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Research Article

Spectrum of ocular lesions in a tertiary care centre: a five year retrospective study

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ABSTRACT

Background: FNAC has been playing an important role in the diagnosis of ophthalmic lesions. Being a quick and cost effective method, FNAC aids in the diagnosis of non-neoplastic and neoplastic lesions that warrant immediate medical or surgical intervention. However, there is a paucity of studies in this regard. The aim of our study is to analyze the cytological spectrum of ocular lesions followed by subsequent histopathological examination.
Methods: The study was conducted over a period of 5 years. FNAC was done on patients clinically presenting with ocular lesions. Cytological findings were retrospectively correlated with histopathological diagnosis.
Results: A total 63 cases of ophthalmic lesions were analysed. Of these, 36 were males and 27 were females. The age of patients ranged from 3 to 75 years. The cases were categorised according to location and into benign (58.73%) and malignant cases (41.27%). Histopathological diagnosis was available in 58 cases. The commonest benign lesion was chalazion (9 cases). The commonest benign lid tumour was hemangioma (5 cases) while commonest malignant lid tumour was basal cell carcinoma (4 cases) followed by squamous cell carcinoma and sebaceous gland carcinoma (3 cases each). Retinoblastoma was the most common intra-ocular tumour of childhood (<2 years). Adenoid cystic carcinoma was the commonest malignancy of lacrimal gland while pleomorphic adenoma was the commonest benign neoplasm.
Conclusions: This study showed that FNAC is a reliable, sensitive and specific tool for diagnosing ocular lesions. Hence, it may be used as a first line of investigation in the evaluation of ophthalmic pathology.

Keywords: Ocular lesions, FNAC, Histopathology

INTRODUCTION

The orbit is a unique and anatomically complex structure composed of the globe, extra ocular muscles, fat, vascular, nerve, glandular and connective tissues.[1] Many of the tissues are neuroectodermal in origin. Therefore, neoplastic lesions of these tissues display wider range of pathological findings as compared to similar tumours in rest of the body.[2] The diverse presentation of orbital lesions is compounded by the patients' fear of loss of vision. Hence, quite often lesions of the orbit pose as a major challenge to ophthalmologists and surgical pathologists alike. Fine-needle aspiration cytology (FNAC) provides a safe, simple, cost effective and reliable outpatient department technique for the rapid diagnosis of orbital lesions. FNAC has a high diagnostic accuracy rate, provided that adequate material is aspirated for microscopical examination and interpretation is done properly.[3,4] It allows the diagnosis of a new primary lesion or the recurrence or metastasis of a tumour. In addition, it aids to identify benign resectable neoplasms that are treated by limited surgery while reducing unnecessary surgeries for diseases that medical therapy, as in nonresectable, inflammatory, and lymphoid tumours.[5]

Aim

To evaluate different orbital as well as eyelid lesions presenting as a palpable swelling or mass, using fine needle aspiration cytology (FNAC) and to conduct a cytological diagnosis of these lesions followed by histopathological correlation.

METHODS

Study design

This study was conducted in the Department of Pathology, Silchar Medical College and Hospital, which included all the patients presenting with orbital swelling or eyelid lesions over a period of 5 years from October 2010 to September 2015.

Data collection

FNAC was performed by the standard procedure by the cytopathologist using 23-25 gauge needle and five ml syringe. In deep seated orbital lesions, the mass was localized by prior ultrasound or computerized tomography and the needle was introduced by the ophthalmologist and the aspiration was done by the cytopathologist. The cytological smears were prepared and stained with May-Gru¨nwald–Geimsa (MGG) and Hematoxylin and Eosin (H&E) stains routinely, along with special stains like Ziehl-Neilsen stain, Periodic-acid Schiff's stain, wherever indicated. Biopsies & whole specimen of tumors were obtained from patients. The surgically resected specimens fixed in the 10% formalin were received. A detailed gross examination of each mass was done keeping in view its size, shape, and consistency. Several representative areas of tissue were taken from received surgical specimen & subjected to routine paraffin embedding. Hematoxylin & Eosin staining was done in all cases. Special stain such as PAS stain was used whenever required. A detailed history of each patient regarding age, sex, chief complaints, & other relevant findings were taken. Histopathologic diagnosis was obtained and the cytologic diagnosis was retrospectively correlated with histologic findings.

