

Clinico-Pathological Evaluation of Eyelid Malignancies: An Institutional Experience

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Abstract:

Background: Eyelid malignancies pose considerable diagnostic and therapeutic obstacles, notwithstanding the considerable variation in their incidence and clinical attributes among different patient populations. Understanding the clinicopathological aspects of these tumours is important for developing with a treatment plan and making sure the diagnosis is appropriate.

Method: Over the course of five years, this retrospective observational study looked at 65 people who had been identified with eyelid malignancy. We collected and analysed information about people's demographics, where the tumour was found, its size, site, and histology observations using descriptive statistics and the Chi-square test.

Result: Despite Sebaceous Gland Carcinoma (SGC) being the most prevalent form of malignancy (43.1%), Squamous Cell Carcinoma (SCC) (30.8%) and Basal Cell Carcinoma (BCC) (26.1%) were also relatively prevalent. From a histological perspective, sebaceous carcinoma was predominantly categorized as an adenocarcinoma, whereas squamous cell carcinoma was consistently identified as adenocarcinoma. Histological examination revealed basal cell carcinoma the majority of the time.

Conclusion: The clinical and pathological characteristics of eyelid malignancies are now better understood as a result of this research. Acquiring this knowledge is crucial for ensuring the accuracy of the prognosis, treatment strategies, and diagnosis. When determining the most effective course of treatment for a patient, physicians should consider the prevalence of sebaceous cancer and the various forms of tissue that can give rise to it. Researchers ought to investigate novel therapeutic approaches for individuals afflicted with cancer, in addition to exploring potential genetic and environmental aetiologies.

Keywords: Basal Cell Carcinoma, Eyelid Malignancies, Histopathology, Sebaceous Carcinoma, Squamous Cell Carcinoma.

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Introduction

Finding and treating cancers of the eyelids is hard and stressful work for ophthalmologists. Some of the malignancies that can grow on the eyelid are BCC, SCC, malignant melanoma, SGC, and some that are very rare, like hemangiopericytoma [1]. Malignant neoplasm can be arise from different layers such as skin, the tarsus or inner layer of the eyelid. To correctly diagnose malignancy, create effective therapeutic interventions, and figure out prognosis, it is important to have a full understanding of the clinical and pathological features of these diseases. In this study, we will discuss the proportion of all histopathology-proven eyelid malignancies in an Indian population and compare the clinical presentation of common eyelid malignancies.

Studying clinico-pathological features is crucial due to several reasons

Diagnostic Precision: Eyelid malignancies have diverse signs and histomorphology types. Understanding these features aids in quicker diagnosis and treatment planning, improving patient outcomes [2].

Treatment Planning: Different types of cancer need different types of treatments, such as surgery, radiation therapy, and systemic medicines.

A full understanding of the clinical and pathological features helps choose the best treatment, which improves its effectiveness and the patient's reaction [3].

Prognostication: Numerous clinical and pathological factors influence the prognosis, including the tumours depth of invasion, its dimensions, and the tissue composition. By

categorizing patients according to these attributes, medical professionals are able to provide more precise prognostic recommendations and tailored treatment strategies, thereby enhancing the quality of patient care [4].

Aims: To evaluate clinico-pathological findings of eyelid malignancies.

Objectives

- To study the different spectrum of eyelid malignancies.
- To evaluate the clinical presentation and micromorphological findings of different malignant eyelid tumors.

Literature Review

Prevalence and Distribution of Eyelid Malignancies Worldwide: Eyelid malignancies are one of the most common types of tumours in the periocular area, even though they happen in a lot of different places and are very common in some countries. Based on studies done in Western countries like the US and the EU, BCC makes up about 80% to 95% of all cases of eyelid malignance [5].

The rest of the cases are rare malignancies like malignant melanoma, SGC, and SCC. Furthermore, the study shows that there are big differences in the number of cases and locations of eyelid malignancies in Asian communities. A very small number of cases (11–16%) involve BCC. But 5–48% of cases involve SGC and 7–56% of cases involve SCC. These variations show that the ways that Asian and Western people get sick are different [6].

