



## FULL THICKNESS LOWER EYELID RECONSTRUCTION WITH LABIAL MUCOSA, CONCHAL CARTILAGE AND VY CHEEK ADVANCEMENT FLAP- A RETROSPECTIVE STUDY

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### ABSTRACT

**Objectives:** To assess efficacy and long term surgical outcome of lower eyelid reconstruction with labial mucosa, conchal cartilage and VY cheek advancement flap in patients with more than 75% full thickness lower eyelid defect.

**Material and Methods:** The study includes 20 patients (12 males and 8 females, mean age 51.95, range 42 to 63 years) that underwent surgery from February, 2018 to November, 2019. The most common etiology was trauma (60%), followed by neoplasm (basal cell carcinoma) (30%) and full thickness burn (10%). Eyelid defects were repaired in three layers as- innermost, labial mucosal graft middle layer, conchal cartilage graft and the outermost layer, VY cheek advancement flap.

**Results:** Mean hospitalization was 2.80 days. Patients were followed by both surgical and ophthalmic specialists weekly for first month, then monthly upto 6 months to assess surgical outcomes and patient satisfaction.

All grafts adhered completely. There was good lid symmetry, aesthetics, patient satisfaction and proper eyelid function. There was no ectropion and entropion of lid, flap necrosis, donor site morbidity and no recurrence in neoplasm cases. There was mild wound infection in 1 case, mild congestion in 2 cases, and mild edema in 3 cases which were treated conservatively.

**Conclusion:** This technique offers thin pliable skin, which blends well with the contour of the recipient site with superior soft tissue characteristics, predictable innervation for reestablishing local sensation, easy to harvest; all grafts can be dissected simultaneously. Hence, this technique provides good functional lid reconstruction with tissues similar to eyelid.

**KEYWORDS :** conchal cartilage; labial mucosa; V-Y advancement.

### INTRODUCTION

Eyelids are complex structures and pose a challenge for reconstruction. It is a bilamellar structure comprising of anterior and posterior lamella. The anterior lamella consists of skin and the orbicularis oculi muscle. The posterior lamella consists of the conjunctiva, tarsus, and the eyelid retractor muscles. The orbital septum can be considered a middle lamella and cannot usually be rebuilt. They play an important role in protecting the globe from trauma, excessive light, and in maintaining the integrity of tear films and moving the tears toward the lacrimal drainage system. [1]

“Reconstruction of an eyelid or even a part of it requires a minimum of three elements: an outer layer of skin; an inner layer of mucosa; and a semirigid skeleton interposed between them” as described by Mustarde.[2]

When patients presents with defects or lesions suspicious for malignancy involving the lower eyelid, it often becomes necessary to reconstruct considering the bilamellar anatomy of the eyelid in order to maintain appropriate function and provide adequate ocular surface protection. Factors such as the patient's age, degree of eyelid laxity, the location of the lesion within the lower lid, ocular/periocular status and the potential involvement of additional anatomical landmarks such as the punctum, canaliculus, and medial and/or lateral canthal tendons, should be taken into account when planning for surgery.[3]

As a general rule, if the involvement is <25% of the entire lower lid or only the anterior lamella is affected, a simple skin graft or direct reapproximation is recommended [4]. When dealing with larger defects, strategies can largely vary and the most appropriate reconstruction technique has to be chosen among the numerous ones available for example, Tenzel's lateral semicircular rotation flap[5], Hewes Tarsconjunctival flap – Horizontal tarsconjunctival transposition flap [6], Hughes Tarsconjunctival advancement flap [7], Mustarde's Marginal pedicle rotation flap [8], Callahan's Composite lid graft [9], Bridged advancement flap [10], Mustarde's cheek rotation flap [8], Rhomboid cheek flap, Free tarsconjunctival graft and myocutaneous advancement flap [11], Tarsconjunctival advancement flap, Lid switch flap[12], Temporal forehead transposition flap[13], Median forehead flap, etc.

The present article is aimed at introducing a simple yet reliable surgical technique using VY cheek advancement flap which is a random pattern flap richly supplied subcutaneously by branches of facial artery. Wide lateral undermining between the dermis and subcutaneous tissue allows upper advancement without tension and does not jeopardise

blood supply of the flap along with labial mucosal graft and conchal cartilage graft for the reconstruction of full thickness lower eyelid defect.

