

The Role of the Lip Adhesion Procedure in Cleft Lip Repair*

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Introduction

A lip adhesion procedure utilizing interdigitating triangular flaps fashioned from tissue ordinarily discarded at the time of lip repair was described by Randall (1) in 1965. The procedure was designed to convert a complete cleft into an incomplete cleft, and in so doing to mold the maxillary dental arch to a more normal position, to reposition the ala of the nose, and to release tension in the lip so that the definitive lip repair can be accomplished under more ideal conditions. As further experience with the procedure has accumulated, its advantages have become more apparent and the operative technique has been revised. This paper is a follow up study based on 68 lip adhesion procedures carried out in 53 patients.

History

A lip adhesion was performed incidentally by Johanson (2) as part of a procedure for preparing soft tissue coverage for early bone grafting across the maxillary alveolar cleft. Millard (3, 4) alluded to the possible uses of a short soft tissue adhesion beneath the nasal floor prior to lip repair, but he has not advocated its use except in rare instances.

Clifford and Pool (5) pointed out that the average length of the upper lip at birth is 10 mm. with growth to 12 mm. by 3 months and to 13 mm. by one year, indicating a possible advantage in delaying definitive repair of the lip until after three months of age. Molding of the bony structures of the alveolus prior to lip repair is desirable. Griswold (6) depended on elastic traction to mobilize the soft tissues in lips with wide clefts. Brauer and Cronin (7) utilized elastic traction in combination with maxillary orthopedic appliances. Walker et al (8) in 1966 described a lip adhesion procedure which was preceded by elastic traction if the cleft was wide.

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Spina (9, 10) described the use of interdigitating flaps behind the prolabium to foster narrowing of the gap and growth of prolabium in patients with bilateral complete cleft lips.

Clinical Material

For several years after the initial report on lip adhesion (8) *all* patients with *complete* unilateral clefts, all patients with very *wide incomplete* unilateral clefts of the lip and all patients having one or two complete clefts as part of a bilateral lip cleft were subjected to the lip adhesion procedure prior to definitive lip repair.

Of the 53 patients, there were 34 with unilateral cleft lips (UCL). Four of these had wide incomplete clefts. Five patients had bilateral cleft lips complete on one side only (BICL), and 14 had bilateral complete cleft lips (BCCL). There were 33 male and 20 female patients.

Of the 67 complete and wide incomplete lip clefts, there were 21 UCL on the left, 13 UCL on the right, 2 BICL on the left, 3 BICL on the right, and 14 BCCL on each side.

Chronic otitis media was present or later developed in 46 of the 47 patients with complete palatal clefts, and in only one of the six patients who had cleft lip without cleft palate. Some of these findings were reported previously (11). Associated congenital abnormalities were present in 11 patients. One of these patients with a trisomy 13-15 and multiple abnormalities died of intercurrent disease eight months after the lip adhesion before a definitive repair could be attempted.

The Lip Adhesion Operation

The operation can be performed equally well under general anesthesia or under local anesthesia with sedation (12). When dental impressions and myringotomies are contemplated general endotracheal anesthesia is preferred. After preparation of the skin, the lip markings for a definitive lip repair are made so that dissection will be confined to tissue that will be excised at the later definitive lip repair. Every attempt is made to avoid encroachment on the tissue to be used for the definitive lip repair. Although triangular flaps were originally described, we now prefer the rectangular flap technique recently described by Randall and Graham (13) (Figure 1).

Two equal rectangular flaps are outlined so that the medial flap is based anteriorly and the lateral flap is based posteriorly. Hemostasis is achieved by local infiltration of about 1 to 1.5 ml of 1:100,000 epinephrine solution. After an interval of a few minutes for full hemostatic effect, the flaps are elevated. If approximation of the flaps is difficult because of a wide cleft, the lateral lip segment is mobilized off the alveolar ridge for a distance of 1.0 to 3.0 cm. with a scalpel. The medial lip segment is rarely undermined. The flaps are approximated in three layers using interrupted everting mucosal sutures of 5-0 chromic catgut followed by two or three muscular

