

# A Novel Technique for Nasal Alar Reconstruction

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**Summary:** Reconstruction of full-thickness alar defects is delicate. Small asymmetries are visible because of the central position of the nose. Different alar reconstruction techniques such as the nasolabial, bilobed, and composite grafts provide an excellent option to reconstruct alar skin and texture. However, these donor tissues will never perfectly match alar tissue in terms of color and contour. This report presents a case of a 56-year-old woman with alar asymmetry due to soft tissue loss of the right alar rim, para-nasal, and nasolabial groove as consequence of a severe trauma in the past. Scarring tissue, retractions, and suboptimal tissue quality on the right side of the face complicated a standard procedure. In this case, a novel reconstruction technique was planned for alar reconstruction. In a two-staged procedure, a well-perfused alar base flap from the contralateral side was raised to recreate the basal portion of the right lateral alar rim. Concomitantly a lip lifting procedure was performed to correct the inadequate incisal show. As result, perfectly matching skin color, texture, and correction toward alar and facial symmetry were realized. Satisfactory aesthetic outcome for the patient was achieved. The final result was evaluated 12 months postoperatively by the use of stereophotogrammetry technology. (*Plast Reconstr Surg Glob Open* 2022;10:e4284; doi: [10.1097/GOX.0000000000004284](https://doi.org/10.1097/GOX.0000000000004284); Published online 22 April 2022.)

**N**asal alar subunit defects are technically challenging to reconstruct due to variable skin texture, contour, and colour. Surgical reconstruction requires a delicate balance between reshaping the nasal curvatures and predicting scar contracture.<sup>1</sup>

Regarding the nasal ala, the external skin, fibrofatty middle portion, and the internal nasal lining can be seen as three anatomically distinct layers.<sup>2</sup>

Relating to surgical reconstruction of soft tissue alar rim defects, numerous techniques have been described in the literature.<sup>2,3</sup> Intervention varies from primary closure and use of skin grafts, to composite grafts and various local flaps.<sup>2,3</sup> Thickness and size of the defect, the patient's risk factors and tolerance, as well as the surgeon's preference are factors to be considered when choosing an appropriate surgical approach. None of these techniques are currently considered as the golden standard.

However, the main difficulty in ala reconstruction remains providing matching donor tissue. Available techniques, and especially the nasolabial flap and auricular composite graft, provide good aesthetic and functional results.<sup>2,4,5</sup> These tissues get close, but will never have the exact same skin texture, colour, and thickness as alar tissue itself.

In this report, a new method for ala reconstruction using alar tissue from the contralateral side is presented.

## Case Report

A 56-year-old woman presented in our clinic requesting nasal ala reconstruction after sustaining traumatic injuries. At the time of the initial trauma several years ago, fractures of the maxillary sinus, left orbital rim, lateral orbital wall, nose septum, nasal bone, and arcus zygomaticus were diagnosed. Concurrently, there was significant soft tissue loss of the right ala, para-nasal, and nasolabial groove.

The maxillofacial fractures were reconstructed by open reduction and internal fixation. The soft tissue defects were primary closed after debridement of necrotic tissue.

At the primary assessment for alar reconstruction, a substantial amount of scar tissue, responsible for retractions, was noticed on her right midface and alar base. Furthermore, a significant asymmetry in size and shape of the nostril was present. The left ala flared too laterally, whereas the right ala was absent due to tissue loss. Also,

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the alar-facial groove was less noticeable. Additionally, a longer than average philtrum length and lack of incisal show was seen in this case.

In this case, taking into account the asymmetry, tissue loss, retractions and scarring tissue on the ipsilateral side of the trauma, the wider left nostril, and limited incisal show, a standard reconstruction was not recommended. Apart from alar reconstruction, a lip-lift was indicated to strive for more incisal show. Reconstruction was performed using an alar base flap from the contralateral side.

### Operative Planning and Surgical Procedure

The alar reconstruction and lip-lift was staged and performed under general anesthesia (orotracheal intubation). The patient was placed in supine position. The facial skin was disinfected using HAC 1% and ethanol 70%. The patient was draped in standard manner.

To create symmetric nostrils using available tissue, the length of the nostril rim was first measured on the affected side a-b-c (Fig. 1). This was then transferred to the nonaffected side a'-b'-c'.

The remaining length of the nostril rim c'-d' was then divided by two. The caudal half (shaded area) of the remaining alar rim dictated the size of the flap. Surgical incisions were marked based on these measurements.

For the surgical procedure, firstly, a full-thickness alar base flap in continuation with lip-lift flap on the left side was raised. The flap base was inferior to the columella. On the right side the scarred ala was released for accepting the contralateral alar base flap. The flap was sutured into the acceptor site with Vicryl 6/0 intranasally (Fig. 2). The skin was closed with Prolene 6/0.

In the second stage, 10 days later, the base of the flap was incised and the lip-lift was performed. The wound was closed in two layers: the subcutaneous tissues were sutured by resorbable monofilament suture (Monocryl 5/0) and the skin was closed using Prolene 6/0 (Fig. 3).

