

CASE REPORT

Bimaxillary Protrusion Treated Without Extractions

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Bimaxillary protrusion in adolescent patients has traditionally been treated by extracting the four first premolars and retracting the anterior teeth.^{1,2} Although this approach is less complex than nonextraction treatment and can produce a good occlusal result, it also tends to retrude the lips and reduce the convexity of the face.³⁻⁶

In cases with severe incisor protrusion, facial convexity, lip incompetence, or crowding, premolar extractions may be unavoidable. In our opinion, however, a nonextraction approach can be more esthetic in patients

with mild or moderate bimaxillary protrusion, as the following case demonstrates.

Diagnosis and Treatment Plan

An 11-year-old female presented with a Class II malocclusion (Fig. 1). The patient's lips were incompetent and procumbent, and the nasolabial angle was closed. Cephalometric analysis (Table 1) showed a marked bimaxillary protrusion (L1-GoGn = 106°; U1-ANS/PNS = 126°).

Despite the extreme incisor

proclination, the parents refused premolar extraction treatment. Therefore, a protocol involving the removal of only the lower third molars was chosen.

Treatment Progress

After the third molar extractions, the upper arch was bonded, and leveling and alignment were carried out with an .016" heat-activated nickel titanium wire. Bendbacks and lacebacks were added to preserve arch length and avoid worsening the incisor proclination. A combi headgear was worn to the upper first molars 16

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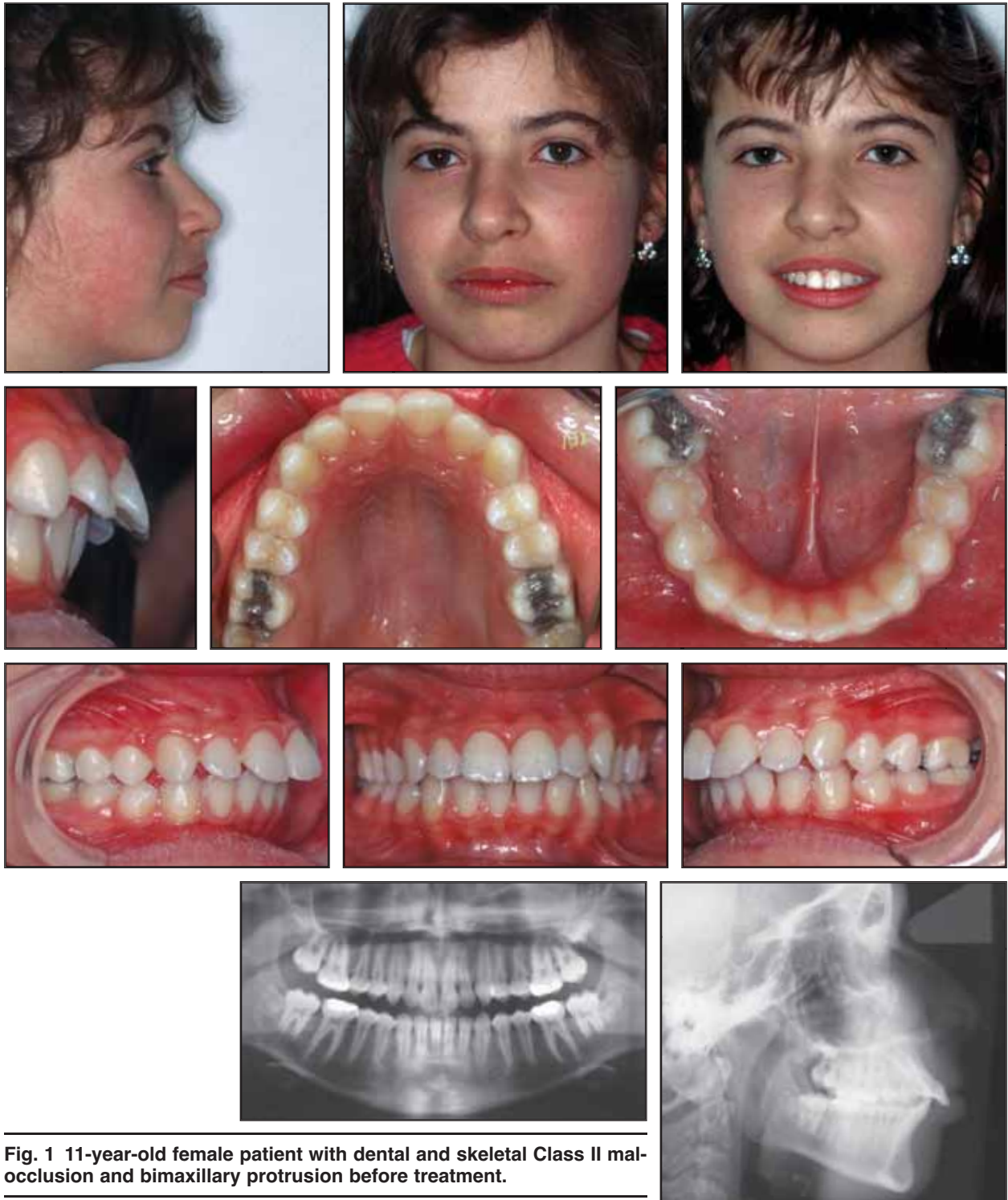


Fig. 1 11-year-old female patient with dental and skeletal Class II malocclusion and bimaxillary protrusion before treatment.

