ISSN: 0975-3583,0976-2833 VOL16, ISSUE 01, 2025

MUSTARDE'S FLAP - A WORKHORSE FLAP FOR RECONSTRUCTION OF DEFECTS FOLLOWING BASAL CELL CARCINOMA EXCISION OF LOWER EYELID

Dr.Sangeeta Patil (Shisode)[1], Dr Chaitanya Gulab Patil[2], Dr.Sarita Arun Kagde[3], Dr Vishal Sarjerao Lokhande[4]

[1]Head of Department and Associate Professor, Department of Ophthalmology, Government Medical College and Cancer Hospital, Chhatrapati Sambhaji Nagar
[2]Assistant Professor, Department of Plastic & Reconstructive Surgery, Government Medical College and Cancer Hospital, Chhatrapati Sambhaji Nagar
[3]Assistant Professor, Department of Ophthalmology, Government Medical College and Cancer Hospital, Chhatrapati Sambhaji Nagar 431001
[4]Junior Resident -1, Department of Ophthalmology, Government Medical College and Cancer Hospital, Chhatrapati Sambhaji Nagar 431001

Abstract: **Background:** Basal cell carcinoma (BCC) is the most common malignant skin tumor arising from pluripotent cells present in basal layer of the epidermis. Surgical excision is the mainstay treatment modality. The Mustardé flap is a popular choice for reconstructing of lower eyelid, as it meets the requirements of an ideal cutaneous flap. **Method**: This is a retrospective review of lower eyelid BCC, reconstructed with MUSTARDE FLAP following excision from 2014 to 2024 at our institute. Total of 17 patients males (7) and females(10) with age ranging from 50 to 82 years underwent MUSTARDE FLAP for reconstruction during the period were included in the present study. **Result**: The postoperative complications, including recurrence, ectropion, epiphora, wound dehiscence and flap necrosis, were recorded. Inspite of the complexity of lower eyelid reconstruction, satisfactory aesthetic and functional results were achieved. **Conclusions**: The MUSTARDE FLAP enables to achieve tension-free defect closure after tumor resection, with good functional and aesthetic outcomes. It a reliable and effective reconstructive surgical technique for oncologic reconstruction of BCC.

Correspondence author:
Dr Chaitanya Gulab Patil, Assistant Professor, Department of Plastic & Reconstructive Surgery, Government Medical College and Cancer Hospital, Chhatrapati Sambhaji Nagar.
Email: drchaitanya256@gmail.com

Received Date: 02 January 2025 Revised Date: 10 January 2025
Accepted Date: 22 January 2025

INTRODUCTION

BCC is the most common skin cancer, and it accounts for >90% of all malignant skin tumours of the head and neck and 75% of non-melanoma skin cancers [1,2]. The most common region affected are the head and neck due to exposure to ultraviolet radiation and mainly occurs in the elderly due to cumulative exposure during their lifetime [1,2] The lower eyelid is one of the most common sites of basal cell carcinoma in the head and neck [3]. Basal cell carcinoma (BCC) is one of the types of malignant skin tumors, originating from pluripotential cells in the basal layer of the epidermis. BCC is usually slow-growing, locally destructive and rarely metastasizes because its growth is highly dependent on the stromal connective tissue at the location of the growing tumor.(4, 5) BCC is more commonly found in individuals with light

ISSN: 0975-3583,0976-2833 VOL16, ISSUE 01, 2025

complexion than those with darker complexion. It is also more common in adults aged above 40 years old, with a higher incidence in men than women.(4, 6)

The main modality in the management of BCC of the eyelid is excision with free margin followed by reconstruction. The goals of reconstruction are to replace each anatomical layer with a like substitute, in order to maintain uniform apposition with the upper eyelid, normal lacrimal pumping system with an optimal layer of tear film, which at the same time should be aesthetically acceptable. The various reconstructive options are primary closure, local rotation advancement flaps, pedicled flaps or free grafts. However Reconstruction of defects which are full-thick or extending beyond two-thirds of eyelid are challenging and often requires staged procedures causing handicap till completion of the procedure and donor site morbidity. Therefore, a reconstructive option that transcends these limitations is favourable. To overcome this difficulities and achieve good functional and aesthetic result explored a versatile flap, first described by Mustardé in 1980, for reconstruction of moderate sized full thickness lower lid defect [6](Mustarde JC (1980) Repair and reconstruction in the orbital region. Churchill Livingstone, Edinburgh) . Thus the aim of our study was to review the role of Mustarde's flap for post BCC excision and lower eyelid reconstruction, its clinical outcomes and complications.

