

Original Article

Result of Simultaneous Correction of Alar Deformity with Primary Repair of Unilateral Cleft Lip.

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Abstract

Cleft lip and cleft palate has been a recognized congenital malformation from a very early stage in recorded history. The infant born with an orofacial deformity, which leads to develop an unwilling psychosocial problem among the parents and also among the relatives. Successful treatment of cleft is based on overcoming in tissue shortage and repositioning of the tissues in normal anatomical pattern so that it restores both appearance and function. Various modalities of theme, works, observations and involvement of multidisciplinary approaches were tried to achieve better cosmetic, aesthetic and functional aspect in management of cleft face. Poorly performed primary surgery carries a high risk of iatrogenic disturbances of subsequent orofacial growth. Delayed nasal repair in patient with cleft lip did not produce satisfactory aesthetic and functioning result. Aim & objective of the study is to achieve a cosmetically well-accepted face in respect to lip, philtrum and nose of both sides after cleft lip surgery and to reduce the incidence of secondary correction of deformed nose in a patient with cleft lip. In our study total 86 cases are studied according to preformed inclusion and exclusion criteria. Simultaneous correction of alar cartilage deformity at the time of primary repair of cleft lip may lessen the staged operative procedure and markedly reduce the economic burden to the family.

Key words: Cleft lip, congenital, alar cartilage, staged procedure.

Introduction :

In contrast to normal lip, the unilateral cleft lip is an asymmetrical structure. The cleft includes, gradually enlarging V-shaped defect passing from the inferior lip border towards the alar base. The white roll at the muco-cutaneous junction disappears as the mucosa turns upward to the border at medial and lateral cleft margin. The medial side of the cleft remain attach to pre maxilla with a frenulum but tends to be more adherent

and less pliable. On the lateral side of cleft, the orbicularis bulge is present with a deep groove above the bulge and just below the alar base. This is due to divided abnormal orbicularis muscles whose fibers bounce up in a haphazard arrangement. The vertical height of the lip on cleft side is diminished as compared to non-cleft side. The medial cleft margin is shorter than lateral cleft margin. On nasal deformity, the septum is deviated and oblique so that columellar base lies nearer the normal side of the nose. The major deformity is the malpositioned cleft alar cartilage. It is subluxed inferiorly and laterally and frequently folds into vestibule. Alar cartilage is displaced posteriorly. The lateral part of alar cartilage bucked or bent into anticonvexity. Widened or narrowed nostril floor, quite frequently depressed.

Operation for repair of unilateral cleft lip should ideally be based on clearly defined landmarks, have a logical sequence, production of a symmetrical lip in three dimension, with near normal dynamics for lip movement and facial expression. There is usually a deficiency of tissue along the cleft margin, including not only lip but also the alveolus. There is also distortion of the muscles orientation.

During repair of unilateral complete cleft lip following aspects must be taken into consideration, which include

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both anatomical and functional repair, the philtral column, the C-junction of the alar base (nostril sill), maintenance of nasal dome and tip of the nose, slight bulging and continuation of nasal floor and the vermilion cutaneous line (white line).

Materials and methods:

This was a prospective study carried out during the period of January 2000 to January 2011. The study was done in the department of pediatric surgery BSMMU, Dhaka, Faridpur Medical College Hospital, General Hospital, Faridpur and Dr. Zahed Memorial Children Hospital, Faridpur. Target Group are all patients age 6 months to 12 years having unilateral cleft lip undergone surgical repair with correction of alar cartilage deformity. The entire patient underwent repair of unilateral cleft lip by estimating the set parameters at preoperative and post operative follow up. Collection of all parameters could not be done in all cases due to some communicating failure. All the parents were given on explanation of the study. The study did not involve any additional investigations and did not involve significant risk. The study did not cause any economic burden to the parents.

Any associated malformation must be identified and treated appropriately. The infant must be thriving and taking feeds from a cup and spoon. The hemoglobin should be about 10 gm/dl. The presence of upper respiratory tract infection must be excluded, as well as infection of the nose and throat with hemolytic streptococcus.

Operative procedure:

The salient points in the architecture of the normal and cleft side of the upper lip were marked. {**Fig. 1**-Length of the lip on normal side (AB); mid-points of cupid's bow line and columella (c,c1); high points of cupid's bow on cleft side(A1); site of the nasal threshold (B1,B2); points at which white roll gives out on cleft side(A2), AB-A1.B1 is the length by which the skin repair line on the cleft side must be elongated}. A thin strip of skin mucosal junction on both sides of the cleft is pared and mucosal flaps reflected on each side of the cleft. Subcutaneous undermining on the lateral side of the cleft frees the orbicularis muscles from its abnormal dermal attachment and from its attachment to the mucosa. On the medial side of the cleft undermining creates a pocket beneath the nasal spine and the midline of the lip. The tissue attachments of muscle around the alar base of the nose are divided. The alar base on the affected side is pushed medially and upwards.

