

Histomorphological Spectrum of Orbito-Ocular Lesions at Tertiary Care Center

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Abstract

Eye is a special sensory organ which exhibits diverse histological structures. It shows wide spectrum of pathologies ranging from trauma, degenerative, inflammatory, and neoplastic conditions. So this study was done to determine the pattern and proportion of different ophthalmic lesions in hospital. Total 95 biopsies and specimens of orbito-ocular lesions were received and were examined after H & E staining and immunohistochemistry was applied whenever required. This study was carried out in the Department of Pathology, SMS Medical College, Jaipur, for the duration of 1 year. It was found that females 50 (52.63%) were more commonly affected than male 45 (47.36%) with male to female ratio of 0.9: 1. The orbito-ocular lesions were highest 20 (21.05%) in age group of 0-10 years. The lesions were categorised as Non-neoplastic 7 (7.36%), Benign 40 (42.10%) and Malignant 48 (50.52%). Eyelid 48 (50.52%) was the most commonly involved site followed by conjunctiva, and was the significant finding. Most common benign lesion was epidermoid cyst 10 (25%). Among malignant lesions squamous cell carcinoma 12 (25%) was most common. Retinoblastoma was the commonest intraocular malignancy in paediatric age group. All surgically resected ophthalmic lesions should always be subjected to histopathological examination to establish the accurate diagnosis for further management.

Keywords: orbito-ocular, non-neoplastic, benign, malignant, eyelid, ophthalmic.

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INTRODUCTION

Eye exhibits diverse histological structures and the knowledge of normal ocular anatomy and spectrum of pathologic changes that involve these structures is necessary [1, 2]. A variety of cell types in and around eye spawn benign and malignant neoplasms and the frequency with which the different cell types become neoplastic varies immensely [3, 4].

Ophthalmic pathology is unique in many aspects as it encompasses variety of tissue epithelium, connective tissue and specialised tissue. It shows wide spectrum of pathologies including injury to eye, degenerative changes, inflammatory lesions and neoplastic conditions which can affect any of the various components of orbito-ocular system [5-7]. It examines the tissues macroscopically and by light microscopy. Other techniques such as immunohistochemistry (IHC), molecular testing and

electron microscopy (EM) are also employed sometimes [5].

The tumours of orbit include tumours of the glandular structures, various connective tissues, muscle, bone and cartilage, lympho-vascular system, peripheral nerve and autonomic nervous system and optic nerve. It also includes metastasis from malignant tumours of contiguous anatomical sites such as nasal cavity, paranasal sinus, parotid gland, skin of forehead and eyelid. The histological characteristics of these tumours are critical to their biological behaviour, line of management, outcome and prognosis [8, 9].

Eyelid and periocular skin lesions are very common due to the unique anatomical features of the eyelid as all the skin structures and its appendages, muscles, modified glands and conjunctival mucus membrane are represented in the eyelid. The majority of malignant tumours affecting the eyelids and periocular

area are slowly enlarging, destructive lesions that distort the anatomy and make it difficult to distinguish the exact location of lesion [10, 11].

The adequate management of patients depends upon the histopathological diagnosis. Therefore the purpose of the study is to evaluate histomorphological spectrum of different orbito-ocular lesion and to help in further treatment based on histopathological reports [6, 12].

MATERIAL AND METHODS

The present study was prospective hospital based study carried out in Department of Pathology SMS medical college, Jaipur for period of one year. The study was descriptive cross-sectional study. Prior permission from ethical committee and informed consent from all study patients were taken. Patient's clinical history and other investigations were recorded in proforma. Formalin fixed specimens were included in study and those which were poorly fixed, very tiny biopsy, previously diagnosed cases were excluded from the study. Sample size was calculated at 95% confidence level. At absolute allowable error (precision) of 10%, minimum 95 biopsies and specimens were taken as sample size. Qualitative data was expressed in percentage, proportion, graphs, and tables and analysed by appropriate statistical test. Mean age was included in quantitative data. p value < 0.05 was taken as significant.

