



Tarsal-Conjunctival Graft or Flap and Skin-Muscle Transposition Flap in Lower Eyelid Reconstruction

38

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Lateral and total lower eyelid defects can be nicely reconstructed in one stage. This is a useful tool for the oculoplastic surgeon to have in their armamentarium, particularly for monocular patients. Two techniques can be utilized to accomplish these closures. The first method uses a free tarsal-conjunctival graft for the posterior lamella and a skin-muscle transposition flap for the anterior lamella. Alternatively, a tarsal-conjunctival flap can be used for the posterior lamella with a full-thickness skin graft for the anterior lamella.

Anesthesia

These procedures can be performed in the office under straight local anesthesia, but most patients would be more comfortable with general or monitored anesthesia care in an operating room setting. The surrounding area of repair and the location from which the grafts and flaps will be harvested are infiltrated with a 1:1 mixture of 2% lidocaine with epinephrine and 0.75% bupivacaine. The use of long-acting local anesthesia with epinephrine aids in intraoperative hemostasis and postoperative pain control.

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Surgical Technique

Free Tarsal-Conjunctival Graft for Posterior Lamella with Skin-Muscle Transposition Flap for Anterior Lamella

Step 1

The tumor is excised using frozen section control or Mohs surgery. If a remnant of the lower eyelid remains laterally, it is sacrificed for reconstructive purposes.

Step 2

A skin-muscle flap is mobilized from the ipsilateral upper eyelid, leaving the flap based and widened at the lateral canthus (Fig. 38.1). The lower border of the flap corresponds to the upper eyelid crease. Some patients may request/require upper blepharoplasty on the other side for cosmetic or functional purposes. However, it is best to defer cosmetic and even functional surgery on the contralateral upper eyelid for several months. In rare situations where a cicatricial ectropion develops in the reconstructed lower eyelid, the skin from the contralateral upper eyelid can then be utilized as a full-thickness skin graft.

Step 3

A 4-0 silk suture is passed through the gray line of the upper eyelid, and the lid is everted over a Desmarres retractor. The ipsilateral or contralateral upper eyelid can be utilized for this free tarsal-conjunctival graft (Video 38.1). Contralateral is likely preferred in case the cancer recurs, and a Hughes flap would be needed later. A #15 blade is used to make an incision 4 mm above and parallel to the eyelid margin, through the conjunctiva and tarsus, along the entire length of the tarsus, until the pretarsal space is entered (Fig. 38.2). Westcott scissors are used to completely dissect the tarsus from the levator aponeurosis to the superior edge of the tarsal plate. Careful attention is taken to ensure that Müller's muscle is also dissected away from the tarsal-conjunctival graft in order to prevent postoperative retraction of the upper eyelid. The harvested graft is then placed in a saline sponge

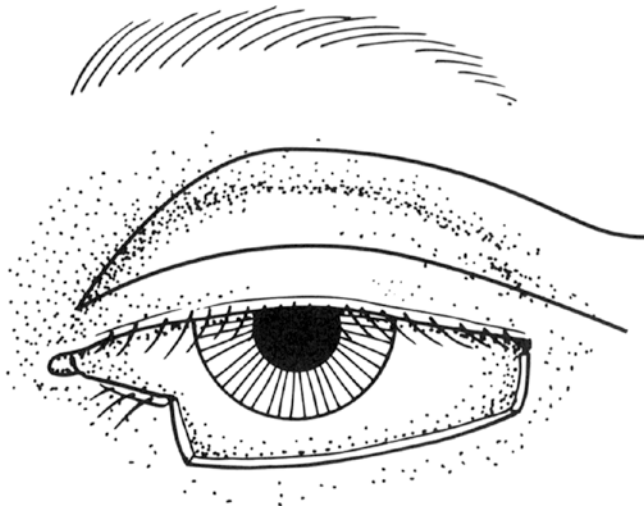


Fig. 38.1 Full-thickness lower eyelid defect. Solid line showing area of skin-muscle flap to be mobilized from ipsilateral upper eyelid

