



# Venous Graft for Full-thickness Palpebral Reconstruction

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**Summary:** Full-thickness palpebral reconstruction is a challenge for most surgeons. The complex structures composing the eyelid must be reconstructed with care both for functional and cosmetic reasons. It is possible to find in literature different methods to reconstruct either the anterior or posterior lamella, based on graft or flaps. Most patients involved in this kind of surgery are elderly. It is important to use easy and fast procedures to minimize the length of the operation and its complications. In our department, we used to reconstruct the anterior lamella by means of a Tenzel or a Mustardé flap, whereas for the posterior lamella, we previously utilized a chondromucosal graft, harvested from nasal septum. Thus, these procedures required general anesthesia and long operatory time. We started using a vein graft for the posterior lamella. In this article, we present a series of 9 patients who underwent complex palpebral reconstruction for oncological reasons. In 5 patients (group A), we reconstructed the tarsoconjunctival layer by a chondromucosal graft, whereas in 4 patients (group B), we used a propulsive vein graft. The follow-up was from 10 to 20 months. The patient satisfaction was high, and we had no relapse in the series. In group A, we had more complications, including ectropion and septal perforations, whereas in group B, the operation was faster and we noted minor complications. In conclusion, the use of a propulsive vein to reconstruct the tarsoconjunctival layer was a reliable, safe, and fast procedure that can be considered in complex palpebral reconstructions. (*Plast Reconstr Surg Glob Open* 2015;3:e344; doi:10.1097/GOX.0000000000000300; Published online 30 March 2015.)

**A** defect of the eyelids and/or canthal regions can have various causes: congenital, traumatic, or oncologic resection. Eyelid tumor exci-

sion and traumas are the main common causes of eyelid defects in our department.

Palpebral reconstruction can be complex and difficult. Eyelids are composite structures, formed by an anterior and a posterior lamella, with the anterior lamella being the skin and orbicularis and the posterior lamella being the tarsus and conjunctiva. In full-thickness reconstruction, both structures must be repaired, if possible with matching tissues with respect to composition, size, color, and pliability, leaving minimal donor-site morbidity and inconspicuous scars. Different methods to repair the structures composing eyelids have been proposed; these methods are well described in many reviews.<sup>1,2</sup>

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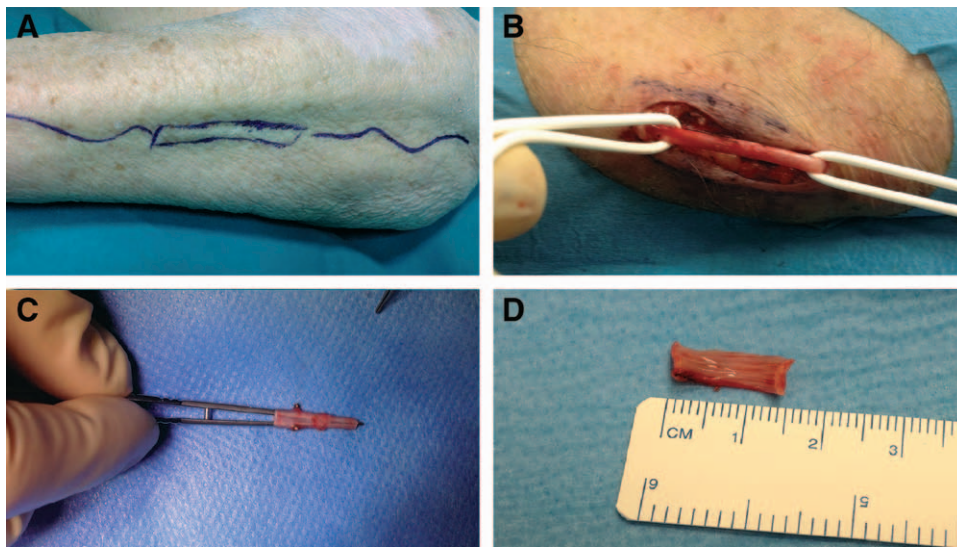
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**Fig. 1.** The 4-part image displays the patient at the following stage: vein identification (A), vein isolation and harvest (B), vein specimen preparation (C), and opened vein (D), the adventitial layer has not been removed.

