

A prospective comparative analysis of clinical versus histopathological diagnosis following excision biopsy of ocular lesions

Manoj Vasudevan^{1,*}, Nivean Madhivanan², Pratheeba Devi Nivean³

¹Consultant Eye Surgeon, ²Academic Director, ³Medical Director, Dept. of Ophthalmology, ¹Janu's Eye Clinic, ^{2,3}M N Eye Hospital Pvt. Ltd.

***Corresponding Author:**

Email: manojvasudevanms@gmail.com

Abstract

Biopsy is surgical removal of a tissue specimen for histopathological evaluation of the clinical lesion to arrive at a confirmatory diagnosis. Most of the ocular and extra ocular lesions are diagnosed by a good history and clinical examination and confirmed by non-invasive investigations. However, there are certain situations that warrant a definitive indication for a biopsy to confirm the clinical diagnosis and plan further management as relevant. The role of ophthalmologist in making a prompt clinical diagnosis and planning the further management along with a pathologist is crucial in saving the patients vision and the eye. Excision biopsy provide both diagnostic and more often a therapeutic benefit to most of the benign conditions and clue to prognosis and further treatment in salvaging the vision and the eye in malignant lesions of the eye.

Keywords: Benign, Excision biopsy, Malignant lesions.

Introduction

Diagnosis of a disease can be clinical after a thorough examination and later an etiological diagnosis could be established by non-invasive and invasive investigations. Non-invasive tests include ultrasonography and other imaging techniques while invasive includes those of the blood and tissue based tests obtained from the lesion with histopathology and molecular studies.

Biopsy is the histopathological evaluation of a tissue specimen after its surgical removal either in part or in whole. The role of a biopsy is to provide a confirmatory diagnosis and to estimate the prognosis of the clinical condition. In ophthalmology these are very limited as the structures involved are too intricate to be accessed or the structures involved are small and removal could potentially lead to blindness as in the posterior segment of the eye although the anterior segment is easily accessible. The first intraocular biopsy was performed by Hirschberg in 1868.⁽¹⁾ The anterior segment lesions causing discomfort functionally or cosmetically to the patients can be subjected to a biopsy. The biopsy can be incisional or excisional biopsy. An incision biopsy is a procedure wherein a small piece of tissue is taken to identify the composition of a lesion or abnormality by histopathology mostly for posterior segment pathology of the eye like in lesions of the retina, choroid or the vitreous and iris of the anterior segment. An excision biopsy is removal of the entire lesion which mostly eliminates the pathology in addition to confirming the condition for most of the anterior segment pathologies involving the eyelids, conjunctiva, sclera and lesions involving the limbus, lacrimal gland and some orbital conditions.

From fine-needle aspiration biopsy (FNAB) to surgical excision, all tissue collection techniques have

been studied in the literature. Each technique has its indications and limitations. FNAB has been reported to provide for 88–95% reliable and safe ophthalmic tumor diagnosis and has gained popularity for prognostic purposes and providing eye conserving treatment surgeries.⁽²⁾ One another method of tissue collection technique for ocular surface lesions is the impression cytology (IC) which is not a substitute for histopathology but there exists high correlation between IC and HPE especially in ocular melanocytic lesions.⁽³⁾

Objectives

The objective of this study is to highlight the correlation of a clinical diagnosis with that of the tissue histopathological diagnosis following excision biopsy of ocular lesions seen over a period of 1 year and to establish excision biopsy to be a helpful tool in the management of certain ocular lesions amenable to complete excision.

Materials and Methods

All patients with some abnormal growth in the eye not responding to medical management, causing discomfort, symptomatic or clinically appearing suspicious of a tumor were subjected to an excision biopsy after consent and sent for histopathological evaluation (HPE) and followed up as required. Based on the HPE further management was done if required.