RESULTS

A total 63 cases of the different ophthalmic lesions (non-neoplastic and neoplastic) were analysed. Out of 63 cases, 36 were males and 27 were females (male: female ratio 1.3:1). The age of the patients ranged from 3 years to 75 years; majority were in the age group 31-40 years. The cases were categorised according to their location and into benign (37 cases, 58.73%) and malignant cases (26 cases, 41.27%). Histopathological diagnosis was available in 58 cases.

The most common benign lesion was chalazion accounting for 9 cases. Smear showed histiocytes, foamy cells and neutrophils with few granulomas. 8 cases were confirmed histologically. 1 case was unsatisfactory for evaluation. Others include dermoid cyst, epidermal inclusion cyst, keratinous cyst, granuloma pyogenicum. Aspirates from 7 cases of epithelial cysts yielded foul smelling, thick, greasy material. Smears showed high cellularity with numerous nucleated squamous cells and anucleated squames in a background of keratinous debris. The commonest benign lid tumour was hemangioma accounting for 5 cases. Most of the hemangiomas yielded blood, with a few cases showing an occasional cluster of endothelial cells. The commonest malignant lid tumour was basal cell carcinoma (4 cases) followed by squamous cell carcinoma and sebaceous gland carcinoma (3 cases each). Smears of basal cell carcinoma showed evenly distributed cohesive basaloid cells with monomorphic nuclei and a little cytoplasm. Hyperchromasia of nuclei and basophilia of cytoplasm were best seen in Papanicolaou stain. Peripheral palisading was also found.

The aspirates of squamous cell carcinoma showed sheets, clusters and individual atypical squamous cells. Necrosis was also present. Nuclear atypia and nucleoli were seen. In sebaceous gland carcinoma, smears showed loose clusters of pleomorphic cells with focal acinar or glandular pattern. Numerous lipid vacuoles were found in cytoplasm or in the background.

Retinoblastoma is the most common intra-ocular tumour of childhood (<2 years). The retinoblastoma cells were hyperchromatic small round cells with high N:C ratio. Sometimes the cells formed rosettes.

Table 1: Orbital and eyelid lesions in different age groups and gender of the patients (n = 63).

Age group years	Male	Female	Total number of patients
0-5	3	3	6
6-10	2	2	4
11-20	5	2	7
21-30	4	3	7
31-40	10	5	15
41-50	5	6	11
51-60	4	4	8
>60	3	2	5
Total	36	27	63

Table 2: Distribution of orbital and eyelid lesions according to location.

Location	Total cases=63
Eyelids	36
Conjunctiva	13
Ocular globe	6
Lacrimal gland	5
Retina	3

Adenoid cystic carcinoma is the most common malignant tumour of lacrimal gland. Smear showed hyaline globules

and uniform small cells. Pleomorphic adenoma was the most common benign neoplasm. Smear showed clusters of spindle shaped mesenchymal cells and fibrillary chondromyxoid ground substance.

Table 3: Different eyelid lesions and their respective number of cases.

Eyelid Lesions	Total cases =36
Dermoid cyst	2
Epidermal inclusion cyst	4
Pigmented Nevus	1
Sebaceous (meibomian) carcinoma	3
Capillary haemangioma	3
Cavernous haemangioma	2
Seborrheic keratosis	2
Basal cell carcinoma	4
Squamous cell carcinoma	3
Keratinous cyst	1
Schwannoma	1
Lipoma	1
Chalazion	9

