

Labial Supportive Appliance

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The patient with a repaired cleft lip and palate and an associated displacement and deficiency of the premaxilla presents problems which may be of concern to the plastic surgeon, speech pathologist, orthodontist, and prosthodontist.

The upper lip may appear flat or retruded in relation to the lower lip. When maxillary anterior teeth are missing, either congenitally, naturally (as in the mixed dentition period), or because of neglect, the upper lip may appear to be rolled under the premaxilla. The lower lip usually assumes a characteristic 'pouty' appearance.

This complex of tissue deformities also may be important in the articulation of speech sounds. Fricatives and plosives are difficult to produce correctly because of the malposition of the lip. There may be interference with direction of air current, contact of tongue to alveolar ridge, and normal contact of lips.

Corrective procedures are designed to improve the labial profile and to establish more normal relationships of intraoral structures. These procedures, employed individually or in combination, may include orthodontic movement of maxillary segments, dental prosthesis, and cheiloplasty. Another more recently developed adjunct involves autogenous osseous implantation in the cleft areas.

Case Report

D.H., white female, aged five years and six months, was referred by the attending plastic surgeon and the speech pathologist for a prosthesis which would support the upper lip. A deficient and displaced premaxilla containing only two partially erupted anomalous microdonts offered inadequate support for the upper lip (Figure 1). The tightness and length of the lip caused the vermilion portion to be withdrawn under the alveolar ridge. This faulty anatomic relationship prevented proper bilabial and lingual-alveolar consonant articulation. The lower lip appeared full and protrusive (Figure 2).

Study models of the dental arches verified the observation that the mandibular anterior teeth contacted the premaxilla during closure. In order to use a typical

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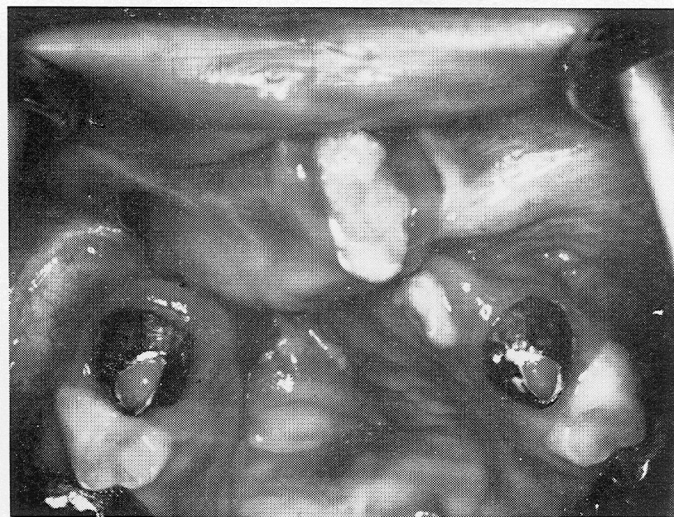


FIGURE 1. Before placing the prosthesis, the subject showed a deficient and displaced premaxilla.

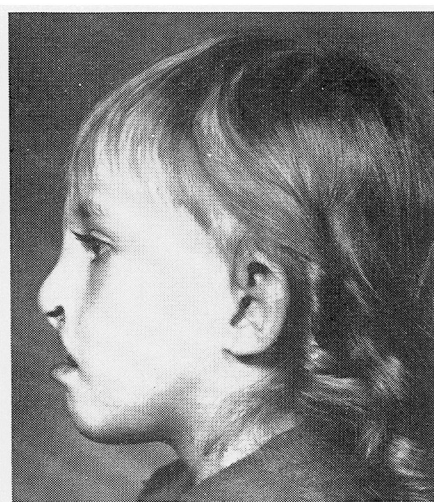


FIGURE 2. Profile of subject before placement of the prosthesis.

palatal acrylic appliance to carry a labial extension for lip support, removal of mandibular tooth structure and/or premaxillary gingival tissue would have been necessary.

The patient had recently completed initial orthodontic treatment (by author LB) in order to correct the posterior crossbite relationship. Stainless steel crowns on the maxillary second primary molars carried the expansion appliance. In lieu of the Hawley type palatal retention appliance which is usually used as a retainer for the expanded arch, a labial appliance was designed to serve not only as a retainer but also as the lip-supporting prosthesis.