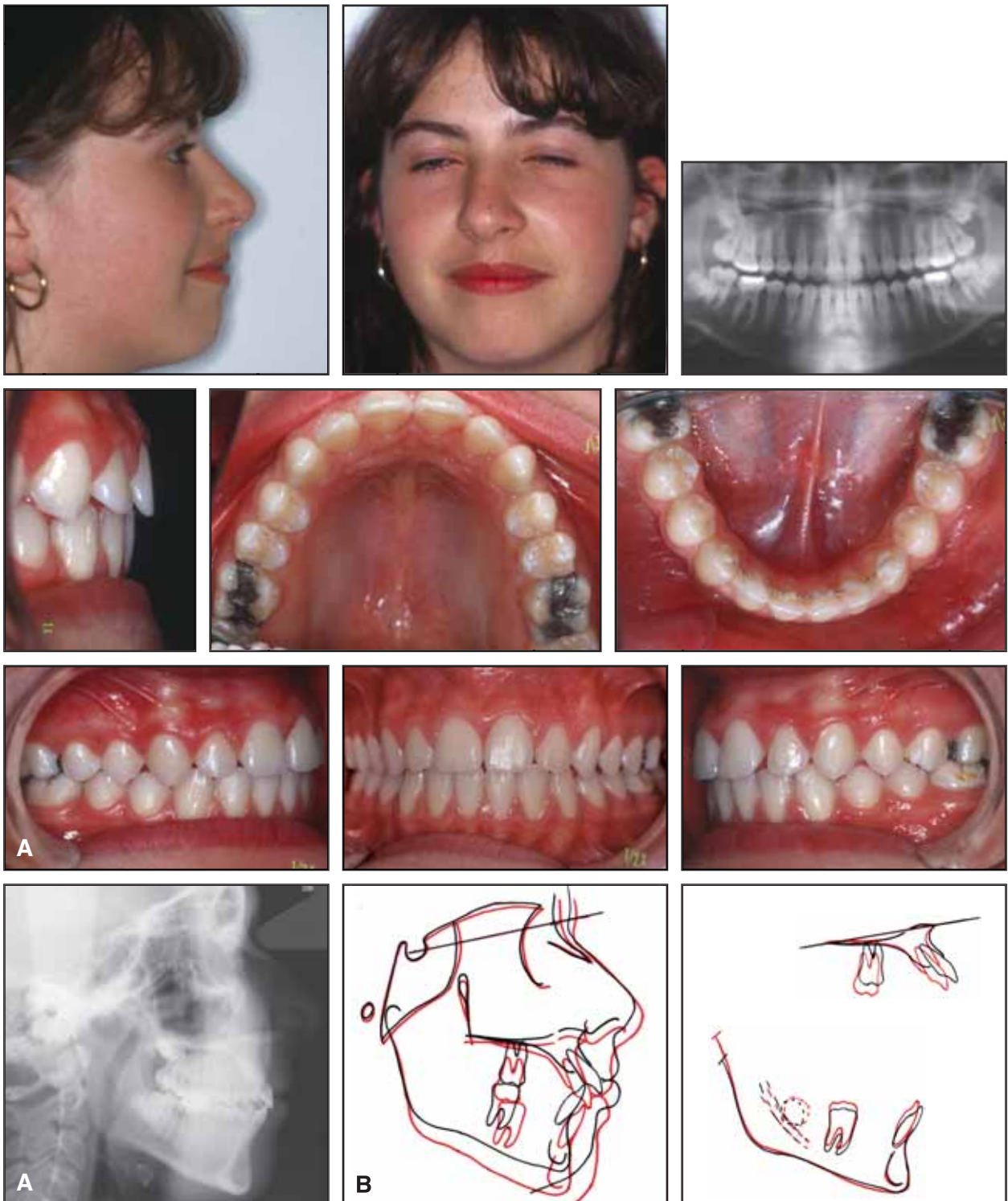


Fig. 2 A. Patient after 26 months of treatment. B. Superimposition of cephalometric tracings before and after treatment.

hours per day.

