Morphological Spectrum of Ophthalmic Tumors in Northern Pakistan

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Abstract

Objective: The objective ot the study was to assess the frequency and pattern of ophthalmic tumours in Northern Pakistan.
Methods: This study included all ophthalmic tumours diagnosed during a one year period (January to December 1992).
Results: One hundred and fourteen ophthalmic turnours were diagnosed at the Armed Forces institute of Pathology (AFIP) and Pathology Department. of the Army Medical College (AMC), Rawalpindi. Of these tuniours, 70 were malignant (61.5%) and 44 were benign (38.5%). The age distribution of malignant ophthalmic tumours had two peaks. The first was seen in the paediatric age group and was mainly due to retinoblastoma. The second peak was seen above 50 years of age and was mainly due to conjunctival squamous cell carcinoma and malignant eyelid tumours which constituted 85% of the malignant ophthalmic turnours in paediatric age group. The average age at presentation of retinoblastoma was 3.8 years. The average age at presentation for squamous cell carcinoma was 56 years. Basal cell carcinoma was the most common malignant eyelid tumour (55%). The most common extraocular malignant orbital tumour was non-Hodgkin's lymphoma. Malignant melanoma of the uvea formed 22% of all melanomas diagnosed during this period. The most common benign tumours were naevi (33%), epidermal inclusion cysts (18%), choristomata (16%) and haemangioma (8%). The malignant ophthalmic tumours constituted 3% of all the malignant turnours diagnosed in Northern Pakistan during 1992 at AFIP and AMC, Rawalpindi.
Conclusion: The ophthalmic turnours, both benign and malignant are not infrequent in clinical practice in Northern Pakistan UPMA 51:19; 2001).

Introduction

A large variety of benign and malignant ophthalmic turnours can arise from structures within the orbit and ocular adnexa. The orbit is a limited bony space and even a small pathological reaction occurring inside the orbit disturbs the complex arrangement of the orbital structures and can impair vision.
The retinoblasloma is the most common malignant intraocular tumour of infancy and early childhood and is the most common orbital tumour in Pakistan[1-3] as well as other countries[4,5] It is worldwide in distribution, affecting all racial groups[6] and is responsible for approximately 1% of all deaths from cancer in the paediatric age group upto 15 years[7]. Malignant melanoma of the uvea is another common intraocular tumour and in the United States comprises about 20% of all malignant melanonias[8].
Tumours of the conjunctiva, eyelids and lacrirnal gland, form an important group of ophthalmic neoplasms which can impair vision[7,10]. Lymphoid neoplasia can involve the eye and certain lymphomas e.g. the large cell non-Hodgkin's lymphoma have an unusual predilection for the eve and central nervous system[11]. The orbit, eyelids and intraocular tissues can also be involved by metastatic turnours. The posterior choroid is the most common site for these metastases[12]. The benign tumours, like haemangioma. choristoma, fibroma and liporna can occur within the orbit and can result in grave consequences for the patient's vision[13].
lnformation about the pattern of ophthalmic tumours in Pakistan and particularly the northern parts is

limited. A study was carried out at the Armed Forces Institute of Pathology (AFIP) and the Army Medical College (AMC). Rawalpindi to assess the frequency pattern of ophthalmic tumours in the northern parts of Pakistan and to compare the observations with similar studies from Pakistan and abroad.

Material and Methods

All ophthalmic biopsies received at the AFIP and AMC, Rawalpindi during the period January 1992 to December 1992 were studied and only those diagnosed as ophthalmic tumours (malignant or benign) were included in the study. The AFIP and AMC, Rawalpindi receive specimens not only from military hospitals but also from many civil hospitals of Northern Punjab, N.W.F.P and Azad Kashmir. The major referral centers included, Al-Shifa Eye Hospital, Rawalpindi and the Lady Reading Hospital, Peshawar. The cases in this study were a heterogeneous population of both civilian and Armed forces personnel of both sexes. One hundred and seventy ophthalmic biopsies were received There were 29 enucleated eye ball specimens and 141 small biopsies. The small excision biopsies were processed as such but a standard procedure for processing the eyeball was followed[14] in which the coronal sections of the whole eyeball were made, passing through the optic nerve and cornea. The other sections were made parallel to the first.

