Epidemiology and presentation patterns of eyelid tumors in Tripura

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Abstract:

Eyelid tumors represent a unique subset of ocular pathology, combining dermatological, oncological, and ophthalmic concerns within a compact and functionally critical anatomical region. Despite their visibility, these lesions are often overlooked or misdiagnosed, particularly in resource-limited settings. Globally, eyelid masses range from benign cysts and nevi to aggressive malignancies. This is an observational epidemiological study to assess the demographic profile & frequency of eyelid tumors in patients presenting in a tertiary institute of Tripura.

Keywords: Eyelid, Carcinoma, Cyst, Sebaceous, Basal, Squamous, Benign, Malignant

1. INTRODUCTION

Eyelid mass is one of the most commonly presenting complaint to an ophthalmologist. The annual age-adjusted incidence of eyelid malignancies in Asia ranges from 3.1 to 6.5 per million population [1]. It can range from a small, inflammatory chalazion to a large, neoplastic carcinoma [2]. The eyelids act as a protective shutter for the eye. It is rich in various glands like glands of Zeis, glands of wolfing, Krause, meibomian glands, and glands of moll [3]. These glands can act as the origin of various mass also. Among the skin cancers, 90% are in head and neck region and among them 10% are at the level of eyelid [4].

The tumors in eyelid range from a papilloma, nevus, keratosis which are benign to basal cell carcinoma, squamous cell carcinoma, sebaceous cell carcinoma which are malignant [5-7]. All these tumors can cause impairment of vision if they are significantly large or if they compress the eye. Therefore, early and accurate diagnosis and management is crucial to prevent further complications, morbidity and mortality.

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Although eyelid masses are frequently encountered in Tripura, yet no systematic study has been conducted in the Tripura. Hence, the present study was conducted to assess the demographic profile & frequency of eyelid tumors in patients presenting in this part of the country.

2. MATERIALS AND METHODS

Place of study- This observational epidemiological study was conducted at the Department of Ophthalmology, AGMC, and GBP Hospital from October 2021 to October 2023.

Inclusion criteria: Patients of either gender and any age group presenting to our eye OPD with eyelid growth and who underwent surgical management or excision biopsy of the tumor in our institute followed by histopathological examination.

Exclusion Criteria: Inflammatory or infective conditions mimicking tumors.

Sample collection:

Forty patients of both sexes with clinically diagnosed eyelid growths were enrolled in the study. All cases were examined by an ophthalmologist, and patient complaints were documented. Following informed written consent, tumors were surgically excised and submitted for histopathological evaluation. Specimens were preserved in 10% formalin, and their size, shape, and consistency were recorded. Larger samples were sectioned sagittally, while smaller specimens were embedded whole, wrapped in paper, placed in cassettes, and fixed overnight in 10% formalin. After fixation, tissues were dehydrated through graded ethanol, cleared in xylene, and embedded in paraffin with appropriate orientation. Sections of 5–7 µm thickness were prepared and stained with hematoxylin and eosin (H&E) for microscopic examination.

Statistical Analysis

Descriptive statistics (mean, percentage distribution) were used. No inferential statistics were applied due to limited sample size.

3. RESULTS

A total of 40 consecutive confirmed cases with eyelid growths who presented to the outpatient department of ophthalmology at Agartala Government Medical College were recruited in the study. The mean age of the study population was 49.14 yrs. (range of 8-72 yrs.)

Out of total 40 cases, there were 55% female and 45% male patients (Figure 1).

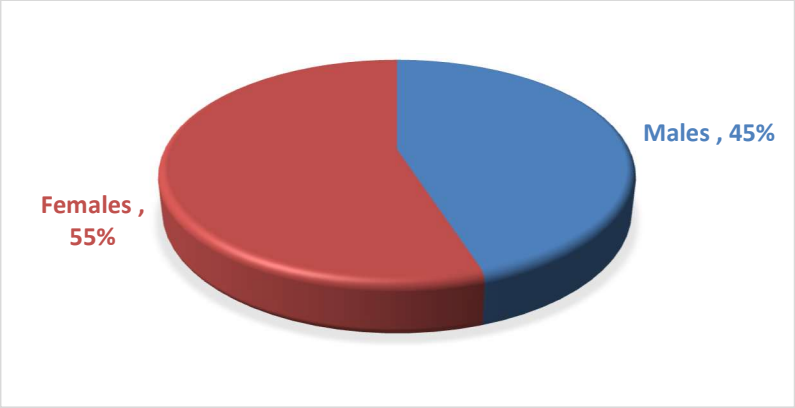

Figure 1. Sex predisposition

The most common location of the eyelid lesions was upper eyelid 62.5% (n=27) while lower eyelids had 25% (n=10) lesions. There were 3 cases with lesions at canthus (8%) (Figure 2).

