SURGICAL TREATMENT OF PERIOCULAR BASAL CELL CARCINOMAS – 15 YEARS OF EXPERIENCE

Zornitsa Zlatarova, Binna Nenkova, Christina Grupcheva

Department of Ophthalmology and Visual Science, Medical University of Varna, Specialized Eye Hospital, Varna

ABSTRACT

PURPOSE: To analyze the outcome of periocular basal cell carcinoma (BCC) treated by surgical excision and evaluated using formalin fixed, paraffin-embedded sections.

METHODS: One hundred-ninety-three patients with periocular BCC, were operated in Department of ophthalmology and Specialized Eye Hospital, Varna, Bulgaria since 1999 to 2013. Data were analyzed considering demographics, tumor localization, histological results, type of eyelid reconstruction, recurrence rate and aesthetic outcome.

RESULTS: Of the total 193 patients with BCC, 136 (70.5%) had lower eyelid involvement. The most common histologic subtype was solid 126 (65.3%). One hundred seventy-six patients (91.2%) were with primary and 17 (8.8%) with recurrent tumors. Fifty-nine percent of lid defects were treated by direct closure. The mean follow-up period was 50 months. There were 15 (7.8%) recurrences. Excellent aesthetic outcome was achieved in 45%.

CONCLUSIONS: Basal cell carcinoma is the most common malignant tumor of the eyelid engaging mainly the lower eyelid. Surgical excision with paraffin sections is a viable technique for managing periocular BCCs. Delayed repair is advisable in cases of poorly demarcated tumors. Significantly higher risk of recurrence exists in a more aggressive form of BCC. Using different techniques of reconstruction provides very good functional and aesthetic results.

Keywords: *basal cell carcinoma, eyelid, surgical excision, recurrence rate*

Address for correspondence:
Zornitsa Zlatarova, MD, PhD
Department of ophthalmology and visual sciences
Medical University of Varna
Specialized Eye Hospital
Doyran 15
Varna 9002, Bulgaria
e-mail: zzlatarova@abv.bg
phone: + 359 898 53 20 83

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Basal cell carcinoma is the most common skin cancer and the most common eyelid malignancy (2,6,14,21). BCC is usually observed in elderly patients and the most typical location is skin, directly exposed to UV radiation (3,21). Thus the eyelid is a quite common location of BCC. Almost 90% occur on the head and neck with 10% of those involving the eyelid (6,9,21). BCC is a slow growing, non-metastasising, malignant tumor accounting for less than 0.1% of patient deaths, but may cause major complications with its significant invasive potential (6). Ra-

diotherapy, cryoterapy, laser ablation, photodynamic therapy, chemotherapy, and immunotherapy have all been described and may be useful for inoperable or widespread disease. The complete surgical excision of BCC of the eyelid remains the "gold" standard of treatment and excellent results are obtained if the tumor is completely removed (12). In their evidence-based update regarding treatment options of basal cell carcinoma, Cook and Bartley conclude that Mohs' micrographic surgery (MMS) and excision with frozen-section or permanent-section control yield the highest cure rate and lowest frequency of recurrence (3). Mohs' micrographic surgery, a method of tumor excision with complete frozen section margin control, offers the lowest recurrence rate for BCC and is the standard in Australia and USA (15), but not available in Bulgaria. There are two more options to evaluate radical excision – paraffin section or frozen section control. In our unit in Varna, Bulgaria we use the former. It is debatable in the literature, but general appreciation is that paraffin sections are histologically superior to frozen section, with better preservation of detail on examination (7,12). Ghauri et al. found that 5% of tumors reported as having clear margins on frozen section were seen later to have involved margins on permanent section (8). Khandwala et al., reported the results of using a standard paraffin section technique to confirm histological clearance and found low recurrence rate (1.7%), which is comparable to that following Mohs' technique (13). The principle risk factors for recurrence include previous treatment, localization, large tumor size and an infiltrative or micronodular histological growth pattern (1,18,25). Pieh et al. reported that the recurrence rate increases up to 50% for patients who have undergone a second or third operation (18).

The aim of this study was to analyze the outcome of periocular basal cell carcinoma treated by surgical excision and evaluated using formalin fixed, paraffin-embedded sections.

