

## Case Report

# Skin graft of contralateral aesthetic unit for reconstruction of the upper eyelid: case report and literature review

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### ABSTRACT

Eyelids represent a complex structure; its principal function is to provide physical and immunological barrier. The complexity of this structure lies in the blinking and in the range of movement they carry out respecting the integrity of the cornea. The objective of this study is to provide a surgical alternative with minimal morbidity for the reconstruction of the upper eyelid, as well as to present the available tools for the treatment of this complex area of the facial anatomy. We present the case of a female patient of 62 years, with 50% of necrosis on the surface of the upper eyelid and infection data, surgical management was initiated with debridement, systemic antibiotic therapy and negative pressure system device, once the infectious process was resolved and according to the principles of reconstruction by aesthetic subunits, it was decided to reconstruct 100% of the subunit affected by a skin graft of total thickness of the contralateral eyelid through a blepharoplasty with good aesthetic-functional results. The reconstruction of the eyelids should be managed by a plastic surgeon, taking into account the principles of the aesthetic subunits, optimally the donor tissue should have similarity with the tissue to be reconstructed, with respect to the size, color and flexibility, to obtain an adequate aesthetic and functional result.

**Keywords:** Blepharoplasty, Palpebral reconstruction, Functional surgery, VAC system, Full thickness skin graft

### INTRODUCTION

The eyelids are a complex structure that provides protection to the eyes from trauma, excessive light, and maintains the integrity of the tear film.<sup>1</sup> The eyelids in turn represent a physical and immunological barrier against infection.<sup>2</sup> Any loss of tissue in this structure is particularly problematic because the eyelid must maintain its range of mobility, flexibility, function, as well as an integral mucosal surface to be in contact with the cornea, which is an extremely delicate structure. Dynamic blinking and range of motion are often challenging to achieve adequate repair in cases of tissue loss; Caution is necessary as the inability to close the eyelids can cause loss of adequate moisture from the eye, resulting in

blurred vision, sensitivity to light and corneal ulceration as well as an increased risk of infection that can eventually lead to loss of the eye.<sup>3</sup> In addition, the upper eyelid represents one of the main characteristics of the human face, so it must have an acceptable aesthetic appearance compared to the contralateral upper eyelid, taking into account the symmetry in the height of the eyelid, the muscular excursion, as well as the contour and skin folds.<sup>4</sup> Blepharoplasty is a surgical procedure in which the skin of the eyelid, the orbicularis oculi muscle and the orbital fat are remodeled for mainly cosmetic purposes.<sup>5</sup> Ideally, skin covering defects anywhere on the body should be reconstructed with matching tissues with respect to composition, size, color, and flexibility, leaving minimal morbidity at the donor site and

inconspicuous scars.<sup>6</sup> Regarding eyelid reconstruction, this can be achieved with different types of local or locoregional flaps, however; optimal results are not always obtained.<sup>7</sup> Full thickness skin graft of the eyelid represents a suitable alternative, especially if a flap is not feasible. In such cases, the skin graft is frequently performed from classic donor sites, such as the preauricular, retroauricular or supraclavicular region; sometimes the donor skin of the aforementioned sites does not meet the optimal characteristics, so the results they are not ideal.<sup>8,9</sup> Aesthetic units consist of areas bounded by folds and natural boundaries; These are subdivided into subunits based on the anatomical complexity of some areas such as the eyelids or the nose; therefore, defects can be closed with a full-thickness skin graft taken from the corresponding contralateral aesthetic unit.<sup>10</sup> By dividing the face into skin segments of different color, texture, and thickness, amount of subcutaneous fat, mobility and distribution of hair, it facilitates the reconstruction of these segments, taking grafts as close to the affected area as possible.<sup>11</sup> There are 9 facial aesthetic units described: forehead, nose, eyelid, cheek, upper lip, lower lip, chin, ear, scalp, which, in turn, are divided into subunits. There are general recommendations to obtain better results when repairing these units, however, there is no standardized guide to determine which is the best option for the repair of each aesthetic unit.

**CASE REPORT**

A 62-year-old female who onset her condition suddenly with significant edema, erythema, purulent discharge and pain in the upper left eyelid for 8 hours without a history of trauma or infection (Figure 1).



**Figure 1: Initial clinical presentation.**

The patient presents an impossibility for the movement of the eyelid, specifically limitation for opening which conditions impossibility for vision with that eye. The patient decides to give treatment with lukewarm water promotion without observing improvement, so she decides to go to the emergency service one week after having started with the symptoms.



