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CASE REPORT
Reconstructive

Large Eyelid Defect Repair Using a Free Full-Thickness Eyelid Graft

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Summary: Large eyelid full-thickness defects are traditionally repaired using flaps with a blood-supplying pedicle, for the reconstruction of the anterior or posterior lamella or both. This is a 2-stage procedure involving occlusion of vision in the affected eye for 4–8 weeks, as the flap pedicle is not divided until vascularization is deemed adequate. However, the importance of using a flap with a pedicle to ensure adequate perfusion of the graft has recently been questioned. *(Plast Reconstr Surg Glob Open 2017;5:e1413; doi: 10.1097/GOX.0000000000001413; Published online 26 July 2017.)*

This case involves a 60-year-old man who required extensive excision of the left upper eyelid (50% of the width) due to squamous cell carcinoma in situ. The upper eyelid defect was reconstructed using a free full-thickness eyelid graft (a mucocutaneous–tarsoconjunctival graft without a pedicle) from the lower eyelid. There were no complications and the graft healed well. The functional and cosmetic results were excellent, and the patient was satisfied with the results.

This case report provides evidence that a single-stage grafting procedure with a free full-thickness eyelid graft may be a possible option for remediating large eyelid defects.

PATIENT AND METHODS

A 60-year-old male patient had a 1-year history of irritation in the left eye. Examination revealed suspected cancerous changes in the tarsal conjunctiva of the upper eyelid. An excision biopsy showed squamous cell carcinoma in situ. The tumor was excised and the defect was reconstructed using a local Tenzel flap.

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Received for publication May 2, 2016; accepted May 25, 2017.
Supported by the Swedish Government Grant for Clinical Research (ALF), the Swedish Research Council (VR), the Skåne University Hospital (SUS) Research Grants, Crown Princess Margaret's Foundation (KMA), the Foundation for the Visually Impaired in the County of Malmöhus, the Ingrid Nordmarks Foundation, the Diabetes Society of South-west Skåne, and the Swedish Eye Foundation.

DOI: 10.1097/GOX.0000000000001413

Histology of the excision verified squamous cell carcinoma; however, the margins of the excision contained carcinoma cells and the patient therefore needed to undergo an extended resection. The patient agreed to undergo a novel surgical procedure involving a full-thickness eyelid autograft without the traditional use of a pedicle to the graft to avoid the occlusion of vision associated with a Cutler Beard 2-stage procedure. He also expressed the desire to minimize the number of surgical interventions, and with the proposed approach, there is no need for a second operation to cut the pedicle. The patient was an otherwise healthy, nonsmoking man with no cardiovascular disease, or other indications that wound healing may be impaired.

Surgery was carried out with local infiltration anesthetics using lidocaine and epinephrine (Xylocaine Dental Adrenalin, 20 mg/ml lidocaine, and 12.5 μg/ml epinephrine, AstraZeneca, Cambridge, UK) and Tetracaine eye drops (Tetracaine, Bausch & Lomb, Rochester, N.Y.). Extended resection of the tumor involved full-thickness excision of the upper lid, measuring 12 mm in width and 10 mm in height. A full-thickness free graft (a mucocutaneous–tarsoconjunctival graft without a pedicle) was excised from the center of the lower lid, corresponding to approximately one-third of the width of the lower lid. The lower lid was then closed using a Tenzel flap. The harvested free graft was smaller than the resected area, and the upper limb of the lateral canthal tendon was therefore cut to reduce the tension on the graft. The full-thickness graft was sutured in 2 layers using 5/0 resorbable sutures (Vicryl, Ethicon, Somerville, N.J.) in the deeper layer and 6/0 nonabsorbable nylon sutures (Ethilon, Ethicon) in the skin. Chloramphenicol ointment (Chloromycetin 1%, Pfizer, New York, N.Y.) was applied 4 times daily for the next 3 weeks, followed by moisturizing eye drops until the graft had healed.

