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### The Outcomes of Lower Eyelid Reconstruction after Carcinoma Excision: Case Series

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#### ABSTRACT

**Introduction:** Eyelid reconstruction after excision of carcinoma can be challenging due to the dynamic movement and anatomy of the eyelid. Flap and graft are choices of techniques to fill and repair broad eyelid defects. Significant lower eyelid defects can typically be closed using skin flaps and grafts to substantiate the posterior lamella. This study aims to describe three cases with lower eyelid reconstruction and evaluate the outcome of the surgery. **Case presentation:** There are three cases of lower eyelid reconstruction reported in this study. In cases 1 and 2, the surgical procedures need graft for posterior lamellae reconstruction. In case 3, the reconstruction process only required a rotational flap. All patients are in good aesthetic and functional outcomes. **Conclusion:** Combination of skin flap (transposition and rotational flap) and graft (oral mucosa and transconjunctival) and only rotational flap can achieve favorable functional and aesthetic outcomes in wide excision of carcinoma.

#### 1. Introduction

The eyelids are a predisposing site for the appearance of skin lesions. About 5-10% of all skin malignancies are found in the eyelids.<sup>1,2</sup> The eyelids are the part of the eye that experiences the most exposure to ultraviolet light. Patients with extensive lesions of the lower eyelid after removal of carcinoma have difficulties with reconstruction associated with anterior and posterior lamellar reconstruction to preserve the ocular surface and eyelid function.<sup>3-5</sup>

Some methods can be the right choice for the reconstruction of certain eyelid defects. The choice of procedure depends on the age of the patient, the condition of the eyelids, and the size and position of the defects. For defects that are too large to be closed

or cannot be closed primarily, the use of skin flaps and grafts in eyelid reconstruction can be a solution to restore the anatomy and function of the eyelids.<sup>6-8</sup> The classification of flaps based on vascularization includes random pattern skin flaps and axial pattern skin flaps, while the classification of flaps used is based on the dominant movement in eyelid reconstruction, namely advancement flaps, rotation flaps, and transposition flaps.<sup>9</sup> This study aims to describe three cases with lower eyelid reconstruction measures and evaluate the outcomes of these operations.

## 2. Case Presentation

### Case 1

A 92-year-old female patient was consulted from the tumor subsection with a diagnosis of squamous cell carcinoma of the right lower eyelid. The patient came with complaints of lumps on the outer corner of the lower right upper and lower eyelids 6 months ago. Visual acuity in the right eye (OD) was 2/60, and left eye (OS) 1/300; anterior and posterior segments were within normal limits with a cloudy lens in both eyes.

The right inferior palpebral mass appeared approximately 15x15x5 mm (Figure 1), with a flat palpable surface, a deep ulcer in the middle, hard solid consistency, and challenging moving from the base. The defect in the inferior palpebral after wide excision is approximately 20x10 mm full thickness involving the eyelid margin and lateral canthus, and a defect in the superior palpebral is 12x10 mm full thickness. An advancement flap procedure with an oral mucosal graft was performed on this patient.



Figure 1. Tumor mass in the outer corner of the inferior lid and involving the superior lid.

The advancement flap technique is performed for the facial part by pulling the border of the defect made forward or advancing towards the defect without rotation or lateral movement. In this case, an incision was made at the right time in the form of a triangle with a length of 30x20 mm and involving the inferior and superior palpebral and the lateral canthus. Cantholysis was performed, then reshaped the canthus by suturing the inferior margo tendon to the periosteum and making the posterior lamellar with a lip mucosa graft.

Lip mucosa graft takers performed a rectangular incision measuring 20x10 mm on the oral mucosa for grafting, ballooning with pehacain to separate the mucosa from the underlying tissue. Take the lip mucosal graft and soak it in a mixture of NaCl and Gentamycine. Identify the remaining conjunctiva, and suture the lip mucosa over the remaining canthus and conjunctiva to create the posterior lamella. After the posterior lamella is formed, the inferior and superior palpebral defects are sutured (Figure 2).



Figure 2. Defect before suturing.

Follow-up of postoperative patients was carried out on the third day, after one week, two weeks and after one month. The first follow-up was done after the third day after surgery to see if there was an opposition between the flap or graft and the recipient. On the third day of follow-up (Figure 3), the right eyelid was edematous and hematoma, the heating flap of the inferior eyelid was in good condition, there was no suppuration process and the flap did not appear necrotic.

