EYELID TUMORS IN SOUTHERN TAIWAN: A 5-YEAR SURVEY FROM A MEDICAL UNIVERSITY

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This retrospective case analysis investigated the epidemiology of eyelid tumors in a subtropical area. The study assessed the proportion of all eyelid tumors that were malignancies, the accuracy of diagnosis, and surgical results. We retrospectively collected all cases of eyelid tumors in the Department of Ophthalmology, Kaohsiung Medical University, Taiwan, between January 1994 and December 1998. Among the 144 cases collected, about half of the tumors were located in the upper eyelids and the other half in the lower eyelids. Nearly 50% of cases underwent tumor resection with eyelid reconstruction. When followed up to April 1999, 97% of patients were satisfied with the surgical results. There were 18 cases (12.5%) of malignant tumors, including 14 basal cell carcinomas, three sebaceous carcinomas, and one squamous cell carcinoma. Before surgery, two malignancies were presumed to be benign tumors while another two were thought to be different malignant tumors. The benign tumors included 38 nevi, 15 squamous papillomas, 13 cysts, 11 verrucae, 10 seborrheic keratoses, four hemangiomas, and others. All tumors that were thought to be malignancies were treated using complete resection with margin monitoring by frozen section. At the end of follow-up, no recurrence was noted. More than 10% of cases of eyelid tumors in this subtropical teaching hospital were malignant. All surgeons should be alert to this phenomenon when they operate on an eyelid tumor. The best policy is to send all specimens for pathologic examination.

Key Words: eyelid, tumor, malignancy, benign, subtropical
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Eyelid tumors are a common disorder encountered by oculoplastic surgeons. A certain proportion are malignant, with the potential to threaten a patient's life [1,2]. Unfortunately, malignant tumors can be presumed to be benign. Some surgically removed tumors may not be sent for pathologic examination, especially in private clinics. In this study, we analyzed the frequency of malignancy in normal eyelid tumor surgery.

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Eyelid tumors such as actinic keratosis, basal cell carcinoma, and squamous cell carcinoma, especially those that are malignant, have been reported to bear a relationship to sunlight exposure [3–6]. Southern Taiwan is located in a subtropical area where there is exposure to strong sunlight. In this study, we analyzed the frequencies of different eyelid tumors in the area.

Large and malignant eyelid tumors usually require wide resection. The large defect requires eyelid reconstruction, including different methods of flapping and grafting to restore the normal function of the eyelid and to avoid complications such as lagophthalmos, ectropion, and subsequent keratopathy. In this study, we analyzed the surgical results of tumor resection.

Patients and Methods

We retrospectively collected consecutive cases of patients with eyelid tumors who underwent surgery between January 1994 and December 1998 in the Department of Ophthalmology, Kaohsiung Medical University, Taiwan. Demographic data, tumor location, surgical procedures and their results, and histopathologic findings were reviewed and analyzed.

Results

The 144 collected cases included 47 male and 97 female patients whose ages ranged from 5 to 92 years (mean, 48.3 years). Of the tumors, 71 (49.3%) were located in the upper eyelids and 71 (49.3%) in the lower eyelids. In two cases, tumors were located in both the upper and lower eyelids.

Of these 144 cases, 71 underwent simple excision, 42 underwent excision with skin-muscular flaps, 18 were treated with a pentagonal resection of the full thickness of the eyelid with or without cantholysis, and six cases underwent tumor resection with Tenzel semicircular flaps and canthoplasties. Four patients underwent resection and the Hughes procedure, one underwent resection and Culter-Beard procedure, one underwent excision with skin graft, and one underwent excision with a conjunctival graft. Excluding 16 cases without complete follow-up, the results of wound healing were uneventful in 123 cases (96.1%). Five cases did not have successful wound healing: two cases had wound gaps, two had lid notches, and one had preseptal cellulites. Results were cosmetically satisfactory in 96.9% of patients.

There were 18 cases (12.5%) of histologically malignant tumors, including 14 basal cell carcinomas, three sebaceous carcinomas, and one squamous cell carcinoma. Benign tumors included nevi, squamous papillomas, cysts, verrucae, seborrheic keratoses, granulomatous inflammation, hemangiomas, and angiokeratomas (Table 1). Among the 38 nevi, 28 were intradermal, nine were compound, and one was a blue nevus. Of the 13 cysts, eight were epidermoid, two were dermoid, two were epidermal inclusion cysts, and one was a sebaceous cyst. Resected specimens from 15 cases were not sent for pathologic examination.

