

## Primary Repair of Unilateral Cleft Lip Nasal Deformity

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### ABSTRACT:

#### BACKGROUND:

There is a growing attitude towards correcting the nasal deformity in conjunction with primary repair of cleft lip. Many studies had concluded that this repair will not affect the nasal cartilages growth; it usually reorients the deformed nasal cartilages into a near normal position, and will allow a better growth pattern.

#### OBJECTIVE:

This study was conducted to document the pattern of primary unilateral cleft lip nasal repair and to evaluate the medium term outcome.

#### METHODS:

A total of 33 babies with unilateral cleft lip deformities underwent simultaneous nasal correction with their lip closure, between March of 2004 and April of 2008. Through short nostril rim incision, alar suspension to the dorsal skin at the nasion and interdomal sutures were performed primarily. Alar transfixion stitches were used to maintain the new position of the suspended cartilages.

#### RESULTS:

The average follow up periods were 3 years (ranging from 1 – 5 years). The results were assessed by 4 parameters: Nostril asymmetry, nasal dome projection, alar buckling deformity, and flaring deformity of the alar base. Eleven patients had good results, 16 patients had acceptable results, and 6 patients had poor results.

#### CONCLUSION:

Alar suspension is a relatively simple effective procedure for the primary correction of cleft lip nasal deformity. Short nostril rim incision can be relied on to access the alar dome and facilitate insertion of suspension sutures. Whether it interferes with nasal growth or not, it is necessary to have a long period of follow up to answer this question.

**KEY WORDS:** unilateral cleft lip, alar suspension, cleft lip nose.

### INTRODUCTION:

Cleft lip nasal deformity is a pathophysiological deformity of cleft lip that necessarily accompanies it. It is caused by displacement of alar cartilage and abnormal positioning of the columella, nasal septum, and lower skeleton of the nose. Among these, the abnormal position of alar cartilage is the most significant cause of nasal deformity<sup>(1, 2)</sup>. Normally, the domes of alar cartilages lie at the level of the junction of the middle and lower thirds of the nasal bridge. The upper border of the alar cartilage lie above and superficial to the lower border of the upper lateral cartilage<sup>(2)</sup>. In unilateral cleft lip deformity, there is associated hypoplastic maxilla with widened nostril floor on the cleft side<sup>(3)</sup> (figure 1). The alar cartilage is depressed, concave and separated from the contralateral cartilage<sup>(4)</sup>. The lateral crus is often broadened from above downward and the angle between the

medial and lateral crura is excessively obtuse<sup>(3, 5)</sup>. The cleft alar cartilage is splayed out like a bucket handle (spread-eagle deformity) and rotated caudally so that the nasal dome is retroposed, depressed and associated with overhang of the ipsilateral nostril apex<sup>(2-5)</sup>. The nose is lengthened on the cleft side<sup>(2, 5)</sup>. The cleft side ala buckles inwardly and the interior of the cleft side nostril is bowed by a linear contracture, the vestibular web. The tip of the nose and the caudal septum are deviated away from the cleft side<sup>(3)</sup>. Most authorities agree that early correction of the unilateral cleft lip nose is indicated and there is no interference with nasal growth<sup>(1, 4, 6-13)</sup>. In this study we present our experience in repairing the nasal deformity simultaneously with the primary lip closure.

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**Figure 1: Three months old baby with left complete cleft lip and palate, the pictures shows clearly most of the anatomical changes in lip and nose. Alar cartilages were drawn in red and the intervening oblique green line represents the septum and how it is clearly deviated towards the noncleft side.**

### **PATIENTS:**

Thirty three unilateral cleft lip repairs (21 boys and 12 girls) were performed from March of 2004 to April of 2008. The mean age was 4 months ranged from 3 to 6 months. Twenty four cases were of complete cleft type while 9 cases were of incomplete type. Simultaneous nasal correction was performed for all patients. Of these, 21 babies had a cleft of the lip alone, 12 had a cleft of the palate continuous with the cleft lip. Nineteen clefts were left-sided, whereas 14 were on the right side. All babies underwent no prior lip adhesion, orthodontics or orthopedics even those who had wide alveolar gaps and severely collapsed lateral alveolar segments.

