CASE REPORT

Functional Treatment of Mild Skeletal Asymmetry

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Treatment options for a skeletal asymmetry depend on the seriousness of the problem, the age of the patient, and other individual esthetic and functional concerns. Surgical therapy is usually delayed until the end of growth, although it may be initiated earlier if the facial deformation is so serious that several surgical interventions are required.[1]

On the other hand, functional therapy is recommended in a growing, cooperative patient with mild skeletal asymmetry due to hemifacial microsomia or traumatic ankylosis.[2-4] The functional appliance is usually a hybrid designed to perform several tasks simultaneously: repositioning the mandible in the frontal and sagittal planes, correcting the midlines, and opening the bite on the affected side.[5,6]

This article presents a case in which a patient with mild skeletal asymmetry was treated with a rapid palatal expander, a hybrid functional appliance, and a multibracketed fixed appliance.

Diagnosis

A 9-year-old female presented with a skeletal Class I jaw relationship, a bimaxillary protrusion, and a mesofacial growth pattern (Fig. 1). There was no history of trauma or temporomandibular joint disorder. The patient had a Class I molar and canine relationship on the left side and a Class II molar and canine relationship with a buccal crossbite on the right. The deviation of the midlines in maximum mouth opening indicated a mandibular laterognathia.

The panoramic radiograph further revealed an asymmetry of the mandible, as confirmed by greater linear measurements for condylion-gonion, gonion-menton, and condylion-menton on the left side. A posteroanterior radiograph showed a difference between the right and left maxillomandibular width (the distance from the jugal point to the frontal facial plane) as well as a postural asymmetry (the difference between the left and right angles formed by the zygomatic frontal sutures, antegonial protuberances, and zygomatic arches).

Treatment Plan

The treatment objectives were to correct the skeletal asymmetry, the midline discrepancy, and the buccal crossbite,

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Fig. 1 9-year-old female patient with mild skeletal asymmetry before treatment.

Fig. 2 After six months of rapid palatal expansion.

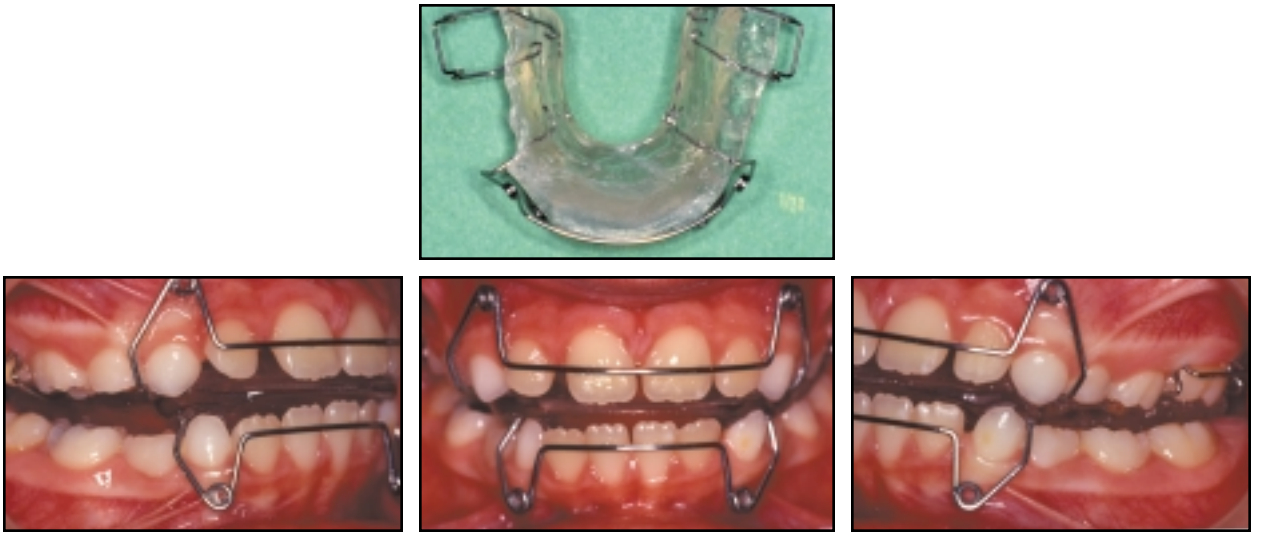

Fig. 3 Hybrid functional appliance with no occlusal acrylic on underdeveloped side.

and to obtain a Class I dental relationship on both sides, with normal overbite and overjet. If the patient showed a lack of cooperation or inadequate biological response, surgical correction at the end of growth would be the only alternative.

Treatment Progress

A rapid palatal expander was worn for six months, but the midline discrepancy persisted (Fig. 2).

A hybrid functional appliance was then designed to stimulate asymmetrical compensatory growth and to reposition the mandible in the horizontal plane, overcorrecting the discrepancy (Fig. 3). To allow vertical dentoalveolar growth, the appliance had no occlusal coverage on the underdeveloped side.

