

CASE REPORT

THE MANAGEMENT OF CICATRICIAL ECTROPION CAUSED BY BURN INJURY: A CASE REPORT**Okiningtyas Kun Cahyandari¹, Ratna Doemilah¹**¹Department of Ophthalmology, Faculty of Medicine, Airlangga University, Surabaya
Email: okiningtyas@gmail.com**ABSTRACT**

Introduction: Eyelid reconstruction in cicatricial ectropion caused by facial burns represents a surgical challenge. Surgical management consists in correcting the lid defect often associated with a skin graft and lid tightening.

Case Description: a 18-years-old man was referred because suffered cicatricial ectropion on superior-inferior eyelid of right eye after got burn injury 4 months before come to our outclinic, with cicatricial tissue on 50% on right face after facial burns. Ocular examination revealed a visual acuity 20/20 on both eyes, lagophthalmos but a good Bell's phenomenon, and diffused ectropion on the eyelid of right eye. Reconstruction was made a release contracture tissue, lid tightening and full thickness skin grafts from donor site which recommended from supraclavicular 60 x 30 mm for superior eyelid and 50 x 40 mm for inferior eyelid, place the graft and fix it with a bolster and Frosz suture. We follow up the patient, 1 day, 1 week, and 6 months post operation.

Discussion: Major issues when addressing cicatricial ectropion followed by severe burns are : right donor site selection, slightly oversized graft allowed for some contraction and full eyelid closure. For further plan is consultation to plastic surgery to manage other cicatricial tissue of part of body.

Conclusion: Reconstruction for diffused ectropion by using full thickness skin graft and lid tightening are better option for correction of cicatricial ectropion.

Keywords: Cicatricial Ectropion, Full thickness skin grafts, Eyelid reconstruction

INTRODUCTION

Ectropion is an eversion of the eyelid margin away from the globe and is commonly classified according to its etiology: involuntional, cicatricial, paralytic, mechanical, or congenital. Cicatricial ectropion is generally secondary to burn, trauma, and inappropriate surgery¹. Periocular area and lids are frequently affected with facial burns, ranging from 7.5 to 20% of all burn cases².

Eyelid involvement is common in facial burns. Eyelid burn injuries, especially by chemical contact, are critical emergencies. Priority is always given to eye closure. The acute management includes gentle eyelid and eyelash hygiene to prevent crusting. Topical ophthalmic antibiotic ointments and artificial tears should be applied frequently³.

Eyelid reconstruction followed by facial burns represents a surgical challenge due to difficulties

to obtain proper, healthy skin graft, tissue ischemia, and necrosis. Surgical management consists in correcting the lid defect often associated with a skin graft². The affected skin area usually does not permit large skin grafting and is prone to necrosis and short graft survival. This makes cicatricial ectropion surgery following burn injuries difficult and sometimes unsuccessful⁴.

Surgical repair of cicatricial ectropion usually requires release of the scar tissue in the lower eyelid and upper face, a Full Thickness Skin Graft (FTSG), and resuspension of the lower eyelid to the lateral orbital rim sometimes combined with a medial canthopexy. However, the traditional thinking in plastic surgery is to avoid FTSG in heavily irradiated beds for fear of compromised blood supply and graft failure. In addition to graft failure, other potential complications of skin grafting may include partial failures related to hematoma formation, graft hypertrophy or contraction, and graft infection that could necessitate further revision⁵.

The aim of cicatricial ectropion surgery is to correct the causative factors of horizontal and vertical lid laxity and contracture of the lower lid's anterior lamella. Surgery with insertion of skin using a FTSG or transpositional flap into the lower lid, retractor plication and horizontal lid tightening is considered an effective treatment for cicatricial ectropion and can result in excellent functional, anatomic and cosmetic outcomes⁶.

CASE DESCRIPTION

A 18-years-old man was referred because suffered cicatricial ectropion on superior-inferior eyelid of right eye after got burn injury 4 months before come to our outclinic, with cicatricial tissue on 50% on right face after facial burns. Four months prior to this presentation, patient sustained thermal burn injuries. Mechanism of the injury was explained by patient as being doused with some amount of gasoline and set ablaze in closed space. Initial diagnosis stated that face, neck, and upper bilateral extremities were affected with deep dermal and third-degree burns; right eyelid ectropion; cicatricial tissue of the both lower hands. Primary treatment was obtained at the hospital in the city due the need recucitation. All burns were covered with bandages.

