Original Article

Surgical Excision and Reconstruction of Primary Basal Cell Carcinoma (PBCC) of Eyelid (Clinical Control Excision Method)

Partab Rai, Syed Imtiaz Ali Shah, Mahesh Kumar, Ashoke Kumar, Memon Muhammad Khan, Saeed Iqbal

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See end of article for authors affiliations

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Correspondence to:
Partab Rai
Department of Ophthalmology
Chandka Medical College Hospital
Larkana

Purpose: To evaluate the patients with PBCC of eye lid and to demonstrate outcome of clinically controlled tumor excision method and to correct significant functional and cosmetic blemish.

Material and Methods: This study was conducted in the department of ophthalmology, Chandka Medical College Hospital, Larkana from Sept. 2001 to Feb.' 2008. In this study evaluation of 24 patients of 45 years to 80 years old with histological diagnosis of PBCC involving the eye lid and/or its margins was done. All patients under went with tumor excision and immediate reconstruction using clinical control excision method with the operating biomicroscope under local anaesthesia. The surgical procedures used were selected by on the size & location of the tumor. Postoperative follow up examinations were carried out at 1st week then after at 1, 3, 6 and 12 months, later on annually for a further 5 years and longer. Tumors location, size, type, recurrence and postoperative complications were evaluated.

Results: The primary tumor location was on the lower lid 10 (41.66%) cases, upper lid 7 (29.16%) cases, medial canthus 4 (16.66%) cases and lateral canthus 3 (12.50%) cases. The size of tumors at presentation was, tumor involving 1/4 of the eye lid 2 (8.33%) cases, 1/3 of lid 6 (25.00%) cases, 1/2 of lid 6 (25.00%) cases, 2/3 or more of lid in 3 (12.50%) cases, 1/4 medial canthus

4 (16.66%) cases and 1/4 lateral canthus 3 (12.50%) cases. The type of the tumor was nodulo ulcerative in 15 (62.50%) cases, sclerosing 5 (20.83%) cases and superficial multicentric 4 (16.66%) cases. The recurrence of the tumor was noticed in 3 (12.50%) cases.

Conclusion: Early presentation of patient in the initial stage of the tumor will allow simple primary wound closure with less functional tissue loss and this also resulted in decreased risk of tumor recurrence and cosmetic blemish.

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Basal cell carcinoma (BCC) is a locally invasing malignant tumor arising from basal cells present in deepest layer of the epidermis of skin[1]. It is the commonest cutaneous malignancy of the eye lid, accounting for 80 - 90% of cases[2]. These tumors typically appear on sun-exposed skin like face, ears, neck, scalp, shoulders and back[3]. BCC generally grows slowly, invading and destroying the adjacent tissues and metastasis is rare (less than 0.1%)[4].

Although the exact etiology of BCC is unknown, but following well-established relationship exits between BCC and Ultraviolet Light (UVL) induced damage of the pilosebaceous unit , pluripotent cells (cells which have the capacity to form hair)[5].

On the skin sunlight exposure leads to DNA cross linking between thymidine residues. While DNA repair removes most UV- induced damage, not all cross links are excised. There is, therefore, cumulative DNA damage leading to mutations. Apart from the mutagenesis, sunlight depresses the local immune system, possibly decreasing immune surveillance for new tumor cells. Some believe that the decrease in the ozone layer is allowing more ultraviolet radiation from the sun to reach the earth's surface[6]. Therefore, chronic over exposure to the sun is the cause for most BCC specially on the hair- bearing areas of skin, but risk can increase with certain following genetic and environmental factors.

Genetic Factors

- Light (fair) colored skin.
- Blue or green eyes.
- Blond or red hair.
- Xeroderma Pigmentosum: This autosomal recessive disease results in the inability to repair UV induced DNA damage. Skin pigmentany changes are seen early in life followed by the development of BCC, squamous cell carcinoma and malignant melanoma. Other features include corneal opacities, eventual blindness, and neurological deficits.
- Nevoid BCC Syndrome: (Basal Cell Nevus Syndrome, Gorlin Syndrome): This autosomal dominant disorder results in the early formation of multiple odontogenic keratocytes, palmoplanter pitting, intracranial calcification, and lid anomalies. Various tumors such as medullo-blastomas, meningioma, fetal rhabdomyoma and ameloblastoma also can occur.

