

Dramatic Advances in Cleft Lip and Palate Surgery

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ABSTRACT: Traditional approaches to cleft lip and palate deformities have focused on early closure of the lip with little attention paid to the underlying bone and dental arches. Bypassing correction of these crucial areas has resulted in alveolar collapse, oral nasal fistulas, and nasal deformities. A more progressive approach is to insert palatomaxillary appliances in the early weeks after birth to painlessly realign the cleft bony segments into normal position. In one surgical procedure the dental arch is then fused, the oral nasal fistula closed, and the nose and lip repaired.

INTRODUCTION

Clefting deformities occur in approximately 1 in 800 births and generate significant physical and psychological challenges to all involved. The decisions made in the newborn period will be reflected for a lifetime.

The pediatrician's role is crucial not only to the child, but as an invaluable support to the parents. Families rely on the pediatrician for guidance in choosing a plastic surgeon who can achieve the most natural facial restoration possible.

This article presents results of a new technique that has dramatic effects on achieving structural, functional, and aesthetic harmony.

PROBLEMS CAUSED BY TRADITIONAL METHODS

Traditional approaches to cleft lip and palate focused solely on early closure of the lip: little or no attention was given to the underlying bony or dental arches. Although superficial cosmetic improvement was achieved initially, the failure to correct the facial infrastructure resulted in alveolar collapse, oral nasal fistulas, and dental and nasal deformities. Late correction of these problems required multiple and complex surgical and dental procedures extending well into adolescence (Fig. 1).

This new method of treatment offers superior correction of a complex deformity.

A NEW APPROACH

A new and progressive approach is to utilize dynamic palatomaxillary appliances in the newborn period to painlessly realign the cleft bony segments into normal position. In one surgical procedure, the dental arch is then fused, the oral nasal fistula closed, and the lip and nose reconstructed in a tension-free fashion (Fig. 2).

METHODOLOGY

Early referral and intervention is critical. At birth the child should be seen and evaluated by a plastic surgeon and a prosthodontist especially trained in this technique.¹ Together a treatment plan is formulated. A static (retainer type) appliance is molded and placed; this has

¹Doctor Frederick Lukash is the only plastic surgeon on Long Island who has trained in this method. *Editor's note.*

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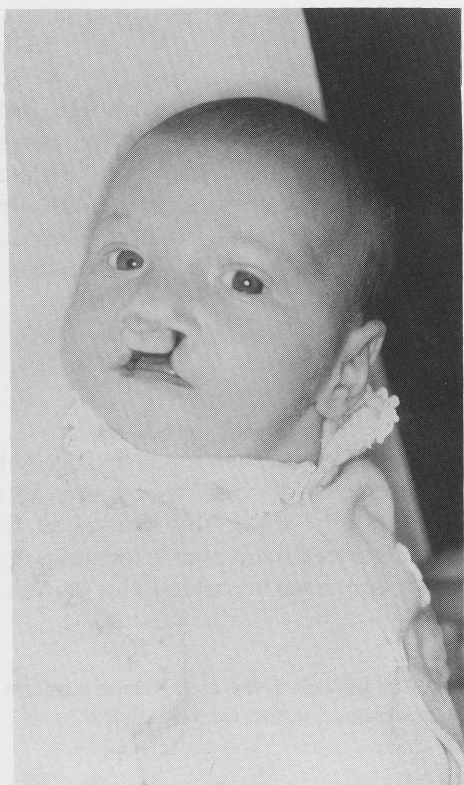
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(A) Complete unilateral cleft lip and palate deformity.



(B) Appearance after soft tissue repair only. There is marked facial asymmetry and nasal deformity resultant from bony alveolar arch collapse.



(C) Complete bilateral cleft lip and palate deformity.

