*Original Article*

# Profile of Ophthalmic Tumors in Adult Nepalese Population in Central Nepal

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## Abstract

**Introduction:** Ophthalmic tumors cover benign and malignant tumors of eyelids, conjunctiva, globe, and orbit. There is limited literature on ophthalmic tumors in Nepal. The objective of the study was to find the relative frequency of various ophthalmic tumors in the adult Nepalese population in Central Nepal.

**Material and methods:** This is an observational descriptive study. A total of 100 consecutive patients, presenting with ophthalmic tumors to tertiary referral eye hospital were enrolled for the study. Demographic profile, detailed history, clinical features and diagnosis of the ophthalmic tumors were recorded. The tissue from incisional or excisional biopsy was then subjected to histopathological examination for confirmatory diagnosis.

**Results:** Mean age of subjects with ophthalmic tumors was 51.5 ± 18.2 years with a female to male ratio of 1.2:1. Benign tumors (64%) were the most common tumors followed by malignant (26%) and premalignant tumors (10%). Most common benign tumor was naevus (26.5%); most common premalignant tumor was conjunctival intraepithelial neoplasia (60%), and most common malignant tumor was sebaceous gland carcinoma (30.8%). Eyelid was most frequently involved with ophthalmic tumors (59%) followed by conjunctiva (21%). Clinical diagnosis correlated with histopathological diagnosis in 77% of cases.

**Conclusion:** As different ophthalmic tumors present in a myriad of ways and a significant proportion of these cases presenting to hospital settings are malignant, it is prudent to confirm with a histopathological diagnosis for optimum management of such cases.

**Key words:** Ophthalmic tumors, Benign, Premalignant, Malignant.

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## Introduction

Ophthalmic tumors cover benign and malignant tumors of eyelids, conjunctiva, globe and orbit. Though ophthalmic tumors are not very common entities, they pose a big challenge for clinicians in diagnosis and management. The average annual incidence rate in the United

States was about 1/100,000 population and the estimated prevalence rate was about 12/100,000 population (Kleinstein & Lehman, 1977). The incidence of eye cancers in the Western populations ranged from 5.4 to 8.1 /100,000, while incidence was only 1.81 to 2.57/100,000 in East Asians (Cheng & Hsu 2004). As some tumors are not frequently seen during clinical practice due to their low prevalence rates, they can produce significant diagnostic dilemmas to the examining clinician. Some tumors can safely be observed while others can have grave consequences in the form of disfigurement, blindness and even death. Correct and timely diagnosis can not only save the patient from these serious complications, but also help to avoid unnecessary investigations and surgical procedures in case of certain tumors which can be safely observed. Limited literature is available on the relative frequency of various tumors in Nepalese population. Thus, we conducted a study to identify common tumors observed in the adult Nepalese population.

## Material and methods

This is an observational, descriptive type of study. A total of 100 patients, above the age of 16 years, presenting with ophthalmic tumors to B.P. Koirala Lions Center for Ophthalmic Studies (BPKLCOS) and inpatient service of Tribhuvan University Teaching Hospital (TUTH) from March 2016 to February 2017 were enrolled for the study. BPKLCOS is a tertiary referral center for eye diseases. Specially designed pro-forma was used to record demographic profile, detailed history, clinical features, investigations, clinical diagnosis and histopathological diagnosis of ophthalmic tumors. Histopathology examination of the acquired specimen using incisional biopsy or excisional biopsy was done in all cases. The Statistical Package for Social Sciences (SPSS) Version 20 was used for entering data and statistical analysis. The Institutional Review Board provided ethical consent for this study. Written consent was obtained from all the patients.

## Results

There were a total of 100 study subjects. Most of the patients were in the age range of 61-70 years (21%) as shown in figure 1. Mean age of subjects with ophthalmic tumors was 51.5±18.2 years. There was a preponderance of patients with benign tumors in the age group of 31-50 years [48.4% (n=31)] and malignant tumors in the age range of 61-70 years [38.5% (n=10). Figure 2 shows a decreasing trend of benign tumors with increasing age and rising trend of malignant tumors with elderly age. Females were affected more in all types of ophthalmic tumors. Sixty-two percent of the study population was females.

Left side (53 %) was found to be more affected. Most common symptom at presentation was swelling / mass (89%) followed by discoloration (10 %), ocular pain (6%) and diminution of vision (6%) as shown in table 1.