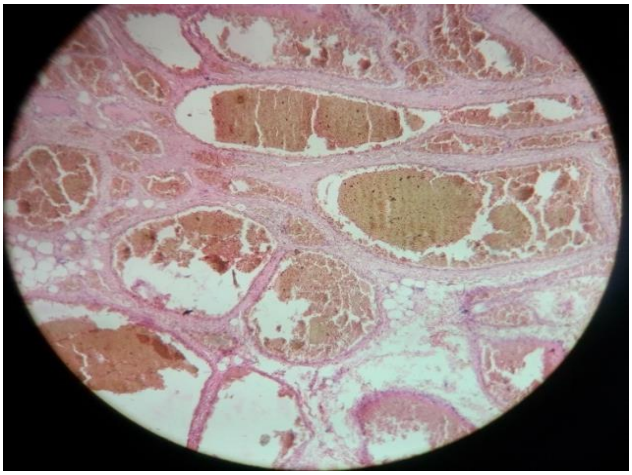

Figure 1: Capillary hemangioma (H&E, 10X).

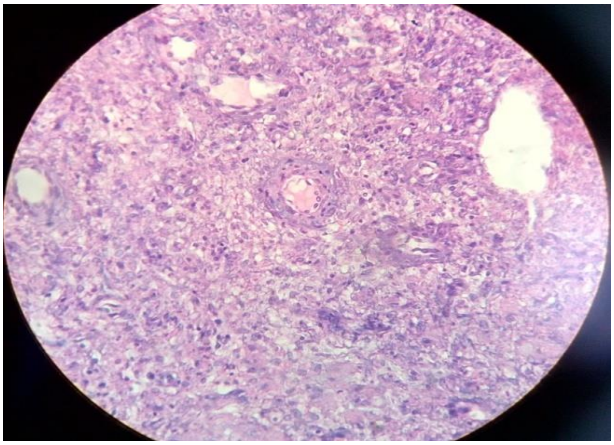

Figure 2: Inflammatory psuedotumor (H&E, 10X).

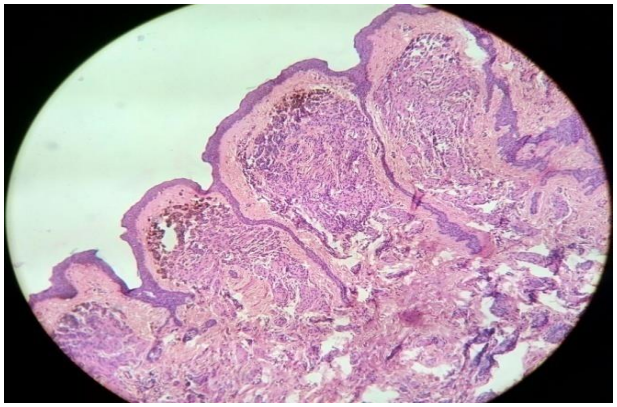

Figure 3: Intradermal nevus (H&E, 10X).

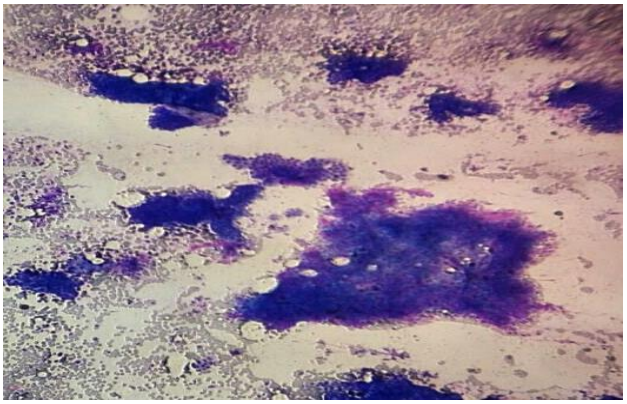

Fig 4A: Cytological smear showing poorly cohesive epithelial-like cells associated with fibrillar fibromyxoid stroma staining brightly red/magenta (MGG, LP).

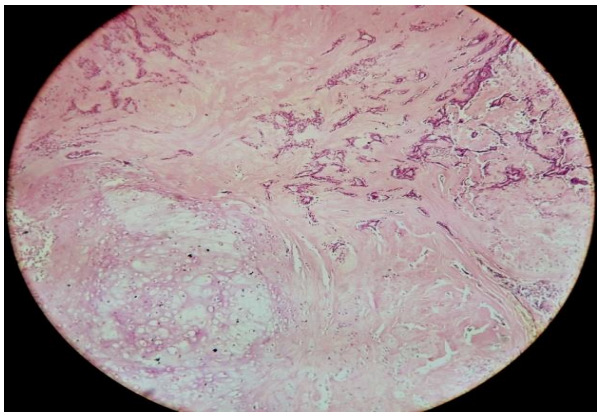

Fig 4B: Section showing characteristic regional variation in cellularity, melting pattern and chondroid matrix. (H&E, 10X).