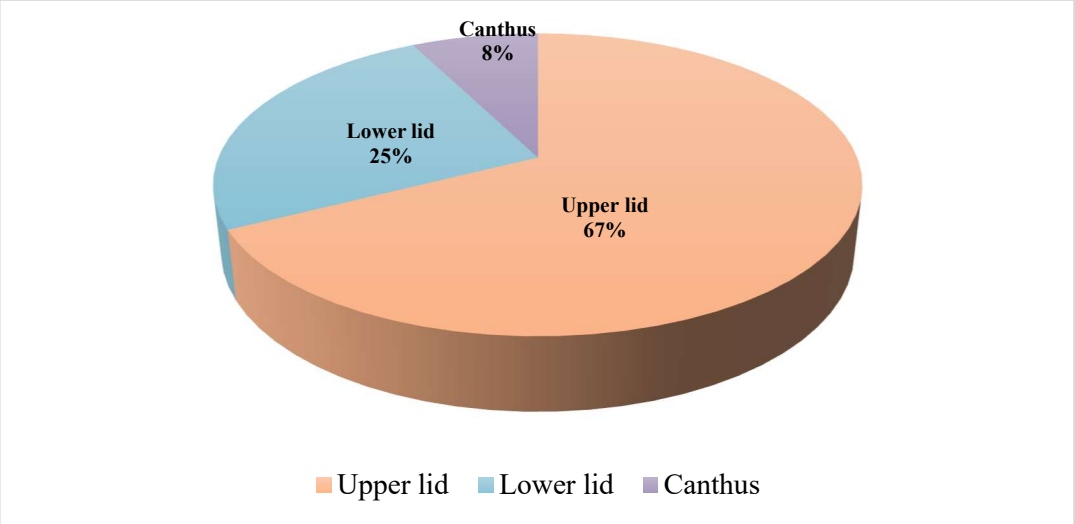

Figure 2. Location of mass

Out of 40 cases, 13 (32.5%) were malignant neoplasms while rest 27 were benign (67.5%).

Among 27 benign lesions, dermoid was the most common (22.22%, n=6) (Image 3), followed by capillary hemangioma (18.51%, n=5) (Image 4), sebaceous cyst (18.51%, n=5) (Image 1). The less common benign lesions were papilloma (14.81%, n=4), keratinous cyst (11.1%, n=3), seborrheic keratosis (7.40%, n=2), hydrocystoma (3.7%, n=1) and schwannoma (3.7%, n=1) (Image 2) (Figure 3).

