SMJ- Sohag Medical Journal, Vol. 29 No(1) 2025

Print ISSN1687-8353 Online ISSN2682-4159

Original Article

Hughes Flap In Management Of Lower Eyelid Defects

Haitham Thabit Abd Al-Kareem Rashdan

Department of Ophthalmology, Faculty of Medicine, Sohag University, Sohag, Egypt

Abstract

Purpose : The Hughes tarsoconjunctival flap provides a means of reconstructing posterior lamellar defects of the lower eyelid. The aim of our study was to determine and assess the outcomes of this procedure that is used in eyelid reconstruction and to assess associated intra and post operative complications .

Methods : Twelve eyes were included in the study and were subjected to posterior lamella reconstruction by hughs flap . Palpebral fissure measurements , eyelid movements , tear break up time, degree of post operative scar and patient degree of satisfaction all were used to assess the anatomical and functional success of this procedure .

Results : Our study revealed both high anatomical and functional success of hughs flap

Conclusion : Hughes tarsoconjnvtival flap is an effective and convenient procedure that is indicated to manage up to near total lower eyelid defect with little intra operative and post operative complications.

Keywords : hughes flap , lid defects

DOI : 10.21608/SMJ.2025.348874.1523 **Received:** December 30, 2024 **Accepted:** January 19 , 2025

Published: January 30, 2025

Corresponding Author: **Haitham Thabit Abd Al-Kareem Rashdan** **E.mail**: haithamrashdan90@gmail.com

Citation: **Haitham Thabit Abd Al-Kareem Rashdan . et al** Hughes Flap In Management Of Lower Eyelid Defects. SMJ,2025 Vol. 29 No (1) 2025: 111- 116

Introduction

Eyelid reconstruction after tumor excision is designed based on the resulted length and width of the defect, Either the lateral or medial canthus is included or not , and whether the lacrimal passages are involved or not. Each surgeon will design a plan for the reconstruction that is based on his knowledge , experience, skills and preference with different eyelid reconstruction procedures. [(1)]

The eyelids are divided into anterior lamella (skin and muscle) and posterior lamella(tarsus and conjunctiva) . Both need to be considered and replaced for good structural integrity and better cosmesis results . In general, one of these lamellae needs to be reconstructed as a flap which allows good vascularity and a free graft can be used to reconstruct the other lamella. [(2)]

The Hughes tarsoconjunctival flap provides a mean that is suitable for reconstruction of posterior lamellar defects of the lower lid. This is considered a type of lid sharing procedure that allows lower lid reconstruction following defects up to 90 % of the eyelid. This type of flap includes advancing a flap of upper lid tarsus and conjunctiva down to the lower lid. This flap is measured and sized according to the defect size , Approximately at least 4 mm of upper lid height is left intact to maintain upper lid stability and avoid complications. [(3)]

Multiple choices are available for anterior lamella reconstruction , including transposition flap (including skin and muscle) from the upper eyelid or full thickness skin graft (that can be used from the same or opposite upper eyelid, supraclavicular area , or retroauricular area . If full thickness skin graft was choosen as a method of anterior lamella reconstruction , then it is better to include muller muscle in the tarsoconjunctival flap to improve vascular supply to the skin graft. [(4)]

This study aimed to evaluate the outcome of Hughes flap procedure for medium and large sized full-thickness defects of the lower eyelid and to assess intraoperative and post operative complications of this procedure .

Patients and Methods :

Twelve eyes of twelve patients were included in this prospective study, patients with lower eyelid lesions and candidate for surgical management were included in the study . All participants in our study signed a written informed consent that illustrated the procedure, possible intra and postoperative complications, the purpose of the study and their acceptance to participate in it., Approval of Sohag Faculty of Medicine ethical committee was fulfilled. This study complied with the tenets of the Declaration of Helsinki.

Preoperative evaluation of patients included : History , visual acquity assessment and slit lamp examination . Then detailed eyelid and lacrimal system examination was done , this included evaluation of the lid position , motility , lid laxity and the state of surrounding skin of the same eye and the contralateral eye .

Measurement of palpebral fissure dimensions (horizontal and vertical) was also done , tear break up time test and measurement of length and depth of of the lesion .

After tumor excision including safety margin , The residual lower lid defect was accurately measured by pulling the two cut ends toward each other. The upper lid was everted. A horizontal incision was made after marking on the conjunctival surface, about 4 mm above the lid margin lash line. The mark was extended upward toward the fornix from the both ends.

