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Primary Rhinoplasty In Cleft Lip And Palate Deformity --- Our Experience

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Abstract

Nasal deformity is a part of cleft lip and cleft palate deformity. Reconstruction of the distorted nasal anatomy is the last in the evolution of cleft lip repair. A study was carried out to assess the results of primary rhinoplasty carried out at the time of cleft lip repair (prospective) viz a viz cleft lip repair without correction of nasal deformity (retrospective). Results and parent satisfaction were much superior in case of primary rhinoplasty compared to cleft lip repair alone.

Keywords: Unilateral cleft lip and palate, primary rhinoplasty, open approach, long-term follow-up

Introduction

The cleft nasal deformity involves the skin, cartilage, mucosa, and skeletal platform. The anatomic abnormalities have been measured and documented. Blair and Brown first described the cleft nose in 1931, critically identifying the nuances of the pathology[1]. The relationship between clinical presentation and embryologic development is an essential step in appreciating the factors involved in surgical correction of the cleft lip and nose. Deformational abnormalities are attributable to a combination of intrinsic and extrinsic factors, such as mesenchymal migration and mechanical stresses[2]. A cleft lip forms from improper fusion of the medial and lateral nasal prominences with the maxillary prominence during embryologic development. Studies have shown that the medial nasal process remains centralized and fails to fuse with the maxillary process in cleft patients.[3] As embryogenesis continues, the unopposed forces, created by the development of the discontinuous orbicularis musculature, further define the aberrant clinical features of the cleft nose[2,4] .

The unilateral cleft nasal deformity involves the structural framework of the nose as well as the soft tissue envelope. The aberrant orbicularis muscle insertion results in an imbalance that is further compounded by the maxillary skeletal hypoplasia [2]. Rather than a horizontal insertion and continuous decussation with the contralateral orbicularis oris seen in the normal lip, the orbicularis oris inserts in a discontinuous manner into the columella on the noncleft side. This creates an unopposed force that pulls the columella and caudal nasal septum to the noncleft side[4]. On the cleft side, the orbicularis inserts into the nasal base, retracting it laterally and inferiorly. Additionally, due to poor maxillary skeletal support at the alar base, the ala is further displaced posteriorly[4]. The asymmetric nasal tip results from the irregularly formed lower lateral cartilage on the cleft side. Although not ubiquitously accepted, the length of the lower lateral cartilage on the cleft side is considered equal to the noncleft side, primarily differing in shape and position[5–8]. On the cleft side, the medial crus is shorter and the lateral crus longer, with a less defined and wider dome[9]. This results in a poorly defined nasal tip with less projection.

Patients And Methods

This study was carried out in the Plastic Surgery Department of GMC Srinagar. All children with cleft nose deformity were included in study. The study included the 57 patients in which no primary rhinoplasty was done who were operated from year 2008 to 2014, the study also included (prospective group) patients operated from year 2015 to 2020 in which primary rhinoplasty (72 patients) was carried out at the time of lip repair. Results were assessed in the form of a questionnaire to a) parents of the child and b) plastic surgeon not a member of operating team in either group.

Surgical Procedure:

Our approach to nasal deformity correction consists of following steps:

1. Wide undermining of the external skin envelope on the normal and cleft side to release the medial and lateral crura of the alar cartilages.
2. Alar cinche sutures from base of ala to the caudal septum.
3. Adjusting the c- flap which may be put horizontally across the nasal sill or vertically to correct nasal tip centralisation and collumella length.
4. Intra nasal 3-0 or 4-0 prolene sutures to elevate the alar cartilage and to fix it with upper nasal cartilage and septum as was described first by McCoomb[10].
5. An occasional z-plasty to correct vestibular webbing.

