

Reconstruction of Lower Eyelid Fistula with the Combined Four Local Flaps: a Case Report and Review of Literature

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Introduction: Lower eyelid retraction or ectropion often is caused by trauma, infections, graft skin contractures, failed blepharoplasty, or other factors. This defect not only affects the cosmetic appearance of the lower eyelid but also leads to hypophthalmos. **Case Report:** Herein, we report a reconstruction of lower eyelid fistula following a trauma due to car accident with combined four local flap in a 26 year- old man. A review of the relevant literature is also presented. **Results:** Nine relevant articles were assessment and all of this article show the using flap for the correction of severe ectropion may be an appropriate treatment modality. **Conclusion:** Using of four combined flap is a good and safe method for correction of severe lower eyelid ectropion with good result versus using of this flaps alone

Keywords: Eyelid; Ectropion; Fistula; Reconstruction; Surgical Flaps

Introduction

Ectropion, an outward rotation of the eyelid margin, affects the lower eyelid and causes ocular irritation, conjunctival inflammation, and corneal exposure (1). The eyelid is located in the middle of the face. It not only affects the closing function of the eyelid but also plays an important role in the aesthetic subunit on the face (2). lower eyelid often is damaged by trauma, skin graft contracture failed lower eyelid blepharoplasty surgery thermal or chemical burns, mechanical or surgical trauma, scars, medications, sun damage, chronic inflammation, and involutional changes, (3, 4). These factors lead to full-thickness skin and muscle loss of the lower eyelid margin as well as conjunctiva contractures and vertical shortening and/or scarring of the anterior lamella of eyelid, which result in severe retraction or ectropion of the lower eyelid (5, 6). is the well-known prime principle of reconstruction and among various methods for correcting ectropion including skin grafts, a great variety of flaps such as facial rotation flaps, advancement skin flaps (5), island upper orbicularis muscle flaps (5, 6), island superficial temporal artery forehead flaps has been describe (7-9) Reconstruction of secondary ectropion after previous surgery is challenging. Traditionally, a superficial layer can be closed with a skin graft, whereas full thickness with larger than one-third of lid length needs local or distant flaps (10, 11, 12) each flap has its

advantages and disadvantages, and the surgeon has to decide and justify his flap selection. Flaps from the periorbital region seems to be a better option than a skin graft (13, 14). Although reconstruction with skin graft is technically easy postoperative care could be difficult from the point of adapting the graft to the recipient bed. Also, retraction of the grafts in the long term is a well-known factor that limits their usage Cicatricial lower lid.

Herein, we report a Reconstruction of Lower Eyelid Ectropion following a truma due to car accident with combined three local flap in 26 years old man.

Review of the literature

An electronic search was carried out in PubMed; Embase and Cochrane databases after screening nine relevant articles were chosen, The MeSH keywords were, ectropion, flap and, eyelid, the inclusion criteria were article about using flap for reconstruction of severe ectropion and the data extracted from the articles are categorized in Table1.

Case Report

A 26 year-old man patient was referred to department of oral and maxillofacial surgery at Taleghani University hospital in Shahid Beheshti University of Medical Sciences, Tehran, Iran. The patient had a motorcycle accident that caused sever pan

Table 1. Categorized papers reported using local flaps for reconstruction of lower eyelid ectropion

References	Number of patients	Reason of ectropion	Type of flap	Post op assessment
Jin An Cha <i>et al.</i> (2020)	7	Malignant skin lesion	Modified Tenzel flap	Completely correction
Eri Ishikawa <i>et al.</i> 2019	3	Trauma	Lazy-T flap	Completely correction
Ryuichi Azuma <i>et al.</i> 2018	11	Facial paralysis	vertical orbicularis oculi muscle flap	Completely correction
Seong H. Park <i>et al.</i> 2018	7	trauma	Laterally Based Orbicularis Oculi Myocutaneous Flap	Completely correction
Chun-Yu Xue <i>et al.</i> 2012	67	Trauma Burntumor	Paranasal Flap	Completely correction
Gholamreza Maghsodnia <i>et al.</i> 2007	15	Skin cancer	Bipedicled Myocutaneous Tripiier Flap	Completely correction
Jing-Hong Xu <i>et al.</i> 2007	11	Trauma	Bipedicle Orbicularis Oculi Flap	Completely correction
JUTTALIEBAU <i>et al.</i> 2006	58	Trauma, Tumor, Facial paralysis	Wedge excision, skin graft, local flaps	Incomplete correction
R. B. KELLOR <i>et al.</i> 1988	33	Trauma	Pedicle upper eyelid skin and muscle Flap	Completely correction