Total 95 surgically resected specimens of orbito-ocular lesions were received in 10% formalin and the gross features such as size, shape, colour, external surface, cut surface and consistency were noted. Several representative areas of tumour tissue were subjected to routine paraffin embedding. The sections were stained with haematoxylin and eosin stain. The final diagnoses were given by a combination of clinical findings, radiological imaging and

histopathological examination. Immunohistochemistry was applied in some cases to arrive at final diagnosis.

RESULTS

The study population was evaluated for age, sex, sites of lesions, their behaviour and proportion. The patient's age ranged from 1-89 years with mean age of 41 years. The female patients (52.63%) were more than the males (47.36%). It was found that orbito-ocular lesions were highest 20 (21.05%) in age group of 0-10 years and lowest in 11-20 years, after this proportion of lesions increases up-to 80 years of age as shown in table no. 1.

Out of 95 cases, 7 (7.36%) were non neoplastic, which included inflammatory lesions, granulomatous lesion and a case of Rhinosporidiosis. Benign lesions constituted 40 (42.10%) and the most common benign lesion was epidermoid cyst. Among Malignant lesions 48 (50.52%), Squamous cell carcinoma 12 (25%) followed by sebaceous cell carcinoma 10 (20.83%) were the commonest malignancies as shown in table no. 2. Similar finding among malignancy was seen in study done by Chauhan Sanjay *et al*. [5] and P Bastola *et al*. [13] as shown in table no. 5.

Eyelid (50.52%) was the most commonly involved site followed by conjunctiva (15.78%) and orbit (14.73%), while canthus was least involved site as shown in table no. 3. Sebaceous cell carcinoma, 10 (20.83%) was the commonest malignant lesion affecting the eyelid. Epidermoid cyst was most common benign lesion over eyelid.

Out of 95 cases, 23 cases were presented in paediatric age group. Majority of cases 14 (60.87%) were affected the age group of 1- 5 years. Cases were benign constituted 60.87% and 9 cases were malignant, constituted 39.13%. The most common benign lesion was epidermoid cyst and Retinoblastoma was the commonest malignant lesion as shown in table no. 4.

Table-1: Distribution of cases as per age and sex

AGE GROUP	MALE	FEMALE	TOTAL (%)
0-10 Year	13	7	20 (21.05)
11-20 year	3	3	6 (6.31)
21-30 year	1	7	8 (8.42)
31-40 year	5	4	9 (9.47)
41-50 year	7	11	18 (18.94)
51-60 year	4	7	11 (11.57)
61-70 year	6	8	14 (14.73)
>70 year	6	3	9 (9.47)
TOTAL	45 (47.36%)	50 (52.63%)	95 (100)

Table-2: Histopathological diagnosis and categories of lesions

HISTO PATHOLOGICAL DIAGNOSIS	NON-NEO PLASTIC	NEOPLASTIC		TOTAL
		BENIGN	MALIGNANT	
Actinic keratosis	0	1	0	1
Atypical meningioma (WHO GRADE II)	0	1	0	1
Mesenchymal neoplasm of vascular origin	0	1	0	1
Basal cell carcinoma (BCC)	0	0	9	9
Spindle cell mesenchymal lesion	0	1	0	1
Cavernous haemangioma	0	3	0	3
Capillary Haemangioma	0	1	0	1
Dermoid Cyst	0	5	0	5
Dermal lipoma	0	1	0	1
Epidermoid cyst	0	10	0	10
Fibro lipoma/ hamartoma	0	1	0	1
Fibrous histiocytoma	0	1	0	1
Granulomatous lesion	1	0	0	1
Haemangioma	0	2	0	2
Inflammatory lesion	5	0	0	5
Infected mucocele	0	1	0	1
Inflammatory pseudotumor	0	1	0	1
Immature teratoma	0	0	1	1
Lobular capillary haemangioma	0	1	0	1
Lymphoproliferative neoplasm	0	0	3	3
Malignant melanoma	0	0	3	3
Malignant epithelial neoplasm	0	0	2	2
Malignant mesenchymal neoplasm	0	0	1	1
Meningioma	0	1	0	1
Nevus	0	1	0	1
Ocular surface squamous neoplasia	0	0	1	1
Papilloma	0	2	0	2
Pilomatricoma	0	1	0	1
Plexiform Neurofibroma	0	1	0	1
Poorly differentiated malignant neoplasm	0	0	1	1
Retinoblastoma	0	0	3	3
Rhinosporidiosis	1	0	0	1
Round cell neoplasm	0	0	1	1
Sebaceous cell carcinoma	0	0	10	10
Squamous Cell carcinoma	0	0	12	12
Seborrheic keratosis	0	1	0	1
Schwannoma	0	1	0	1
Malignant neoplasm	0	0	1	1
Lymphangiomatosis	0	1	0	1
TOTAL (%)	7 (7.36%)	40 (42.10%)	48 (50.52%)	95 (100%)