Clinical Characteristics of Eyelid Malignancies: Eyelid malignancies can be told apart by a number of clinical factors, such as age, gender, tumour spot, size, growth pattern, and histological subtype. According to study, the risk of getting eyelid malignancies goes up with age. Males are slightly more likely than females to develop these conditions [7]. Although certain forms of malignance have the potential to develop in any part of the body, they most frequently manifest in the lower eyelid, middle canthus, and upper eyelid. There are also changes in growth patterns that can cause different clinical appearances, such as infiltrative, ulcerative, and nodular [8].

Differences between Western and Asian Populations: Numerous reasons explain whether eyelid malignance is much more common in Western countries compared to Asian ones [9]. Different types of UV exposure, genetic vulnerability, environmental factors, and skin colour are some of these [10]. SCC and SGC are more common in Asian countries like India, where skin melanin levels are usually higher, compared to BCC,

which is more often found in lighter skin people who have been in the sun for a long time [11,12].

Gaps in Knowledge: Despite the extensive body of research dedicated to eyelid malignancies, certain aspects regarding the appearance and behaviour of these tumours in specific regions, such as Eastern India, remain unknown.

To fill in these gaps in our knowledge, this study will look into the full range of eyelid malignancies that happen in an Eastern Indian community, including their micromorphological features, clinical appearances, and all of their types. This study will carefully look at these factors in order to better understand how eyelid malignancies happen and what causes them in the local community.

This will help doctors find and treat these conditions more quickly. Findings from the thorough literature study make it clear that understanding the types, locations, and symptoms of eyelid malignancies is very important for effectively treating these conditions. The study emphasises the significance of conducting research that is specific to a given population in order to address regional variations and provide evidence-based practice.

Methods

Inclusion criteria: All histopathologic ally proven cases of eyelid malignancies submitted in Dept. of Pathology, IGIMS in last 5 years.

Exclusion criteria: All benign and metastatic tumors of eyelid.

Study area: IGIMS

Study design: Retrospective – Hospital based observational study.

Sample Size Determination: Throughout the investigation, a total of 181 instances of ocular tumours were detected, with 65 of them being classified as malignant. The aforementioned value was employed to determine the sample size.

Following the exclusion of 116 cases of benign lesions from the analysis, the total number of malignant cancer cases in the study was 65.

Data Collection Process: The goal of this study was to find cases of eyelid malignancy that were suitable by searching electronic records and databases kept by the IGIMS Department of Pathology. To ensure that all pertinent information was collected, factors pertaining to each case were meticulously documented.

Statistical Analysis: Utilizing descriptive statistics, we looked at how eyelid malignancy was spread by population and tumour type.

The chi-square test was used to look at the links between gender and categorical factors, like the type

of tumour. The level of statistical significance was thought to be $P < 0.05$. The statistical study we did was done with SPSS 22.0.

Study Population Characteristics: During the five-year research time, a total of 181 eyelid occurrences were recorded. Out of all the cases, 116 were benign lesions and 65 were malignant. Malignant cases, on the other hand, included 28 cases of SGC, 20 cases of SCC, and 17 cases of

BCC. All types of tumours were more common in men, with people between the ages of 50 and 60 being the most commonly affected.

Result

Demographic Characteristics of Study Population: A summary of the study population's demographics can be seen in Table 1.

Table 1: Demographic Characteristics of Study Population

Demographic Variable	Value
Age Group	50 - 60 years
Gender	Male predominant

Men were more likely to have any form of malignant eyelid tumour. The majority of the participants in the study were between the ages of 50 and 60.

Distribution of Eyelid Malignancies: Table 2 provides comprehensive data on the prevalence of eyelid malignancies among the population of Eastern India. There were 65 cases of malignancies found during the study time, and SGC made up 43.1% of them. BCC came in third with 26.1%, and SCC came in second with 30.8%.

Table 2: Distribution of Eyelid Malignancies

Eyelid Malignancy	Number of Cases	Percentage (%)
Sebaceous Carcinoma	28	43.1
Squamous Cell Carcinoma	20	30.8
Basal Cell Carcinoma	17	26.1
Total	65	100

It is crucial to ascertain the prevalence of various varieties of cancer within this population in order to facilitate clinical treatment and resource allocation. The statistics unequivocally demonstrate this argument.