The patient was released in good general condition and recommendation for surgical treatment of the right eyelid. Our examination found: a visual acuity was 20/20 on both eyes, normal eye pressure, lagophthalmos with inferior scleral show but a good Bell's phenomenon, and diffused ectropion on the right superior and inferior eyelids which showed by figure 1. For conjunctiva and cornea within normal limit with no evidence of chemosis or keratoconjunctivitis.

We performed superior and inferior eyelids reconstructive surgery with general endotracheal anesthesia. Surgical protocol was as follows: patient's surgical site antiseptic skin

preparation with povidone iodine (10%), followed by 7 mm at skin crease of superior eyelid and 4 mm at skin crease of inferior right eyelid (Blepharoplasty incision). Next procedure was released of cicatricial tissue with undermine or dissected to lid margin and superior for upper eyelid and to inferior for lower eyelid until orbicularis muscle presentation. After all cicatricial tissue was released, canthopexy of lateral canthus was performed, and tightening of the lid margin to a normal anatomical position. A wound bed or defect was 50 x 20 mm for superior eyelid and 40 x 30 mm for inferior eyelid. Due to extensive skin damage and scarring tissue caused by burn injury, we used available and suitable healthy skin for grafting method from the right and left of supraclavicular regions.

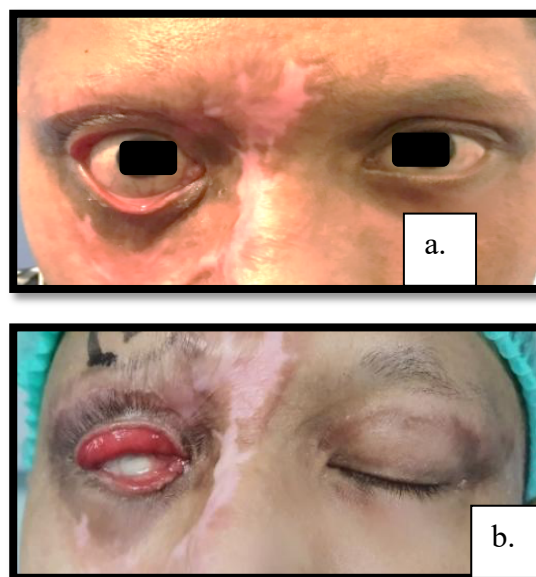


Figure 1. Photograph shows features before surgery, right eye ectropion on superior-inferior eyelid (a) and lagophthalmos with good Bell's phenomenon (b)

The right and left supraclavicular surgical site region was pre-operatively prepared and cleaned with povidone iodine (10%), and the FTSG was taken (Wolfe technique), to replace the skin defect on right eyelid which showed by figure 2.

For superior eyelid we took 60 x 30 mm and 50 x 40 mm for inferior eyelid. We decided to exaggerate the donor skin to anticipate the tissue contracture that will occur again. Graft was sutured using the 6.0 non-absorbable prolene suture and make Frost suture for superior eyelid and pressed with bolster on superior and inferior right eyelid.

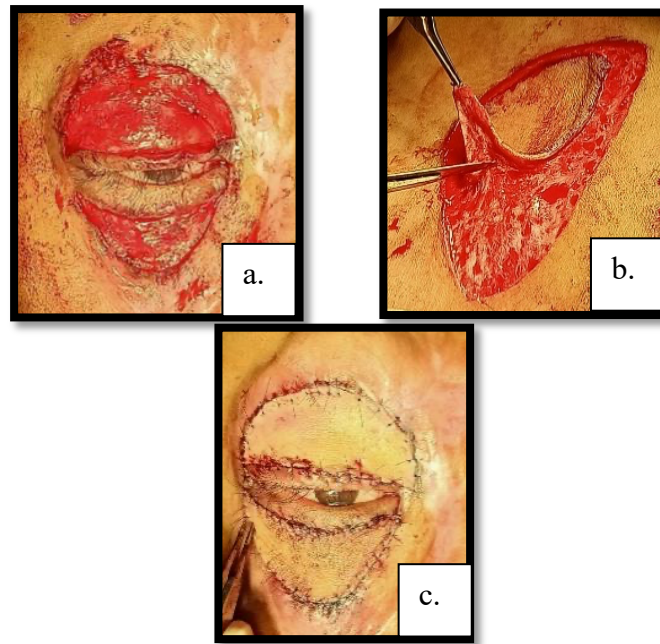


Figure 2. Step during surgery, release contracture tissue, horizontal tightening of the lid margin, and canthopexy of lateral canthus (a), FTSG from supraclavicular donor site (b), and place at recipient site (c)

Post operation we gave antibiotic systemic and topical broad spectrum. First inspection was made 24 hours after operation; there was bolster cover the wound with no active bleeding. 1 week post operation, bolster dan Frost suture were released, and the wound cared. Graft was 100% viable and of appropriate colour. Two weeks after, all sutured was taken off, graft exposed, and no additional dressing was applied which showed by figure 3.