All the tissues were processed for routine Haematoxylin and Eosin (H&E) staining and 4-5 microns sections were stained with l-l&E. PAS stain Masson Fontana's stain for melanin were also performed when required.

Results

During the study period, a total of 114 (67%) ophthalmic tumours were studied.Of these 70 were malignant (61.5%) and 44 (38.5%) benign . During the same period a total of 2632 malignant tumours of all types were diagnosed at both AFIP and AMC. The malignant ophthalmic tumours constituted 3% of all the malignant tuniours diagnosed during this study period.

The age of patients varied from 1 year to 82 years (Mean 39 years). Nearly 30% of ophthalmic tumours were seen in the paediatric age group (1-15 years) and a second peak was seen between 51-80 years group. In benign ophthalmic tumours the age varied from 1 year to 70 years (Mean30 years), whereas 29.5% of these turnours were seen in the paediatric age group and the rest in adults.

Of the70 malignant ophthalmic tumours, 38 (54%) were in males and 32 (46%) in females. (male to female ratio 1.18:1). Of the benign ophthalmic tumours (n=44), 32 were seen in males and 1 2 in females, (male to female ratio 2.7:1).

Analysis of the malignant ophthalmic turnout's is shown in Table 1.

Table-1. Histological Types of Malignant Ophthalmic Tumors (n=70).

S.No.	Type of Lesion	Number of cases	Percentage
1.	Retinoblastoma	17	24.5
2.	Squamous cell carcinoma (Conjunctival)	15	21.5
3.	Squamous cell carcinoma (Eyelid)	3	4.3
4.	Basal cell carcinom a (Eyelid)	11	15.8
5.	Sebaceous carcinoma (Eyelid)	3	4.3
6.	Malignant melanoma (Eyelid)	1	1.4
7.	Malignant melanoma (Uvea)	3	4.3
8.	Non-Hodgkin's lymphoma (Orbit, Conjunctiva)	4	5.7
9.	Mucoepidermoid carcinoma (Conjunctiva)	2	2.8
10.	Adenocarcinoma mucinous type (Eyelid)	2	2.8
11.	Adenoid cystic carcinoma (Lacrimal gland)	2	2.8
12.	Poorly Differentiated adenocarcinoma (Lacrimal gland)	2	2.8
13.	Glioma (Optic nerve)	1	1.4
14.	Embryonal Rhabdomyosarcoma (Orbit)	1	1.4
15.	Small Blue cell tumour (Orbit)	1	1.4
16.	Secondary tumours (Sinonasal carcinoma)	2	2.8

Retinoblastoma, squamous cell carcinoma of the conjunctiva and basal cell carcinoma of the eyelid are the three most common malignant ophthalmic tumours. Constituting 62% of all malignant ophthalmic tumours.

Among the benign ophthalmic tumours (Table 2)

Table 2. Histological types of Benign OphthlmicTumors (n=44).

S.No	Type of Lesion	Number of cases	Percentage
1.	Naevus (conjunctiva, eyelid)	15	33
2.	Epidermal inclusion cyst (conjunctiva)	8	18
3.	Choristoma	7	16
4.	Haemangioma	3	8
5.	Squamous papilloma (conjunctiva)	3	8
6.	Pleomorphic adenoma (lacrimal gland)	1	2
7.	Plexiform neurofibroma (eyelid)	1	2
8.	Lymphangioma (eyelid)	1	2
9.	Miscellaneous	5	11

naevi and epidermal inclusion cysts were the most common, constituting 35% of all benign ophthalmic tuniours. The site distribution of malignant ophthalmic turnours (Table 3)

Table 3. Distribution of malignant tumours according to site.

