

## Original Research Article

# Histopathological spectrum of ophthalmic lesions in Chhattisgarh: study from a tertiary care centre

Kujur P., Mulkalwar M.\*, Kosam S.

Department of Pathology, Pt. J. N. M. Medical College, Raipur, Chhattisgarh, India

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### \*Correspondence:

Dr. Mulkalwar Madhubala,

E-mail: [mulkalwarmadhu@gmail.com](mailto:mulkalwarmadhu@gmail.com)

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## ABSTRACT

**Background:** Ophthalmic pathology is a subspecialty of cellular pathology which deals with the diagnosis and characterization of eye diseases. Ophthalmic pathologists study tissues excised by ophthalmologists through evisceration and enucleation and other small biopsies from various ophthalmic surgeries. Ophthalmic lesions include a wide spectrum of lesions ranging from benign, premalignant to malignant lesions. The diagnosis of these lesions is based on the clinical as well as histopathological features.

**Methods:** The present study was an observational prospective study conducted on a 62 ophthalmic biopsies received in Histopathology laboratory, Department of Pathology, Pt. J.N.M. Medical College and Dr. B.R.A.M. Hospital, Raipur, Chhattisgarh, India, between March 2016 and October 2016. Institutional ethics committee of Pt. J.N.M. Medical College, Raipur, India has approved this study. Informed written consent was collected from the patients or their relatives.

**Results:** Out of 62 cases of ophthalmic biopsies, 38 (61.29%) were non-neoplastic and 24 (38.71%) were neoplastic lesions. Among non-neoplastic lesions, inflammatory lesions of lacrimal sac were more common 16 (42%) followed by conjunctival lesions 10 (26.3%). Among the neoplastic lesions, retinoblastoma was the most common malignancy 11 (45.83%).

**Conclusions:** The most common ocular malignancy was retinoblastoma; among non-neoplastic disorder, chronic dacryoadenitis followed by benign lesions of conjunctiva. Some ocular masses composed of rhino sporangium involving conjunctiva, lid or lacrimal sac.

**Keywords:** Adnexal, Leukocoria, Ocular lesions, Retinoblastoma

## INTRODUCTION

Ophthalmic pathology is a subspecialty of cellular pathology which deals with the diagnosis and characterization of eye diseases.<sup>1</sup> Malignant orbital tumors are generally treated by orbital exenteration. The term enucleation applies to the removal of the eye alone, sparing the conjunctiva and eyelids. The term evisceration refers to the evacuation of intraocular contents and replacement with space occupying material to preserve motility of a cosmetically acceptable

prosthesis.<sup>2</sup> Ophthalmic pathologists study tissues excised by ophthalmologists through evisceration and enucleation and other ophthalmic biopsies.<sup>3</sup> The orbit is composed of the globe, extra ocular muscles, fat, vascular, nerve, glandular and connective tissues of neuroectodermal origin.<sup>4</sup> The neoplastic orbital lesions show wider range of pathological findings and further compounded by the patients' fear of loss of vision pose as a major challenge to ophthalmologists.<sup>5</sup> Ophthalmic histology techniques differ from those of normal tissue in fixation, processing and sectioning. Ophthalmic pathologist should be trained

to identify disease processes unique to eye and to demonstrate them on a microscopic slide along with the pupil and optic nerve.<sup>6</sup> The present study is aimed to correlation morphological and clinico-pathological features of ophthalmic lesions, to know the pattern of prevalence of various ophthalmic lesions in Chhattisgarh, India.