Table-3: Frequency of lesions at different sites

Sites	Number of lesions	%
Cornea	2	2.10
Canthus	1	1.05
Conjunctiva	15	15.78
Eyelid	48	50.52
Limbus	3	3.15
Orbit	14	14.73
Retina	4	4.21
Retro orbit	4	4.21
Uvea	4	4.21
TOTAL	95	100

Table-4: Distribution of benign and malignant lesions in Paediatric age group

Age group	Benign	Malignant	Total
1- 5 years	Epidermoid cyst Epidermoid cyst Epidermoid cyst Epidermoid cyst Dermoid cyst Fibro lipoma Benign spindle cell mesenchymal neoplasm Squamous papilloma	Immature teratoma Retinoblastoma Retinoblastoma Malignant epithelial neoplasm Retinoblastoma Round cell neoplasm (Retinoblastoma) Malignant neoplasm (Rhabdomyosarcoma)	
6-10 years	Epidermal cyst Inflammatory pseudotumor Mesenchymal neoplasm of vascular origin (Atypical meningioma) Dermal lipoma	Lympho proliferative neoplasm	
10-15 years	Plexiform neurifibroma Meningioma	Invasive squamous cell carcinoma	
Total (%)	14 (60.87%)	9 (39.13%)	23 (100%)

Table-5: Comparison of Most common benign and malignant lesion with other studies

Studies	Chauhan Sanjay et al. [5] (2012) N = 100	Yashita Gupta et al. [1] (2017) N = 488	P Bastola et al. [13] (2013) N = 100	Present study N = 95
Most common Benign lesion	Dermoid cyst	Angiomatous lesion	Granuloma pyogenicum	Epidermoid cyst
Most common Malignant lesion	Squamous cell carcinoma	Retinoblastoma	Squamous cell carcinoma	Squamous cell carcinoma