Environmental Factors

- Historically, men are affected twice as often as women. The higher incidence in men is probably due to increased recreational sun-exposure (e.g. sun bathing, outdoor sports, fishing, boating) and occupational sun-exposure (e.g. farming, construction).
- Patients often complain of a slowly enlarging lesion that does not heal and that bleeds when traumatized. Basal cell carcinoma can usually be diagnosed with a simple biopsy and is fairly easy to treat when detected early[7-10]. The treatment possibilities include; Shave, curettage and cautery[11], total clinically controlled excision[12], Mohs micrographically controlled excision[13], Photodynamic therapy[14], Imiquimod cream[15], Cryotherapy[16], Radiotherapy[17] and laser surgery[18].

MATERIAL AND METHODS

This study was conducted from September 2001 to February 2008 at the Ophthalmology Department of Chandka Medical College and Hospital Larkana. All the 24 patients were admitted in the eye ward from the eye out-patient department. After getting detailed history of these patients they were thoroughly examined, photographed and treated surgically under local anesthesia. The diagnosis of tumor was based on histopathology of excised tumor. Patients with involvement of lid with or without canthus were included in this study and patients with involvement of site other than lid were referred to plastic surgeon and excluded from the study. Before surgical repair of the tumor the following basic principles of eye lid reconstruction were kept in mind.

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

The surgical treatment for PBCC depends on its size, location and the preference or expertise of the surgeon. The tumor involving 1/4th size of lid was treated by direct primary closure in 2 (8.33%) cases, 1/3rd by direct closure with lateral canthotomy and cantholysis in 6 (25.00%) cases, 1/2 by Tenzel's semicircular flap from lateral canthal region in 6 (25.00%) cases, 2 /3 or more by Mustarde Cheek rotation flap in 3 (12.50%) cases, lid-medial canthal tumors by Glabellar flap in 4 (16.66%) cases, and lid-lateral canthal tumors by Tenzel's semicircular flap from lateral canthal region with full thickness skin graft from postauricular region in 3 (12.50%) cases (Table-1). All tumors with surrounding 3-4 mm safety zone were excised and immediately reconstructed using clinical control excision method with the operating biomicroscope alone. The conjunctiva was undermined and mobilized from fornix. In autologus skin graft cases the pressure bandage and suture technique was applied. The lid margins were brought together by 2 layer approximation of the tarsus with 5/0 prolene suture and skin with 6/0 black silk suture. The eye was padded after applying traction suture in the normal lid. Eye dressing was removed on the next day and topical antibiotic drops (Ciprofloxacin) and eye ointment (Tobramycin) was given. Postoperatively patients were kept on oral antibiotics (Cephradine 500 mg x TDS) and analgesics (Ibuprofen 400 mg x TDS) for 5 days. The skin stitches were removed on the 10th postoperative day. Postoperative follow up examinations were carried out at 1st week, then after at 1, 3,6 and 12 months, later on annually for a further 5 years and longer.

Table 1: Showing size of tumor and their treatment.

Tumor Size	**Treatment**	**No of Patients n (%)**
1/4 size of eyelid	Direct primary closure	2 (8.33).
1/3 size of eyelid	Closure with lateral canthoomy and cantholysis	6 (25) .
1/2 size of eyelid	Tenzel's semicircular flap from lateral canthal region.	6 (25).
2/3 size and more of eyelid	Mustarde cheek rotation flap	3 (2.50)
1/4 medial canthus tumor	Glabellar flap	4 (16.66)
1/4 lateral canthus tumor	Tenzel's semicircular flap from lateral canthal region with full thickness skin graft from post auricular region.	3 (2.50)

Table 2: Showing age, sex, laterality, occupation and skin complex of patients with PBCC of lid.