## METHODS

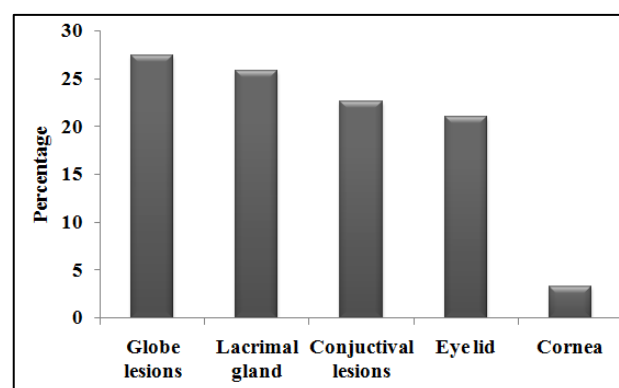
A total of 62 ophthalmic biopsy specimens referred Histopathology and Cytology laboratory, Department of Pathology, Pt. J. N. M. Medical College and Dr. B. R. A. M. Hospital, Raipur, Chhattisgarh, India, between March 2016 and October 2016 included in this study. Institutional ethics committee of Pt. J. N. M. Medical College, Raipur, India has approved this study. Informed written consent was collected from the patients or their relatives. All specimens were subjected to the fixation, grossing, processing and staining with Harris haematoxylin and Eosin stain. Microscopic evaluation was done on each specimen along with the clinical data on hand. The study was done to report the spectrum and frequency of different ocular and adnexal lesions in a tertiary care hospital in Chhattisgarh, India.

## RESULTS

The site specific distributions of the ophthalmic biopsies were given in Figure 1. Of the 62 ophthalmic biopsies, 17

(27.42%) specimens were from globe lesions including retina and choroid, 16 (25.8%) from lacrimal gland, 14 (22.58%) from conjunctiva lesions, 13 (20.97%) from eye lid and 2 (3.23%) cases from cornea. The age range was from 5 months to 86 years with the mean age of 32.53 years.

Out of 62 biopsies evaluated, 33 (53.22%) were of male and 29 (46.78%) were of female [Figure 2(A)]. About 38 (61.29%) ophthalmic biopsies were found to be non-neoplastic and 24 (38.71%) were neoplastic in nature [(Figure 2(B)]. Frequencies of distribution of various non- neoplastic and neoplastic ocular lesions were documented in Table 1.



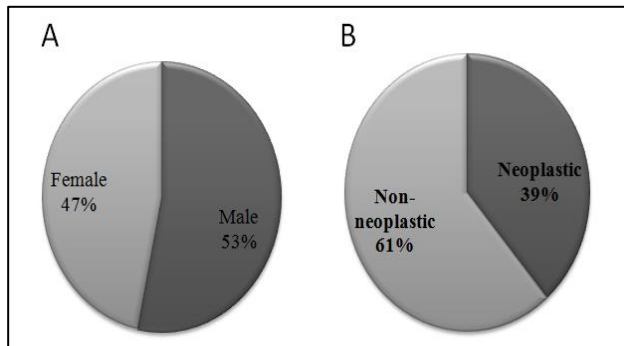
**Figure 1: Site specific distributions of the ophthalmic biopsies.**

**Table 1: Frequency of distribution of non neoplastic and neoplastic ocular lesions.**

Diagnosis	Site of biopsy				
	Globe	Conjunctiva	Cornea	Eye- lid	Lacrimal apparatus
<b>Non-neoplastic</b>					
Inflammatory	2	4	-	-	-
Cystic	-	2	-	4	-
Infectious (rhinosporidium)	-	2	-	1	1
Granulomatous (tubercular)	-	1	-	-	-
Chalazion	-	-	-	2	-
Retinal detachment	2	-	-	-	-
Pterigium	-	1	-	-	-
Ulcer	-	-	1	-	-
Chronic dacryoadenitis	-	-	-	-	14
Recurrent dacryoadenitis	-	-	-	-	1
<b>Neoplastic</b>					
RB	11	-	-	-	-
Sebaceous cell carcinoma	-	-	-	3	-
SCC	-	2	-	-	-
BCC	-	-	-	1	-
NHL	1	-	-	-	-
MM	1	-	-	-	-
Squamous papilloma	-	1	-	-	-
Neurofibroma	-	-	-	1	-
Dysplastic changes	-	1	1	1	-

RB: Retinoblastoma; SCC: Squamous cell carcinoma; BCC: Basal cell carcinoma; NHL: Non-Hodgkin's lymphoma; MM: Malignant melanoma.

