Original Article

The spectrum and clinicopathological correlation of eyelid lesions: Twenty years' experience at a tertiary eye care center in South India

Prabrisha Banerjee, Kirthi Koka, Md Shahid Alam[1], Nirmala Subramanian, Jyotirmay Biswas[2], Subramanian Krishnakumar[2], Bipasha Mukherjee

Purpose: To study the epidemiological pattern and diagnostic accuracy of histopathologically proven eyelid lesions over a period of two decades. **Methods**: A retrospective study of all histopathologically proven eyelid lesions from April 1996 to March 2016 was conducted. The lesions were broadly categorized as benign or malignant. Inflammatory and infectious lesions were included under the benign category. The percentage and diagnostic accuracy of each lesion was calculated. **Results**: There were a total of 994 (M = 551, F = 443) cases. The mean age of the patients was 43.5 ± 19.9 years. There were 809 (81.4%) benign and 185 (18.6%) malignant lesions. Benign lesions were commonly seen in the fourth decade, while the malignant ones in the late fifth decade. The upper lid was the most common site in both groups (n = 481, 48.4%). The commonest benign lesion was chalazion (n = 484, 59.8%). Dermal nevus (n = 94, 11.6%) was the most common benign neoplasm, while Molluscum contagiosum (n = 25, 3.09%) was the most common infectious lesion. Sebaceous gland carcinoma (SGC) (n = 103, 55.7%) was the leading malignant lesion followed by basal cell carcinoma (n = 39, 21.1%). Eleven malignant cases were misdiagnosed as benign (5.9%). Chalazion (99.1%) and SGC (65%) had the highest diagnostic accuracy, while Molluscum (40%) and squamous cell carcinoma (40%) were the most misdiagnosed lesions in the respective groups. **Conclusion**: Benign eyelid lesions are far more common than malignant ones. Atypical and rare presentations may lead to misdiagnosis. Knowledge of epidemiological patterns and clinical features can help in achieving higher diagnostic accuracy.

Access this article online

Website: www.ijo.in

DOI: 10.4103/ijo.IJO_428_21

Quick Response Code:

Key words: Benign lid lesions, clinicopathological correlation, eyelid lesions, malignant lid lesions

The presence of various skin appendages in the eyelids gives rise to a wide spectrum of lesions.[1] The prevalence and the type of lesion vary with the geographical location, race, age, gender, genetics, and skin type. The clinical diagnosis is based on the history and appearance, while the final diagnosis is established on histopathology. Knowledge of the prevalence of different eyelid lesions in a particular geographical area aids in making a correct clinical diagnosis and formulating the appropriate treatment plan.[2] However, the final diagnosis may differ from the provisional one in cases with rare and atypical presentations. The majority of the existing literature on the epidemiology of eyelid lesions focuses mainly on the neoplastic masses but fails to throw light on the entire spectrum. There are very few studies comparing the clinicopathological correlation to determine the accuracy of the clinical diagnosis. The aim of the present study was to review the epidemiological profile of all histopathologically proven eyelid lesions diagnosed over a period of 20 years and to determine the accuracy of their clinical diagnosis. To the best of the authors' knowledge, this is the first study from India to analyze the wide range of eyelid lesions that we encounter in our daily practice over such a long duration.

Orbit, Oculoplasty, Reconstructive and Aesthetic Services, Sankara Nethralaya, Medical Research Foundation, Chennai, Tamil Nadu, [1]Orbit, Oculoplasty, Reconstructive and Aesthetic Services, Aditya Birla Sankara Nethralaya, Kolkata (A Unit of Medical Research Foundation, Chennai), West Bengal, [2]Larson and Tourbo Department of Ocular Pathology, Vision Research Foundation, Sankara Nethralaya, Chennai, Tamil Nadu, India

Correspondence to: Dr. Md Shahid Alam, Kolkata - 700 099, West Bengal, India. E-mail: mshahidalam@gmail.com

Received: 19-Feb-2021 Revision: 07-Jun-2021
Accepted: 03-Aug-2021 Published: 23-Dec-2021

Methods

It was a retrospective analysis of all histopathologically proven eyelid lesions presenting to our institute over the past 20 years (1996–2016). Medical records were scrutinized, and data concerned with the demography, laterality, topography, and clinical and histopathological diagnosis of the lesions were collected and analyzed. Institutional review board approval was obtained, and the study adhered to the tenets of the Declaration of Helsinki. The ethics committee gave an exemption since it was a retrospective study (3/5/2015).

The lesions were grouped into two broad categories as benign and malignant lesions. Both the benign and malignant neoplastic lesions were classified according to the origin of their cells as epidermal, stromal, and adnexal as stated by the World Health Organization International Histological Classification of Tumors [Table 1][3,4] Inflammatory and infectious lesions were categorized separately under the benign category.

