Outcome of Mustarde's flap for post basal cell carcinoma excision and lower eyelid reconstruction: an analysis

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Abstract

AIM AND OBJECTIVE:

To review the role of Mustarde's flap for post basal cell carcinoma (BCC) excision and lower eyelid reconstruction, its clinical outcomes and complications.

METHODS:

The Mustarde's rotational cheek flap has been used to reconstruct the lower eyelids of 16 patients during a period of 7 years from 2008 to 2015 in proven cases of BCC.

RESULT

Mustarde's flaps have very high functionally as well as cosmetic acceptability with minimum patient morbidity. The most frequent complications were downward contraction and sagging of the flap and ectropion of the lid margin.

CONCLUSION

To prevent sasgging, the zygomatico-cheek flap must be carefully designed, rotated, and sutured as high as possible so that immediately postoperatively, the palpebral fissure is only a narrow slit.

KEYWORDS: mustarde's flap, basal cell carcinoma, lower eyelid reconstruction, contraction of flap, sagging

Introduction

The incidence of eyelid malignancies is reported to be increasing. Though their global distribution is varied and under- characterised, 90% of the reported malignant eyelid tumors are basal cell carcinoma (BCC) while other malignant forms like sebaceous cell carcinoma and squamous cell carcinoma (SqCC) are rare.[1]

BCC has a predilection for the periorbital region, which is a special, prominent, cosmetic, functional area to protect the eyeball. For SqCC and melanoma, extensive resection with reconstruction is performed. In contrast, for BCC, resection is often confined to a small to medium-sized area, necessitating higher-quality reconstructive surgery.[2]

Due to low mortality rates because of BCC, it is highly prevalent, and so it constitutes a significant and costly health problem.[3,4] BCC is a slow-developing malignant skin tumor,

infiltrating the adjacent tissues, and ultraviolet (UV) radiation is said to be one of the most important causal factors of BCCs. Exposure to ionizing radiation, exposure to chemical carcinogens, and possibly infection with human papilloma viruses, ethnical differences, type of skin, chronic irritation, chronic inflammation, burns, skin lesions, immunologic, and genetic factors are the other causal factors.[5,6]

Haryana is an agriculture based state. Almost all farmers working in fields exposed to sunlight for full day. So incidence of BCC especially on sun expose area like face is very high. BCC is usually slow growing and rarely metastasizes but can cause significant local destruction and disfigurement if neglected or treated inadequately. The primary principal in the management of BCC of the eyelid is complete removal of the tumour and reconstruction.

While defects involving eyelid margins are given a lot of attention, defects in the periocular area are sometimes repaired, without much attention to cosmesis. A poorly performed reconstruction or the injudicious selection of a technique may be harmful for the eye and may necessitate further surgical correction.[7] Also reconstruction should preferably be with local tissue to achieve the best cosmetic results. Mustarde's flap provides high functional and aesthetic quality in reconstruction.

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 prospective analysis of data of 16 patients with histopathologically confirmed BCC in period from 2008 to 2015. Age, gender of the patients, size, localization, and their early and late complications were analyzed. Follow up was done for a period of three months to two years. All patients were operated by the same surgeon. Before surgical repair of the tumour the following basic principles of eyelid reconstruction were kept in mind.[8]

- Replacement of involved tissue with similar tissue.
- Maintaince of integrity and mobility of upper lid (levator function).
- Establishment of aesthetic balance.
- Provision of protective lining, stable skin cover and internal lid support.

Figure 1-3 shows three cases of BCC involving lower eye lid, who underwent surgical procedure in our study.

Figure 1: BCC of lower eye lid

Figure 2: BCC of lower eye lid

Figure 3: BCC of lower eye lid

Surgical technique

The surgery was performed in general anaesthesia. BCC with 3-4 mm margin and flap is marked. Reconstruction was done at the time of surgery aiming at best possible functional and cosmetic result. Different types of sutures were used to mark the orientation of the BCC in the excised material; one for medial and two for the lateral side of the tumour.

After excision, flap marking was confirmed by planning in reverse method. Flap was raised in subcutaneous plane. The final extent of the incision can only be determined after undermining the cheek flap in the layer of subcutaneous fat and repeatedly testing to see whether further extension of the incision and rotation of the cheek is necessary. Tension is taken off from the flap by anchoring it to the periosteum of the orbital margin. As defect become larger, the flap is extended superolaterally and inferiorly in front of the ear. Inner lamellae of lower eyelid were reconstructed by composite nasomucoperichondrium graft anchored to medial and lateral canthal ligament. The septal cartilage needs to be thinned and scored to conform to the shape of the globe.[9]

Figure 4-8 shows the clinical pictures depicting flap markings, dissection, early post operative patient and successfully healed post operative patient.