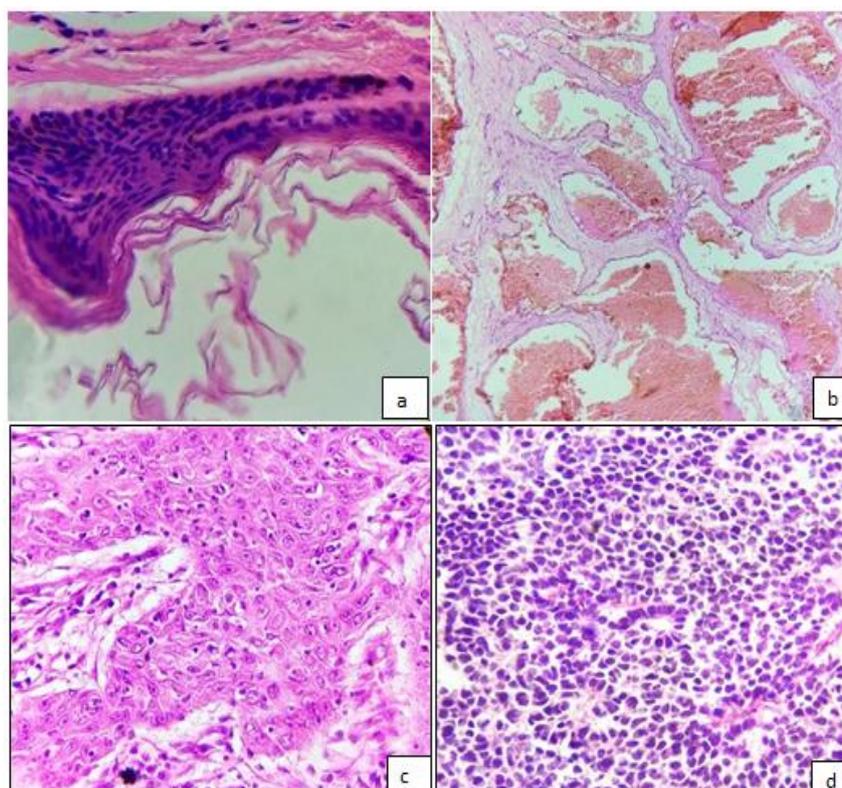


Fig-1 a): H & E stained section (400 X):- showing fibro-collagenous wall lined by stratified squamous epithelium, lumen shows keratinous debris – EPIDERMOID CYST. b) Blood filled cystically dilated channels – HEMANGIOMA. c) Sheets of pleomorphic squamous cells – SQUAMOUS CELL CARCINOMA d) sheets of small round cells and true rosettes – RETINOBLASTOMA.

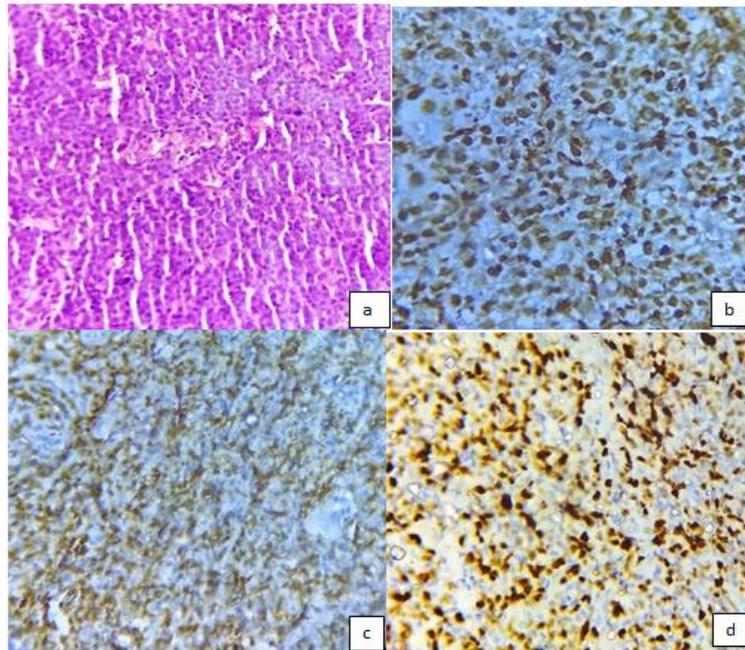


Fig-2 a): H & E stained slide (400X) of orbital mass biopsy comprised of monomorphic cells with enlarged nuclei- lymphoproliferative disorder. **b) BCL2 – Positive** **c) CD3 – Negative** in tumour cells, positive in normal T cell population. **d) Ki67 – 90%.** Diagnosis - B CELL NHL – DLBCL.

DISCUSSION

The Present study was a prospective study to access the distribution of lesions of eye (orbit and ocular adnexa) in relation to the age, sex and biologic behaviour in order to determine the pattern of prevalence of different ophthalmic lesions. We had analysed 95 surgically resected specimens of various orbital and ocular adnexal lesions. This sample size was almost similar to studies done by Chauhan Sanjay et al. [5] - 100, P Bastola et al. [13] - 100.