Duration of symptoms ranged from 11 days to 75 years. Figure 3 demonstrates that the majority had symptoms for one month to one year (44%). Majority of patients of benign tumors presented with symptoms for 1 year to 10 years [39.1% (n=25)] duration, premalignant tumors presented more from one month to 12 months [60% (n=6)] duration and malignant tumors presented with history of one month to 12 months [57.7% (n=15)] duration.

Benign tumors were more common than malignant tumors (64% vs. 26%). Premalignant ophthalmic tumors were found in only 10% of the cases. Eyelid was the most common site to be affected by ophthalmic tumors (59%) followed by conjunctiva (21%) and orbit (17%) as shown by figure 4. There was a single case of intraocular tumor.

Most common benign tumor of orbit was dermoid cyst seen in 23.4% (n=4) cases followed

by haemangioma 17.6% (n=3) as shown in table 2. Malignant tumors of orbit were spindle cell neoplasm, sebaceous carcinoma and non-Hodgkin's lymphoma.

There were two benign tumors in eyebrow: pilomatrixoma and naevus. Naevus was the most common benign tumor of eyelid which was seen in 23.7% (n=14) patients followed by haemangioma and squamous papilloma (13.6% each) as depicted in table 3. This study showed that the most common malignant tumor of eyelid was Sebaceous gland carcinoma. [10.2% (n=6)] followed by basal cell carcinoma. Upper eyelid was found to be affected more with tumors compared to the lower eyelid. Conjunctival tumors are presented in table 4. Most common benign tumors of conjunctiva were sub-epithelial naevus and reactive lymphoid hyperplasia and most common malignant tumor of conjunctiva was squamous cell carcinoma (14. 2% of total). Premalignant conjunctival tumor seen was Conjunctival Intraepithelial Neoplasia (CIN). Malignant melanoma was the only one intraocular tumor (1%) in our study.

Most common benign tumor was naevus [26.5% (n=17). Naevus was most frequently observed in eyelids, found in 14 out of total 17 cases. Most common malignant tumor was sebaceous carcinoma (30.8 %) followed by squamous cell carcinoma (15.4 %) and most common premalignant tumor was CIN [60% (n=6)] in this study.

Clinical diagnosis was consistent with pathological correlation in 77% of ophthalmic tumors.

In orbit, 47 % (8 out of 17) cases did not have clinical diagnosis consistent with histopathological diagnosis. Table 5 shows cases without clinico-pathological correlation in orbit. Of all the eyelid tumors, histopathological diagnosis was not consistent with clinical diagnosis in 18.6% of cases. Table 6 lists eyelid tumor cases without clinico-pathological correlation. Table 7 displays conjunctival tumors in which histopathological diagnosis did not correlate with clinical diagnosis.

**Table 1: Mode of presentation**

| Symptoms | Frequency | Percent |
|---|---|---|
| Mass | 89 | 89 |
| Discoloration | 10 | 10 |
| Diminution of vision | 6 | 6 |
| Ocular pain / Orbital pain / Periorbital pain | 6 | 6 |
| Protrusion of eyeball | 5 | 5 |
| Foreign Body Sensation | 4 | 4 |
| Drooping of Upper Eyelid | 4 | 4 |
| Restricted Extraocular Movement | 3 | 3 |
| Floater | 1 | 1 |

**Table 2: Tumors of orbit**

| Origin | Histopathological Diagnosis | Number | Percent |
|---|---|---|---|
| **A. Benign (n=14)** | | | |
| 1 .Congenital | Dermoid cyst | 4 | 23.4 |
| 2.Vascular origin | Cavernous haemangioma | 3 | 17.6 |
| 3. Lymphoid origin | Reactive lymphoid hyperplasia | 1 | 5.9 |
| | Benign lymphoproliferative lesion | 1 | 5.9 |
| | Pleomorphic adenoma | 1 | 5.9 |
| 4. Neural | Meningioepithelial meningioma | 1 | 5.9 |
| | Rhabdoid meningioma | 1 | 5.9 |
| 5. Mesenchymal | Lipoma | 1 | 5.9 |
| 6. Xanthogranuloma | Xanthogranuloma | 1 | 5.9 |
| **B. Malignant (n=3)** | | | |
| 1. Mesenchymal origin | Spindle cell neoplasm | 1 | 5.9 |
| 2. Sebaceous origin | Sebaceous carcinoma | 1 | 5.9 |
| 3. Lymphoid origin | Non-Hodgkin's lymphoma | 1 | 5.9 |
| **Total** | | **17** | **100** |