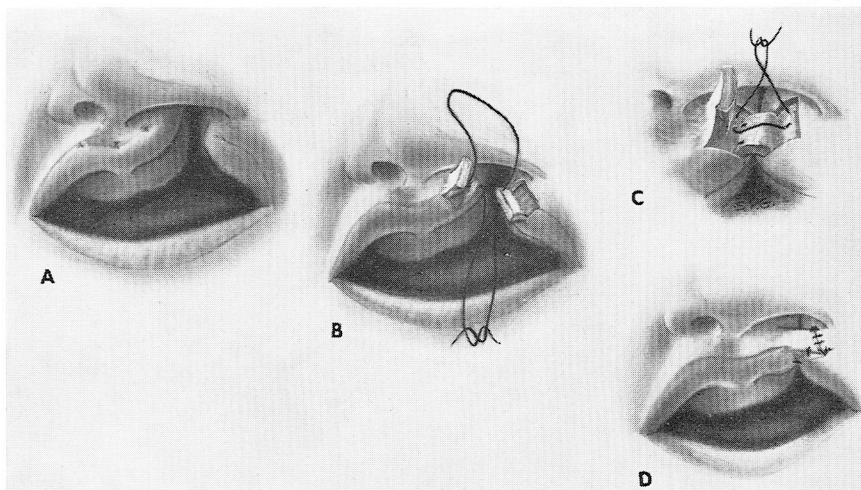


FIGURE 1. The lip adhesion using rectangular flaps. A. Markings for a definitive lip repair. The dissection for the lip adhesion is confined to tissues that will be discarded at the later repair. B. Two flaps are interdigitated. Incision along the gingival labial sulcus for 1-3 cm. beneath the lateral flap is occasionally necessary. Such a dissection should be carried out until the flaps approximate with minimal tension. C. 5-0 chromic catgut sutures are used for the mucosa and for the muscle. A generous mass of tissue must be included from the medial segment for a secure closure. D. The skin is closed with 6-0 silk sutures.

From Randall, P. and Graham, W. P. III, Lip Adhesion Cheilorrhaphy in Grabb, W. C., Rosenstein, S. W. and Bzoch, K. R. *Cleft Lip and Palate* Little, Brown and Co. (In Press).

sutures of the same material. Interrupted sutures of 6-0 silk are used to approximate the skin edges.

If there is tension on the suture line, a partially buried retention suture of 3-0 silk or 3-0 nylon is placed to minimize the tension as described in Figure 2. When this suture is tied, it relieves tension on the lip repair with only two tiny punctate scars of the skin. It is left in place for seven to ten days before removal.

Results

68 lip adhesion procedures were carried out on 63 complete lip clefts. The average age at which the first or the only adhesion was carried out was 3.5 months, although operation was done as early as three days and as late as 13.9 months of age. Contralateral adhesions on patients with BCCL were carried out 1.1 to 1.4 months later.

The operations were carried out under local anesthesia in 10 cases and under general anesthesia in 58 cases. A triangular flap technique was used for the first 38 procedures. The C-W adhesion, as described by Walker et al (8), was performed twice. Recently, the rectangular flap technique has been used for 28 procedures.

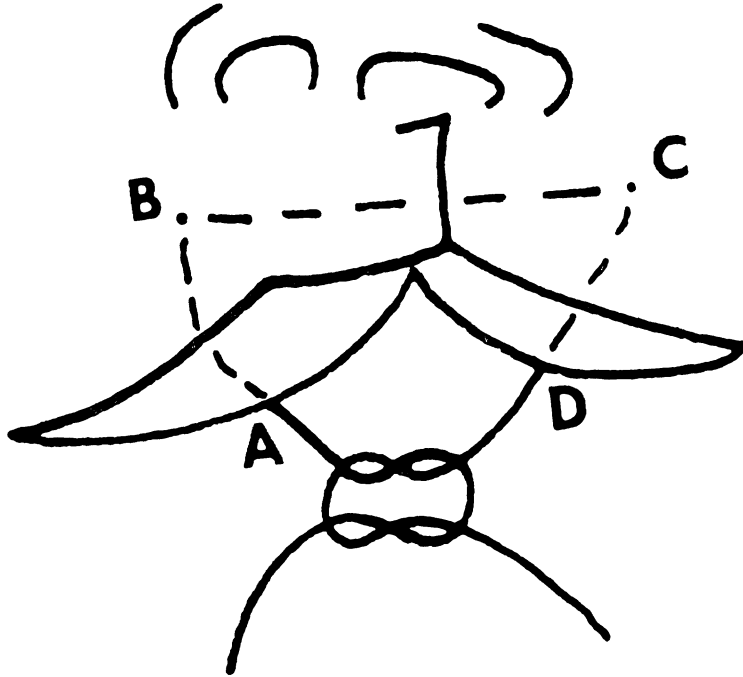


FIGURE 2. Removable retention suture. The needle is inserted from the mucosal side of the lip at A and then out through the skin at B. It is reinserted at B through the same hole in the skin, is directed across the repair and out through the skin about 1-1.5 cm. lateral to the cleft at C. It is then reinserted at C through the lip, and through the mucosa at D and tied. This is a large suture of 3-0 silk or nylon. The ends should be cut long so that its removal is 7-10 days can be assured. Minimal skin scarring results.