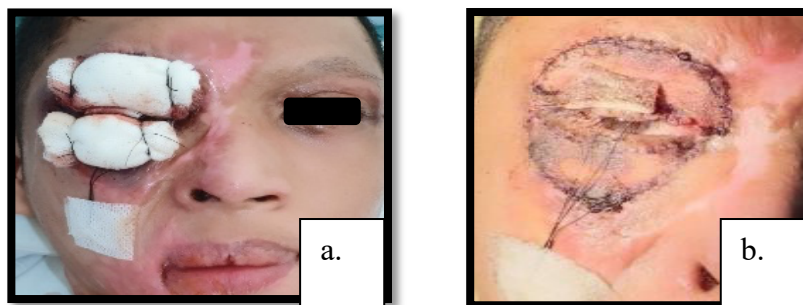


Figure 3. Photograph shows features 1 day after operation with bolster (a) and Frost suture (b)

On 1 week postoperative, lid positions were satisfying, no corneal exposure was marked, good lid motility was obtained and preserved mild medial ectropion on the inferior eyelid, but with no extensive corneal exposure. 6 months follow up grafts had good colour with no signs of necrosis, or discoloration which showed by figure 4.



Figure 4. Photograph shows features 1 week with preserved mild medial ectropion on the inferior eyelid (a) and 6 months after operation with lagophthalmos was not found (b) and (c)

DISCUSSION

The upper eyelid is responsible for moistening the cornea. Patients with eyelid burns should be examined daily, especially while asleep. When the patient is asleep the voluntary component of lid closure is lost and the cornea maybe partially exposed. Tarsorrhaphy was advocated for corneal protection in the past, but it cannot prevent lid retraction in the long term. Tarsorrhaphy is not a substitute for timely skin grafting. The optimal time to perform a skin graft on an eyelid for deep second or third degree burn injury is still controversial. Most surgeons suggest grafting as early as possible. Early skin grafting increases the risks of infection and complications. However, delayed skin grafting also increases the risk of eyelid hypertrophic scarring, asymmetry and other deformities that can lead to eyelid contractures and result in cornea exposure³.

Liu *et al.*, performed skin grafting at three days after burn injury. This prevented excessive exudation and contributed to skin grafting success and also prevented large and firm scar formation and further eyelid contractures in the future³. The benefits of the technique include a lower graft retraction rate, resulting in better corneal protection. Loosening and separating of the orbicularis muscle ensures that a big graft can be applied. This procedure makes an artificial fold on the graft, allowing extra skin for future graft contracture while still preserving the ability to close the eye adequately. Donor site should be gained by 5 mm of space by this technique (one-fifth longer than eyelid defect), which can elongate the graft by 10 mm for optimal results⁷.

Reconstruction of the cicatricial ectropion following face burns should have priority in

planning and management of further treatment, although usually that is hard to obtain in case of large affected skin areas⁸. Incision and skin release without eschar excision is recommended by some authors⁴.

If the orbicularis oculi been viable, it should be freed completely to avoid subsequent ectropion and scarring. Some authors advise for Frost suture placement to allow for skin stretching and prevention of scarring. For lower eyelid management, a subciliary incision from cantus to cantus, or extending, is preferable, followed by anterior lamella dissection, contracture release and scarring tissue ex-cision. After affected tissue debridement, time of grafting reconstruction should be balanced to avoid excess granulation and, thus scarring caused by delayed grafting time, or poor graft adherence caused by premature grafting⁹.

Periocular region is a favorable FTSG recipient area by virtue of its high vascularity. The usual donor sites for harvesting FTSG for the periocular area are upper eyelid, preauricular, postauricular, neck, clavicular, supraclavicular, and inner brachial area. Different sites yield different graft thickness. The thicker the graft, the less the potential for contracture. Other advantages include increase resistance to trauma overthin grafts and less distortion functionally and cosmetically¹⁰. Special care should be placed on the graft oversizing the defect, due to fact that FTSG contractures for at least a third¹.