Then, incision (partial thickness) was made respecting the markings. This partial-thickness flap included the conjunctiva part of tarsus . The flap can be moved upward so that we can be pull it down to cover the lower lid defect ensuring there is no tension.

The mobilized flap was sutured to the inferior, lateral and medial borders of the lower lid defect with 6/0 absorbable vicryl with either interrupted or continuous knots as shown in (Figure 1).

Advancement skin flap was used in anterior lamellae reconstruction in 10 of our cases , It was brought from the lower or lateral aspect of the lower lid to fill the defect and replace the anterior lamellae .

Another option for anterior lamella reconstruction was to use rotational flap from the upper lax periocular skin (It was used in two cases) , continuous absorbable sutures were used between the myocutanous flap and tarsoconjunctival flap along the newly formed lower lid margin .

The tarsoconjunctival flap was separated and divided after 4-6 weeks (figure 2)

All patients were examined on the third post operative day after surgery. Then follow up visits were scheduled at the end of the first week, first month, 3rd month and the 6th month. Flap division was done after 4 to 6 weeks following the primary procedure

After flap division , patients were assessed as regard the following : Horizontal and vertical palpebral fissure length , assessment of eye lid motility , the anterior and posterior flaps state , tear break up time test , documentation of postoperative complications including flap necrosis, lid malpositions and any tumor recurrence , assessment of the post operative scar and patient satisfaction after surgery .

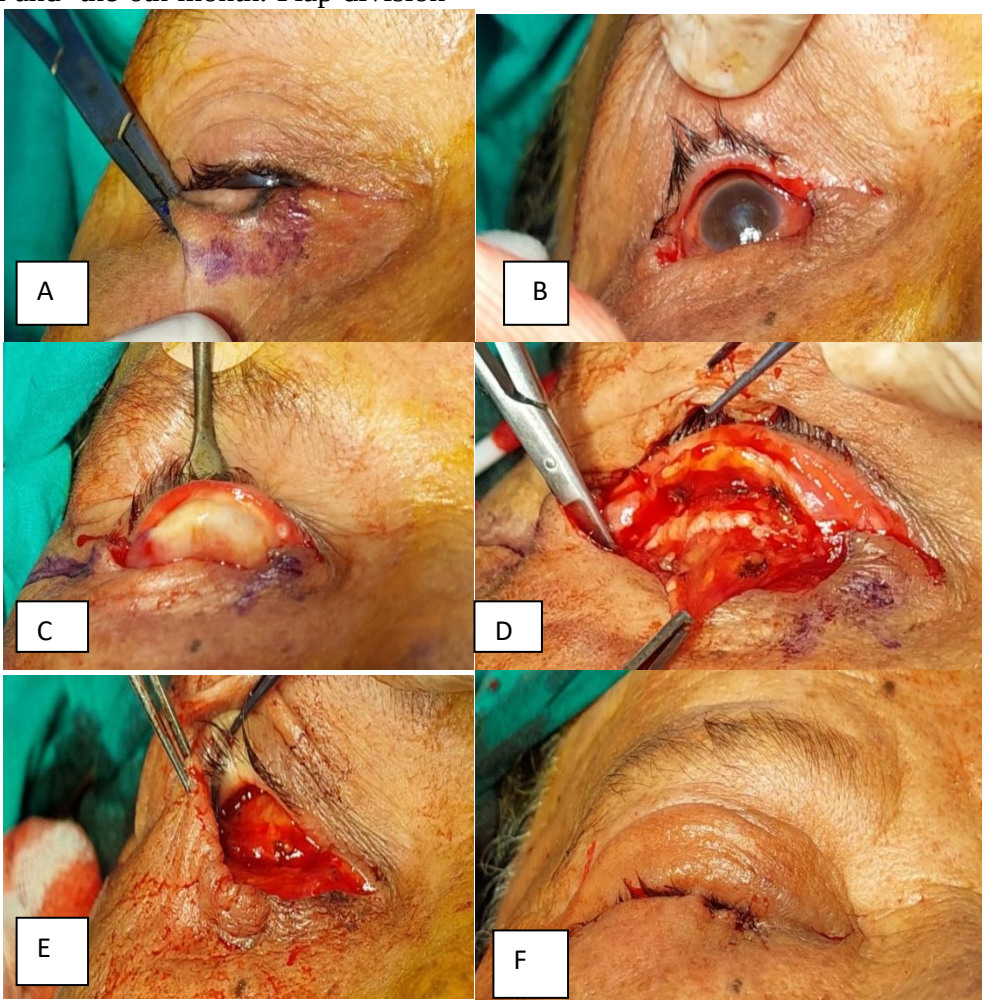

Figure 1 showing reconstruction of large lower lid defect by tarso-conjunctival flap from the upper lid and advancement myocutanous flap.

