



## Early repair of unilateral cleft lip employing a small triangular flap method and primary nasal correction

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**SUMMARY.** We describe a technique for early unilateral cleft lip and nose repair in the neonatal period which we have used successfully in 84 cases. Some other children have had the same method used at a later time. The method has some advantages which we believe are particularly useful in neonatal repair.

Postoperative results of neonatal cleft surgery have improved greatly. As we reported previously,<sup>1</sup> we have a multidisciplinary team to support early surgery, and here we report our method of treatment for unilateral cleft lip. Characteristics of our method are: (1) early surgery done within 2 weeks after birth, (2) very small triangular flap method of lip repair, (3) primary nasal correction using a bilateral reverse-U incision, and (4) non-surgical correction of the alveolar arch using a palatal plate. This report will mainly describe details of our surgical technique.

### Preoperative care of neonates

Cleft babies are transferred early to our cleft lip/palate centre. After careful preoperative screening of the general condition, a maxillary impression is taken by the orthodontist and a palatal plate is prepared. Combination of this plate with early surgery is highly effective, because the tongue pressure and repaired lip pressure are well balanced by the plate, so that growth of the lesser maxillary segment is enhanced, subsequently resulting in nearly normal alveolar alignment.<sup>2</sup>

### Surgical technique

Loupe magnification is used. Points 1, 2 and 3 are marked on the non-cleft side, corresponding to the midpoint of the cupid's bow, the peak of the cupid's bow on the non-cleft side and the assumed opposite peak of the cupid's bow, respectively (Fig. 1). Point 4 is marked where the convex curve of the vermillion border becomes concave. Point 5 is marked above point 4. Then point 6, the tip of the triangular flap (flap A), is marked. Each side of this triangle usually measures less than 1.5 mm in a 2-week-old baby. Point 7 is at the nasal side of the alar base of the cleft side and point 8 is behind the prominence of the medial crus on the affected columella base. Point 8 is marked so that the distances between points 5 to 7 and 3 to 8 are equal.

The triangle of skin, seen at the alar base tipped towards the alveolus on the affected side, is used as flap B. The size of this flap is usually about 7-8 mm long and 7 mm wide at its base. This flap is advanced to the columella base to make the nostril sill. To facilitate this advancement, a back-cut is added at the nasal end

of flap B. A small triangle based on point 8 is resected to receive the flap B, so as not to push the medial crus forward. We dissect the displaced muscle of the affected side from the alar base and then securely reposition it.

Flap C is raised from the cleft margin of the affected side with a subcutaneous pedicle. Flap D is a pedicled

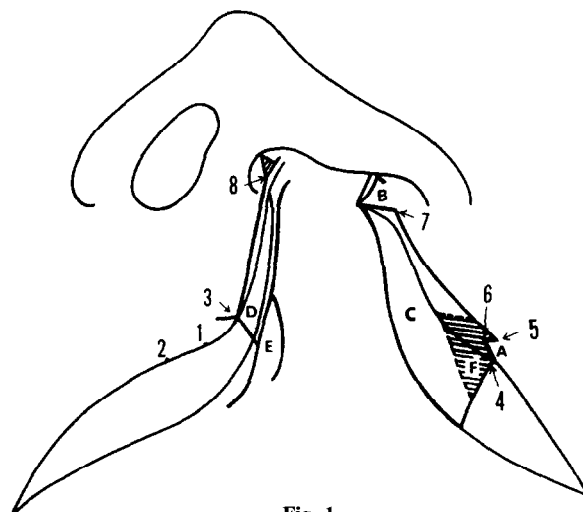


Fig. 1

Figure 1—Design of the incision for repair of unilateral cleft lip (see text for details).

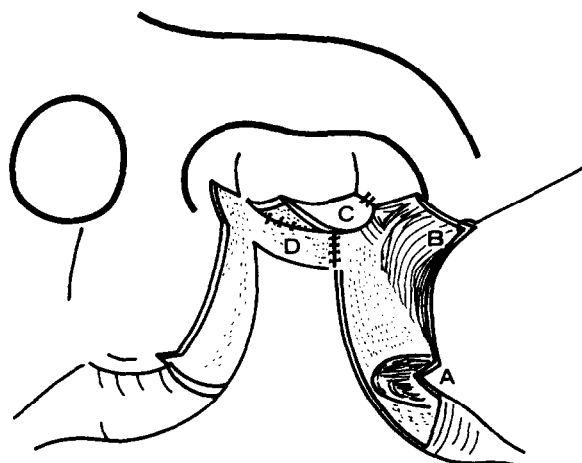


Fig. 2

Figure 2—Schema showing the relative positioning of the flaps.

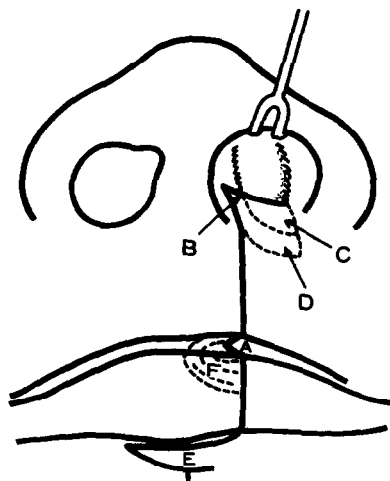


Fig. 3

Figure 3—Resulting suture line.

