

International Journal of Ophthalmology and Optometry



ISSN Print: 2664-8547
ISSN Online: 2664-8555
IJO 2024; 6(1): 40-42
www.opthajournal.com
Received: 12-04-2024
Accepted: 15-05-2024

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Single stage eyelid reconstruction in near total full thickness lower eyelid defect

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DOI: <https://doi.org/10.33545/26648547.2024.v6.i1a.32>

Abstract

Introduction: Reconstruction of the lower eyelid after surgical mass excision can be challenging due to its complex anatomical orientation. Flaps and grafts are used to fill the eyelid gap when direct closure is not possible. Near total full-thickness lower eyelid defects can be effectively sutured by replacing flaps for anterior lamella and grafts for posterior lamella. The present case emphasizes the importance of full-thickness near total lower eyelid reconstruction and its outcome of surgery.

Case Summary: This is a near-total full-thickness lower eyelid mass involving the medial half of the lid up to the medial canthus without sentinel lymphadenopathy. After a thorough history, clinical examination, and essential investigation, reconstructive surgery of the lower eyelid was done. The patient had good anatomical, functional, and aesthetic outcomes.

Conclusion: A combination of myocutaneous advancement flap and mucoperichondrial graft can achieve favorable anatomical, functional, and aesthetic outcomes in the wide excision of carcinoma of the lower eyelid. The surgical technique utilized in this case can be an alternative to lid-sharing procedures.

Purpose: To emphasize a single-stage reconstruction technique for near-total full-thickness lower eyelid defects using a lateral advancement flap combined with a mucoperichondrial graft.

Keywords: Mucoperichondrial graft, Single stage eyelid reconstruction, eyelid, functional

Introduction

The eyelid is an important facial aesthetic and functional unit. It lubricates the eye by secreting the meibum and helps in the distribution of tears. It keeps sebum out of the eye, prevents tear overflow, and stabilizes tear film^[1]. In facial plastic and reconstructive surgery, the eyelid is classified as a bilamellar complex structure. The skin, subcutaneous tissue, and the orbicularis muscle form anterior lamella. The Tarsconjunctival complex form posterior lamella^[2]. The precise alignment of each lamella at the eyelash line, grey line, and orifices of meibomian glands are the prerequisite for excellent functional and aesthetic outcomes^[3]. The skin lesions are very frequent over the eyelid because of exposure to ultraviolet light. Eyelid lesions constitute 5 to 10 percent of all skin malignancies^[4]. Patients with extensive lower eyelid lesions following excision of the mass, presented with difficulties in the reconstruction of anterior and posterior lamella to preserve the ocular surface, eyelid alignment, and function^[5]. There are several methods used for eyelid reconstruction, the surgical method of choice varies from case to case and depends on the patient's age, the nature and number of the lesion, the eyelid condition, and the size, position, and number of the defects^[6]. Small eyelid defects are closed directly without the use of any grafts or flaps^[7]. Skin flaps and grafts are used for medium to large-size defects or those that cannot closed directly, flaps and grafts are considered for eyelid reconstruction to restore the functional and aesthetic outcome^[8]. In eyelid reconstruction, the most accepted classification of flaps is based on dominant movement during surgery. The types of flaps used for anterior lamellar reconstruction are sliding flaps, advancement flaps, rotation flaps, transpositional flaps, and Island flaps^[9]. The present case series elaborates on two cases thoroughly with lower eyelid reconstruction measures and evaluates the outcomes of these operations. We used a rectangular advancement musculocutaneous flap for anterior lamellar reconstruction and a similar-sized mucoperichondrial graft for posterior lamellar reconstruction.

The risk of ocular complications was thus decreased.

Case Presentation

An elderly female was reported to the oculoplastic clinic for a right lower lid mass 1.5 years ago. On examination, a flat palpable mass of 20x8mm size extended up to the inner canthus and right lower puncta is also involved. The lesion had a rough surface, irregular margin, poorly defined borders, non-tender, non-pulsatile, non-transilluminant, firm in consistency, and adherent to the underlying eyelid tissue. There was an architectural distortion of the lid margin and a loss of eyelashes. The underlying conjunctiva was indurated. Visual acuity was 6/18 in the right eye with pseudophakia and posterior capsular opacification, and 6/60 with immature senile cataract in the left eye. The anterior and posterior segments were within normal limits in the left eye. There was no sentinel lymph node. Following surgical excision with a clear margin, the right lower lid coloboma was approximately 23x10 mm. An advancement flap procedure with an oral mucoperichondrial graft was performed on this patient. The advancement flap was generated following the lateral canthotomy technique by extension of the incision 23 mm lateral to the lateral canthus. An identical parallel incision was applied 10 mm inferior to the first incision to release the flap from the underlying tissue. The flap was moved by lateral advancement to overcome the defect produced after the excision of mass. A rectangular mucoperichondrial graft measuring 23x10mm was harvested from the anterolateral aspects of the hard palate for posterior lamellar reconstruction. The free margin of the flap was sutured with the medial free margin of the lower eyelid. The remaining conjunctiva was identified and sutured with a mucoperichondrial graft to create posterior lamella. The inferior palpebral defect was sutured after the reconstruction of the posterior lamella. The postoperative follow-up was done on the third day, after one week, and after one month. On the third day of surgery, the graft and flaps were well opposed, and the suture site was healthy with mild edema and hematoma of the eyelid. There was no sign of suppuration or necrosis seen on the lower eyelid. One week after surgery wound healing starts in the form of granulation tissue near the lateral canthus with 1 mm lagophthalmos. At one month of follow-up, there was no lagophthalmos and granulation tissue in the suture area of the lower lid.

