Columellar Elongation in Bilateral Cleft Lip Repair: Early Results

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Flattening of the nasal tip and shortness of the columella are two of the deformities that remain following successful repair of a bilateral cleft of the lip.

Until now, correction has not been possible without producing undesirable scars on the surface of the nose or lip.

A three-dimensional Z-plasty on the alar rim achieves columellar lengthening and forward projection of the tip, but it does not have these disadvantages.

A short columella and a depressed tip are both stigmata that remain following repair of the bilateral cleft lip. These problems are usually solved by columellar lengthening. The forked flap advocated by Millard\(^1\) and the sliding method designed by Cronin\(^2\) have served this purpose for many years.

McComb,\(^3\) dissatisfied with his long-term results, has recently reported a different approach. He now uses an external skin incision of the nasal tip as a V-Y technique to obtain columellar length. Unfortunately, the quality of skin incisions in the lip, the columella, or the nasal tip, although the incisions are well planned and performed, is not always predictable. These incisions should therefore be avoided, if possible.

This paper presents a new procedure to obtain columellar length without the production of visible and sometimes conspicuous scars.

**Operative Technique**

A medially based triangular flap is marked over the depressed rim of the nostril. The inferior limb follows the rim's edge, extending toward the columellar base. The superior limb marks the contour of the future alar dome. It is stopped short at the site where the apex of the dome is seen. The dorsal nasal skin envelope is widely undermined through the rim incision, exposing the inferior nasal cartilage. The medial crus with the nostril lining attached to it is then mobilized and elevated by a columellar back-cut that runs almost at right angles to the rim incision. This cut transects the medial crus of the inferior cartilage. The integrity of this structure can be preserved, however, if it is first freed from its pocket at the base of the columella. Elevation of the nostril lining will produce a triangular defect at the lateral aspect of the columella that is filled with the medial-based flap now raised in the alar rim (Figs. 1 and 2).

The tip of this flap is pulled into the nostril and attached to the apex of the V-shaped defect, inverting the alar rim and giving it a normal position with a rounded contour. The defect on the inner side of the rim is easily closed with the elevated nostril lining. Traction on the undermined and, if necessary, expanded dorsal surface allows the surgeon to gain even more skin for transposition purposes and makes the technique relatively easy. Any excess of skin or mucosa is trimmed to achieve the desired result.

A transfixion suture passing through the transposed flaps helps to narrow the elongated columella.

**Patients**

I did not do columella lengthening in bilateral cleft noses for many years. The main reason was that the results of the forked-flap procedure observed in referred patients rarely proved satisfactory because of excessive growth of a frequently retracted columella and lip scarring.\(^3,4\) It
seemed imperative to know what the long-term results would be when nothing was done, except for banking the excess skin of the philtrum at the base of the columella. This conservative attitude was changed when the long-term results in my own patients with bilateral cleft noses clearly demonstrated that the characteristic nasal stigmata remained once natural growth was completed. Raising the medial crus of the inferior lateral cartilage in conjunction with the transposed nostril lining to obtain columella lengthening seemed to provide an excellent alternative to the usual approximation of the cartilaginous domes. The patients in Figures 3 to 6 are presented to illustrate the degree of columella lengthening in a recent series of patients.

**DISCUSSION**

The anatomy of the nasal deformity in cleft lip has been well described by many authors. The inferior lateral cartilage is tilted forward and downward, obliterating the upper angle of the nostril and changing the vertical orientation of the nares into one that is more horizontally directed.

The deformity has its origin in a combination of premaxillary protrusion and maxillary retrusion. Closure of the skeletal defect by periosteal flaps to prevent further dislocation and closure of the muscular disruption to achieve remodeling of the dislocated premaxilla are first indicated. Elongation of the columella comes next. McComb states that, ideally, the columella should be reconstructed from tissues that already lie within the nasal tip. He and others feel that since the columellar crura are increasingly separated from the nasal spine upward, they should be brought together and the alar domes united.

This concept seems sound, but bringing the domes together puts traction on the tethered lateral crura and accentuates the mucocartilaginous plicae that are already projecting into the nostrils. This complication can be avoided, however, by elevation of the medial crus with the attached nostril lining. The proposed technique raises the cartilaginous domes, and the skin flaps on the medial aspect of the lengthened columella provide support to the projected tip.