**Figure 1.** A-C) Clinical view and CT scan of patient immediately after trauma

facial fracture. The patient had suffered from Lefort 3 fracture, left comminuted ZMC fracture, NOE type 3 and unilateral mandibular body fracture (Figure 1 A-C). Clinical evaluation also revealed severe enophthalmus and hypoglobus in left eye and laceration of left eyelid. Visual acuity was detected to be normal in both sides. Bottom to up open reduction and internal fixation (ORIF) were performed for the patient through intraoral approach. Bicornal flap provide a thorough access to zygomatico-frontal area of the left orbit

(Figure 2). Cranial cortical bone was harvested with Fissure bur to reconstruct the orbital cavity where the inferior and middle wall were completely lost (Figure 3A). The recipient site was filled with Freeze Dried Bone Allograft (FDBA) (Hamanad saz baft Kish, Iran) and covered with titanium mesh (Jeil, South Korea) to protect the inner table from unwanted fracture (Figure 3B). The cranial bone was sectioned to several pieces and naso-orbito-ethmoidal (NOE) complex were tried to rebuild with the aid micro screws and microplates

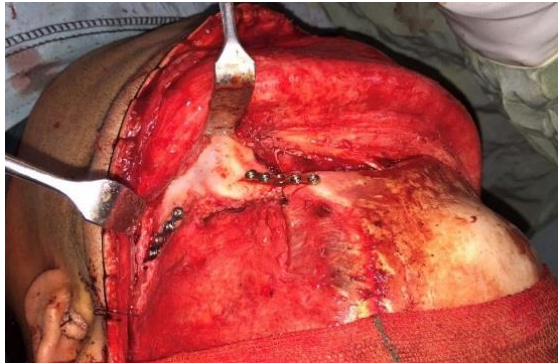


Figure 2. Bicoronal flap

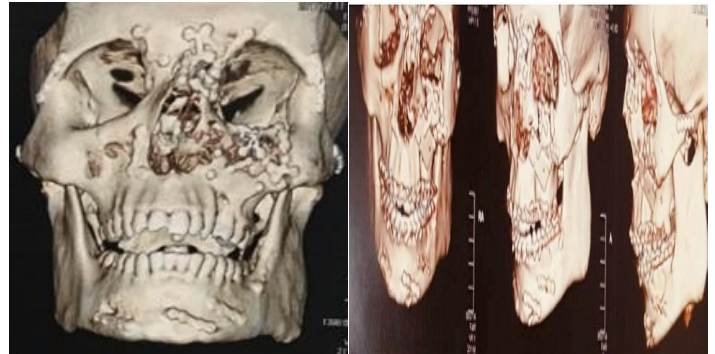


Figure 5. CT scan of patient after surgery

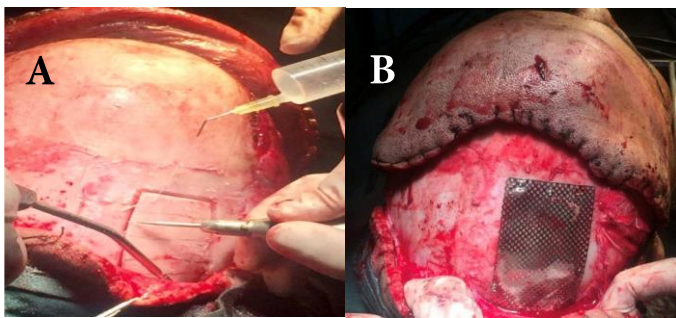


Figure 3. A-B) Harvesting of cranial bone graft



Figure 6. A-B) Rotation bilobed skin flap



Figure 4. Clinical view of patient 4 month after surgery



Figure 7. View of composite 3 layers defect

(Figure 3). The patient was referred to the department of oculoplastic surgery to reconstruct the avulsed through and through part of left lower lid. Four-month later, patient was referred to our clinic with the chief complaint of lower lid fistula and severe ectropion and exposed microplate beneath the avulsed skin (Figure 4). Conjunctival graft and pedicle