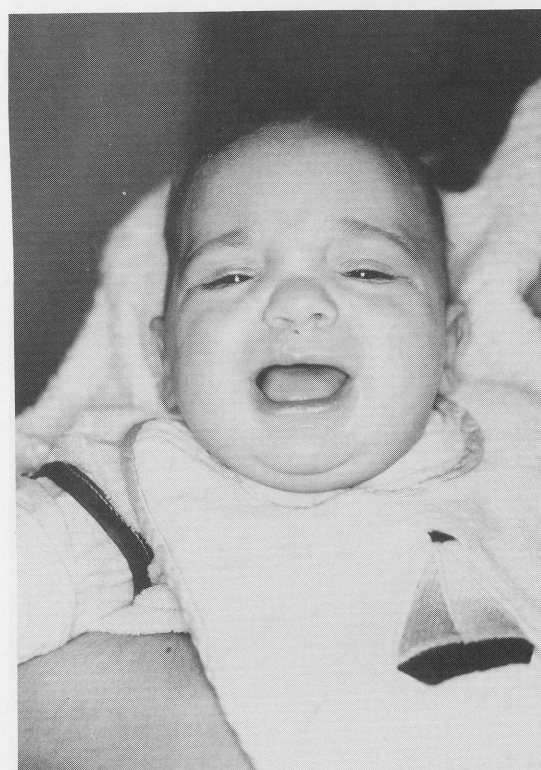


(D) Appearance after soft tissue closure only. There is a snout-like facies resultant from collapse of the lateral alveolar arches behind the protruding premaxilla.

Figure 1. Traditional approach to cleft lip repair.



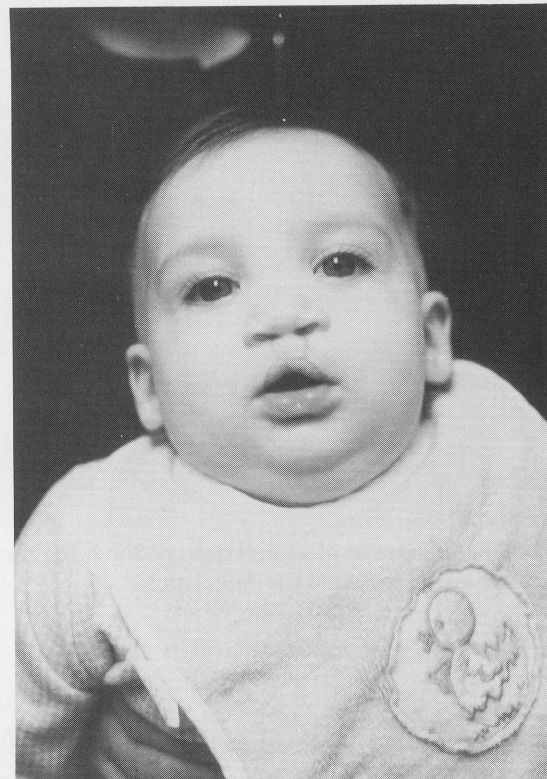
(A) Complete unilateral cleft lip and palate deformity.



(B) Appearance after dynamic arch alignment closure of the oral-nasal fistula and reconstruction of the nose and lip. Note the normal structural and aesthetic facial balance.