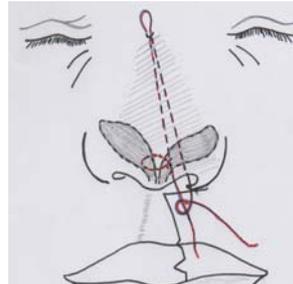
### **METHODS:**

Under general anesthesia, Key landmarks are tattooed with gentian violet dye. 1:200,000 epinephrine solution (maximum dose, 0.5 ml/kg) is infiltrated over the lip, columella, nasal tip and nasal dorsum. Modified Millard's rotation-advancement design was used for lip closure where the C-flap is designed to lengthen the short columella (Millard[1]). Angled nasal tip scissor is used to access the nasal tip between the foot plates of the alar cartilages. The cleft medial footplate attachments are released to allow anterior movement and lengthening of the columella. Repair of the lip processed as usual. Through short nostril rim incision, wide subcutaneous nasal dissection is performed, with spreading scissor, to

include the nasal tip, the area between the medial crura of both alar cartilages and continued over the upper lateral cartilage on the cleft side (figure 2). The displaced alar cartilage is freed from the overlying skin but not from the thin adherent underlying mucosa. The dome of the cleft alar cartilage with its underlying mucosa is suspended with 4/0 polydioxanone to the opposite alar dome (interdomal sutures) threaded through a hypodermic needle and another one to the dorsal skin at the nasion which is running from within the nostril, then passing subcutaneously upward and slightly medially over the nasal skeleton to emerge at the nasion, then returned back through the same hole to emerge in the vestibule where it is tightened to the desired elevation of the depressed alar cartilage (figure 3). The rim incision is left unsutured to heal spontaneously. Any vestibular web is then lateralized with 4-0 polydioxanone suture which passes intranasally through the web to exit at the nasofacial groove and then returned back through the same hole to pass out intranasally where its tightening will straddle the web. Few alar transfixion stitches with 4/0 polydioxanone are then inserted to obliterate dead space and to further maintain the elevated position of the cleft alar cartilage. Antibiotic ointment is applied on the suture line. Infants can breast or bottle feed already in the recovery room. Photographs were taken preoperatively and at 1 month, 6 month and if possible each year postoperatively.



**Figure 2:** Shows the route to access the dome and alar cartilages through a short nostril rim incision.



**Figure 3:** Schematic representation of interdomal and cartilage/nasion suspension sutures.

**RESULTS:**

The average follow up periods were 3 years (ranging from 1 – 5 years).The records and photographs of the patients operated were evaluated. It was based on preoperative and postoperative comparative views and overall aesthetic results. All patients have well balanced growth in their noses. Nostril asymmetry, nasal dome projection, buckling deformity of the alar cartilage (alar web), and flaring deformity of the alar base were selected as 4 parameters for evaluation. Minor nostril asymmetry (less than 10% difference of the longitudinal and transverse

diameter of the cleft nostril with the opposite nostril at the midcolumnella level) is considered as acceptable nostril asymmetry. Patient that had all the parameters corrected after surgery were labeled as good result. Patient with 3 parameters corrected were labeled as acceptable result. Patient with only 1 or 2 parameters corrected were labeled as poor result. We got 11 patients with good results (33%), 16 patients with acceptable result (49%), and 6 patients with poor results (17%). Example cases are shown (figure 4 through 10).



**A:** Three months old baby with CL/P.



**B:** Three weeks postoperatively.



**C:** Six months postoperatively.



**D:** Five years postoperatively.

**Figure 4:** Same baby in figure 1, good result. All the 4 evaluation parameters achieved.

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**Figure 5: Three months old baby with left complete CL/P. Right picture shows good result 3 years postoperatively.**



**Figure 6: Three months old baby with left complete CL/P. Right picture shows good result 3 years postoperatively.**



**Figure 7: Three months old baby with right incomplete CL. Right picture shows good result 2 years postoperatively.**



**A: Three months old baby with Rt complete CL/P.**



**B: Immediate postoperative view.**



**C: Operative view shows alar suspension suture.**



**D: Three weeks postoperative view.**



**E: Three years postoperatively.**



**F: Three years postoperatively.**

**Figure 8: A: Three months old baby with Rt complete CL/P. B and C: Operative and immediate postoperative views. D: Early postoperative view .E**

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**A:Left complete CL/P.**



**B:Three weeks postoperative view**



**C:Five years postoperative worm eye view**



**D: Acceptable result 5 years postoperatively.**

**Figure 9: A: Three months old baby with left complete CL/P.B: Three weeks postoperative view shows a well suspended alar cartilage .C and D: Five years postoperative worm eye view shows a well projected nasal tip but there is a mild drooping of the suspended alar cartilage causing a mild nostril asymmetry. The result is considered as acceptable.**