At a 1-week follow-up, the inferior palpebral flap towards the lateral canthus showed granulation tissue in the wound healing process, and the lagophthalmos was approximately 2 mm. (Figure 4). Follow-up after 1 month, there was no granulation tissue in the suture area at the inferior palpebral margin, but slight ectropion with lagophthalmos reduced to 1 mm (Figure 5).



Figure 3. The Inferior and superior palpebral have been flapped.



Figure 4. Follow up after 1 week.

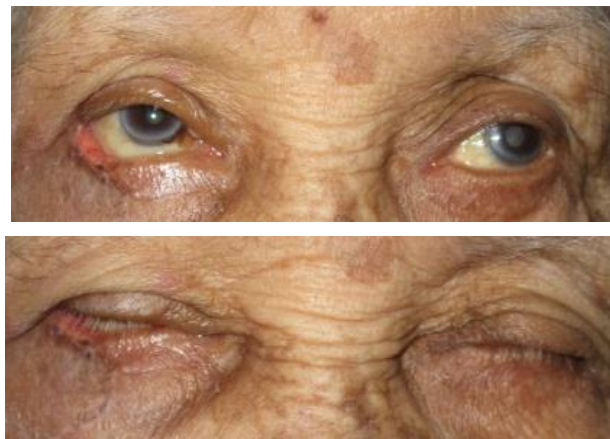


Figure 5. Follow up after 1 month, with minimal ectropion and minimal lagophthalmos.

**Case 2**

A female patient, aged 80 years, was consulted from the Tumor subsection with a diagnosis of Basal cell carcinoma of the inferior palpebral left eye (OS). The patient complained of a lump in the lower left eye and at the tip near the nose since 8 months ago. Visual acuity in the right eye (OD) was 20/60 and the left eye (OS) 20/80, the anterior and posterior segments were within normal limits, with cloudy lenses in both eyes,

the eyeball position was normal. On examination of the left inferior palpebral, a mass measuring 10x5x2 mm was seen near the medial canthus and a mass in the inferior eyelid measuring 25x10x2 mm involving the margin (Figure 6), with a hard palpable blackish-colored surface with a resonant in the middle, firm spongy consistency and difficult to move from the base.



Figure 6. Basal cell carcinoma tumor mass involving margo and medial chantus.

Identification of the extent of the defect in the inferior lid after wide excision is approximately 15x10 mm in the medial canthus area and size 30x10 mm full thickness involving the inferior palpebral margin. A transposition flap procedure with a superior transconjunctival graft in the same eye was performed on this patient. After the posterior lamella was formed with a transconjunctival graft and sutured, the lid flap was sutured from the superior lid according to the size of the defect.

Follow-up of postoperative patients was carried out on the third day, after one week, two weeks, and one month. The first follow-up was carried out after the third day of apposition between the flap or graft and the recipient. At 1 week follow-up (Figure 7), the left eyelid was slightly edematous, the heating flap of the inferior eyelid was in good condition, there was no suppuration and the flap did not appear necrotic. There was a 3 mm lagophthalmos in the patient.



Figure 7. Follows up 1 week, lagophthalmos 3 mm in the left eye.

Follow-up after 2 weeks of surgery (Figure 8), it appears that the flap tissue on the inferior eyelid has blended well with the skin of the eyelid. There was no

the difference in color between the eyelid skin and the flap tissue. There was no conjunctival chemosis and 3 mm lagophthalmos was found.



Figure 8. Follow up 2 weeks, lagophthalmos 3 mm.

**Case 3**

A female patient, aged 65 years, was consulted from the Tumor subsection with a diagnosis of Basal cell carcinoma of the right eye inferior palpebral (OD). The patient complained of a lump in the lower right eye 1 year ago. Visual acuity in the right eye (OD) was 20/40 and the left eye (OS) 20/50, the anterior and

posterior segments were within normal limits, with cloudy lenses in both eyes, and the eyeball position was normal. Examination of the right inferior palpebral mass showed a mass measuring 20x10x1 mm with a hard palpable surface with a resonant echo in the middle, dense spongy consistency, and difficult to move from its base (Figure 9).



Figure 9. Tumor mass in inferior lid OD.

Identification of the extent of the defect in the inferior lid after wide excision is approximately 30x10 mm in the inferior palpebral muscle depth. Flap

transposition procedure with flap size taken according to the size of the defect (Figure 10).