A)Lower lid basal cell carcinoma , B) The lid defect following lesionexcision with safety margins, C) Desmarres retractor was used for upper lid eversion and marking of the conjunctival incision was done , D) The tarso-conjunctival flap was moved down to manage the lower lid defect , E) Advancement flap was used to manage the anterior lamella , F) The defect after reconstruction.

Figure 2 showing another patient who was subjected to hughs flap reconstruction and division of the flap after 6 weeks from the first operation.

Results

The change in palpebral fissure: The mean pre operative vertical fissure height was 8.2 mm. that changed to 9 mm. in post operative follow up visits with no significant change.

The mean pre operative transverse palpebtal fissure width was 27.5 mm. and changed to 28.5 mm. in post operative follow up visits with also no significant change between pre or post operative measurements or even between post operative measurements and the other eye.Eyelid motility :Eyelid opening and closure was documented to be normal in 10 patients with good eyelid motility and adequate eye closure . 2 eyes were asscociated with inadequate opening in the early post operative period following flap divisionmostly due to associated lid edema that improved to normal during follow up period.

Complications included one case that was associated with mild degree of ptosis , another case was associated with epiphora .

The scar of surgery was minimally seen in 7 eyes , visible scar in 4 eyes and hypertrophic scar in one eye .

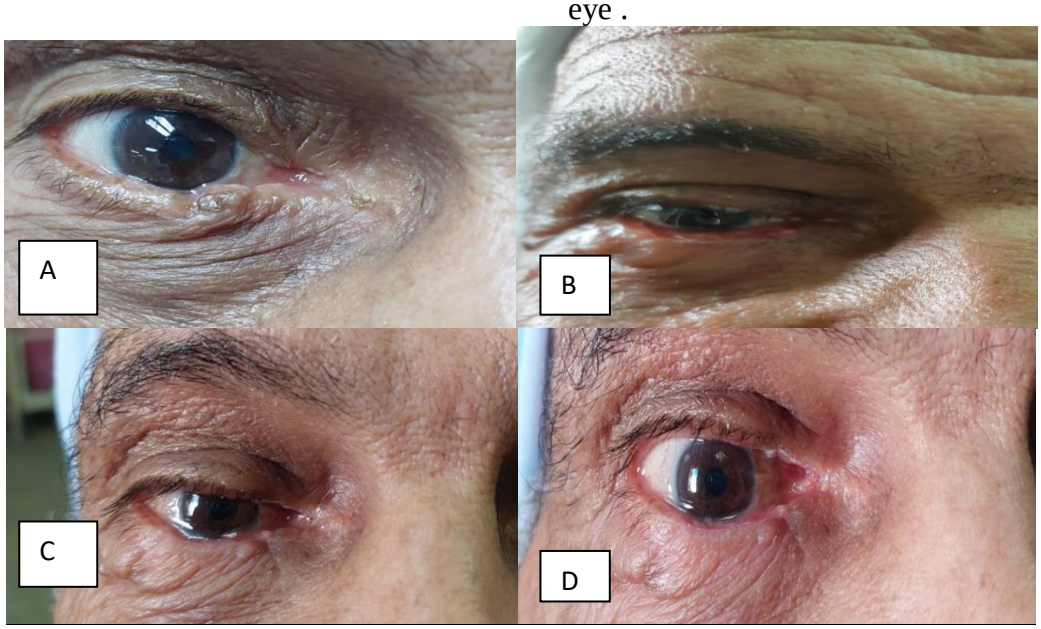

Figure 3 shows A) 66 years old male with right lower lid basal cell carcinoma , Reconstruction was done by hughs flap and skin advancement flap ,B) post operative photo after flap division showing narrowing of palpebral fissure in early post operative period , C) post operative photo after 1.5 month ,D) Improvement after 6 months follow up.