Seven months later, the lower arch was banded and bonded, except for the four incisors. An .016" heat-activated nickel titanium wire with bendbacks and lacebacks was used in conjunction with a lightly activated open-coil spring from canine to canine. Light Class III elastics were worn only when the headgear was in place. After 11 months of treatment, both archwires were changed to .019" × .025" heat-activated nickel titanium, still with bendbacks and lacebacks.

Further alignment was carried out using .019" × .025" stainless steel archwires with tiebacks for torque control, followed by .014" Australian* wires for finishing. Class II elastics were used to optimize intercuspation.

**TABLE 1
CEPHALOMETRIC DATA**

	Pre-treatment	Post-Treatment
SNA	88.0°	84.5°
SNB	81.0°	80.0°
ANB	7.0°	4.5°
SN-ANS/PNS	11.0°	11.0°
SN-GoGn	34.0°	35.0°
ANS/PNS-GoGn	23.0°	24.0°
U1-ANS/PNS	126.0°	120.0°
L1-GoGn	106.0°	98.0°
L1-APo	5.0mm	4.5mm
Nasolabial angle	121.0°	121.0°
Lower lip to E-line	5.0mm	-2.0mm

Treatment Results

After 26 months of treatment, the patient showed a Class I occlusal relationship with normal overbite and overjet control (Fig. 2). The axial inclination of the upper incisors was controlled, as shown by a 6° reduction in U1-ANS/PNS (Table 1). The Class II correction was achieved mainly by maxillary retraction, while the mandibular plane remained essentially stable, despite the limited use of Class III elastics. The lower incisor inclination was clearly reduced; the mandibular superimposition demonstrated that the entire arch was tipped back. The profile was improved, lip prominence was reduced, the nasolabial angle remained stable, and the facial convexity was reduced (Fig. 3).

Discussion

Several factors must be taken into account when planning the treatment of a patient with moderate bimaxillary protrusion. The clinician has to consider not only the outcome of treatment at debonding, but also how the results will change throughout the growth and aging process.

While the subject is controversial, excessive incisor proclination has been correlated with periodontal recession and bony defects.^{7,8} Moderate incisor proclination, on the other hand, can improve lip support. In addition, a slight protrusion will help balance the tendency of the profile to flatten due to continuing growth of the nose and forward rotation of

the chin.⁹⁻¹¹ This will maintain a more esthetic profile over the long term, especially in ethnic groups where moderate lip protrusion is a desirable feature.

Most cephalometric and profile standards are derived from North American and northern European samples of Caucasian patients.¹²⁻¹⁷ In recent years, however, researchers have begun to develop norms for ethnic subgroups that may have different esthetic concerns.¹⁸⁻²³ Specifically, Bowman and Johnston proposed that the lips should be 2-3mm in front of the E-plane in African Americans, as opposed to 2-3mm behind the E-plane in Caucasians.²⁴ In our experience, the Italian norm for lip protrusion is somewhere in between.

Several studies have found that the general public associates a fuller, more protrusive dentofacial pattern with a youthful appearance.²⁵⁻²⁷ Some authors have stated that premolar extractions cause a narrowing of the arches, producing dark buccal corridors in smiling^{28,29}—although this view has been contradicted by recent reports.^{30,31} To improve the post-extraction smile, Zachrisson has recommended adding buccal crown torque to lingually inclined canines and premolars.³²

In severe skeletal Class II cases, facial esthetics generally tend to worsen when extractions are performed, even if a good occlusion is achieved.³³⁻³⁵ According to Proffit and Field, Class II

*G&H Wire Company, P.O. Box 248, Greenwood, IN 46142; www.ghwire.com.



Fig. 3 Patient one year after treatment.

extraction treatment can result in a more prominent nose and a deficiency in the middle and lower thirds of the face.³³ This was a concern in the present case, especially if mandibular growth turned out to be insufficient.

Various nonextraction options were considered for this patient, including anterior interproximal enamel reduction.^{36,37} Although the stripping procedure is considered safe and reliable,³⁸⁻⁴³ we preferred to maintain the patient's Bolton Index⁴⁴ and dental integrity.^{42,45-47}

The combination of headgear with light Class III elastics has been previously described by McLaughlin and Bennett as a

method for controlling anchorage in extraction treatment.⁴⁸ Our results show that these mechanics can also correct a skeletal Class II relationship by means of maxillary growth inhibition or retraction. Mandibular growth will assist in the Class II correction, while Class III elastics can control or retrocline the lower incisors. Alveolar bone remodeling of the mandibular arch, supported by planned extractions of the lower third molars, will further improve the incisor inclination.⁴⁹

Conclusion

The protocol described here

was designed for borderline cases of bimaxillary protrusion, in which nonextraction treatment may produce more esthetic results than can be achieved with premolar extractions.

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