The percentage of each lesion in the various subcategories was then calculated. For each lesion, the clinical diagnosis

Cite this article as: Banerjee P, Koka K, Alam MS, Subramanian N, Biswas J, Krishnakumar S, *et al*. The spectrum and clinicopathological correlation of eyelid lesions: Twenty years' experience at a tertiary eye care center in South India. Indian J Ophthalmol 2022;70:43-50.

Table 1: WHO international histological classification of tumors

Category	Subtypes
Epidermal tumors	Nonmelanocytic tumors Melanocytic tumors
Adnexal tumors	Sebaceous gland tumors Sweat gland tumors Lacrimal gland tumors Hair follicle tumors Cystic lesions
Stromal tumors	Fibrous tissue tumors Fibrohistiocystic tumors Lipomatous tumors Smooth muscle tumors Skeletal muscle tumors Vascular tumors Perivascular tumors Neural tumors Lymphoid, plasmacytic, leukemic tumors Cartilage, and bone tumors Hamartoma and Choristoma Palpebral conjunctival tumors
Secondary tumors	
Metastatic tumors	
Inflammatory and infectious lesions that simulate neoplasms	

Table 2: Demographic details of the study population

Parameters	Frequency
Total cases	*n*=994
Gender	Male=551 (55.4%) Female=443 (44.6%)
Mean age	43.5±19.9 years (Range 1-90 years)
Frequency in various age groups	0-20 years=129 (13%) 21-40 years=309 (31.1%) 41-60 years=322 (32.4%) Above 60 years=234 (23.5%)
Laterality	Right eye=436 (43.9%) Left eye=452 (45.5%) Both eyes=106 (10.6%)
Site	Upper lid=481 (48.4%) Lower lid=373 (37.5%) Medial canthus=117 (11.8%) Lateral canthus=6 (0.6%) Multiple sites=17 (1.7%)
Type of lesion	Benign=809 (81.4%) Malignant=185 (18.6%)

was compared with the final histopathological diagnosis. Eyelid lesions whose final histopathological diagnosis did not correlate with the clinical diagnosis at presentation were reviewed. Mean, standard deviation, percentage and range were computed for the numerical data, and percentage and frequency were calculated for categorical data with Statistical Package for Social Sciences (SPSS Inc. Chicago IL, version 22.0). The diagnostic accuracy was calculated in form of percentages for all the subcategories of eyelid lesions.

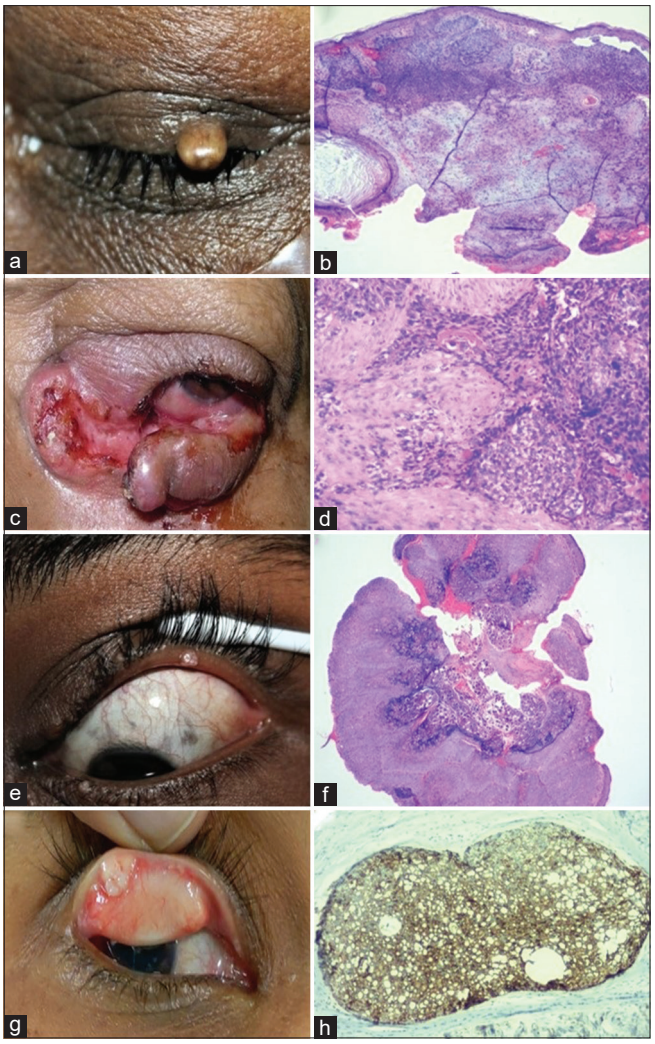

Figure 1: (a) Right upper eyelid basal cell carcinoma mimicking a sebaceous cyst, (b) histopathology (H and E x 20) of the same lesion showing nests of tumor cells with characteristic peripheral palisading pattern, (c) squamous cell carcinoma of the left lower eyelid misdiagnosed as sebaceous cell carcinoma, (d) microphotograph (H and E x 40) displaying tumors cells with acidophilic cytoplasm and prominent nuclei with occasional keratin pearls, (e) clinical picture of the left upperlid molluscum contagiosum presenting as marginal chalazion, (f) epidermal hyperplasia with eosinophilic inclusion (Henderson–Patterson) bodies are seen in the microphotograph (H and E x20), (g) right upper lid sebaceous gland carcinoma in a young patient misdiagnosed as burst chalazion, and (h) microphotograph showing adipophilin stain positive tumor cells

