

Repair of large full thickness lower lid defect following mass excision using Modified Hughes procedure

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Abstract

Objective: To highlight a case of lower lid repair using Hughes procedure.

Case Report: 70 year old male presented with painless, firm looking growth on left lower eyelid for 2 years. A pentagonal shaped lid excision done involving whole extent of the mass along with 2 mm of surrounding healthy looking tissue. Large posterior lamellar horizontal defect was repaired with a Hughes tarsoconjunctival flap prepared by undermining the tarsus and conjunctiva upto the levator aponeurosis in superior fornix and inferiorly leaving at least 4 mm of tarsus for lid stability. This bridge flap was advanced to the lower lid defect and sutured to the remnants of tarsus of lower lid to form posterior lamella. Anterior lamella was repaired with an appropriately sized full thickness skin graft taken from upper lid. A second stage surgery was done after 6 weeks to excise the bridge. With the help of a grooved director, which was slid underneath the flap anterior to the cornea, the flap was divided using a blade. Conjunctiva sutured to the lower eyelid margin.

Results: Post op showed excellent graft uptake. During follow up visits there were good lid movements, no exposure keratitis. There was no lid retraction or lagophthalmos.

Conclusion: This case highlights that management for a large lid defect using Hughes Procedure gives a successful outcome in terms of graft uptake and stability. Anterior lamella repaired from upper eyelid skin gives superior results as it is easily available and matches the host site in color and skin characteristics.

Case Report

A 70 year old gentleman presented with a painless progressive mass (Fig. 1) involving the central half of the lower lid for last 2 years. The mass was pigmented, irregularly raised from the surrounding tissue with trophic skin changes. It was associated with thickened lid margin, underlying conjunctival changes and loss of adjacent cilia. Due to hard consistency of the swelling FNAC was not possible. Clinically there was a strong suspicion of malignancy.



Fig. 1: Mass involving lower lid central half

The patient was taken up for full thickness excision biopsy. After making a pentagon shaped marking the excision was done including 2mm margin beyond the visible margins of the mass. The resultant full thickness defect involved approximately two thirds of the central lid area (Fig. 2) requiring repair of both the anterior and

posterior lamella. It was decided to repair the defect by modified Hughes procedure.



Fig. 2: Full thickness lid defect involving more than central half

Initial marking was made parallel to the ipsilateral upperlid margin corresponding to the horizontal lid defect on the everted tarso conjunctiva, 4 mm from the lid margin (Fig. 3). Incision was made on the conjunctiva through the tarsus thickness and a plane was created between tarsus and pre tarsal muscle (orbicularis oculi). Steel blade was preferred over cutting cautery as authors believe cautery causes contraction of tissue which might decrease the safety margin availability around the mass. The incision was extended to complete the horizontal extent to free the tarsus from the pretarsal tissue (Fig. 4). Releasing vertical incisions were made at both the ends till the

upper tarsal border to allow for movement of the flap. The plane of dissection was continued to the superior margin in between conjunctiva and muller's muscle to create a tarsoconjunctival flap hinged at the conjunctiva superiorly. A flap was thus fashioned which could be comfortably advanced to the lower lid without causing any significant tension on the upper lid. Minimal cautery was used to preserve blood supply to the flap. The tarsus of the flap was sutured to the remaining medial and lateral tarsus in the lower lid horizontally using polygalactin 6-0 suture. Conjunctiva inferiorly was sutured in a running fashion to the new lower border of flap to completely recreate the posterior lamella of lower lid.