All tumors that were thought to be basal cell carcinoma, squamous cell carcinoma, or sebaceous carcinoma underwent complete resection with margins monitored using frozen section. At the end of follow-up (April 1999), no recurrence was noted. Further analysis showed that most malignant tumors occurred in females (74%) and in the lower eyelids (79%) (Table 2). All three cases of sebaceous carcinomas occurred in the upper eyelids. All but one of the basal cell carcinomas occurred in the lower eyelids. The one case of basal cell carcinoma located in the upper eyelid was preoperatively misdiagnosed as a sebaceous carcinoma. Among other malignant tumors, three were misdiagnosed before surgery. The first case was a pigmented basal cell carcinoma that was misdiagnosed as a nevus; this patient later underwent secondary excision at the previous surgical site using resection with margins monitored by frozen section. The second case was a basal cell carcinoma that was misdiagnosed as a verruca. However, pathology showed that the resection margins were free of tumor cells. The patient was followed for 49 months without recurrence. The last case was a squamous cell carcinoma that was misdiagnosed as an ulcerative basal cell carcinoma. However, frozen section allowed the misdiagnosis to be immediately corrected and the resection margins in the primary operation were free of tumor cells.

Table 1. Pathology of eyelid tumors

Malignant tumors	
Basal cell carcinoma	14
Sebaceous carcinoma	3
Squamous cell carcinoma	1
Benign tumors	
Nevi	38
Squamous papilloma	15
Cyst	13
Verruca	11
Seborrheic keratosis	10
Granulomatous inflammation	6
Hemangioma	4
Angiokeratoma	3
Lipomatous infiltration	2
Keratoacanthoma	1
Cylindroma	1
Pleomorphic adenoma	1
Chondroid syringoma	1
Apocrine hidrocystoma	1
Pilomatrixoma	1
Neurofibroma	1
Fibrous histiocytoma	1
Arteriovenous hemangioma	1
Unknown	15

Table 2. Demographic data and clinical features of malignant eyelid tumors

Case	Age (yr)/ Sex	Location	Preliminary diagnosis	Final pathologic diagnosis	Surgical procedures	Follow-up (mo)
1	48/F	Lower lat.	BCC	BCC (ulcerative)	Excision + Tenzel flap	15
2	64/F	Lower	BCC	BCC (ulcerative)	Excision + advanced flap	6
3	55/F	Lower	Nevus	BCC (pigmented)	Excision + advanced flap	3
4	67/M	Lower	BCC	BCC (pigmented)	Excision + Hughes procedure	4
5	59/F	Lower	BCC	BCC (pigmented)	Excision + advanced flap	11
6	71/F	Lower	BCC	BCC (morpheaform)	Excision + Hughes procedure	60
7	54/M	Lower	BCC	BCC (ulcerative)	Excision + Tenzel flap	44
8	54/F	Lower	BCC	BCC (pigmented)	Excision + penta.	14
9	76/F	Lower	BCC	BCC (ulcerative)	Excision + rotational flap	29
10	45/M	Lower	BCC	BCC (pigmented)	Excision + skin flap	58
11	52/F	Lower	BCC	BCC (ulcerative)	Excision + reconstruction	55
12	57/M	Upper	Seb. C.	BCC (ulcerative)	Excision + reversed Hughes	22
13	57/F	Lower	Verruca	BCC	Excision	49
14	73/F	Lower	BCC	BCC	Excision + Tenzel flap	12
15	67/F	Upper	Seb. C	Seb. C.	Excision + reconstruction	4
16	89/F	Upper	Seb. C.	Seb. C.	Excision + reversed Hughes	1
17	52/F	Upper	Seb. C.	Seb. C.	Excision + Culter-Beard	15
18	61/M	Lower	BCC	SCC	Excision + Tenzel flap	3

F = female; M = male; lat. = lateral; BCC = basal cell carcinoma; penta. = pentagonal resection; Seb. C. = sebaceous carcinoma; SCC = squamous cell carcinoma.

Case descriptions

Case 6 (Table 2, Figure 1): a 71-year-old woman presented with a diffuse, hard tumor in the right lower eyelid for several months. She underwent resection for morpheaform basal cell carcinoma, with margins monitored by frozen section. A large defect was noted after complete resection. The Hughes procedure was performed and a good result was achieved [7]. Pathology confirmed the clinical diagnosis. No recurrence occurred during 5 years of follow-up. The patient was satisfied with the cosmetic results.