Results

A total of 994 cases (1,100 eyes) were included in the study. There were 551 (55.4%) males and 443 (44.6%) females. The mean age of the study population was 43.5 ± 19.9 years (Range 1–90 years). The right eye was involved in 436 (43.9%) cases, left in 452 (45.5%) cases, and 106 (10.6%) cases had bilateral involvement [Table 2]. The upper eyelid was more commonly involved (n = 481, 48.4%). The various eyelid lesions have been depicted in Table 3.

Benign lesions

Benign lesions constituted 81.4% (n = 809) of the total lesions analyzed. The mean age at presentation was

Table 3:Various eyelid lesions in the study population as per the WHO histological classification

Category		Lesions in our Study (*n*, %)
Epidermal tumors	Benign	Nevus (94, 9.5%) Papilloma (85, 8.6%) Cutaneous horn (2, 0.2%)
	Premalignant	None
	Malignant	Basal cell carcinoma (39, 3.9%) Squamous cell carcinoma (20, 2%) Melanoma (8, 0.8%)
Adnexal tumors	Benign	Sebaceous cyst/Epidermoid cyst (44, 4.4%) Benign adnexal tumor (3, 0.3%) Eccrine hydrocystoma (3, 0.3%) Pilomatrixoma (2, 0.2%) Inclusion cyst (2, 0.2%)
	Premalignant	None
	Malignant	Sebaceous gland carcinoma (103, 10.4%) Malignant adnexal tumor (3, 0.3%) Adenocarcinoma (1, 0.1%)
Stromal tumors	Benign	Neurofibroma (24, 2.4%) Xanthogranuloma (10, 1%) Xanthelasma (9, 0.9%) Capillary hemangioma (5, 0.5%) Lymphangioma (3, 0.3%) Cavernous hemangioma (2, 0.2%) Dermoid cyst (1, 0.1%)
	Premalignant	None
	Malignant	Lymphoma (9, 0.9%) Round cell tumor (2, 0.2%)
Inflammatory and infectious lesions that simulate neoplasms		Chalazion (484, 48.7%) Molluscum contagiosum (25, 2.5%) Wart (4, 0.4%) Rhinosporidiosis (3, 0.3%) Tuberculosis (1, 0.1%) Pyogenic granuloma (1, 0.1%)
Others		Amyloidosis (2, 0.2%)

40.2 ± 19.6 years (Range: 1–85 years) and there were 458 males (56.6%) and 351 females (43.4%). The maximum number of cases were seen in the age group of 21–40 years (n = 297, 36.7%) [Table 4]. The left eye was involved in 45.6% of the cases, the right eye in 41.3%, while 13.1% had bilateral involvement. The upper lid was the most common site (n = 396, 48.9%) followed by the lower lid (n = 294, 36.3%) and the medial canthus (n = 111, 13.7%). Two hundred and ninety cases (35.8%) were of neoplastic origin, and the most common of them was eyelid nevus (94, 32.4%) followed by squamous papilloma (n = 85, 29.3%). Overall chalazion (484, 59.8%) was the most common benign lesion, while molluscum contagiosum was the most common infectious lesion (25, 3.09%). Rare eyelid lesions included lymphangioma, xanthogranuloma, and cavernous hemangioma among neoplastic lesions, while amyloid, rhinosporidiosis, and tuberculosis in the nonneoplastic category. The histopathological diagnosis of 730 lesions (90.2%) was consistent with their respective clinical diagnosis, while 79 lesions (9.8%) were misdiagnosed. Chalazion was the benign lesion with the highest accuracy of clinical diagnosis (99.1%), while molluscum was the most common misdiagnosed lesion (40%). The prevalence of all the benign lesions encountered in each of the subgroups and the accuracy of their clinical diagnosis have been enlisted in Tables 4 and 5, respectively.