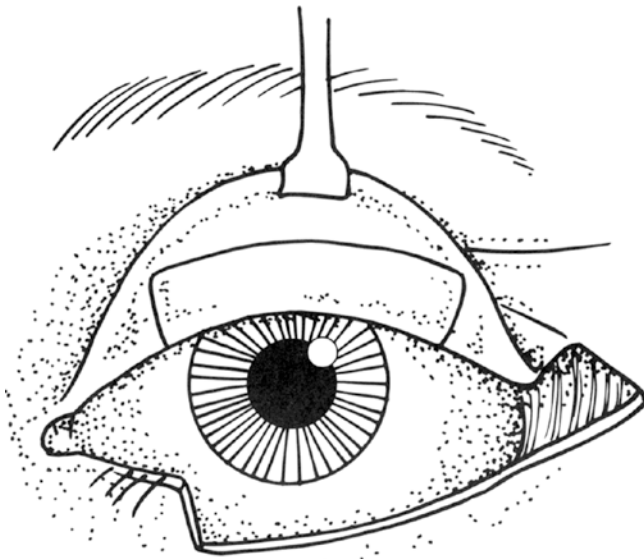


Fig. 38.2 Solid line showing free tarsal-conjunctival graft from posterior lamella of ipsilateral upper eyelid

until it is utilized. Hemostasis is achieved, and the bed from which the tarsal-conjunctival graft was harvested is allowed to heal by secondary intention.

Step 4

The tarsal-conjunctival graft is sewn into the lower eyelid defect under slight tension using a 5-0 Vicryl suture on a spatulated needle. Medially, the tarsal-conjunctival graft should be 1–2 mm higher than the remaining lower eyelid margin as the graft could contract postoperatively. Laterally, the graft is secured to the periosteum of the lateral orbital rim at the level of Whitnall's tubercle using a 5-0 Vicryl suture (Fig. 38.3a, b). The inferior edge of the graft is sewn to the remaining

conjunctiva of the lower eyelid with a running 5-0 Vicryl suture. If the width of the graft is insufficient to reach the lateral orbital rim, a periosteal flap can be lifted to help lengthen the width of the tarsal-conjunctival graft (Video 38.2). Using a caliper, determine how long the periosteal flap needs to be to bridge the gap and add 2 mm, just in case your measurements are slightly off. Dissect through the orbicularis muscle using a Freer periosteal elevator until the periosteum is visualized. A cotton-tip applicator can be used to help clear off the orbicularis muscle and expose the periosteum. Mark the area of the medially based periosteum flap with the length needed and a height of 6 mm. A #15 blade is used to incise the periosteum, while a Freer elevator is used to peel up the flap. The flap is then attached to the lateral aspect of the tarsal-conjunctival graft using interrupted 5-0 Vicryl suture on a spatulated needle. Make sure that there is appropriate tension such that the reconstructed lower eyelid hugs the globe.

Step 5

The skin-muscle flap that was mobilized from the ipsilateral upper eyelid is now rotated into the lower eyelid (Fig. 38.4a). If there is remaining skin between the lateral aspect of the lower eyelid surgical defect and the inferior wound of the skin-muscle flap, this should be excised. The skin-muscle flap is then trimmed medially such that the flap is under slight tension. Horizontal mattress sutures with 6-0 chromic sutures are used to recess the top of the skin-muscle flap from the top of the tarsal-conjunctival graft to prevent the keratinized epithelium of the skin from irritating the eye. The perimeter of the flap is sewn into place with a running 6-0 plain gut suture. The upper eyelid wound is closed with a running 6-0 plain gut suture (Fig. 38.4b).

Tarsal-Conjunctival Flap for Posterior Lamella with Full-Thickness Skin Graft for Anterior Lamella

Step 1

The tumor is excised using frozen section control or Mohs surgery. If a remnant of the lower eyelid remains laterally, it is sacrificed for reconstructive purposes.