There are reports in the literature on the surgical management of cicatricial lower eyelid ectropion with skin grafting in cases of burns, congenital and acquired skin abnormalities, prior blepharoplasties, postradiation scarring, and excision of eyelid tumors¹⁰. Strategies for repair of lower eyelid ectropion should attempt to anatomically address the etiology of the ectropion. A retrospective study by Marshall et al previously reported full-thickness lower eyelid shortening as the primary method of correcting lower eyelid ectropion¹².

Graft survival is uniformly high in studies to date, with graft failure rate (including partial and complete failure) ranging from 0% to 2%. Recurrence rate, on the other hand, is more variable depending on the underlying etiology. Rathore et al. reported graft contracture leading to lower eyelid ectropion in 5 patients (8% of lower eyelid cases of all etiologies), 3 of whom needed additional corrective surgery¹⁰.

The early complications seen in the first 2 weeks are mainly bleeding with hematoma formation beneath the graft, or infection. These complications may prevent graft adherence to the underlying wound bed, prolong the ischemic phase, compromise the graft's vascular supply, and result in graft failure. Late complications seen by 3 months are cicatricial ectropion and graft hypertrophy and contracture. The long term complications are mainly cosmetic or functional and result from color and texture mismatch, and hyper or hypopigmentation¹⁰.

In addition, any downward traction during the healing process of the graft or flap may exacerbate the ectropion caused by horizontal eyelid laxity. Lateral tarsal strip or canthopexy in combination with local transposition flaps from the upper eyelid may help treat horizontal laxity. However, care should be taken to ensure that there is enough skin in the donor site (upper eyelid) for adequate eyelid closure¹³. Z-plasty is applied for the treatment of small tractions and linear scars. This technique can be associated with a lateral canthal sling for enhanced anatomic results. Skin grafts are the treatment of choice for more important tractions. Full skin grafts are preferred to split-thickness skin grafts for correcting diffuse scars. Cicatricial ectropion is a complication that demands an adjusted and personalised surgical treatment¹⁴.

Once cicatricial changes begin in the eyelids, relentless and rapid deterioration of the patient's ocular status often ensues secondary to cicatricial ectropion and eyelid retraction, lagophthalmos, and corneal exposure. If tarsorrhaphies are used, they should always be more extensive than seems to be immediately necessary. Unfortunately, with progression of the cicatricial traction, even the most aggressive eyelid adhesions may dehisce. In the past, skin grafting was usually delayed until the cicatricial changes stabilized, but the early use of FTSG, amniotic membrane, and various types of flaps can effectively reduce ocular morbidity in select patients. Cicatrization may also be reduced with the early use of ablative fractional laser and wound modulators (5-fluorouracil)¹⁵.

Priorities in eyelid reconstruction are preserving eyelid function, developing a stable eyelid margin, ensuring adequate eyelid closure for ocular protection, maintaining adequate vertical eyelid height, creating a smooth, epithelialized internal surface, maximizing cosmesis and symmetry. Beside that, there are following general principles guide the practice of eyelid reconstruction : One may reconstruct either the anterior or the posterior eyelid lamella, but not both, with a graft; 1 of the layers must provide a blood supply (pedicle flap); direct the tension horizontally, while minimizing vertical tension; maintain sufficient and anatomical canthal fixation; match tissue similar in color and thickness to each other; minimize the defect area as much as possible before sizing a graft; request assistance from a subspecialist if necessary¹⁵.

If the defect is too large to be closed primarily, techniques utilizing advancement or transposition of local skin flaps may be employed. The flaps most commonly used are rectangular advancement, rotation, and transposition. Flaps usually provide the best tissue match and aesthetic result, but they require planning in order to minimize secondary deformities. Upper eyelid skin is often an acceptable option for lower eyelid anterior lamellar defect repair. The final texture, contour, and cosmesis are typically better with flaps as compared to skin grafts from sites other than eyelid skin. Anterior lamella upper eyelid defects

are best repaired with FTSG from the contralateral upper eyelid. Preauricular or postauricular skin grafts may be used, but their greater thickness may limit upper eyelid mobility. If flaps are not sufficient, lower eyelid defects are best filled with preauricular or postauricular skin grafts. If skin is not available from the upper eyelid or auricular areas, FTSG may be harvested from the supraclavicular fossa or the inner upper arm. Grafts should be slightly oversized, because contraction is likely to occur¹⁵.

CONCLUSION

Reconstruction for diffused ectropion by using FTSG and lid tightening are better option for correction of cicatricial ectropion. FTSG have minimal donor site morbidity with excellent graft survival rates with achieving good eyelid position and color match.

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