Malignant lesions

There were a total of 185 (19%) malignant eyelid lesions in the present cohort. Males and females were equally affected (50%). The affected population's mean age was 58 ± 13.26 years (Range 4–90 years). The maximum number of patients were in the age group of 41–60 years (n = 89, 48.1%), closely followed by the age group of 60 years and above (n = 83, 44.9%). The increase in the frequency of the lesions after 40 years of age was found to be statistically significant (P < 0.05) when compared with the benign group. All the malignant eyelid lesions had unilateral involvement with a preponderance for the right eye (right eye 102, 55.1%; left eye 83, 44.9%). The upper lid (n = 85, 46%) was the most common site involved followed by the lower lid (n = 79, 43%), medial canthus (n = 6, 3%), and lateral canthus (n = 5, 2.7%), respectively. Sebaceous gland carcinoma (SGC) (103, 55.7%) was the most common malignant lesion followed by basal cell carcinoma (BCC) (39, 21.1%) and squamous cell carcinoma (SCC) (20, 10.8%). Melanoma (8, 4.3%), lymphoma (9, 4.9%), round cell tumors (2, 1.1%), and adenocarcinoma (1, 0.5%) were some of the rare malignancies noted. SGC, SCC, and melanoma were more commonly seen to occur in the age group of 41–60 years, while BCC and eyelid lymphoma occurred more commonly beyond 60 years of age. Only one case of eyelid

Table 4: Analysis of benign lesions

Parameters	Frequency
Total cases	*n*=809
Gender	Male=458 (56.6%)
	Female=351 (43.4%)
Mean age	40.2±19.6 years
Distribution in various age groups	0-20 years=128 (15.8%)
	21-40 years=297 (36.7%)
	41-60 years=233 (28.8%)
	Older than 60 years=151 (18.7%)
Laterality	Right eye=334 (41.3%)
	Left eye=369 (45.6%)
	Both eyes=106 (13.1%)
Site	Upper lid=396 (48.9%)
	Lower lid=294 (36.3%)
	Medial canthus=111 (13.7%)
	Lateral canthus=1 (0.1%)
	Upper lid + Lower lid=6 (0.7%)
	Lateral canthus + Upper lid=1 (0.1%)
Lesion types	Inflammatory (chalazion) = 484 (59.8%)
	Neoplastic=290 (35.8%)
	Infectious=33 (4%)
	Infiltrative=2 (0.2%)
Most common lesions in male	Chalazion (284, 62%), Squamous papilloma (57, 12.4%)
Most common lesions in female	Chalazion (200, 57%), Nevus (65, 18.5%)
Common lesions in the age groups	
0-20 years	Chalazion=69 (8.5%), Molluscum contagiosum=20 (2.5%)
21-40 years	Chalazion=217 (26.8%), Nevus=25 (3.1%)
41-60 years	Chalazion=125 (15.5%), Nevus=36 (4.4%)
Above 60 years	Chalazion=70 (8.7%), Papilloma=30 (3.7%)
Diagnostic accuracy	Accurate=731 (90.4%)
	Misdiagnosis=78 (9.6%)
Most accurately diagnosed lesion	Chalazion=99.1%
Most common misdiagnosed lesion	Molluscum contagiosum=40%

Table 5: Age-wise distribution of benign lesions

Benign lesions	0-20 years	21-40 years	41-60 years	Above 60 years
Chalazion	69 (8.5%)	220 (27.2%)	125 (15.5%)	70 (8.7%)
Nevus	11 (1.4%)	25 (3.1%)	36 (4.4%)	22 (2.7%)
Papilloma	7 (0.9%)	18 (2.2%)	30 (3.7%)	30 (3.7%)
Sebaceous cyst/Epidermoid cyst	-	5 (0.6%)	18 (2.2%)	21 (2.6%)
Molluscum contagiosum	20 (2.5%)	4 (0.5%)	1 (0.1%)	-
Neurofibroma	12 (1.5%)	11 (1.4%)	1 (0.1%)	-
Xanthogranuloma	2 (0.2%)	2 (0.2%)	4 (0.5%)	2 (0.2%)
Xanthelasma	-	6 (0.7%)	3 (0.4%)	-
Capillary hemangioma	2 (0.2%)	1 (0.1%)	2 (0.2%)	-
Wart	-	2 (0.2%)	1 (0.1%)	1 (0.1%)
Benign adnexal tumor	-	1 (0.1%)	2 (0.2%)	-
Eccrine hydrocystoma	1 (0.1%)	-	1 (0.1%)	1 (0.1%)
Lymphangioma	2 (0.2%)	1 (0.1%)	-	-
Rhinosporidiosis	-	1 (0.1%)	2 (0.2%)	-
Amyloidosis	-	1 (0.1%)	1 (0.1%)	-
Inclusion cyst	-	-	2 (0.2%)	-
Pilomatrixoma	-	1 (0.1%)	1 (0.1%)	-
Cavernous hemangioma	-	-	2 (0.2%)	-
Cutaneous horn	-	-	2 (0.2%)	-
Dermoid	-	1 (0.1%)	-	-
Keratoacanthoma	-	1 (0.1%)	-	-
Pyogenic granuloma	1 (0.1%)	-	-	-
Tuberculosis	1 (0.1%)	-	-	-