Figure 4: Pleomorphic adenoma.

One case of inflammatory pseudotumor was diagnosed on cytology. The smear showed predominantly mature lymphocytes with round nuclei, scattered histiocytes, benign spindle cells and plasma cells.

Table 4: Different conjunctival lesions and their respective number of cases.

Conjunctival lesions	Total cases (n=13)
Granuloma Pyogenicum	4
Capillary haemangioma	3
Epidermal inclusion cyst	2
Squamous cell carcinoma	2
Cavernous haemangioma	1
Compound nevus	1

Table 5: Different ocular globe lesions and their respective number of cases.

Ocular globe lesions	Total cases =5
Non Hodgkin's Lymphoma	2
Rhabdomyosarcoma	1
Inflammatory pseudotumour	2

Table 6: Different lacrimal gland lesions and their respective number of cases.

Lacrimal gland lesions	Total cases =5
Pleomorphic adenoma	2
Adenoid cystic carcinoma	2
Chronic dacryoadenitis	1

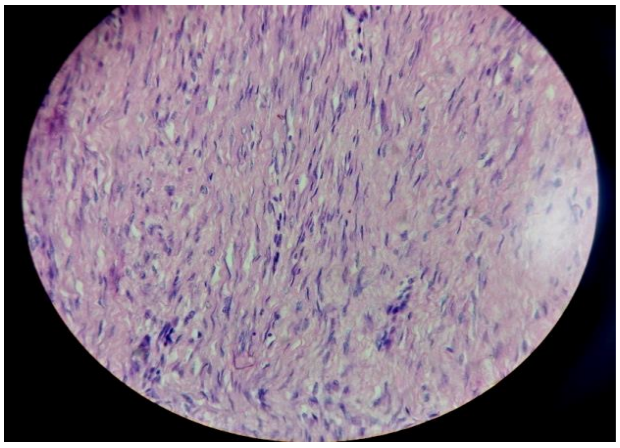

Figure 5: Nuerofibroma (H&E, 10X).

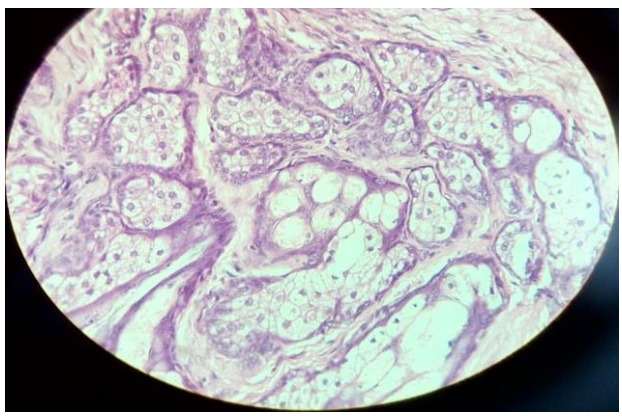

Figure 6: Sebaceous adenoma (H&E, 10X).

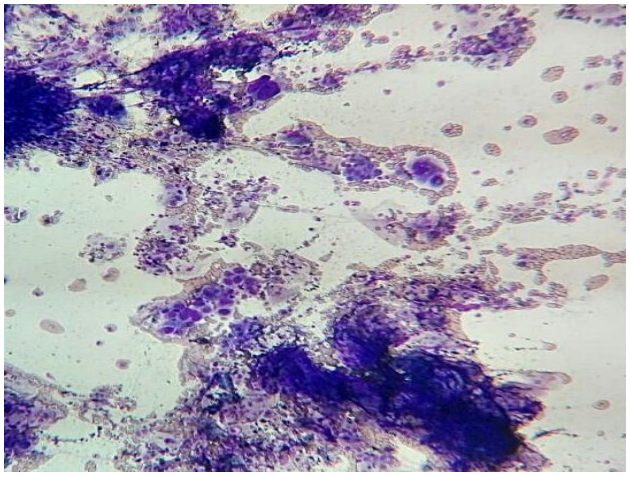

Figure 7A: Sebaceous carcinoma: Cytological smear showing poorly differentiated, atypical cells of varying nuclear size with lipid droplets in the background (MGG, LP).