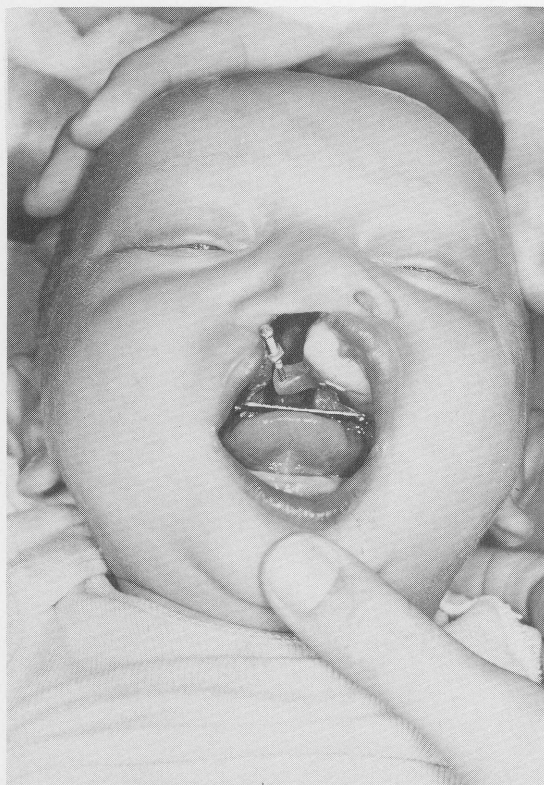


(C) Complete bilateral cleft lip and palate.



(D) Appearance after dynamic arch alignment, closure of the oral-nasal fistulas and repair of the lip and nose. Structural and aesthetic balance has been achieved.

Figure 2. Dynamic facial reconstruction.



(A) Unilateral appliance in place and designed to realign the dental arch.



(B) Bilateral appliance in place and designed to bring the protruding premaxilla back into the dental arch.

Figure 3. Dynamic palatomaxillary appliances.

a twofold purpose. It holds the cleft segments and prevents further deformity; and it obturates the open palatal roof so that the infant can generate a sucking response for feeding.

When the child is 6 weeks of age a dynamic appli-



(A) Before and after plaster casts demonstrating arch alignment in a complete unilateral deformity.



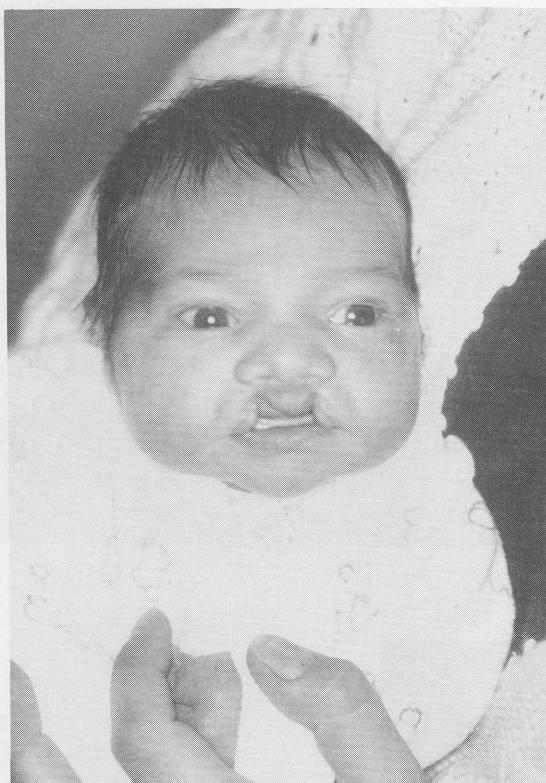
(B) Before and after casts demonstrating arch alignment in a complete bilateral deformity.

Figure 4. Dynamic arch alignment.

ance is substituted. This has been mathematically designed to permit maxillary arch realignment, and the appliance is held in place with small pins. Placement is performed as an outpatient procedure and is accomplished rapidly (between 15 and 45 minutes). (Fig. 3).

These infants are followed twice weekly to ensure that dynamic arch alignment is progressing. This is accomplished by turning a screw that moves the appliance parts together to align the cleft. The process usually takes about 3 weeks (Fig. 4).