Results

The study included the 57 patients in which no primary rhinoplasty was done who were operated from year 2008 to 2014, the study also included (prospective group) patients operated from year 2015 to 2020 in which primary rhinoplasty (72 patients) was carried out at the time of lip repair. The results were assessed in terms of nostril shape, elevation of alar cartilage and centralistion of tip of nose. In retrospective group; nostril shape was wide and elliptical, there was no elevation of alar cartilage, and nasal tip was deviated to non cleft side. While as in prospective group; nostril shape was rounded and equalized to normal side, elevation of alar cartilage was nearly equal to normal side, and nasal tip was centralized.

Post operative result after primary rhinoplasty

Discussion

Primary cheilo-rhinoplasty involves proper reconstruction of the clefted musculoapeneurotic complex by placing the muscles in their proper anatomic-physiologic orientation through careful identification, dissection, and mobilization of the paranasal and the labial musculatures. In short, the cleft repair is a muscle repair, and this enhances the establishment of a normal nasolabial complex. Delicate dissection and accurate repositioning of the lower alar cartilages during the primary lip repair will definitely help to establish a normal nasal shape. The nasal tissues must be supported with accurately

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placed sutures either by an open or by a closed approach. The degree of nasal deformity in cleft lip / palate deformity is proportional to the severity of clefting but is always seen in even the most minor clefts.

Timing of cleft lip nasal surgery can be divided into primary, intermediate, and secondary repairs. Multiple studies have disproved the idea that early manipulation of the nasal cartilage interferes with growth[5]. Originally based on experimental studies that showed large submucous resections of the nasal septum affected subsequent nasal and midface growth, studies by McComb and Coghlan overturned this philosophy by demonstrating that repositioning of the lower lateral cartilage without cartilage resection did not interfere with subsequent nasal and midfacial development[10]. The benefit of early intervention allows for an earlier restoration of nasal shape with the potential for more symmetric nasal growth. It is important to note that any surgery done at an early age will subsequently result in scar tissue and consequently affect future surgeries.

Primary rhinoplasty is defined as nasal surgery at the time of primary cleft lip repair. Although both the nose and lip are addressed simultaneously, the nasal correction should not be considered an adjunct to the lip, but should instead be a part of the overall cleft pathology. These two anatomic structures are connected and should be considered together when it comes to repair and reconstruction. The goal of primary rhinoplasty for both the unilateral and bilateral deformity is to provide better contour, symmetry, and projection of the nasal tip by releasing, undermining, and repositioning the lower lateral cartilages[11-15]. In addition, in unilateral deformities, the caudal nasal septum can be placed back on the anterior nasal spine to allow for more symmetric growth. There have been various techniques described to correct the unilateral cleft nose[16]. Most techniques involve a dissection of the skin overlying the lower lateral cartilages through both medial and lateral tunnels within the cleft lip incisions[17]. This allows for a differential movement of nasal alae and lower lateral cartilage when it comes to positioning the nasal base and relocating the lower lateral cartilages. The vestibular skin is rarely dissected during the primary nasal surgery.

Conclusion

The cleft nasal deformity is a common problem that has both consistent and reliable findings, as well as distinctive nuances. The deformed soft tissue and skeletal foundation are further complicated by the long-term effects of anatomic growth and surgical scarring. The goals of primary rhinoplasty are to restore symmetry and reposition the nasal structures such that further growth will not exacerbate deformities. Intermediate rhinoplasty, although not always indicated, can be utilized before school age to help achieve greater symmetry and help alleviate future growth deformities. Secondary rhinoplasty is best approached after nasal growth has concluded and done via an open technique to fully visualize the nasal structure. Cleft nasal deformity is a complicated problem that should be addressed during multiple stages of the patient's life. It has been shown that primary nasal repair is beneficial and long lasting and does not interfere with the growth and development of the nose and in fact it is very difficult to correct the nasal deformity in later period because in small children (3 months is the usual period of repair) cartilages can be molded easily and with the growth of face get remodeled. Therefore we strongly recommend primary rhinoplasty in all cases of cleft lip repair.

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