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,3 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.

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.

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...
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.

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                                                    |
|                     | Fibrohistiocytic 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 Chrístoma                                                  |
|                     | 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%) |

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...
January 2022  Banerjee, et al.: Eyelid lesions

[54x748]Banerjee, et al.:

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 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   | Chalazion (484, 48.7%)                                           |
| simulate neoplasms**      | 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%)                                          |

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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           |           |
| Chalazion=99.1%                          |           |
| 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 angioma  | -          | 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%)   | -           | -           | -              |
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 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%)       |
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. 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., 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. 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. 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.

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 and Huang et al., where they observed sweat gland hidrocystomas, 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. 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.

Malignant lesions were frequently encountered in the late 50s, as expected. 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. 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., 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. The rise in SGC in the Indian subcontinent was first pointed by Jahagirdar et al., in their study in 2007. Recent studies by Indian researchers have revealed SGC as the most common malignant eyelid lesion. This was in agreement with several studies particularly from Asian countries like Thailand and Nepal. 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. Studies from other parts of the world have reported BCC as the most common malignant eyelid lesion. Our study reinforced the established fact of female preponderance in SGC. 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.

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. Kersten et al., (92.9%) and Deokule et al., (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., 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%). 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

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**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 | 89 (98.8%) |
| Malignant lesions | 1 (1.2%) |
| Benign lesions | Chalazion (42, 5.2%) | Molluscum contagiosum (20, 2.5%) | Neurofibroma (8, 1.1%) | 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%) |
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

| 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) | Sebaceous cyst/Epidermoid cyst (1) |
|                |                                                   | Lymphoma (3)       |
| Chalazion (4)  |                                                   | Sebaceous gland carcinoma (3) |
|                |                                                   | Tubercular nodule (1) |
| Sebaceous cyst/Epidermoid cyst (2) | Cyst of Zeis (2) | Sebaceous cyst/Epidermoid cyst (1) |
| Xanthelasma (2) |                                                   | 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 |
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.

Conclusions
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.

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