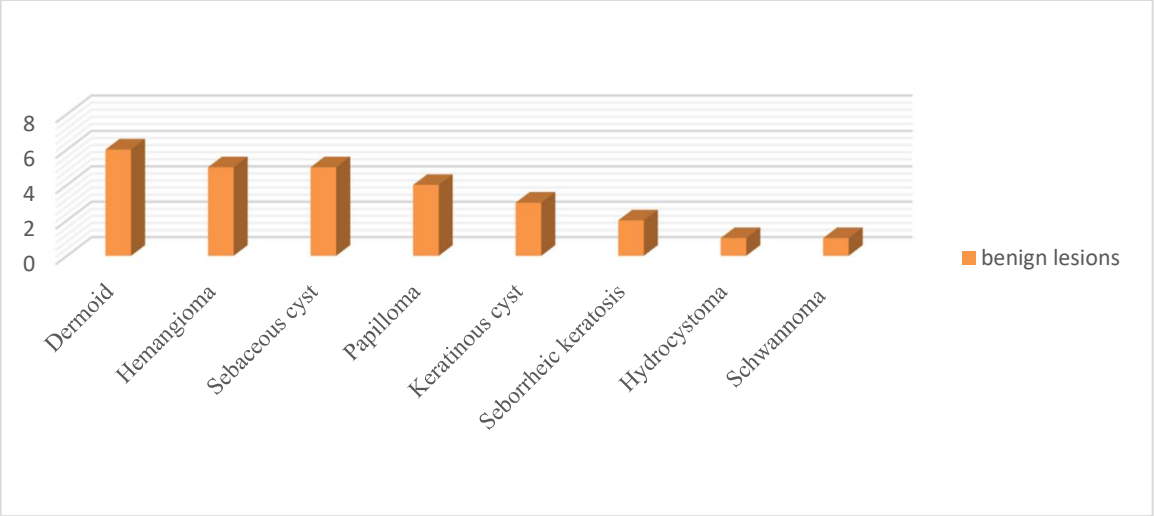

Figure 3. Benign lesions

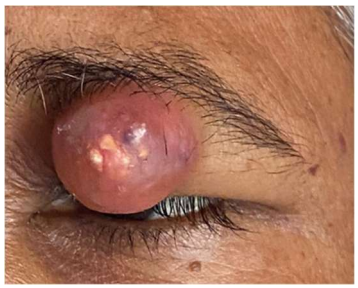

Image 1: Sebaceous cyst

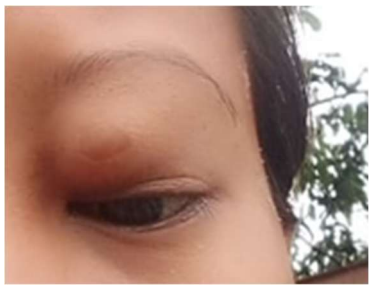

Image 2: Schwanomma

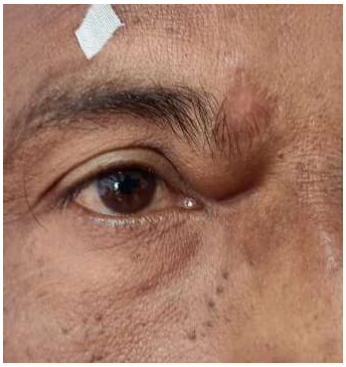

Image 3: Dermoid

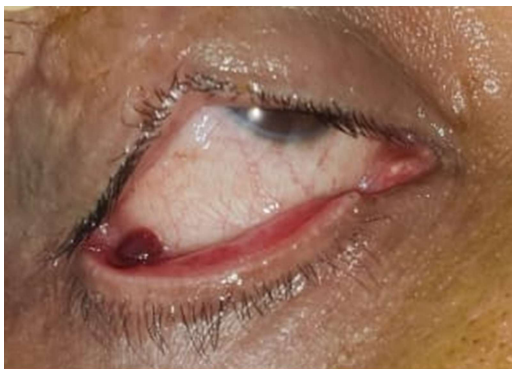

Image 4: Hemangioma

Of the malignant lesions (Figure 4), basal cell carcinoma was most common (30.76%, n=4) (Image 5 and 6) followed by sebaceous gland carcinoma (Image 7) and squamous cell carcinoma of equal number (23.07%, n=3). Less common were malignant melanoma, lymphoma and rhabdomyosarcoma with each being 7.60% (n=1).

