

# Prelaminated Temporoparietal Osteofascial Flap: A Novel Nasal Reconstruction Technique

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**Summary:** Nasal reconstruction can be a difficult task to perform. It is a challenge when the defect to be reconstructed is extensive and involves the entire thickness of the nose. The difficulty is further increased when a recurrent tumor is removed, where other flaps were previously used to reconstruct the initial defect. A therapeutic option is microsurgical reconstruction; however, sometimes this cannot be performed. Furthermore, free flaps such as the anterolateral thigh or the antebraichialis radial tend to be very thick for the integuments of the face. Therefore, it is important to think of another reconstructive option to solve this problem. We present a case of nasal reconstruction with a prelaminated temporoparietal osteofascial flap, after full-thickness excision for recurrent carcinoma. (*Plast Reconstr Surg Glob Open* 2021;9:e3977; doi: [10.1097/GOX.0000000000003977](https://doi.org/10.1097/GOX.0000000000003977); Published online 7 December 2021.)

The superficial temporal fascia flap is widely used in facial reconstruction.<sup>1</sup> Its vascularization depends on the superficial temporal artery whose collateral branch participates in the irrigation of the other tissues of the temporoparietal region, including the bone plane. The osteofascial variant of this flap is used for composite orbitomaxillary reconstructions, as they require restoration of skeletal support and a fine tissue lining.<sup>2</sup> When the loss of substance approaches the midline and reaches the nasal region, flaps from other donor areas are usually used, mainly from the forehead, whose skin characteristics are very similar to those of the nose. However, sometimes the forehead does not have all its vascular pedicles, due to previous scars, while local flaps have limitations to reconstruct very large defects. The superficial temporal fascia flap also reaches the nasal region, including the midline, depending on the anatomy of the patient, it may or may not require an autonomization time. We describe a case of nasal reconstruction with a temporoparietal osteofascial flap in a patient with recurrent carcinoma, who had already had nasal reconstructions on the same side in the past.

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## CLINICAL CASE

The patient is a 58-year-old man with Gorlin-Goltz syndrome, or nevoid basal cell carcinoma syndrome, who underwent surgery 2 years ago for a sclerodermiform basal cell carcinoma on the left nasal ala and tip of the nose, and underwent reconstruction with a local flap and a right paramedian forehead flap. He presented with a recurrence of tumor, the excision of which affects the left half of the nose throughout its thickness, extending to the nasal septum, the upper left lip, the cheek, and the anterior wall of the maxillary sinus on the same side (Fig. 1). After the pathological examination confirmed complete excision of the tumor, the reconstruction was done in three surgical stages. (See Video 1 [online], which shows the reconstruction of a complex nose defect with a prelaminated temporoparietal osteofascial flap, associated with a paramedian forehead flap.) The patient complied with the institutional rules and signed an informed consent.

## OPERATIVE TECHNIQUE

In the first stage, we designed a temporoparietal fascia flap, incising its anterior and posterior edges but without dissecting it in depth. At its distal end, we prelaminated the superficial face of the superficial temporal fascia with split-thickness skin grafts and sutured this donor site. Twelve days later, we again accessed the temporoparietal zone and dissected an osteofascial flap whose limits were the same as the prelaminated temporoparietal flap designed in the first surgical stage (Fig. 2). This osteofascial flap included

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**Fig. 1.** A 58-year-old patient with a recurrent nasal carcinoma on the left side, affecting various anatomical subunits of the nose and adjacent regions. The image shows a large nasal defect and neighboring areas after oncological excision.

a parietal bone fragment, the parietal periosteum, the deep temporal fascia, the innominate fascia, and the pre-laminated superficial temporal fascia. The flap was rotated 180 degrees and was tunneled into the cheek in the subcutaneous plane, mobilizing it until it reached the nasal region. The parietal bone, which reconstructs the left nasal bone, was fixed with a miniplate to the right nasal bone (Fig. 3). The remaining nasal defect was covered with the temporal aponeuroses that were sutured in the midline of the nose; the superficial temporal fascia was previously pre-laminated to reconstruct the nasal mucosa. The anterior wall of the maxillary sinus was also reconstructed with the temporoparietal fascia. In the nasal region, we superficially covered the osteofascial flap with a left paramedian forehead flap. We sutured the donor sites with a suction drain in the temporoparietal region. During this time, the left nasal ala support was restored with a cartilaginous graft from the concha of the ear, while the loss of substance from the upper lip was reconstructed with a full-thickness supraclavicular skin graft. Division of the pedicle of the forehead flap was performed 3 weeks later to allow sufficient neovascularization. In the postoperative period, a nasal endoscopy and a tomography were performed, which showed viable and stable tissues 6 months after reconstruction (Fig. 4). At the parietal donor site, we had a small seroma that resolved without problems.