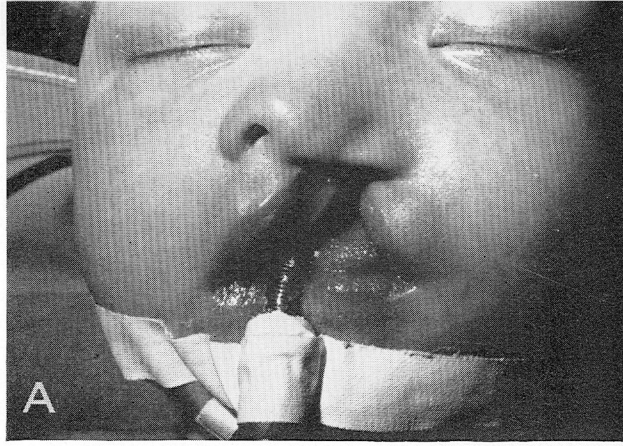
At the time of the lip adhesion operation, other procedures were done in a majority of the patients. Myringotomies using an operating microscope at 10 power magnification were performed in 55 instances. Dental impressions for fabrication of expansion or retention plates were performed in 47 instances. In seven of the procedures vomer flaps were used to close the anterior palatal cleft. In six patients a closure of the soft palate was done at the time of lip adhesion.

There were no operative deaths. Wound dehiscence involving nine clefts occurred twelve times. One dehisced wound was immediately resutured with success. A second lip adhesion after dehiscence was successful twice in five attempts. Thus, 90% (57 of 63) of the clefts operated upon were successfully converted to incomplete clefts by the lip adhesion procedure.

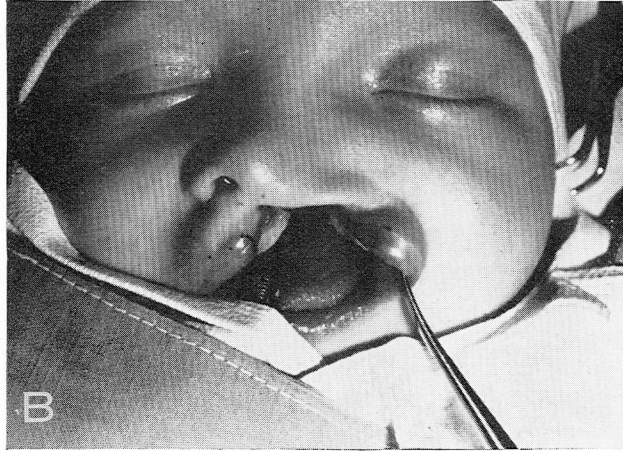
Dehiscence on the first attempt occurred in 24% (6 of 25) of operations on patients with bilateral complete clefts, and in only 8% (three of 38) of operations in patients with a single complete or wide incomplete cleft. At the time of the lip adhesion patients failed to meet "the rule of 10" (4) (hemoglobin 10 grams % or greater, or hematocrit of 30% or greater,

FIGURE 3

A. The lip adhesion procedure can be performed equally well under general endotracheal anesthesia, or under local anesthesia with sedation.



B. This lip has been marked as for a definitive repair. Equal rectangular flaps are outlined utilizing only tissue to be discarded at the time of the definitive repair.



C. Six months later at the time of the definitive lip repair. It is felt that a definite closure at the time of picture A would have been much more difficult than at the time of picture C.