We used to reconstruct the anterior lamella with a rotational cheek flap (according to Mustardé<sup>3</sup>) or with a Tenzel flap.<sup>4</sup> The posterior lamella was reconstructed mainly with a septal chondromucosal graft, as described by Mustardé<sup>3</sup> in 1972. The major problem with this kind of procedure is that it requires general anesthesia that is risky for older patients. Barbera et al<sup>5</sup> proposed in 2008 to use a propulsive vein graft to reconstruct the tarsoconjunctival layer. The vein has in fact many analogies with the posterior lamellae, including the smoothness of the conjunctiva and the resistance of the tarsus.

### AIM OF THE STUDY

The aim of this study was to compare the 2 techniques of posterior lamellae reconstruction: the well-known septal chondromucosal graft versus the propulsive vein graft.

### MATERIAL AND METHODS

This was a retrospective blind study, in which we included all patients admitted to our department for complex palpebral reconstruction after oncological surgery in the last 2 years. We included 5 male and 4 female patients aged 62–89 years with a follow-up

between 10 and 20 months. We realized a blind evaluation of results, based on clinical examination to detect palpebral function and aesthetic, patient satisfaction, and complications. The tumor dimension was always bigger than 1/3 of the eyelid, involving all palpebral structures and requiring complex reconstruction of the eyelid.

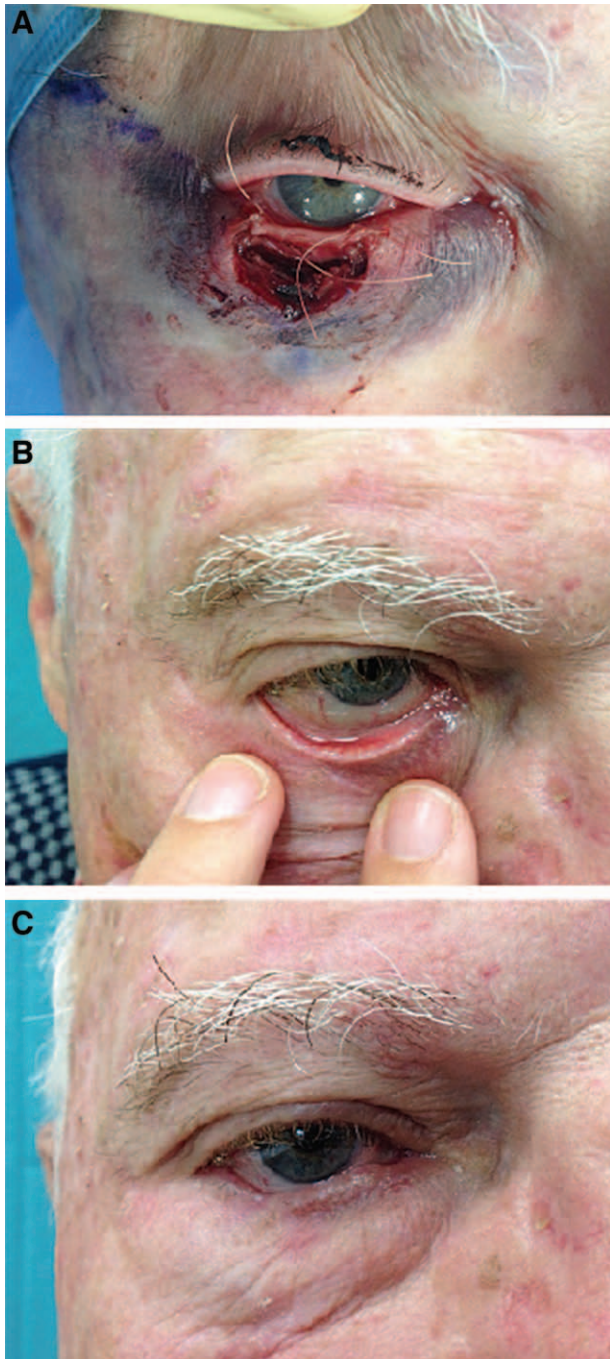
We reconstructed the anterior lamella by means of a Mustardé ( $n = 7$ ) or Tenzel ( $n = 2$ ) flap. The posterior lamella was reconstructed by a chondromucosal graft (group A, 5 patients) or by a propulsive vein (group B, 4 patients).