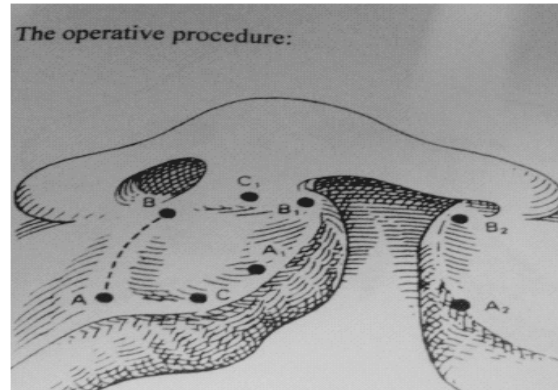


Figure: 1

An incision is marked to mimic the curve of the normal nostril along the center of the cartilage from the lateral oblique nostril fold, upwards and externally over the nostril rim, and back to the vestibule to end halfway down the membranous septum {**Fig. 2**}.

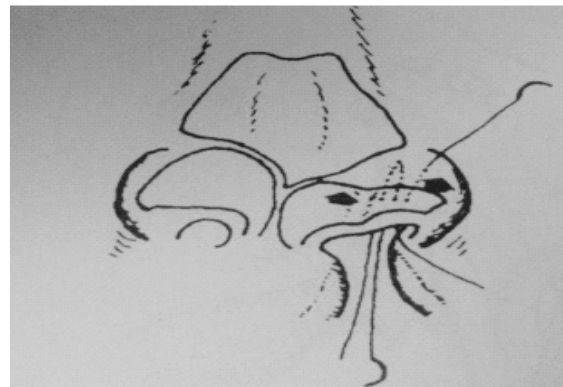


Figure: 2

Realignment and suturing of the cleft nasal alar cartilage by few hanging suture with the dermis of nasal dome overlying the deformed cartilage {**Fig. 3**}.



Figure: 3

The upper portion of the mucosal flaps are trimmed and approximated. The muscle flap is advanced sutured with muscle with 4/0 vicryl into the pocket created on the non cleft side. Skin elongation is accomplished by Z-plasties, the first being placed under the nostril sill.

The flaps of the Z are transported and sutured {Fig. 4}. A balanced cupid's bow has been achieved by a secondary smaller Z just above the white roll of the lip.

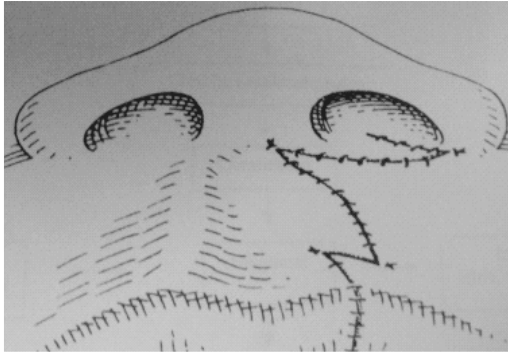


Figure: 4



Figure: 5

Preoperative and postoperative photograph

Observation and results:

With the aim of evaluation of different parameters, measurements were taken preoperatively and postoperatively. Measurement was taken on preoperative visit and 7-10 days and around 3 months post operative period. Total 86 subjects were included in this study according to the defined criteria among which postoperative 58 subjects were evaluated 3 months postoperatively. Other subjects could not be evaluated after 3 months postoperatively due to some communication failure.

The observation and findings with regards to age, sex, mode of presentation, preoperative and postoperative

parameters have been analyzed. The parameters are gap between cleft margin (mm), hemi length of lip (mm), philtral ridge (mm), transverse diameter, vertical height of nostrils (preoperatively, 7-10 days and 3-6 months postoperatively), differences between expected and achieved (mm).

Table I: Age distribution of patients (n= 86)

Age group	Number of patients	Percentage
6 months to 1 year	36	41
>1year to 5 year	40	47
>5year to 12 year	10	12

Table II: Sex distribution (n=86)

Sex	Number of patients	percentage
Male	52	60
Female	34	40

Table III: Side involved (n= 86)

Side involved	Number of patients	Percentage
Left	68	79
Right	18	21

Table IV: Cleft lip with nasal deformity (n= 86)

Deformity	Number of patients	Percentage
Complete	60	70
Incomplete	26	30

Discussion:

The facial cleft deformity cannot be treated successfully by only one discipline or specialty. In general, the preferred time for cleft repair is 3 months of age. The purported benefit of delayed surgery as done in the present study is principally three folds¹. Anesthetic risks are regarded by some as being lower in infancy than in neonatal period and allowing a certain amount of time to elapse between birth and operative event. It also permits the diagnosis of associated anomalies that might if un-recognized, increase the hazards of surgery². It is felt that larger structures of an older infant will permit a better definitive repair with less chance of subjecting the child to subsequent revision. For simultaneous correction of unilateral nasal deformity must have to delay up to 5 months for better exploration and repositioning of alar cartilage. It is held by some that a period of "living with the defect" will

promote more realistic expectation of the end result and lessen the dissatisfaction attendant upon a less than perfect outcome³.