Discussion

The Hughes flap is a procedure that is used in lower eyelid reconstruction, especially for central lid defects with residual medial and lateral \tarsus. [5]

In our study 12 cases were subjected to posterior lamella reconstruction by Hughes flap , anterior lamella in these cases were reconstructed by advancement flaps except two cases at which rotational flap were used . Post operative assessment of all cases after division of the flap revealed little changes in palpebral fissure mesurements , one case showed decrease in vertical fissure height and some degree of ptosis , patients were moderately to highly satisfied with the final aesthetic result .

In atudy by McKelvie J et al that evaluated hughes flap as a method of eyelid reconstruction , postoperative aesthetic appearance was satisfactory in 91% of their patients. Mean follow-up was 7 months in thei study and flap division was done around 37 days from the primary procedure, [6] That was similar to our study at which follow up was 6 months and flap division was after 4-6 weeks .

Fourteen percent of patients in their study had complications which required another surgical intervention . Patients with significantly shorter duration of flap division are more liable to develop lid retraction. There was no statistical difference between flap width and complications. Their study suggests that this method of reconstruction is useful and practical in a range of lower eyelid defects with good functional and cosmetic results. [6]

Another study by Meryem A. et al about the outcomes of hughes tarso-conjunctival flap , in their study the anterior lamella was reconstructed with advancement flaps and full-thickness skin grafts in 58.6% and 41.4% of patients, respectively. The success the intervention was not significantly affected by the different methods of anterior lamellar reconstruction. Functional and cosmetic outcomes in their study were 96.6% and 94.8%, respectively. [7]

In our study we preferred advancement and rotational flaps for anterior lamella reconstruction with hughes flap over the use of skin graft due to the advantages of flaps , their better colour match and avoidance of graft associated possible poor vascular supply and donor site associated morbidity and scar .

Advancement flap was the most commonly used technique in our study to reconstruct the anterior lamella . We preferred advancement flaps as the peri-orbital area is an area where advancement flaps can survive very well due to the high and good blood supply in the head and neck . The lid margin was stable initially and remains so till the end of the study .

The skin graft can be considered when the local anterior lamellar defect is large and the surgeon wants to avoid facial scars due to the use of different flaps. Skin grafts are associated with contractility, and a premature incision can lead to lower eyelid retraction. Compared to the surrounding normal skin coloure and texture , The graft may have poor match which can lead to patient dissatisfaction

Complications of a Hughes flap include possible associated eyelid malposition, such as ectropion, conjunctival ectropion, or upper lid retraction. The risk of lower eyelid ectropion can be minimized during the flap separation in second stage by performing a lower lid tightening procedure. The risk of upper eyelid retraction can be reduced by dissecting Müller muscle away from conjunctiva and avoiding advancing it with the tarsoconjunctival flap during the first stage.

Another important disadvantage of the Hughes procedure is that the operative eye is not exposed for about 4-6 weeks until flap division, which is extremely inconvenient and unsuitable for single eyed patients with blindness in the other eye.

Conclusion

Hughes tarsoconjnvtival flap is an effective and convenient procedure that is indicated to manage up to near total lower eyelid defect with little intra operative and post operative complications .

References

1. Orbit, Eyelids, and Lacrimal System, section 7, American Academy of Ophthalmology, 2011.
2. Bowman PH, Fosko SW, Hartstein ME. Periocular Reconstruction Semin Cutan Med Surg. 2003;22:263–72
3. JJ Dutton (Ed.), Atlas of Oculoplastic and Orbital Surgery (2nd ed.), Lippincott Williams & Wilkins (2018), pp. 210-213
4. KS Lee, JO Kim, NG Kim, YJ Lee, YJ Park, JS Kim , A comparison of the local flap and skin graft by location of face in reconstruction after resection of facial skin cancer , Arch Craniofac Surg, 18 (2017), pp. 255-260
5. Kopecky A, Rokohl AC, Heindl LM. Techniques for the Reconstruction of the Posterior Eyelid Lamella. Klin Monbl Augenheilkd 2018;235:1415-28.
6. McKelvie J, Ferguson R, Ng SGJ. Eyelid reconstruction using the ‘’Hughes’’ tarsoconjunctival advancement flap .ORBIT 2017;36(4):228-33.
7. Meryem Altin Ekin , Seyda Karadeniz Ugurlu .Impact of the type of anterior lamellar reconstruction on the success of modified Hughes procedure Bras. Oftalmol. 2020, 83 (1):11-18.