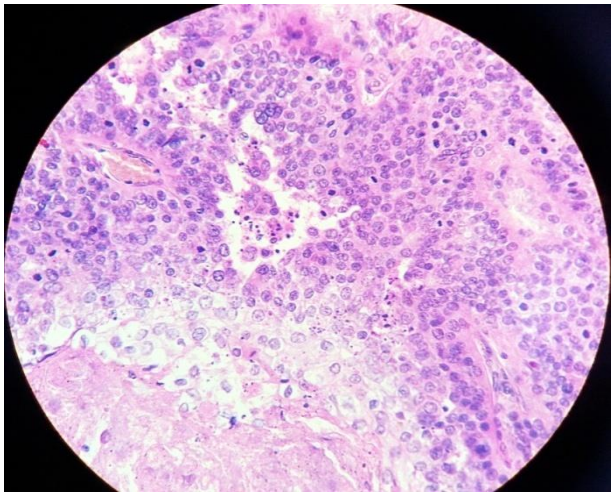

Figure 7B: Sebaceous carcinoma: Sebaceous carcinoma in histological section (H&E, 10X).

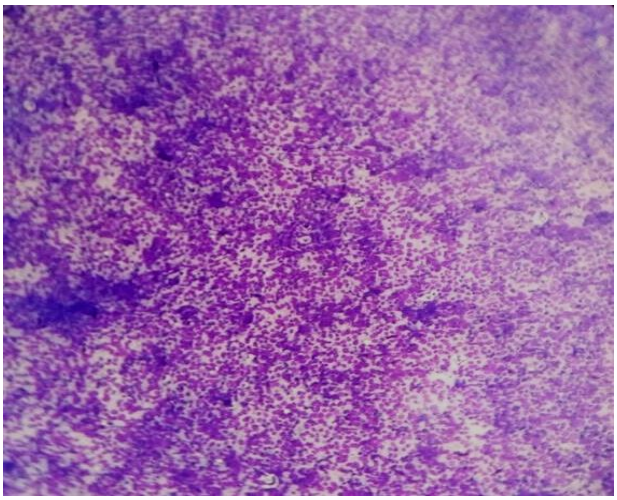

Figure 8A: Cytological smear showing a monotonous population of small lymphoid cells (MGG, LP).

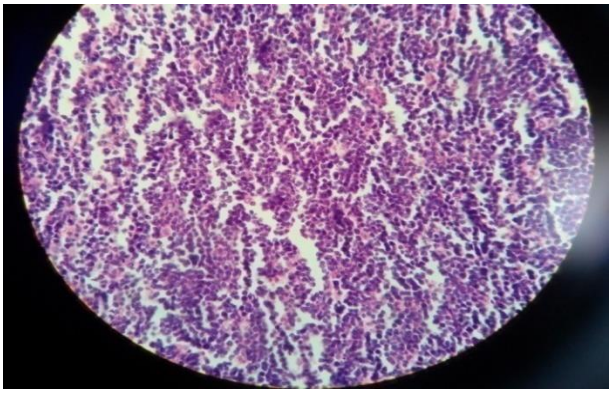

Figure 8B: Section showing diffuse effacement of architecture by small lymphocytes (H&E, 10X).

Figure 8: Non-Hodgkin lymphoma.