A total of 16 ocular specimens from 16 patients were obtained by excision biopsy and were analyzed and then correlated with the original clinical diagnosis. Age of patients varied from 8 months to 68 years. 4 were of paediatric patients with age varying from 8 months to 16 years. The remaining 12 were of adults age varying between 25 and 68 years. There were 11 males and 5 female patients. One of the patient's

specimen was evaluated for microbiology by staining and culture for suspected tuberculosis based on the clinical suspicion which came positive for M.tuberculosis on Lowenstein Jenson medium and acid fast staining as the authors had suspected it to be osteomyelitis of maxilla spreading into the orbital floor and palate. Radiological imaging confirmed erosion of the bony margins from the maxillary antrum into the orbit. The orbital lesion responded well to the anti tuberculosis treatment and a course of ATT of 9 months was completed and child was regularly followed up till 2 years of age.

3	Limbus	2
4	Orbit	3

Table 2:

S.No	Clinical Etiology suspected	No. of eyes
1	Inflammatory	2
2	Infectious	1
3	Benign Tumor (Dermoid, Lipoma, Papilloma, Haemangioma, Neurofibroma)	10
4	Malignant Tumor (Sebaceous glandcarcinoma, Melanoma)	2
5	Degenerative	1

Table 1:

S.No	Tissue	No. of specimens
1	Eyelid	7
2	Conjunctiva	4

Table 3:

S.No	HPE report/Pathology	No. of eyes	% correlation to clinical Etiology
1	Foreign body granuloma/Inflammaory	2	100
2	AFB Mycobacterium/Infectious	1	100
3	Dermoid cyst/Benign tumor	3	100
4	Lipoma/Benign tumor	2	100
5	Neurofibroma/Benign tumor	1	100
6	Keratinous cyst/Benign tumor	1	0
7	Haemangioma/Benign tumor	2	100
8	Squamous papiloma	1	100
9	Meibomian gland carcinoma	1	0
10	Pigmented Bowens disease/Carcinoma in situ	1	0
11	Calcareous deposits/Degenerative	1	100

Results

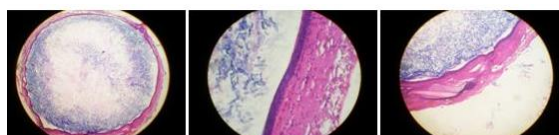


Fig. 1: HPE-dermid cyst

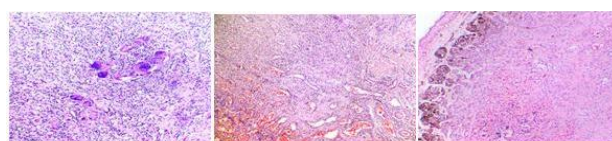


Fig. 4: HPE-foreign body granuloma

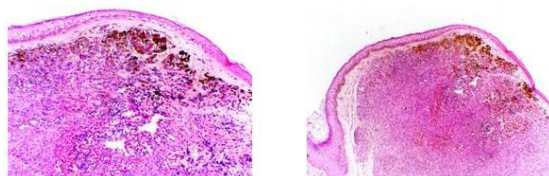


Fig. 2: HPE-keratinous cyst

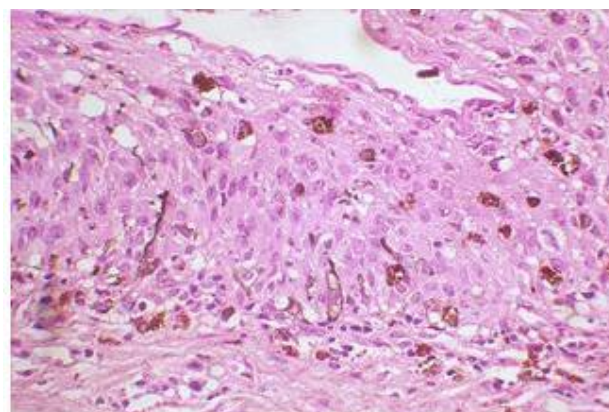


Fig. 5: Bowens disease (intra epithelial squamous dysplasia)