Table 6: Analysis of malignant lesions

Parameters	Frequency
Total cases	*n*=185
Gender	Male=93 (50.3%) Female=92 (49.7%)
Mean age	58±13.2 years
Distribution in various age groups	0-20 years=1 (0.5%) 21-40 years=12 (6.5%) 41-60 years=89 (48.1%) Older than 60 years=83 (44.9%)
Laterality	Right eye=102 (55.1%) Left eye=83 (44.9%)
Site	Upper lid=85 (46%) Lower lid=79 (43%) Medial canthus=6 (3%) Lateral canthus=5 (2.7%) Upper lid + Lower lid + Medial canthus=5 (2.7%) Upper lid + Lower lid + Lateral canthus=2 (1%) Lower lid + Medial canthus=2 (1%) Lower lid + Lateral canthus=1 (0.6%)
Lesion types	Sebaceous gland carcinoma=103 (55.7%) Basal cell carcinoma=39 (21.1%) Squamous cell carcinoma=20 (10.8%) Lymphoma=9 (4.9%) Melanoma=8 (4.3%) Malignant adnexal tumors=4 (2.1%) Round cell tumor=2 (1.1%)
Common lesions in the age groups	
0-20 years	Round cell tumor=1 (0.5%)
21-40 years	Sebaceous gland carcinoma=5 (2.7%)
41-60 years	Sebaceous gland carcinoma=54 (29.2%), Basal cell carcinoma=14 (7.6%)
Above 60 years	Sebaceous gland carcinoma=44 (23.8%), Basal cell carcinoma=23 (12.4%)
Diagnostic accuracy	Accurate=125 (67.6%) Misdiagnosis=60 (32.4%)
Most accurately diagnosed lesion	Sebaceous gland carcinoma=65%
Most common misdiagnosed lesion	Squamous cell carcinoma=40%

Table 7: Age-wise distribution of malignant lesions

Malignant Lesions	0-20 years	21-40 years	41-60 years	Above 60 years
Sebaceous gland carcinoma	-	5 (2.7%)	54 (29.2%)	44 (23.8%)
Basal cell carcinoma	-	2 (1.1%)	14 (7.6%)	23 (12.4%)
Squamous cell carcinoma	-	2 (1.1%)	10 (5.4%)	8 (4.3%)
Lymphoma	-	2 (1.1%)	2 (1.1%)	5 (2.3%)
Melanoma	-	1 (0.5%)	6 (3.2%)	1 (0.5%)
Malignant adnexal tumor	-	-	2 (1.1%)	1 (0.5%)
Round cell tumor	1 (0.5%)	-	1 (0.5%)	-
Adenocarcinoma	-	-	-	1 (0.5%)

malignancy (lymphoma) was noted in the pediatric age group. The clinical diagnosis of 125 cases (67.6%) correlated with the histopathological diagnosis, whereas 60 cases (32.4%) had an erroneous clinical diagnosis. Among the misdiagnosed lesions, only 11 malignant lesions were diagnosed as benign (5.9%), while the remaining 49 cases (26.5%) were suspected as malignancy but of some other type [. 1]. SGC was diagnosed most accurately (65%), while SCC was the most misdiagnosed malignant lesion (40%). The other details pertaining to malignant lesions have been displayed in Tables 6 and 7. Table 8 shows the eyelid lesions in the pediatric age group. The lesions where the clinical and histopathological diagnoses were not identical have been enlisted in Table 9.

Discussion

The present study, to the best of our knowledge, is the first from India to analyze the entire spectrum of eyelid lesions encountered over such a long duration. As expected, we noted benign eyelid lesions to be much more common as compared to malignant ones. Chalazion was the most common benign

Table 8: Eyelid lesions in the pediatric age-group

Parameters	Frequency
n	90
Mean age (years)	8±4.4
Gender	Male=41 (45.5%) Female=49 (54.5%)
Benign lesions Malignant lesions	89 (98.8%) 1 (1.2%)
Benign lesions	Chalazion (42, 5.2%) Molluscum contagiosum (20, 2.5%) Neurofibroma (8, 1%) Nevus (7, 0.9%) Papilloma (5, 0.6%) Capillary hemangioma (2, 0.2%) Xanthogranuloma (2, 0.2%) Lymphangioma (1, 0.1%) Tuberculosis (1, 0.1%) Pyogenic granuloma (1, 0.1%)
Malignant lesions	Lymphoma (1, 0.5%)

eyelid lesion, while SGC was the most common malignant eyelid lesion. Both these lesions also had the maximum accuracy of clinical diagnosis in their respective categories.