Figure 10. Defect after wide excision of inferior lid OD.

In this patient, a flap was transposed, which was taken from the temporal forehead as wide as the defect, then the flap was sutured directly to the defect.

Because of the defect after wide excision of muscle depth, only a skin flap was performed (Figure 11).



Figure 11. Transposition of the flap on the inferior lid OD post-op.

Follow-up of postoperative patients was carried out on the third day, after one week, two weeks, and one month. The first follow-up was carried out after the third day of apposition between the flap or graft and the recipient. At 1 week follow-up (Figure 12), the healing flap of the inferior lid was in good condition, there was no suppuration and the flap did not show

necrosis. There was no lagophthalmos in this patient. After 2 weeks of follow-up, the flap was intact with the surrounding tissue. Hecht sutures were opened on all flaps, flap healing was good and there was no lagophthalmos (Figure 13).



Figure 12. Follow-up 1 week after rotational flap.



Figure 13. Follow up 2 weeks

### 3. Discussion

The purpose of eyelid reconstruction is to restore the normal function of the eyelids as protection of the eyeball and good cosmetic restoration. The defect that occurred, in this case, was caused by wide excision of the inferior palpebral squamous cell carcinoma of the right eye. The type of reconstruction for the eyelids depends on several factors such as the size of the lesion, the laxity of the lids, and the association of surrounding tissues, such as the canaliculi, and canthus tendons, the top of the cheek, and the nasojugal area. For large defects (>25 mm) and full thickness, flaps and grafts are necessary for palpebral reconstruction.<sup>5,10</sup>

Most of the defects are due to resection of malignancies located in the lower eyelid, the defects that form are most commonly found to be wedge-shaped like the defect in this case. Wedge-shaped defects involving up to more than 50% of the eyelid margin can be closed especially in elderly patients. Lateral cantholysis is required if the edges of the defect cannot be brought together easily. The edge of the defect should be perpendicular to the eyelid margin along the full height of the tarsus to avoid notching.<sup>11-</sup>

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The method used for the reconstruction of the inferior eyelid depends on the involvement of the

anterior lamella only or involving the anterior and posterior lamellae. In cases 1 and 2, the defect involved the anterior and posterior lamellae. For such a defect, adequate reconstruction of both lamellae is performed, taking into account the vasculature for both lamellae, or one lamellae vasculature can support the other.<sup>14</sup>

Reconstruction of anterior lamellae defects requires flaps with optimal skin color and skin texture equality, minimizing cicatricial, and minimizing vertical stress on the lid margins and not causing postoperative palpebral malposition. Flap classification is based on vascularity, namely random pattern and axial pattern skin flaps, while the flap classification used is based on the dominant movement in eyelid reconstruction, namely advancement, rotation, and Mustardee's cheek rotation flaps.<sup>15</sup>

Advancement flaps have a linear or rectangular configuration. In the advancement flap technique, the movement is carried out directly forward or forward towards the defect without rotation or lateral movement.<sup>16</sup> In the rotation flap (semicircular), the flap is rotated to cover the defect (Figure 14). The donor site can be closed with a skin graft or done by direct suturing.<sup>6</sup>

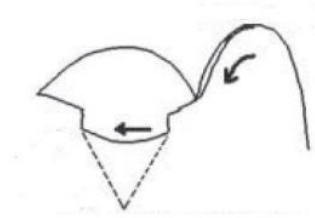


Figure 14. The pattern of advancement flaps.<sup>6</sup>

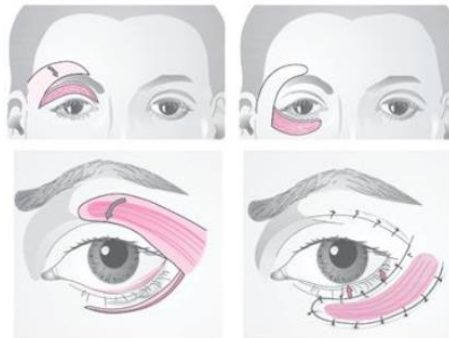


Figure 15. Transposition flap pattern.<sup>4</sup>

Mustarde's cheek rotation flap is used to reconstruct extensive inferior palpebral defects, particularly in defects with long vertical lines. The flap usually extends to the canthus area. In this flap, it is taken from the site in front of the curved ear and undermined to the subcutaneous layer. It is then brought to cover the defect. The medial end of the flap can be closed on the medial vertical portion of the orbit. The lateral part of the lamella is completed by taking the tarsoconjunctiva or by mucosa.<sup>7</sup>

