STRATIFYING EYELID MALIGNANCIES: A STUDY OF THE TUMORS PRESENTING TO A TERTIARY CARE HOSPITAL IN PAKISTAN

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ABSTRACT

Background: Eyelid malignancies are relatively uncommon, but because of their propensity for local invasion and impact on ocular function due to the complexity of reconstruction, they pose a significant challenge.

Objective: To evaluate the histological subtypes, clinical outcomes, and demographic trends of patients with malignant eyelid tumors in a tertiary care hospital in Peshawar, Pakistan.

Methods: A descriptive cross-sectional study was conducted at the Ophthalmology Department of Hayatabad Medical Complex, Peshawar, Pakistan. Eyelid tumors were classified based on histological examination of biopsy samples. Statistical analysis was performed with SPSS Version 25.0, with statistical significance set at $p < 0.05$.

Results: A total of 125 patients had malignant eyelid tumors. The majority 52% were males; ages ranging from 30 to 60 years, while females constituted 48%. Basal cell carcinoma had the highest prevalence of all the malignancies at 72% and typically involved the lower lid in about 56%, whereas surgical resection was the standard treatment in almost all cases. Malignant melanoma and sebaceous gland carcinoma showed the highest recurrence rates at 20% each, whereas basal cell carcinoma had the lowest rate at 5.6%.

Conclusion: The most common type of malignant eyelid tumor in this study was basal cell carcinoma, consistent with local and global epidemiological patterns. The main course of treatment is still surgical excision, supplemented with adjuvant and reconstructive therapies according to necessity.

Keywords: Eyelid Tumor, Malignancies, Stratifying, Tertiary Care Hospital

INTRODUCTION

The eye is a complex organ that has a variety of histological components. [1] Several pathologies can impact the eye and ocular adnexa, and in many situations, a meaningful diagnosis requires rapid and careful consultation with the ophthalmologist who submits the specimens [2]. The eyelids serve a natural protective function for the globe, both physically and by regulation the tear film. [3] The majority of pathologic processes affecting the eyelid are skin-related [4].

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Eyelid lesions are frequently encountered in clinical practice. Eyelid tumors constitute around 5–10% of all skin tumors, which can be classified as either benign or malignant based on the tissue or cell from which they originate. Eighty to ninety percent of eyelid lesions typically show up as benign tumors [5]. However, the 5-year mortality rate of patients with sebaceous cell carcinoma can reach up to 30%, so malignant eyelid tumors are potentially fatal. Eyelid tumors form a broad category of neoplasms, ranging from malignant to benign lesions [6]. Basal Cell Carcinoma (BCC), Squamous cell carcinoma (SCC), sebaceous gland carcinoma (SGC), and malignant melanoma, are the most common malignant eyelid tumors worldwide [7].

Examples of malignant cases include melanoma (less than 1%), squamous cell carcinoma (5%), sebaceous cell carcinoma (1.0–5.5%), and basal cell carcinoma (80–90%). [8] The incidence and prognosis of different subtypes of eyelid tumors vary significantly with differences in geographic location, genetic background, socioeconomic level, and occupational exposures [9]. The usual course of treatment for malignant lesions is complete surgical excision with intraoperative margin control, which can lower the recurrence

rate. [8] Therefore, to reduce mortality and complications, it is essential to correctly distinguish between benign and malignant tumors at the beginning of treatment. It takes specialized knowledge and a biological or pathological procedure to diagnose eyelid lesions, which is time-consuming, difficult, and dependent on the pathologists' experience. [10] Regional differences do exist, though, and are impacted by things like genetic susceptibility, exposure to the environment, and access to treatment. [11] In Pakistan, eyelid malignancies have not been studied in detail. Hence, it is essential to have local data to have an appropriate clinical approach. The literature review has shown scarce information regarding its prevalence and clinicopathological features. This study will help develop effective management strategies.

MATERIALS AND METHODS

A descriptive study was conducted at the Department of Ophthalmology at Hayatabad Medical Complex, from January to December 2024. Ethical authority to carry out the study was given by the Institutional Research and Ethical Board (IREB) of MTI, Hayatabad Medical Complex under Approval No. 1903. The sample size was calculated according to OpenEpi sample size calculator keeping a confidence interval of 95%, a margin of error 5% and an expected frequency of 2.25%. The study was carried out in accordance with principles of the Helsinki Declaration. Patients of all age groups diagnosed with malignant eyelid tumors were included in the study and those patients with incomplete records were excluded from the study. The data included demographic details, tumor size, location, duration, and related symptoms. Histopathological findings included tumor type, grade, and margin involvement; treatment included adjuvant therapies such as chemotherapy or radiation after surgical excision. Clinical outcomes included recurrence rates, comorbidities, and follow-up duration. An excisional biopsy was performed to obtain tissue samples, which were subsequently subjected to histological examination. The diagnosis was confirmed by pathologist once staining with hematoxylin and eosin was completed. SPSS Version 25.0 was used for statistical analysis. Continuous variables were reported as descriptive statistics like means, medians, and standard deviations, whereas categorical variables were reported as frequencies and percentages. Fisher's exact test was conducted to determine recurrence among subtypes, while the chi-square tests were used in the evaluation of the tumor subtypes and demographic factors. All results with a P-value less than 0.05 were considered statistically significant.