Ophthalmologists come across a wide variety of eyelid lesions in their routine practice. The presence of numerous histological elements that include skin, appendages, muscle, and modified glands gives rise to a wide spectrum of lesions.[1] According to our study, benign lesions were more frequently encountered in males, while malignant lesions showed equal sex distribution. This reflects the findings of Gupta *et al*.[5], and it can be attributed to the difference in lifestyle which subjects the male to increased sun exposure and the habit of smoking. However, few studies report a female preponderance in their analysis of the epidemiology of benign eyelid lesions.[2,6,7] The upper lid was found to be the most common site for the occurrence of an eyelid lesion. Meibomian gland lesion, being more common in both the benign (chalazion) and malignant (SGC) categories in our study can explain that finding, since the upper lid contains far more meibomian glands.[8] However, few studies have shown upper lid preponderance for benign lesions, while the lower lid was the more common site for malignant neoplastic lesions except SGC.[6,9,10]

Benign eyelid lesion was commonly observed in the middle-aged population (~40 years), and it corroborated with the results of other published studies. According to the present study, chalazion was the most common benign lesion in all the age groups. This finding differed from the study of Al-Faky[2] and Huang *et al*.[6], where they observed sweat gland hidrocystomaas, the leading benign eyelid lesion. Other than chalazion, the most common benign lesion in the pediatric age group was molluscum contagiosum, while it was intradermal nevus in the 21–60 age group and squamous papilloma in the age group of more than 60 years, respectively. This finding corroborates well with the results of the published literature.[2,6,7,9,11-13] Dermal nevus was the most common benign eyelid tumor seen in the present cohort, and this was supported by several studies in India as well as abroad.[11-14]

Malignant lesions were frequently encountered in the late 50s, as expected.[14-20] Several studies on eyelid tumors have reported the late 60s or 70s as the age of presentation of malignant lesions, but these studies are from the western population.[6,9,13] Malignant eyelid lesions in the Indian subcontinent occur a decade earlier as compared to the west as per the present cohort. According to the present study, malignant lesions showed a predilection for the right eye. Kavak *et al*.[21] in their study on Turkish drivers noted the occurrence of malignant eyelid lesions to be more common on the side related to driving because of increased sun exposure on that side. In our study, too malignant lesions were more common on the right side, which can be correlated with the right-sided driving pattern in India. However, this does not explain the increased prevalence of malignant lid tumors noted in the females of lower socioeconomic strata who mostly do not drive. Right eye predilection was also seen in a study on malignant eyelid tumors from central India and SGC was the most common malignant lesion.[16] The rise in SGC in the Indian subcontinent was first pointed by Jahagirdar *et al*.[16] in their study in 2007. Recent studies by Indian researchers have revealed SGC as the most common malignant eyelid lesion.[22-24] This was in agreement with several studies particularly from Asian countries like Thailand and Nepal.[11,17] On the contrary, few other studies from other Asian countries like Japan, China, Hongkong, and Taiwan found BCC as the major malignant lesion in their respective nations.[6,9,12,14,25] Studies from other parts of the world have reported BCC as the most common malignant eyelid lesion.[7,10,13,15] Our study reinforced the established fact of female preponderance in SGC.[22] Eyelid malignancy in the pediatric age group is rare. In our study, we observed one case of round cell tumors (lymphoma). Oncologists have reported cases of eyelid rhabdomyosarcoma, occurring in the pediatric age group.[26,27]

The present study reported an overall diagnostic accuracy of 85.7%, while it was 90.2% for benign lesions. This corroborated with the findings of Margo who showed 84% overall diagnostic accuracy and 81.5% diagnostic accuracy of benign lesions, respectively.[28] Kersten *et al*.[29] (92.9%) and Deokule *et al*.[30] (96%) demonstrated higher diagnostic accuracies. Chalazion was the benign lesion with the highest diagnostic accuracy (99.1%), and the possible reason is the frequent occurrence of chalazion, which has made the ophthalmologists familiar with the clinical features of the lesion. Ozdal *et al*.[31] reported diagnostic accuracy of 93.6% for chalazion in their study and attributed the misdiagnosed cases to the lesions mimicking chalazia-like, seborrheic keratosis, pyogenic granuloma, SGC, and BCC. In our study, 67.6% of the malignant lesions had an accurate clinical diagnosis. The diagnostic accuracy of SGC was noted to be 65%. The most misdiagnosed malignant lesion in our study was SCC. In contrast to this, Margo revealed a high diagnostic accuracy of malignant lesions in their study (73.7%).[28] Atypical and masquerading presentations were the major cause of misdiagnosis. Analysis of the diagnostic accuracy revealed a progressive rise in accuracy over the 20-year period. This can be attributed to the refinement of clinical acumen, increasing evidence of literature, and the cumulative experience of the oculoplastic surgeons at the institute. Moreover, only 11 malignant lesions (5.9%) were misdiagnosed as benign over a duration of 20 years, which seems reasonable.

