

The paranasal flap in reconstruction of the lower eyelid

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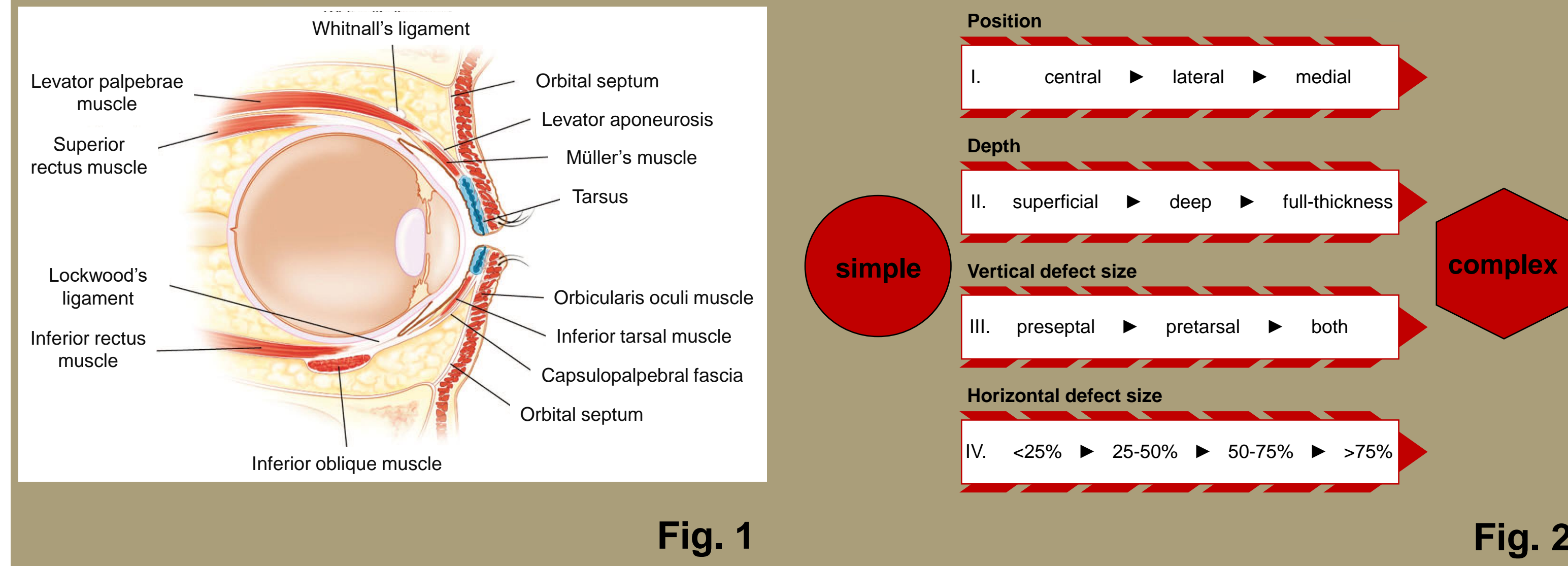
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Objectives

Structural and functional reconstruction of extensive and full-thickness defects of the lower eyelid is challenging and requires vascularized tissue with semirigid stability, a non-abrasive inner lining and matching outer lining to protect the eye and provide a natural and symmetric appearance (Fig. 1). The complexity of reconstruction increases based on the position, depth and size of the defect (Fig. 2).



The orbitonasal flap, published by Blasius in 1842, can be used to restore the outer lining of the lower eyelid in selected cases.¹ The potential and pit falls of this flap are illustrated in two clinical cases.

Methods

Reconstruction of extensive and full-thickness lower lid defects is both functionally and aesthetically challenging. The potential and limitations of the paranasal flap in lower lid reconstruction are illustrated in two cases.

Case 1:

A 93-year-old male patient with multiple comorbidities (metastatic prostate cancer, benign monoclonal IgM-gammopathy, diabetes, COLD) presented with a rapidly growing recurrency of a squamous cell carcinoma of the lower eyelid following primary treatment elsewhere. Radical tumor excision was carried out under fresh frozen section control (R0) and preservation of the posterior lamella. The defect affected the center of the lower eyelid with a vertical diameter of 2.5 cm (Fig. 3a).



Primary repair was performed with a Tenzel flap and lateral tarsal strip procedure (Fig. 3b). Final histology revealed extensive perineural sheath infiltration and indicated further excision that led to partial loss of the Tenzel flap. After histologically confirmed R0-resection, the defect involved the central, medial and lateral part (>75%) of the anterior and middle lamella of the lower eyelid with a vertical diameter of 3 cm and intact lacrimal system. In addition to scars from the previous operation, there were several marks on the patient's cheek from his student days. Secondary reconstruction was hampered by insufficient and scarred cheek skin not suitable for a Mustardé cheek rotation, limited size and blood supply for a Fricke's temporal forehead flap or a Tripiet flap and the need for two stages of a paramedian forehead flap. Therefore, a wide paranasal flap was chosen in this situation (Fig. 3c).



