

Clinicopathological Analysis of Eyelid Masses: A Cross-sectional Study

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ABSTRACT

Introduction: Eye lid masses are common presentations in ophthalmic practices, ranging from benign lesions to potentially life-threatening malignancies. While the clinical examination provides the initial diagnosis, histopathological evaluation remains the gold standard for accurate identification and management. Limited studies in Nepal have explored the clinicopathological correlation of eyelid tumors. **Aims:** To analyze the demographic profile, clinical presentation, and histopathological findings of benign and malignant eyelid masses, and to assess the correlation between clinical and histopathological diagnosis. **Methods:** This hospital based cross sectional study was conducted from May 2022 to May 2023 in the department of oculoplasty, Lumbini eye institute and research Centre. Total 53 patients presenting with eye lid masses underwent detailed ocular examination, surgical excision and histopathological analysis. Data were analyzed using SPSS version 22.0. **Results:** Among 53 patients, 30(56%) were female and 23(43%) male in both benign and malignant eyelid masses. Left upper lid was predominantly affected. The predominant clinical presentation was eye lid mass 33(62.26%) followed by pigmentary changes 8(15.09%). Ulcerated wounds and mechanical ptosis were equally observed in about 5(9.4%) cases each, while mechanical ectropion was the least common presentation, seen in 2(3.7%) cases. Histopathological analysis revealed 44(83%) as benign lesion and 9(17%) as malignant. The most common type of benign lesion was cyst (epidermal, inclusion, and sebaceous types) accounting for 19(43.8%) cases, followed by Nevi (simple, compound and intradermal) and papilloma comprising 8(18.8%) cases each. Among malignancies, Basal cell carcinoma 4 (44.44%) was most common followed by sebaceous cell carcinoma 3(33.33%). The overall clinical diagnostic accuracy compared to histopathological diagnosis was 75%. **Conclusion:** Benign eyelid lesions were more prevalent than malignant ones, with cysts being the most common benign lesion and basal cell carcinoma the most frequent malignancy. Only clinical examination may not be sufficient for accurate diagnosis; therefore, histopathological evaluation is essential for guiding appropriate management

Keywords: Basal cell carcinoma, Benign, Eyelid tumors, Histopathology, Malignant, Sebaceous carcinoma

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INTRODUCTION

Eyelid masses are commonly encountered in ophthalmic practice. The incidence of skin tumor is mainly due to the environmental factor, exposure to sunlight, ultraviolet rays. Approximately 10% of all skin tumors occurs in eyelid.³ The relative frequencies of eyelid lesions are different in various parts of the world as reported in literature. The Benign tumor of eyelid is more common as compared to the malignant tumor.² The main malignant tumors affecting the eyelids are basal cell carcinoma, sebaceous carcinoma, squamous cell carcinoma, malignant melanoma. Basal cell carcinoma has the highest incidence among the malignant tumor in the western part of the world whereas sebaceous carcinoma is reported to have the highest incidence in Asians.⁶ Although all the eyelid masses

are diagnosed clinically at first, histopathological examination give us the definitive diagnosis which play the major role in further treatment. There are limited studies done in Nepal regarding eyelid tumor with clinicopathological correlation. This study analyzed the demography, clinical presentation, gross and histopathological findings to support the clinical diagnosis of different benign and malignant eye lid masses. This study aims to analyze the demographic profile, clinical presentation, and histopathological findings of benign and malignant eyelid masses, and to assess the correlation between clinical and histopathological diagnosis.

METHODS

This was a hospital based cross sectional study done of all con-

secutive cases of eye lid mass presenting to the department of oculoplasty, Lumbini eye institute and research Centre, over one year from May 2022 to May 2023. The eyelid masses were examined in ambient room light and photograph were taken in some cases. The eye lid masses presented undergo surgical excision with histopathological examination at National Pathology laboratory. The sample size was 53.

Sample size

$$n = Z^2 \times p \times q/d^2 \text{ where}$$

P= Prevalence of eyelid mass (36% = 0.36)

Z= 1.96 at 95% confidence interval

$$q= 1-p=1-0.36=0.64$$

d= maximum tolerable error=10% = 0.1

$$n= (1.96)^2 \times 0.36 \times 0.64/ (0.1)^2 = 53.02$$

Sample size=53

Inclusion criteria

1. Patients with eyelid masses who underwent surgery and histopathological examination.
2. All patients ready to enroll in our study.