The main drawback of the present study is its retrospective design. It provides an overview of all the eyelid lesions that

Table 9: List of clinically misdiagnosed lesions and their final histopathological diagnosis

Type of lesion	Histopathological diagnosis of misdiagnosed lesion	Clinical diagnosis
Benign	Squamous papilloma (25)	Seborrheic horn (9) Cyst (7) Cutaneous tag (5) Nevus (4)
	Nevus (20)	Papilloma (14) Cystic lesion (4) Hemangioma (2)
	Molluscum contagiosum (10)	Chalazion (3) Sebaceous cyst/Epidermoid cyst (3) Lid abscess (2) Sebaceous gland carcinoma (2)
	Xanthogranuloma (6)	Sebaceous cyst/Epidermoid cyst (3) Lymphoma (3)
	Chalazion (4)	Sebaceous gland carcinoma (3) Tubercular nodule (1)
	Sebaceous cyst/Epidermoid cyst (2)	Cyst of Zeis (2)
	Xanthelasma (2)	Sebaceous cyst/Epidermoid cyst (1) Xanthogranuloma (1)
	Benign adnexal tumor (2)	Chalazion (1) Sebaceous cyst/Epidermoid cyst (1)
	Inclusion cyst (1)	Cyst of Mol
	Capillary hemangioma (3)	Cystic lesion (1) Granuloma (1) Eyelid mass (1)
	Lymphangioma (1)	Capillary hemangioma
	Eccrine hydrocystoma (1)	Sebaceous cyst/Epidermoid cyst
	Rhinosporidiosis (1)	Peripheral nerve sheath tumor
Malignant	Sebaceous gland carcinoma (36)	Basal cell carcinoma (22) Squamous cell carcinoma (8) Chalazion (2) Conjunctival granuloma (1) Seborrheic keratosis (1) Sebaceous cyst/Epidermoid cyst (1) Metastasis (1)
	Basal cell carcinoma (7)	Squamous cell carcinoma (2) Sebaceous gland carcinoma (1) Keratoacanthoma (1) Nevus (1) Sebaceous cyst/Epidermoid cyst (1) Surgical scar (1)
	Squamous cell carcinoma (8)	Sebaceous gland carcinoma (3) Lymphoma (2) Basal cell carcinoma (1) Melanoma (1) Squamous papilloma (1)
	Malignant adnexal tumor (3)	Sebaceous gland carcinoma (3)
	Lymphoma (2)	Sebaceous gland carcinoma (1) Granuloma (1)
	Round cell tumors (2)	Neuroblastoma (1) Lymphoma (1)
	Adenocarcinoma (1)	Sebaceous horn
	Melanoma (1)	Sebaceous gland carcinoma

were encountered at our tertiary eye care center and only those patients who underwent surgery at our institute were included. The clinical diagnostic accuracy varies with the skill and experience of the surgeon and that too can be a limitation of the study. The data is not representative of the entire population since ours is a referral institute and secondly there is

every possibility of missing out on cases owing to the inherent shortcomings of medical record keeping. Having said that the present study to a large extent provides an epidemiological profile of the complete spectrum of eyelid lesions that an ophthalmologist can come across in his/her daily practice.