RESULTS

A total of 125 patients were included in the study diagnosed with malignant eyelid tumors out of which 48% were females and 52% were males. Table 1 shows the demographics stratified according to gender, age and residence.

Table 1: Demographic Features with Malignant Eyelid Tumors

Variables	Frequency
Gender	
Male	65 (52%)
Female	60 (48%)
Age Group	
Less than 30 years	15 (12%)
Between 30-60 years	60 (48%)
More than 60 years	50 (40%)
Residing place	
Urban	90 (72%)
Rural	35 (28%)

In Table 2, the tumors have been classified according to the site of adnexa primarily affected whereas Table 3 shows that the most prevalent histological type. The lower eyelid was the most affected (56%), with the upper eyelid only in (32%). The most prevalent histological type was basal cell carcinoma (72%), followed by squamous cell carcinoma (16%), sebaceous glands (8%), and malignant melanoma (4%).

Table 2: Clinical Features of Various Malignant Tumors of Eyelids

Variable	Frequency n (%)
Site of Tumor	
Lower Eyelid	70 (56%)
Upper Eyelid	40 (32%)
Medial Canthus	10 (8%)
Lateral Canthus	5 (4%)

Table 3: Histological Features of Various Malignant Tumors of Eyelids

Variable	Frequency n (%)
Histological Subtype of Tumor	
Basal Cell Carcinoma	90 (72%)
Squamous Cell Carcinoma	20 (16%)
Sebaceous Gland Carcinoma	10 (8%)
Malignant Melanoma	5 (4%)

Table 4 shows that nearly 96% of patients received a surgical excision as their primary treatment, with 9.6% receiving radiation therapy and 6.4% receiving chemotherapy as adjuvant therapy. In Table 5, the recurrence rates have been described. Malignant melanoma and sebaceous gland carcinoma exhibited the highest recurrence rates while basal cell carcinoma had the lowest.

Table 4: Treatment Approaches and Outcomes

Treatment Type	Frequency n (%)
Surgical Excision	120 (96%)
Adjuvant Therapy	20 (16%)
Chemotherapy	8 (6.4%)
Radiotherapy	12 (9.6%)
Recurrence	10 (8%)

Table 5: Recurrence Rates of Different Types of Tumors

Tumor Sub Type	Frequency n (%)
Basal Cell Carcinoma	5 (5.6%)
Squamous Cell Carcinoma	2 (10%)
Sebaceous Gland Carcinoma	2 (20%)
Malignant Melanoma	1 (20%)

DISCUSSION

Eyelid tumors are becoming more prevalent with time. [1–5] As a result, eyelid tumors are by far the most prevalent neoplasms seen in ophthalmology practice and constitute a significant portion of it. Eyelid tumors are prevalent in both men and women of all age groups and account for over 90% of tumors in ophthalmology [6]. The majority of tumors are identified clinically. According to the study findings, basal cell carcinoma (BCC) was the most common type of malignant eyelid tumor. The patients' site and age group were the same as in other studies conducted globally. [12,13]
The results bring to light that BCC accounts for a significant percentage of malignant eyelid tumors (72% in the study), which was consistent with global statistics showing that BCC often accounts for 80–90% of instances. [14,15] This persistent trend brings into focus the importance of early identification and surgical intervention for the best possible patient outcomes.
The study further shows the clinical presentation and trends in the treatment of malignant eyelid tumors in Pakistan. Tumors on the lower eyelid 56% were more common compared to the upper eyelid, which was 32%, as reported in other regions [16,17]. Since thorough excision with distinct margins is crucial for reducing recurrence, therefore, surgical excision is the preferred treatment method (96%) as consistent with international recommendations [18]. Due to the localized

nature of the majority of malignant eyelid tumors and the overall efficacy of excision in treating BCC, a limited percentage of patients received adjuvant therapies, such as chemotherapy and radiation.

The significance of continuous monitoring is highlighted by the recurrence rates found in this investigation. Malignant melanoma and sebaceous gland carcinoma had the highest recurrence rates (20% each), despite the overall recurrence rate of 8%. This suggests that certain tumor types may need more intensive therapy and closer monitoring. This is in line with results from earlier research, which have linked sebaceous gland carcinoma to a worse prognosis and increased recurrence. [19,20] Although less common in eyelid tumors, malignant melanoma also demonstrated higher rates of recurrence, indicating the aggressive character of this cancer [13].

The study found that 72% of cases were in urban areas, indicating that access to medical facilities may be important for diagnosing and treating these tumors. Urban population may benefit from earlier access to specialized care [21]. The study has some limitations due to being a single-center study, the results might not be representative of the larger Pakistani community. Furthermore, the data's generalizability may be impacted by geographical differences in tumor incidence and treatment results.

CONCLUSION

This study confirms that basal cell carcinoma is the most common malignant eyelid tumor in Pakistan, consistent with worldwide patterns. Most patients were elderly individuals, with a slight male preponderance. The most frequent location for tumors was the lower eyelid.

DECLARATIONS

Authors' contributions

Dr. Aleena Khan: substantial contributions to design, analysis and interpretation of data, approval of work, drafting text.
Dr. Sofia Iqbal: substantial contributions to design, analysis and interpretation of data.
Dr. Abdul Basit: drafting text, intellectual input.
Dr. Bakht Danyal Khan: drafting text, interpretation of data and revisions.

Conflicts of Interest

No financial or other conflicts of interest.

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