D. Four month after the definitive lip repair.



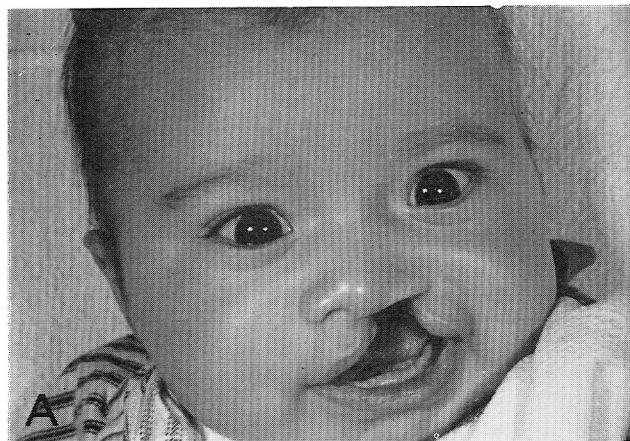
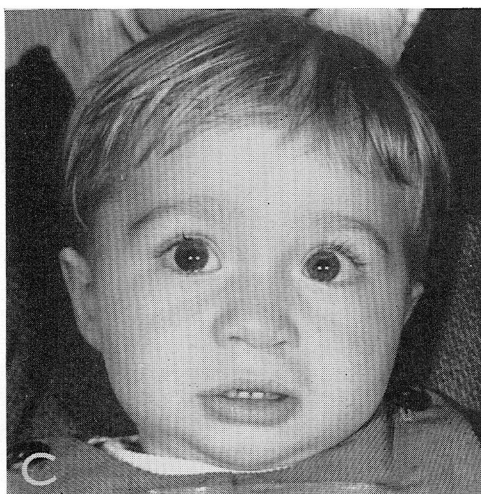


FIGURE 4

A. At age four months. A wide complete lip cleft was converted to an incomplete cleft by a lip adhesion procedure.



B. Age six months, at the time of the definitive lip repair, the landmarks are more easily identified. The underlying alveolus is in a more normal position and closure is achieved with less tension on the suture line.