### Takeaways

**Question:** How to do a nasal reconstruction due to an extensive defect in a patient with recurrent carcinoma, and who already had several reconstructions in the past?

**Findings:** The pre-laminated temporoparietal osteofascial flap, combined with the paramedian forehead flap, allows for full thickness reconstruction of the nose.

**Meaning:** Some patients with recurrent carcinomas of the nose require extensive excision and full-thickness nasal reconstruction. If reconstructive technical resources are limited due to the use of other flaps in the past, the reconstruction can be performed with a pre-laminated temporoparietal osteofascial flap.

### DISCUSSION

Nasal reconstruction can be a challenge, especially when a defect that involves several anatomical subunits must be restored, when it is full-thickness, and in the case of tumor recurrence where other flaps such as the paramedian forehead flap have already been used.<sup>3</sup> The restoration of the tissues of the nasal half, extended to the cheek, requires a skeletal support that provides stability to the functional and aesthetic result. For this reason, we decided to use an osteofascial flap. Flap prefabrication and prelamination are two different concepts.<sup>4</sup> In this case, the objective of the graft of the superficial face of the superficial temporal fascia was to restore the nasal



**Fig. 2.** Pre-laminated temporoparietal osteofascial flap. The split-thickness skin graft is observed in the distal area of the flap, which corresponds to the superficial face of the temporoparietal fascia. When the flap turns over into the defect, the skin graft will replace the nasal mucosa.



**Fig. 3.** The pre-laminated temporoparietal osteofascial flap is turned over and tunneled into the cheek, until it reaches the nasal defect. The deep face of the flap, where the parietal bone is, becomes superficial, whereas the superficial face of the flap, where the skin graft is, becomes deep. The parietal bone is fixed to the right nasal bone with a miniplate. The flap will be covered with a paramedian forehead flap.



**Fig. 4.** Postoperative result. Nasal reconstruction with a pre-laminated temporoparietal osteofascial flap and a paramedian forehead flap.

mucosa, so with this pre-laminated flap we were able to reconstruct the deep plane of the nose. The superficial temporal osteofascial flap has been described and used in different reconstructions of the face,<sup>5-7</sup> but we have not found reports on nasal reconstruction. We dissected a flap that included the superficial and deep temporal fascia, the periosteum, and the parietal bone, since the same superficial temporal artery participates in the vascularization of all these tissues. We included the deep tissues of the superficial temporal fascia to ensure vascular supply to the parietal bone. This flap allowed the restoration of the nasal median plane. We respected the temporofrontal branch so as not to compromise the vascularization of the forehead, since we had to use the left supratrochlear artery in the dissection of the forehead flap. The left paramedian forehead flap restored the superficial nasal plane. The passage of the temporal fascia in the cheek reconstructed the anterior wall of the maxillary sinus.

The complex wounds left by oncological excision, as in this case, require the art and imagination of the plastic surgeon. There are other reconstructive techniques, such as the converse flap,<sup>8</sup> but surgical excision left a defect that required restoration of a well-vascularized nasal bone. Nasal reconstructions with microsurgical techniques have also been described,<sup>9-11</sup> but these often cannot be used or are very thick.

Our reconstructive proposal provided a result that remains stable over time, structurally and functionally. It will probably require a revision to improve the cosmetic result.

## CONCLUSIONS

The indications for the temporoparietal osteofascial flap could be extended to nasal reconstruction. The previous preparation of the flap with skin graft, or pre-laminated flap, together with the dissection of a paramedian forehead flap, allowed for the restoration of the losses of substances from the full thickness of the nose.

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## PATIENT CONSENT

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

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