

UNILATERAL CLEFT NOSE DEFORMITY

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ABSTRACT

INTRODUCTION

Cleft lip deformity is a complex 3-dimensional congenital facial deformity which leads to poor functional, aesthetic and social outcomes.

METHODOLOGY

In order to optimize the aesthetic symmetry of unilateral cleft lip nasal deformity correction, we propose an anatomic technique involving reconstruction and restoration of the cleft side alone and to fashion it akin to the normal side in the form of a case series.

SURGICAL TECHNIQUE

1. All the cases were operated by the open Rhinoplasty approach, using the standard stair step trans-columellar and infracartilaginous incision. In unilateral cleft lip nose deformity, the whole lateral wall of nose including the nasal bone, the upper lateral cartilages and the lower lateral cartilages of the cleft side appears to be imbalanced with respect to the normal side.

RESULT

Based on the Rhinoplasty Outcome Evaluation (ROE) questionnaire, all patients experienced improved appearance of the nose and felt less stigmatization from the society

Keywords: Cleft lip deformity, Rhinoplasty, open Rhinoplasty

INTRODUCTION

Cleft lip deformity is a complex 3-dimensional congenital facial deformity which leads to poor functional, aesthetic and social outcomes.⁽¹⁾ The lip and the nose are central facial features.

Aesthetic outcome of their surgical correction is appreciated by the patient and the surgeon only by achieving near normal bilateral symmetry. This perfection however, is seldom achieved (2,3) and poses a reconstructive challenge for the Rhinoplasty surgeon. (3,4,5)

Even though there is a consensus in modern practice to do a Rhinoplasty at the time of primary cleft lip repair,⁽¹⁾ there still exists a vast patient pool where a primary cheilionrhinoplasty was not done, with an untouched nasal deformity. Secondary or revision Rhinoplasty is also indicated for residual defects or secondary defects accentuated by time and growth.⁽⁶⁾

In order to optimize the aesthetic symmetry of unilateral cleft lip nasal deformity correction, we propose an anatomic technique involving reconstruction and restoration of the cleft side alone and to fashion it akin to the normal side. This helps us achieve better symmetrical results as compared to camouflaging the deformity with on-lay grafts.

MATERIAL & METHODS

Our aim is to propose a Rhinoplasty technique, involving reconstruction and restoration of the cleft side alone. We surgically fashion the cleft side akin to the normal side in order to optimise bilateral nasal aesthetic symmetry. We evaluated our results via a pre-operative and post-operative patient satisfaction questionnaire.

Between March 2016 to January 2020, 14 cases of unilateral cleft lip nose deformity were operated at Akash Hospital, Indore and Jaslok Hospital, Mumbai. They all underwent unilateral cleft rhinoplasty with the same method by the

same surgeon. The indications of surgery were primarily aesthetic improvement of the nose. None of the cases had undergone a primary Rhinoplasty at the time of primary cleft lip repair. 9 cases underwent Rhinoplasty for the first time with us and the remaining 5 cases had previous rhinoplasty operation elsewhere. No exclusion criteria were stated. All cases had their Orthodontics treatment and maxillary augmentation before we took them for Rhinoplasty. The patients were followed up for 1 year to more than 3 years. The results were evaluated by comparing the answers of the Rhinoplasty Outcome Evaluation (ROE) questionnaire, which the patient undertook preoperatively and then at 1 year follow-up postoperatively. The data was statistically analyzed using t-test.

SURGICAL TECHNIQUE

1. All the cases were operated by the open Rhinoplasty approach, using the standard stair step trans-columellar and infra-cartilaginous incision.
2. The nasal skin and soft-tissue envelope is elevated and the structural deformity is visualized and assessed.



Fig: Exposure of the anatomic deformity after raising the skin and soft tissue envelope.

3. The nasal septum is approached by sharp dissection between the medial crura of the two lower lateral cartilages. The caudal septum is visualized between these two

cartilages. A sub muco perichondrial plane is identified and dissection is continued in the correct plane.

