

Original Research Article

The Turnover Nasolabial Flap for Full-Thickness Alar Reconstruction: A Single-Stage Technique for Optimal Cosmetic and Functional Results

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Article History: | Received: 22.04.2025 | Accepted: 27.05.2025 | Published: 18.06.2025 |

Abstract: **Background:** Full-thickness alar defects require complex reconstruction of the nasal lining, framework, and skin. While the forehead flap is the standard, it involves multiple stages. This study presents the nasolabial turnover flap as a single-stage alternative offering both functional and aesthetic advantages. **Method:** Over a two-year period, 16 patients with basal cell carcinoma underwent alar reconstruction using a folded nasolabial turnover flap with cartilage grafting. Candidates had thick nasal skin and adequate cheek laxity. Reconstruction followed the nasal subunit principle, and a nasal conformer was used postoperatively. **Results:** All flaps survived with no infections. Minor complications included two cases of venous congestion and one case of partial nasal obstruction requiring revision. Donor sites healed well with concealed scarring. At 12 months, outcomes were functionally and cosmetically satisfactory with high patient satisfaction and minimal need for secondary procedures. **Conclusion:** The nasolabial turnover flap is a reliable, single-stage solution for full-thickness alar reconstruction in select patients. It offers excellent color match, structural support, and minimal morbidity, making it a valuable alternative to multistage techniques.

Keywords: Alar Defect, One Stage Technique, Naso-Labial Flap.

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INTRODUCTION

Full-thickness alar defects, including nasal rim defects acquired through trauma or oncologic resection, present complex challenges in reconstructive surgery that require innovative approaches to restore both form and function. These defects necessitate reconstruction of the inner mucosal lining, external skin, and supporting framework. Various reconstruction methods are available depending on the defect's size and depth, including primary closure, skin grafts, composite auricular grafts, cheek advancement flaps, septal mucosal flaps, and paramedian forehead flaps.

However, options for full-thickness alar defects are limited. While the forehead flap remains the gold standard, [1], the nasolabial turnover flap has been largely underutilized. Based on our experience, we propose the nasolabial turnover flap as a reliable, single-stage technique offering a good functional and aesthetic solution. The skin color and texture perfectly match

those of the nasal alar subunit. Additionally, surrounding skin redundancy, proximity to the defect, and the ability to conceal the scar in the nasolabial fold make it a valuable reconstructive option.

Achieving optimal functional and aesthetic outcomes requires both careful patient selection and precise technical execution to ensure appropriate flap conformation. Following a series of 16 cases of folded nasolabial flap for full-thickness nasal ala reconstruction, we have developed a reproducible and effective surgical approach.

PATIENT SELECTION AND METHOD

Over a two-year period (January 2023 to December 2024), we selected appropriate candidates based on the following criteria:

- Full-thickness nostril defect
- Thick nasal skin

Citation: H. Sqalli Houssaini, D. Jaadi, Z. Badaoui, O. Liban, A. Khaled, A. Achboub, K. Ababou (2025). The Turnover Nasolabial Flap for Full-Thickness Alar Reconstruction: A Single-Stage Technique for Optimal Cosmetic and Functional Results. *SAR J Surg*, 6(3), 53-56.

- Cheek skin laxity (typically patients over 40 years)
- Thin-skinned patients who decline multi-stage procedures

Sixteen patients underwent reconstruction with a nasolabial flap following oncologic excision with clear margins. All cases involved basal cell carcinoma (BCC), confirmed histopathologically [2]. The average patient age was 59 years, and 87.5% of the patients were male. The mean follow-up period was 12 months.

SURGICAL TECHNIQUE

Anatomical Basis

The flap's vascular supply is derived from perforators of the facial artery inferiorly and the angular artery superiorly. On average, five perforators arise from the facial artery between the mandibular border and the nostril [3]. These do not require direct visualization or skeletonization during dissection.

Markings

The flap can measure up to 10 cm in length and 2–3 cm in width, adhering to a 5:1 length-to-width ratio. The plicated design allows for reconstruction of all three layers, with interposition of a cartilage graft. Reconstruction follows the subunit principle described by Burget and Menick [4], often using the contralateral ala as a template.

Flap length is tailored to the tissue loss, incorporating additional 2 to 3mm length for mucosal

reconstruction and subalar fold coverage, allowing a tension-free inset a pinch test determines suitable flap width. A 2 cm base width ensures adequate subdermal vascular capture.

The medial incision traces the nasolabial fold, extending below the labial commissure if needed, and superiorly along the defect's lateral margin toward the medial canthus. The lateral incision mirrors this trajectory without breaching the palpebral unit.