Fig. 3: Marking on upperlid conjunctiva



Fig. 4: Hughes flap preparation

For anterior lamellar reconstruction, free full thickness skin graft was harvested from the ipsilateral upper eyelid after making the marking according to the size of the defect (Fig. 5). Full thickness skin graft is fashioned with the plane just below the skin so as to not to carry any orbicularis muscle fibers in the graft. The donor site was closed in a running fashion using polygalactin 6-0. The free graft was sutured using polygalactin 6-0. (Fig. 6)



Fig. 5: Skin markings for anterior lamellar graft



Fig. 6: Anterior lamellar reconstruction

Flap division was undertaken 6 weeks after the surgery under local anesthesia. A grooved dissector was slid beneath the flap to protect the globe. After insertion the pedicle flap was cut 0.5 mm above the area of skin inset to allow the mucocutaneous line to heal by secondary intention. (Fig. 7)

The reconstructed lid maintains normal lid function and aesthetic cosmesis 18 months post surgery (Fig. 8). The lid movements are normal with regular lid margin integrity. No complications like flap dehiscence, necrosis or donor site complications like lid retraction, ectropion, entropion or irregular contour occurred. Surgical success was accompanied with high patient satisfaction.



Fig. 7: Post-op after lower lid reconstruction



Fig. 8: After flap division

Discussion

Lid reconstruction requires considerable knowledge and skill to ensure that the newly recreated lid has maximum possible restoration of structural, functional and aesthetic integrity.⁽¹⁻³⁾ Amongst various techniques⁽⁴⁻⁶⁾ available for full thickness lower lid reconstruction, Hughes method or tarsoconjunctival advancement flap stands out as a favorable choice to impart normal anatomy and function to lid as it uses the principle of "like with like" i.e. replacing lid tissue with lid tissue.⁽⁷⁾ This method was introduced by Dr. Wendel L. Hughes, first presented in 1937.⁽⁸⁾ Hughes^(9,10) procedure is a two stage, eyelid sharing process for repair of full thickness lower eyelid defect involving at least 50% of the horizontal extent of lid margin. The first step involves creating a tarsoconjunctival flap from upper lid which is then advanced to the lower lid to recreate posterior lamella. The anterior lamella can be reconstructed using a free full thickness skin graft from ipsilateral or contralateral upper lid or a skin muscle advancement flap. After several weeks, the second step is performed which entails division of the pedicle at the level of the new lower lid margin. This period allows for the anterior and posterior lamellar grafts to get vascularized.

Several modifications⁽¹¹⁻¹²⁾ have been introduced including sparing of upper lid marginal tarsus to keep the donor lid stable after graft excision, levator muscle complex removal from the flap along with leaving Muller's muscle in place to reduce donor site complications such as upper lid entropion, retraction and trichiasis as it can give a more thick robust flap. Donor site complications have been more frequently seen with the classical Hughes method.⁽¹³⁻¹⁴⁾

In our case modified technique was used to enhance the surgical outcome. A plane of dissection was chosen so as to remove levator muscle complex and superior tarsal muscle (Muller's muscle) from the tarso conjunctival flap to prevent premature flap dehiscence and upper lid retraction. 4 mm of marginal tarsus was left to maintain the upper lid stability and prevent floppy eyelid or damage to eyelash roots. The blood supplying flap pedicle was left for a period of 6

weeks in situ to allow for new vessels to form within and around the newly reconstructed anterior and posterior lamellar grafts. Due to temporary eyelid closure this procedure is unsuitable for one eyed patient needing lid reconstruction in the seeing eye. The anterior lamellar recreation using a free full thickness skin graft from upper eyelid is a suitable option in terms of color and skin characteristics.

Tenzel semicircular flap, free tarsoconjunctival graft and Mustarde cheek rotation flap are other techniques which have been used for lower eyelid reconstruction.⁽⁴⁻⁶⁾ These techniques are associated with myriad of complications including donor site scarring, limits tissue availability. Premature flap dehiscence has been reported in 8% of cases.⁽¹⁵⁾ In this modified technique the functional and aesthetic outcome is superior with low rates of complications. It can be used to recreate large lower lid full thickness defects which span more than half of the lid extent. Authors believe that this technique is well suited for repair of such large defects involving horizontal lid margin, even upto 100% of the length. The resultant lid has satisfactory cosmesis with good anatomical and functional outcome.

Compliance with Ethical Standards

No funding was used in this project. There are no conflicts of interests. The procedure performed was in accordance with the ethical standards of the institution and with the 1964 Helsinki declaration and its later amendments. Informed written consent was taken from the patient and relatives. This article does not contain any study with animals performed by any of the authors.

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