skin graft could not provide normal lid function. Radiographic evaluation showed bony union in the anterior part of maxilla as well as medial and inferior wall of the orbit. The orbital volume was comparable with the right side (Figure 5). Three-layer reconstruction was planned for the patient. According to the previous scar in the area a rotation bilobed skin flap has been raised in supra SMAS plane (Figure 6A, B).

At this stage, the composite 3 layer defect could be seen in medial part of the left lower lid (Figure 7). Another deep rotational flap has been dissected in sub-SMAS plane with extreme caution to avoid injuring to the facial nerve. Deep temporal fascia has also been reached in the posterior part of the skin rotational flap. A finger like flap has been raised from the SMAS layer (Fist flap) and rotated to rebuild connective tissue beneath orbicularis muscle (Figure 8). Temporalis muscle has been released in anterior part as a pedicled rotational flap (Second flap) to reconstruct medial part of lower orbicularis oculi muscle (Figure 9A, B). A Skin only 10 mm diameter flap (Third flap), was separated from

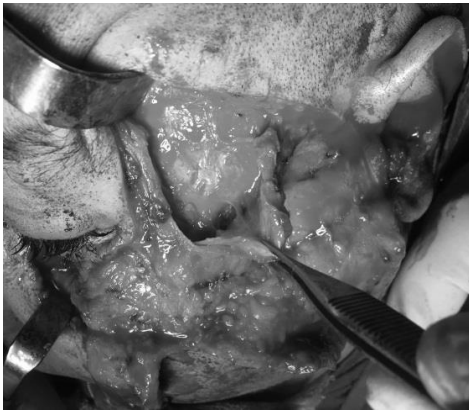


Figure 8. View of finger flap raised from the SMAS layer



Figure 11. Clinical view of patient immediately after surgery



Figure 9. A-B) Pediculated temporalis muscle flap



Figure 10. A-B) Pediculated upper eyelid flap (skin only)

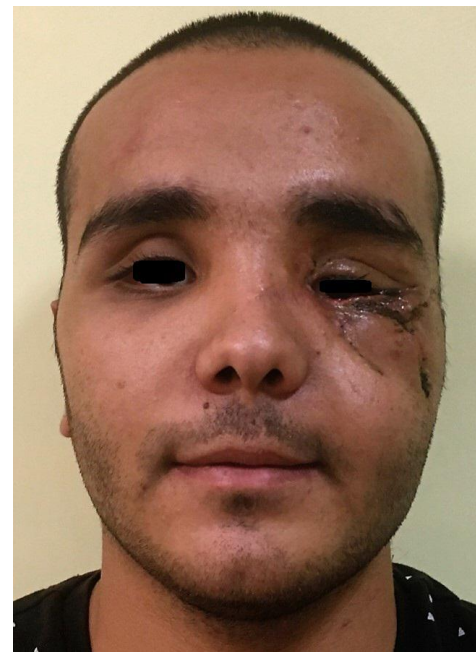


Figure 12. Clinical view of patient 1 year after surgery

the upper lid through an upper blepharoplasty incision and rotated and tunneled to restore the lower lid (Figure 10 A, B). Finally, bilobed chick rotational flap (Fourth flap) was advanced to close the defect. (Figure 11). One month follow up showed complete healing of lower lid fistula and turning severe ectropion to moderate one. One year follow up also showed a stable result (Figure 12).