Number of Patients	24
Age (Range)	45 to 80 Years.
Sex	
Male	13 (54.16%)
Female	11 (45.83%)
Laterality	All cases had unilateral involvement.
RT. Eye lid involved	16 (66.66%) cases
LT. Eye lid involved	08 (33.33%) cases
Occupation	
Farmer	14 (58.33%)

Labourer	10 (41.66%)
Skin Complex	
Less fair skin	16.66.66%
Dark skin	08(33.33%)

RESULTS

Total 24 patients with biopsy proven PBBC of lids were included in this study. The age range was from 45 years to 80 years. 13(54.16%) cases were male and 11(45.83%) cases were female. All cases had unilateral involvement. The right eye lid was involved in 16(66.66%) cases and left eye lid was involved in 8(33.33%) cases. The occupation wise 14(58.33%) cases were farmer and 10(41.66%) cases were labourer. The skin complex of 16(66.66%) cases was less fair and of 8 (33.33%) cases was dark (Table 2). The tumor location was on the lower lid 10(41.66%) cases, upper lid 7(29.16%) cases, medial canthal region 4(16.66%) cases and lateral canthal region 3(12.50%) cases. The types of the tumor were seen noduloalcerative 15(62.50%) cases, sclerosing (Morphoeic) 5(20.83%) cases, and superficial multicentric 4(16.66%) cases. The recurrence of the tumor was seen from the medial canthus with sclerosing type in 1(4.66%) case, noduloulcerative type in 1(4.66%) case and from lateral canthus with sclerosing type in 1(4.16%) case after 6 to 12 months of primary surgery (Table 3). All three first time recurrent cases were treated again by skin regrafting from other post auricular region. After the second operation again second time recurrence was observed in all three cases within next six months due to indepth extension, later on which were send to oncologist for adjuvant treatment such as radiotherapy. The postoperative complications and their treatment is shown in (Table 4).

Table 3: Showing location, size, type and recurrence of PBCC. n (%)

Location of Tumor	
Lower eye lid	10 (41.66%) cases
Upper eye lid	07 (29.16%) cases
Lid-medical canthal region	04 (16.66%) cases
Lid-lateral canthal region	03 (12.50%) cases
Size of Tumor	
1/ 4 size of the eye lid	02 (8.33%) cases
1 /3 size of eye lid	06 (25.00%)cases
1/2 size of eye lid	06 (25.00%) cases
2/3, or more size of the eyelid	03 (12.50%) cases
1/4 Medial Canthal Tumor	04 (16.66%) cases
1/4 Lateral Canthal Tumor	03 (12.50%) cases.
Type of Tumor	
Noduloulcerative	15 (62.50%) cases.
Sclerosing (Morphoeic)	05 (20.83%) cases
Superficial multicentric	04 (16.66%) cases
Recurrence of Tumor	
From medial canthus	02 (8.33%) cases
Sclorzing - 1 case	
Nodulo Ulcerative - 1 case	
From Lid-lateral canthus	01 (4.16%) case
Sclorzing - 1 case	

DISCUSSION

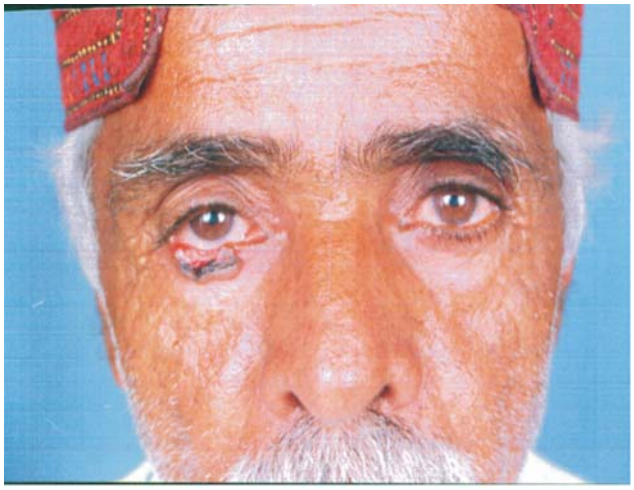
Collin JRO, reported in his study, that the incidence of PBCCs increases with age and with no sex predilection, similarly in our study the mean age of patients was 62.5 years with Male**:** Female Ratio of 1.1**:**1.0. In our study males and females are nearly equally affected because of similar outdoor services in the exposed sun as labourer or farmer[19]. Although both environmental and hereditary factors are known to increase the risk of developing PBCC[20], but in our study no doubt all patients were labourers and farmers but with less fair and dark skin. Like the study of Doxanas MT et al[21,22], we also found an even location of the PBCC of lid. The relatively high incidence of PBCC in the lower lid and medical canthal area could perhaps be explained by local conditions other than sun exposure. Perhaps the presence of thin epithelium in the medial canthal area allows more UVR to reach the cell of basal layer.