The functional appliance was worn 16 hours a day for 18 months. A multibracketed fixed appliance was then placed for arch coordination. After another 18 months of treatment, an upper wraparound Hawley and lower spring retainer were delivered.

Results

Treatment with the hybrid functional appliance achieved the desired mandibular and midline corrections. An effective growth of the less developed side and an esthetic improvement in the lower third of the face occurred, as confirmed by the progress photographs (Fig. 4).

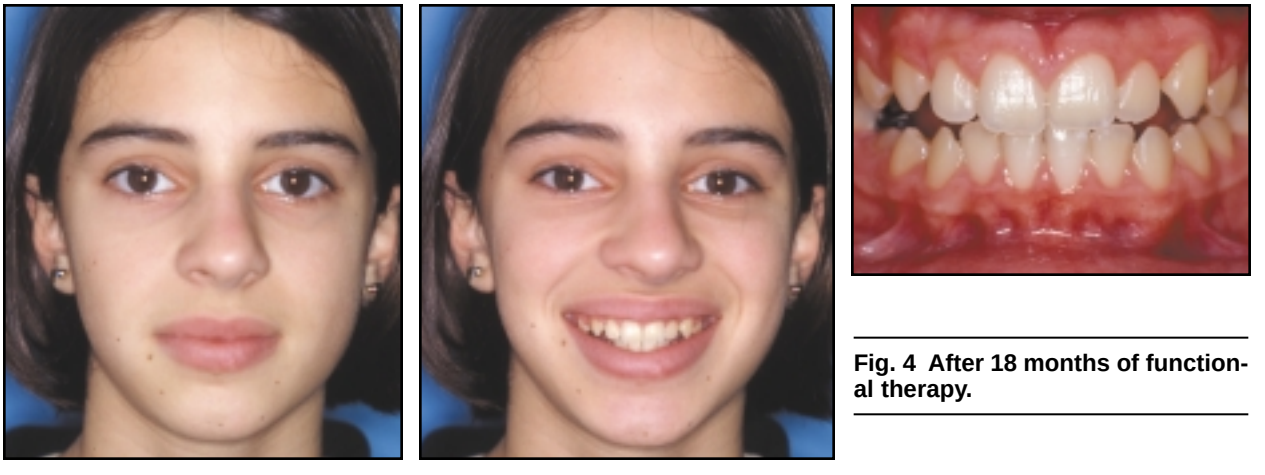

Fig. 4 After 18 months of functional therapy.

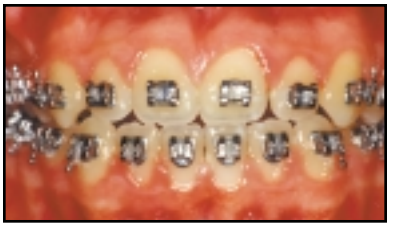

Fig. 5 Fixed appliance.

The fixed appliance (Fig. 5) produced a Class I occlusion and a normal overbite and overjet, as well as a complete correction of the midline (Fig. 6). The left and right linear measurements were similar in the final panoramic x-ray. Comparison of the pre- and post-treatment posteroanterior radiographs also confirmed the normalization of maxillomandibular relationships and postural symmetry.

Two years after treatment, the patient continued to show stable results (Fig. 7).