Exclusion Criteria

1. The patient presenting with infective or inflammatory eyelid masses.
2. Recurrent eyelid tumor.
3. Eyelid masses without surgery or histopathological examination.
4. The patient not willing to enroll in the study .
5. Evidence of systemic involvement as there may be evidence of metastasis to the adjacent structures and other systemic organ.

A comprehensive history of each patient presenting with eyelid mass was recorded. Particular emphasis was placed on the onset, laterality, progression, duration of the lesion, and time of initial presentation. Any evidence of lymph node involvement or systemic metastasis at presentation was documented. Potential risk factors, including tobacco use, smoking, prolonged sun exposure, history of radiation exposure and relevant family history were also noted. Systemic history was taken with specific reference to chronic illnesses and known case of metastatic carcinoma. Initial visual acuity assessment was performed using the Snellen visual acuity chart. All patients underwent detailed ocular examination using slit -lamp bio-microscopy conducted by an oculoplastic surgeon. Special attention was given to evaluating the eyelid mass, including its anatomical location, laterality, and dimensions (measured in millimeters). The mass was assessed for characteristics such as site, shape, form, mobility, compressibility, consistency, color, depth and surface features (e.g. regularity, elevation and margin definition). Additional features such as bleeding points,

vascularization, and any other notable morphological traits were carefully recorded. To aid in clinical diagnosis, relevant imaging and laboratory investigations were performed. These included ultrasonography, Xray, computed tomography (CT), Magnetic resonance imaging (MRI), and routine blood tests. Based on clinical and radiological evaluation, a decision was made to proceed with excisional biopsy under local anesthesia (LA) or general anesthesia (GA), as deemed appropriate. Surgical excision of the eyelid mass was performed with a 4-5 mm margin of healthy tissue. Depending on the size and location of the resulting defect, appropriate reconstructive procedures were selected. These included direct closure, modified Hughes procedure, Cutler-Beard flap, or combinations of local flaps and grafts to restore functional and cosmetic integrity. The surgically resected specimens will be fixed in 10% formalin and will be sent to the department of pathology at National pathology lab for histopathological diagnosis by consultant pathologist Dr. Jeevan Adhikari.

The specimen sections will be stained by eosin stain and hematoxylin then to routine paraffin embedding in all cases. From different areas of the specimen, four to five sections 2-3 mm thick were taken and processed in automatic tissue processor. After trimming of blocks sections of 5-7 um thick were cut with help of rotatory microtome. Sections were floated on water at temperature of 45 degree and were taken on albuminized slides. Special stain such as PAS stain was used whenever required. Clinical records of patients were entered and verified by the specialist performing the clinical examination and intervention procedure. Collected data was entered on computer case sheet for statistical analysis.

Statistical analysis

Analysis was done with statistical package for social science (SPSS) 22.0. Flow diagrams, bar diagrams, histograms were used as needed. Interim analysis of the data was done after one month of completion of study followed by final analysis by computer. Statistician was consulted whenever necessary.

RESULTS

Out of 53 cases 30 (56%) were female and 23 (43%) were male. The most common age of presentation was 40-59 yrs. Elderly (>60 yrs) made up 35.8%. Among malignant eyelid lesion a higher proportion was seen in patients above 60 years, indicating age related increase in malignancy (Table I).

Age group in years	Total number of patients	Percentage
<20	4	7.5
20-39	12	22.6
40-59	18	34.0
60-79	15	28.3
>80	4	7.5
Total	53	100

Table I: Demographic profile of patients

Left upper lid was seen predominantly affected in both benign and malignant cases accounting for 19(35.85%) cases. Right lower lid was least affected and seen in 7(13.21%) cases. (Table II)

Lesion locations	Total number of patients	Percentage
Left upper lid	19	35.85
Right upper lid	15	28.30
Left lower lid	12	22.64
Right lower lid	7	13.21
Total	53	100

Table II : Anatomical locations of eye lid masses

The majority of the patients presented with an eyelid mass, 33(62.26%) cases. Ulcerated wounds and mechanical ptosis were equally observed in about 5(9.4%) cases each. Mechanical ptosis was due to the size of the mass in upper eye lid. Discoloration of the skin or pigmentary changes were noted in 8(15.09%) patients, while mechanical ectropion was the least common presentation, seen in 2(3.7%) cases. Discoloration of skin or pigmentary changes were seen mostly in benign lesions as the primary symptoms. (Table III)