Table 4: Showing postoperative complications and their treatment.

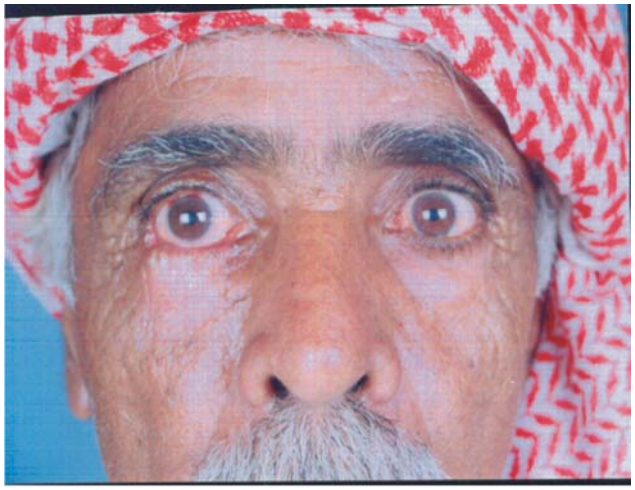
Complication	**No of cases n (%)**	**Treatment**
Preseptal cellulitis	05 (20.83)	Intravenous antibiotics (Cepharadine 500 mg x 8 hourly, Gentamycine 80 mg 8 hourly) for five

		days.
Corneal abrasion from lid margin suture cut ends	04 (16.66).	Removal of irritating suture at lid margin
Exposure keratopathy	04 (16.66)	Artificial tears and lubricants 1 hourly.
Restriction of eye lid function	04 (16.66)	Release of suture tension
Ectropion	03 (12.50)	Release with full thick-ess arm skin graft.
Partial loss of skin graft due to hema-oma collection	02 (8.33)	Secondary intention healing.
Epidermal loss	01 (4.16)	Antiseptic dressing.

However the large difference in tumor localization between the upper and lower eye lids is difficult to explain on these grounds[21,22]. In our study 41.44% of PBCC and in study of GunLindgren et al 68% of PBCC were mainly located on the lower eye lids[23]. The lack of association between relative UVR exposure on the eye lids and PBCC location indicates that UVR exposure only partially explained the etiology of periorbital PBCC and there are probably other, yet unidentified, factors that contribute to the development of these tumors[24]. It is evident from recurrences that PBBC on the medial-canthus is more likely to recur than one located anywhere else in the lid region. This may be due to the complex anatomy of medial-canthal tendon, of the canalicular system, and

