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Histopathological study of pterygium

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ABSTRACT

Pterygium is a degenerative ocular disorder. The objective of this study was to determine the various histopathological changes in pterygium. Various findings such as goblet cell hyperplasia, basophilic degeneration, neovascularization, inflammatory infiltrate and dysplasia was observed. Ocular surface squamous neoplasia (OSSN) was identified in 14 out of 66 cases (21.3%). This high rate of OSSN in patients with pterygium is sufficient for the histopathological examination of all pterygium specimens so that patients can be warned of the possible recurrence of OSSN at a later time.

Keywords: *Pterygium, OSSN, Dysplasia*

INTRODUCTION

Pterygium is an ocular condition which takes its name from the Greek word “Pterygos” for wing. A pterygium is a horizontally oriented triangular growth of abnormal tissue that invades cornea. It can be divided into three parts: body, apex (head), and cap. It arises in the interpalpebral fissure as an elevated, fleshy mass on the bulbar conjunctiva near the limbus most often nasally. Symptoms of burning, irritation, lacrimation and foreign body sensation may accompany the growth of a pterygium onto the cornea. Astigmatism leads to decreased vision. [1]

The various etiological factors in the occurrence of pterygium include ultraviolet radiation (UV), chronic eye inflammation, toxic effects of chemical substances. Some viruses also play a role in the development of pterygium. It is composed of fibrovascular tissue with elastosis of collagen fibers. It posses many histopathological hallmarks of chronic inflammation. There is lymphocytic infiltration consisting predominately of T lymphocytes, plasma cells and mastocytes. The increase of newly formed blood vessels, number of fibroblasts and the presence of abnormal elastic fibers indicate the presence of chronic inflammation. [2]

Pterygium is found to occur more in males than females with a higher prevalence in the age group above 40 years. It is rare below the age of 20. Pterygium is more common on the nasal aspect but can also occur on the temporal side. Pathophysiology of pterygia reveal it to be a case of elastoid degeneration of collagen and fibro vascular proliferation which underlies a normal conjunctival epithelium. The collagen at the region of elastic degeneration gives it a basophilia with

haematoxylin and eosin staining. Some studies consider it to be a growth disorder due to reduction in apoptosis. [3]

Pterygium is graded depending on the extent of corneal involvement. Grade 1 - crossing the limbus, Grade 2 - midway between the limbus and pupil, Grade 3 - reaching upto papillary margin and Grade 4 - crossing papillary margin. [4]

Ocular surface squamous neoplasia (OSSN) presents as a spectrum ranging from simple dysplasia, to carcinoma in situ and invasive squamous cell carcinoma. Advanced age, male gender, exposure to solar ultraviolet radiation, infection with human papilloma virus (HPV), immunosuppression and infection with human immunodeficiency virus (HIV) are the factors which play an essential role in the development of OSSN.[5] Because OSSN and pterygium share the same risk factors, they are believed to coexist and may even be related. [6, 7]

Pre invasive OSSN can be classified as mild, moderate or severe depending on the extent of dysplasia in the epithelium. Mild: CIN grade 1, involves dysplasia in lower third of the epithelium. Moderate: CIN grade 2, dysplasia involves middle third of the epithelium. Severe: CIN grade 3, also called as carcinoma in situ where in dysplasia involves whole thickness of epithelium with intact basement membrane. Invasive carcinoma: when basement membrane of epithelium is breached and cells infiltrate into stroma. [8]

MATERIALS AND METHODS

The records of 66 patients who underwent surgery for pterygium in the past two years were analyzed. All the specimens underwent routine paraffin processing and were stained with haematoxylin and eosin stain (H & E). Detailed microscopic examination was done to look for the presence of dysplasia with its severity, goblet cell hyperplasia, basophilic degeneration, neovascularization and inflammatory infiltrate. Dysplasia was categorized in mild, moderate and severe.

RESULTS AND DISCUSSION

All the cases which were diagnosed histopathologically as pterygium were included in the study. Among the 66 cases of pterygia, there were 62 cases of primary pterygia (93.9%) and 4 cases of recurrent pterygia (6.1%). These findings were consistent with the study by Sankar et al [3], who in a study of 45 cases found 42 cases of primary pterygia (93.3%) and 3 cases of recurrent pterygia (6.66%).

In this study 36 cases occurred in males (54.5%) and 30 in females (45.5%). The male to female ratio was 1.2:1. However Sankar et al [3] found a ratio of 1:1.14, Odashiro et al [9] found a ratio of 1:1.5 while in the study by Sun et al [10] it was 1.9:1. The age of the patients ranged from 24 to 80 years with mean of 50.3 years, in this study.

Most of the pterygia in this study were located nasally (96.9%) and only 2 were located on the temporal side (3.1%). Similar findings were seen by Sankar et al[3] and Odashiro et al [9]. Pterygium occurred with an equal frequency in the right and left eye. Pterygia were graded into 4 grades and the majority was of Grade 2 (70%), this was followed by Grade 3 and Grade 1. There were only 2 cases of Grade 4 pterygia. These findings were in concordance with the study by Odashiro et al [9].

The various histopathological findings are shown in table 1, figure 1 and figure 2.

Table 1: Histopathological findings in Pterygium.