Discussion

Eyelid reconstruction is very difficult without basic knowledge of its complex anatomy. The lower eyelid is poorly mobile, vertically smaller, and contributes very little to eye closure. The eyelid skin is tightly adhered in the pretarsal, medial, & lateral canthal area due to the absence of subcutaneous tissue^[10]. In eyelid reconstruction, several factors need to be considered like site, size, and number of lesions, the patient's age & laxity of eyelids, and the involvement of nearby tissues such as canthal tendons, canaliculi, and the nasojugal area for the accepted outcome. Barba-Gomez *et al.* proposed various techniques of near-total or total full-thickness lower eyelid reconstruction^[11]. The flap classification is primarily based on dominant movement in eyelid reconstruction, namely the advancement flap, rotation flap, transposition flap, transposition flap, and island flaps. For eyelid reconstruction, flaps should have identical skin color, texture, and dimension, with their blood supply, and maintaining proper horizontal and vertical eyelid tension is

an essential component for excellent outcomes^[12]. Mostly the advancement flap has a rectangular or linear configuration with axial, rotation, or advance movement. In the present case, advancement flaps have a rectangular pattern in which movement is carried out directly toward the defect^[13]. The posterior lamella is completed by taking the adjacent tars conjunctiva or by harvesting a mucoperichondrial graft. The principal aim of posterior lamellar replacement is to obtain thick palpebral support of the lamellar surface. In the present case, a mucoperichondrial graft was harvested from the anterolateral part of the hard palate^[14].

In the present case, the author considered a technique of the hard palate graft covered by lateral myocutaneous advancement flap for near-total lower eyelid reconstruction^[6]. In lower eyelid reconstruction, the type of method used depends on lamellar involvement. The present case has full-thickness near total lower eyelid defects, in which the author decided to barrow a vascular myocutaneous lateral advancement flap for anterior lamella and a hard palate-originated mucoperichondrial graft for reconstruction of posterior lamella. Adequate lamellar reconstruction is needed, considering the vasculature of one lamella can support the other for better functional and cosmetic outcomes^[12]. For extensive lower eyelid defects with small vertical tissue loss, a Mustarde cheek rotation flap can also be used. It is an alternative to lid sharing procedure but has more risk of facial nerve trauma^[13]. In literature, several post-operative complications following lid reconstruction were documented the important once are as follows graft rejection, wound necrosis, bulbar conjunctiva and cornea injury, eyelid retraction, entropion, ectropion, ptosis, trichiasis, lagophthalmos, and exposure keratitis. However, in the present case, no such complication was noted^[14]. In facial plastic surgery, the flap classification is primarily based on dominant movement in eyelid reconstruction, namely the advancement flap, rotation flap, transposition flap, transposition flap, and island flaps. For eyelid reconstruction, flaps should have identical skin color, texture, and dimension, with their blood supply, and maintaining proper horizontal and vertical eyelid tension is an essential component for excellent outcomes^[15]. Mostly the advancement flap has a rectangular or linear configuration with axial, rotation, or advance movement. In the present case, advancement flaps have a rectangular pattern in which movement is carried out directly toward the defect^[16]. The posterior lamella is completed by taking the adjacent tarsoconjunctiva or by harvesting a mucoperichondrial graft. The principal aim of posterior lamellar replacement is to obtain thick palpebral support of the lamellar surface. In the present case, a mucoperichondrial graft was harvested from the anterolateral part of the hard palate^[17]. The reconstruction of the Lower Eyelid by flap technique has several advantages, including adequate vascularization, limited contraction during wound healing, and identical color, and texture, resulting in excellent cosmetic outcomes. In the present case series, anterior and posterior lamella of the lower eyelid are substituted by lateral myocutaneous advancement flap and mucoperichondrial graft respectively.

Conclusion

Although several techniques are available for lower eyelid reconstruction in literature, one has to choose the procedure that suits both the patient and the surgeon. Emphasis must be given to the age of the patient, nature of the lesion, area

of involvement, degree of tissue loss, and above all availability of a skilled oculoplastic surgeon. It is a well-known fact that lower eyelids sparsely contribute to eye closure, rather their main function is to maintain stability. So, post-procedure it is mandatory to make the lower eyelid more stable. A lateral advancement flap for anterior lamella combined with a mucoperichondrial graft for posterior lamella is an excellent technique alternative to the lid-sharing procedure. It can be applicable in cases where extensive tissue loss in both the upper and lower eyelid, to close the near total lower lid defects providing a good structural, functional, and aesthetic outcome.



Fig 1: Show lower eyelids sparsely contribute to eye closure

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