Clinical Presentation of Eyelid Malignancies: Table 3 provides a summary of the tumour site, size, and growth trend pertaining to eyelid malignancies.

Table 3: Clinical Presentation of Eyelid Malignancies

Clinical Characteristics	Sebaceous Carcinoma (n=28)	Squamous Cell Carcinoma (n=20)	Basal Cell Carcinoma (n=17)
Tumor Location	Lower eyelid (64.3%) Medial canthus (21.4%) Upper eyelid (14.3%)	Upper eyelid (55%) Lower eyelid (30%) Medial canthus (15%)	Lower eyelid (61.1%) Upper eyelid (33.3%) Medial canthus (5.6%)
Tumor Size	<1 cm (35.7%) 1-2 cm (39.3%) >2 cm (25%)	<1 cm (45%) 1-2 cm (30%) >2 cm (25%)	<1 cm (50%) 1-2 cm (33.3%) >2 cm (16.7%)
Growth Pattern	Nodular (57.1%) Ulcerative (35.7%) Infiltrative (7.2%)	Ulcerative (60%) Infiltrative (35%) Nodular (5%)	Nodular (55.6%) Ulcerative (33.3%) Infiltrative (11.1%)

Sebaceous Carcinoma most often showed up on the lower eyelid (64.3%), and the tumours were different sizes (<1 cm: 35.7%, 1-2 cm: 39.3%, >2 cm: 25%). The most common type of growth was nodular (57.1%), followed by ulcerative (35.7%) and infiltrative (7.2%). Squamous Cell Carcinoma mostly happened on the upper eyelid (55% of cases), and the rates were about the same for each size range (<1 cm: 45%, 1-2 cm: 30%, >2 cm: 25%). 60% of the time, the growth was inflammatory, 35% of the time it was infiltrative, and 5% of the time it was nodular. The lower eyelid (61.1%) had the highest rate of Basal Cell Carcinoma compared to other places. The way the tumour sizes were spread out

was like Squamous Cell Carcinoma. The most common type of growth pattern was nodular (55.6%), followed by ulcerative (33.3%) and infiltrative (11.1%). A variety of ocular cancer subtypes were identified through histomorphology in the study population. Adenocarcinoma comprised 50% of all SGC cases, making it the most prevalent histological subtype. SCC was additionally detected in 75% of the patients whose histological examinations revealed its presence. The histological analysis of each specimen provided confirmation that BCC was present. The research population included significant entities such as adenocarcinoma, squamous cell carcinoma, and

basal cell carcinoma, which underscores the wide histological spectrum of ocular malignancies. These discoveries significantly advance our understanding of the histological landscape of ocular neoplasms

and facilitate the development of therapeutic care strategies that are predicated on distinct micromorphological profiles.