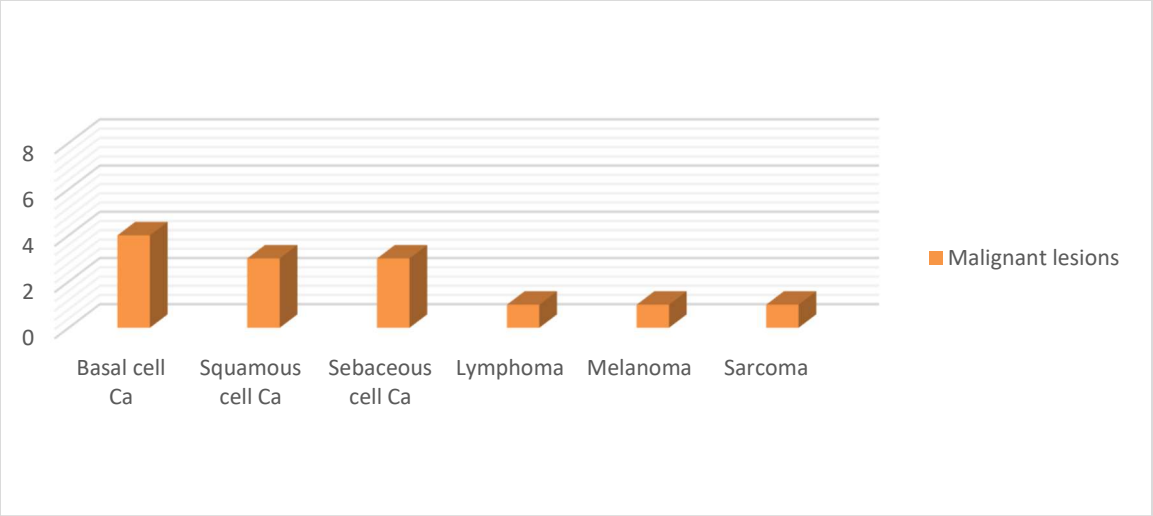

Figure 4. Malignant lesions

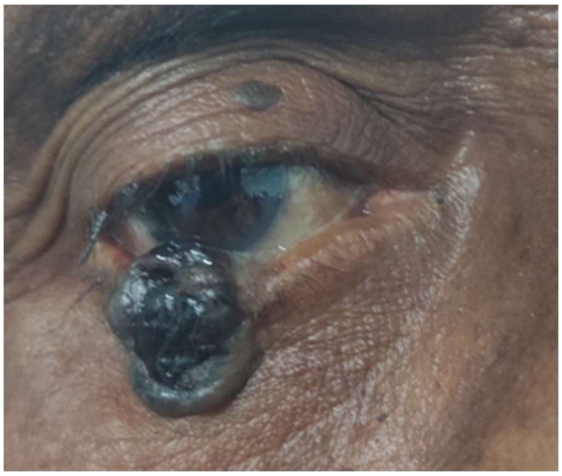

Image 5: Basal cell carcinoma (clinically)

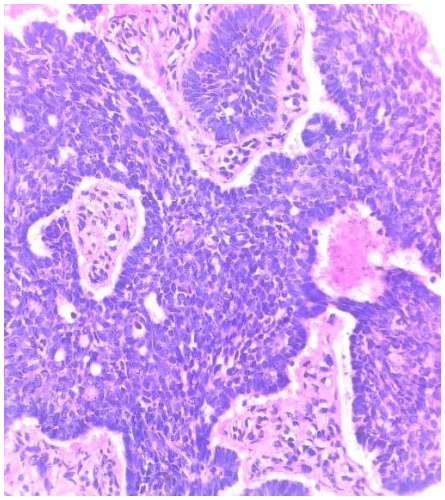

Image 6: Basal cell carcinoma (Histopathology)

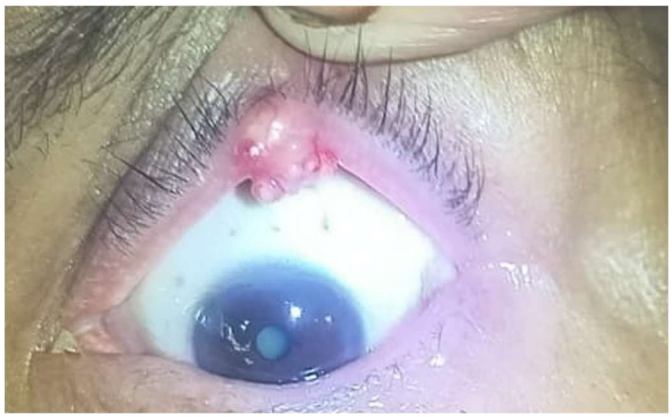

Image 7: Sebaceous cell carcinoma

4. DISCUSSION

The present study evaluated the clinical profile and distribution of eyelid tumors in a hospital-based population from Tripura and compared the findings with previously published literature from different regions. In our study of 40 patients, the mean age of presentation was 49.14 years, which is comparable to the mean ages reported by Paul et al. (43.22 ± 17.4 years) [8]. Studies by Choudhary et al. (54 years) [9], Eren et al. (51 years) [11], and Yu et al. (51.16 ± 15.4 years) [12] reported slightly higher mean ages, indicating that eyelid tumors tend to occur predominantly in middle-aged to older adults across various populations.