Materials and methods

The paper presents retrospective analysis of data of patients with histopathologically confirmed BCC in period from 2014 to 2024. Age gender of the patients, size, localization, and their early and late complications were analyzed. Follow up range for a period of three months to two years. Before surgical repair of the tumour the following basic principles of eyelid reconstruction were kept in mind[8]. Data on patient demographics, diagnosis, defect type, and outcome were collected. All patients underwent a wide excision of the lesion followed by immediate reconstruction by Mustarde 's flap.All patient were operated in general anesthesia . The flap was elevated superficial to the superficial musculoaponeurotic system (SMAS) in the parotid region and deep to the platysma in the neck.

RESULTS: Patients undergoing reconstruction with a MUSTARDE flap at our institution, during the period from January 2014 to November 2024, were included, without consideration of age or comorbidity. Total of 17 patients with male [9] and female [10] were included in study. The age ranged from 50 to 82 years, with a mean age of 65.5 years. BCC occurred in the lower lid in all cases within the periorbital area. Right eyelid involved in 5 cases and left eyelid involved in 12 cases.On histopathological examinations of the specimen, patients had basal cell carcinoma. The follow-up range from 03 months to 24 months]. No local recurrence was seen in any patient. 1 PT ECTROPION WHICH REQUIRED CORRECTION WITH FTSG.2 patients developed MINOR wound complications of edge necrosis WHICH HEALED PRIMARILY. No facial nerve injury was observed. The match of skin colour and texture was excellent. All patients were pleased with the Cosmetic results outcome. Preoperative and postoperative photographs representative patients are shown in Figures 1-2-3.

DISCUSSION

BCCs generally occur in persons older than 50 years, but not much is known about its incidence in persons younger than 40 years.[10] In our study also the range of patients having BCC was 50 to 82yrs, similar to as reported by previous studiesThe diagnosis of BCC in this patient was based on clinical and histopathological examinations. According to the literature, BCC tends to appear on sun-exposed areas, particularly the face and neck region, which accounted for around 80% of BCC cases, while the rest are usually found on the truncal region and lower extremities(2). A study conducted in Indonesia suggested the predilection of BCC on cheeks and forehead in 50% of cases, nose and nasal folds in 28% of cases, orbits and surrounding

ISSN: 0975-3583,0976-2833 VOL16, ISSUE 01, 2025

areas in 17% of cases, and the lips in 5% of cases(9). CC is often found at the age above 40 years old (2).

As regards the distribution of BCC(11), found that 62.1% of their patients were females. Kumar sumir etal (12)found 63.9% females.Our findings confirm these data with 59% of our patients being female

Complete excision surgery technique is considered the gold standard for BCC management histopathological with control examination.6,7,11 institution, In of our complete excision surgery is a standard procedure for this condition, routinely conducted before flap or graft(13). The goals of BCC excision are R0 resection with free margins of 4–5 mm from affected margins of the lesion including induration if any. Although total lesion removal is the overarching goal of BCC excision, esthetic reconstruction is paramount when dealing with post-excisional defects over the face.(14, 15,16). Minimizing disfigurement by reducing displacement of facial structures during reconstruction, replacement of like tissue from same esthetic unit, restoration of function to maximum are the primary goals of reconstruction in facial soft-tissue defects.(17)

The basic aim of reconstruction is to restore the anatomy and function of eyelids. Color match is important for cosmetic appearance of anterior lamellae. There are varieties of techniques to reconstruct eyelid defects after bcc excision. Type of technique depends upon site and size of defect and surgeon's experience. Mustarde's flap provides high functional and aesthetic quality in reconstruction.(18) It was first described by Mustarde's in 1971and then by Callahan & Callahan (1980). Understanding this flap design and versatility is important for all surgeons involved in the treatment of tumours in the orbito-palpebral area. (19)

Indications of flap include the large size of the defect and the need for excellent cosmetic outcome.11,13,15 Rotation flap is created using adjacent tissue that is rotated to close a defect(16). The flap rotation technique was chosen to reduce ectropion and scarring on the lower lid. The incision can be hidden so that it does not cause significant scarring. An advancement flap is carried out to resolve skin defects through tissue mobilization along linear directions(20).