Flap Harvesting

Following markings, the flap is harvested from distal to proximal using a No. 15 blade within the subcutaneous fat. Dissection remains superficial to the SMAS layer, preserving subdermal plexus and ensuring appropriate flap thickness. As the dissection proceeds proximally, the flap harvest may be completed in a deeper plane. Additional defatting of the flap is usually performed over the entire surface of the flap for better aesthetic result and to prevent postoperative lymphedema.

Flap Tailoring

A Burrow's triangle is excised laterally in the submuscular plane to prevent dog-ear formation.

To prevent alar collapse from scar contracture, conchal cartilage is harvested via a posterior approach to conceal the retroauricular scar. The graft is contoured and sutured using 5-0 Prolene, with internal knot placement. It is positioned in a marginal—not anatomical—location to prevent collapse.



Fig. 1a: Conchal cartilage harvesting and graft suturing in a marginal position



Fig. 1b: Nasal conformer and sutures

After adequate trimming, the flap is then folded over the cartilage to recreate the nostril margin and external ala. The distal flap is anchored with absorbable

sutures to the mucosa, and the proximal part to the external skin with 5-0 Prolene.

A nasal conformer is secured to the septum and maintained for four weeks to ensure airway patency.

Donor Site Closure

Tension-free closure of the donor site is essential to avoid facial distortion. Adjacent cheek undermining may be required. Closure involves deep dermal sutures with slow-resorbing monofilament and skin sutures with 5-0 or 6-0 nylon or Prolene. Proper planning allows the scar to merge with the nasolabial crease.

Postoperative Care and Complications

Postoperative care included dressings, systemic prophylactic antibiotics, and a 3-day course of oral corticosteroids. Stitches were removed on day 7, and the nasal conformer remained for four weeks.

No infections were reported. Two cases of venous congestion were managed with scarification and topical heparin. One patient reported mild inspiratory alar collapse which combined with septal deviation caused nasal obstruction; secondary cartilage grafting and septoplasty are planned. One female patient underwent secondary flap thinning under local anesthesia at six months.



**Fig. 2a: Patient 1 markings
Tumor excision with margins,
flap limits and Burrow triangle**



Fig. 2b and 2c: Patient 1 at 12 months follow-up



**Fig. 3a: Patient 2 markings.
Tumor excision with margins,
flap limits and Burrow triangle**

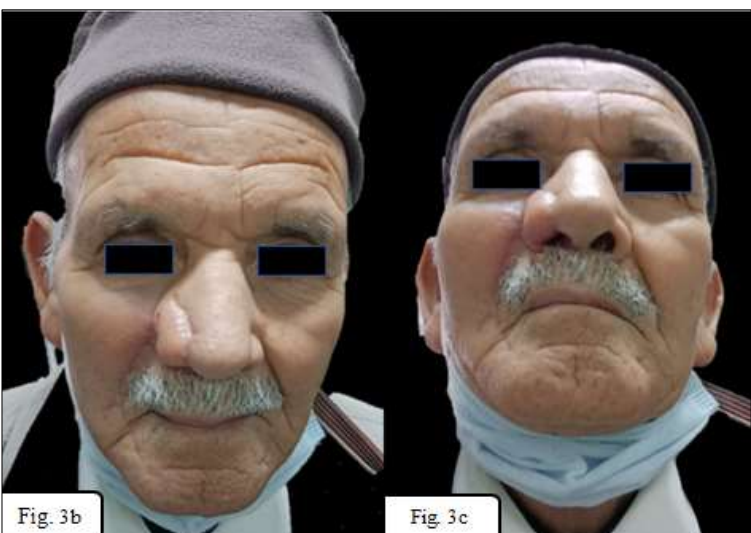


Fig. 3b and 3c: Patient 2 at 12 months follow-up

DISCUSSION

The nasolabial flap is a well-established technique for facial reconstruction, particularly well-suited for the alar region due to its color and texture match. Its primary advantage lies in scar concealment within the nasolabial fold [5]. Rich subdermal vascularity allows for excellent shaping and adaptation. It is ideal for elderly patients or those unfit for multistage procedures. When combined with cartilage grafting, the flap is best suited for patients with thick nasal skin and is less appropriate for those with thin skin.

A key drawback is reconstruction of two nasal subunits, obliterating the supra-alar sulcus. Some authors suggest not to resect the Burrow triangle of the lateral sidewall of the nose, but to undermine it and place it over a de-epidermized nasolabial flap, to recreate a supra-alar fold or instead to use a nasolabial island flap [6]. We prefer placing capiton sutures at the supra-alar sulcus to recreate the crease. Resection of the triangle is still essential to prevent bulkiness.

CONCLUSION

The nasolabial turnover flap allows outpatient, single-stage nasal ala reconstruction, optimizing cost-efficiency and minimizing patient burden. With proper candidate selection and meticulous surgical technique, it achieves excellent functional and aesthetic outcomes, with minimal need for revision. This flap is time-efficient, yields high patient satisfaction, and provides a discreet final scar—making it a valuable reconstructive option.

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