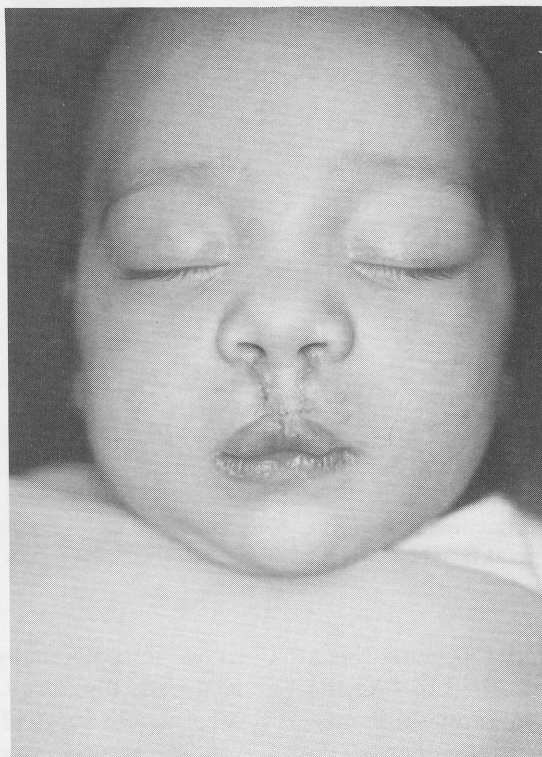
At 3 months of age the baby undergoes the definitive repair. The dynamic maxillary appliance is removed



(A) Bilateral cleft lip and palate deformity.



(B) Bilateral mucoperiosteal gingivoplasty to fuse the aligned clefted alveolar arches.



(C) One week post-repair of the cleft lip and alveolar arches.

Figure 5. Definitive surgery.

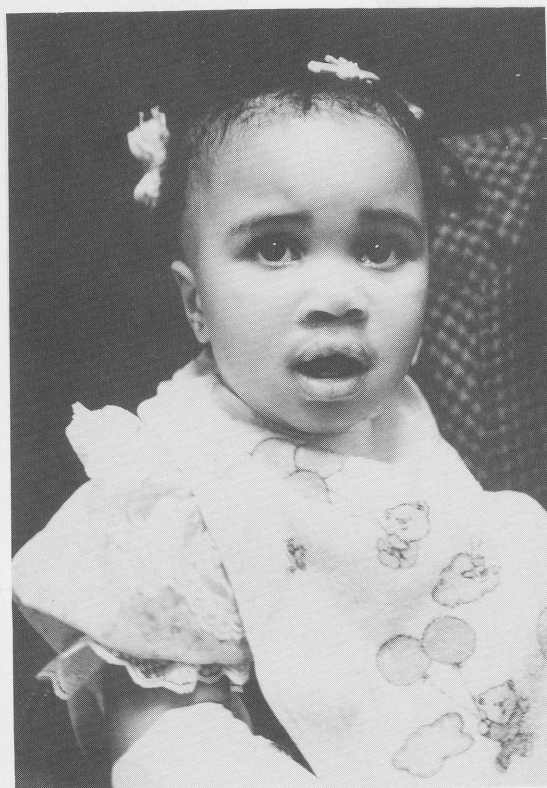
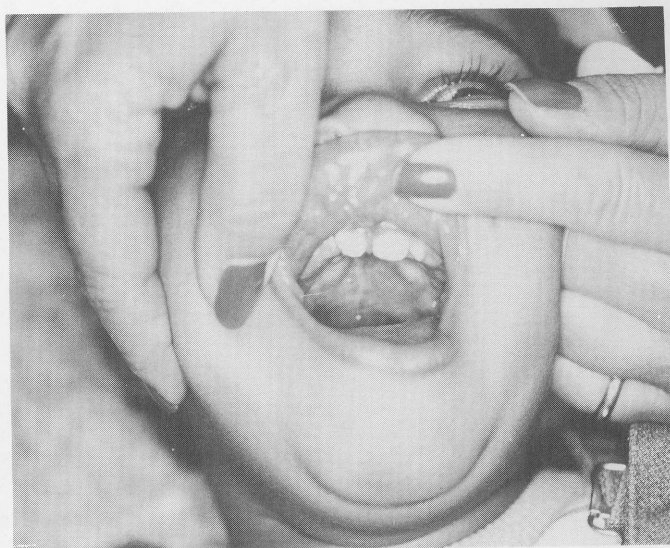
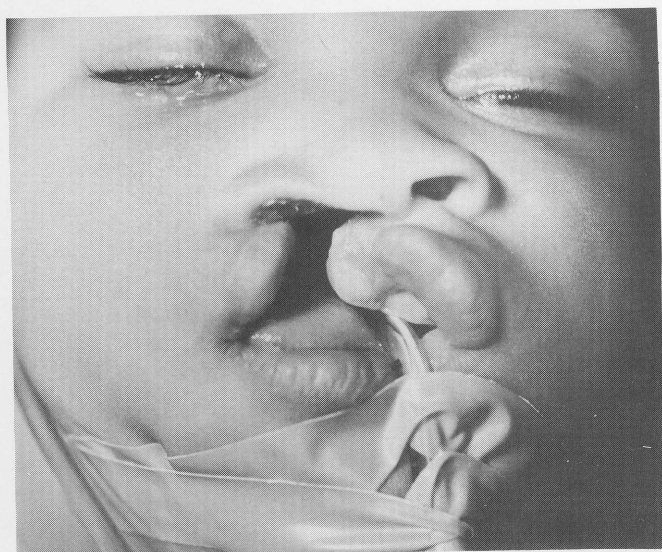