Patients were examined before surgery and signed a consent form. They were operated on under general anesthesia or local anesthesia plus sedation and received preoperative antibiotic therapy (ceftriaxone 2g), an infraorbital nerve block with ropivacaine and mepivacaine (7.5%) 2 mL, and protective contact lenses to avoid corneal abrasion or damage.

Tumor resection was performed with wide margins (3mm for basocellular carcinoma, 5 mm for spinocellular carcinoma) and with intraoperative biopsy specimens.

- In group A, under general anesthesia, the septal chondromucosal graft was harvested from nasal septum, after infiltration with a solution of mepivacaine and epinephrine 1:100,000. A Killian's incision was performed to elevate the nasal perichondrium of the contralateral side to protect the nasal mucosa. After that, on the chosen side (usually the right side), with the aid of an ophthalmic knife 30 degree (Alcon, Novartis Group, Basel, Switzerland), the chondromucosal

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**Fig. 2.** The 3-part image displays the patient at the following stages: vein positioning (A), vein integration (8 months) (B), and postoperative view (8 months) (C).

graft was harvested and then thinned and positioned with the mucosa as conjunctival layer. In our opinion, it was important to achieve a slight excess of mucosa on the sides so that it was easier to suture the graft. The graft was fixed with a Vicryl 6/0 (Ethicon, Johnson&Johnson Group, Diegem, Belgium) to the tarsus and with a Vicryl

7/0 to the conjunctiva. The nose was medicated with anterior nasal tampon and Aueromycine ointment (Clorhetracyclina clorhydrate; Lederle Laboratoires, Pfizer, New York, N.Y.)

- In group B, under local anesthesia plus sedation ( $n = 3$ ) or general anesthesia ( $n = 1$ ), we selected a propulsive vein (saphenous, cephalic, or basilic). The vein should be without branches, as straight as possible. It is important to avoid varix, first of all because they are difficult to harvest and because the intimal layer is often disrupted with multiple irregularities and the wall is stiff. The chosen vein is drawn on the skin with a marker and then harvested under local anesthesia and tourniquet ischemia. The vein was then prepared under magnification, and the adventitial layer was removed and the vein was divided in a longitudinal sense and fixed with a Vicryl 6/0 to the tarsus and with a Vicryl 7/0 to the conjunctiva. The endothelium was used to reconstruct the conjunctival margin. The limb was then treated with a compressive dressing for 30 days, and the patient received antithrombotic postoperative therapy (light molecular weight eparine) (Figs. 1 and 2).

The flap was then rotated and the anterior lamella reconstructed. Special care was dedicated to fix the flap with some nonresorbable transparent 5/0 stitches to the zygomatic periosteum to avoid ectropion due to the weight of the flap. A drain was positioned under the flap and removed after a few days. The postoperative therapy included the following: antibiotic therapy until drain removal, corticosteroid (Metilprednisolone 125 mg  $\times$  3 times each day for 2–3 days; Pfizer, New York, N.Y.), steri-strips on surgical incisions, anterior nasal tampon, silicon nasal conformer until septal healing, and topical treatment (protective gel by night, Dacriogel; Alcon, Novartis Group, Basel, Switzerland). We did not perform eye occlusion because we think that it can hide a retrobulbar hematoma. The hospitalization days were different among patients, based on the nature of procedures and on the patient's characteristics (age, associated pathologies, etc.). The patient was then controlled at 10 days, 1 month, 3 months, 6 months, 1 year, and 18 months or more frequently for the follow-up of SCC (every 3 months the first 2 years).