The utilization of a Mustardé rotational cheek flap to reconstruct the anterior lamella of the lower eyelid satisfies the fundamental requirements of an ideal cutaneous flap: the skin must be of superior color and texture, and it must be transferred into position during a single surgical procedure. Since its initial documentation by Mustardé in 1971, the advancement rotation temporo jugal skin flap has been predominantly employed to remove cheek, temple, and inferior eyelid tissue.

The notable complications of the Mustardé flap reported in literature are sagging of the lower eyelid and ectropion [24].

However, three vital strate gies may be employed to ameliorate them. The first is to use a composite septal cartilage-mucoperichondrium graft that enhances the stability of the remnant floppy lid. The second strategy that is routinely employed is the use of hitching sutures between the undersurface of the Mustardé flap with periosteum along the orbital rim to avoid sagging and con sequent ectropion [25].

Thirdly, high arching of the skin flap till the level of the eyebrow in conjunction with hitching sutures reduces these complications. The potential advan tages of the modified Mustardé flap are reconstruction of moderate to large full thickness defects, optimal skin colour and texture match, dependable robust vascular supply and excellent cosmetic outcome [26].

Careful dissection techniques should be employed to remain in the correct plane while raising the flap to avoid button-holing of skin (too superficial) or damage to branches of facial nerve (too deep) [27]. Gentle handling of the medial edge of the skin flap is critical to avoid necrosis and wound dehiscence.

ISSN: 0975-3583,0976-2833 VOL16, ISSUE 01, 2025

Conclusion

Mustarde's flap provides very good option whenever there is a need to reconstruct the lower eyelid after BCC excision. It is a simple flap that can be mastered very easily and the associated minor complications can also be managed very easily. Patient's satisfaction is also very high. Overall, this flap has an excellent functional and cosmetic outcome and may serve as the workhorse for lower lid reconstruction

Funding

This work did not receive any grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest

There are no conflicts of interest to declare by any of the authors of this study.

Figure 1: BCC of lower eyelid

Figure 2: a-tumour; b-defect after tumour excision; c-Plane of Mustarde flap; d-final suture line of mustarde flap

ISSN: 0975-3583,0976-2833 VOL16, ISSUE 01, 2025

Figure 3: a-tumour; b-defect after tumour excision; c-Plane of Mustarde flap; d-final suture line of mustarde flap

Figure 4: ectropion correction done with Post-auricular full thickness skin graft.
a-ectropion of lower eyelid; b-eye closure after ectropion correction; c-eye opening after correction

References :

1. Goldman A, Wollina U. Defect closure after successful skin cancer surgery of the nose: a report of 52 cases. Acta Der matovenerol Alp Pannonica Adriat. 2020 Dec;29(4):209-214. PMID: 33348941.
2. Rao J, Deora H. Surgical excision with forehead flap as single modality treatment for Basal cell cancer of central face: single institutional experience of 50 cases. J Skin

