

Rhinoplasty in Cleft Lip and Palate

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Abstract

Various surgical techniques and approaches have been described to repair cleft nose deformities. It is necessary to consider that since it is a congenital deformity, surgical management must consider the patient's growth process, as well as the healing itself from the surgery. The present study aims to evaluate an alternative solution to secondary rhinology, aesthetic, and functional alterations to unilateral or bilateral cleft lift palate to minimize deformities and ensure good results. 11 patients were studied between 1995 to 2002, ten male and one female. In 8 cases, the patients had a history of cleft lip and palate on the left side, 2 patients with cleft lift palate on the right, and 1 patient with bilateral cleft lip and palate. 100% of the patients increased their naso-labial angle. This improved their appearance and structure, starting from a preoperative arithmetic mean of 39 degrees to a postoperative arithmetic mean of 96 degrees. Such intervention increased the naso-labial angle by 57 degrees. At the base of the nose, it was possible to improve the inclination of the alar line (line B) in 10 of the cases with a variation of 2 to 3 mm in relation to the perpendicular line A and only one case remained with the same inclination.

Keywords

Cleft Lip and Palate, Naso-Labial Angle, Inclination, Appearance

1. Introduction

Cleft lip and palate (CLP) is one of the most common congenital malformations in the world. Patients with unilateral or bilateral CLP coexist with serious functional, aesthetic, and structural problems of the nose, and we frequently witness these patients with a history of unsuccessful nasal surgeries without improve-

ment on their conditions and at times worsening their deformity related to their CLP anatomical relation such as septal deviation, nostril atresia and maxillary growth deficiency that alters the nasal floor [1].

Therefore, structuring a surgical technique and demonstrating its effectiveness is important to avoid several unsatisfactory repair surgeries for the patient. Since a poor nasal function in these patients is constant mainly due to secondary septal deviation. The nasal airway is severely affected in patients with CLP with resistance to nasal airflow between 20 to 30 percent higher in comparison to the general population [2], causing secondary problems of the ear, sinus, and phonation. It has been shown that palatoplasty prior to our procedure is highly important demonstrating an improvement in hypernasality in 50 to 75 percent of the cases [3]. Rhinoplasty should also contribute to improving alterations caused in the ear, sinus and phonation and its probable relation to a proper mastication and deglutition process. Apart from respiratory problems, aesthetic relations secondary to CLP affect self-esteem. As well as structural alterations, it is convenient to add that they are the cause of both functional and aesthetic alterations [4].

The objective of the present study was to analyze and evaluate an alternative solution to secondary rhinology, aesthetic, and functional alterations to unilateral or bilateral cleft lift palate.

2. Patients and Methods

11 patients were selected, 10 male and 1 female, between the years of 1995 and 2022 at the Institute of High Specialty in Ear, Nose, Throat and Surgery of Head and Neck.

In 8 of the patients, the patients had a history of CLP on the left side, 2 patients with right CLP and 1 with bilateral CLP, all with a previous history of nasal surgery on more than 1 occasion (1 to 3 previous nasal surgeries) between the ages of 15 to 25 years.

Photographic records are made before surgery and 6 months after surgery to make two assessments as follows:

Draw a line A that crosses the corners of the eyes and another line B that touches the lower edge of both nostrils. Subsequently, the distance that must be corrected is calculated, so that line B is perpendicular to line A (**Figure 1(a)**, **Figure 1(b)**).

Both face profiles are evaluated by measuring the naso-labial angle before and after surgery (**Figure 2**).

At 6 months after surgery, the patients are questioned about two aspects on a scale of 1 to 10 (1 is the lowest satisfaction and 10 being the highest satisfaction):

Do you feel that you are breathing better after surgery on a scale from 1 to 10? How do you rate yourself?

Do you feel that your appearance improved after surgery from 1 to 10? How would you rate yourself?