Extensive palpebral reconstruction with the flap technique has several advantages.<sup>8-10</sup> The anterior lamella can be reconstructed with fewer contractures during the healing period, adequate vascularization, and good cosmetic results being obtained, where skin color and skin texture are similar. In the first and second cases, posterior lamella reconstruction was performed using a transconjunctival free graft and a lip mucosal graft. Other options include the mucosa of the cheek, the mucopericardium of the hard and nasal palate, or the auricular cartilage. The purpose of posterior lamella replacement is to obtain thick, palpebral support for the lamellae surface.

#### 4. Conclusion

In extensive inferior palpebral defects, skin flaps, and skin grafts are an option to restore anatomic and functional palpebral function. In some cases, there are complications of lagophthalmos, but anatomically and functionally, the inferior palpebral can be reconstructed well.

#### 5. References

1. Silverman N, Shinder R. What's new in eyelid tumors. *Asia Pac J Ophthalmol.* 2017; 6(2):143-52.
2. Stein JD, Antonyshyn OM. Aesthetic eyelid reconstruction. *Clin Plast Surg.* 2009; 36(3):379-97.
3. Sengupta S, Baruah B, Pai S, Deaf IP. Total reconstruction of the lower eyelid in a post-traumatic patient using modified Fricke's cheek flap. *J Surg Tech Case Rep.* 2013; 5(2):95-8.
4. Subramanian N. Reconstruction of eyelid defects. *Indian J Plast Surg.* 2011; 44:5-13.
5. Barba-Gómez J, Zuñiga-Mendoza O, Iñiguez-Briseño I, Sánchez-Tadeo MT, Barba-Gómez



- JF, et al. Total lower-eyelid reconstruction: Modified Fricke's cheek flap. *J Plast Reconstr Aesthet Surg.* 2011; 64:1430–5.
6. Lalonde DH, Osei-Tutu KB. Functional reconstruction of unilateral, subtotal, full-thickness upper and lower eyelid defects with a single hard palate graft covered with advancement orbicularis myocutaneous flaps. *Plast Reconstr Surg.* 2005; 115:1696–700.
  7. Miyawaki T, Hisako A, Suzuki H, Kurihara K, Jackson IT. Pre-expansion of mucosa-lined flap for lower eyelid reconstruction. *Plast Reconstr Surg.* 2005; 116:76e–82e.
  8. Wilcsek G, Leatherbarrow B, Halliwell M, Francis I. The 'RITE' use of the Fricke flap in periorbital reconstruction. *Eyes.* 2005; 19(8): 854–60.
  9. Orgun D, Hayashi, A, Yoshizawa H. Oncoplastic lower eyelid reconstruction analysis. *J Craniofac Surg.* 2019; 30(8) :2396–400.
  10. Trieu DN, Drosou A, White LE. Outcomes of second intention healing of the lower eyelid margin after Mohs micrographic surgery. *Dermatol Surg.* 2019; 45(7):884–9.
  11. Nasiri M, Kardar MH. Nasojugal flap with a dermal pennant for reconstructive of lower lid defect. *World J Plast Surg.* 2019; 8(2):245–8.
  12. Albanese G, Kasbekar S, Abercrombie LC. Modified cheek advancement flap for the medial lower eyelid, nasal sidewall, and infraorbital cheek reconstruction: a case series. *Orbit.* 2020; 39(2):123–7.
  13. Ibáñez-Flores N, Bruzual-Lezama C, Castellar-Cerpa JJ. Lower eyelid reconstruction with pericranium graft and Mustarde flap. *Arch Soc Esp Oftalmol.* 2019; 94(10):514–7.
  14. Ali MJ, Paulsen F. Human lacrimal drainage system reconstruction, recanalization, and regeneration. *Curr Eye Res.* 2020; 45(3):241–52.
  15. Grace KA, William WS. Reconstruction of nasal defects: contemporary approaches. *Curr Opin Otolaryngol Head Neck Surg.* 2016; 24(5):453–60.
  16. Skippen B, Hamilton A, Evans S. One-Stage Alternatives to the Hughes Procedure for Reconstruction of Large Lower Eyelid Defects: Surgical Techniques and Outcomes. *Ophthalmic Plast Reconstr Surg.* 2016; 32(2):145-9.