

Original Article

Secondary bilateral cleft lip-nose deformity correction by rhinoplasty with simultaneous Abbe flap

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ABSTRACT

Aim: The purpose of this article is to review modification and outcome of secondary rhinoplasty along with Abbé flap for correction of secondary bilateral cleft lip deformity. **Materials and Methods:** A total of thirteen patients of secondary bilateral cleft lip-nose deformity having tight upper lip, lack of acceptable philtral column, Cupid's bow definition, irregular lip scars, and associated nasal deformity were selected. All the patients received Abbé flap and simultaneous nasal correction. All cases were treated during a period of three years. Mean patient age at the time of the operation was 21 years, and ranged from 16 to 27 years. The average follow-up period was three years. **Results:** Assessment of results was based on comparing preoperative and postoperative clinical photographs done by surgeon and patient relatives and patient satisfaction questionnaires. The columellar lengthening and upper lip vermilion correction achieved was satisfactory. There were no perioperative complications such as airway obstruction, bleeding, infection, wound disruption, or flap necrosis.

KEY WORDS

Abbe flap; bilateral cleft lip; rhinoplasty

INTRODUCTION

The characteristics of secondary bilateral cleft lip deformity are: imbalance in the tissue volume between the upper and lower lip, a short columella, an inadequate nasal tip, increased columella-labial angle and the so-called whistling deformity due to tissue deficiency of the central vermilion.^[1]

The nasal deformity is primarily a deformation of

normal anatomical elements. There can be some degree of primary hypoplasia of the embryonic lateral nasal prominences. The components of the nasal deformity which require correction are nasal width, the columella and the nasal tip.^[2,3]

Our aim is to discuss the feasibility and applicability of nose correction with simultaneous Abbe flap in the treatment of bilateral cleft lip nasal deformity to achieve optimum results. Open rhinoplasty approach using the bilateral rim incisions were extended on to the prolabium, which was used for nose correction and the resultant upper lip defect was covered by an Abbe flap.

MATERIALS AND METHODS

Our study is based on 13 patients with bilateral cleft lip-nose deformity treated over a period of 3 years. The

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age of the patients ranged from 18 to 27 yrs. The mean age was 21 yrs. The female to male ratio was 6:5. The assessment of patients were based on symmetry of the alar bases and nostril shape, length of the columella and any deformations or deficiencies of the nasal lining, and associated lip deformity due to a lack of correct muscle realignment at primary surgery. A combination of the bilateral cleft lip and nasal deformities was present in all patients, including tight upper lip with protruding lower lip, short prolabium in vertical dimension without a good definition of the philtrum and Cupid's bow, central vermilion insufficiency, irregular lip scars, wide alae, large nostrils, depressed nasal tip with separated bilateral lower lateral cartilages, and short columella. During the pre-op consultation it was observed that four patients had normal occlusion, nine patients had Angle class III malocclusion. Prior to the definitive correction for the nose and lip deformity, malocclusion was corrected by following methods as shown in Table 1 and shown in Figures 1 and 3.

Open rhinoplasty was performed using the incision along lower border of alar cartilages extending till the composite chondromucosal V-Y release of the alar cartilages from the upper lateral cartilages.

Depending upon the skeletal requirements, costochondral graft was used for nasal dorsum and as columellar strut in nine of our patients as shown in Figure 2. The alar cartilages were sutured to the costochondral graft in the midline for providing nasal tip definition. Alar cinch sutures were sometimes used to maintain the reduction of the nostrils and the alar width. The alar rim excision was carried out for the overhanging excess nostril skin. The Abbé flap was designed to match the normal aesthetic unit of the philtrum appropriately for the age and sex of the patient. While planning the flap dimensions, it is crucial to keep in mind the degree of stretching the flap may undergo postoperatively. A relatively narrow flap gives a better cosmetic result. The end of the Abbé flap was cut in a reverse V-shape to match the V-shaped excision at the columellar base.

The Abbé flap was harvested and the donor site of the Abbé flap was carefully closed in layers i.e. mucosa, muscle and skin. The skin was closed in the form of a "Z" plasty to avoid straight line closure. The excision of nostril floor was adjusted to correct asymmetric nostrils. No nasal packing or oral airway was used in the post-operative period. The patients were discharged on the

first postoperative day. The Abbé flap was divided after 2 weeks under infraorbital and mental nerve block.

RESULTS

All of these cases had been followed up from the time of operation on a monthly basis until six months. The average follow-up period in this group of patients was three years. During the follow-up period, assessment of results was based on satisfaction by comparing preoperative and postoperative clinical photographs by surgeon and patient relatives and patient satisfaction questionnaires as mentioned in Table 2. The parameters were decided based on the well-known Visual analogue scale. The symmetry and fullness of the lip vermilion, columellar lengthening, the axis of nose, and its deviation from the midline, tip projection and dorsal augmentation were judged. and as is shown in table 2, none of the patients had deforming malposition, distortion, asymmetry or scar. The patient perspectives and feelings towards their general outcome were evaluated and all the patients expressed satisfaction with the final lip/nose appearance. There were no perioperative complications such as airway obstruction, bleeding, infection, wound disruption, or flap necrosis.