**Figure 2: (A) Initial clinical presentation with necrosis of the left upper eyelid (B) 50% of the skin tissue surface is lost after surgical debridement.**

During the evaluation in the emergency department, the presence of cutaneous necrosis greater than 50% of the compromised eyelid was observed (Figure 2), according to the evaluation of the ophthalmology service without compromising the eyeball, for which antibiotic treatment with tobramycin ophthalmic solution was started. performed surgical cleaning with debridement, the integrity of the levator eyelid muscle was confirmed, as well as the orbicularis oculi muscle, and it was decided to place an intermittent vacuum assisted closure (VAC) therapy system with negative pressure at 125 mm Hg, using the black polyurethane sponge. (VAC Granu Foam) performing exchanges every 3 days, completing a total therapy of 3 exchanges (Figure 3).



**Figure 3: Negative pressure (VAC) system placement with intermittent pressure at 125 mmHg.**

When removing the VAC, an area of skin loss is observed in the upper eyelid greater than 50% of the surface, well delimited with adequate granulation tissue, with integrity of the levator eyelid and orbicularis muscle, without data of active infection and negative culture results (Figure 4).

Taking into account that the patient no longer presented infection and that the lesion had been delimited by only

compromising the anterior lamina of the eyelid, it was decided to perform a surgical procedure to reconstruct affected subunits using a full-thickness skin graft.



**Figure 4: Removal of the system with negative pressure, with integrity of the levator eyelid and orbicularis muscles, showing granulation tissue with no evidence of infection.**



**Figure 5: (A) pre-surgical planning B) immediate postsurgical.**

In the evaluation of the patient, the possibility of performing a right blepharoplasty in a single procedure using local anesthesia and using resected tissue as a full-thickness graft to reconstruct the contralateral unit is considered. To perform a reconstruction with aesthetic subunits, the ideal is to use a graft with the characteristics most similar to the unit to be reconstructed, for this reason this therapeutic decision was made.

By presenting compromise of more than 50% of the eyelid and taking into account the reconstructive principles according to the aesthetic subunits, it is necessary to reconstruct 100% of the affected subunit by means of a full thickness skin graft with tissue of the most similar characteristics possible to the original ones, finding the contralateral eyelid as the ideal donor (Figure 5).

The patient presented for a subsequent consultation with good evolution, with adequate function of both eyelids, and with good cosmetic results. Postsurgical at 6 months (Figure 6).



**Figure 6: Post-surgical result at 6 months.**

## DISCUSSION

When there is an upper eyelid lesion that represents more than 30% of the aesthetic subunit, its primary closure is not recommended, so some other technique must be used for the reconstruction of this aesthetic subunit.

Reconstruction of the upper eyelid with a full-thickness skin graft represents a good alternative to other repair methods in cases where only the anterior lamina has been affected and there is no muscle involvement.

It is difficult to achieve good results when reconstructing the upper eyelid, although there are several techniques described, the use of lateral rotation skin flaps increases the risk of damaging fibers of the facial nerve that can cause paralysis of the orbicularis oculi muscle, causing in turn lagophthalmos.

Eyelid exchange, which mobilizes the tissue layers in a compound manner from the lower eyelid ipsilateral to the defect, is also described. Examples of this principle are the Cutler-Beard technique, and the mustarde technique both require a secondary procedure to divide the flap and sacrifice tissue from the lower eyelid. Another option includes techniques without a cutaneous bridge that depend on an anterior lamellar flap that is supported by a posterior lamellar graft or bilamellar grafts with high complication rates that include: lagophthalmos, keratopathies, lid retraction, marginal entropion.

There are also options for flaps taken from the forehead, however the scars are very evident, compromising the final result. A case is presented with an injury that results in a defect to be repaired which requires a procedure for eyelid reconstruction, in which, the circumstances of the contralateral aesthetic unit are taken advantage of and a contralateral full thickness skin graft is taken, without compromising function and converting this procedure

with merely reconstructive purposes to an aesthetic procedure.

Taking a graft from the healthy eyelid corrects an aesthetic problem of blepharochalasia, while obtaining a reconstructive option for the affected side. In the same way, the same procedure is used for aesthetic purposes such as blepharoplasty to solve the blepharochalasia and in turn reconstructive in terms of taking the cutaneous redundancy of the blepharochalasia to solve the loss of the aesthetic subunit of the eyelid.

The contralateral eyelid represents a good option since the skin of the donor area lacks hair, has an ideal thickness, a texture and a color similar to the native one, and the scar of the donor aesthetic unit is practically imperceptible.

## CONCLUSION

Due to the versatility of the Estlander flap, its blood flow, simple technique, and the possibility of performing it under local anaesthesia in addition to its long-term aesthetic and functional results, it is still an ideal option for managing the defects that involve over than 1/3 of the volume of the lip and commissure.

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