**A:Three months old baby with Rt incomplete CL.**



**B: Two and a half years postoperative view shows a poor result.**

**Figure 10: A: Three months old baby with right incomplete CL. B: Two and a half years postoperative view shows a poor result were there is drooping of the alar cartilage with nostril**

### DISCUSSION:

For many years, the nose was left untouched at the time of primary lip closure because of concern for the delicate infantile alar cartilages and their growth and it had been thought that nasal repair should be postponed until development is complete<sup>(2,12)</sup>. Consequently, these children will suffer a good deal of embarrassment from their appearance during childhood<sup>(2, 12)</sup>. Later on the trend has changed towards simultaneous nasal repair with the lip closure and it was concluded that the anatomically proper and early replacement of the displaced alar cartilage promotes a well balanced nasal growth<sup>(1,4, 6 -13)</sup>. The cleft alar cartilage can be suspended to the contralateral upper lateral cartilage/septum junction<sup>(6)</sup>, or to the ipsilateral upper lateral cartilage/septum<sup>(14)</sup>, or to the opposite alar cartilage (Interdomal suture)<sup>(14)</sup>. In our series we used 2 types of suspension sutures; interdomal and (cartilage- to- skin nasion) suspension sutures. Closed subcutaneous suspension is sometime used<sup>(4)</sup> or an open suspension can be relied on through different approaches e.g. infracartilaginous inverted U incision<sup>(6)</sup>. Mulliken and co workers used a rim incision in his series<sup>(14)</sup> while we used a short rim incision at the dome that gave us good access to dissect the alar cartilages and the dorsum. We preferred this short incision to avoid constriction effect of a longer incision in the healing phase. Luckily none of our patients had this complication. The domal and supracartilage dissection encourages a desirable skin/cartilage adhesion which helps to maintain the new relation of the alar cartilage in conjunction with the suspension sutures. We found alar suspension to the skin at the nasion can be easily applied and manipulated. One can manipulate tip projection to the desired level of elevation. It is a less extensive approach because it doesn't dissect the cartilage from the underlying mucosa. We agree with Salyer in his report that it is too radical to completely dissect alar cartilages in infants because they are friable and soft<sup>(1, 15)</sup>. We just perform supracartilage dissection rather than excising any of the soft tissues over the alar cartilage as it might affect the future growth of the cartilages<sup>(7)</sup>. A couple of alar transfixion stitches were used to obliterate dead space and to further maintain the alar cartilage in its elevated position. We found that this maneuver is better than relying on nasal retainers which are usually difficult to be kept for long period and it was not used in our cases. Although alar transfixion sutures initially

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caused dimpling of the skin but the dimples disappear within 3 to 4 week after surgery, without visible scarring. Primary nasal repair essentially consists of correcting the caudal rotation of the alar cartilage at the time of lip repair<sup>(2, 11)</sup>. Harold McComb believes that shortening the half of the nose ( on the side of the cleft) is an essential step too<sup>(2)</sup>. We found that suspending the cleft alar cartilage to the contralateral alar dome and to the dorsal skin at the nasion will fulfill both targets: elevating the cartilage and shortening the nose on the cleft side. This procedure will achieve better nostril symmetry. McComb suspends the cleft alar cartilage in the nasion using sutures passed through needles and tied on bolsters, to be kept for 5 days<sup>(2)</sup>. We used buried polydioxanone sutures to maintain the new position for a much longer period without the need to use the bolsters. Causes of poor results (figure 10) which were found in 6 patients were alar cartilage drooping which may be explained by its inadequate fixation, nostril asymmetry and remnant alar webbing. Those babies already had wide collapsed clefts and had no preoperative orthodontic treatment or nasoalveolar molding. Out of The 16 patients with the acceptable results, 9 had alar cartilage drooping (figure 9) and 7 had a persistent alar web. These unwanted results should be addressed in the preschool revision procedures and dealt with accordingly. Our overall results encourages this early nasal correction but we need to have a larger series of patients and a longer follow up period to evaluate the end results.

### CONCLUSION:

Alar suspension is a relatively simple effective procedure for correcting primarily the cleft lip nasal deformity. Within the limited period of follow up (5 years) we found it did not interfere with nasal growth. Yet a long term assessment is necessary to conclude whether it affects the growth pattern of the cartilages or not. We believe this procedure would promote more symmetrical nose and better appearance at an early age. Short nostril rim incision can be relied on to access the alar dome and facilitate insertion of suspension sutures.

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