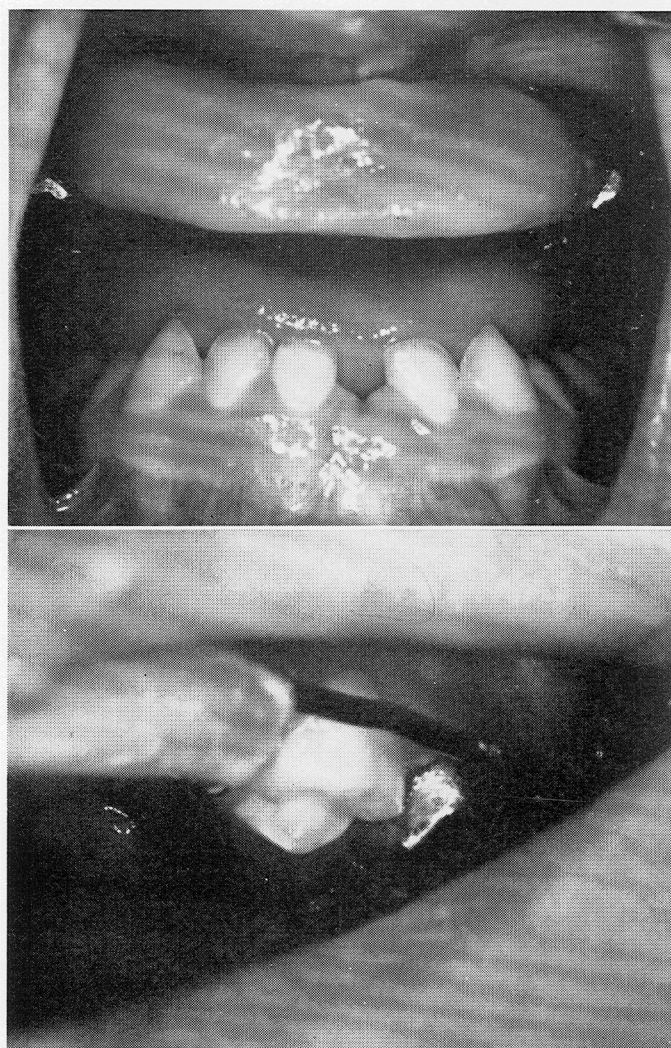


FIGURE 3. Frontal view of prosthesis in place.

FIGURE 4. A labial arch retainer was fabricated to fit into the buccal tubes on the molar bands.

Using .040-inch diameter stainless steel wire, a labial arch retainer was fabricated to fit into the buccal tubes on the molar bands (Figures 3 and 4). To the intercuspid portion of the labial arch, wire struts were soldered to support the acrylic prosthesis. An acrylic impression material¹ was molded around the metal framework prior to the placement of the arch wire in the molar tubes. Digital pressure on the lip was used to mold the underlying impression material to the proper fullness and length. The appliance was left in place for 24 hours to allow this semi-rigid material to continue to flow and to be molded by tissue function.

¹ Amco Soft Line 2.

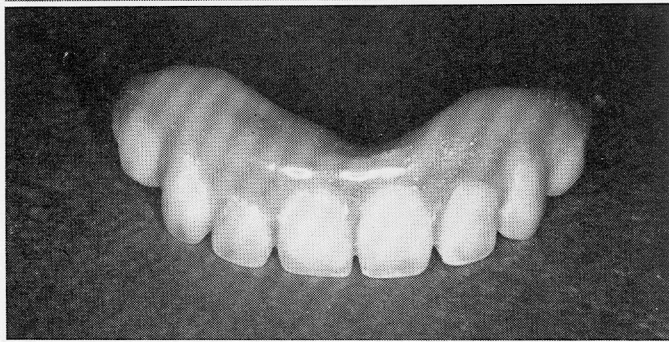
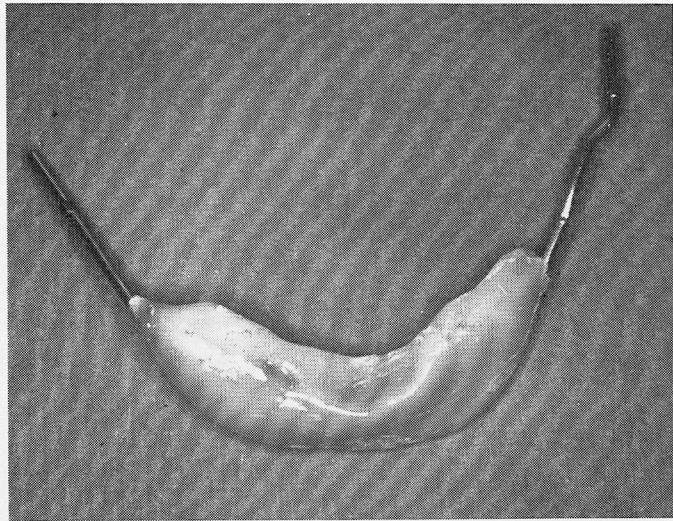


FIGURE 5. View of the prosthesis, from above.
FIGURE 6. Prosthesis with teeth.



FIGURE 7. Profile of subject after placement of the prosthesis.

At the second visit, the tissues were noted to be normal and the retention of the appliance adequate. The semi-rigid acrylic material was coated with an acrylic lacquer² to counteract the surface porosity and to provide a relatively hard, glossy, and hygienic acrylic surface (Figure 5).

The parent was instructed about the insertion of the appliance into the buccal tubes, the removal of it, and proper maintenance.

The referring plastic surgeon then saw the child in order to evaluate the effectiveness of the lip-supporting appliance. He recommended utilizing the appliance for further stretching of the lip at intervals prior to subsequent surgical repair. The speech clinician at the elementary school where the patient had been receiving speech therapy noted an immediate articulatory improvement, especially in fricatives and plosives. Because this appliance does not encroach upon any palatal structures, the tongue continues to show full range of movement. The palatal type appliance with its bulk of acrylic alters the size and shape of the oral cavity and often requires the tongue to make tactile and neuromuscular adjustments which frequently are detrimental to continued improvement in articulation.

With the appliance functioning adequately, consideration was then given to the feasibility of improving esthetics by inserting replacement teeth in the existing acrylic material to simulate the natural dentition. Four days after the placement of the lip-supporting appliance, the teeth were added to complete the esthetic dimension (Figures 6 and 7).

Comments

The use of this type of appliance permits postponement of secondary surgical procedures until careful evaluation of the patient's growth and development suggests the optimum treatment plan. Both speech and esthetics are enhanced during this interim period.

The planning and construction of a labial supportive prosthesis represents an example of interdisciplinary cooperation. It is designed to serve the current orthodontic, speech, and cosmetic needs of the patient and to serve as a base of reference for future surgical procedures.

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² Unitek cold cure acrylic lacquer.