

Histopathological Profile of Malignant Oculoadnexal tumours in a Tertiary Care Hospital: A 10 Year Retrospective Study

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Abstract

Aim: To analyze the histopathological profile of malignant oculoadnexal tumors among the patients treated in a tertiary care hospital in Northeast India and to compare findings with previously reported data and seek the cause of disparity wherever possible.

Material & Methods: The present study is a 10 years retrospective study (March 2004 to March 2014) carried out in the lab of Regional Institute of Ophthalmology, Guwahati in Northeast India. All the tissues sent for HPE were routinely fixed, processed and stained. IHC was done wherever necessary. Only malignant cases were included in the study and the lab records of these cases were thoroughly reviewed.

Results: A total of 135 consecutive histologically diagnosed malignant cases of ocular adnexal tumor were observed in the 10 year period. Males (60.7%) were affected more than females (39.2%). The age incidence shows two peaks, one in the first decade due to Retinoblastoma and the other in 5th to 6th decade. The most commonly affected site was intraocular (36.29%). Retinoblastoma was the most common malignancy followed by squamous cell carcinoma from various oculoadnexal sites (21.48%).

Conclusion: Intraocular region was the most commonly affected site and retinoblastoma was the most commonly observed malignancy.

Keywords: Oculoadnexal malignancies, retinoblastoma, squamous cell carcinoma.

I. Introduction

Malignant oculoadnexal tumors are not uncommon and several studies have been carried out both in India and worldwide to better understand the epidemiology of these tumors.

The oculoadnexal region is histogenetically diverse and account for the diversity of tumors affecting this region. Moreover tumors in this region maybe primary, secondary or metastatic and as in other parts of the body benign tumors usually outnumber the malignant ones.

The oculoadnexal malignancies can affect any age group. Retinoblastoma, a childhood malignant tumor not only accounts for the vast majority of ocular adnexal tumors but also causes visual morbidity and mortality without adequate timely intervention.

II. Materials And Methods

The present study is a 10 year retrospective study carried out in the laboratory of Regional Institute of Ophthalmology (RIO), Guwahati, which is a tertiary care hospital under the Government of Assam and mainly caters to the patient from the lower part of the Assam covering a population of approximately ten million people, however patients from other parts of the state as well as from the neighboring states of Northeast India are referred here.

The lab records of the cases diagnosed as malignant were studied and data regarding age, sex, site of the tumor, laterality, nature of specimen, gross features, clinical diagnosis and final HPE diagnosis were reviewed. All the patients, who presented with oculoadnexal lesions, were operated upon, wherever appropriate and tissues sent to the RIO were routinely fixed and processed. The tissue sections were stained with H&E stain and where necessary special histochemical stains and IHC was done to arrive at the final diagnosis. Only those cases which were diagnosed as malignant were included in our study

III. Results

A Total of 135 cases of malignant oculoadnexal tumor were recorded in our study. There were 82 males (60.7 %) and 53 female cases (39.2 %). The age distribution shows two peaks one in the first decade and the other in the fifth to six decade (table 1). Table 2 shows site wise distribution of malignant oculoadnexal tumors. The most commonly affected site was intraocular (36.29 %) followed by eyelid (34%) conjunctiva

(15.55 %), limbus (6.66 %) Orbit (4.44 %) and the lacrimal gland were the least affected site (2.96 %). Retinoblastoma was the most frequently occurring tumor in our study and it was also the most common intraocular tumor. Basal cell carcinoma was the most common eyelid malignancy. Squamous cell carcinoma was the most commonly observed tumor both in the conjunctiva and limbus. Among orbital tumors lymphoma was the most common and adenoid cystic carcinoma was most frequently observed tumour in the lacrimal gland.