Discussion

In this study we using four combined flaps for correction of fistula and severe ectropion in lower eyelid. In other study various method are describe for correction of ectropion (15-19),

in the 2020 years Jin An Cha and society use modified Tenzel flap for reconstruction of periorbital defect in seven patient, the modified Tenzel flap was shown to have several advantages over traditional procedures. Its principal advantages are its broad applicability, procedural simplicity, less noticeable scars, and effective prevention of complications such as lower eyelid ectropion and distal flap necrosis, and This flap can thus be considered to be a reliable and useful method for periorbital reconstruction (20) in the 2019 year Eri Ishikawa and society use Modification of the Lazy-T Procedure for Correction of Punctal Ectropion in 3 patient, and achieved good anatomical results with cosmetically acceptable postoperative appearances and no remarkable complication (21) in the 2018 years Ryuichi

Azuma and society use vertical orbiculari oculi muscle turn-over procedure for the correction of paralytic ectropion of the lower eyelid in 11 patient, and showed favorable outcome following surgery, with stable result. The orbicularis oculi muscle flap was an effective means of suspension and was able to maintain long-term traction tension. This procedure can therefore be considered a favorable treatment option for lower eyelid ectropion due to facial paralysis (22) in the 2018 park and society use Laterally Based Orbicularis Oculi Myocutaneous Flap for the Secondary Ectropion Correction in 7 patient. Satisfactory eyelid function and cosmetic appearance were obtained and no recurrence was found in 2-years follow-up. The method proved that the donor scar was well hidden in the supratarsal crease. Mild flap color change occurred in the early stages but disappeared gradually within 2 months after (23). In the 2012 years Chun-Yu Xue and society use paranasal flap for Reconstruction of Lower Eyelid Ectropion in 67 patient, and result was good with good eyelid function and a good color, contour, and texture match with the surrounding skin. Overall, the functional and cosmetic results were satisfactory, (2) in the 2011 year Gholamreza Maghsodnia and society use Bipedicled Myocutaneous Tripiier Flap to Correct Ectropion After Excision of Lower Eyelid Basal Cell Carcinoma in 15 patient, and the result was satisfied, and ectropion was corrected in all cases. There were no complications such as dry eye or corneal abrasion after operation. Also, we had not any case of ischemic flap (24) in the 2007 Jing-Hong Xu and society use Bipedicle Orbicularis Oculi Flap in the Reconstruction of the Lower Eyelid Ectropion in 11 patient and there is No problem of flap viability was encountered in any of the patients, and all healed well. Deformities were corrected, and evaluation showed satisfactory function and appearance during 0.5 to 6 years (average, 2 years) of follow-up evaluation. Eyelid malposition and bulkiness of the lower eyelid occurred in the early stages, but disappeared gradually about 3 months after the operation. There was no flap contraction, recurrent deformity, or significant donor site morbidity in the follow-up period. The incision scars were almost invisible (25). In the 2006 year JUTTA LIEBAU and society use wedge excision, skin graft, local flap for correction of ectropion in 58 patient, and the result was not good and Postoperative complications included incomplete correction of ectropion and Eight patients had to be reoperated. (26) In the 1998 year KELLOR and society use upper eyelid pedicle skin and muscle flap for correction of cicatricial ectropion in 33 patient and the result was good, and

The colour of the flap matches surrounding colour and texture of skin. Viability of the flap is guaranteed because of the excellent blood supply to the graft. There have been no problems with corneal exposure as preoperative assessment and Punctal eversion usually resolves following the procedure, but lid shortening or a lazy T procedure may be required (27). Our study showed the using four combined flap including rotation bilobed skin flap in smas layer, anterior Temporalis muscle pedicled rotational flap, pediculate upper eyelid flap (skin only) and bilobed chick rotational flap for reconstruction of lower eyelid fistula and severe ectropion, have a good technique for this defect, and the patients was satisfied and fistula and severe eyelid ectropion was resolvable and turning moderate one, in addition using of pediculated upper eyelid flaps leads to correction of ptosis of upper eyelid. One year follow up also showed a stable and good result and this procedure can be a valuable surgical option for reconstruction of full-thickness lower-eyelid defects.

Our results are completely matched with the other studies, and all of them show that the using flap is a good technique for correction of severe ectropion and fistula in lower eyelid especially when compare to other technic including skin graft, Wedge excision, and the texture, contour, and skin color of the repaired tissue is well-matched the surrounding tissues without secondary devitalization of the donor area, and combined of this flaps lead to the good and stable result versus using this flaps alone.

Conclusion

Using of four combined flap is a good and safe method for correction of severe lower eyelid ectropion with good result versus using of this flaps alone.

Conflict of Interest: 'None declared'.

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