MATERIALS AND METHODS

The study includes 193 patients with periocular BCC, treated by standardized surgical technique in Department of ophthalmology and Specialized Eye Hospital, Varna, between 1999 and 2013. All tumors were newly diagnosed or recurrent tumors from our sample. The surgical technique was as follows. All lesions were excised under local anesthesia using Lidocain 2%. The excision line was measured and marked 3 mm from the tumor edge with skin under tension. Standard excision techniques were used and specimens were fixed on hard pad and marked with different colored needles for orientation. The specimens were sent for histological examination in formalin. In cases with well demarcated tumors surgical wounds were closed after excision. The choice of repair was determined by the size and position of the defect, following standard reconstructive techniques. In cases of poorly demarcated tumors after hemostasis, the wound was treated with chloramphenicol ointment and a non-adherent dressing while awaiting paraffin section histological confirmation of tumor clearance (3–4 days). If the tumor was found to extend to any margin of the specimen, a further 2 mm of tissue was excised from the involved margin and repair delayed until clearance was achieved. Follow-up was every 3 months for the first year, every 6 months for the second year and thereafter annually.

Cosmetic outcomes were evaluated according to lid position and aesthetic view after reconstructive surgery.

RESULTS

From the total 193 patients with eyelid BCC, 91 were male (47.2%) and 102 (52.8%) female; the mean age was 67 years (from 26 to 95). Tumors localization was as follows: lower lid – 136 (70.5%), medial canthal area – 29 (15%), upper lid – 19 (9.8%) and lateral canthal area – 9 (4.7%). One hundred seventy-six patients (91.2%) were with primary and 17 (8.8%) with recurrent tumors. The most common histological subtype of BCC was solid 126 (65.3%), followed by adenoidocystic – 30 (15.5%), morphea – 20 (10.4%) and superficial – 17 (8.8%).

The pathology revealed 62.2% complete primary excision within 3mm excision margins. Most often incomplete excision we found in cases with morphea subtype of BCC – 54.3%, followed by adenoidocystic – 53.2%. Regarding tumor localization, the rate of incomplete excision is highest in upper lid lesions – 77.8%, followed by lateral and medial canthal area – 66.7% and 58.5%. Fifty-nine percent of lid defects were treated by direct closure, 23% with Hughes tarsoconjunctival flaps, 10% with full thickness skin

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grafts, 7% with local skin flaps and 1% with Cutller-Beard procedure.

Repair was delayed for 4 days in 16 patients, with poorly demarcated tumors, to allow formal paraffin sections to be prepared and examined by the histopathologist. In 7 (43.8%) patients the tumor was incompletely excised and further 2 mm of tissue was excised from the involved margin. Only in three (42.8%) of the 7 specimens there were tumor cells.

The follow-up ranged from 2 months to 110 months (with a mean of 50 months). Eight of the operated patients died during the follow-up period for reasons not connected to the eyelid tumor. There were 15 (7.8%) recurrences, 8 of which were following incomplete excision, as revealed by pathohistology. Ten of the relapses were after primary tumor excision and 5 after excision of the recurrences. In the first year of follow-up we observed 3 recurrences, all in tumor engaged surgical margins. The other 12 recurrences were detected after 1 to 5 years after surgery. Histological subtypes of relapses were as follows: solid 6, morphea type 4, adenoidocystic 3, and superficial 2 cases, respectively. There were no recurrences in the group with delayed repair.

Aesthetic outcome was deemed excellent in 45%, good in 21%, adequate in 16%, unknown in 14% and additional surgery for cosmetic reasons required only 4% (Fig. 1). From the few minor complications reported, cicatricial ectropion (4 patients) and corneal erosion (10 patients) were the most important.

DISCUSSION

Periocular skin tumors are the most common tumors encountered in clinical ophthalmic practice (13,14,16). BCCs are the most common periocular skin cancers, accounting for 80-90% from all cases (13,18). There are reports suggesting the increasing incidence of BCC located on the eyelids over the last decades (20). The main risk factors for BCC development are UV radiation, light complexion, age over 60. As sun exposure plays a role in the development and transformation of BCC, patients with blue eyes, red hair and easy freckling, are particularly predisposed as expected (4,21).

In the current study BCCs occur most frequently on the lower lid (70.5%) and most often the tumors were of solid subtype (65.3%), which is in agreement with previous reports. Authors who reported tumors situated on the lower eyelid and solid subtypes are as follows: Salmon – 87.3% and 68.6% (21), Sigurdson – 79.8% and 95.2% (23), Pieh – 56% and 73,5% (18).