IV. Discussion

1. Intraocular malignancy

1.1 Retinoblastoma

Retinoblastoma was found to be the most frequent intraocular tumour (87.78%) followed by choroidal melanoma (12.2 %) consistent with studies conducted in India, [1,2,3] Singapore, [4] and Korea, [5] whereas malignant melanoma was reported to be the most common intraocular malignancy in the West. [6, 7] Retinoblastoma was also the single most common tumor of the oculoadnexal region similar to other studies. [2,3,8,9] However, Reddy *et al.* [10] in India and Pombeara *et al.* [11] in Thailand found squamous cell carcinoma to be the most common tumor. Average age of presentation of retinoblastoma was found to be 32.4 months similar to other Indian studies, [1,2] which was significantly higher as compared to 23 months in Singapore and 24 months in Thailand, [4,11] while in the West the average age was 18 months.

Review of literature shows slight male preponderance. [12,13] P Sunderrajid did not observe any significant sex difference. [2] Kandelkar *et al.* noted a female preponderance. [14] Majority of tumors (83%) had an endophytic growth pattern (figure 1) and were well differentiated (65%) on histology with the classic Flexner Wintersteiner rosettes. Optic nerve involvement (Fig 2) was seen in 34.8 % of the cases and these were advanced cases with poorly differentiated tumor lacking Flexner Wintersteiner rosettes. In our patients, poverty and lack of awareness results in late presentation with advanced lesions.

1.2 Melanoma

We recorded a total of 15 cases of oculoadnexal melanoma of which six cases were choroidal, five conjunctival and four eyelid melanomas with extraocular outnumbering intraocular tumors similar to D Das *et al.* [1] and P Sunderraj. [2] Choroidal Melanoma accounted for 12.2% of intraocular malignancies similar to observation made by D Das *et al.* [1] in the Northeastern population where intraocular melanoma accounted for 18.4 % of intraocular malignancies. However, in the west melanoma was found to be the most common intraocular malignancy (59%). [7] This disparity with the west is probably due to genetic and yet unknown factors that protect the pigmented race from the harmful effect of UV rays and sunlight exposure. The mean age of presentation was found to be 45 years with a male preponderance as was noted by Biswas *et al.* [15] and Maneesh Dhupper *et al.* [16] who observed that choroidal melanoma occurred at an earlier mean age of 45.9 ± 14.8 years among the Asians as compared to the west where the mean age was 60 years. On histology, all the tumors were of the mixed cell variety with both spindle and epithelioid cells. The spindle cells were highly cohesive, fusiform cells with small nuclei and the epithelioid cells were large polyhedral with distinct cell margins, abundant cytoplasm and large nuclei with prominent round nucleoli.

2. Eyelid malignancies

Basal cell carcinoma (BCC) was the most frequently observed eyelid malignancy followed by Squamous cell carcinoma (SCC) and Sebaceous gland carcinoma (SGC), these findings are similar with Thailand, Pakistan, and the West. [11,17,18] D Das *et al.* [1] reported similar finding in the North Eastern population. However SCC was noted to be the most common eyelid malignancy in South India, [2,10] whereas in central India BCC was the most common followed by SGC. [19,20] The incidence of BCC shows geographic variation with the west reporting 90% of all eyelid malignancies to be BCC. [21] Whereas studies from Asia show the incidence of BCC to be around 64-65%. [11,22] Studies from India report a much lower incidence, [19] in our study we found it to be 34.7 % similar to the finding of D. Das *et al.* [1] The average age of presentation of BCC was 51.2 years with slight female predominance similar to other studies. [9,11,19] The predominant histology of basal cell carcinoma was the insular type with variably sized islands of basaloid cells bordered by a palisaded outer row of cells which was separated from the adjacent stroma by a cleft (Fig 3).

SCC was the second most commonly observed malignancy in the eyelid 26.1% similar to other studies, [1,9,11] with average age of presentation being 54.5 years and a female predominance similar to Satish MKale *et al.* [19] Out of the 12 cases, seven were well differentiated exhibiting lobules of squamous cell with keratin pearls and modest cytological atypia and the other four cases were moderately differentiated with lobular to infiltrative growth pattern lacking the keratin pearls. Cytologic atypia was more marked in these cases. One case of squamous cell carcinoma with sebaceous differentiation was also noted.