4. A portion of the septal cartilage along with the bony part is harvested for reconstruction, leaving behind at least 1.2 cm of the dorso-caudal septal strip. In primary cases, ample septal cartilage and bone is available for graft harvesting but is not so in revision cases. We also encounter excessive scarring and fibrosis in revision Rhinoplasty cases.
5. If there is no significant septal deviation in cases undergoing revision rhinoplasty, the dissection should be confined to the anterior part of the septum as unnecessary dissection carries the risk of buttonholing and septal perforation.

6. CAUDAL SEPTUM DEVIATION CORRECTION –

In a majority of the cases the caudal septum is deviated to the non-cleft side. The deviated caudal septum needs to be mobilized, repositioned and fixed in the midline, by drilling a hole in the anterior nasal spine or its remnant. If the septum length is adequate, it is mobilized and fixed with the nasal spine by a 3-0 PDS or prolene suture. However, in case of inadequate septal length, a septal extension graft is used. If the spine is deviated to the non-cleft side, then the caudal septum can be fixed on the opposite side.

7. Usually, dorsal humps and irregularities are not very significant but if present, needs to be corrected by rasping and upper lateral cartilage trimming.
8. In unilateral cleft lip nose deformity, the whole lateral wall of nose including the nasal bone, the upper lateral cartilages and the lower lateral cartilages of the cleft side appears to be imbalanced with respect to the normal side. The root of the nasal dorsum is usually directed toward the side of

the cleft, resulting in the tip of the nose deviating away from the cleft. We do not propose to do major changes but try to correct the abnormal anatomy on the cleft side by readjusting structures and correcting deficiency.

9. TECHNIQUE FOR RECONSTRUCTING THE DEFICIENT CLEFT SIDE –

The upper lateral cartilage on the cleft side is separated from the dorsal septum, while preserving the underlying mucoperichondrium.

Para-median osteotomy and medial osteotomy is done with the help of a piezotome saw, for precision.

Transvers osteotomy is done at the level of the medial canthus.

Per cutaneous low to low lateral osteotomy is done using a 2mm osteotome.

The above combination of a para-median, transverse and lateral osteotomy helps in mobilizing the lateral nasal wall of the cleft side.



Fig2-Paramedian, transverse & lateral osteotomies only on the cleft side, the cleft side is mobilised & elevated with an elevator

The mobilized lateral wall is then elevated and moved upwards and outwards (laterally), at the same level as the normal side.

A lengthened spreader graft (rib cartilage, septal cartilage or bone graft) is used, which extends up to the nasal bones and keeps the mobilized lateral wall in an elevated position.



Fig3- Extended spreader graft to, support & keep the lateralized cleft side in the elevated position

10. CORRECTION OF THE LOWER LATERAL CARTILAGE DEFORMITY AND NASAL TIP

A few studies state that the length of the lower lateral cartilage on the cleft side is equal to the noncleft side, differing primarily in shape and position. (7,8). The medial crus is shorter and the lateral crus longer on the cleft side and the angle between them is obtuse, resulting in a less defined and wider dome.²⁸

The lower lateral cartilage is completely separated from the vestibular skin and then released from its attachment to the piriform ligament.

At times the cartilage is too wide and a cephalic trimming may be required to achieve symmetry with the non-cleft side. The lateral crus is mobilised medially to create a new dome with an increased height, which is comparable to the dome of the non-cleft side.

The two domes are then sutured together by an inverting mattress suture using 5-0 PDS. This reconstitutes the dome into a more cephalic position.

An autologous septal cartilage or rib cartilage slice is used as a batten graft to supplement the lateral crus. This batten graft is carved in the shape of an arch and made to rest on the pyriform aperture so that it can provide a stable support to the cleft side and help achieve a symmetrical nasal tip.



Fig 4: Nasal tip reconstruction, lateral crural steal & Alar Batten graft (sliced Rib cartilage)

Vestibular skin is mobilised and anchored with the new dome and the lateral crus with 6-0 vicryl sutures, which in some cases may fall short and a lateral release incision may be required, to avoid skin tension. On lay shield grafts can be used to give better definition to the ill-defined nasal tip when required. The problem of vestibular web is dealt with wedge excision of the excess mucosa and repair of the defect, or by a v-y plasty.