Management of BCC involves complete eradication of the tumor. It is important to preserve as much normal tissue as possible and achieve good functional and aesthetic results after eyelid reconstruction. The size of the excision margin has been debated for many years with recommendations from 2 to 10 mm. The current recommended margin for low-risk tumors is 3-4 mm (25).

The prognosis for patients with eyelid basal cell carcinoma is highly dependent on a complete surgical excision. Incomplete excisions have been related to various factors including BCC location at the inner canthus and the histological subtype of the tumor especially morpheic, infiltrative, and multifocal patterns (17,18). In our study we found the highest rate of incomplete excision in upper lid lesions – 77.8%, followed by lateral and medial canthal area – 66.7% and 58.5%, and in 54.3% of cases with morphea type BCC.

In their study Khandwala et al. achieved 56.9% histological clearance after the initial operation with 3 mm margins, after re-excision they found tumor cells in 14.3% (5/35) (13). In our study the excision line was 3 mm from the tumor edge and we achieved 62.2% complete primary excision. We re-excised 7 patients with involved margins and found 57.1% (4/7) free of tumor cells specimens at re-excision. Hamada, however, reported 84% complete primary excision with 2 to 4 mm margins. From those reported incompletely excised, 53% contained no tumor at re-excision (10).

It is well known that only a minority of cases with histologically documented positive margins will demonstrate recurrence. Walker and Hill reported in their study that the tumor recurrence rate after excision with margin involvement averages 38% (25). Rakofsky reported incomplete excision in 47 of 95 cases, and from these 11 developed recurrent tumors, giving an overall recurrence rate of nearly 12% (19). DeSilva and Dellon followed 38 patients with positive margins and demonstrated a recurrence in only 37% (5). In the current study we found 15 (7.8%) recurrences, 10.9% (8) in the group with positive margins and 5.8% (7) in those with negative margins. Hauben

found a recurrence rate of 25.6% in positive margins and 22.8% in negative margins (11). Sarma et al. suggested that tumor cells at the operative site may be devitalised by surgery, thus accounting for the lower than expected recurrence rate (22). Incompletely excised tumors present a treatment dilemma: clinical monitoring or immediate re-excision. If an excision is performed with a primary repair then it is disheartening for the patient and surgeon if the tumor is subsequently found on histology to have been incompletely removed. The disadvantage of immediate re-excision is that about 62% of the tumors will not recur if left (25). In our practice, as demonstrated by this study, we prefer to follow-up the patient every three months, rather than to perform a re-operation.

Pieh et al. reported that the sclerosing type and recurrent BCCs have a higher potential for recurrence (18). Our results are similar, higher potential for recurrences we found in group of morphea type BBCs – 20%. In regard to relapses of recurrent tumors, we found a recurrence rate of 29.4% in this group, which is approximately 4 times more than in the group of primary BCCs (5.7%).

The rates of complications after eyelid reconstruction were low in our study. The most important of it were cicatricial ectropion (4 patients) and corneal erosion (10 patients). We achieved very good results using full-thickness skin grafts and Hughes flaps, which give us courage to use these techniques in cases with large lid defects. Despite all, the reconstruction technique of choice in the majority of our patients was direct closure (59%). Hamada reported repair by direct closure in 72% of the cases with excellent functional and cosmetic results (10). Hsuan found the same in 34.5% of cases (12).

The aesthetic result is also a very important issue in surgical excision of the BCC. Our study demonstrated excellent cosmetic results in almost half of the patients. Considering the volume of surgery and the inability to apply Mohs technique, we believe that our results are of very good standard. However, in order to improve them, a closer long term follow-up and combination of graft techniques might be beneficial.

CONCLUSIONS

Basal cell carcinoma is the most common malignant tumor of the eyelid engaging mainly the lower eyelid. Surgical excision with paraffin sections is a viable technique for managing periocular BCCs. Delayed repair is advisable in cases of poorly demarcated tumors. Significantly higher risk of recurrence exists in a more aggressive form of BCC. Using different techniques of reconstruction provides very good functional and aesthetic results.

Fig. 1. Left lower lid BCC before (a) and eight months after (b) surgical excision and reconstruction with Hughes tarsoconjunctival flap and full thickness skin graft.

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