### Clinical Assessment

To assess symmetry, three fixed reference points were chosen: alar right [Al(r)], alar left [Al(l)], and nasal tip (Ntp). Preoperatively, the straight-line distance from



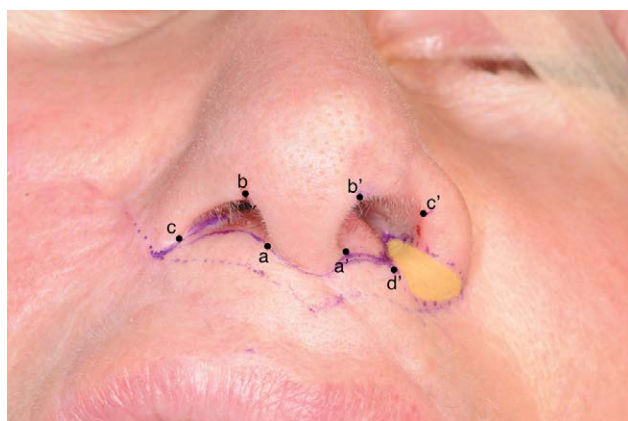
**Fig. 2.** Alar base flap suturing into the acceptor site using Vicryl 6/0.

landmark Ntp to Al(r) and Ntp to Al(l) was 27.2 mm and 29.5 mm, respectively. (See figure 1, Supplemental Digital Content 1, which demonstrates a 3D Vectra image of the patient at the time of primary assessment (left) and 12 months postoperatively (right). The landmarks marked are the nose tip (1), alar right (2) and alar left (3). <http://links.lww.com/PRSGO/C25>.)

### Postoperative Results

Postoperatively, no complications were seen. The flap survived and no necrosis was noticed at donor and recipient sites. At follow-up, 12 months after surgery, 3D images were taken using stereophotogrammetry technology (3D Vectra Canfield). Satisfying alar symmetry and perfect colour match were achieved compared with initial assessment. Furthermore, the alar-facial groove was more extended. Nasal tip to Al(r) distance increased from 27.2 to 28.5 mm, confirming expansion of alar width on the right side, and thus correction toward nasal symmetry and harmony (Supplemental Digital Content 1, <http://links.lww.com/PRSGO/C25>).

At 12 months of follow-up, the anteroposterior view (Fig. 4) and worm's eye view showed good results. (See figure 2, Supplemental Digital Content 2, which shows a worm's eye view at 12 months of follow-up. <http://links.lww.com/PRSGO/C26>.)



**Fig. 1.** Operative planning and marking of the incisions and flap design.



**Fig. 3.** Closure of the wound in two layers: subcutaneous tissues are sutured using Monocryl 5/0. The skin is closed using Prolene 6/0.



**Fig. 4.** Anteroposterior view at 12 months of follow-up.

## DISCUSSION

In nasal reconstruction, the subunit principle is important. This principle, as described by Burget and Menick in 1985, is based on replacing the entire nasal subunit rather than patching the defect whenever a large part of the subunit is missing.<sup>6,7</sup> This approach intends flap borders to mimic the normal shadowed valleys and lighted ridges of the nasal surface and provides superior results.<sup>6,7</sup> Although this principle is essential, good results can be achieved as well by performing reconstruction of the defect itself in smaller tissue defects.<sup>6,7</sup> The choice for reconstruction should be made based on each individual case.

The best possible reconstruction option for partial nasal ala defects might be a nasolabial flap.<sup>1,8,9</sup> Anterior and posterior alar defects can be successfully reconstructed using defect-only nasolabial flaps. However, liberal cartilage grafting is needed to provide support for these flaps and prevent alar collapse from scar contracture. This technique is often a two-staged procedure. Their matching properties of skin tone, texture, and convexity of the nose make this technique widely used.<sup>9</sup> However, intact tissue and sufficient cheek laxity is required.

Composite chondrocutaneous grafts are solid for full-thickness defects up to 1.5 cm when structural support is missing.<sup>1</sup> Typical donor sites are the helical root and rim.<sup>10,11</sup> These grafts mimic the natural arch of the nasal ala. In addition, the conchal skin is a good colour match to the alar region. However, chondral grafts retract over time and require a new surgical incision. Grafts greater than 1.5 cm have failure rates of greater than 50%.<sup>12</sup>

Regardless of which reconstruction technique is used, the donor flap/graft will never provide identical features as tissue from the alar itself.

In this case, soft tissue loss of the right ala, para-nasal and nasolabial groove with subsequent scar tissue retraction was present. Also, the upper lip was too long, and consequently, there was inadequate incisal show—a phenomenon often seen in aged individuals. The multiple aspects in this case led us to think out of the box and present this novel technique for ala reconstruction, using an alar flap from the contralateral side. Reconstruction of the

defect was performed without replacing the alar subunit. Arguments for this approach were the limited soft tissue loss of the right ala as well as optimal skin texture, color, and contour available from the contralateral alar flap.

This novel technique can be used as an alternative for alar reconstruction within strict indications and when structural support is present. Alar flaps can be excellent for the reconstruction of limited soft lateral alar rim defects due to the ideal matching colour and texture. This technique can particularly be useful when scarring in the cheek and nasolabial region of the affected side is present, and in elderly patients in whom a lip-lift is to be considered for cosmetic reasons.

In the case presented with posttraumatic absence of lateral ala, the reconstructive goal was to create nostril and alar symmetry with concomitant lip lifting using contralateral lateral ala. To our knowledge, this is a novel technique in the reconstruction of the lateral alar rim, where a structural support of the rim is not necessary. A one year follow-up showed satisfactory results.

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## PATIENT CONSENT

*The patient provided written consent for the use of her images.*

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