Among non-neoplastic lesions, chronic dacryoadenitis was found highest 14 (36.8%). Among all malignancies 11 (45.83%) specimens were diagnosed as retinoblastoma. Complete histopathological spectrum of retinoblastoma based on optic nerve invasion was shown in Table 2.



**Figure 2: Distributions of the ophthalmic biopsies (A) based on sex; (B) neoplastic status.**

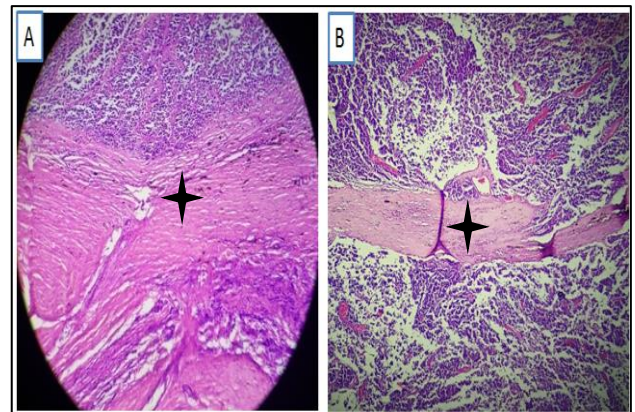
**Table 2: Histopathological spectrum retinoblastoma based on optic nerve invasion.**

Level of optic nerve invasion	n (%)
Laminar ONI	1(9.09%)
ONI to the transection line involvement	3(27.3%)
ONI to the transection line involvement, adjacent muscle, and FFT infiltrated by tumor	1(9.09%)
Marked calcification with retrolaminar ONI	2(3.22%)
Focal calcification with retrolaminar ONI	2(3.22%)
Marked calcification without ONI	1(9.09%)
Focal calcification with extensive necrosis without ONI	1(9.09%)

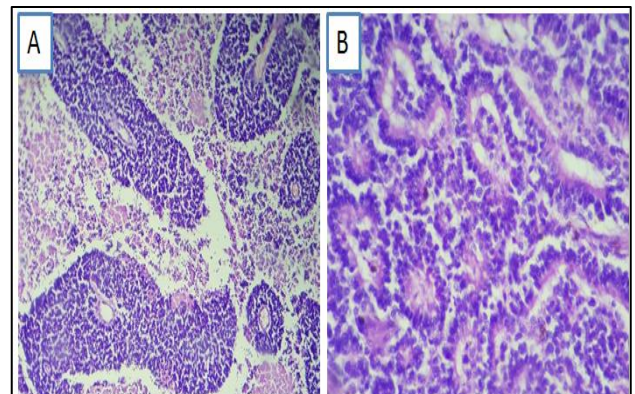
ONI: Optic nerve invasion; FFT: fibrofatty tissue.

Photomicrographs of some the lesions showed focal to marked calcification and necrosis with or without optic nerve infiltration by tumor as depicted in Figure 3, 4 and 5. Second most common malignancy was squamous in origin; of which two cases of frank WDSCC (Figure 6), one squamous papilloma; remaining showed the spectrum of range from mild, moderate to markedly dysplastic epithelium. Sebaceous cell carcinoma was the commonest malignancy in patients with eye lid mass which is simulating the lipogranulomatous lesions like chalazion mainly when presented recurrently (Figure 7), the other malignancy was the basal cell carcinoma of eye lid. One case of NHL (Figure 8) and another case of malignant melanoma of choroid were diagnosed in excised eye ball specimens. A single case was presented as firm to hard mass over upper eye lid and patient complaining of foreign body sensation; on histopathological examination it proved out to be a neurofibroma. One specimen of lacrimal sac lesion showed mass composed of rhinosporangium at various

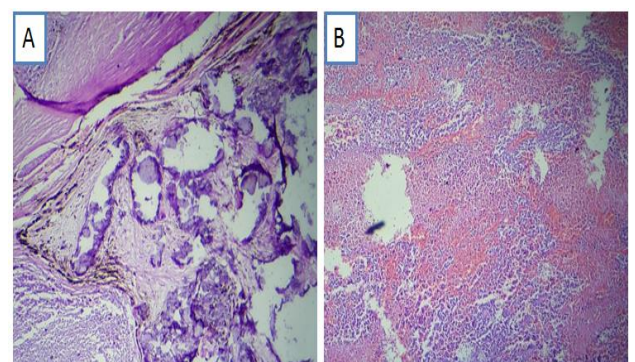
maturation stages and background elicited intense granulomatous-giant cell reaction (Figure 9).



