

## *Correction of Class II, Division 2 malocclusions through the use of the Bionator appliance*

### *Report of two cases*

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The correction of two Class II, Division 2 malocclusions during the mixed dentition phase with the use of a Bionator appliance is presented. The suggestion that correction of Class II, Division 2 malocclusions may be achieved in the absence of fixed appliances is supported in these case reports. (AM J ORTHOD DENTOFAC ORTHOP 1990;97:106-12.)

The great majority of orthodontists who have received traditional fixed-appliance training in American university programs lack first-hand exposure to the functional appliances routinely used by most European orthodontists.<sup>1-3</sup> To acquaint the American reader with the potential offered by one of these appliances (the Bionator) in the correction of Class II, Division 2 malocclusions, two case reports are presented here. The Bionator differs from the classic activator in that the extent of acrylic is greatly reduced to allow normal tongue function and speech. The appliance can therefore be worn at all times, except while eating.

The Bionator as described by Balters<sup>4</sup> and as modified by Witt<sup>5</sup> is constructed so as to position the mandible forward, with interarch relationships near normal. It is desirable to position the mandible beyond normal rest position so as to elicit a muscular response.<sup>6,7</sup> The extent of this positioning is kept within the limits of unstrained lip closure.

Each patient treatment regimen involved a Class II, Division 2 malocclusion intercepted during the mixed dentition phase of dental development. As is commonly required in Bionator treatment, and because of the individual characteristics and physiologic responses of the malocclusions, two or more appliances were used in each of these cases during the combined periods of active and retentive care. No bands or brackets were used at any stage of treatment.

The basic configuration of the Bionator appliance is shown in **Fig. 1, A and B**. In a Class II, Division 1 correction, extraoral traction is applied directly to the Bionator, and the appliance often includes a labial wire to control lip position.<sup>8</sup> In the Class II, Division 2 treatment reviewed here, a special spring (**Fig. 1, C and D**) was used to protrude the

lingually inclined maxillary incisors.

During the active phase of treatment, patients wore the Bionator appliance approximately 15 to 18 hours a day.

## **CASE REPORTS**

### **CASE 1 (Figs. 2 through 6)**

G. B., an 8-year, 8-month-old male patient, was accepted for treatment at the University of Würzburg for correction of a Class II, Division 2 malocclusion exhibiting typical dental relationships without extreme cephalometric values. The dentition presented permanent incisors and first molars in all four quadrants.

A Bionator appliance was introduced when the patient was 8 years, 6 months old. A second Bionator appliance was constructed for the patient at 10 years, 6 months of age, and, later, a third Bionator appliance was used for passive retention. All appliances were discontinued when the patient was 16 years, 5 months old.

Posttreatment records shown here were obtained 2 years after all retention appliances had been discontinued. With the exception of slight rotations of the maxillary left second premolar and mandibular left lateral incisor, the dentition after treatment was near ideal. Temporomandibular joint function was without complication. Cephalometric records (**Fig. 6**) revealed an excellent skeletal pattern and a marked improvement in facial profile. The growth pattern, under the influence of Bionator therapy, appears to have been most favorable. Third molar teeth have subsequently been removed.

### **Case 2 (Figs. 7 through 11)**

J.S., a 10-year, 3-month-old male patient, was accepted for treatment at the University of Würzburg for correction of a Class II, Division 2 malocclusion of classic description. The mixed dentition presented permanent incisors and first molars in all four quadrants.

A Bionator appliance was introduced when the patient was 10 years, 5 months old. A second Bionator appliance was used for the patient at 12 years, 5 months of age. Orthodontic treatment was discontinued when the patient was 15 years old, except for intermittent wear at night while the third molar teeth were under continued observation.

Posttreatment records were obtained 2 years after the discontinuation of all appliances. With the exception of a slight diastema at the maxillary midline, the dentition presents an occlusion near ideal. Temporomandibular joint function is without complication. Cephalometric records (**Fig. 11**) reveal excellent skeletal relationships and improved facial profile. Under the influence of Bionator therapy, a most favorable development of the occlusion has taken place.

It has been demonstrated that the resolution of Class II, Division 2 malocclusion in the growing child is indeed within the capability of Bionator therapy.<sup>9</sup> The correction of minor rotations or diastemata with fixed appliances remains a patient option. The health of the individual teeth and their supporting structures, of course, is subjected to far less stress during functional appliance therapy than when full banding and bracketing is used.

We will soon report on Class II, Division 1 correction with a modified Bionator to which extraoral traction is directly applied.

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