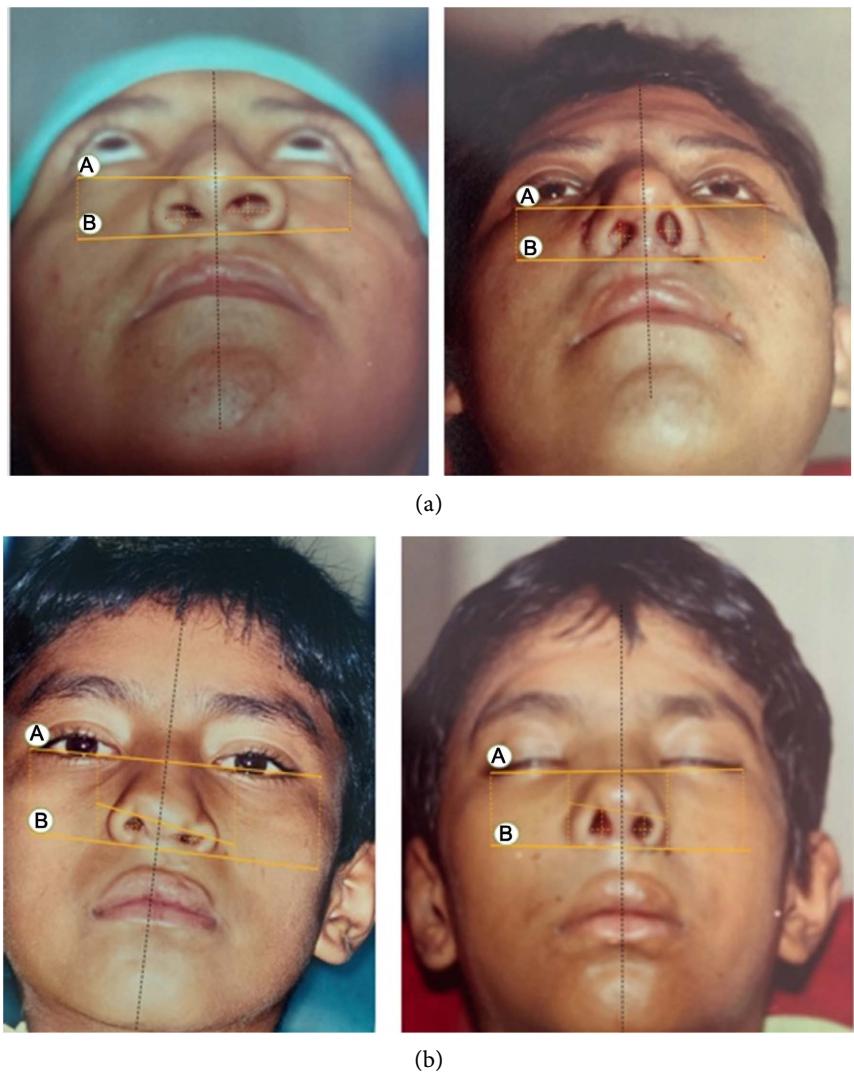


Figure 1. Before and after surgery with lines of measurement (line A is a line that is drawn from out canthus to out canthus of the eye and line B is drawn horizontally at the nasal base).

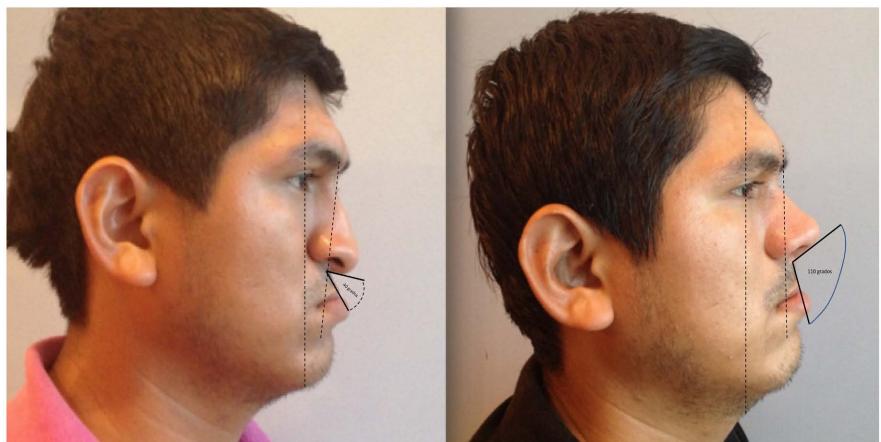


Figure 2. Before and after surgery, shows an angle modification from 40 degrees to 110 degrees.