SGC accounted for 19.5 % of cases similar to the D Das *et al.* [1] (23%) which is lower than the incidence of SGC observed in the South (33%), [2] and Central India (37%). [20] This disparity is probably due

to different climatic conditions in these regions with Central and South India being more warmer and humid than Northeast India . The average age of presentation of SGC was 53.4% with a slight female predominance similar to other studies.[2, 19] Histopathologically, these were well to moderately differentiated having lobular patterns (Fig 3) with cells at the center of the lobules exhibiting sebaceous differentiation with abundant finely vacuolated to amphophilic cytoplasm, the nuclei were centrally placed with prominent nucleoli and showed moderate mitotic activity.

Malignant melanoma accounted for 8.6 % of all eyelid malignancies with average age of presentation being 64 years and a male predominance unlike Satish M Kaleet *al.*[19] who found eyelid melanoma more commonly in younger females.

In the undifferentiated carcinoma cases IHC with cytokeratin helped to clinch the diagnosis.

3. Conjunctiva

Among the conjunctival tumors, squamous cell carcinoma was the most common malignancy (47.6%) similar to other studies.[1,2] The average age of presentation being 57.7 years and a male preponderance similar to P Sunderraj.[2] There were equal number of conjunctival CIS and melanoma cases. CIS was mostly seen in male and occurred at a younger average of 42.2 years.[2] Conjunctival melanoma however showed a female predominance. These findings were consistent with those of P Sunderraj.[2]

4. Limbus

Squamous cell carcinoma was the most frequent tumor at this subsite followed by CIS, similar to other studies.[2] The average age for SCC was 51.3 years with a male predominance whereas CIS occurred at a relatively younger age group similar to the observation made by P Sunderraj.[2]

On Histology among the conjunctival SCC six cases were well differentiated, three moderately differentiated and one case was poorly differentiated. All the limbal SCC were well differentiated. CIS in both the conjunctiva and limbus exhibited full thickness replacement of normal epithelium by anaplastic cells that lacked normal maturation.

5. Orbit

4.44 % of oculoadnexal tumor belongs to this group .Lymphoma was the most common malignancy at this site similar to other Indian,[1,2] Asian,[9,11] and western authors.[23] However AB Umaret *al.* in Kano, Nigeria observed Rhabdomyosarcoma to be the commonest orbital malignancy.[8] All the lymphoma cases were B cell NHL. The majority were males and the age ranged from 25 to 55 years. One case of rhabdomyosarcoma in a nine year old child and a case of squamous cell carcinoma secondary to the orbit with primary in the conjunctiva were also noted. All the orbital lymphoma cases were B cell NHL with three cases of diffuse lymphocytic lymphoma (Fig 4) and a case of follicular lymphoma.

6. Lacrimal gland

This was the site that was least affected (2.96 %) similar to other studies.[2, 10] There were two cases of adenoid cystic carcinoma and one case each of B cell NHL and pleomorphic adenocarcinoma.

Table 3 shows a comparative analysis of malignant Oculoadnexal tumors among different Indian authors.

The total number of malignant oculoadnexal tumors recorded in our study is comparatively less as compared to D Das *et al.*[1] in the North Eastern Indian population. This disparity could be due to the fact that RIO, being a government hospital mainly caters to the low socioeconomic group where poverty and lack of awareness results in late presentation with advanced stage making the tumor inoperable and has to be referred to oncology centers elsewhere.

V. Conclusion

Since the oculoadnexal region is a favored site for aggressive tumors, there is an urgent need to educate and create awareness among the general population to ensure early detection of cases and enable prompt & adequate treatment and prevent undue loss of vision or life

VI. Figures And Tables

Table 1: Showing age and sex distribution of oculoadnexal malignancy

Age	Male	Female	Total
0-10	30	14	44
11-20	1	1	2
21-30	2	2	4
31-40	5	3	8
41-50	14	12	26

51-60	13	14	27
61-70	14	6	20
71-80	3	1	4
	81 (60.7%)	53(39.2%)	Total

Table2: Showing site wise distribution of malignancy.