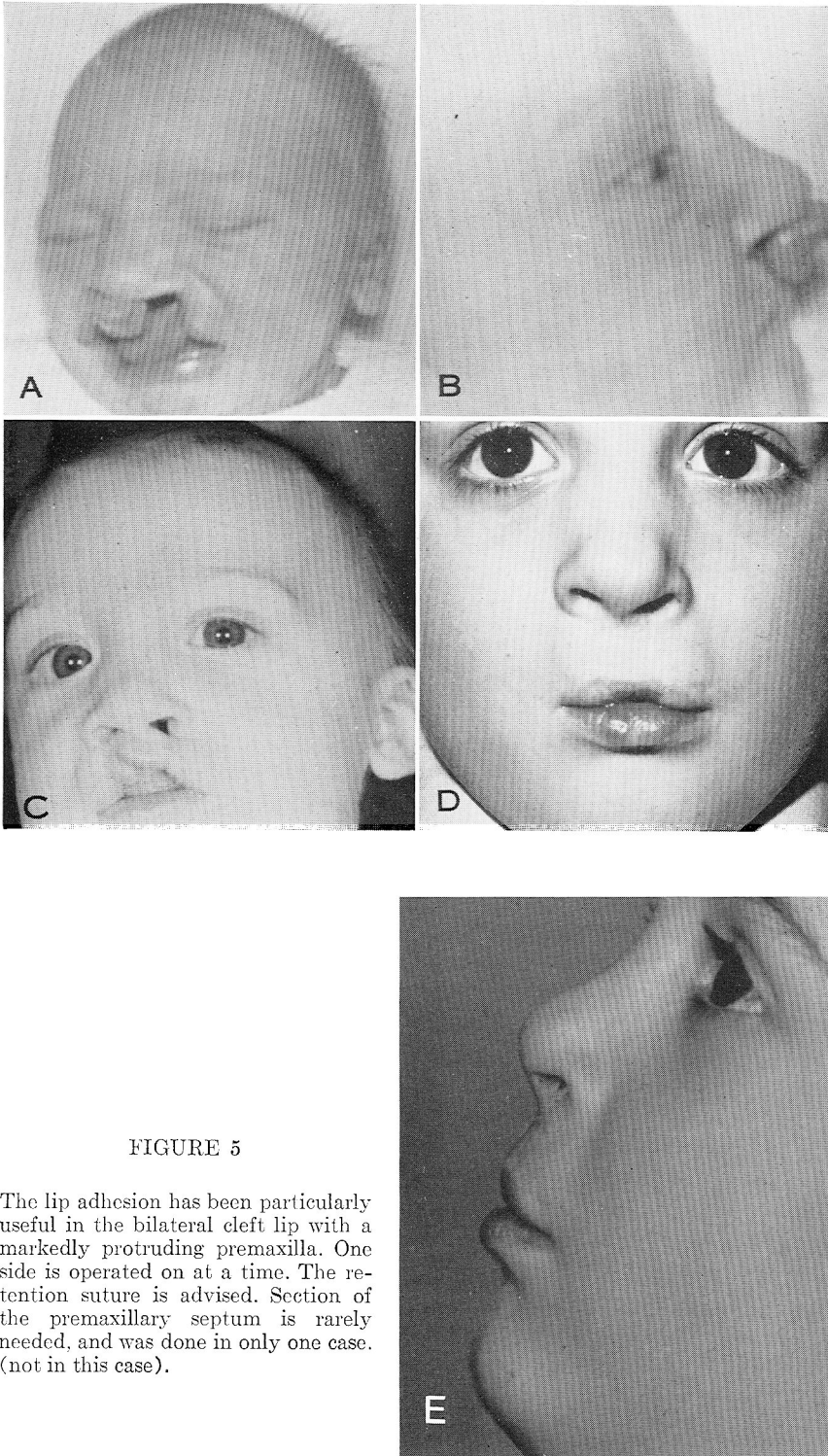


FIGURE 5

The lip adhesion has been particularly useful in the bilateral cleft lip with a markedly protruding premaxilla. One side is operated on at a time. The retention suture is advised. Section of the premaxillary septum is rarely needed, and was done in only one case. (not in this case).

weight of 10 lbs. or greater, and age of 10 weeks or greater) in 21 of 65 operations on which data was available. There was no correlation between dehiscence and the patient's general condition as judged by the "rule of 10". There was no correlation between dehiscence and the type of anesthesia, the type of operative technique, or the concurrent operations on the palate.

In the unilateral cleft lip patients, a definitive lip repair was carried out at 9.8 months of age on the average (range 3.4 to 21.5 months), or about six months after the adhesion. Scar from the adhesion was noted in the tissues to be used in the definitive repair only twice, and did not pose a significant problem.

Discussion

Seven years of experience with the lip adhesion procedure has confirmed its usefulness in converting wide complete clefts of the lip into incomplete clefts. Displacement of soft tissue, malposition of the maxillary segments, and distortion of the nose are partially corrected by the adhesion and favorably modified by growth. The maxillary segments can usually be moved and held in a more favorable position by orthopedic appliances. The parents are more acceptable of delay until a definitive repair can be done if a lip adhesion is substituted for a wide cleft. The definitive lip repair done about six months later is accomplished with less tension, better identification of landmarks and on a more symmetrical bony foundation (Figure 3). It is our impression that the definitive lip repairs on wide clefts were completed more easily and were of superior quality when lip adhesions were done first (Figure 4). However, having carried out the lip adhesion for several years on *all* complete clefts of the lip it is now our feeling that in patients with minimal displacement of the lip components, whether the cleft is complete or incomplete, a lip adhesion is of no great value.

The lip adhesion operation is technically demanding because of the limited quantity of tissue available for flaps, especially in the widest clefts. Adequate undermining of the cheek and use of the retention suture can be helpful. The buried sutures must be placed with care to include sufficient tissue for strength. While all of the dehiscences occurred in wide clefts, eight occurred before the seventh postoperative day, suggesting that residual tension exceeded the strength of the buried sutures. Particular care to overcome tension is necessary for adhesions on patients with bilateral complete cleft lips (Figure 5). The operation is particularly valuable in wide bilateral clefts with a severely protruding premaxilla. Sectioning of the vomer to achieve repositioning of the premaxilla was done in one case.

The decision to introduce an additional one or two procedures into a sequence of operations for the child with a complete palatal and prepalatal cleft is not made lightly. It does permit the fabrication of a dental

appliance with safety. It does provide a dynamic molding force for the premaxilla.

Perhaps the salient indication for the lip adhesion procedure lies in the surgeon's answer to a question, "Can I perform my best possible repair at this time?" If the answer is negative, then two procedures are already decided upon. The decision then is whether the first procedure should be a lip adhesion rather than a definitive repair. The alternative would be a definitive lip repair under adverse conditions expecting to do a secondary revision at a later date.

Summary and Conclusions

1. The lip adhesion converts a complete cleft of the lip into an incomplete cleft utilizing tissue discarded at the time of the definitive lip repair.

2. Successful lip adhesions were performed on 57 of the 63 lip clefts operated upon in 53 patients. Definitive lip repairs usually were performed six months later.

3. A lip adhesion procedure should be considered for wide complete and wide near-complete clefts where a definitive lip repair is technically difficult due to tension, displacement of soft tissue, bony distortion or a small size of the lip components.

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