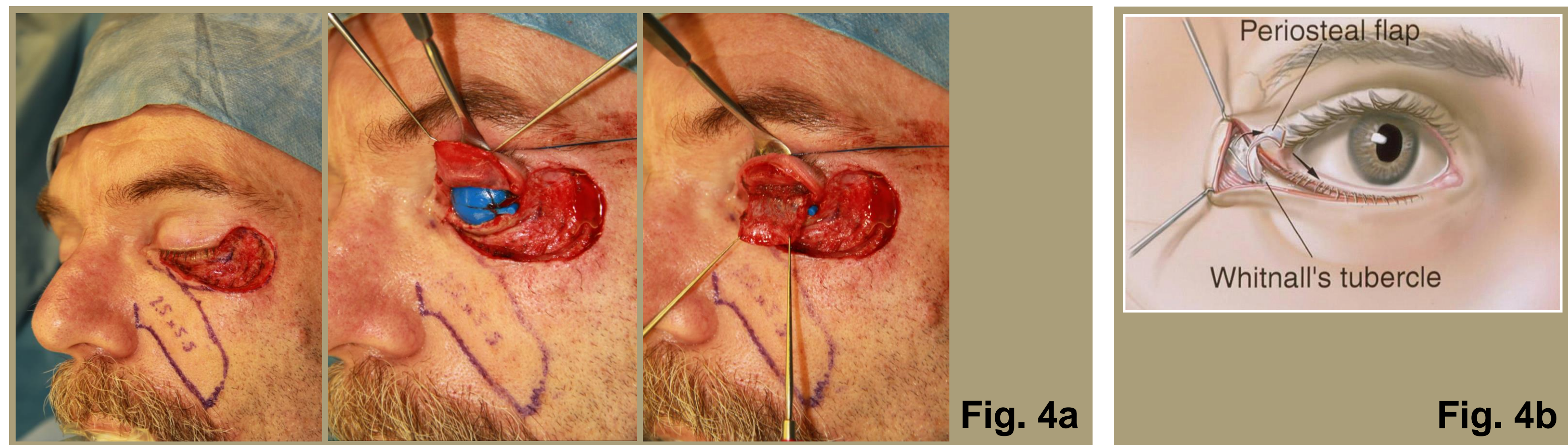
Early postoperative recovery was uneventful, but prolonged flap edema associated with a low pivot point, scar contracture and lack of muscular support after extensive resection of the pretarsal and preseptal orbicularis oculi muscle resulted in lower lid retraction and ectropium (Fig. 3d). Ectropium correction was achieved with a bipediced myocutaneous Tripiet flap with good functional and cosmetic outcome after 1 year (Fig. 3e).



Case 2:

A 59-year-old man was referred for radical resection of histologically confirmed in situ melanoma (lentigo maligna). The posterior lamella was spared during primary excision. However, histology revealed an invasive melanoma with extensive in situ component and incomplete removal (R1). Subsequent radical resection included the posterior lamella and resulted in a large full-thickness defect involving the central, medial and lateral part (>90%) of the lower eyelid and extending onto the cheek with a vertical diameter of 2.5 cm and intact lacrimal system. Histology confirmed complete resection (Clark Level II, Breslow 0.4 mm, LO, RO; pT1a).

There was insufficient temporal skin for a Tenzel flap and not even enough cheek skin for a Mustardé cheek rotation. The inner lamella was reconstructed with a tarsoconjunctival flap from the upper lid (Fig. 4a) and attached to the lateral orbit with a periosteal flap (Fig. 4b).



The outer lamella was restored with a wide paranasal flap with a high pivot point (Fig. 4c).



The tarsoconjunctival flap pedicle was divided after 4 weeks and the eye opened again (Fig. 4d), after which the lower eyelid was stable and correctly positioned with full lid closure and an excellent functional and aesthetic result at 1 year follow-up (Fig. 4e).



Results

Case 1: After secondary lower lid reconstruction with paranasal flap with a pivot point below the medial canthus, uneventful primary healing with full lid closure was followed by a protracted lymphedema that was not adequately controlled by conservative treatment and ultimately led to flap contracture and ectropion. The ectropion was treated successfully by a combination of a midface lift and a bipediced myocutaneous flap from the upper eyelid, achieving a good functional and cosmetic result after contralateral upper blepharoplasty.

Case 2: Postoperative healing was uneventful after the combination of a paranasal flap with high pivot point at the level of the medial canthus and a tarsoconjunctival flap. Correct lower eyelid position with full lid closure was achieved following pedicle division of the tarsoconjunctival flap and the functional and cosmetic outcome was judged to be very good.

Discussion

The paranasal or orbitonasal flap has been reported as a simple, safe and single-stage technique for lower lid reconstruction that is ideal in elderly patients.² Sasaki et al. published a free nasolabial composite flap with buccal mucosa as inner lining for full-thickness reconstruction of the lower eyelid.³ Similarly, a subcutaneously pedicled nasolabial flap combined with a tarsoconjunctival Hughes flap was used for full-thickness lower lid restoration by Tei.⁴ And Vyvada reported 10 lower lid reconstructions with paranasal flaps for the anterior lamella and chondromucosal, chondrocutaneous and mucosal grafts for the posterior lamella.⁵ The present report adds two cases of paranasal flaps for lower lid reconstruction used in different clinical scenarios to the current literature.

Conclusions

In patients with extensive skin malignancies of the lower eyelid, histologically controlled complete tumor removal is mandatory prior to any reconstruction. The paranasal flap is suitable for reconstruction of the outer lamella in partial and total lower lid defects because of thin flap skin with a width of 2.5-3 cm, depending on cheek skin laxity, save blood supply via the angular artery as well as easy flap harvest and transfer with primary closure of the donor site by cheek rotation. In full-thickness defects, the flap needs to be combined with appropriate techniques, such as a tarsoconjunctival upper lid flap, to provide the inner lining of the lower lid. A high pivot point of the flap is mandatory in this setting to avoid extensive flap rotation, facilitate flap inset and prevent flap edema, contracture and ectropion.

References
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