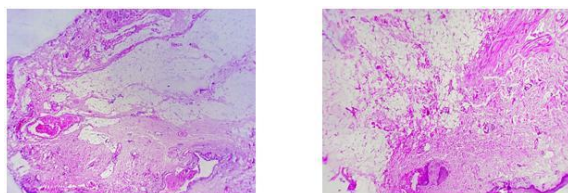


Fig. 3: HPE-lipodermoid cyst

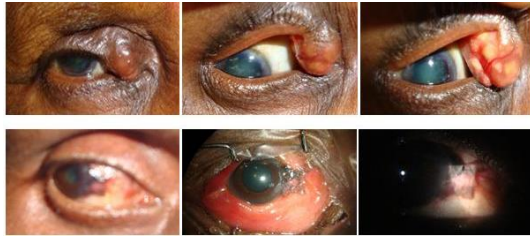


Fig. 6: Ocular lesions clinically suspicious of malignancy



Fig. 7: Clinically diagnosed as acquired benign lesions-Lipoma



Fig. 8: Clinically diagnosed as congenital lesions- Dermoid cyst



Fig. 9: Diagnosed as a part of systemic syndrome- Neurofibromatosis



Fig. 10: Clinically diagnosed as benign vascular lesions



Fig. 11: Clinically diagnosed as inflammatory or infectious

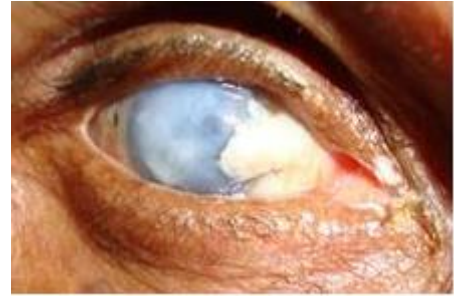


Fig. 12: Miscellaneous lesions of degenerations

16 ocular lesions from 16 patients were removed by excision biopsy and evaluated histopathologically and the clinical diagnosis was correlated with the HPE report. In 13 out of the 16 lesions, the clinical diagnosis correlated 100% with that of the HPE. Of the remaining 3 lesions the one which was suspected to be a sebaceous cell carcinoma clinically proved to be a meibomian gland carcinoma on HPE and the pigmented lesion to be melanoma of the conjunctiva clinically turned out to be pigmented bowens disease on HPE which is a very rare carcinoma in situ. The other lesion was clinically suspected to be a squamous cell papilloma which clinically turned to be keratinous cyst on HPE. Other than the 2 malignant lesions none of the patients needed further management as the excision biopsy turned out to be both diagnostic as well as therapeutic. In the 2 malignant lesions further investigations to rule out metastasis and surgery were done to clear the chance of recurrence and spread.

Discussion

Ocular lesions can be inflammatory, infectious, neoplastic or degenerative. A clinical diagnosis has to be made and then intervention has to be done in all patients showing variability in the signs and symptoms of those lesions over time. The lesions of the eye are not quiet amenable to extensive removal many a times due its anatomical location and physiological morbidity especially of the posterior segment although anterior segment lesions have a better chance to be studied by various tissue sampling techniques like impression cytology, FNAC, and excision biopsy of such lesions without compromising on the anatomy as well as the physiology of the ocular structures.

Pigmented lesions should always be monitored carefully and in the absence of clear criteria for malignancy, any change in color, size, or vascularization of a pigmented lesion of conjunctiva, caruncle or of the eyelid should hasten excision biopsy and HPE to rule out malignancy at the earliest.⁽⁴⁾

A similar study involving cytopathology was done to evaluate ocular lesions which included cyto morphological criteria for normal ocular specimen and pathological specimens of inflammatory, pre-malignant and malignant lesions.⁽⁵⁾ The results of that study indicated that cytological evaluation of the ocular

specimens can be a valuable adjunct in the work up of suspected neoplastic eye lesions.⁽⁵⁾

It has been showed in literature that there is a poor correlation between the clinical and HPE diagnosis are concerned especially with respect to various malignancy subtypes of the eyelid and conjunctiva.⁽⁶⁾

In this study as well the HPE showed variability only in the type or subtype of malignancy and the clinical diagnosis of a lesion to be of inflammatory, infectious, neoplastic or degenerative in nature were not missed in any of the patients and the two malignant lesions identified clinically were confirmed by HPE.