RESULT:

Based on the Rhinoplasty Out come Evaluation (ROE) questionnaire, all patients experienced improved appearance of the nose and felt less stigmatization from the society. According to the t-test, all scores of the four questions improved significantly in the postoperative 1 year, compared with the preoperative scores.



Fig.5: Comparative pre & post-operative pictures at 4 months follow up.

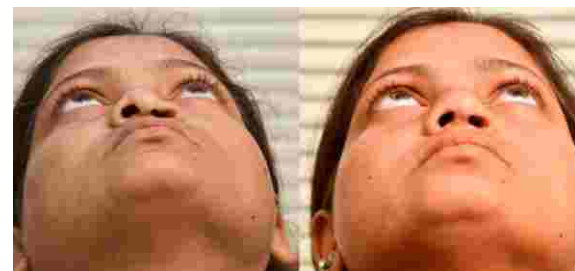


Fig 6-Comparative pictures at 6 months follow up





Fig-7 (case 3) comparative pre and post-operative pictures at 1 year follow up

DISCUSSION

The unilateral cleft lip nose deformity is a common problem. The annual incidence of cleft lip palate deformity is 28,600, which means 3 infants with clefts are born every hour.(9,10) Significant components of unilateral cleft lip nose deformities have been well- documented by Huffman and Lierle and involves the following (11,12)

1. Aberrant orbicularis oris muscle insertion (13,14)
 - This results in:
 - a) Shorter columella on the cleft side.
 - b) Wider nostril on the cleft side.
 - c) Caudal septum deviation to the noncleft side.
2. Anterior nasal spine is displaced to the noncleft side.
3. The cleft side ala is buckled inward.
4. The cleft side alar dome is depressed.
5. Poorly defined nasal tip with less projection.
6. External nasal valve defect.
7. Vestibular webbing. (6)

Cleft nasal deformity is a complicated problem that should be addressed during multiple stages of the patient's life. Even though there is a consensus in modern practice to do a rhinoplasty at the time of primary cleft lip repair, (1) there still exists a vast patient pool where a primary

cheiliorhinoplasty was not done. Secondary rhinoplasty is best approached after nasal growth has concluded and done via an open technique to fully visualize the nasal structures.(15,16)

A patient with cleft nasal deformity appreciates the surgical outcome of rhinoplasty, when the surgeon can achieve near normal aesthetic symmetry of the cleft side with that of the non-cleft side of the nose. This perfection is however, seldom achieved. (17,18)

Significant component for success of cleft Rhinoplasty is placement of cartilage grafts for support and reinforcement. Use of the cartilage grafts reinforces the structural support of the nose and allows for improved tip definition. It also prevents wound contracture and collapse. (19,20,21)

The three basic steps performed by our centre to optimise the aesthetic symmetry of our cleft lip nasal deformity cases are as follows:

- 1) Caudal septum deviation is corrected. The deviated septum is mobilised and moved to the non-cleft side and fixed in a more medial position, this provides a stable foundation to the nasal tip.
- 2) Mobilization of the cleft side lateral nasal wall in a superior-lateral direction. Thereafter, the level of the lateral nasal wall on the cleft side is raised to match that of the normal side. This reconstruction is further stabilized by an extended spreader graft.
- 3) Nasal tip symmetry is achieved by separating the lateral crura completely from the vestibular skin and the pyriform aperture. It is then mobilized medially to create a new dome, matching with that of the normal side. The two domes are then sutured together.

CONCLUSION

To obtain symmetry of the cleft and the non-cleft side is a surgical challenge even in the most experienced hands. The deformed soft tissue and skeletal foundation are further complicated by the

long-term effects of continuing asymmetric anatomic growth and surgical scarring from previous surgeries.

A novel anatomic technique is proposed here, where only structural grafts are used to reconstruct the cleft side to simulate the non-cleft side of the nose. Usually, nasal dorsal on-lay grafts are used in cleft Rhinoplasty to create an illusion of symmetry. However, with this anatomic technique employing only structural grafts, we were able to achieve a more natural and non-operated nasal appearance.

In our opinion, satisfactory aesthetic improvement can be achieved with our technique, as indicated by the ROE questionnaire assessment results.

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