Figure 6A. Comprehensive follow-up and documentation. Complete unilateral cleft - 2 year follow-up - demonstrates normal arch alignment and tooth eruption as well as good facial balance and aesthetics.

under general anesthesia. Immediately following this a mucoperiosteal gingivoplasty is performed to fuse the aligned cleft segments and to close the oronasal fistula. Next, the displaced nasal cartilages are repositioned. Finally, the cleft lip segments are rotated and advanced into normal anatomical position. The operation takes approximately 3 hours (Fig. 5).

As soon as the baby has recovered from anesthesia,

a clear liquid diet is started. Once adequate oral intake is achieved, discharge is planned. This is usually on the second post-surgical day.

The sutures are removed 1 week after surgery. When the child is 1 year of age the hard and soft palates are closed in a single maneuver. The procedure takes about 1 1/2 hours and requires general anesthesia. This completes total cleft reconstruction. None of the children

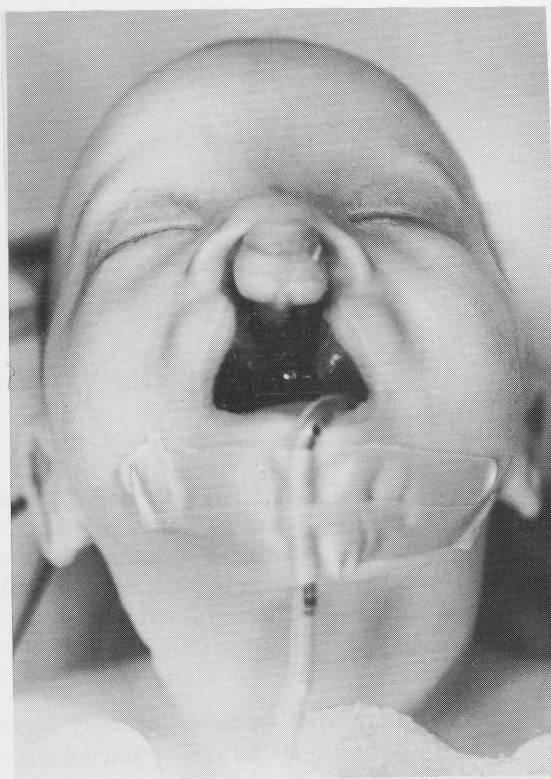


Figure 6B. Comprehensive follow-up and documentation. Complete bilateral cleft lip and palate. Two and one-half year follow-up demonstrating excellent arch and tooth relationships and good facial balance.