Site	No. of cases	Percentage
Eyeball	20	28.5
Eyelids	20	28.5
Conjunctiva	18	26.0
Lacrimal gland	4	5.7
Extraocular orbit	8	10.3

showed that eyeball (28.5%). eyelids (28.5%) and conjunctiva (26%) were the three most common sites involved.

Discussion

In this study, the malignant ophthalmic tumours constituted 3% of all malignant tumours diagnosed at the Armed Forces Institute of Pathology and the Army Medical College. The relative frequency of ophthalmic tumours appeared to be higher than the earlier reported studies from within Pakistan in which the frequency ranged between 0.9% to 1 .9%[15]. The higher frequency is most probably due to special arrangements made to collect the ophthalmic biopsies during the study period from two centres.
A higher percentage of malignant ophthalmic tumours was observed in the paediatric age group due to retinoblastoma which constituted 25% of all malignant ophthalmic turnours and 85% of the malignant ophthalmic tumours in the paediatric age group. In a study from Karachi, Southern Pakistan, the retinoblastoma was reported to be 16% of all childhood malignancies[16,17] and 4.7% of all malignant solid tumours. Another study from Northern Pakistan Showed retinoblastoma asone of the ten commonest malignant tumours in paediatric age group[18,19] and 22.5% of all malignant ophthalmic turnours in our observations regarding the frequency of retinoblastoma were similar to other studies reported from Pakistan.
A higher percentage of malignant ophthalmic tumours was also seen in the elderly, above 50 years of age and it was mainly due to the eyelid tunlours and the conjunctival squamous cell carcinoma. The eyelids and the conjunctiva play a very important role in maintaining the integrity of the visual apparatus and the tumours arising from these structures can be responsible for loss of vision either due to invasion of the orbit or of the eyeball. The most common malignant eyelid tumour in the United States and the United Kingdom is reported to be the basal cell carcinoma which occurs most frequently on the lower eyelid and medial canthus in elderly patients[9,20]. In the present study the most common eyelid tumour was also the basal cell carcinoma. A high incidence of basal cell carcinoma and squamous cell carcinoma is seen in individuals with fair skin due to exposure to sun light[21]. A similar factor may also be operative in some of our patients, because a large proportion of the population in Northern Pakistan has relatively fair skin as compared to Southern Pakistan.
Squamous cell carcinoma of the conjunctiva was also seen with greater frequency in our material (2 1 . 5%). It was seen in the elderly and the most common site involved was the limbus (60%). This finding was consistent with other studies from within the country and abroad[22,23]. An aetiological role of trauma to the eye, actinic exposure, radiation therapy, chemical treatment, chronic irritation and viruses, have been proposed in the development of squamous cell carcinoma of the conjunctiva[22,24]. Since the climate in most of Pakistan is dry and dusty with high sun exposure. similar factors may be operative in the causation of squamous cell carcinoma in Pakistani patients.
Malignant melanoma of the uvea comprised about 20% of all malignant melanomas in the United States[6]. In our material, 3 cases of malignant melanoma of the uvea were diagnosed and they formed 22% of all malignant melanomas seen during the period of study.
Lymphoid neoplasia can involve the eye and represents extranodal type of non-Hodgkin's l ymphoma. Non-Hodgkin's lymphoma has greater predilection for the eye and central nervous system[9]. Approximately 60% of patients have lesions of orbit, 30% in the conjunctiva and 10% in the eyelids"[25]. The most common type of lymphoid neoplasia seen in this study was non-Hodgkin's lymphoma, Diffuse large cell type. A large number of benign lesions e.g. haemangiomas, orbital cysts etc. were also seen in our material. These tumours are also equally important because of their location within the orbit, which is a limited bony space[4,13]. The present study has shown that ophthalmic tumours are quite frequently encountered in clinical practice particularly among the paediatric age

group and the elderly in northern Pakistan.

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