

# **Outcome of Alar Base Support in Unilateral Secondary Cleft Lip and Nasal Deformity Repair with Dermal Roll Flap**

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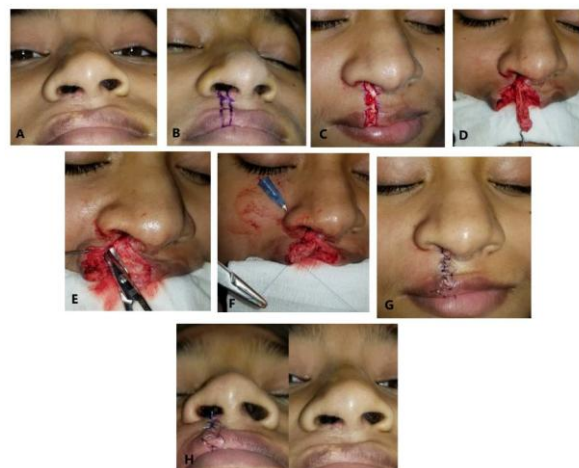
**Ethics Statement:** The study was presented before the Ethical Review Committee and approval was granted with IRB Ref No.45/2024 dated 22 Aug 2024.

**Background:** Unilateral secondary cleft lip and nasal deformity is almost always associated with underdeveloped central face on cleft side<sup>1</sup>. Imbalance of tissues on both sides of central face has gross impacts on appearance of the patients particularly asymmetric nose due tripod tilt<sup>2</sup>. Alar base on the cleft side is under projected in almost every patient which is attributed to many factors including maxillary hypoplasia, cleft groove, weak upper part of lip, thin alar base and stretch of unrepaired orbicularis oris muscle<sup>3</sup>. Tissue support is needed to bring it in harmony with the contralateral alar base position. In literature, alar base augmentation with autologous grafts like cartilage, fat, fascia or synthetic material like silicon have been described<sup>4</sup>. Alone or sometimes in combination, these autologous or synthetic materials help in gaining symmetry<sup>5</sup>. Definitive rhinoplasty at any stage is even not enough to get satisfactory nasal appearance without alar base support.

Lip revision is sometimes inevitable in cases with secondary cleft lip and nasal deformity with wide scarring of the repaired lip, vermilion disparities or improperly repaired orbicularis oris muscle<sup>6</sup>. Wide scars running vertically through lip are always unacceptable aesthetically and require revision. Similarly, vermilion disparities like white roll mal alignment, deep notching and mucosal adhesions invite secondary revision of lip. Orbicularis oris is a special sphincteric muscle responsible for lip competence and articulation. Inadequately repaired orbicularis also requires readdressing the lip surgically<sup>7</sup>.

**Objective:** During lip revision surgery, usually scar tissue is excised and structures are reapproximated. While excising vertical lip scar, in most of the cases of secondary cleft lip and nasal deformity, some lip tissue on either side of the scar can be taken with the scar to increase its volume and ensure its vascularity when left attached superiorly. Though based on random blood supply through superior attachment, this tissue is tissue comprises of both fibrous as well as nonfibrous tissue and can be utilized after de-epithelization of skin and mucosa as dermal roll flap for augmentation of alar base<sup>8</sup>. The rationale of this study was to find out spareable lip tissue utility in augmentation of alar base for improving nasal outlook in secondary cleft lip and nasal deformity.

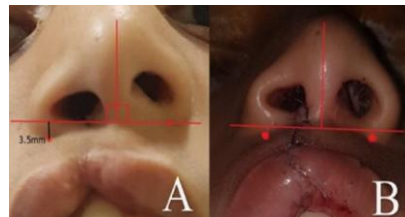
**Methodology:** In this prospective interventional study conducted in Plastic surgery department of Allama Iqbal Medical College, Lahore, Pakistan from October 2023 to December 2024. The study comprised of 45 patients which were recruited from out-patient department requiring lip scar revision with unilateral secondary cleft lip and nasal deformity having difference of alar base projection more than 2mm measured on basal view. Two patients were lost to follow up so study was completed with 43 patients. Patients who required only scar revision or rearrangement at vermillion only for notching were not included. Similarly, patients having tight upper lip were also not considered for the study. All patients were explained about the treatment and informed consent was taken. After pre-operative photographs, measurement of differences in alar base projection of cleft and non-cleft side was done. Area of the planned dermal roll flap was marked. Lidocaine 2% with epinephrine 1:10000 was infiltrated in the incision line as well as around the base. Before raising the flap, cutaneous incisions were made on both sides of the flap and flap was de-epithelized. Similarly, mucosal side was also de-epithelized. Then flap incisions were completed on both sides while superior attachment of the flap was left intact. Once superiorly based flap was raised, a tunnel was made under ipsilateral alar base starting from upper end of lateral incision. Flap was rolled on itself and in-setting was done in the under-base tunnel by passing polyglactin suture subcutaneously with the help of 22G needle. After hemostasis, lip repair was completed by approximating medial and lateral edge of left over orbicularis and the proceeding with cutaneous and mucosal repair. Procedural steps are shown in sequence of Figure 1 which ranges from appearance of the secondary cleft lip and nasal deformity to marking, both sides de-epithelization, flap raising, tunnelling, flap inseting and lip closure. This also shows immediate outcome of the lip and nose on table.



**Fig 1: Steps of flap execution. Pre operative appearance(A), cutaneous marking(B), steps of flap raising(C,D,E), flap in-setting(F,G) and immediate post operative appearance(H).**

Steris strips were applied on skin and polymyxin-B ointment layer on vermillion. Non-steroidal anti-inflammatory agent and first-generation cephalosporin were prescribed for five days and skin stitches were removed at 5th to 7th day after which scar therapy was started. After 72 hours when acute inflammation settles, ultrasound was done to determine the volume of the flap and patients were kept under monthly follow up with moisturizing cream for scar therapy.

At 6 months, repeat photographs were taken and measurement of difference in projection of cleft side and non-cleft side alar bases was repeated. Comparison of measurements pre-operatively and 6 months post-operatively was done to find out improvement in the alar base projection of cleft side as shown in Figure 2 which shows the comparison of levels of both alar bases pre and post procedure. Repeat ultrasound was also done at 6 months to find out the volume of the flap and compared with volume of the flap at 72 hours post operatively.



**Fig2: Measurement of alar base projection. Pre-operative(A) and 6 month Post-operative(B) position of cleft and non-cleft side alar base showing the difference**

**Results:** Age of the patients, lip scarring and notching, duration of primary lip repair was determined. Experience of the primary surgeon performing surgery in the past was found out. The difference of alar base projection on cleft side and non-cleft side measured preoperatively. All the patients were operated by consultant plastic surgeon with more than 5 years post fellowship experience. Average operative time from skin incision to completion of stitch work was noted. Patients were admitted in ward for observation of bleeding. Cefradine injection was given at the time of induction in operation while same antibiotic was given orally in the ward and 3 days after discharge along with ibuprofen as analgesic and anti-inflammatory agent. All the patients were discharged after 24 hours of surgery and called for follow up after 72 hours when skin tapes were removed, wound was cleaned and ultrasonographic measurement of dermal roll flap volume was documented. Skin stitches were removed at 5th to 7th day depending on healing of the wound.

After 6 months of the repair, repeat measurement of alar base projection was done. Paired t-test applied on pre procedure and 6 months post procedure alar base projection and p value less than 0.05 was considered significant. Volume of the dermal role flap was again measured ultrasonography at 6 months and its persistence was compared to the volume at 72 hours after surgery.

Complications seen in all patients which settled without any sequelae in 3 weeks and patients' satisfaction was scored.