It is thought that the cartilage acts to pull the skin and dome of nose downward and outward, flattening the tip of the nose, pulling the domes of the cleft and non cleft alar cartilages apart and obliterating alar facial groove as the deformed alar cartilage joints the face at an obtuse angle, this inferior displacement of alar cartilage, unless corrected at the time of lip repair results in persistence of a dropped nostril associated with an intranasal fold obstructs the nostril aperture⁴. The severity of nasal deformity in a patient with a cleft with or without cleft alveolus and palate depends on width of cleft in lip and completeness of the cleft lip. The very abnormal appearance of the nasal alar on the cleft side is a result of the rotated alar cartilage which is also fused to the small cleft segment⁵. The unilateral nasal deformity is corrected during the same procedure as the lip repair at the age of 5-7 months. The deviated nasal dome must therefore be carefully sutured, which allows un-inhibited growth of the individual character of nasal skeleton⁶.

The unilateral cleft lip reconstruction is an anatomical and functional closure. This means that for the scar to be aesthetically acceptable. The orbicularis oris muscles must be correctly rotated and aligned for its correct function⁷. The correct lip repair technique as well as specially careful suturing for repositioning of the nasal sill with rotation of alar cartilage and for formation of nasal dome should result in a good aesthetic result⁸. Revision surgery in the patient with a unilateral cleft deformity is usually a more difficult reconstruction than in the patient who has a bilateral cleft deformity⁹. With all these consideration, the present study was designed to assess the cosmetic and aesthetic appearance of face by simultaneous correction of unilateral nasal deformity with the repair of unilateral complete cleft lip.

In this study preoperative evaluation of spectrum of anatomical and functional defect was possible by quantitative measuring the parameters and with steel photograph. Other investigation procedure for evaluation of other associated anomalies and for fitness for operative procedure done not be used as quantitative or qualitative data. Postoperative follow up measurement of parameters and photograph provided quantitative data about anatomical and aesthetical appearances which showed cosmetic results. This is found to be significant. Total 86 patients were studied by defined criteria both preoperative and

postoperatively. 36 (41%) cases were below 1 year and 68 (79%) cases were in left sided involvement with a male predominance 52 (62%). 26 cases (30%) were incomplete cleft but with a significant nasal deformity so they were included in the study group. In those cases incomplete cleft were converted to complete cleft lip by dividing the nasal sill¹⁰. There was none with post operative infection and wound dehiscence, two had only notching in lip. Hemi length of lip (repaired) were equal in 79 (91%) cases and 7 cases (9%) had 01 mm shortening. Philtral height in both sides are equal in 70 (81%) cases and 01 mm shortening in 16 (18%) cases.

Due to some difficulties in communication in all cases post operative late follow up could not be possible. Cases were evaluated after 7-10 days and 3-6 months of reconstructive procedure. Cases showed cosmetic appearance with maintaining the transverse and vertical height of the nostrils, there were a good correlation with normal nostril and reconstructed nostrils proved by paired 't' test where $p > 0.05$. In 3 (3.5%) cases there was slight narrowing of the inner aspect of reconstructed nostrils.

In our study, we tried to make a declaration, that simultaneous correction and repositioning of deformed alar cartilage with the repair of unilateral cleft lip make a child anatomically, aesthetically and functionally accepted and may not need a secondary correction of the nose in future (fig 5). This needs further evaluation; communication and observation of the patients (operated) in long term follow up.

Conclusion:

This study was attempted to gain better cosmetic, aesthetic and functional outcome for child with unilateral cleft lip and nasal deformity by simultaneous correction of alar deformity with primary repair of unilateral cleft lip. The expected oval shaped nostrils on measurement by transverse and vertical height of nostrils were gained and differences between expected and achieved are insignificant. From our study it was found that cosmetic and aesthetic aspect of face was significantly improved and maintained after 3-6 months postoperative period. It means that though it needs operative skill and long term follow up for a definitive comment regarding the result of the study. It is to be said that correction of the deformed alar cartilage and its repositioning at the time of primary repair of the unilateral cleft lip is essential which enhances results and subsequent systemic development of the nose.

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