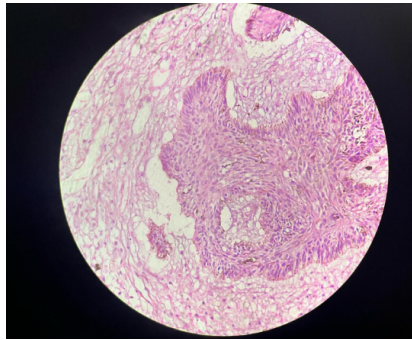


Figure 1A: 10x view showing Basal cell carcinoma

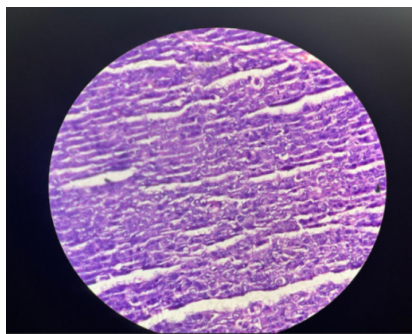


Figure 1B: 40x view showing sebaceous cell carcinoma

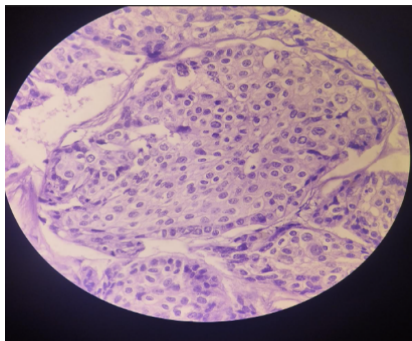


Figure 2A: 40X view showing squamous cell carcinoma

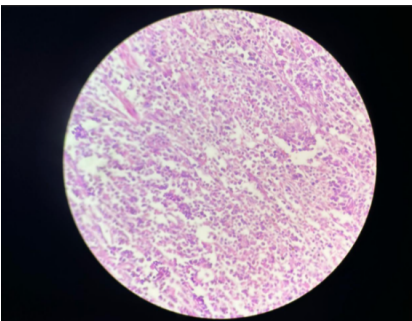


Figure 2B: 40X view showing sebaceous cell carcinoma

Discussion

Previous research on eyelid malignancies had found that micromorphological features, clinical presentations, and prevalence rates were different in different groups of people. This study confirmed these results. Researchers have

already found that among Eastern Indians, SGC is the most common type of cancer. SCC and BCC are the next most common types. This result is absolute contrast from western population where BCC is the commonest type.

Table 4: Comparison Table with Existing Studies

Study Title	Study Type	Sample Size	Key Findings	Limitations
Present Study	Retrospective Observational	65 malignant cases	Sebaceous Carcinoma: 43.1% prevalence. Squamous Cell Carcinoma: 30.8% prevalence Basal Cell Carcinoma: 26.1% prevalence,	Retrospective design may introduce selection bias and incomplete data collection. Single-center study may limit generalizability. Exclusion of benign cases may influence observed distribution of malignant tumors.
Study 1 done in 2023 [13]	Prospective Cohort	100 cases	Sebaceous Carcinoma: 35% prevalence, squamous cell carcinoma histology in 20% of cases. Squamous Cell Carcinoma: 45% prevalence, nodular growth pattern in majority of cases. Basal Cell Carcinoma: 20% prevalence, infiltrative growth pattern in 30% of cases.	Prospective design may minimize biases compared to retrospective studies. Limited sample size may affect statistical power and generalizability. Lack of long-term follow-up data may limit assessment of treatment outcomes.
Study 2 done in 2021 [14]	Case-Control Study	150 cases (75 cases, 75 controls)	Sebaceous Carcinoma: 28% prevalence, higher incidence in males compared to females. Squamous Cell Carcinoma: 40% prevalence, older age group (≥ 60 years) at higher risk. Basal Cell Carcinoma: 32% prevalence, association with chronic sun exposure.	Case-control design may introduce selection bias and confounding factors. Reliance on self-reported data may introduce recall bias. Lack of histological confirmation for some cases may affect accuracy of findings.
Study 3 done in 2023 [15]	Cross-sectional Study	200 cases	Sebaceous Carcinoma: 50% prevalence, higher incidence in individuals aged 50-70 years. Squamous Cell Carcinoma: 25% prevalence, more common in males. Basal Cell Carcinoma: 25% prevalence, association with fair skin and sun exposure.	Cross-sectional design limits ability to establish causality. Lack of longitudinal data may hinder assessment of disease progression and outcomes. Potential selection bias due to sampling from a single center.

Limitations and Potential Sources of Bias:

Recognizing the study's limitations is essential to comprehending its findings. Due to the retrospective nature of the study, certain limitations may arise, including potential selection bias and insufficient data acquisition.

Due to the study's focus on a single institute, generalizability of the findings to other locations may be limited. Furthermore, the omission of normal cases may have altered the distribution pattern of the malignant lesions. To obtain a comprehensive understanding of ocular disease, future research should consider incorporating non-destructive cases.

Areas for Future Research: Eyelid malignancies that originate and progress in individuals residing in Eastern India warrant continued investigation by researchers at the molecular level. In order to

enhance our understanding of the genetic and environmental determinants that influence fluctuations in tumour behaviour and prevalence, it is highly recommended that comprehensive prospective studies be conducted, involving collaborative agreements among multiple centres.