**Figure 3: Photomicrograph of retinoblastoma shows tumor invasion. (A) Up to lamina cribrosa (marked with star); (B) another case showing retrolaminar optic nerve invasion (H and E-100X).**

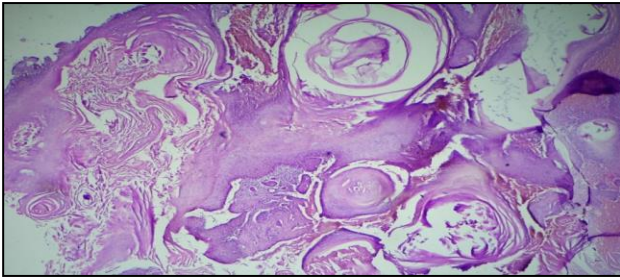


**Figure 4: Photomicrograph of retinoblastoma shows malignant cell arrangement. (A) Basophilic cells are arranged around the lumen of tumor vessels, perivascular pseudorosettes with necrosis; (B) Another case showing fleurettes (H and E-400X).**

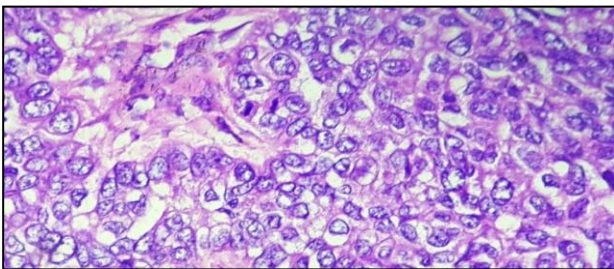


**Figure 5: Photomicrograph of retinoblastoma shows advance changes. (A) calcifications involving choroid and retina; (B) extensive necrosis and hemorrhages (H and E-100X).**

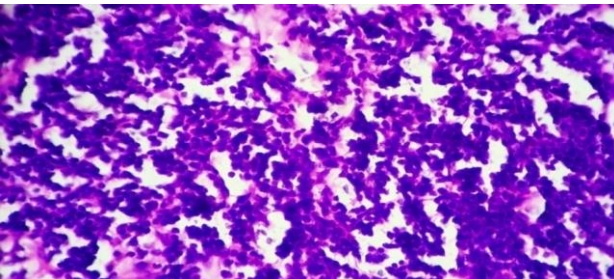




**Figure 6:** Photomicrograph shows well differentiated squamous cell carcinoma. Squamous cell carcinoma demonstrates enough differentiation to tell that the cells are of squamous origin. The cells are pink and polygonal in shape show pleomorphism, with hyperchromatic nuclei and malignant squamous pearls (H and E-400X).



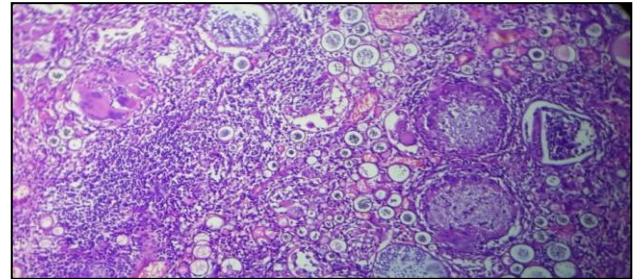
**Figure 7:** Photomicrograph of sebaceous cell carcinoma. Intracytoplasmic vacuolation within the neoplastic cells were seen (H and E-400X).



**Figure 8:** Photomicrograph of non-Hodgkin's lymphoma. Monomorphic population of malignant round cells were seen (H and E-400X).