Incidence of ocular lesions was slightly higher in female 50 (52.63%) than male 45 (47.36%), similar to studies done by Chauhan Sanjay et al. [5], Imran Y Shaikh et al. [3], and P Bastola et al. [13]. There was wide age range from 1 - 89 years with mean age 41 years. Age group of 1-10 years had maximum incidence of orbito-ocular lesions (21.05%), this was also observed in study done by Yashita Gupta et al. [1]. Whereas study done by Imran Y Shaikh et al. [3] and Shastry Shrikanth et al. [14] had maximum incidence in age group of 41 -50 years. Chauhan Sanjay et al. [5] had maximum incidence in age group of 31- 40 years.

Incidence of malignant lesions 48 (50.52%), was higher than benign lesions 40 (42.10%), also found in study done by Yashita Gupta et al. [1]. However Rajharsh D Hanmante et al. [6], Chauhan Sanjay et al. [5], Imran Y Shaikh et al. [3] and Shastry Shrikanth et al. [14] found a low incidence of malignant lesions.

Commonest site affected was eyelid (50.52%) followed by conjunctiva (15.78%) and orbit 14 (14.73%). This was statistically significant.

This finding was in accordance with study done by Imran Y Shaikh et al. [3] (37.96%) and Chauhan Sanjay et al. [5] (57%) where eyelid was the most common site. In contrast Shikha Ghanghoria et al. [15] found conjunctiva (66.8%) as most common site followed by Eyelid (20.8%).

Non-neoplastic lesions were petite comparing to neoplastic lesions. Malignant lesions were more frequent as compared to benign lesions. Epidermoid cyst (25%) was the most common benign lesion in our study followed by Haemangioma (17.5%).

Chauhan Sanjay et al. [5] found dermoid cyst (21%), Yashita Gupta et al. [1] observed angiomatous lesion (44.7%) and P Bastola et al. [13] found Granuloma pyogenicum (22.5%) as the most common benign lesions in their studies, which was not observed in our study.

Most common malignant orbito-ocular lesion was Squamous cell carcinoma (25%) like the study done by Chauhan Sanjay et al. [5] and P Bastola et al. [13]. Yashita Gupta et al. [1] found Retinoblastoma as most common malignant lesion in the paediatric population.

Wide varieties of rare intraocular and orbital neoplasm differ in presentation in the paediatric population when compared with the adults. While most paediatric ophthalmic tumours are benign, a delay in diagnosis, even if benign, can lead to vision loss and may result in significant morbidity [16].

23 (24.21%) tumours were in paediatric population and most of which were affecting the 1-5yr age group comprising of 65.21% of total paediatric tumours. Benign lesions (60.87%) were higher than malignant lesions (39.13%). Most common benign paediatric lesion was epidermoid cyst (21.73%), and Retinoblastoma (17.39%) was the most common malignant lesion similar to study done by Yashita Gupta *et al*. [1], Lavaju P *et al*. [17] and D Chinda *et al*. [9].

Among the various studies reviewed some of them were having the same observations while some had shown the differences in age, sex, site distribution and nature of lesions in comparison to our study which can be due to variation in sample size, study duration, geographical distributions of lesions or a incidental finding.

CONCLUSION

Eyes the vital organ of vision, shows a wide spectrum of non- neoplastic and neoplastic pathologies occurring in different age groups. Many non- neoplastic lesions mimic the neoplasm and need differentiation before the initiation of definitive therapy. Some aggressive lesions of eyes and contiguous structures of head and neck may endanger the patient vision and life. The eye lesions are usually diagnosed late in paediatric population and hence increase the importance of early diagnosis and management. The histopathology along with immunohistochemistry serves the purpose. In conjunction with clinical details it helps in further guidance of therapy to patients.

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