Histological findings		No. of cases	Percentage
Goblet cell hyperplasia		18	27.2
Neovascularization		52	78.7
Basophilic degeneration		18	27.2
Chronic inflammatory infiltrate		58	87.8
Dysplasia (OSSN)	Mild	8	12.1
	Moderate	4	6.1
	Severe	2	3.1

In this study, ocular surface squamous neoplasia (OSSN) was seen in 21.3% of cases with mild dysplasia seen in 8 cases (12.1%), moderate dysplasia in 4 cases (6.1%) and severe dysplasia in 2 cases (3.1%). A study by Sun et al [10] found OSSN in 13.3%, with mild dysplasia in 6.7%, moderate dysplasia in 3.8%, severe dysplasia in 1.9% and carcinoma in situ in 1% of the cases. The rate of OSSN was 9.8% in a study by Hirst et al. [7]

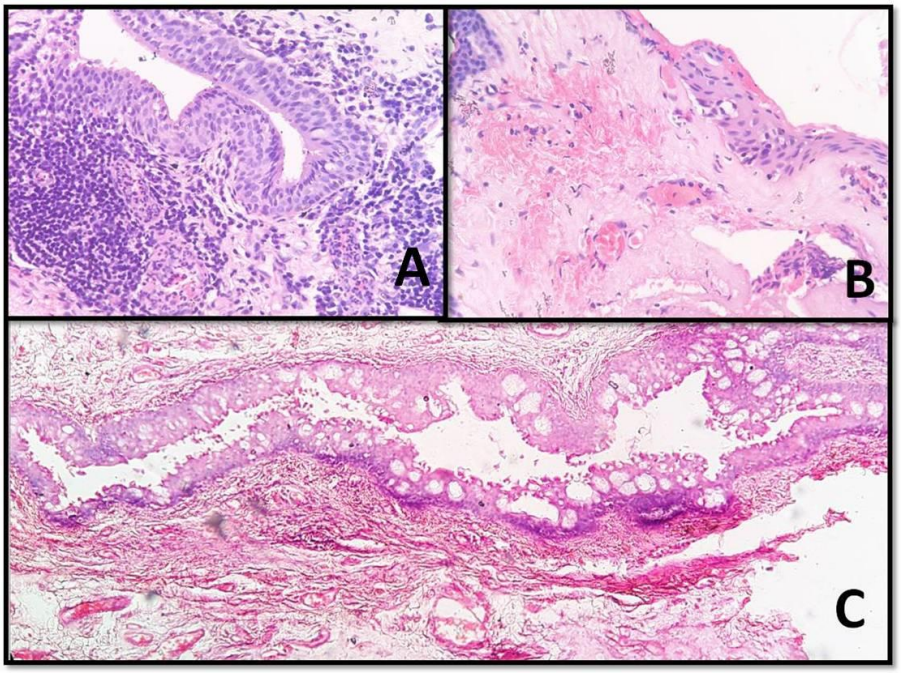

Figure 1: H & E stained section of Pterygium lined by stratified squamous epithelium showing (A) subepithelial tissue with dense chronic inflammatory infiltrate, (B) basophilic degeneration and (C) goblet cell hyperplasia with neovascularisation.

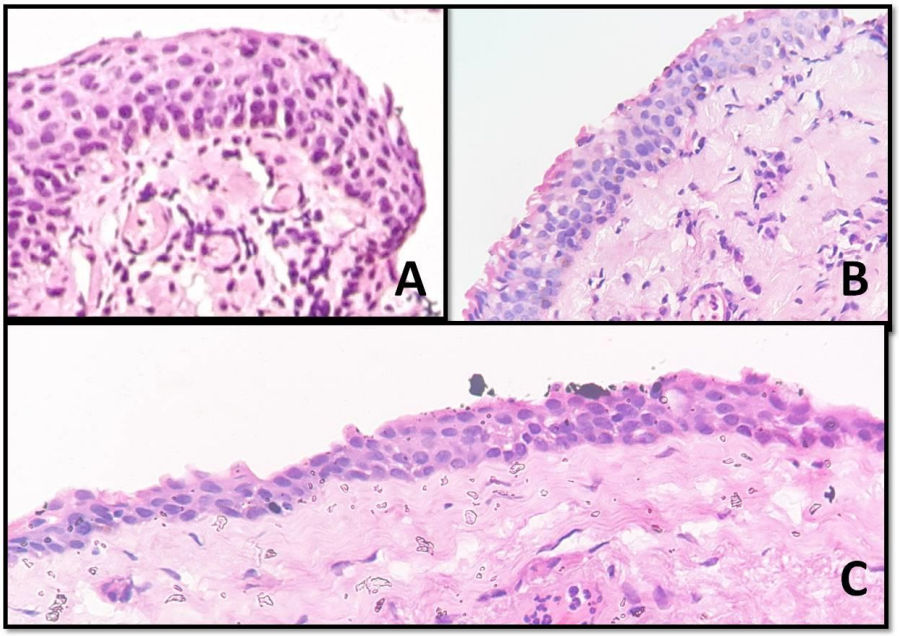

Figure 2: H & E stained section of Pterygium lined by stratified squamous epithelium showing (A) mild dysplasia, (B) moderate dysplasia and (C) severe dysplasia.

CONCLUSION

A high rate of dysplasia in the histopathological study of pterygium suggests the need for routine submission of all pterygium tissues for histopathological analysis, so that proper post operative treatment and follow up can be given to the patient.

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