**Table 3: Tumors of eyelid**

| Type of tumors | Tumors | Number | Percent |
|---|---|---|---|
| **A. Benign (n=42)** | | | |
| 1. Melanocytic origin | Naevus | 14 | 23.7 |
| 2. Epithelial origin | Squamous Papilloma | 8 | 13.6 |
| | Verruca vulgaris | 1 | 1.7 |
| 3 .Vascular origin | Haemangioma | 8 | 13.6 |
| | Pyogenic granuloma | 4 | 6.8 |
| 4. Congenital | Dermoid cyst | 2 | 3.4 |
| 5. Adnexal tumors | | | |
| a Sebaceous origin | Sebaceous adenoma | 1 | 1.7 |
| b. Eccrine origin | Chondroid syringoma | 1 | 1.7 |
| c. Apocrine origin | Hidrocystoma | 1 | 1.7 |
| 6.Neural origin | Schwannoma | 1 | 1.7 |
| | Neurofibroma | 1 | 1.7 |
| **B. Premalignant (n=4)** | | | |
| Epithelial origin | Seborrhoeic keratosis | 3 | 5.0 |
| | Actinic keratosis | 1 | 1.7 |
| **C. Malignant (n=13)** | | | |
| 1.Epithelial origin | Basal cell carcinoma | 5 | 8.5 |
| | Squamous cell carcinoma | 1 | 1.7 |
| 2. Adnexal tumors | | | |
| Sebaceous origin | Sebaceous carcinoma | 6 | 10.2 |
| 3.Lymphoid origin | Non-Hodgkin Lymphoma | 1 | 1.7 |
| **Total** | | **59** | **100.0** |

**Table 4: Conjunctival tumors**

| Tumor type | Tumor | Number | Percent |
|---|---|---|---|
| **Benign (n=6)** | | | |
| 1. Pigmented tumors of melanocytic origin | Naevus | 2 | 9.5 |
| 2. Lymphoid origin | Reactive lymphoid hyperplasia | 2 | 9.5 |
| 3. Epithelial origin | Squamous Papilloma | 1 | 4.8 |
| 4. Myxoid | Conjunctival myxoma | 1 | 4.8 |
| **B. Premalignant (n=6)** | | | |
| 1. Epithelial origin | CIN | 6 | 28.6 |
| **C. Malignant (n=9)** | | | |
| 1.Epithelial origin | Squamous cell carcinoma | 3 | 14.2 |
| | Squamous cell carcinoma in situ | 2 | 9.5 |
| 2.Adnexal origin | Sebaceous gland carcinoma | 1 | 4.8 |
| 3. Melanocytic origin | Malignant melanoma | 2 | 9.5 |
| 3. Lymphoid origin | Non-Hodgkin lymphoma | 1 | 4.8 |
| **Total** | | **21** | **100** |

**Table 5: Cases without clinico-pathological correlation in orbital tumors**

| Clinical Diagnosis | Histopathological Diagnosis |
|---|---|
| A-V malformation | Spindle cell neoplasm |
| A-V malformation | Haemangioma |
| Extraconal orbital cyst | Cavernous haemangioma |
| Haemangioma | Reactive lymphoid hyperplasia |
| Implantation dermoid | Pleomorphic adenoma |
| Lymphoma | Sebaceous gland carcinoma |
| NHL | Benign lymphoid hyperplasia |
| Superior orbital mass | Non Hodgkin lymphoma |

**Table 6: Cases without clinico-pathological correlation in eyelid tumors**

| Clinical Diagnosis | Histopathological Diagnosis |
|---|---|
| Cutaneous horn | Actinic keratosis |
| Granuloma | Haemangioma |
| Haemangioma | Chondroid syringoma |
| Naevus | Squamous papilloma |
| Naevus | Seborrhoeic keratosis |
| Papilloma | Naevus |
| Papilloma | Verruca vulgaris |
| Pyogenic granuloma | Haemangioma |
| Sebaceous cyst | Schwannoma |
| Meibomian gland carcinoma | Non Hodgkin lymphoma |
| Basal cell carcinoma | Seborrhoeic keratosis |

