

# Treatment of an Infant With a Rare Cleft Resolved With Use of an Orthopedic Appliance

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**Objective:** Cases of bilateral complete clefts of the primary palate and unaffected secondary palate are very rare. One of these cases as well as a new method of presurgical orthopedics to solve the protruding premaxilla protrusion is presented.

KEY WORDS: *cleft palate, orthopedic appliances*

Unusual and rare forms of the cleft condition can present a challenge to management and create a need to revisit the treatment options, including newer treatments. This is a case report of such an infant born with bilateral complete clefts of the primary palate (lip and alveolar ridge) and premaxillary deformity. Surgical closure of the lip appeared to be very difficult with a risk of dehiscence of the repair site.

At present there are three methods available for presurgical orthopedic treatment of bilateral complete clefts of the lip and palate. First, there is the original McNeil method, which utilizes intraoral prostheses and a head-bonnet with extraoral straps and modifications (Jones et al., 1985). Second, there is the technique of presurgical nasoalveolar molding, which was described by Grayson et al. (1999). This includes active molding and repositioning of the deformed nasal cartilages and alveolar processes as well as the lengthening of the columella. Finally, there is the intraoral elastic chain premaxillary repositioning appliance, which was developed from an earlier device described by Georgiade and Latham (1975) and more recently by Millard and Latham (1999). This appliance consists of acrylic pads over the maxillary segments connected posteriorly by an expansion mechanism. The premaxillary segment is retracted by elastic bands attached to a pin placed through the premaxillary bones just anterior to the premaxillovomer suture.

From the viewpoint of the esthetics of the lip and nose, Ross and MacNamara (1994) reported that presurgical orthopedic treatment in patients with bilateral cleft palate has no lasting effects and does not alter the need for revisionary surgery. However, other authors (Santiago et al., 1997; Grayson and

Cutting, 2001) take the contrary view insofar as presurgical orthopedics can give the opportunity for alveolar ridge repair by gingivoperiosteoplasty. This combined treatment is reported to reduce the need for a bone graft later.

Controversy exists with regard to treatment and the dental occlusion. Bitter (1992) and Millard and Latham (1999) believed that use of the elastic chain premaxillary repositioning appliance for alignment of the alveolar segments is beneficial not only for lip and nose reconstruction but also for the occlusion as well. Other authors (Berkowitz, 1996; Henkel and Gundlach, 1998) consider that this produces results in more malocclusion than when there is no orthopedic treatment. All considered, the facilitation of lip and nose reconstruction in the difficult case makes presurgical orthopedics with improved technique worthwhile not only because of reduced tension at the suture lines and less need for soft tissue undermining but also because it does eliminate the necessity for additional lip adhesion surgery.

## CASE REPORT

The patient was born with bilateral complete clefts of the primary palate, but the secondary palate appeared to be un-



FIGURE 1 The premaxillary segment protruded and rotated to the right side.

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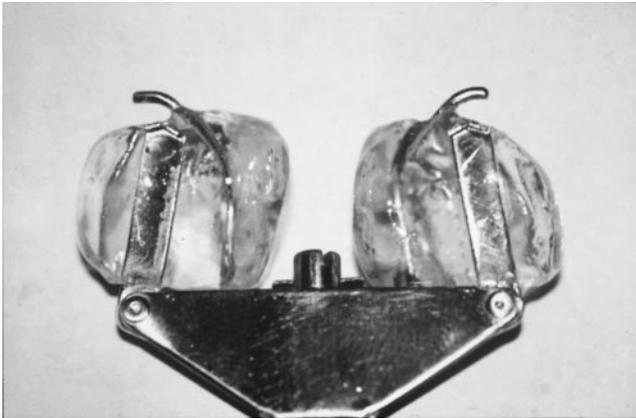


FIGURE 2 Modified Georgiade-Latham expansion appliance, with hooks.

affected. The premaxillary segment was protruded and rotated to the right side (Fig. 1). Premaxillary width was 11 mm and the protrusion from the anterior end of the maxillary gum pads was 8 mm. Because of the premaxillary malalignment, surgical closure of the lip was considered to be very difficult. Because there was no cleft of the secondary palate, the use of the elastic chain premaxillary repositioning appliance, which we usually use in patients with bilateral cleft palate, was not possible. Therefore, it was decided to use a new orthopedic approach that combines Latham's appliance with a micropalate attached to the anterior surface of the premaxillary segment (Papay et al., 1994).