Tumour location and histologic type	Number of cases (%)
Intraocular	49 (36.29%)
Retinoblastoma	43 (31.85)
Uveal melanoma	6 (4.44)
Eyelid	46 (34.07%)
Basal cell carcinoma	16 (11.85)
Squamous cell carcinoma	12 (8.88)
Sebaceous gland carcinoma	9 (6.66)
Malignant melanoma	4 (2.96)
Carcinoma in situ	3 (2.22)
Undifferentiated carcinoma	2 (1.48)
Conjunctiva	21 (15.55%)
Squamous cell carcinoma	10 (7.40)
Malignant melanoma	5 (3.70)
Carcinoma in situ	5 (3.70)
Lymphoma	1 (0.74)
Limbus	9 (6.66%)
Squamous cell carcinoma	6 (4.44)
Carcinoma in situ	3 (2.22)
Orbit	6 (4.44%)
Lymphoma	4(2.96)
Rhabdomyosarcoma	1(0.74)
Secondarysquamous cell carcinoma	1(0.74)
Lacrimal Gland	4(2.96%)
Adenoid cystic carcinoma	2 (1.48)
Pleomorphic adenocarcinoma	1 (0.74)
Lymphoma	1 (0.74)

Table 3: showing a comparative analysis of malignant Oculoadnexal tumors among different Indian authors.

Name of author	D Das <i>et al.</i> ^[1]	P Sunderraj. ^[2]	Present study
Duration of study	10 yrs	9 yrs	10yrs
Total number of cases	381	262	135
Most common site	Orbit (31.4 %)	Intraocular (34%)	Intraocular (36.8%)
Most frequent malignancy	NHL (24.1%)	Retinoblastoma (32%)	Retinoblastoma (31.8%)
Most common intraocular tumour	Retinoblastoma (81.5%)	Retinoblastoma (96%)	Retinoblastoma (87.7%)
Most common eyelid malignancy	BCC (35.1%)	SCC (34%)	BCC (34.7%)
Most common conjunctival malignancy	SCC (72.5%)	SCC (55.1%)	SCC (47.6%)

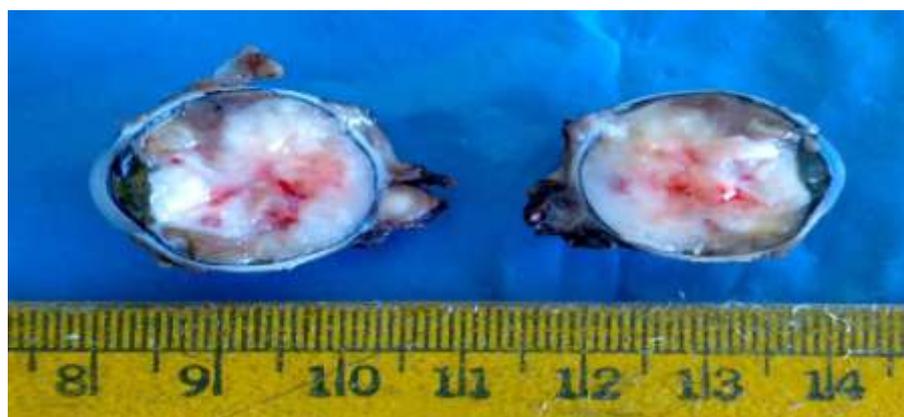


Figure 1 - Microphotograph showing tumour mass replacing whole eyeball (Retinoblastoma)

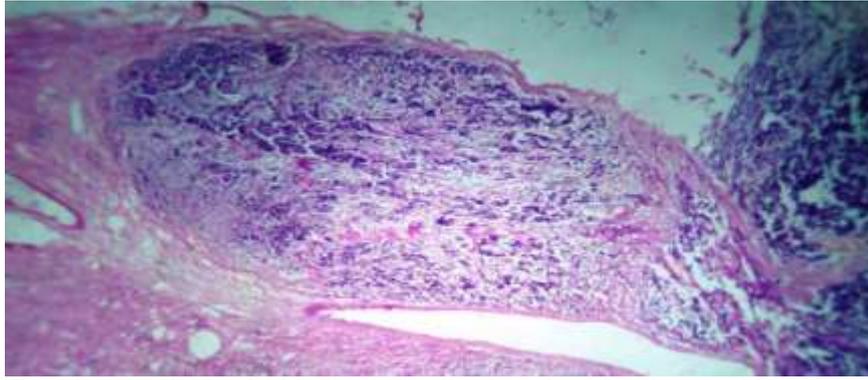


Figure 2- Microphotograph of retinoblastoma, showing invasion of optic nerve by tumours cells (10x)