Case 12 (Table 2, Figure 2): a 57-year-old man presented with a nodular, ulcerated tumor mass in the left upper eyelid that had been growing for months. He underwent resection for sebaceous carcinoma, with margins monitored

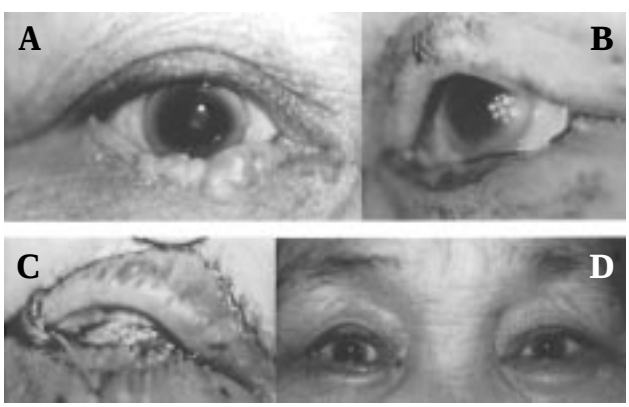

Figure 1. *Morpheaform basal cell carcinoma. (A) A 71-year-old female patient presented with a diffuse, hard tumor in the right lower eyelid for several months; (B) a large defect was noted after complete resection; (C) the Hughes procedure was performed; (D) postoperative appearance.*

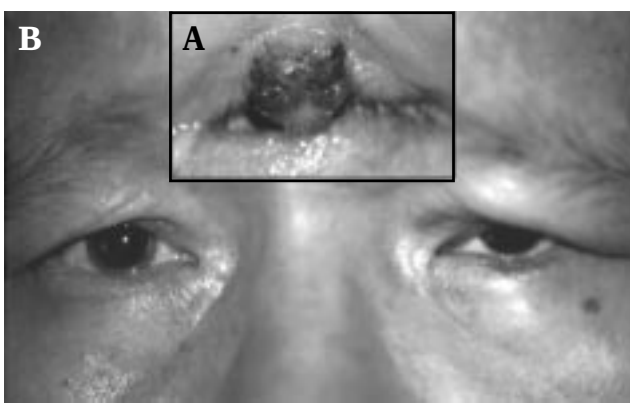

Figure 2. *Basal cell carcinoma mimicking sebaceous gland carcinoma. (A) A 57-year-old male patient presented with a nodular, ulcerated tumor mass in the left upper eyelid that had been growing for several months; (B) postoperative appearance after a reversed Hughes procedure was performed.*

by frozen section. Pathology showed that the tumor was a basal cell carcinoma. A margin free of tumor cells was obtained and a reversed Hughes procedure was performed [8]. The result was satisfactory and no recurrence was noted during follow-up of 22 months.

Discussion

In this series, more than 10% of eyelid tumors undergoing resection were shown to be malignant by histopathologic examination. This incidence is very high, but this series is from a referral center where tumors are usually scheduled for removal under suspicion of malignancy. However, the high proportion should serve as an alert to primary care physicians that timely referral is essential.

Nearly three-quarters of malignant eyelid tumors in this series were basal cell carcinomas, which is similar to the proportion of skin tumors and eyelid tumors in other series [1,2,9–15]. Basal cell carcinoma, though malignant, has a good prognosis if removed completely [16–18]. As a result, early detection and referral for complete removal are important. In this series, all tumors thought to be malignant were removed with margin monitoring using frozen section. No recurrence was noted, although follow-up times were not long enough in some cases. Morpheaform basal cell carcinoma usually presents with an indistinct tumor margin (Case 6) [18]. The resection margin must be carefully monitored by frozen section.

The second most common malignant tumor in this series was sebaceous carcinoma, followed by squamous cell carcinoma. Although this series was small, the order of frequency was compatible with those of other Oriental series [19–22]. In Oriental series, sebaceous carcinoma is usually the second most common malignant tumor and squamous cell carcinoma is the third, but in Western series, squamous cell carcinoma is the second most common while melanoma or sebaceous carcinoma is the third [9–15].

In a study to test the accuracy of clinical diagnosis, agreement with final pathologic diagnosis was 84% while about 5% of clinical diagnoses that were presumed to be benign proved to be malignant [23]. In this study, four malignant tumors were misdiagnosed before surgery. However, two were thought to be other malignant tumors and were resected with margin monitoring using frozen section. The tumors were completely removed in the primary operation. Two of 18 (> 10%) malignant tumors were misdiagnosed as benign before surgery. Therefore, it is mandatory to submit all tumor samples for pathologic examination.