### MATERIALS AND METHOD

Between February, 2018 to November, 2019, a total of 20 patients with  $\geq 75\%$  full thickness lower eyelid defect underwent surgery. The study comprised 12 males and 8 females with an average age of 51.95 years (range 42–63). The lids were affected by trauma in 12 patients, basal cell carcinomas in 6 patients and burn in 2 patients.

All patients with any previous scar over the cheek, extensive injury over eyelid involving cheek in trauma cases and oral mucosal pathology were not included in the study.

Detail history and examination (Site, size and extent was assessed in case of tumor) of each patient was done followed by routine blood investigations and radiological investigations (to rule out underlying fractures in case of trauma).

Ophthalmic opinion was taken to rule out other ocular pathology.

After signing an informed consent, patients underwent surgery under general anesthesia. Following all aseptic protocols and using separate sets of instruments for intraoral and extraoral procedures markings and resection was done in all neoplastic cases (e.g. Figure 1a,b). The labial mucosal graft with the same size and shape as the defect in the palpebral conjunctiva is harvested from the inner side of the lower lip in a transverse manner. The donor site wound is closed primarily.

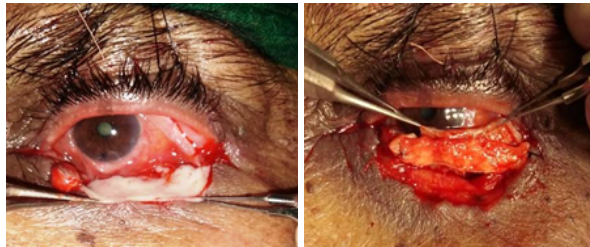


(a)

(b)

**Figure 1 (a) shows the pre-operative picture of the patient with the neoplasm involving >75% of the full thickness lower eyelid (b) shows the defect post resection of the neoplasm.**

Next, the conchal cartilage graft is harvested from the ipsilateral conchal lateral wall through a postauricular incision as a rectangular strip approximately 5–6 mm in width. The length of the cartilage graft is fit to the defect width. The conchal cartilage graft does not need to entirely cover the defect; it is sufficient to only interpose the defect. The donor site wound is closed primarily. Then, the harvested labial mucosa is thinned and is sutured to the defect margin using an absorbable suture from outside so as to avoid conjunctival and corneal irritation by sutures. Next, the conchal cartilage graft is thinned and sutured with non resorbable suture material to the stumps of the tarsal palate. If there is no residual tarsal palate due to resection, then the cartilage graft is fixed to the canthal tendon or the periosteum. Finally, the outer layer of the defect is covered by skin flaps from the adjacent region. Keeping in mind biogeometry of V Y advancement flap, V Y cheek advancement flap marking was done. Flap was elevated in standard fashion taking all necessary precautions. Flap inseting was done and the eyelid defect was repaired in three layers as- innermost, labial mucosal graft middle layer, conchal cartilage graft and the outermost layer, VY cheek advancement flap. (e.g. Figure 2 a,b,c,d).



(a) (b)



(c) (d)

**Figure 2 (a) shows innermost, labial mucosal graft (b) shows middle layer, conchal cartilage graft (c) shows markings for the VY cheek advancement flap (d) shows the outermost layer, VY cheek advancement flap.**

Same procedure for closure of full thickness lower eyelid defect was followed in case of trauma and burn patients.

**RESULT**

Twenty patients were found who fulfilled the inclusion criteria for the study (Table 1). Mean hospitalization was 2.80 days. Patients were followed by both surgical and ophthalmic specialists weekly for first month, then monthly upto 6 months to assess surgical outcomes and patient satisfaction. (e.g. Figure 3).