The conjunctival lesions attributed mainly by inflammatory infiltrates, some were cystic in nature showing sebaceous cyst, inclusion cyst etc. Among infectious, two cases were showing conjunctival mass composed of rhinosporidium and one case composed of chronic inflammatory cells along with Langhan's type of giant cells with granuloma (tubercular in nature). Eye lid mass mainly cystic in nature namely two cases of epidermal inclusion cyst; sebaceous cyst and dermoid cyst had reported one case each. Chalazion was reported in two cases of lid and its most strong differential was sebaceous cell carcinoma; one lid mass was also showing rhinosporidiosis. Two cases involving whole globe, composed of mixed chronic inflammatory infiltrates, one

diagnosed as panophthalmitis and other as endophthalmitis. One case of glaucoma showed retinal detachment and another traumatic case showed retinal detachment along with detachment of sclera. One case of corneal ulcer was also diagnosed showed complete destruction of corneal membrane.



**Figure 9:** Photomicrograph biopsy from lacrimal sac mass. Rhinosporidiosis at various stages with granulomatous (giant cell) reaction was seen (H and E-100X).

## DISCUSSION

Neoplastic lesions of ocular and adnexa have relatively high morbidity and mortality. Diagnosing the accurate lesions and for commenting on extent and type of lesion along with surgical margin which can guide for further therapy of patients. In the present study non-neoplastic lesions were outnumbered of neoplastic lesions. Non-neoplastic lesions constituted by chronic dacryoadenitis followed by benign and inflammatory lesions of conjunctiva. Out of all non-neoplastic lesions, four cases (6.45%) were showed infection from *Rhinosporidium Seeberi*. Ocular rhinosporidiosis due to this organism are not so common in India, occur particularly in endemic areas. It affects predominantly one of the mucous membranes of the nose and nasopharynx but occasionally other structures, such as conjunctiva, lacrimal sac, eyelids etc. Our study document different ocular and adnexal structures involved by rhinosporidium i.e. conjunctiva in two cases, lid mass in one case and lacrimal sac in one case. A great deal of research related ocular biopsies revealed that the ocular rhinosporidiosis is one of the major ocular infections in different areas. The most common site of ocular rhinosporidiosis is the lower palpebral conjunctiva in Tamil Nadu nasal and nasopharyngeal sac in Orissa, lacrimal sac in Chhattisgarh.<sup>7-10</sup>

In our study, among all the neoplastic lesions retinoblastoma was found the commonest malignancy. Retinoblastoma was the commonest malignancy first decade of age.<sup>11</sup> The overall incidence was 11.2 for children aged 0 to 4 years and 5.3 for children aged 0 to 9 years per 1,000,000 person-years, 5.9 per 100,000 live births, and 5.3 per 100,000 live births.<sup>12</sup> Most common presenting complaint was leukocoria in patients of retinoblastoma; most of the studies reported the same clinical presentation, also some patients complaining of

loss of vision and proptosis similar to other studies.<sup>13-16</sup> Our study report extensive necrosis in 9.09% cases of retinoblastoma, but much higher frequency of necrosis (25.58%) was reported in another study.<sup>17</sup> On histopathology optic nerve invasion was found in 81.8% cases of retinoblastoma, but much lower frequency of optic nerve invasion (32%) was reported.<sup>18</sup> Other histopathological findings like rosette, perivascular pseudorosette, fleurette formation, calcification, necrosis and haemorrhage etc. were similarly found as other studies. Squamous origin of neoplastic lesions were found in our study is showing coherence with the other studies.<sup>19-21</sup>

## CONCLUSION

In summary our study revealed that the retinoblastoma is the commonest ocular malignancy and most of them are presented with either leukocoria or blindness. Furthermore, diagnosing sebaceous cell carcinoma is difficult because it simulates chalazion which is a benign lesion. Among non-neoplastic disorder, chronic dacryoadenitis (adnexal) followed by benign lesions of conjunctiva (ocular) and few of them get infected due a fungal organism called *Rhinosporidium Seeberi*, which is endemic in some regions of our Chhattisgarh, India. So in our region, all ophthalmic lesions removed surgically should be sent for histopathological examination to establish the correct diagnosis which helps in further guidance of therapy to patients.

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