**Table 7: Cases without clinico-pathological correlation in conjunctival tumors**

| Clinical Diagnosis | Histopathological Diagnosis |
|---|---|
| Amyloidosis | Reactive lymphoid hyperplasia |
| Inclusion cyst | Myxoma |
| Xanthogranuloma | Reactive lymphoid hyperplasia |

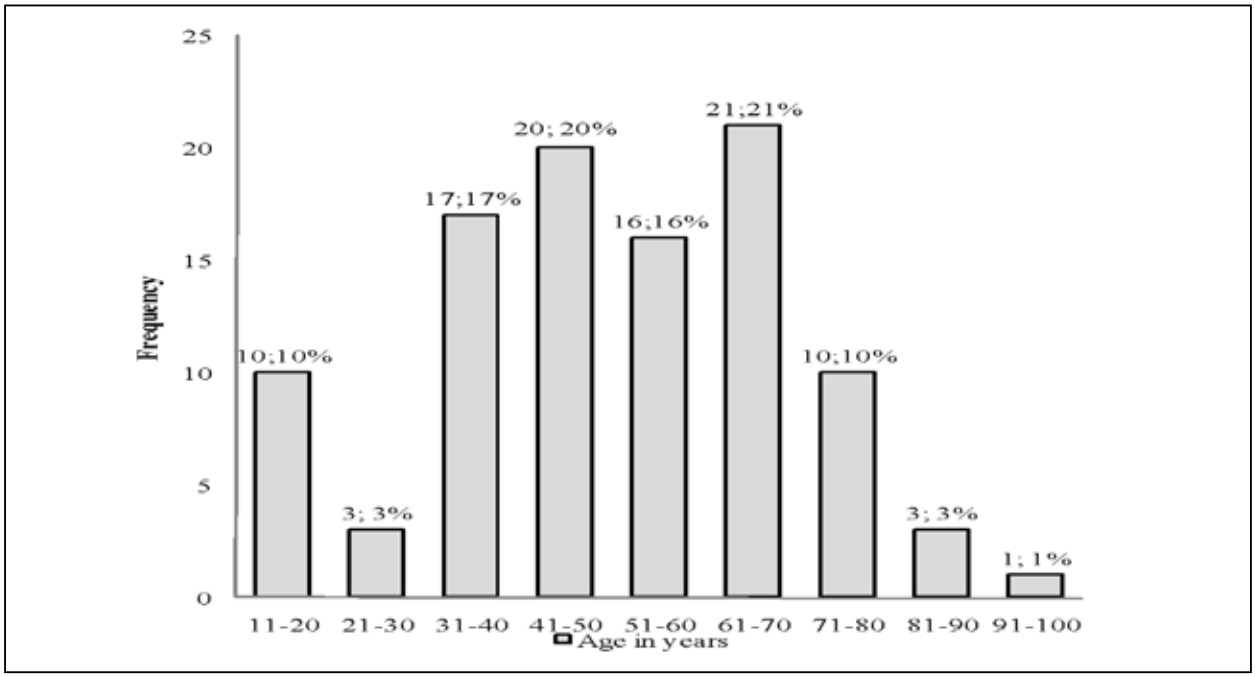


**Figure 1:** Patient distribution according to age group.

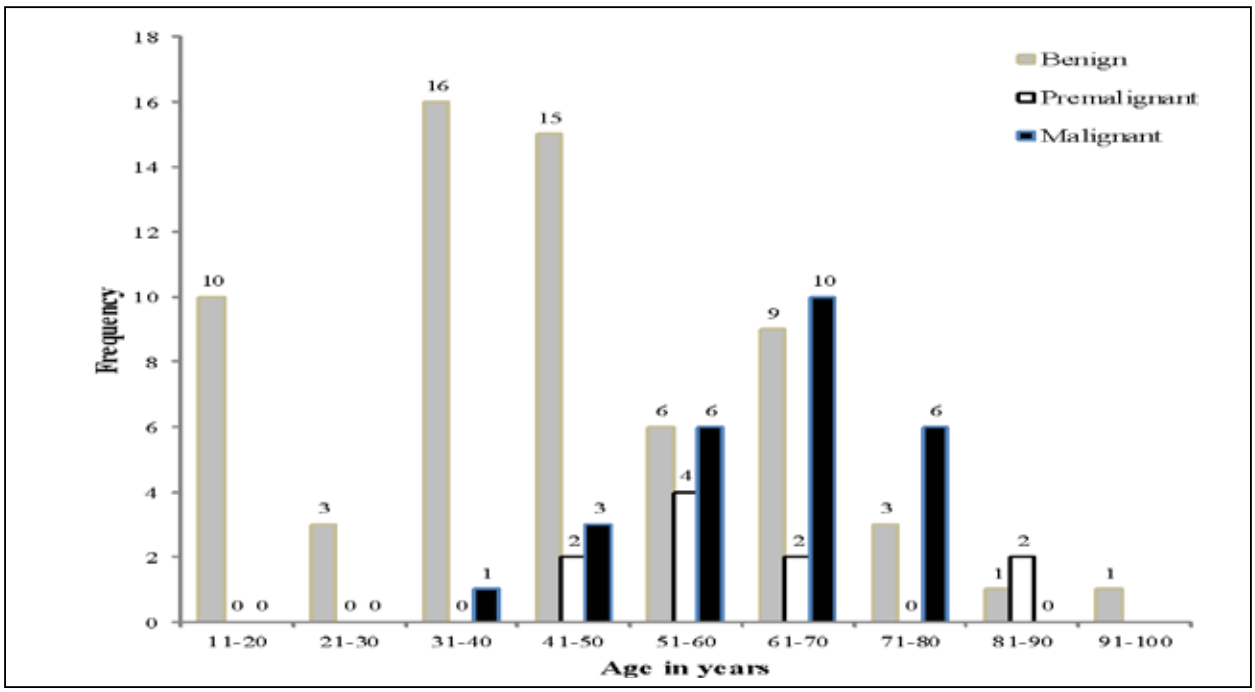


**Figure 2:** Age distribution in different types of ophthalmic tumors

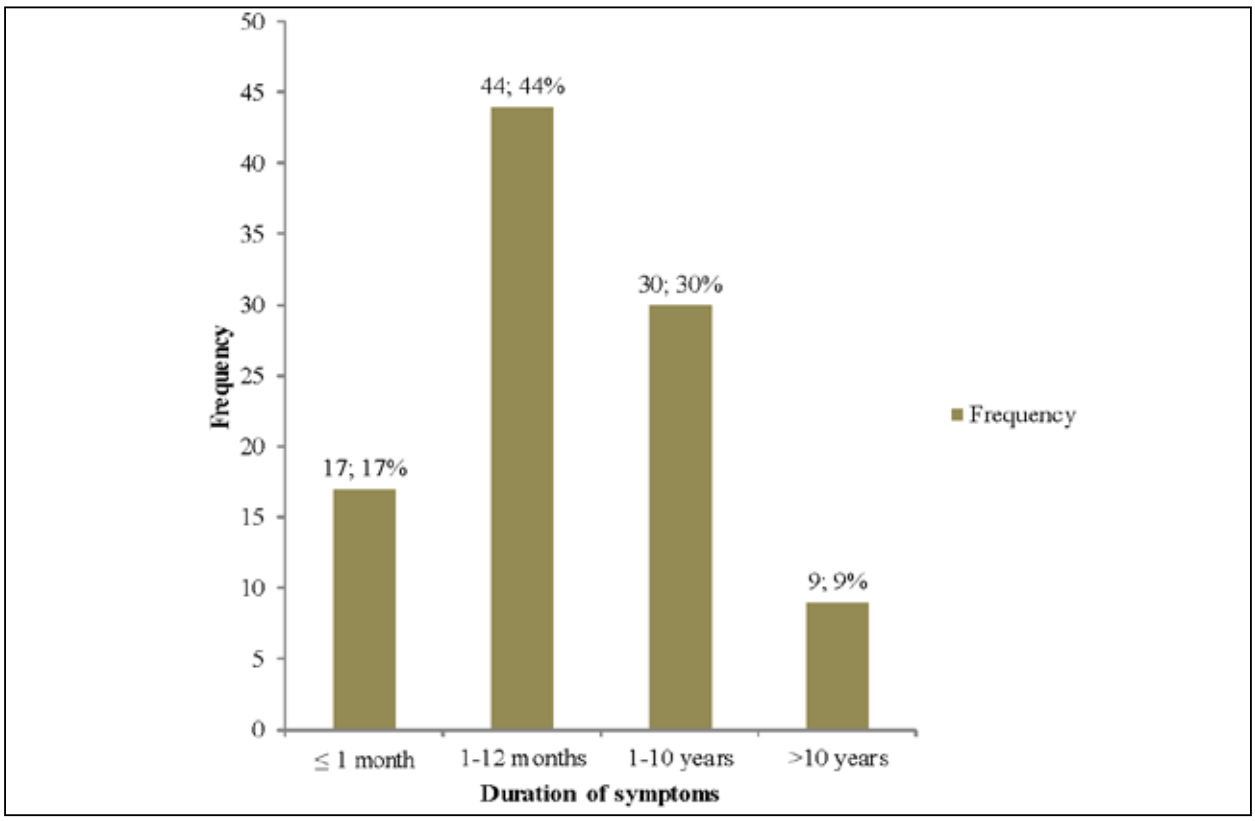


**Figure 3:** Duration of symptoms.

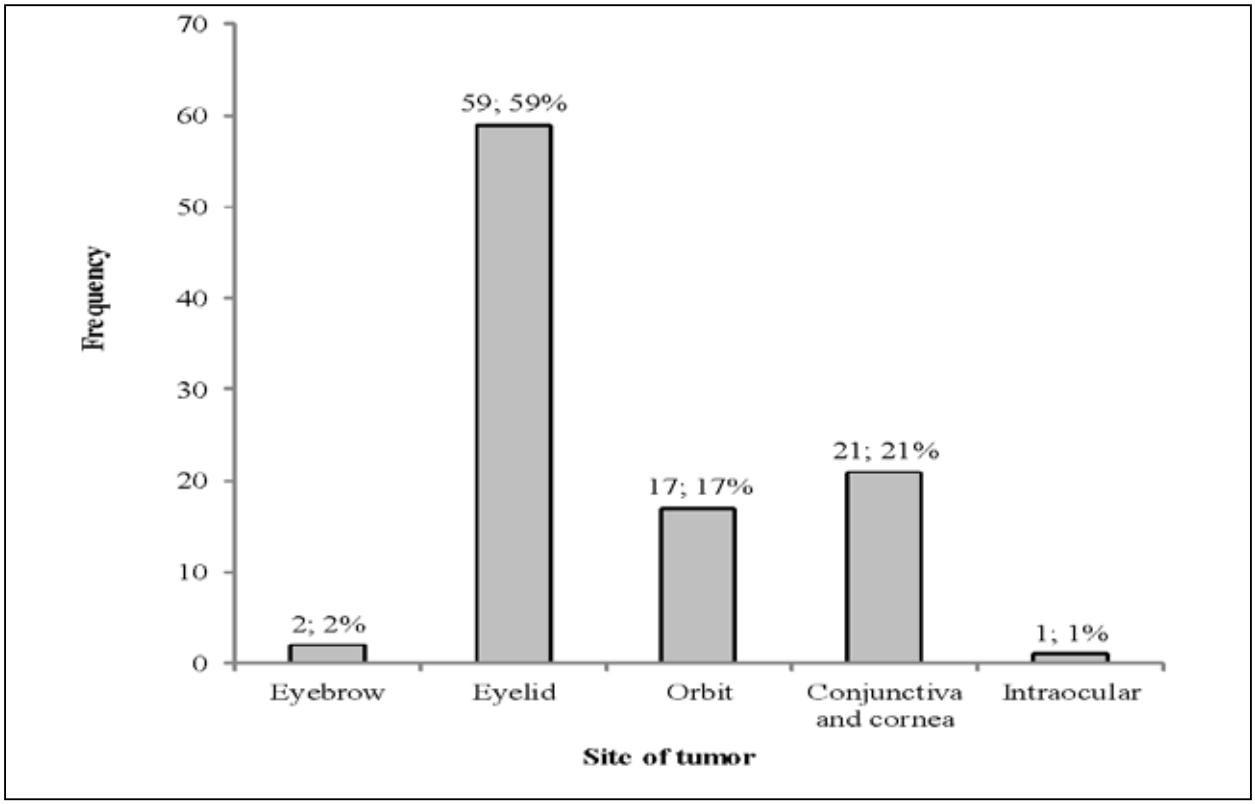


**Figure 4:** Site of Ophthalmic Tumors.

## Discussion

Majority of the patients fall in the age group of 61-70 years (21%) followed by 20% in the age group of 41-50 years. Mean age of the patients with ophthalmic tumors was 51.5±18.2 years. Similar results were observed in a study done in Bali (Yuliawati et al, 2013) where most eye tumor patients fell in the age group of 61-70 years (29.7%). As duration of exposure to carcinogenic substances increases with rising age, malignant tumors are generally seen in elderly age. Thus, elderly patients have higher chances of suffering from tumors compared to the younger population. In this study, 61.6% (n=16) cases with malignant tumors were above 60 years of age. Among benign tumors majority of