

Cheek Reconstruction with a Nasolabial External-Rotation Flap

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Summary: It remains difficult to reconstruct large preauricular defects in a single step with good cosmetic outcomes. We describe here the nasolabial external-rotation (NER) flap, which was combined with a cervical-rotation flap to reconstruct a large skin defect on the preauricular area that included the malar prominence. The patient in case 1 was a 91-year-old man who had a large defect on his right cheek after excision of a squamous cell carcinoma. Three weeks after excision, the 6.5 × 5.5 cm defect was covered with a 5 × 3 cm NER flap, which had a cephalad base and was rotated so its caudal tip covered the malar prominence. The resulting nasolabial defect and the remaining defect occupied the entire buccomandibular area, which was then covered with a 13 × 10 cm cervical-rotation flap. Revision surgery has not been needed for 8.5 months and the cosmetic outcomes are good. The patient in case 2 was a 90-year-old man who had a large defect on his right cheek after excision of a squamous cell carcinoma. Four weeks after excision, the 4.7 × 4 cm defect was covered with an 8 × 3 cm NER flap. The buccomandibular defect was covered with a 9.5 × 5 cm cervical-rotation flap. The flaps survived completely. The NER flap is unique because the flap is moved from the midface to the lateral face. It can reconstruct the malar prominence with thick skin tissue, and it is particularly suitable for older patients. Combining it with a cervical-rotation flap allows for natural subunit reconstruction in a relatively minimally invasive manner with good aesthetic outcomes. (*Plast Reconstr Surg Glob Open* 2024; 12:e5527; doi: 10.1097/GOX.0000000000005527; Published online 19 January 2024.)

It is difficult to reconstruct extensive preauricular skin defects in one step with local flaps. We report two cases of large preauricular defects that were reconstructed with a flap termed the nasolabial external-rotation (NER) flap: this flap covered the top of the defect, including the malar prominence. A cervical-rotation flap was then used to cover both the nasolabial defect left by NER flap elevation and the remaining preauricular defect.

CASE REPORT

In case 1, the 91-year-old male patient underwent excision of squamous cell carcinoma on his right cheek. The 7 × 7 cm preauricular defect included the malar prominence

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and was covered temporarily with artificial dermis. Three weeks later, reconstruction was performed under general anesthesia. The defect was then 6.5 × 5.5 cm. Two flaps were designed. One was a 5 × 3-cm NER flap, which had a cephalad base and was designed over a facial artery. The second was a 13 × 10 cm cervical-rotation flap (Fig. 1). The NER flap was elevated from the distal side with subcutaneous fat, and the facial artery was preserved. The flap was rotated externally so that the malar prominence could be covered easily. The skin at the base of the NER flap was then incised to island the flap. The nasolabial-fold donor site and remaining skin defect occupied the entire buccomandibular area and were covered with the cervical-rotation flap (Fig. 2).

After surgery, the flap was disinfected daily and a vaseline-based ointment was applied. A small necrosis developed in the cervical-rotation flap that epithelialized with continuous ointment application (Fig. 3). At 8.5 postoperative months, revision surgery has not been required, and the cosmetic outcomes are good (Fig. 4).

In case 2, the patient was a 90-year-old man who had a large defect on his right cheek after excision of a squamous cell carcinoma. Four weeks after excision, the 4.7 × 4-cm defect was covered with an 8 × 3 cm NER flap. The buccomandibular defect was covered with a 9.5 × 5 cm cervical-rotation flap. The flaps survived completely.

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Fig. 1. A 91-year-old male patient (case 1) had a 6.5×5.5 -cm wound on his right cheek after resection of a tumor. The defect was reconstructed with a 5×3 cm NER flap and a 13×10 cm cervical-rotation flap.

DISCUSSION

Cosmetic reconstruction of the face must consider the aesthetic facial units, which were first reported by Gonzalez et al.¹ Later, the cheek aesthetic unit was subdivided into three overlapping aesthetic cheek zones, namely the suborbital, preauricular, and buccomandibular zones. Heller et al recently described how to choose the optimal reconstruction method for each zone. In particular, they suggested that the preauricular area can be reconstructed with regional flaps such as the anteriorly-based cervicofacial flap, the deltopectoral flap, and the pectoralis-major flap.² However, the deltopectoral and pectoralis-major flaps are relatively invasive, although the cervicofacial flap is less so. Ebrahimi et al noted that when the cheek-skin defect is less than 6 cm and there is no risk of tumor recurrence, local flaps provide superior cosmetic outcomes compared with skin grafting. However, they also observed that there are few local flaps for reconstructing cheek defects of more than 6 cm and suggested that such cases will need a regional, distant, or free flap.³ Very recently, however, Shah et al reported using an infraorbital cheek flap that extended into the neck for a 7.0×5.5 -cm defect around the malar prominence: this can be considered a suborbital-reconstruction approach.⁴ Moreover, Tian et al achieved good results when using tissue expanders to reconstruct the cervicoperiauricular area after burn