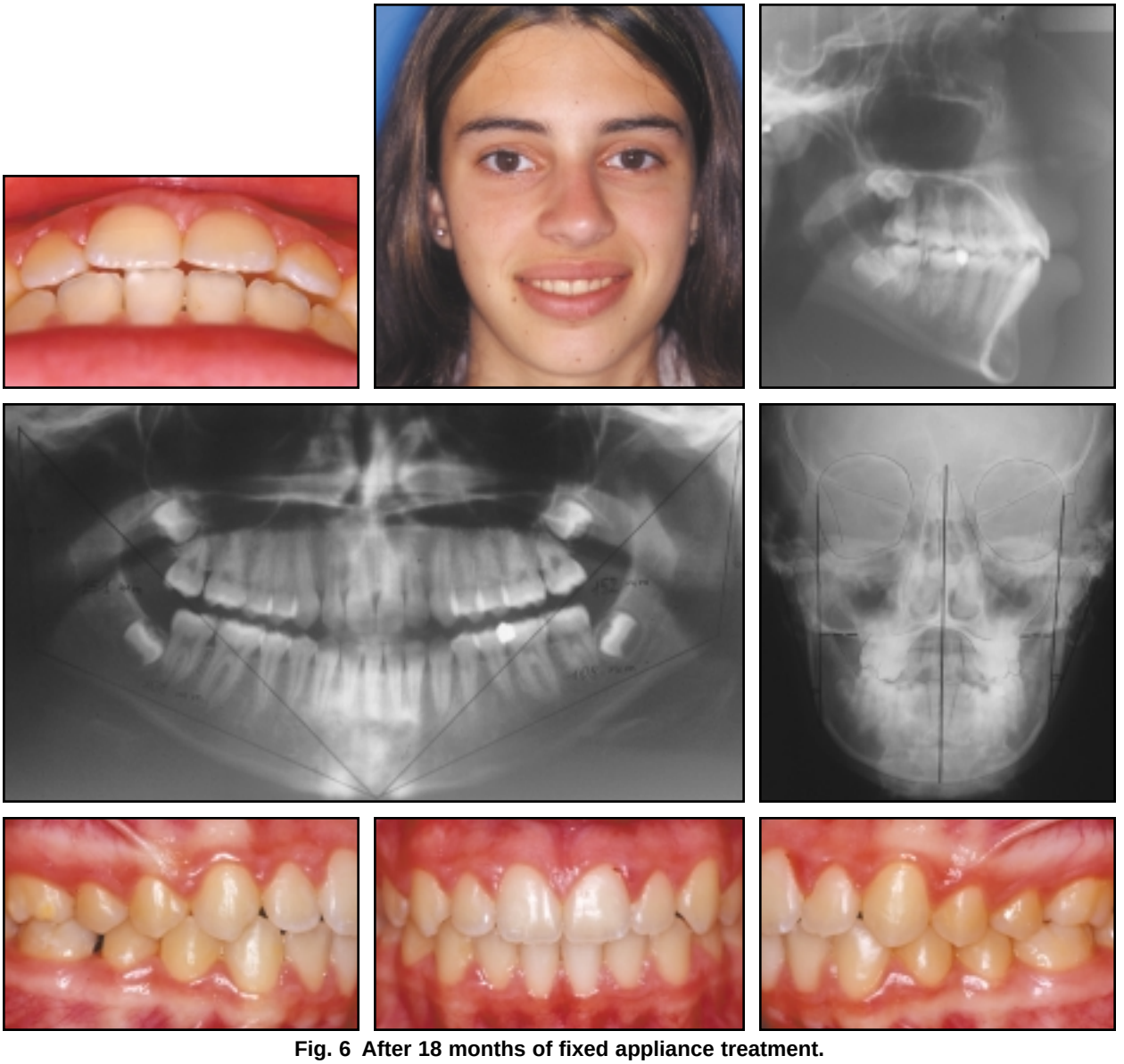

Fig. 6 After 18 months of fixed appliance treatment.

Discussion

Mild skeletal asymmetries can sometimes be overlooked in clinical examinations.[7] Even a functional asymmetry, in which a lateral deviation of the mandible is not caused by a skeletal condition, can turn into a skeletal deformation (laterognathia) if it is not recognized and treated accordingly.[8] Proper diagnosis of asymmetry, therefore, is critically important, and should include not only standard records such as panoramic and cephalometric radiographs, but posteroanterior and possibly submental vertex radiographs as well.

A functional appliance designed for treatment of asymmetry must restrict vertical growth on the more developed side while encouraging it on the underdeveloped side. Lingual pads and vestibular shields are often used to stimulate vertical and transverse development. In addition, the wax bite should be softer on the healthy side and harder on the affected side. If the midlines cannot be corrected with the first wax bite registration, periodic reactivations of the appliance with new bite registrations will be necessary until the desired mandibular position is reached.

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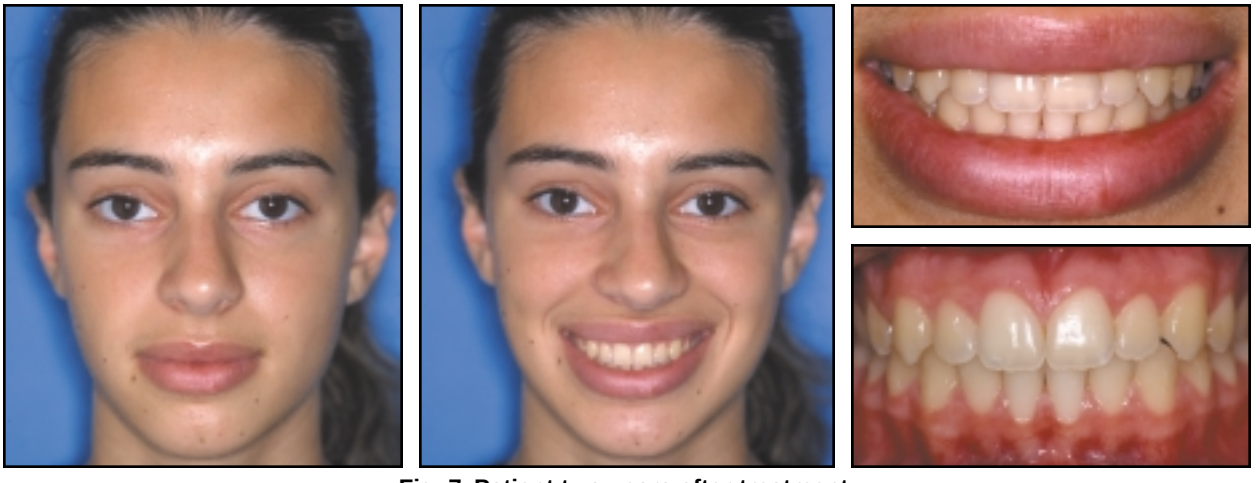

Fig. 7 Patient two years after treatment.