the cases were below 60 years [78.1% (n=50)]. Benign tumors were more common in younger people and malignant tumors were more common in older individuals. Similar results were seen in a study by Das et al (2016) who prepared a profile of malignant ocular-adnexal tumors in India including all age group patients. However, as also evident in our study, malignant and benign tumors can occur in any age group.

In this study, 62% (n=62) of the patients were females with a female: male ratio of 2.1:1. Contrary to our study, males (60.7%) were affected more in a 10 year retrospective study done by Das et al (2016) in India. In a study from Nepal by Bastola et al (2013), there was no significant difference as 49% females and 51% males had ophthalmic tumors.

Duration of symptoms ranged from 11 days to 75 years. Patients with non-Hodgkin's lymphoma presented with symptoms for only 11 days. Patients with nevus had history for more than 75 years. Patients with benign tumors presented with longer duration of symptoms. Though patients with malignant tumors present earlier, there were few late presenters in this study. One patient with spindle cell carcinoma presented with symptoms for 7 years. A patient with basal cell carcinoma presented with symptoms for 30 years. Another patient with sebaceous gland carcinoma presented with symptoms for 10 years. Late presentation to the hospital was, in majority, due to non-hindrance of tumors in the day-to-day activities and poor socio-economic status of the patients. Some patients visited earlier at the local health care centers from where they were advised to attend tertiary eye center but failed to do so due to financial constraints.

The commonest symptom at presentation was swelling/mass (89%) followed by discoloration in 10 %, ocular pain and diminution of vision in 6% each. In the study of the profile of orbital disease by Shrestha et al (2017), the commonest symptom at presentation was lump in 85.1%. In another study done by Yuliawati et al (2013) in Indonesia, 95.5% of the patients presented with eye lump. Both of these studies support the findings of our study.

Benign tumors were the most common tumors in our study (64%). Obata et al (2005) (benign: 73%, malignant: 27%), Abdi et al (1996) (benign: 58.90%, malignant: 41.10%), Bastola et al (2013) (benign: 79%, malignant: 21%) Roh et al (1988) (benign: 63.6 %, malignant: 36.4%) and Tesluk (1985) (benign: 82.60%, malignant: 17.40%) also found out that benign tumors are more common than malignant tumors.

Most common site of tumor was eyelid [59% (n=59)] followed by conjunctiva [21% (n=21)] and orbit [17% (n=17)]. Study in eastern Nepal by Lavaju et al (2009) (42.6%) and mid-western part of Nepal by Bastola et al (2013) (57%) also found that the most common site involved was eyelid.