Attempts to use the excess of skin in the alar rim for correction of the deformity in bilateral repairs have been few. Straith compared the alar rim to a web crossing the nostril. He advocated the use of a three-dimensional Z-plasty and exchanged a laterally based skin flap with a medially based flap in the nostril lining. Tajima and Matuyama have taken advantage of the excess alar skin in unilateral cleft nose repair by their reversed-U procedure, in which the skin is in-
Verted and the inferior cartilage is raised by fixation into a better position.

Gubisch has recently described a technique in which the alar rim is incised and two flaps are formed: one, medially based, to lengthen the columna, and the other, alar based, to hold the inferior cartilage in its corrected position after shortening. The results shown are excellent, but a cartilage graft is often needed to achieve the desired height of the nostril. Correction of the alar rim by the use of a reversed Straith procedure without elevation of the cartilaginous dome seemed a logical solution to the problem of the cleft nose. It was first tried some 20 years ago in a unilateral cleft nose and later in 1984 in a bilateral cleft nose. Improvement was obtained, but the results were considered unsatisfactory because of a rather acute transition at the junction of the transposed flap.

The main difference between these techniques and the procedure described herein is that the slumped inferior cartilage is released at its medial insertion and lifted to achieve a more normal position.

Applications of the Z-principle, sometimes combined with downward advancement of the dorsal skin, are numerous. Although the idea to raise the medial crus of the inferior cartilage in conjunction with the nostril lining was conceived little more than a year ago, the technique has already been used a number of times with the following indications:

1. Patients with bilateral clefting of the lip: nine secondarily and one primarily (an older girl with untreated clefts of the lip who was operated on during a recent visit to Sumatra, Indonesia).
2. Patients with unilateral clefting of the lip: five secondarily and at least five primarily...
FIG. 3. M. van der M., born July 7, 1981, following closure of severe bilateral clefting of the lip. (Above, left) Frontal view, preoperative. (Above, right) Frontal view 1 year postoperatively. (Below, left) View from below, preoperative. (Below, right) View from below 1 year postoperatively.
FIG. 4. S. A., born February 14, 1986, with characteristic nasal deformities following closure of bilateral lip clefts in his native country. Note the downward tilt of the premaxilla. (Above, left) Frontal view, preoperative. (Above, right) Frontal view 6 months postoperatively. (Below, left) Lateral view, preoperative. (Below, right) Lateral view 6 months postoperatively.
S. R., born November 20, 1984, with characteristic stigmata of the nose following closure of bilateral lip clefts and severe scarring of the lip due to loss of the philtrum. The tip of the nose almost touches the vermilion. Expansion of the nasal skin using a custom-made implant was performed to gain more skin for downward advancement. The philtrum was recently reconstructed with a full-thickness graft. (Above, left) Frontal view, preoperative. (Above, center) Frontal view following expansion. (Above, right) Frontal view 6 months postoperatively. (Below, left) Lateral view, preoperative. (Below, center) Lateral view following expansion. (Below, right) Lateral view 6 months postoperatively.
FIG. 6. M. O., born January 1, 1960, following an abortive attempt to repair bilateral clefting of the lip in his native country. The philtrum has not been included in the correction. Note the unrestricted growth of the nose and the contracted philtrum at the columellar base. (Above, left) Frontal view, preoperative. (Above, right) Lateral view, preoperative. (Below, left) Frontal view 9 months postoperatively. (Below, right) Lateral view 9 months postoperatively.
(these belonged to the same group of 27 patients with unoperated clefts of the lip treated in Indonesia).

3. Four patients with stenosis of the nostril due to trauma (two cases following skin avulsions and two following burns). In the burn patients, a double-opposed Z-plasty was applied.

It is too early to tell whether the corrections will remain stable, because most of my patients are still young. So far, however, my results have been gratifying, with one exception: My first patient, operated on in December of 1990, had a poor result. This was due to an inaccurately planned Z-plasty in conjunction with an insufficiently released inferior cartilage. Reoperation was required, and it produced a good result.

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