Under general anesthesia, dental impressions of the maxillary and mandibular arches were taken using custom impression trays. A modified Georgiade-Latham expansion appliance was designed to have two hooks located anteriorly and a little lateral to the dental ridge (Fig. 2). These were for the attachment of right and left elastic bands. Under general anesthesia, the modified expansion appliance was inserted onto the palate and retained with four stainless steel pins. A maxillofacial microplate was then secured to the premaxillary segment (Fig. 3). Incisions were made on the lateral aspect of the premaxillary segment and, through a tunnel made in the soft tissues across the anterior premaxillary border, the microplate was in-

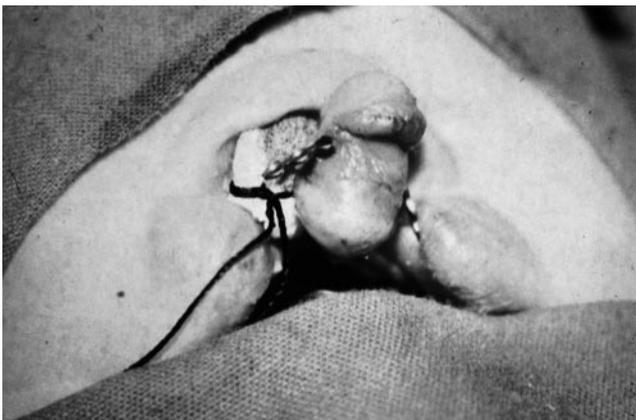


FIGURE 3 Microplate secured to the premaxillary segment.



FIGURE 4 Elastic bands secured to the hooks of the appliance and to the microplate.

serted so that on each side several microplate holes were exposed. Orthodontic elastic bands were secured to each end of the microplate and also onto the hooks of the appliance (Fig. 4). The patient was checked weekly and the elastic bands were adjusted to reposition and align the premaxillary segment. After 5 weeks the premaxillary segment was aligned. Cheiloplasty was performed using Mulliken's method. There was no repair of the alveolar clefts at this time.

In follow-up, good alignment of the premaxillary segment in the maxillary dental arch was maintained in relation to the repaired lip (Figs. 5 and 6).

#### DISCUSSION

The treatment of this special infant was based on the previously described method of Papay et al. (1994) but differs from it in two notable respects. The description of their technique relates to the treatment of bilateral complete clefts of the lip and palate. Our experience indicated that the concept applied very well to the infant affected by bilateral clefts exclusively of the primary palate, which is quite a rare cleft condition. Secondly, we used a modified Georgiade-Latham expansion appliance on which to anchor the premaxillary elas-

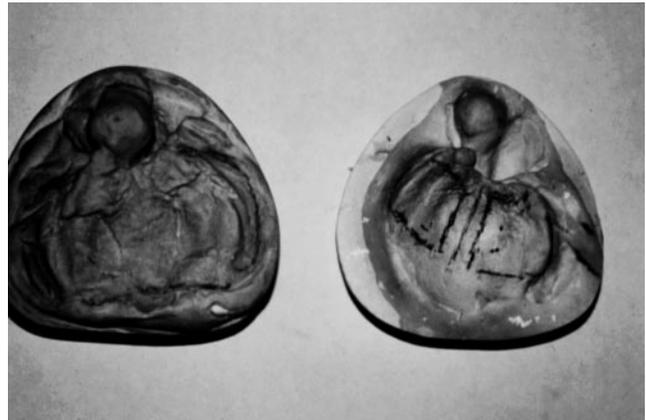


FIGURE 5 Initial and final casts.



**FIGURE 6** Face of the patient some months after surgery.

tics and obtain maxillary arch expansion, but Papay et al. (1994) used a different pin-retained prosthesis.

An important problem in this case was the lack of space. The space available in the anterior maxilla transversely was inadequate to accommodate retrusion of the premaxillary segment. The modified Georgiade-Latham appliance used produced the expansion that was necessary to accommodate the premaxillary segment, but the possibility that more expansion would be needed in the future was not ruled out. In this case, in which the secondary palate was unaffected, the anchorage this modified Georgiade-Latham appliance provided appeared to make it more efficient than other techniques because removable appliances' lack of retention make it more difficult to get optimal results.

Retracting the premaxilla strapping with a bonnet after using a plate to expand, as used by Peat (1974), has been shown to work well in clefts of the primary and secondary palate, but apart from needing a high degree of parental compliance, caution must be used in placing the retraction component of the appliance. If not precisely positioned, a downward rotation of

the premaxilla, rather than retraction, may result (Sierra and Turner, 1995).

In spite of persistent controversy surrounding presurgical orthopedic treatment for patients with cleft palate, the results of this case support the view of authors proposing that presurgical orthopedics can facilitate cheiloplasty (Sierra and Turner, 1995; Braumann et al., 1999; Grayson and Cutting, 2001).

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