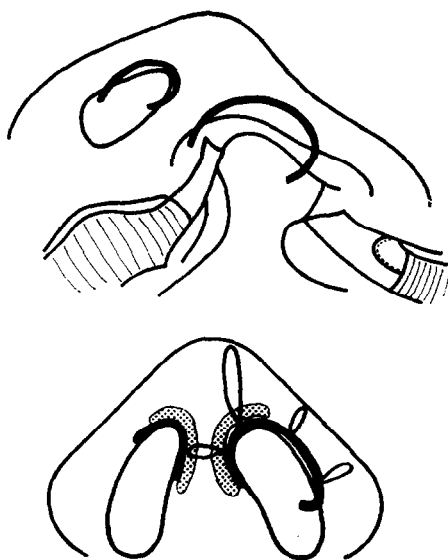


Fig. 4

Figure 4—Bilateral reverse-U incision.

flap raised from the cleft margin of non-cleft side. Flaps C and D are sutured to each other and line the flap B to make the nostril floor (Fig. 2).

Flap E is a thin long triangle based on the buccal sulcus, cut from along the inferior margin of flap D, and transposed to an incision in the frenulum to deepen the sulcus.

Deepithelialised flap F is drawn along the vermilion border together with flap A. It is inserted beneath the vermilion border of the non-cleft side in order to ensure the accurate continuity and natural contour of the cupid's bow.

The postoperative suture line obtained is almost straight and runs along the philtral ridge (Fig. 3). There is less possibility for depression of the nostril floor or flaring of the ala with this technique of nostril floor reconstruction, as sometimes occurs in conventional straight-line methods.

In many cases of unilateral cleft lip, there seems to be a bilateral nasal deformity which only becomes apparent after lip repair. Therefore, we use a modified reverse-U incision on both sides. Subcutaneous undermining of the nose tip is performed on both sides. The

affected alar cartilage is raised with the reverse-U flap and sutured to the contralateral alar cartilage. In this manner, deformed cartilage can be brought into the corrected position. When there happens to be a little tension on the lateral end of the reverse-U flap, a V-shaped back-cut or Z-plasty is added to the lateral end of reverse-U incision.<sup>3</sup> Finally, a long nasal retainer<sup>4</sup> is inserted into the nostrils and fixed against a bolster placed over the nasal dorsum. This fixation is kept in place for 5–7 days after surgery. After removal of the bolster, the retainer is continued for over a month.

## Results

During the 6-year period since the beginning of our team approach, we have treated 117 cases with early surgery. Thanks to the thorough examination of the babies by paediatricians both before and after surgery, we have not experienced any problems, complications or growth disturbance due to early surgery.

The method reported here was used in 84 early surgery cases. The scars resulting from this method were much more acceptable than those of the rotation-advancement method. Furthermore, very few cases showed relapse of the nasal deformity. Representative patients are presented in Figures 5 and 6.

## Discussion

Although more reports are appearing from institutions where early surgery is routine,<sup>5–7</sup> neonatal surgery is still not generally done. We believe that repair of cleft lip in the future is likely to be more often performed in the neonatal period.

Our small triangular flap method for unilateral cleft lip, which can be performed in the neonatal period, has the following advantages.

1. *Nearly straight line scar.* The ideal cleft lip suture line is simple and straight, running along the philtrum column. Although flap B of our method resembles the "inside flap" reported by Randall,<sup>8</sup> ours is made as large as possible at the alar base and brought into the nostril floor. On the contrary, flap A is made small enough to be set within the hollow along the white skin roll. Consequently, we can make a suture line as nearly straight as possible, running along the philtrum column with a symmetric cupid's bow.

2. *Correction of the deformed nose and septal deviation.* Since the nasal skin and cartilage of the neonate are soft and malleable,<sup>9</sup> it is easy to correct a nasal deformity through surgical intervention in the neonatal period. After one month of age, however, the nasal cartilage becomes more rigid, and any nasal deformity tends to relapse after surgical correction.

As Tange<sup>10</sup> reported, the nasal deformity in unilateral cleft lip appears bilaterally in many cases. In such cases, it is effective to make a reverse-U incision bilaterally to widen the operative field, and make surgery to achieve symmetry of the nose easier. In addition, use of our long retainer for some time after surgery enables effective correction of the septal cartilage deviation.

3. *Other additional advantages.* Besides the technical advantages described above, early surgery gives some additional benefits such as early development of the



Fig. 5



Fig. 6

**Figure 5**—Patient with right complete cleft lip and palate. (A) Preoperative view. Surgery was performed at 2 weeks after birth. (B) Four years postoperatively. **Figure 6**— Patient with left complete cleft lip and palate. (A) Preoperative view. Surgery was performed on the 10th day of life. (B) Three years postoperatively.

orbicularis oris muscle, fine postoperative scar, and reduction of the psychological and social burden on the baby's family.

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