Presenting symptoms	Total number of patients	Percentage
Eyelid mass	33	62.26
Ulcerated wound	5	9.4
Mechanical ptosis	5	9.4
Discoloration /pigmentation of the skin	8	15.09
Mechanical Ectropion	2	3.7
Total	53	100

Table III: Clinical presentations of eye lid masses

Out of 54 cases, 44(83%) were identified as benign lesions after histopathological examination, and 9(17%) identified as malignant. The most common type was cystic lesions (epidermal, inclusion, and sebaceous type) accounting for 19 cases (43.8%). Nevi (simple, compound and intradermal) and papilloma were the next most frequent, each comprising 8 cases (18.8%). Less common lesions included xanthelasma, hemangioma, seborrheic dermatitis, and dermolipoma, 2 cases (4.55%) each. The least frequent lesion observed was neurofibroma, 1 case (2.27%). (Table IV)

Benign lesions	Total number of patients	Percentage
Cyst (epidermal, Inclusion, sebaceous)	19	43.8
Nevus	5	9.4
(simple, compound, intradermal)	8	18.8
Papilloma	8	18.8

Xanthelasma	2	4.55
Hemangioma	2	4.55
Seborrheic dermatitis	2	4.55
Dermolipoma	2	4.55
Neurofibroma	1	2.27
Total	44	100

Table IV: Histopathological spectrum of benign eyelid masses

Among 9 cases diagnosed as malignant after histopathological examination, the most common was Basal cell carcinoma 4 (44.44%). Sebaceous cell carcinoma accounted for 3(33.33%) cases, while squamous cell carcinoma and Non-Hodkins lymphoma accounted for 1 (11.11%) each. (Table V)

Malignant lesions	Total number of patients	Percentage
Basal Cell Carcinoma	4	44.44
Sebaceous cell Carcinoma	3	33.33
Squamous cell carcinoma	1	11.11
Non-Hodkins Lymphoma	1	11.11
Total	9	100

Table V: Histopathological spectrum of malignant eyelid masses

Among 53 patients, 75% of the clinical accuracy was seen while correlating clinical and histopathological diagnosis of all the cases. (Figure 1)

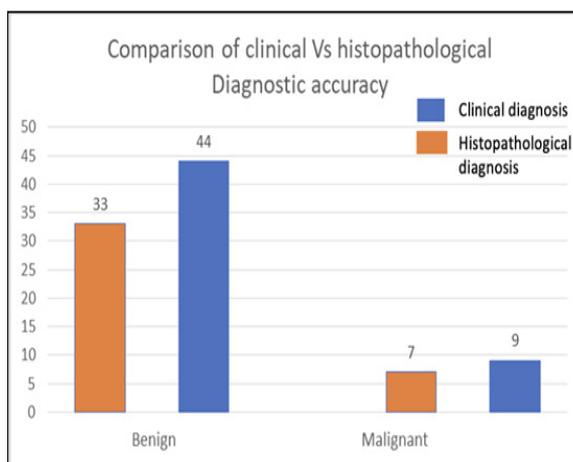


Figure 1 : Comparison of clinical vs histopathological diagnostic accuracy of eye lid masses

DISCUSSION

Eyelid masses are commonly encountered in ophthalmic practice. The incidence of skin tumor is mainly due to the environmental factor, exposure to sunlight, ultraviolet rays. Approximately 10% of all skin tumors occurs in eyelid.³ various studies have been done regarding the eyelid mass tumor in various part of the world. These tumors may show geographical and ethnic variation. The data of our study shows the demography,

various modes of presentations of the eyelid tumor presenting in the tertiary eye care center of the western part of Nepal. The data will serve as the reference for this geographical region and guide in planning resources for screening as well as in proper management of the eyelid tumors. In our study benign eye lid lesions 44(81%) were far common than malignant lesion 9(17%) in accordance with previous other studies worldwide that ranged from (71% -91%).^{2,6,7} Female preponderance was observed in our study 30 (56%) were female and 23(43%) patient were male similar to the study conducted in another center. The most common age of the presentation was 40-59yrs. Elderly (>60 yrs) make up to 35.8% important for malignancy trend.^{2,1} Eye lid malignancies are more common in elderly patients due to cumulative sun damage, age related immune decline, DNA repair and chronic skin changes over time.^{3,6} Left upper lid was predominantly affected 35.85%.