Step 2

A 4-0 silk suture is passed through the gray line, and the eyelid is everted over a Desmarres retractor. A caliper is used to measure the width of the lower eyelid defect. A laterally based tarsal-conjunctival flap is delineated with a marking pen to ensure the width is adequate and that 4 mm of tarsus is left remaining in the upper eyelid. A #15 blade is used to make an incision through the marked conjunctiva and tarsus until the pretarsal space is entered. Westcott scissors are used to completely dissect the tarsus from the levator aponeurosis

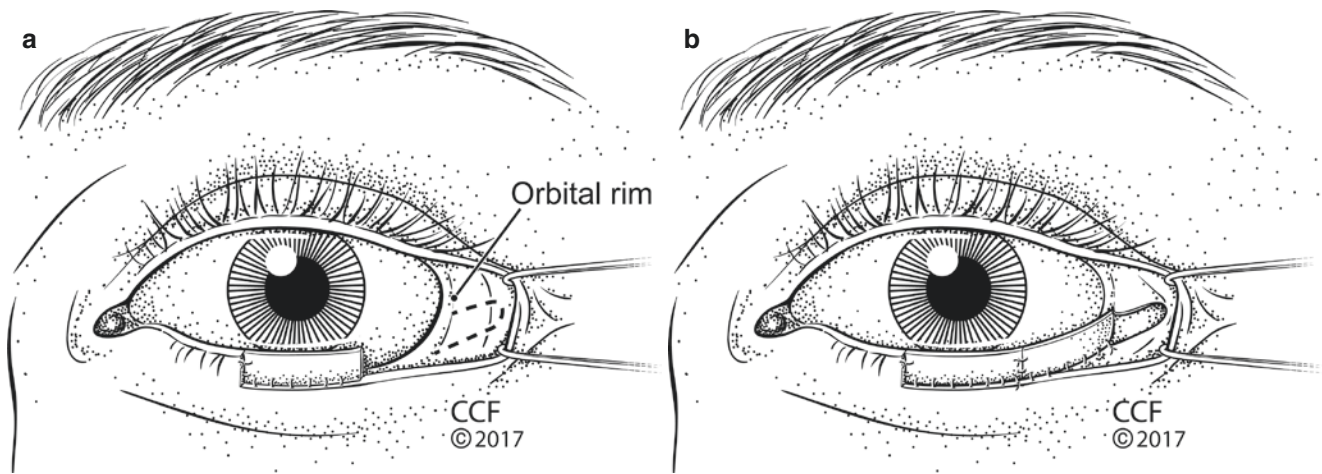


Fig. 38.3 (a) Free tarsal-conjunctival graft with dotted line showing area of periosteal graft to be harvested. (b) Free tarsal-conjunctival graft with reflected periosteal flap reconstructing the posterior lamella.

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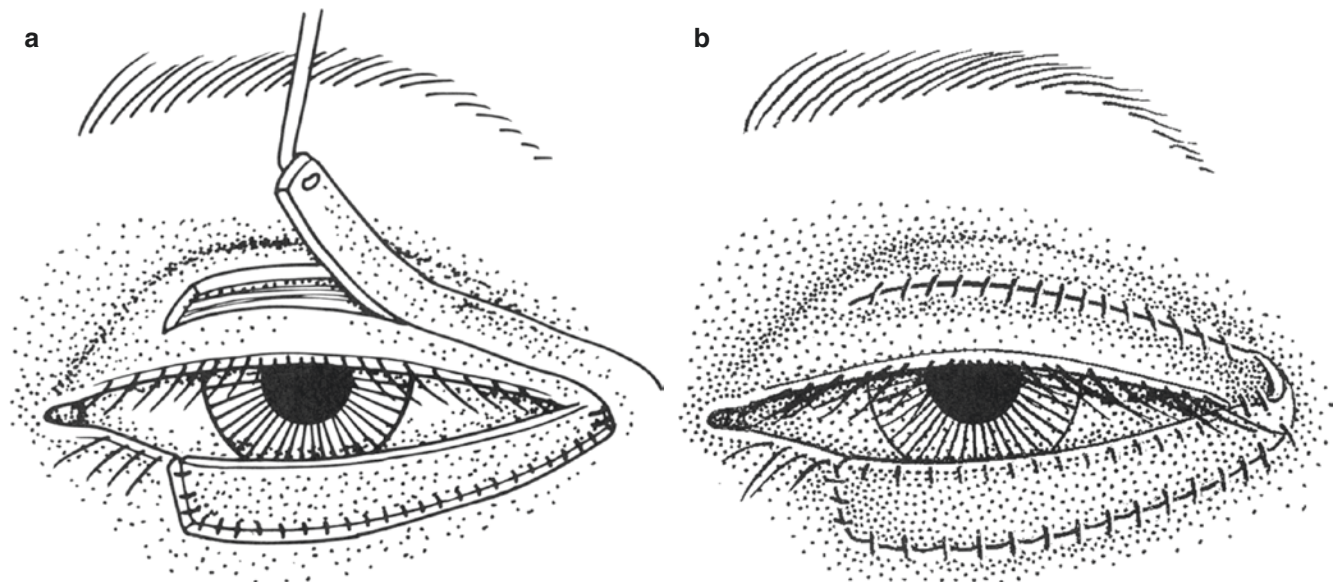