Surgical Technique

Under general anesthesia and orotracheal intubation after asepsis, antisepsis, and placement of sterile fields, we proceed to one of the following two:

In case of no longer having the integrity of the septum due to previous nasal surgeries: Auricular cartilage graft is taken with perichondrium through a retro auricular incision in the insertion fold of the pinna, taking only the concha area and preserving the folds that give shape to the ear. It is optional depending on the calculated need to take from one or both auricles. These auricular cartilages with perichondrium serve to give volume and support to the base of the nose, aimed at the reconstruction of the premaxilla and anterior nasal spine, they can be used cylindrically **Figure 3(a)** or in sheet **Figure 3(b)**.

This could be decided in relation of the requirement on the patient, the use of cylindrical grafts in those patients with insufficient septal cartilage to reconstruct the premaxilla is recommended to balance the characteristic and accentuated cephalometric disproportions in patients who did not undergo palatoplasty surgery at an appropriate time. The retro auricular wounds are sutured with nylon 4-0.

In case, there is integrity of the nasal septum:

It is recommended to make a hemi transfixion incision in the nose to approach the septum and we take a cartilaginous or osseocartilaginous septal portion, wide as far as possible respecting the supporting frame of the nose. In this intervention, it is not recommended to separate the perpendicular sheet from the quadrangular sheet to obtain longer grafts. Up until this point, the material to reconstruct the missing areas at the base of the piriform opening has been obtained and the volume, where there is a cleft as well as the region of the anterior nasal spine (consider this material as the foundation to place the nasal structure to be renewed). Three bars from the graft taken from the nasal septum can be used, giving it an approximately 5 mm wide and whose length depends on the height desired on the nose tip [5].

The hemi transfixion incision is completed in transfixion, then a bilateral incision is also made at the level of the nasal valve and it is connected with the



Figure 3. Auricular cartilage with perichondrium to make nasal volume on the nasal spine shaped into a cylinder.

transfixion on its respective side to separate the upper nasal cartilage from the lower ones and allow freedom of mobility to all nasal lobes that will also be disinserted from the base with scissors, dissecting the fixation fibers and the possible fibrosis from previous surgeries in the premaxilla, respecting muscles and skin to avoid external scars and leaving the bag or space where the graft will be placed over the site of the anterior nasal spine.

Marginal incisions are made to expose the lower lateral cartilages, removing the cephalic edge of the wider lateral crura and thus making them more symmetrical (these cephalic edges of the crura are saved to later reposition them after reshaping them in the domes as bridges). In the same manner, an incision is made in the dome of the higher lower lateral cartilage and an attempt is made to make both sides as equal as possible by making a cut in the lateral crura of the smaller cartilage to rotate it as an augmentation of the smaller median crura (**Figure 4**).

The medial inter-crura graft is placed and positioned with a 4-0 nylon suture. In this step, the columella acquires shape and height (**Figure 5**), and an anterior graft is placed to the complex columellar to better shape the nasal lobe (**Figure 6**). The next step is to reconstruct the domes by cupuloplasty and/or strengthening them which could also be done by placing the grafts on the lateral crura of the lower lateral cartilages taken from previous cephalic edges (whichever one it requires, or both could be used) and the smaller ones could be managed with a bar of the septal cartilage (**Figure 7**).

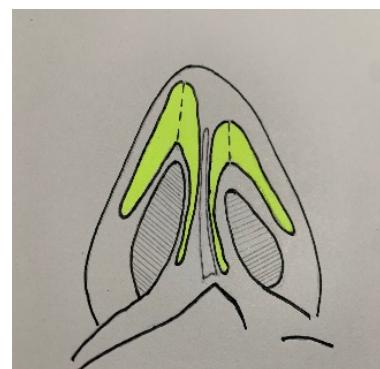


Figure 4. Patients with cleft lip and palate have a lower lateral cartilage asymmetry.



Figure 5. Intercrural bag for the graft.



Figure 6. Graft placed in front of nose to obtain de desire length before placing the intercrural graft.