### RESULTS

In this series, we found 6 BCC and 3 SCC. All tumors were removed with safe margins, and we had no relapse to date, with the follow-up between 10 and 20 months. All patients were very satisfied, except one who developed recurrent ectropion (group A).

Patients belonging to group A (chondromucosal graft) had longer hospitalization and longer operations, and all the patients had to be operated

**Table 1. List of Advantages and Side Effects in the 2 Groups**

	Chondromucosal Graft	Vein
Hospitalization	6 days	3.75 days
Mean operatory time	3 hours	2 hours and 30 minutes
General anesthesia	5	1
Local anesthesia	0	1
Local anesthesia + sedation	0	2
Complication		
Caruncula exposition	0	1
Notch	2	1
Granulomas		1
Ectropion	3	0
Septal perforation	2	0

under general anesthesia. In contrast, patients in group B (vein graft) underwent shorter operatory time, stayed a shorter time in the hospital, and were operated under local anesthesia or local anesthesia plus sedation (Table 1). Patients in group B also had fewer complications both on donor site and on the reconstructed eyelid; the complications included caruncula exposition, granulomas, and an irregularity of the margin of the reconstructed eyelid (notch). In group A, complications were more frequent; we noted 3 ectropion (one of which was recurrent), 2 septal perforations, and in 2 patients an irregularity of the reconstructed eyelid margin (Table 1).

Finally, most patients developed a scleral show.

## DISCUSSION

Palpebral reconstruction can be a real query. Different reconstructive techniques have been proposed over the last decades, of which none is perfect. The mean age of the population has increased so that it is common to have patients who are often very old and in which skin cancer is not infrequent. These patients are usually weak and compromised; thus, many of the new surgical techniques, such as free flaps, are not suitable for these patients.<sup>6,7</sup>

The use of a chondromucosal graft as described by Mustardé<sup>3</sup> has produced in our series some complications, both on donor site (septal perforations) and on receiving site. In particular, we frequently noted ectropions. That can be due to the weight of the chondromucosal graft because the flap is always fixed to the periosteum to reduce the tension, and in group B, we never had any ectropion.

Some palpebral rim irregularities are common in both groups: a slight notch at the level of the point of contact between the tarsus and the graft is frequent.

Most patients developed a scleral show. We cannot describe it as a complication (rather a consequence of palpebral reconstruction) because

eyelid function remains intact, without redness, swelling, or other disorder to the conjunctiva. Nevertheless, the aesthetic of the palpebral region is slightly compromised.

In this series, we noted that the most difficult point to reconstruct is the canthal area. Patients in whom the canthal area was involved had poorer results. Reinsertion of the lateral and medial canthal structure is best achieved with the use of a bone anchor. In group A, 1 patient had recurrent ectropion (3 times), which we treated 2 times with suspension and fixation of the orbital periosteum and finally we solved with bone fixation though a Mini Mitek anchor (DePuy Mitek, Switzerland).

The last point to discuss is how a vein can substitute the posterior lamella (conjunctiva and tarsus). The structure of a vein has some histological similarity with the posterior lamella. The endothelium is smooth, and it can mime the conjunctival layer. It can conform the globe because of its properties of smoothness, pliability, and elasticity. It is thin, so its weight does not impair palpebral static function. Elastic and collagen fibers give the vein properties of resistance. A medium propulsive vein is also as thin as needed (2–4 mm) and, once cut and opened, can easily reconstruct the entire palpebral lack of substance, being more conformable than the chondromucosal graft. The venous wall is slightly different from the tarsoconjunctival layer because of the presence of the adventitial layer. We do not believe that it is important to preserve the adventitial layer as Barbera et al,<sup>5</sup> and we always performed the adventitiectomy. This implies a better management of the graft without any impairment on healing and integration of the graft itself.

## CONCLUSION

In conclusion, the use of the vein graft is a good technique to consider in palpebral reconstruction. It is safe, fast, and easily reproducible, as other procedures can lead to complications. Further studies could better describe its limits.

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