Fig. 38.4 Free tarsal-conjunctival graft for posterior lamella with skin-muscle transposition flap for anterior lamella. (a) The skin-muscle flap that was mobilized from the ipsilateral upper eyelid is rotated into

the lower eyelid. (b) The upper eyelid wound is closed with a running 6-0 plain gut suture

to the superior edge of the tarsal plate. Careful attention is taken to ensure that Müller's muscle is also dissected away from the tarsal-conjunctival graft to avoid postoperative-induced retraction of the upper eyelid. The lateral aspect of the flap is left intact (Fig. 38.5).

Step 3

The tarsal-conjunctival flap is then rotated into the lower eyelid defect such that the conjunctiva is posterior. The medial aspect of the flap is sewn 1–2 mm higher than the remaining eyelid with interrupted 5-0 Vicryl sutures. The lateral aspect of the flap is secured to the lateral orbital wall with interrupted 5-0 Vicryl suture. The inferior aspect of the

flap is sewn to the remaining conjunctiva of the lower eyelid with a running 5-0 Vicryl suture.

Step 4

In cases where patients have enough skin laxity in the lower eyelid, then a skin-muscle flap can be utilized to reconstruct the anterior lamella (Fig. 38.6). If there is any concern of anterior lamella deficiency in a flap, then a full-thickness skin graft is needed for the anterior lamella reconstruction. The best skin match for the lower eyelid is from the ipsilateral or contralateral upper eyelid. If these sites are not available, then other non-hair-bearing skin can be utilized. The harvested full-thickness skin graft is thinned using Westcott

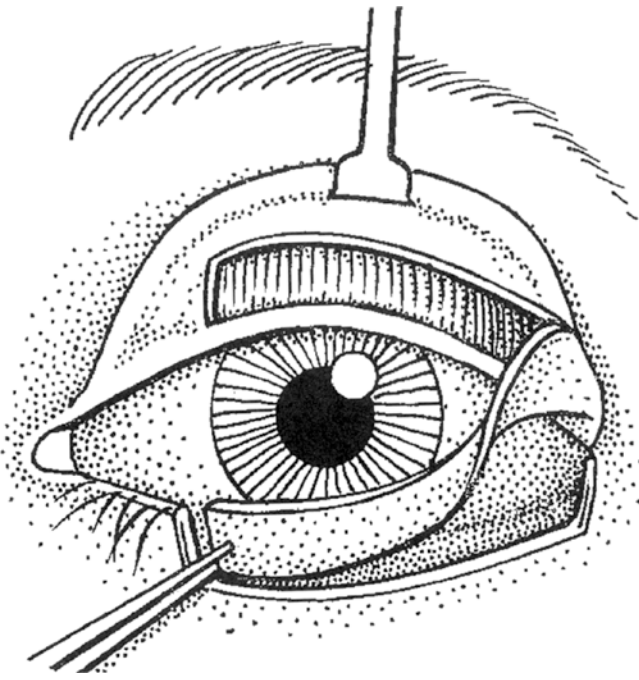


Fig. 38.5 Repair with tarsal-conjunctival flap from ipsilateral upper eyelid for posterior lamella and full-thickness skin graft for anterior lamella