Another interesting point to note of the malignant eyelid tumors in this series was the predilection for lower eyelids and female patients. Of basal cell carcinomas, 93% were located in the lower eyelids and 71% were in female patients. Further studies could focus on the hormonal effect, sunlight exposure, and histologic differences between the upper and lower eyelids.

In conclusion, malignancy can comprise up to 10% of eyelid tumors that undergo surgery. On some occasions, malignancies can be misdiagnosed. Therefore, the resection specimen from eyelid tumors should always be submitted for histopathologic examination.

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References

1. Welch RB, Duke JR. Lesions of the lids: a statistical note. *Am J Ophthalmol* 1958;45:415–6.
2. Aurora AL, Blodi FC. Lesions of the eyelids: a clinicopathologic study. *Surv Ophthalmol* 1970;15:94–104.
3. Armstrong BK, Kricker A. The epidemiology of UV induced skin cancer. *J Photochem Photobiol B* 2001;63:8–18.
4. Corona R, Dogliotti E, D'Errico M, et al. Risk factors for basal cell carcinoma in a Mediterranean population: role of recreational sun exposure early in life. *Arch Dermatol* 2001;137: 1162–8.
5. Green A, Whiteman D, Frost C, Battistutta D. Sun exposure, skin cancers and related skin conditions. *J Epidemiol* 1999;9(6 Suppl):S7–13.
6. de Gruijl FR, van Kranen HJ, Mullenders LH. UV-induced DNA damage, repair, mutations and oncogenic pathways in skin cancer. *J Photochem Photobiol B* 2001;63:19–27.
7. Hughes WL. A new method for rebuilding a lower lid: report of a case. *Arch Ophthalmol* 1937;17:1008.
8. Mauriello JA Jr, Antonacci R. Single tarsoconjunctival flap (lower eyelid) for upper eyelid reconstruction ("reverse" modified Hughes procedure). *Ophthalmic Surg* 1994;25:374–8.
9. Cook BE Jr, Bartley GB. Epidemiologic characteristics and clinical course of patients with malignant eyelid tumors in an incidence cohort in Olmstead County, Minnesota. *Ophthalmology* 1999;106:746–50.
10. Cook BE Jr, Bartley GB. Treatment options and future prospects for the management of eyelid malignancies: an evidence-based update. *Ophthalmology* 2001;108:2088–98.
11. Soparkar CN, Patrinely JR. Eyelid cancers. *Curr Opin Ophthalmol* 1998;9:49–53.

12. Piest KL. Malignant lesions of the eyelids. *J Dermatol Surg Oncol* 1992;18:1056–9.
13. Swanson MW, Cloud G. A retrospective analysis of primary eye cancer at the University of Alabama 1958–1988. Part 2: Eyelid tumors. *J Am Optom Assoc* 1991;62:820–3.
14. Lober CW, Fenske NA. Basal cell, squamous cell, and sebaceous gland carcinomas of the periorbital region. *J Am Acad Dermatol* 1991;25:685–90.
15. Loeffler M, Hornblass A. Characteristics and behavior of eyelid carcinoma (basal cell, squamous cell sebaceous gland, and malignant melanoma). *Ophthalmic Surg* 1990;21:513–8.
16. Sigurdsson H, Agnarsson BA. Basal cell carcinoma of the eyelid. Risk of recurrence according to adequacy of surgical margins. *Acta Ophthalmol Scand* 1998;76:477–80.
17. Margo CE, Waltz K. Basal cell carcinoma of the eyelid and periocular skin. *Surv Ophthalmol* 1993;38:169–92.
18. Pieh S, Kuchar A, Novak P, et al. Long-term results after surgical basal cell carcinoma excision in the eyelid region. *Br J Ophthalmol* 1999;83:85–8.
19. Wang JK, Liao SL, Jou JR, et al. Malignant eyelid tumours in Taiwan. *Eye* 2003;17:216–20.
20. Liu CH, Ma L. The clinical features and surgical results of malignant eyelid tumors. *Chang Gung Med J* 2001;24: 84–90.
21. Lee SB, Saw SM, Au Eong KG, et al. Incidence of eyelid cancers in Singapore from 1968 to 1995. *Br J Ophthalmol* 1999;83:595–7.
22. Ni Z. Histopathologic classification of 3,510 cases with eyelid tumor. *Zhonghua Yan Ke Za Zhi* 1996;32: 435–7.
23. Margo CE. Eyelid tumors: accuracy of clinical diagnosis. *Am J Ophthalmol* 1999;128:635–6.