Disclosure: *The authors have no financial interest to declare in relation to the content of this article. The Article Processing Charge was paid for by the authors.*

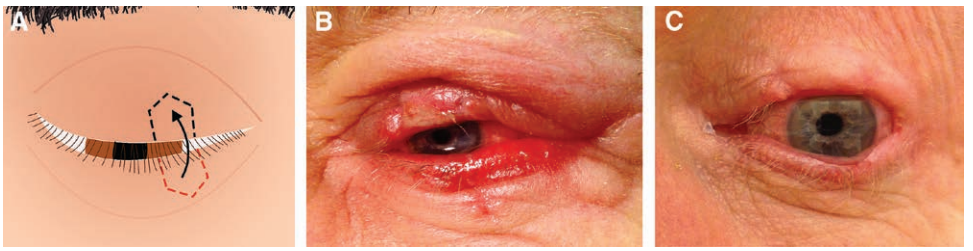

Fig. 1. A, Schematic illustration of how a free full-thickness eyelid graft was excised on the lower eyelid and inserted on the upper eyelid. Postoperative view 1 (B) and 7 months (C) after surgery showing excellent functional and cosmetic results.

RESULTS

The patient suffered no bleeding or infection. There was some swelling and bluish discoloration of the transplant, which resolved within 3 weeks.

No ocular-specific complications such as epiphora, ectropion, trichiasis, lid malposition, or exposure keratopathy were observed. Histological examination confirmed the absence of squamous cell carcinoma in situ, from all margins in the sections examined. The functional and cosmetic results were excellent 7 months after surgery.

DISCUSSION

The eyelid can be divided into the anterior and posterior lamellae. The basic principle of full-thickness eyelid reconstruction is to combine a vascularized flap for 1 lamella with a free graft for the other lamella, to preserve the blood supply to the reconstructed tissues. Defects involving up to 25% of the lid width can be closed primarily, whereas larger defects up to 50% can be repaired with a Tenzel semicircular flap. Defects larger than 50% are better repaired with an orbicularis myocutaneous advancement flap, the Cutler Beard, modified Hughes procedure, or regional flaps, where the reconstruction flap for either the anterior or posterior lamella is vascularized.

The large flaps usually created in the modified Hughes tarsoconjunctival procedure or the Cutler-Beard flap have the disadvantage of occluding vision in the affected eye for 4–8 weeks, and they must be divided in the second stage of the surgical procedure. This is especially disabling for patients with sight in only the involved eye, or in those of amblyogenic age.

In a recent study, we suggested that single-stage grafting of a free full-thickness eyelid flap may be possible.[1] This was based on the findings that flap survival was not compromised despite there being no blood perfusion or oxygenation of the tarsal end of a tarsoconjunctival flap.[1] There are case reports of good cosmetic and functional results despite the accidental loss of the blood-supplying pedicle of the flap in the early postoperative period.[2,3] Bartley and Messenger[3], 2002, reported premature flap dehiscence 1–11 days postoperatively, as a result of accidental trauma in 8 patients with tarsoconjunctival flaps following the modified Hughes procedure. Surgical repair of the dehiscence was unsuccessful, and the eyelids were allowed to heal spontaneously. Despite this, the ultimate functional and esthetic outcomes were surprisingly good.[3] Boboridis[2] speculated that a vascularized pedicle may not be necessary for tarsal flaps less than 13 mm in width. This suggestion was based on 4 patients who had undergone reconstructive surgery using a combination of a free mucosal graft for the posterior lamella and a free skin graft for the anterior lamella.[2] All grafts were viable and healed with no signs of ischemia. In a different study, Beyer and Bathrick[4] suggested a single-stage lower eyelid reconstruction procedure. The pedicle of the tarsoconjunctival flap does not seem to contribute to the nourishment of the tarsoconjunctival flap.[1] Nourishment may instead be supplied by the rich vascularization of the remaining eyelid and tear film.

The rather remarkable functional and cosmetic results of the present case, and previous reports, suggest that a single-stage procedure involving a free full-thickness eyelid graft may be possible in clinical practice. This would avoid the necessity of depriving the patient of sight in 1 eye for several weeks, as well as the need for a second surgical procedure, while saving time and resources in the clinic.

This surgical technique indeed warrants serious consideration as a valuable treatment option. The technique must then be applied to larger series of patients to confirm the safety of the approach.

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ACKNOWLEDGMENT

We thank Jenny Hult, MD, for graphics and design.

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