Most common benign tumor of orbit was dermoid cyst in 23.4% (n=4) followed by haemangioma 17.6% (n=3). Malignant tumors of orbit were spindle cell neoplasm, sebaceous gland carcinoma and non-hodgkin lymphoma.

Spindle cell neoplasm is a rare tumor. Shrestha G.B. et al (2017) also found dermoid cyst (23.4%) to be the most common tumor in orbit.

Naevus was the most common benign tumor of eyelid [23.7% (n=14)] followed by haemangioma and squamous papilloma (13.6% each). In a study of 50 patients by Acharya et al (2016), naevus and pyogenic granuloma were the most common (24.60%) tumors. The most common malignant tumor of eyelid was sebaceous gland carcinoma [10.2% (n=6)] followed by basal cell carcinoma. Periocular sebaceous gland carcinoma has been reported more frequently in persons of Asian descent, where studies from China, India and Nepal found it to be the most common or second most common periocular malignancy (Abdi et al 1996, Nelson et al 1995, Slutsky et al, 2012, Kumar, 2010). Studies conducted in India, including study by Abdi et al (1996) of 207 cases over a period of 34 years and other by Gosai et al (2014) and Acharya et al (2016) revealed that Indian population shows a predilection for sebaceous gland carcinoma amongst the malignant tumors.