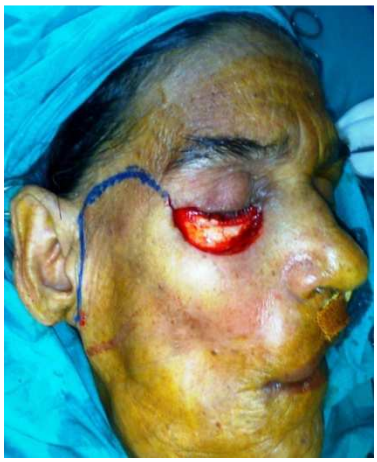

Figure 4: clinical picture depicting flap marking

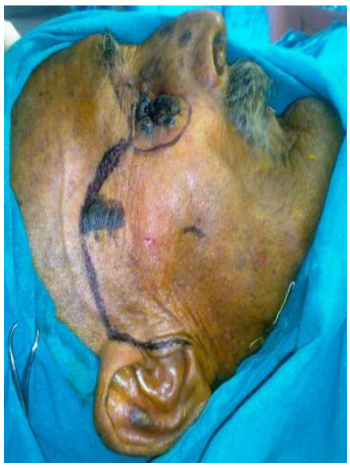

Figure 5: clinical picture depicting flap marking

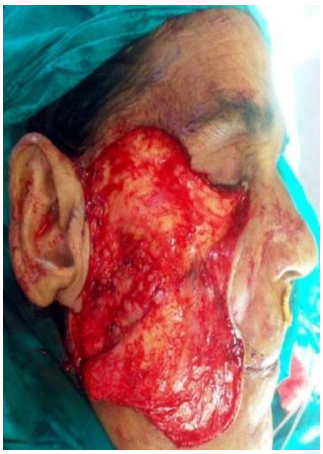

Figure 6: clinical picture depicting mustade's flap dissection

Figure 7: early post-op patient

Figure 8: Post-operative healed patient

Results

It was a prospective analysis. Total 16 procedures were done. Five (31%) were females and sixteen (69%) were males. Age of patients vary from 42 to 78 years. BCC occurred in the lower lid in all cases within the periorbital area. Right eye was involved in 10 (63%) cases and left eye was involved in 6 (37%) cases. General characteristics of the patients are shown in table 1. Patients have been followed from three months to 2 years with a mean time follow-up of six months. Most of the patients showed normal eye closure at the end of follow up. Figure 9 shows one of the successfully healed patients with normal eye closure. Local recurrence was noted in 2 cases one of which underwent revision excision and one refused for reoperation. The complications noted were downward contraction and sagging of the flap and ectropion of the lid margin in three cases (19%). Table 2 demonstrates the above findings and figure 10 shows

one of the three patients with ectropion as complication.

Table 1: general characteristics of 16 BCC cases that underwent surgical procedure in our study

Parameter	Number (%)
Age	42-78 yrs
Males	16 (69%)
Females	5(31%)
BCC in periorbital area	16 (100%)
Right eye BCC	10 (63%)
Left eye BCC	6(37%)

Table 2: Result of our surgical procedure at the end of follow up of three months to two years

Consequence	Number (percentage)
Completely healed with normal function	11 (69%)
Local recurrence	2 (12%)
Sagging and ectropion	3 (19%)

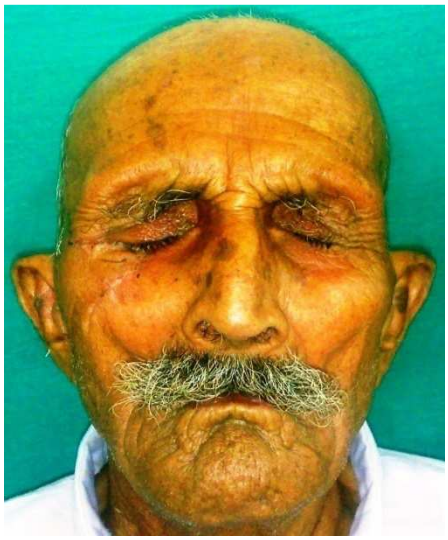

Figure 9: Normal eye closure after

Figure10: Ectropion as squeal

Discussion

BCCs generally occur in persons older than 50 years, but not much is known about its incidence in persons younger than 40 years. To date, studies which aimed to investigate BCC in the young have been unable to determine any trends.[10] In our study also the range of patients having BCC was 42-78yrs, similar to as reported by previous studies

In previous studies, it has been found that the frequency of BCC in females is lower than in men. As regards the distribution of BCC, Yaldiz *et al,* [11] found that 62.8% of their patients were males, Bastiaens *et al,*[12] found it as 54%, and Raasch et al, [13] as 58.6%. Our findings confirm these data with 69% of our patients being male.

The periorbital region forms less than 1% of the total body surface and due to its complex anatomy, it requires a detailed approach.[14] To conceptualize the reconstructions of eyelids basic knowledge of eyelid anatomy is must. The lower lid is shorter in height, less mobile and contributes minimally for palpebral closure. The anterior lamellae consist of the skin and orbicularis muscle. The posterior lamella consists of the conjunctiva and tarsal plate.[15]

Eyelid is a layered structure, so appropriate layered reconstruction is essential. [16] Three elements are required for eyelid reconstruction; an outer layer of skin, an inner layer of mucosa and a semi rigid skeleton interposed between them. One layer should carry its own blood supply and other can be a free graft. 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.[17] It was first described by Mustarde's in 1971and then by Callahan & Callahan in 1980. Understanding this flap design and versatility is important for all surgeons involved in the treatment of tumours in the orbito-palpebral area.[18]

To prevent the complications, the flap must be carefully designed, rotated, and sutured as high as possible so that immediately postoperatively, the palpebral fissure is only a narrow slit,[19] as shown in figure 9 in one of our successfully healed patient after surgical procedure.

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.

The majority of patients had a good cosmetic result and required no further intervention. It can be easily done by all head and neck surgeons. It has very low complication rate and low patient morbidity.

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