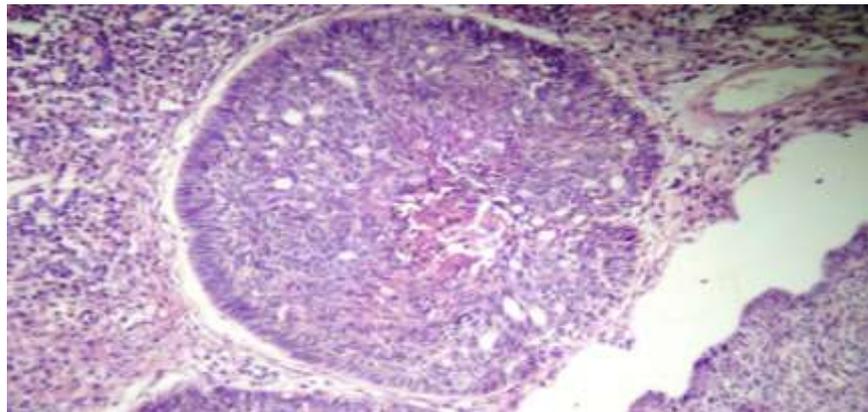


Figure 3 -Microphotograph of BCC showing peripheral palisading of basoid cell with cleft formation (40x)

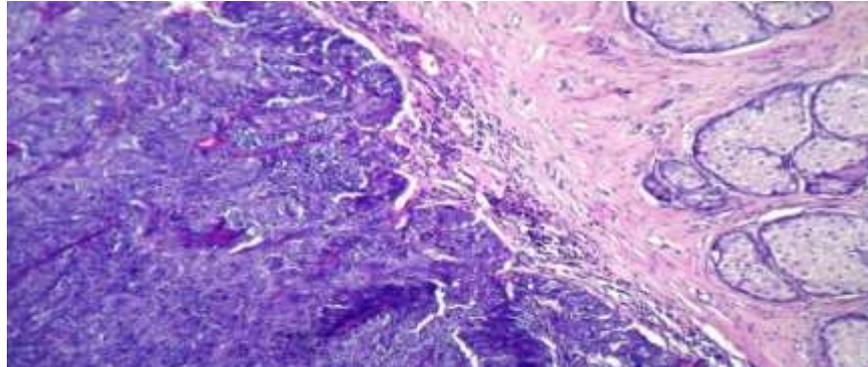


Figure 4 - Microphotograph showing transition between normal sebaceous glands and sebaceous gland carcinoma (10x)

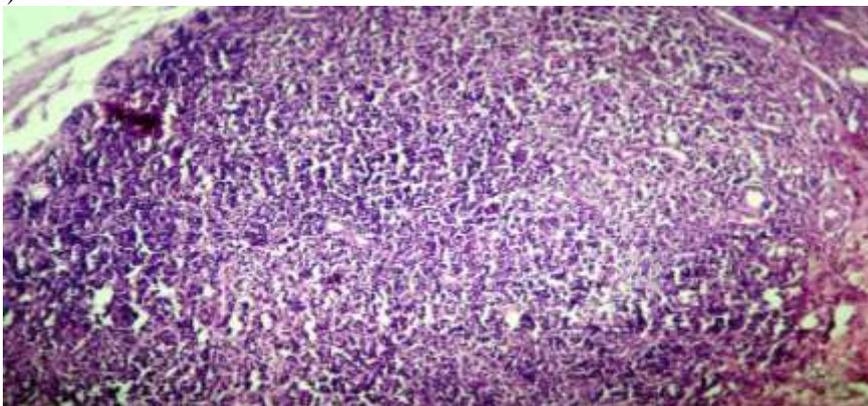


Figure 5 - Microphotograph showing monotonous population of lymphoid cells (10x) in lymphoma

Conflict of interest: None

Ethical approval: Ethical clearance received from Institutional Ethics Committee of Gauhati Medical College and Hospital, Guwahati, Assam

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