Conclusion

The presence of various histological elements makes eyelids the origin of a wide range of lesions. There are multiple factors like geographical location, age, race, skin type, and sun exposure that influence the distribution of eyelid lesions. Overall, chalazion is the most common benign lesion, nevus is the most common benign neoplastic lesion, and SGC is the most common malignant eyelid lesion in the Indian subcontinent. Sound knowledge about the incidence, distribution, and clinical features helps ophthalmologists to achieve a higher rate of diagnostic accuracy. Chalazion and SGC have the highest diagnostic accuracy. The main factors for misdiagnosis are the rarity of the lesion, atypical presentation, and their masquerading nature.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Pe'er J. Pathology of eyelid tumors. Indian J Ophthalmol 2016;64:177-90.
2. Al-Faky YH. Epidemiology of benign eyelid lesions in patients presenting to a teaching hospital. Saudi J Ophthalmol 2012;26:211–6.
3. Pe'er J, Frenkel S. Eyelid tumors: Classification and differential diagnosis. In: Pe'er J, Singh AD, Damato BE, editors. Clinical Ophthalmic Oncology: Eyelid and Conjunctival Tumors. 3rd ed. Switzerland: Springer; 2019. p. 7-13.
4. Campbell RJ, Sobin LH. Tumours of the eyelid. In: Histological Typing of Tumours of the Eye and its Adnexa, World Health Organization International Histological Classification of Tumors. 2nd ed. Berlin: Springer; 1998. p. 3–9.
5. Gupta Y, Gahine R, Hussain N, Memon MJ. Clinico-pathological spectrum of ophthalmic lesions: An experience in tertiary care hospital of Central India. J Clin Diagn Res 2017;11:EC09-13. doi: 10.7860/JCDR/2017/23589.9230.
6. Huang YY, Liang WY, Tsai CC, Kao SC, Yu WK, Kau HC, *et al*. Comparison of the clinical characteristics and outcome of benign and malignant eyelid tumors: An analysis of 4521 eyelid tumors in a tertiary medical center. Biomed Res Int 2015;2015:453091.
7. Bagheri A, Tavakoli A, Kanaani A, Zavareh RB, Esfandiari H, Aletaha M, *et al*. Eyelid masses: A 10-year survey from a tertiary eye hospital in Tehran. Middle East Afr J Ophthalmol 2013;20:187-92.
8. Kass LG, Hornblass A. Sebaceous carcinoma of the ocular adnexa. Surv Ophthalmol 1989;33:477-90.
9. Ho M, Liu DT, Chong KK, Ng HK, Lam DS. Eyelid tumours and pseudotumours in Hong Kong: A ten-year experience. Hong Kong Med J 2013;19:150-5.
10. Coroi MC, Rosca E, Mutiu G, Coroi T, Bonta M. Eyelid tumors: Histopathological and clinical study performed in County Hospital of Oradea between 2000-2007. Rom J Morphol Embryol 2010;51:111-5.
11. Pornpanich K, Chindasub P. Eyelid tumors in Siriraj hospital from 2000-2004. J Med Assoc Thai 2005;88:S11-4.
12. Toshida H, Mamada N, Fujimaki T, Funaki T, Ebihara N, Murakami A, *et al*. Incidence of benign and malignant eyelid tumors in Japan. Int J Ophthalmic Pathol 2012;1:2.
13. Deprez M, Uffer S. Clinicopathological features of eyelid skin tumors. A retrospective study of 5504 cases and review of literature. Am J Dermatopathol 2009;31:256-62.
14. Yu SS, Zhao Y, Zhao H, Lin JY, Tang X. A retrospective study of 2228 cases with eyelid tumors. Int J Ophthalmol 2018;11:1835-41.
15. Asproudis I, Sotiropoulos G, Gartzios C, Raggos V, Papoudou-Bai A, Ntountas I, *et al*. Eyelid tumors at the university eye clinic of Ioannina, Greece: A 30-year retrospective study. Middle East Afr J Ophthalmol 2015;22:230-2.
16. Jahagirdar SS, Thakre TP, Kale SM, Kulkarni H, Mamtani M. A clinicopathological study of eyelid malignancies from central India. Indian J Ophthalmol 2007;55:109-12.
17. Kumar R. Clinicopathologic study of malignant eyelid tumors. Clin Exp Optom 2010;93:224–7.
18. Kale SM, Patil SB, Khare N, Math M, Jain A, Jaiswal S. Clinicopathological analysis of eyelid malignancies-A review of 85 cases. Indian J Plast Surg 2012;45:22–8.
19. Hussain I, Khan FM, Alam M, Khan BS. Clinicopathological analysis of malignant eyelid tumours in north-west Pakistan. J Pak Med Assoc 2013;63:25-7.
20. Abdi U, Tyagi N, Maheshwari V, Gogi R, Tyagi SP. Tumours of eyelid: A Clinicopathologic study. J Indian Med Assoc 1996;94:405-9.
21. Kavak A, Parlak AH, Yesildal N, Aydogan I, Anul H. Preliminary study among truck drivers in Turkey: Effects of ultraviolet light on some skin entities. J Dermatol 2008;35:146-50.
22. Kaliki S, Bothra N, Bejjanki KM, Nayak A, Ramappa G, Mohamed A, *et al*. Malignant eyelid tumors in India: A study of 536 Asian Indian patients. Ocul Oncol Pathol 2019;5:210–9.
23. Patel BC. Epidemiology of eyelid malignancies in Indian Asians: The importance of being earnest. Ocul Oncol Pathol 2019;5:205-9.
24. Gupta R, Bhaduri A, Desai S, Das S, Menon V. Malignant tumors of the eyelid in India: A multicenter, multizone study on clinicopathologic features and outcomes. Indian J Ophthalmol 2020;68:2466-70.
25. Wang JK, Liao SL, Jou JR, Lai PC, Kao SC, Hou PK, *et al*. Malignant eyelid tumors in Taiwan. Eye (Lond) 2003;17:216-20.
26. Plowman PN. Eyelid tumors. Orbit 2007;3:207-13.
27. Kaliki S, Das AV. Ocular and periocular tumors in Asian Indian children and adolescents. Indian Pediatr 2020;57:512-4.
28. Margo CE. Eyelid tumours: Accuracy of clinical diagnosis. Am J Ophthalmol 1999;128:635-6.
29. Kersten RC, Ewing- Chow D, Kulwin DR, Gallon M. Accuracy of clinical diagnosis of cutaneous eyelid lesions. Ophthalmology 1997;104:479-84.
30. Deokule S, Child V, Tarin S, Sandramouli S. Diagnostic accuracy of benign eyelid skin lesions in the minor operation theatre. Orbit 2003;22:235-8.
31. Ozdal PC, Codere F, Callejo S, Caissi AL, Burnier MN. Accuracy of the clinical diagnosis of chalazion. Eye 2004;18:135-8.