A total of 44(81%) benign cases were analyzed. we found the cystic lesion including epidermal, inclusion and sebaceous cyst 19(43.8%)as the most common benign histologic diagnosis. This finding is consistent with previous studies , which also report a high prevalence of these lesions due to obstruction of pilosebaceous units and their tendency to enlarge gradually drawing clinical attention.^{1,2,18} The superficial location and cosmetic prominence of these cysts, especially in the periocular region, often prompt early presentation and surgical excision.¹⁸ The melanocytic nevus simple , compound and intradermal and papilloma were the next most common, each comprising 8(18.8%). Their frequent detection may be attributed to their visibility and ease of excision especially in cosmetically sensitive areas such as eyelids.^{2,5,18} Papilloma, often associated with viral etiology or chronic irritation, also represent a significant proportion of benign eyelid lesions. Less common lesions included were xanthelasma, hemangioma, seborrheic dermatitis, and dermolipoma, each with 2(4.55%) cases. It may be due to the unrecognizable clinical appearance, leading to non-surgical management in many cases unless cosmetic concerns or diagnostic uncertainty necessitate biopsy.⁷ For example, Xanthelasma is usually diagnosed clinically and may be treated with laser or topical modalities rather than excision.⁸ The least frequent lesion observed was neurofibroma, with 1 (2.27 %) case. solitary neurofibromas in the periocular area are rare, and the diagnosis often warrants investigation for underlying neurofibromatosis in younger patients, their low prevalence in the routine eyelid histopathology has been similarly reported in other studies.¹⁰

Among 9 cases diagnosed as malignant after histopathological examination, the most common was Basal cell carcinoma compromising 4(44.44%) of the cases. this finding is consistent with the global epidemiological trends where BCC is reported as the most frequent malignant eyelid tumor, particularly in fair skinned elderly populations with significant cumulative ultraviolet UV exposure.^{6,16,18} The predilection of BCC for the periocular region , especially the lower eyelid and medial canthus, is likely due to greater sun exposure and thinner skin in these areas, making them more susceptible to UV induced DNA damage.^{6,16,18} Sebaceous cell carcinoma was the second most common malignancy in our study, accounting for 3(33.33%)

of cases, While relatively rare in western populations, sebaceous carcinoma is frequently reported in Asian populations , including those from south and east Asia, where it often presents a diagnostic challenge due to its ability to mimic benign conditions such as chalazion or chronic blepharitis.^{9,10,18} The aggressive nature of sebaceous carcinoma, coupled with its tendency for pagetoid spread and regional metastasis, underscores the importance of early diagnosis and prompt surgical management.^{6,17} Squamous cell carcinoma and Non-Hodgkin lymphoma were the least common malignancies in our cohort , each representing 1(11.11%) of cases. SCC of eyelid is known to be less common than BCC but has a higher potential for local invasion and metastasis.^{6,18} Risk factors include chronic sun exposure, immunosuppression, and preexisting actinic keratoses. The single case of Non-Hodgkin Lymphoma likely represents a primary cutaneous or conjunctival lymphoma, which although rare should be considered in the differential diagnosis of persistent eyelid swelling or mass particularly in older adults.⁶ The distribution of malignant lesions in our study highlights the predominance of BCC, followed by sebaceous cell carcinoma, which is in line with patterns seen in South Asian populations.^{6,17} It reinforces the necessity for histopathological evaluation in all excised lesions, especially in older patients and those with recurrent or atypical presentations, to ensure timely and accurate diagnosis.

In the present study, the overall clinical diagnostic accuracy was found to be 75% when comparing clinical impressions with histopathological diagnosis. This suggests that while clinical evaluation plays a vital role in the initial assessment of periocular lesions, it may not always be sufficient to definitively distinguish between benign and malignant conditions. Factors contributing to diagnostic discrepancies may include overlapping clinical features, atypical presentations, or coexisting pathologies that mimic other lesions.¹⁸ Although a reasonably high accuracy was achieved clinically, histopathology remains the gold standard for definitive diagnosis, especially in suspicious or ambiguous cases.

LIMITATIONS

The limitation of the study arises from the relatively small sample size, which confined the detailed subgroup analysis particularly for less common eyelid lesions. As only surgical excision with biopsy cases were included, benign lesions managed conservatively were not included introducing selection bias. Larger studies with longer follow up should be conducted to identify the accurate clinicopathological feature, diagnosis and further management of eye lid masses.

CONCLUSION

Benign eyelid lesions were more prevalent than malignant ones, with cysts being the most common benign lesion and basal cell carcinoma the most frequent malignancy. Only clinical examination may not be sufficient for accurate diagnosis; therefore, histopathological evaluation is essential for guiding appropriate management.

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