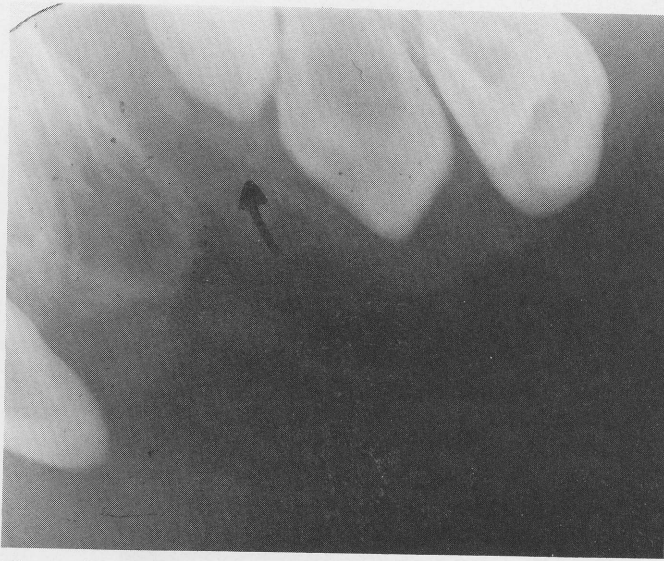


Figure 6C. Comprehensive follow-up and documentation. Radiograph demonstrating bone development in the area of the repaired cleft alveolus after mucoperiosteal gingivoplasty.

thus treated has required a blood transfusion. All children are registered in a cleft lip and palate center where complete follow-up is maintained with attention to hearing, speech and dentistry. Genetic counseling and social services are also available.

RESULTS

This technique has been utilized by the author for more than 3 years during which 21 cases have been completed. The progress and care of the children has been documented extensively with photographic, radiographic, and dental model records. Such records confirm bone consolidation across the cleft alveolar segments - a successful fusing of the dental arch. Facial anthropomorphics are progressing at a normal rate, and tooth eruption is occurring without distortion (Fig. 6).

DISCUSSION: PHILOSOPHY

As any architect will attest, a building needs a structurally correct framework to withstand the stresses of use and time. The same philosophy applies to the face. Without attention to the bony facial infrastructure proper, cleft repair is ill-fated.

Anatomically, clefts can be divided into those of the primary palate and those of the secondary palate. The dividing line is the incisor foramen (Fig. 7). Primary palatal clefts include the lip/nasal complex and the dental alveolus. Secondary palatal clefts involve the hard and soft palates.

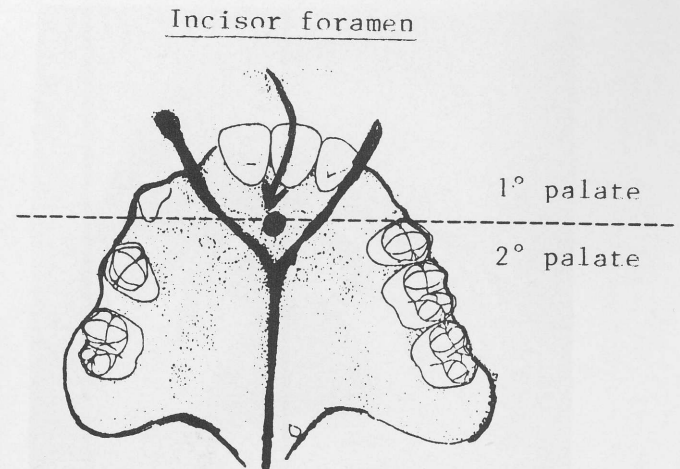


Figure 7. Anatomical nomenclature for clefts. The incisor foramen defines the primary and secondary palates. The primary palate is anterior to the foramen and includes the alveolus, the lip, and the nose. The secondary palate is posterior to this foramen and includes the hard and soft palates.

Clefting may involve either primary or secondary clefts or both and may be either partial or complete. Thus viewed, the logic of the dynamic arch alignment philosophy becomes apparent as does the belief that traditional approaches fail.

The mere closure of the lip at age 3 months represents an *incomplete* closure of the primary palate. Dynamic activity of the facial muscles will move the cleft maxillary segments into a collapsed position.

Regardless of complete closure of the secondary palate (hard and soft) there still remains an incomplete aspect - the alveolus - leaving an oral nasal fistula.