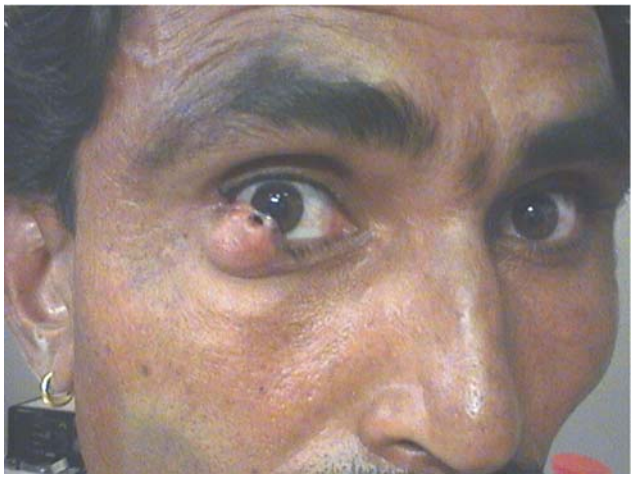


Preoperative Photograph

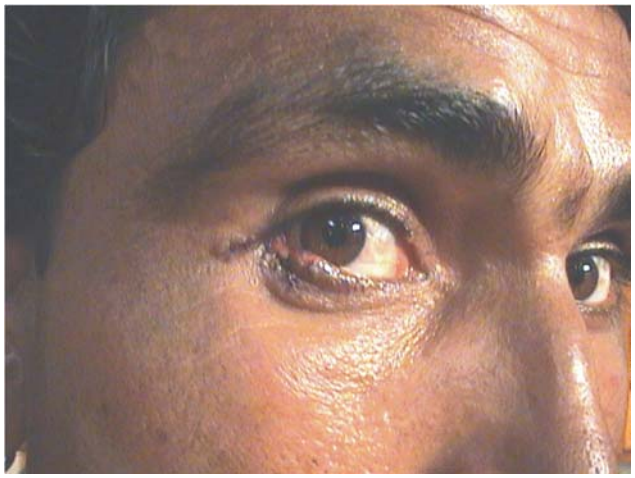


Postoperative Photograph

Fig. 1: *60 years old male with right lower lid PBCC*

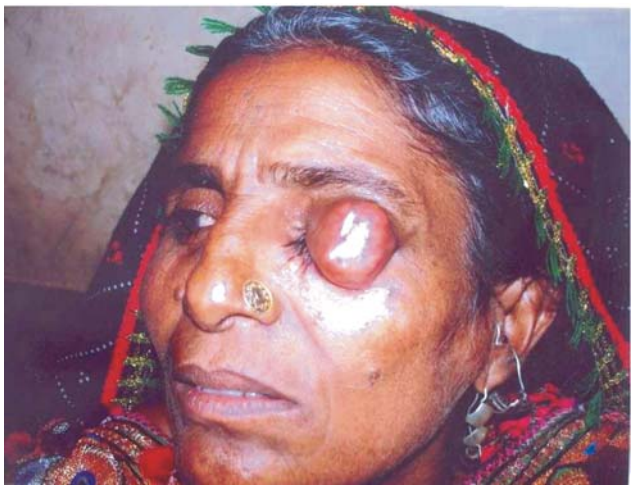


Preoperative Photograph

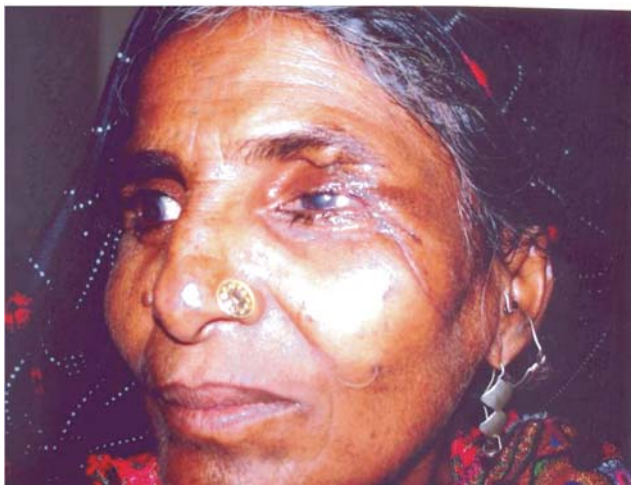


Postoperative Photograph

Fig. 2: *45 years old male with right lower lid PBCC*

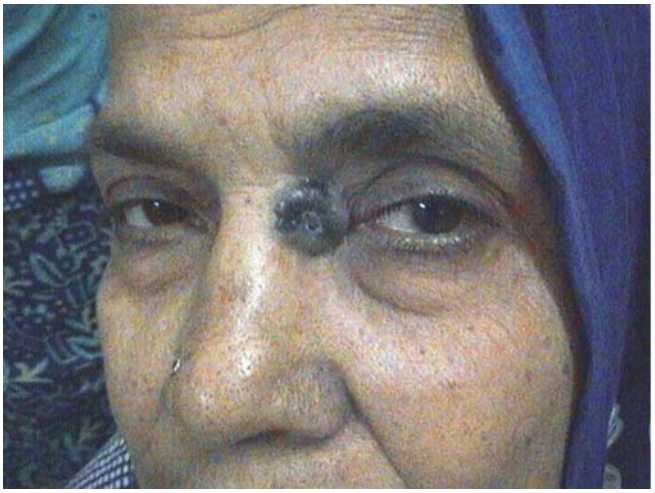


Preoperative Photograph

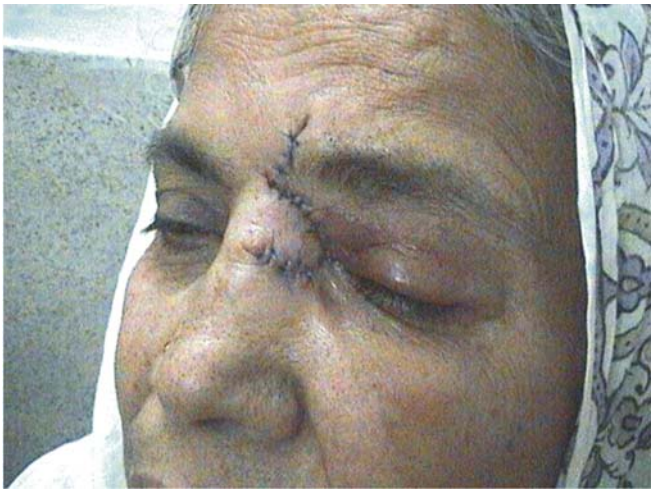


Postoperative Photograph

Fig. 3: *55 years old female with left upper eye lid PBCC*



Preoperative Photograph



Postoperative Photograph

Fig. 4: *60 years old female with left eye medial canthal PBCC*

of the orbital septal attachments. Not only are these predisposed to early indepth extension of the tumor, but the lacrimal drainage system induces the surgeon to be more cautious during tumor excision than in the case at other location in the lid region[25]. Like the study of Stefan Pieh et al, we notice that greatest risk of recurrence exists for PBBC in the medial canthus, for those with an indepth extension, and for the sclerosing type. The recurrence rate increases after every operation for high risk cases, consideration should be given to adjuvant treatment such as radiotherapy[25]. According to previously published reports, residual tumors remain the margins of resection after upto 50% of surgical PBCC excisions performed without intraoperative histological control excision method (Moh's Technique)[26,27], but at our place where Moh's technique facility is not available, we