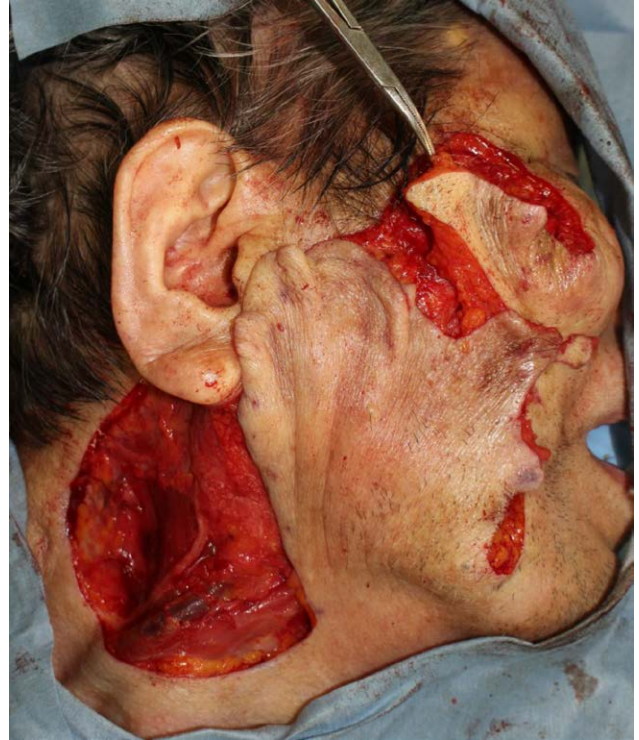


Fig. 2. Perioperative photograph showing the rotation of the NER and cervical-rotation flaps in case 1.

injury.⁵ However, this approach requires two procedures, and the patient's social life is significantly restricted while the tissue expander is in place.

These considerations led us to combine the NER flap with a cervical-rotation flap to reconstruct an extensive defect that covered the entire preauricular area, including the malar prominence. The NER flap is unique in that it moves from the center of the face to the outer cheek, thereby covering the malar prominence with thick skin. Moreover, because elevating the NER flap augmented the original defect and caused it to encompass the entire buccomandibular area, it was possible to then conduct natural subunit reconstruction with the cervical-rotation flap. Moreover, because the NER flap has a cephalad base at the side of nose, it is likely to resist postoperative drooping.

The nasolabial flaps that have been reported are usually pedicled by the facial artery. Notably, Turan et al used the reverse approach with a nasolabial flap: this reverse superior labial-artery flap was fed by a retrograde blood flow on the superior labial artery.⁶ A study of 16 cadavers has observed that on average \pm SD, there are 4 ± 2 facial-artery perforator branches, their length is 14.12 ± 3.46 mm, and their diameter is 0.94 ± 0.29 mm.⁷ Thus, the facial artery is a reliable source of suitable perforators, and its inclusion in a nasolabial flap will likely increase its reliability. This is supported by another study of 20 fresh cadavers, which found that there are seven main reliable perforator types that are fed by the facial-artery perforators.⁸ However, there is a dissenting view: Agarwal et al suggested that subcutaneous



Fig. 3. Photograph taken 8 days after surgery in case 1. Mild necrosis can be observed in the upper part of the cervical-rotation flap. It resolved with continuous vaseline-based ointment application.

nasolabial flaps are fed by the subdermal plexus and thus have a random blood supply: this is supported by the fact that they ligated the facial artery in 31 of 38 patients, yet there was only one case of total flap necrosis and three cases of partial flap necrosis.⁹ In our case, the NER flap was designed over the facial artery and was pedicled by subcutaneous tissue. It is not clear whether it contained the facial-artery perforator or whether it was fed by the subdermal plexus.

It should also be noted that while the malar-fat pad overlaps the orbicularis oculi in younger people, it descends with age to the lateral side of the nasolabial fold.¹⁰ Given that, the NER flaps in our cases derive from an outer nasolabial fold that had already drooped with age and are then moved to the zygomatic prominence. However, this attribute means that the NER flap should be used with caution in younger patients.

CONCLUSIONS

The NER flap is characterized by its movement from the midface to the lateral face. When combined with a cervical-rotation flap, it can reconstruct defects of the entire preauricular area in older patients in just one relatively minimally invasive procedure with good aesthetic outcomes.



Fig. 4. Photograph taken 8.5 months after surgery in case 1.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

PATIENT CONSENT

The patient provided written consent for the use of his image.

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