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Original Research

Clinical Assessment of the Surgical Outcome of Unilateral Cleft Lip Surgery

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ABSTRACT:
Background: Cleft lip repair today is the quintessence of the maxillofacial surgeon's art. It is the pinnacle of combining function, symmetry and appearance in a most conspicuous area starting with a deficiency and distortion of available tissue.There are a number of different methods to repair a cleft lip. While none of the repair is ideal, each has its own advantages and disadvantages and each results in an excellent repair in experienced hands.The ideal repair results in symmetrically shaped nostrils, nasal sill and alar bases, a well defined philtral dimple and column and a natural appearing cupids bow and minimal visible scar. **Objective:** To retrospectively evaluate the post-surgical asymmetries of the upper lip and nose in complete unilateral cleft lip and palate patients. **Methodology:** A study of 85 patients with unilateral complete cleft lip with non syndromic patients who had undergone cheiloplasty by the modified Millard's technique at the age ranging from 3 months to 11 months in the last 1 years were included in the study. The study was conducted at Kim's Dental College, Amalapuram in the year 2017. **Results:** The results showed that statistically significant increase in the width of the nostril. No statistical difference was noted in the philtrum height, vermilion height and length of the horizontal hemi-labium. Scar was found to be mild and nostril axis horizontal in all the patients. **Conclusion:** The present study highlights that the structures most likely to be deformed should be put into as perfect a position as possible at the time of lip repair: these include the level of the ala, the short columella, the nasal deviation, the alar width
Key words: Cleft lip, cleft palate, surgical outcome, symmetry.

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INTRODUCTION:
Cleft lip is one of the most common congenital deformities. The condition is due to insufficient mesenchymal migration during primary palate formation in the fourth through seventh week of intrauterine life. By the fusion of maxillary prominences with the lateral and medial nasal prominences the development of upper lip begins. It usually starts around 4-5 th weeks of gestation and by the 7 th week of intra uterine life it gets completed.
Failure of mesenchymal migration to unite one or both of the maxillary prominences with the medial nasal prominences results in a unilateral or bilateral cleft of the lip respectively. As a result of which there will be distortion and disfigurement of upper lip and nose.
The cleft usually affects the facial formation resulting in anatomic deformity which can also lead for functional dysfunction which affects the child's ability to eat, speak, hear and breathe. In few of the cases the cleft deformity also affects the child's psychosocial difficulties.[1]
The incidence of the cleft lip with or without cleft palate is approximately 1 in 1000 live births. The incidence of such cleft lip or cleft palate is seen more commonly among Asians and less in Caucasians. Among the African Americans the incidence of cleft lip or palate is still low. In India the incidence of such cleft lip is around 1 in 787 live births. The incidence of cleft lip is more common in males when compared to females.
The most common presentation is cleft lip and palate (approximately 45%) followed by cleft palate alone (35%) and cleft lip alone (approximately 20%). Unilateral cleft lips are more common than bilateral cleft lips and occur

more commonly on the left side. (Left cleft lip: right cleft lip: bilateral cleft lip = 6:3:1).[2]
While none of the repair is ideal, each has its own advantages and disadvantages and each results in an excellent repair in experienced hands.[2] The ideal repair results in symmetrically shaped nostrils, nasal sill and alar bases, a well defined philtral dimple and column and a natural appearing cupids bow and minimal visible scar. In addition it results in a functional muscle repair that with animation mimics a normal lip.[3,4] Ultimately the eye first focuses on symmetry and then normal contours of the lip at rest and in animation.

OBJECTIVES:
To objectively assess the symmetry obtained in terms of Philtrum height, width of nostril, vermilion height and length of the horizontal hemi labium and comparing it with the normal side of the same patient.

MATERIALS AND METHODS:
The study population includes patients who have undergone lip surgery at Kim's Dental College, Amalapuram in the year 2017 and who report back for check up/ for their cleft palate surgery are included in this study.
A study of 85 patients with unilateral complete cleft lip with non syndromic patients who had undergone cheiloplasty by the modified Millard's technique at the age ranging from 3 months to 11 months in the last 1 years were included in the study.
These patients were evaluated for symmetry between the cleft side and the non-cleft side of the same patient when they returned for the cleft palate surgery after a minimum post-operative period of 6 months.

Inclusion Criteria:
Non-syndromic unilateral complete cleft lip and palate patients, who have undergone surgery for their cleft lip in last 12 months were included in this study.
Exclusion criteria:
All syndromic patients & patients who had their cleft lip surgery at any other centers.
During the cleft palate surgery after the patient was intubated, landmarks for the study were marked on the lip using indelible ink and measurements made using a caliper. The landmarks are:

1. The width of the nostril was measured from the lateral aspect of the columella to the point at the lower limit of the alar base.
2. The philtrum height was measured from the lateral aspect of the columella to the peak of the Cupid's bow.
3. The vermilion height was measured from the peak of the Cupid's bow to the red line on the lip.
4. The length of the horizontal hemi labium was measured from each oral comissure to the peak of the Cupid's bow.
5. The nostril axis was subjectively assessed based on the inclination of the longitudinal axis of the nostrils from the horizontal. The non-cleft side was intermediate. (highest point and the lowest point of each nostril)
6. Scar was assessed subjectively as mild, moderate and severe.