Fine needle aspiration cytology is an effective method of sampling ocular lesions especially eyelids as it causes little discomfort to the patient and allow us to maintain better control over the procedure.⁽⁷⁾ A distinction between inflammatory, benign and malignant tumors and the subtypes of the malignant tumors can be made.⁽⁷⁾ It is a safe, simple, reliable, minimally invasive and rapid test for diagnosis of orbital and eyelid lesions.⁽⁸⁾ While excision biopsy on the other hand, in addition to the confirmation of the diagnosis also benefits therapeutically and if there is a clear margin free zone seen all around the lesion in patients with malignancy does not need further intervention if the metastatic work up is negative. In other non-malignant lesions excision biopsy eliminates the pathology in a single procedure unlike with FNAC.

Conclusion

If a particular lesion becomes symptomatic or shows variation from the past those are the lesions which warrants a closer observation and documentation. If needed photography of such lesions can be taken on every follow up and can be used as a tool for further intervention whenever changes are evident or become suspicious. The result of one such study showed that experience level has a significant impact on the way in which lesion images are examined.⁽⁹⁾ Those images can be used to construct decision support systems for diagnosis and teaching.⁽⁹⁾

It is very important to differentiate between benign and malignant lesions as it not only causes cosmetic disfigurement following management of such malignant lesions with evisceration/enucleation or exentration but are often associated with higher rates of mortality.⁽¹⁰⁾

So in conclusion, excision biopsy of ocular lesions is found to be a better option very often in not only confirming the diagnosis but also serves to be a final treatment option in certain amenable ocular lesions including early malignancies and the correlation between the clinical diagnosis and the HPE following excision biopsy is 100% in this study except in malignant types and subtypes identification of eyelid and conjunctival lesions.

References

1. Long JC, Black WC, Danielson RW. Aspiration biopsy in intraocular tumors. *AMA Arch Ophthalmol* 1953; 50:303-10.
2. Pukhraj Rishi, Abhinav Dhama, Jyotirmay Biswas. Biopsy techniques for intraocular tumors. *Indian J Ophthalmol*. 2016 Jun; 64(6):415-421.
3. Kanavi MR, Hosseini SB, Aliakbar-Navahi R, Aghaei H. Impression Cytology in a Series of Clinically Diagnosed Ocular Surface Melanocytic Lesions. *J Ophthalmic Vis Res*. 2017 Jan-Mar;12(1):17-22.
4. Kaeser PF, Uffer S, Zografos L, Hamedani M. Tumors of the caruncle: a clinicopathologic correlation. *Am J Ophthalmol*. 2006 Sep;142(3):448-55.
5. Sanderson TL, Pustai W, Shelley L, Gelender H, Ng AB. Cytologic evaluation of ocular lesions. *Acta Cytol*. 1980 Sep-Oct;24(5):391-400.
6. Deprez M, Uffer S. Clinicopathological features of eyelid skin tumors. A retrospective study of 5504 cases and review of literature. *Am J Dermatopathol*. 2009 May; 31(3):256-62.
7. Deshpande AH, Munshi MM. Fine needle capillary sampling of eyelid masses. A study of 70 cases. *Acta Cytol*. 2003 May-Jun;47(3):349-58.
8. Solo S, Siddaraju N, Srinivasan R. Use of fine needle cytology in the diagnosis of orbital and eyelid mass lesions. *Acta Cytol*. 2009 Jan-Feb;53(1):41-52.
9. Dreiseitl S, Pivec M, Binder M. Differences in examination characteristics of pigmented skin lesions: results of an eye tracking study. *Artif Intell Med*. 2012 Mar;54(3):201-5.
10. Huang YY, Liang WY, Tsai CC, Kao SC, Yu WK, Kau HC, Liu CJ. Comparison of the Clinical Characteristics and Outcome of Benign and Malignant Eyelid Tumors: An Analysis of 4521 Eyelid Tumors in a Tertiary Medical Center. *Biomed Res Int*. 2015;2015:453091.