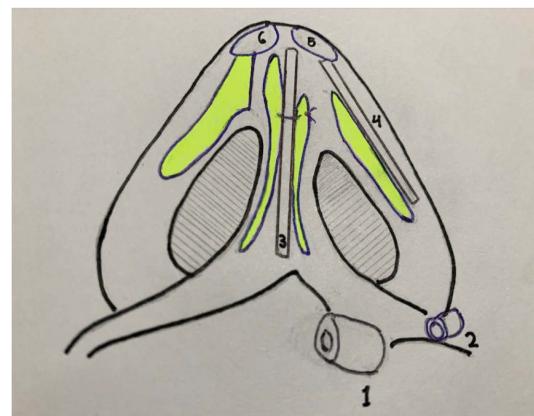


Figure 7. Shows the position of each graft. 1—Cushioned graft of auricular cartilage. 2—Cushioned graft of auricular cartilage. 3—Intercrural graft. 4—Alar graft in lateral crura of septum. 5—Bridge taken from the cephalic border of the lateral lower crura.

The grafts from the base of the nose that were made with the auricular cartilage are then also fixed transcutaneous, which now allows to see the height gained with the tip of the nose. Based on this, a graft may be used to reshape the back of the nose with a full bar of cartilage is recommended [6]. The wounds from the surgery are sutured, mattress sutures are placed in the septum with chromic 3-0 and the nasal pyramid is splinted. In case any nasal bone has been fractured, it is always done in greenstick fracture and if it is not necessary a micropore bandage is placed. No nasal packing is placed because the mattress sutures are placed in the septum. With all descriptions made, the surgical procedure is concluded.

In 100 percent of the patients, the naso-labial angle was increased, improving their appearance and structures starting from a preoperative arithmetic mean of 39 degrees in their naso-labial angle and reaching a postoperative arithmetic mean of 96 degrees. The average naso-labial angle reached was of 57 degrees significantly improving its appearance, structure, and function.

At the base of the nose, it was possible to improve the inclination of the alar line (line B) bringing it to a perpendicular point, in 10 cases with a variation of 2

to 3 mm in relation to line A. Only one case remained with the same inclination after surgery due to fibrosis from previous surgeries but had an improvement in tuning, rotation, and projection.

At 6 months after surgery, all patients referred to be satisfied with the aesthetic and functional improvements.

Giving an average rating of 8 to their subjective perception of aesthetics and 10 for functionality.

3. Discussion

Standardizing a clear route on how to proceed in the face of nasal surgical problems secondary to CLP, implies in itself a major difficulty since a nasal structure must be built where a part of the base or support point is missing, which is the premaxilla, or there could be an opening of the piriform base or a hypoplasia of it [7]. It was determined that the first step is to reconstruct the nasal base, so that the structure supporting the tip of the nose could be correctly supported. The advantage of not having to take tissue from another part of the body [8] other than the nasal or auricular cartilage is a great benefit in terms of recovery time and less aggression to the patient. This also reduces morbidity and mortality in these cases. Therefore, rib tissue is avoided or tissue from other more painful and dangerous areas, as well as the use of prostheses that may generate rejection in multi-intervened patients. There are many surgical techniques for rhinoplasty but in this area, it seems that there is not a defined technique described [9], for which we proposed the following intervention for rhinofacial surgeons.

This technique offers the advantage of a significant improvement on both functional, aesthetic, and structural aspects in relation to what is commonly seen in our medical specialty. This could be seen with patients with a history of unilateral or bilateral CLP undergoing rhinoplasty surgery with persistence of rhinofacial deformities and nasal obstruction, in which some patients had already undergone nasal surgery with 2 or 3 failed attempts.

4. Conclusions

It is concluded that the basic surgical steps to reconstruct a nose with CLP are:

Level the base of the nose with auricular cartilage with perichondrium or with septal osseocartilaginous graft.

Give support and height to the columella, (elongated grafts that give support but do not generate weight) intercrural and anterior to the medial crura.

Strengthen the domes and lateral crura to match their bilateral position (cardinal bridges taken from the cephalic border of the lateral crura of the inferior lateral cartilage).

Strengthen the depressed lateral crura with a septal cartilage bar (if necessary).

Level the nasal dorsum with or without cushioned grafts (if necessary).

These are the basic steps to shape and proportion the nose in relation to the face of the patients with unilateral or bilateral cleft lip and palate.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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