In this study, benign tumors of conjunctiva were subepithelial nevus and reactive lymphoid hyperplasia. In a study by Bastola et al (2013), granuloma pyogenicum (22.5%) was the most common tumor followed by capillary haemangioma (13.5%) among conjunctival tumors. The most common premalignant tumor of conjunctiva and cornea was conjunctival intraepithelial neoplasm. The most common malignant tumor of conjunctiva was squamous cell carcinoma [14.2% (n=3)]. Squamous cell carcinoma was also the most common malignancy in studies done by Das et al (2016), Sunderraj (1991) and Charles & James (2014). Malignant tumors were more common than benign tumors in conjunctiva.

Malignant melanoma was only one intraocular tumor (1%) in this study similar to Kumar et al (2009), who also reported one case of choroidal melanoma among 57 cases of malignant ophthalmic tumors included in their study.

Most common benign tumor in this study was naevus [26.5% (n=17)]. Similarly, in the study of Obata et al (2005) the most common benign lesion was intradermal naevus (13%). Study by Roh et al (1988) also found that most frequent benign tumor was naevus. According to Bastola et al (2013), most common benign lesion was granuloma pyogenicum (22.5%) followed by intradermal naevus (4.5%). Most common malignant tumor in this study was sebaceous carcinoma (30.8 %) followed by squamous cell carcinoma (15.4 %). In a study done by Gupta et al (2017) sebaceous carcinoma (36.5%) was the most common malignancy followed by squamous cell carcinoma (21.0%) among adults above 40 years, which is similar to the findings of our study. In Nepal, Bastola et al (2013) also found sebaceous gland carcinoma to be the most common malignant lesion (8.7%). Most common premalignant tumor was found to be CIN [60% (n=6)] in our study.

Clinical diagnosis was consistent with histopathological diagnosis in 77 % of ophthalmic tumors in this study. This value was 76 % in study by Gupta et al (2017). In study done by Bastola et al (2013), clinical diagnosis was consistent with histopathological diagnosis in approximately 65 study subjects (65%). Study by Tesluk (1985) found it on the higher side as it was 92.8%. In our study, 53 % (n=9) cases, clinical diagnosis was consistent with histopathological diagnosis among orbital tumors. Diverse lesions are seen in orbit and their examination is difficult. Accuracy of imaging is also limited. In a study done by Shrestha et al (2017) at the same study site, clinico-pathological correlation matched in 72.3%. There was a rare case of spindle cell carcinoma which was initially diagnosed as arterio-venous malformation. Radio imaging of this patient also diagnosed the lesion as arterio-venous malformation. This patient had a long

history of symptoms (7 years) suggesting a benign condition. Clinical diagnosis was not consistent with histopathological diagnosis in few benign eyelid tumors because of clinical similarities between various benign tumors of eyelid. Naevus, papilloma, verruca vulgaris can sometimes be confused with each other due to similarities on clinical examination. Similarly, haemangioma and pyogenic granuloma may also have similar presentation. So, in these cases, the diagnosis was made of benign eyelid tumors, but the histological type could not be differentiated clinically. Lesions in conjunctiva and eyelids have better chance of correct clinical diagnosis as these lesions can be directly visualized. One case of Seborrhoeic keratosis was diagnosed as basal cell carcinoma because of clinical appearance. One patient of non-hodgkin lymphoma presenting with swollen lower eyelid was diagnosed as sebaceous cell carcinoma. On his general physical examination, there was generalized lymphadenopathy and testicular mass and histopathology examination revealed non-Hodgkin's lymphoma.

Clinical diagnosis was consistent with histopathological diagnosis in 100 percent of cases of premalignant and malignant conjunctival tumors. The scenario was different for benign tumors. Three cases of reactive lymphoid hyperplasia could not be accurately diagnosed clinically. They were diagnosed as amyloidosis and xanthogranuloma. One case of conjunctival myxoma was diagnosed as an inclusion cyst. As these tumors are rarely seen in day to day practice, there is a greater chance of making a false diagnosis.

## Conclusion

Varieties of tumors can occur in oculo-orbital tissue. Naevus and sebaceous gland carcinoma are the most common benign and malignant tumors respectively. Our study shows that clinical diagnosis does not always match with histopathological diagnosis. Hence, histopathological examination in suspected cases is essential for optimum management of ophthalmic tumors.

## Ethical approval and consent

Institutional review board of the Institute of Medicine provided ethical consent for the study. All the patients provided written consent for the study.

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