ISSN: 0975-3583,0976-2833 VOL16, ISSUE 01, 2025

Cancer. 2014;2014:320792. doi: 10.1155/2014/320792. Epub 2014 Jan 28. PMID: 24616811; PMCID: PMC3927749.
3. Salomon J, Bieniek A, Baran E, Szepietowski JC (2004) Basal cell carcinoma on the eyelids: own experience. Dermatol Surg 30(2 Pt 2):257–263)
4. Tang JY, Epstein EH Jr., Oro AE. Basal cell carcinoma and basal cell nevus syndrome. In: Kang S, Amagai M, Bruckner AL, et al. editors. Fitzpatrick's dermatology in general medicine. 9th ed. Singapore: McGraw-Hill; 2019. p.1884-900
5. Marzuka AG, Book SE. Basal cell carcinoma: Pathogenesis, epidemiology, clinical features, diagnosis, histopathology and management. Yale J Biol Med. 2015; 88(2): 167-79.
6. Emiroglu N, Cengiz FP, Kemeriz F. The relation between dermoscopy and histopathology of basal cellcarcinoma. An Bras Dermatol J. 2015; 90(3): 351-6.
7. Lewin JM, Carucci JA. Advances in the management of basal cell carcinoma. F1000 Prime Reports. 2015; 7:53.)
8. Rai P, Shah SIA, Kumar M, Kumar A, Khan MM, Iqbal S. Surgical excision and reconstruction of primary basal cell carcinoma of eyelid. Pak j ophthalmol. 2009;25(1):1-8.
9. Pramuningtyas R, Mawardi P. Gejala klinis sebagai prediktor pada karsinoma sel basal [In Indonesian]. 2012;4(1):33-6.)
10. Christenson LJ, Borrowman TA, Vachon CM, Tollefson MM, Otley CC, Weaver AL, et al. Incidance ofbasal cell and squamous cell carcinomas in a population younger than 40 years. JAMA 2005;294:681 90
11. George RM et al, [George RM,Nazeer M,Criton S,AbrahamUM,Francis A.Clinicopathological Analysis of Basal cell carcinoma -A retrospective study.J Skin Sex Transm Dis 2021;3(1):51-5]
12. Kumar Sumir, Mahajan Bharat, Bhushan Kaur Sandeep, Yadav Ashish, Singh Navtej, Singh Amarbir, As study of Basal Cell Carcinoma in South Asians for Risk Factor and Clinicopathological Characterization:An Hospital Based Study, *Journal of Skin Cancer*, 2014,173582,9 pages,2014.https://doi.org/10.1155/2012/173582]
13. Puig S, Cecilia N, Malvehy J. Dermoscopic criteria and basal cell carcinoma. G Ita Dermatol Venereol 2012: 147(2); 135-40.
14. Kim KP, Sim HS, Choi JH, et al. The versality of cheek rotation flaps. Arch Craniofac Surg. 2016;17:190-7.
15. Grossman D, Leffell DJ. Squamous cell carcinoma. In: Goldsmith LA, Katz SI, Gilchrest BA, Paller AS, Leffel DJ, Wolff K, editors. Fitzpatrick's dermatology in general medicine. 8th ed. Singapore: McGraw-Hill; 2012. p.1283-94.)
16. Grosfeld EC, Smit JM, Krekels GA, van Rappard JH, Hoogbergen MM. Facial reconstruction following Mohs micrographic surgery: A report of 622 cases. J Cutan Med Surg 2014;18:265-70)
17. Tamaş C, Pintilie CT, Atănăsoae IV, Corduneanu AM, Dabija I, Olaru FŞ, et al. Surgical reconstruction of post-tumoral facial defects. Rom J Morphol Embryol 2018;59:285-91.)
18. A.Arjun, R.K.Chittoria, M.T.Friji, D.P. Mohapatra, D.S.Kumar, N.Vijayaraghavan, B.S.Bibilash, P.Sandhya. Basal cell carcinoma of the lower eyelid: reconstruction with the mustarde's flap, 2014;4(1).
19. Grosu O R, Susanu S P, Ghetu N, Pleptu V, Pleptu V. 2007. TMJ,57(4);249-254)
20. Grossman D, Leffell DJ. Squamous cell carcinoma. In: Goldsmith LA, Katz SI, Gilchrest BA, Paller AS, Leffel DJ, Wolff K, editors. Fitzpatrick's dermatology in general medicine. 8th ed. Singapore: McGraw-Hill; 2012. p.1283-94.

ISSN: 0975-3583,0976-2833 VOL16, ISSUE 01, 2025

21. Lanoue J, Goldenberg G. Basal cell carcinoma: A comprehensive review of existing and emerging nonsurgical therapies. J Clinical Aesthetic Dermatol. 2015. 9(5): 26 36.
22. Laude A, Yipp CC. The role of advancement flaps in peri-ocular reconstructive surgery. Ann Acad Med Singapore. 2007;36(suppl): 27-30.
23. Bradley DT, Murakami CS. Reconstruction of the cheek. In: Baker Shan R, editor. Local flaps in facial reconstruction. Philadelphia: Mosby Elsevier;2007. p. 525-56.)
24. Callahan MA, Callahan A (1980) Mustardé flap lower lid recon struction after malignancy. Ophthalmology 87(4):279–286)
25. Robinson JK (2003) Suspension sutures in facial reconstruction. Dermatol Surg 29(4):386–393)
26. Callahan MA, Callahan A (1980) Mustardé flap lower lid recon struction after malignancy Ophthalmology 87(4):279–286)
27. Callahan MA, Callahan A (1979) Ophthalmic Plastic and Orbital Surgery. Birmingham, AL, Aesculapius Publishing, ; 3–32)
28. Marzuka AG, Book SE. Basal cell carcinoma: Pathogenesis, epidemiology, clinical features, diagnosis, histopathology and management. Yale J Biol Med. 2015; 88(2): 167-79