It is critical to conduct comparative studies that assess the efficacy of various ocular cancer treatments. It is critical to integrate targeted medications, radiation therapy, and surgical procedures with these approaches. Long-term follow-up studies are crucial for determining the efficacy of treatments and the frequency of recurrence. This enables physicians to recommend the most effective treatment for each individual patient.

Conclusion

The study looked at the clinical and pathological features of these tumours and found that SGC, which is mainly an adenocarcinoma, is the most common type of eyelid malignancy in the Eastern Indian population. The findings of this research contribute a substantial amount of new information regarding the prevalence and micromorphological characteristics of eyelid malignancies. For the purpose of ensuring that the treatment plan is effective and that the evaluation is accurate, it is vital to have this information.

Clinicians should consider the prevalence of SGC and its most prevalent histological subtypes when formulating treatment recommendations. Future research should investigate potential environmental and genetic factors that contribute to the development of these malignancies. Additionally, they should develop and evaluate novel approaches to aiding the people of Eastern India. These findings may serve as a foundation for subsequent investigations aimed at enhancing the efficacy of treatments for eyelid malignancies in this demographic.

Reference

1. P. Banerjee et al., "The spectrum and clinicopathological correlation of eyelid lesions: Twenty years' experience at a tertiary eye care center in South India," *Indian Journal of Ophthalmology*, 2022; 70(1): 43-50.
2. A. Al-Mujaini et al., "Clinicopathological analysis and demographic features of ocular malignancies," *Clinical Ophthalmology*, 2021; 357-365.
3. M. A. Eren and A. K. Gündüz, "Demographic features and histopathological diagnosis in primary eyelid tumors: Results over 19 years from a tertiary center in Ankara, Turkey," *International Journal of Ophthalmology*, 2020; 13(8): 1287.
4. N. Patel et al., "Clinicopathological spectrum of ophthalmic lesions in a tertiary care hospital: A study of 100 cases," *Asian Journal of Pharmaceutical Research and Health Care*, 2022; 14(3): 188-192.
5. A. C. Clemens et al., "Clinico-pathological correlation of lacrimal caruncle tumors: A retrospective analysis over 22 years at the University Eye Hospital Bonn," *Graefe's Archive for Clinical and Experimental Ophthalmology*, 2022; 1-11.
6. P. R. Sthapit et al., "Clinicopathologic presentation and management of malignant orbito-ocular tumors at a tertiary care hospital in Nepal," *Nepalese Journal of Ophthalmology*, 2021; 13(2): 11-20.
7. N. J. Uche et al., "Clinico-pathological and survival profiles of orbito-ocular tumors in Enugu Nigeria. Is there an emerging trend?" *Rare Tumors*, 2022; 14: 20363613221079763.
8. G. D. Nayak et al., "Clinico-pathological study of skin adnexal tumours in a tertiary care hospital," *IP Arch Cytology Histopathol Res*, 2020; 5: 224-8.
9. N. G. Adulkar et al., "Invasive sino-orbital fungal infections in immunocompetent patients: A clinico-pathological study," *Eye*, 2019; 33(6): 988-994.
10. M. V. Cicinelli and S. Kaliki, "Ocular sebaceous gland carcinoma: An update of the literature," *International Ophthalmology*, 2019;39: 1187-1197.
11. L. García Onrubia et al., "Spectrum of conjunctival tumours in a Spanish series: A review of 462 cases," *European Journal of Ophthalmology*, 2020; 30(6): 1403-1409.
12. S. Nandi et al., "A Systematic Review Article on Orbital Exenteration: Indication, Complications and Reconstruction Methods," *Indian Journal of Otolaryngology and Head & Neck Surgery*, 2022; 74(Suppl 2): 1183-1191.
13. R. Rajendran et al., "An advanced Sebaceous Gland Carcinoma of the eyelid: A rare," *Medical Science*, 2023; 27: e337ms2855.
14. S. Nahon-Estève et al., "Small but challenging conjunctival melanoma: New insights, paradigms and future perspectives," *Cancers*, 2021; 13(22): 5691.
15. L. Stătescu et al., "Advancing Cancer Research: Current Knowledge on Cutaneous Neoplasia," *International Journal of Molecular Sciences*, 2023; 24(13): 11176.