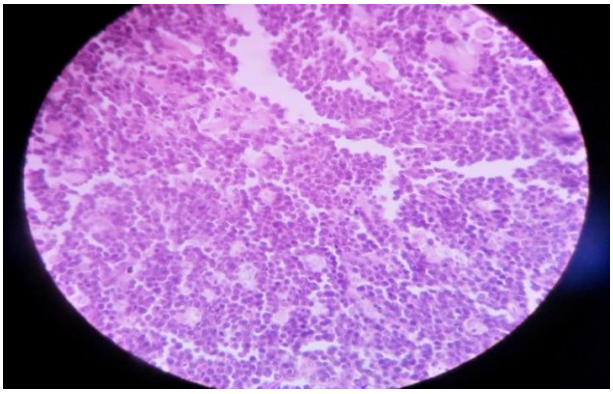

Figure 9: Retinoblastoma (H&E, 10X).

3 out of 5 unsatisfactory smears turned out to be inflammatory pseudotumour on histopathology.

Table 7: Spectrum of orbital and eyelid lesions: correlation of cytological and histopathological diagnoses.

	Histology	Cytology			
		Concordant	Discordant	False negative	Inadequate/ unsatisfactory
Dermoid cyst	2	1			1
Epidermal inclusion cyst	6	5			1
Pigmented Nevus	2	1			1
Sebaceous carcinoma	4	4			
Capillary haemangioma	6	5			1
Cavernous haemangioma	3	3			
Seborrheic keratosis	2	2			
Basal cell carcinoma	4	3	1		
Squamous cell carcinoma	4	4			
Keratinous cyst	1	1			
Schwannoma	1	1			
Lipoma	1	1			
Chalazion	9	8			1
Granuloma Pyogenicum	4	4			
Non Hodgkin's Lymphoma	2	1	1		
Inflammatory pseudotumour	1	1			
Rhabdomyosarcoma	2	1	1		
Pleomorphic adenoma	2	2			
Adenocystic carcinoma	2	2			
Chronic dacryoadenitis	1	1			
Retinoblastoma	3	3			
Total	63	55	3		5

DISCUSSION

The diagnostic accuracy of orbital FNAC has been shown to range between 23 and 100%.[6] Similarly, in eyelid lesions the diagnostic accuracy of FNAC ranges from 87 to 100%.[7-10] Both benign and malignant lesions of the eyelid and orbital tumors were most commonly seen in patients in the age group 30-40 years. It is in concordance with a study conducted by P Bastola et al.[11]

In our study, benign lesions were 58.73% while malignant lesions were 41.27%, while study conducted by Ud Din N et al.[12] was quite similar to the present study, in which the benign and malignant lesions were found to be 61.5% and 38.5% respectively.

Prevalence of benign and malignant lesions of conjunctival tumours in present study was 84.6% and 15.4% respectively. Similar finding was observed in a study conducted by Obata, et al as they were 78.5% and

21.5% respectively.[13] In the study of Bastola, et al most common benign lesion was granuloma pyogenicum and most common malignant lesion was squamous cell carcinoma; similar with our findings.[11]

Among eyelid malignancy, present study found the most common malignant lesion to be basal cell carcinoma which is in concordance with a study carried out by Jahagirdar SS et al.[14]

Amongst various orbital lesions Non-Hodgkin's lymphoma and rhabdomyosarcoma were commonest malignant lesions. In a similar study conducted by Bastola et al Non-Hodgkin's lymphoma was commonest followed by rhabdomyosarcoma.[11]

Most common malignant tumour of the lacrimal gland in the present study was found to be adenoid cystic carcinoma (ACC) which is in concordance with the literature as ACC comprises of about 25-30% of epithelial tumours of the lacrimal gland.[15]

Like Ud-Din N et al study, most common malignancy in children in present study was also retinoblastoma.[12]

Table 8: Comparison of present study with various previous studies.

Name of study (eyelid lesions)	Benign	Malignant
Obata H et al, 2005	73%	27%
Abdu U et al, 1996	58.90%	41.10%
Bastola et al, 2013	79%	21`%
Present study; 2015	72.2%	27.8%

CONCLUSION

To conclude, FNAC is a useful, safe, and cost-effective method of diagnosing eyelid and orbital pathology. Image guidance is helpful especially in deeply situated non-palpable lesions. FNAC may yield valuable diagnostic information, thus obviating major surgical procedures in large number of patients.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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