have seen only 12.50% recurrence rate in the 5 years and more followup period with clinical control excision method. R.M Conway et al seen 9.7% recurrence rate of PBCC with clinical control excision method[28]. The persons with hereditary and environmental risk factors are advised to avoid sunlight exposure by the choice of out door activities, seeking shadow, facing away from sun, wearing hat and sunglasses[29].

CONCLUSION

Early presentation of patient in the initial stage of the tumor will allow simple primary wound closure with less functional tissue loss and this also result decreased risk of tumor recurrence and cosmetic blemish.

Author's affiliation

Dr. Partab Rai
Assistant Professor
Department of Ophthalmology
Chandka Medical College and Hospital
Larkana

Prof. Syed Imtiaz Ali Shah
Department of Ophthalmology
Chandka Medical College and Hospital
Larkana

Ashoke Kumar
Assistant Professer
Department of Ophthalmology
Liaquat University of Health & Medical Science
Jamshoro, Hyderabad

Dr. Muhammad Saeed Iqbal
Assistant Professor Ophthalmology
Sir Syed College of Medical Sciences Hospital
Qayyumabad, Korangi Raod
Karachi

Dr. Memon Mohammad Khan
Assistant Professor &
Head of Ophthalmology Department
Kulsoom Bai Walika Social Security
Serives Site Area Mangho Peer
Karachi

Dr. Nasir Bhatti
Assistant Professor
Isra Postgraduate Institute of Ophthalmology
Old Than Village Memon
Ghoth Maleer, Karachi

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Quiz: Glaucoma

Answers:

1. a
2. b
3. d
4. a
5. d
6. b
7. a
8. d
9. b
10. c
11. a
12. d

13. d

14. b