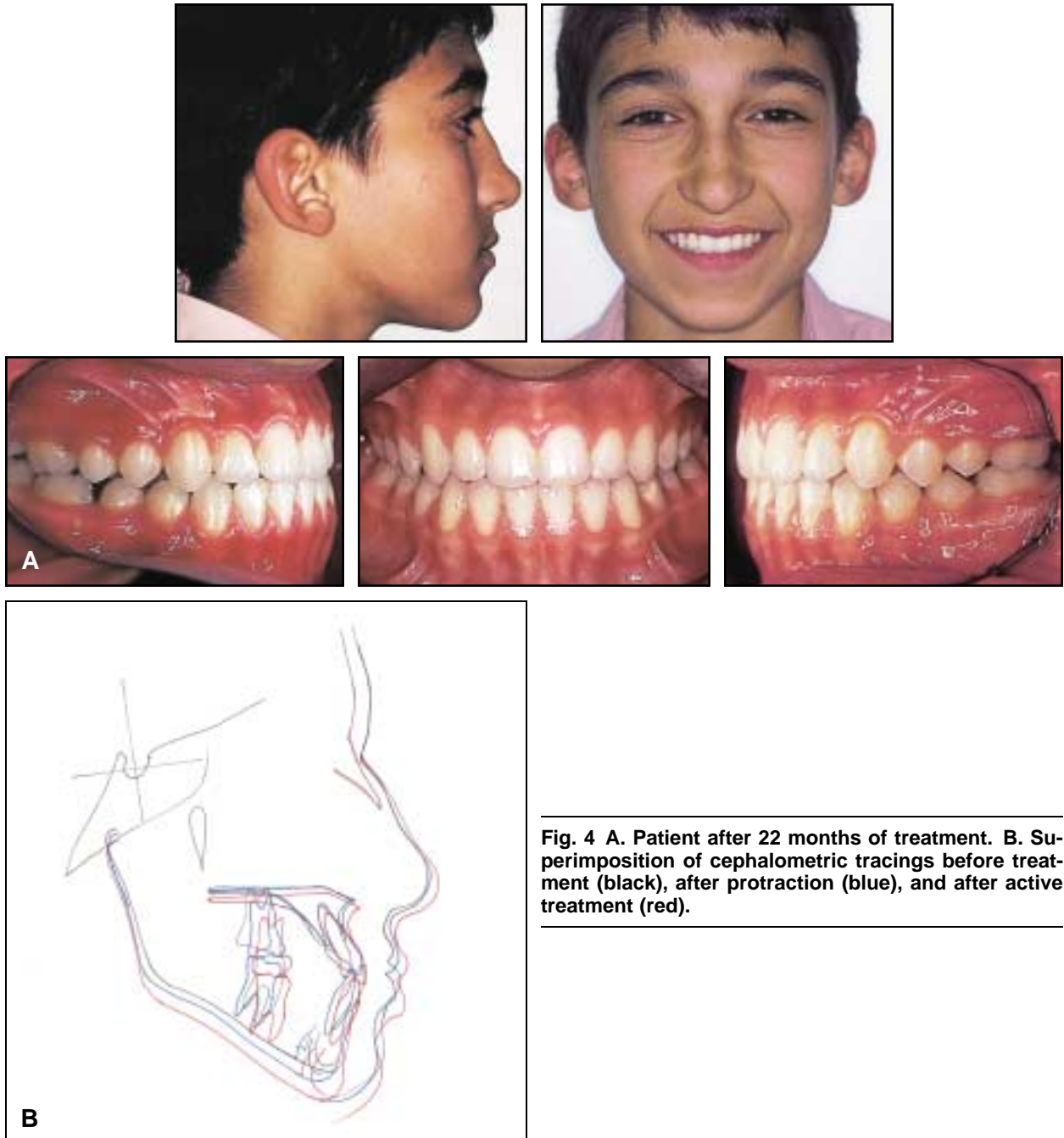


Fig. 4 A. Patient after 22 months of treatment. B. Superimposition of cephalometric tracings before treatment (black), after protraction (blue), and after active treatment (red).