In terms of gender distribution, our study showed a slight female predominance (F: 55%, M: 45%). A similar female predominance was noted in the studies by Choudhary et al. (52% female) [9] and Prajapat et al. (61% female) [10]. In contrast, Paul et al. documented an almost equal gender distribution [8]. These findings suggest that while

eyelid tumors affect both sexes, many South Asian and East Asian populations demonstrate a consistent female predominance, possibly related to healthcare-seeking patterns or demographic characteristics.

Across all studies, including the present one, the upper eyelid emerged as the most common site of involvement. Our study observed the upper lid as the predominant location, consistent with Paul et al., Choudhary et al. (64.28%), Prajapat et al. (48.39%), Eren et al. (45.9%), and Yu et al [8-12]. Nearly all comparative studies reinforce that the anatomical prominence and exposure of the upper lid may contribute to its higher susceptibility to both benign and malignant lesions.

Regarding the benign tumors, 67.5% of eyelid lesions in our study were benign. Dermoid cysts were most frequent (22.22%), followed by haemangiomas (18.51%) and sebaceous cysts (18.51%). This pattern aligns partially with findings from other authors, though with notable regional variation. Paul et al. reported nevus (26.9%) and sudoriferous cysts (19.2%) as the most common benign lesions [8], while Choudhary et al. found epidermal cysts to be predominant [9]. Prajapat et al. observed haemangioma as the leading benign diagnosis, similar to our study [10]. In contrast, Eren et al. [11] identified papilloma as the most frequent benign lesion (15.2%), and Yu et al. [12] reported seborrheic keratosis as the most common. Another study by Huang et al. the most common benign lesions were Intradermal nevus (21.1%), Seborrheic keratosis (12.6%), Xanthelasma (11.2%) [14]. These differences highlight the geographic and demographic variations in benign eyelid pathology, influenced by genetic, environmental, and possibly occupational factors.

Malignant lesions constituted 32.5% of cases in the present study. Basal cell carcinoma (BCC) was the most common malignancy (30.76%), followed by sebaceous cell carcinoma and squamous cell carcinoma (SCC), with the latter two occurring at similar frequencies (23.07%). This distribution is consistent with reports by Paul et al. [8] and Eren et al. [11], both of whom documented BCC as the leading eyelid malignancy (21.0%) respectively. Another similar distribution of malignant tumors has been seen in a study by Mondal SK where most common malignant lesion was basal cell carcinoma (15%) followed by sebaceous gland carcinoma (11.25%) and squamous cell carcinoma (10%) [13]. However, studies such as Prajapat et al. and Choudhary et al. observed a higher prevalence of sebaceous carcinoma, reflecting the known increased incidence of sebaceous cell carcinoma in the Indian subcontinent [9-10]. Yu et al. reported lower malignant proportions overall (13.1%), with BCC remaining the most frequent malignant type (56.5%) [12].

These findings confirm that while BCC remains the most prevalent eyelid malignancy globally, sebaceous carcinoma is comparatively more common in South and Southeast Asian populations, including our setting.

Overall, the results of our study correspond well with patterns reported in Asian and international literature. The similarities in age distribution, gender predominance, upper-lid involvement, and predominance of benign tumors reinforce common epidemiological trends. The variation in specific benign lesions and the relatively higher occurrence of

sebaceous carcinoma in Indian studies underscore the importance of regional data in guiding clinical suspicion and management strategies. Our findings contribute valuable information regarding eyelid tumor characteristics in the northeastern region of India, supporting the need for continued documentation to better understand geographic influences on eyelid tumor epidemiology.

5. CONCLUSION

Eyelid is composed of heterogeneous tissue. Hence, we tend to see a variety of tumor types and subtypes, both benign and malignant. The clinical presentation pattern of eyelid tumors in Tripura is broadly comparable to national and international data. Benign lesions are more predominant in this region of India with dermoid being the most common. Among the malignant lesions, basal cell carcinoma was the most common. Mostly growths were seen in females and most patients were largely from rural areas.

Variations in the distribution of specific benign tumors and sebaceous carcinoma frequency emphasize the need for region-specific data for early recognition and improved patient outcomes. This study adds valuable epidemiological information from Northeast India, a region with limited prior research on eyelid tumors.

6. REFERENCES

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