**Table 1: Shows the patient data, etiology, procedure and complications.**

CASE	AGE	SEX	ETIOLOGY	PROCEDURE	COMPLICATIONS
1.	42 Yrs	Male	Neoplasia	WLE+LMG+CCG+VY ADV	Mild congestion
2.	61 Yrs	Female	Full thickness burn(ectropion)	LMG+CCG+VY ADV	Mild edema
3.	46 Yrs	Male	Neoplasia	WLE+LMG+CCG+VY ADV	-
4.	60 Yrs	Male	Trauma	ORIF+LMG+CCG+VY ADV	Mild congestion
5.	63 Yrs	Female	Neoplasia	WLE+LMG+CCG+VY ADV	-
6.	44 Yrs	Female	Trauma	LMG+CCG+VY ADV	Mild edema
7.	62 Yrs	Male	Neoplasia	WLE+LMG+CCG+VY ADV	-
8.	47 Yrs	Male	Trauma	LMG+CCG+VY ADV	Mild infection
9.	48 Yrs	Female	Neoplasia	WLE+LMG+CCG+VY ADV	Mild congestion
10.	53 Yrs	Male	Trauma	LMG+CCG+VY ADV	-
11.	56 Yrs	Female	Full thickness burn(ectropion)	LMG+CCG+VY ADV	-
12.	47 Yrs	Male	Trauma	LMG+CCG+VY ADV	-
13.	49 Yrs	Female	Trauma	LMG+CCG+VY ADV	-
14.	54 Yrs	Male	Neoplasia	WLE+LMG+CCG+VY ADV	-
15.	45 Yrs	Male	Trauma	LMG+CCG+VY ADV	-
16.	55 Yrs	Female	Trauma	LMG+CCG+VY ADV	-
17.	49 Yrs	Male	Trauma	LMG+CCG+VY ADV	-
18.	42 Yrs	Male	Trauma	LMG+CCG+VY ADV	-
19.	57 Yrs	Female	Trauma	LMG+CCG+VY ADV	-
20.	59 Yrs	Male	Trauma	LMG+CCG+VY ADV	-

ORIF : open reduction internal fixation, WLE: wide local excision , LMG: labial mucosal graft, CCG: conchal cartilage graft, VY ADV : VY cheek advancement flap

the flap donor area, flap necrosis, tightness of cheek, recurrence in neoplasm cases, presence or absence of hypertrophic scar , infection and local hematoma.

All patients had satisfactory results according to the criteria established by the study. None of the patients had complications in the donor area.

There was mild infection in 1 case, mild congestion in 2 cases and mild edema in 3 cases which were managed conservatively.

**DISCUSSION**

Eyelids are of paramount importance for the protection of eyeball. The full thickness eyelid defects have been noted to cause corneal irritation, exposure keratopathy, ulceration and even vision loss [14]

The goals of eyelid reconstruction are to maintain the function of ocular surface and reproduce the color and texture of the eyelid, following the aesthetic subunit with minimal sacrifice.

A skillful operation should be used to repair the defective anterior and posterior lamella of eyelid simultaneously when the full-thickness defects exceed 25% of the eyelid's width.[15]



**Figure 3, shows satisfied patient on follow up.**

Eyelid repair was needed in all patients as a consequence of loss of tissue caused by resection of cutaneous neoplasia , trauma and burn.

Evaluation was done on the basis of , graft adherence ,ability to occlude the eyelids, ectropion & entropion , symmetry , morbidity of

Chondromucosal grafts from the nasal septum,[16,17] palatal mucosa grafts,[18] pedicled transfer of composite tissue from the palpebral[19],[20–22] or from the dorsum of nose,[23] and conchal cartilage grafts[24] have been reported for reconstruction of the inner layer of the eyelid. However, the applications of these methods are sometimes limited.

We used in our study conchal cartilage as a strip-shaped graft coupled with oral mucosa for inner layer reconstruction. The characteristics of the present technique are as follows: the procedure is very easy to perform, the harvested grafts are easily fabricated to fit defects with various sizes and shapes, and sacrifice of the donor site is minimal. Although the grafts should be harvested from the 2 sites involved in our technique, we did not encounter any problems.

The success of the mucosal graft overlying the grafted cartilage is probably due to angiogenesis caused by contact with living tissue at the surgical margin. In addition, we believe tears have positive effects. Tears are richly oxygenated and thus contribute to oxygen delivery to the superficial corneal layer. This mechanism is one potential factor allowing for survival of the grafted mucosa. [24]

## CONCLUSION

This technique offers a thin pliable skin, which blends well with the contour of the recipient site with superior soft tissue characteristics, predictable innervation for re-establishing local sensation, easy to harvest; all grafts can be dissected simultaneously.

### Labial Mucosal Graft:

- Thin and pliable
- Easy to harvest

### Conchal cartilage graft

- Epithelizes quickly
- Easy to harvest
- Pliable
- Stabilizes the rim of the eyelid

### VY Cheek Advancement Flap

- 1 stage procedure
- No dog ear to revise later
- No discarding of healthy tissue and the upper eyelid remains intact.
- Use of this technique does not preclude later use of rotation cheek flap, if necessary.
- Maintains innervation for local sensation
- Superior colour match

Hence, overall this technique has a low incidence of complications, and hence provides good results from both the functional and the aesthetic points of view.

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