DISCUSSION

The labial repair typically aggravates the primary nasal deformity and often creates additional distortions. There has been a general trend toward operation on the cleft lip nose at the time of initial lip surgery in both the unilateral and bilateral cleft lip nasal deformity.^[4,5] However, secondary surgery to further modify the nasal shape is frequently necessary and demanded by patients

Table 1: Various phenotypes and appropriate surgical procedures for correction

Procedure	Phenotype	No of patients
Distraction osteogenesis	Maxillary hypoplasia with class III malocclusion	2
Orthognathic surgery	Maxillary hypoplasia with class III malocclusion	2
Orthodontics	Minimal maxillary hypoplasia	5
-	Normal occlusion	4

Table 2: Assessment of Surgical outcome

Outcome	Malposition	Distortion	Asymmetry	Scar
Unnoticeable	11 patients	12 patients	10 patients	Nil
Obvious	2 patients	1 patient	3 patients	13 patients
Deforming	Nil	Nil	Nil	Nil



Figure 1: Twenty-two-year old male who after correction of occlusion with orthodontics underwent simultaneous correction of the lip and nose. Comparison of preoperative (a, c) and postoperative status (b, d)



Figure 2: Eighteen-year old female had normal occlusion most likely due to unrepaired cleft palate. Patient underwent cleft palate repair and later correction of the lip and nose. Figures a, c showing preoperative status and figures b, d, showing postop results. Figure e, f, are intra op



Figure 3: Seventeen-year old female patient was operated for correction of occlusion with Lefort I and distraction osteogenesis followed by lip and nose correction. Comparison of pre-distraction fig (a, c) and post-distraction status fig (b, d). Figure e, f shows follow-up after 15 months of correction of lip and nose. Figure i, shows occlusion at 3 years follow-up

for functional as well as aesthetic reasons.^[6] Bardach and Salyer delayed secondary correction until the patient was eight to 12 years old for three reasons:

1. To allow completion of orthodontic correction of the skeletal base;
2. To allow as much growth and development of the lower lateral cartilages as possible and thus to have a stronger, more stable support for the reconstructed nasal tip; and
3. To allow bone grafting of the hypoplastic maxillary segment on the cleft side to achieve symmetry, which is performed at age of eight to nine years.^[7-9]

Jackson has advocated much earlier correction in presence of severe deformity.

In our cases the average age of the patients at the time of surgery was 21 years.

Obtain a satisfactory relationship between the lip and nose.

Pigott mentioned that where the inferior view shows a “tent tip” skyline, lateral crus advancement is required and can be achieved in asynchronous repairs by a Pigott alar leapfrog at primary repair or by a Potter V-Y advancement at the time of forked flap columella lengthening.^[10] We use the Potter’s method for lateral crus advancement.

The genu of the alar cartilages are scored vertically to allow the obtuse angle between medial and lateral crura to be restored to the normal acute angle with the aid of a mattress suture. After closure of the V-Y advancement, it was seen that the downward rotation of the lateral crura has been corrected and the ugly eversion of the alar bases has been “rolled in” by the V-Y key stitch. It has been reported by Court Cutting that this method has a disadvantage as cutting of lateral ligaments can produce valving and a cosmetic depression. We do not leave behind any intranasal raw areas in our patients and hence have not come across this deformity in our study.^[3,11]

The Abbé flap was first introduced to correct the secondary deformity of bilateral cleft lip/palate.^[12,13]

As shown in the results of this study, the Abbé flap could be safely and effectively performed simultaneous with reconstructive rhinoplasty without added surgical

morbidity or airway obstruction. Symmetry and satisfactory results have been achieved using the one-stage procedure for correction of the bilateral cleft lip nasal deformity by various authors.^[14]

Kinnebrew mentioned that Abbé flap is only indicated in select patients with a significant cleft lip deformity as described above. For the majority of the cleft patients in whom the primary lip repair is carefully planned and executed, the Abbé flap is not necessary for the correction of secondary deformity. However, when indicated, it is an effective method, and the price of the lower lip scar is well compensated by the overall results.^[15,16]

In our experience, a better result is obtained if the Abbé flap is designed to reconstruct and replace the entire philtral subunit. The extent of the post-operative widening of the Abbé flap was not predictable and varied with upper lip tissue quality, lip tension, and underlying dentoskeletal condition.^[17,18]

Possible surgical complications associated with the Abbé flap include wound infection, bleeding, flap necrosis, unfavorable scars. In case of breathing difficulty occurs, a simple tube in angle of mouth crossing the lips can effectively release the obstruction. Patients with a preexisting nasal obstruction who are mouth breathers tend to have respiratory difficulty after Abbé flap. For these patients, correction of the nasal obstruction should be considered as a prerequisite procedure.^[19,20]

The lower lip donor site was closed as “Z” plasty. The “Z” plasty helps in breaking the straight line scar, realigns the scar in the natural crease, provides gain in length and thus helps in achieving a good lower lip and chin angle.

CONCLUSIONS

An Abbé flap with simultaneous rhinoplasty is safe and effective in correction of secondary deformities of bilateral lips, especially with shortage of tissues. The Abbé flap design simulates the size and shape of the normative philtrum for subunit reconstruction. A uniformly satisfactory outcome, with good aesthetic appearance of the nose, acceptable lower lip scars and with no additional morbidity was obtained in this study.

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