

PRE-OPERATIVE DETECTION OF OCULAR SURFACE SQUAMOUS NEOPLASIA IN PATIENTS WITH PTERYGIUM USING ANTERIOR SEGMENT OPTICAL COHERENCE TOMOGRAPHY

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INTRODUCTION

Pterygium is one of the most common ocular surface disorders. It is considered a fibrovascular overgrowth arising from subconjunctival tissue, triangular in shape, and encroaching on the cornea located in the medial and lateral palpebral fissure. Squamous metaplasia may be present in pterygia specimens.

OSSN is the term including the pre-malignant and malignant epithelial lesions of the conjunctiva and cornea. This spectrum includes Dysplasia, Carcinoma in situ (CIS) and Invasive SCC.

Risk factors for both pterygium and OSSN are closely the same, UV ray exposure being the most important of them. However, Management plans differ significantly for both pterygium and OSSN. This highlights the importance of preoperative detection and therefore the prognosis.

AS-OCT is a safe non-invasive imaging modality. It has an important role in evaluating anterior segment structures including the cornea, anterior chamber, and iris. On AS-OCT, pterygium is a subepithelial hyper-reflective lesion extending from the conjunctiva into the cornea, causing separation of the corneal epithelium from basement membrane (BM). However, OSSN presents as a thickened hyper-reflective epithelial lesion with an abrupt transition between normal and abnormal epithelium.

AIM OF THE WORK

The aim was to detect ocular surface squamous neoplasia associated with pterygium by using anterior segment OCT before surgical intervention.

SUBJECTS AND METHODS

This was a prospective study that had been conducted on 50 eyes of 50 patients aged between 30-70 years old, presenting with primary or recurrent pterygium and was operated at the ophthalmology department of Alexandria Main University Hospital during the period from May 2023 to April 2024.

Exclusion criteria:

- Patients with cicatrizing eye diseases (OCP, chemical burn,...etc.)
- All the patients underwent a complete preoperative ophthalmologic examination, and preoperative anterior segment optical coherence tomography (AS-OCT)-MS-39 by CSO.
 - Excised tissues were enclosed as excisional biopsies for histopathological examination for detection of OSSN.
 - Histopathological findings were compared to pre-operative AS-OCT data and statistical analysis was carried out.

RESULTS

None of the examined patients had OSSN co-existing with pterygium.

Table 1: Distribution of cases found to have epithelial thickness above and below the cut-off value (73.43µm) according to sex, laterality, pathology, occupation, recurrence, age, and VA.

		Epithelial thickness (µm)		
Term	Overall N (%)	Above 73.43 µm N (%) (n=4)	Below 73.43 µm N (%) (n=46)	p-value
Sex				0.99
Female	24 (48)	2 (50)	22 (47.8)	
Male	26 (52)	2 (50)	24 (52.2)	
Uni/bilateral				
Bilateral	18 (36)	1 (25)	17 (37)	
Unilateral	32 (64)	3 (75)	29 (63)	
Pathology				< 0.001**
Pterygium	46 (92)	0 (0)	46 (100)	
Squamous metaplasia	4 (8)	4 (100)	0 (0)	
Occupation				0.659
Indoor	14 (28)	2 (50)	12 (26.1)	
Outdoor	36 (72)	2 (50)	34 (73.9)	
Recurrent				0.99
No	47 (94)	4 (100)	43 (93.5)	
Yes	3 (6)	0 (0)	3 (6.5)	
P-values obtained from Pearson's chi-square test of independence				
		Epithelial thickness (µm)		
Term	Overall	Above 73.43 µm	Below 73.43 µm	p-value
Age (years)	Med (IQR) 47.5 (17.8)	38.5 (6)	48.5 (17.8)	U: 0.0826
VA	Med (IQR) 0.7 (0.4)	0.9 (0.2)	0.7 (0.4)	U: 0.3772
P-values obtained from two-sample t-test (t) or Mann-Whitney test (U)				

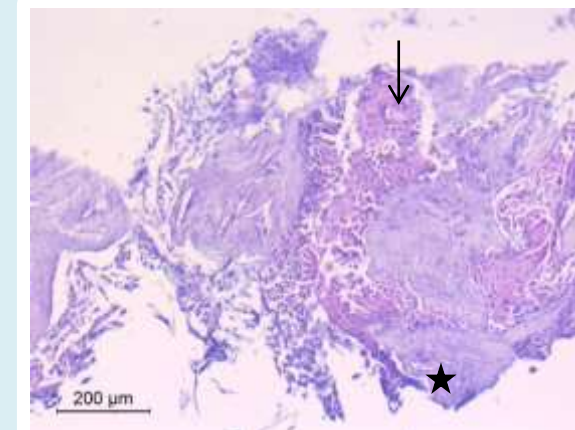


Figure 1: Microphotographs of sections of pterygium showing acanthosis with focal area of squamous metaplasia and goblet cell depletion in covering epithelium (arrow) and underlying stroma is collagenous mixed with basophilic fibrillar structures of elastotic degeneration (star) (H&E stained, x100).

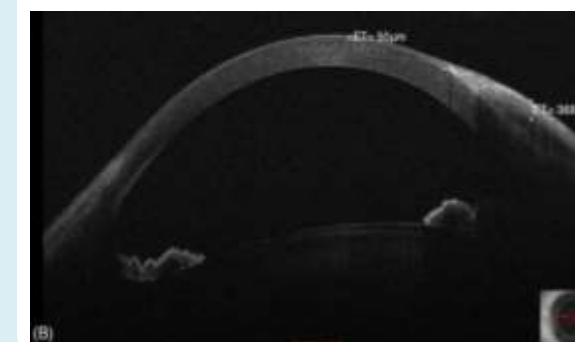


Figure 2: AS-OCT showing an increase in epithelial thickness (ET) in one of our patients diagnosed clinically as pterygium patients, epithelial thickness is 369µm.

CONCLUSION

Squamous metaplasia that co-exists with pterygium can have the same characteristics of OSSN on AS-OCT notably by increasing the epithelial thickness, hyper-reflectivity, and an abrupt transition between normal and abnormal epithelium.

Despite the role of AS-OCT in increasing the suspicion of malignant lesions which guides the management plans, there exists an overlap between squamous metaplasia and OSSN, preventing their differentiation and highlighting the importance of post-operative biopsy.