RESULTS:
A total of 85 patients were included and analyzed in our study. The age group of the patients ranged from 3 months of age to 11 months of age. The mean age of the patients was 7.8 months. In our study nearly 58 (68.2%) were males and 27 (31.8%) were females.
In these patients the symmetry between the cleft side and the non-cleft side of the same patient was assessed by objectively measuring the width of the nostril, philtrum height, vermilion height and length of the horizontal hemi labium.
The mean width of the nostril on the cleft side was 11.99 $\pm$ 1.57 compared to the non-cleft side, which was 8.4 $\pm$ 1.47 (p=0.001). The observed mean difference was found to be statistically very highly significant

Table 1: Comparison of mean width of the nostril for cleft and non-cleft Side

GROUP	Mean	Standard deviation	'p'
Cleft	11.99	1.57	0.001 VHS
Non-cleft	8.4	1.47	

The mean philtrum height on the cleft side was 7.92 $\pm$ 1.69 compared to the non-cleft side, which was 8.24 $\pm$ 1.86 (p= 0.061). The observed mean difference was found to be statistically non significant.

Table 2: Comparison of Mean philtrum height for cleft and non-cleft side.

GROUP	Mean	Standard deviation	'p'
Cleft	7.92	1.69	0.051
Non-cleft	8.24	1.86	NS

The mean vermilion height on the cleft side was 7.48 $\pm$ 7.5 compared to the non-cleft side, which was 6.39 $\pm$ 0.9 (p= 0.256). The observed mean difference was found to be statistically non significant.
Table 3: Comparison of mean vermilion height for cleft and non-cleft side

GROUP	Mean	Standard deviation	'p'
Cleft	7.48	7.5	0.256
Non-cleft	6.39	0.9	NS

The mean horizontal length of the hemi labium on the cleft side was 19.65± 1.89 compared to the non-cleft side, which was 19.67± 1.98 (p= 0.552). The observed mean difference was found to be statistically non significant.

Table 4: Comparison of mean length of the horizontal hemi labium for cleft andnon-cleft side.

GROUP	Mean	Standard deviation	'p'
Cleft	19.65	1.89	0.552
Non-cleft	19.67	1.98	NS

The scar was assessed subjectively & was found to be mild in all the cases.
The nostril axis on the cleft side in all the patients was found to be horizontal compared to the non-cleft side.

DISCUSSION:

Objective evaluation of the overall results of cleft lip repair can be difficult, because esthetic appearance is largely a subjective phenomenon: however the symmetry of the architecture of the lip and nose can be evaluated by mathematical means. In the present study linear measurements of heights and widths of certain important features of the lip and nose are used to assess symmetry. Angles and arcs have not been measured but their importance cannot be disregarded.

The mean width of the nostril between the cleft side and the non cleft side was found to be statistically very significant in our study. The nostril axis inclination was also found to be in horizontal axis in both the cleft lip repaired and non cleft side. The cleft lip nasal deformity is caused by a displacing mechanism rather than a tissue deficiency. The nasal defects are caused by primary deformation of soft tissues; it explains also the observation that some deformed nasal tissues return to their original state after correction by surgery. Some authors would not operate on the nasal deformity at the time of initial repair because such procedures did not produce a lasting result and instead left scar for later procedures.[5]

Primary nasal correction at the time of cleft lip repair resulted in symmetrical nostrils compared to the no nasal correction group.[6] Nasal growth of the cleft side of the nose is unaffected by early primary nasal surgery.[7]

It was observed that both the sides were almost equal and symmetric. In the study done by Holtman and wray the vertical length among the patients operated for cleft lip with rotation advancement repair were shorted at 12 months post operative follow up when compared to the intraoperative findings . Saunders et al also concluded that the growth of the lips depends upon the surgical technique used and its not the lip growth which will determine the length of the lip. In another study done by Chowdri et al the rotation advancement repair resulted in shorter symmetry of the lip length.[8]

The cleft side of the lip is shorter than the non-cleft side in the vertical dimension and Millard's rotation incision and labial back cut carried across the base of the columella and into the philtrum usually gives sufficient elongation of the medial element.[9] Yet Millard asserted that shortness of vertical length was only due to insufficient rotation. Poole has noted that in a Millard repair if all the layers are accurately approximated and a pleasing lip is obtained at the time of primary surgery, the lip height and contour would be precisely similar after a 5-year period.[10]

The mean vermillion length when compare with cleft and non cleft side was found to statistically non significant. In the study done by Amaratunga et al the height of the vermilion was found to be shorter when performed with millard repair.[11] In another study done by Harold et al he opined that in the millard repair if all the layers are accurately approximate and a pleasing lip can be seen at the time of surgery and even after a 5 year period post operatively.[12]

The scar was assessed subjectively as mild, moderate and severe. We found that all the cases showed only mild scars. Though N.A Chowdri[8] and Barbell Holtmann[13] found greater frequency of hypertrophic scars following rotation advancement repair.

The ultimate outcome of the nasal deformity awaits a follow up of many years.[13] The logical consequence is that the operated lip should be repaired as symmetrically to the other side as possible.[14]

Conclusions and Recommendations:

The present study highlights that the structures most likely to be deformed should be put into as perfect a position as possible at the time of lip repair: these include the level of the ala, the short columella, the nasal deviation, the alar width. The abnormal positions of the components of the nose should be corrected at the time of lip repair. The logical consequence is that the operated lip should be repaired as symmetrically to the other side as possible.

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