Traditionally, this has been left unattended until the child's permanent teeth begin to erupt. Then, palatal expansion procedures and bone grafts are needed to close the dental arch. It is frequently unnecessary that such children bear the cleft stigma for so long a period.

The author's approach as stated above is to realign and *completely* reconstruct the primary palate at age 3 months. Therefore, when the secondary palate is closed at 1 year to coincide with the onset of speech, the structural framework is complete and anatomical.

It is believed that this will eliminate the stigma associated with the deformity at a much earlier age and encourage better psychological as well as physical development (Fig. 8).

THE CHALLENGE

Nothing can alter the reality, soften the blow, or compensate for the traumatic experience of having a child deformed by a cleft palate or lip. Parents will experience fear, anxiety, and guilt: fear for the health and

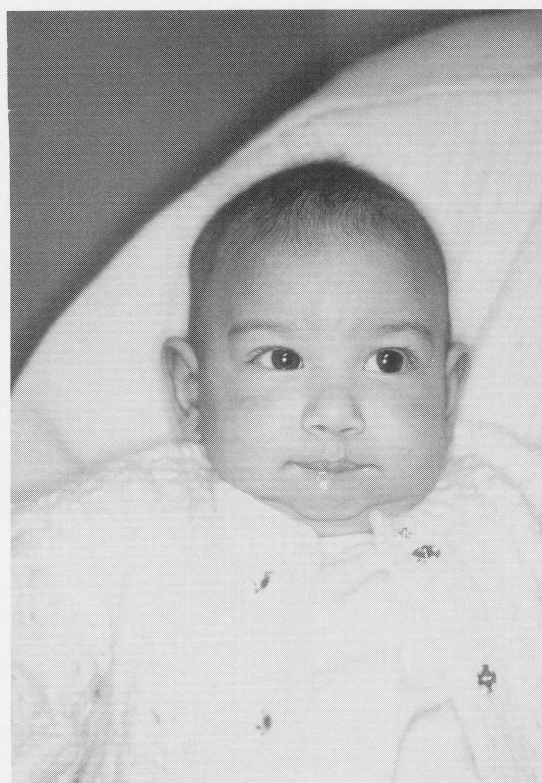
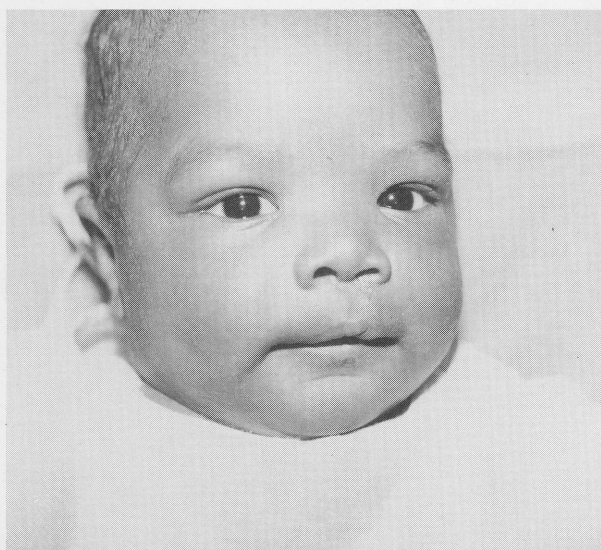


Figure 8. Functional, structural, and aesthetic results allowing for successful psychological and social development without the stigma of cleft deformity.

welfare of the baby; anxiety for lifestyle disruption, which now includes doctors, hospital, and surgery; and guilt for the event itself.

It is of utmost importance that pediatricians be well-versed in cleft care so they can assure families that successful solutions are available. Decisions made in the early weeks after birth will affect the remainder of the child's life. Presented here is a new and progressive program in the treatment of such children, which goes far to lift the functional and aesthetic burdens.

ACKNOWLEDGEMENTS

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SUGGESTED READING

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