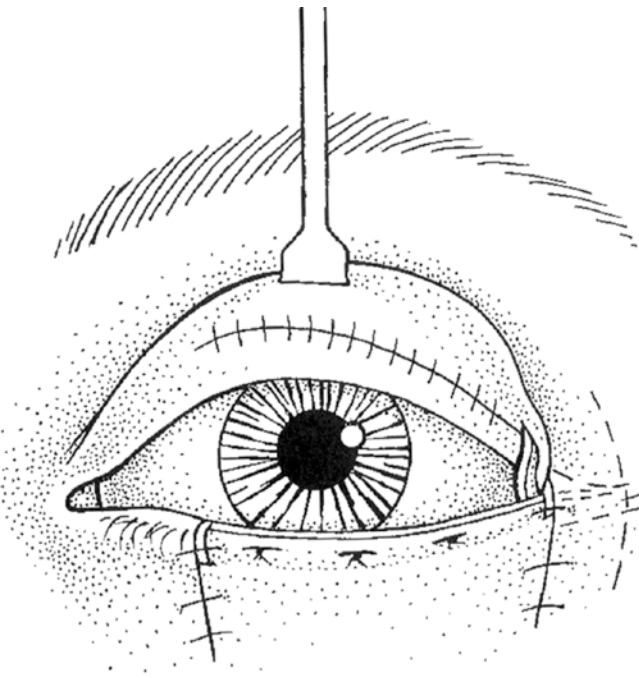


Fig. 38.6 Tarsal-conjunctival flap for posterior lamella with skin-muscle flap for anterior lamella

scissors and trimmed as needed. The graft is sewn to the tarsal-conjunctival graft. Horizontal mattress sutures with 6-0 chromic sutures are used to recess the top of the skin-muscle flap from the top of the tarsal-conjunctival flap

to prevent the keratinized epithelium of the skin from irritating the eye. The perimeter of the skin graft is sewn into place with a running 6-0 plain gut suture. A bolster is placed on the lower eyelid by first placing a piece of Telfa and then securing a dental roll to the area with a 4-0 Prolene suture. This bolster is left in place for 1 week. If tolerated by the patient, a temporary tarsorrhaphy can also be constructed with a 4-0 Prolene suture to immobilize the lower eyelid and place it on stretch. The tarsorrhaphy is opened at 1 week.

Complications and Their Management

In general these techniques for lower eyelid reconstruction are straightforward to execute and well tolerated by patients. The most common complication seen after lower eyelid reconstruction is ectropion. This is typically due to cicatricial changes from insufficient anterior lamella and is more likely to occur in cases where a skin-muscle flap is elevated from the lower eyelid or cheek as seen in Fig. 38.6. Cicatricial ectropion can be addressed with placement of a full-thickness skin graft to add height to the anterior lamella. Since upper eyelid skin is the best match for lower eyelid anterior lamella, all functional and cosmetic upper eyelid surgery should be delayed until the reconstructed lower eyelid is well healed.

Occasionally, ectropion can develop due to increased laxity of the reconstructed eyelid. This occurs when the tarsal-conjunctival graft is not sewn in place with the appropriate amount of tension. In these cases the width of the graft should be shortened, and the graft needs to be secured to the periosteum of the lateral orbital wall at the level of Whitnall's tubercle. This is analogous to the lateral tarsal strip procedure performed for a senile ectropion. In addition, elevation of a periosteal strip that overlaps the free tarsal graft may contribute additional support to the posterior lamella to prevent postoperative lower eyelid malposition.

When harvesting a tarsal-conjunctival graft from the upper eyelid, it is important to leave at least 4 mm of tarsus in the upper eyelid to maintain the structural integrity of the upper eyelid and avoid the potential of postoperative upper eyelid entropion. The upper eyelid is also at risk of developing retraction if the surgeon does not take precaution in dissecting Müller's muscle away from the tarsal-conjunctival graft.

In cases where the patient is amenable, placement of a temporary tarsorrhaphy with a frost suture and bolster can be valuable in proper healing of the reconstructed eyelid. This immobilizes the eyelid, helping with vascularization. The upward splinting of the eyelid also decreases the likelihood of lower eyelid retraction. The suture and bolster are left in place for 7 days postoperatively.

Although every surgery carries an inherent postoperative risk, executing proper surgical techniques can help minimize these complications.