

## The incidence of dysplasia in histopathological analysis of the surgical specimens of patients with a clinical diagnosis of pterygium

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### Abstract

**Purpose:** To determine the rate of dysplasia/ ocular surface squamous neoplasia (OSSN) in all pterygium specimens in a 1 year period at a tertiary care hospital.

**Design:** Non-interventional retrospective study.

**Materials and Methods:** A retrospective review was done for all pterygium surgery performed between the period of Feb 2018 and Feb 2019 at Dhanalakshmi Srinivasan Medical College Hospital in Tamil Nadu. The rate of ocular surface squamous neoplasia, number of specimens sent for histo-pathology analysis and clinical suspicion of dysplastic changes was recorded. OSSN was graded as mild dysplasia, moderate dysplasia, severe dysplasia and carcinoma in-situ according to the classification by Grossniklaus et al. All patients have been followed up regularly. All data were analysed using SPSS version 25.0 & excel.

**Results:** 58 out of 76 pterygia removed were sent for histological analysis, all specimens were found to be suitable for evaluation. 7 out of 58 (12%) showed dysplastic changes/ OSSN changes. Age, gender and outcomes of surgery were not significantly different between patients with histologically normal and dysplastic specimens. OSSN was identified in 7 cases (12%) and four of these cases were from female patients (57.2%). The average age of patients with pterygium and OSSN was similar to pterygium patients without OSSN ( $P > 0.05$ ). 5 cases showed mild dysplasia (6.7%), 1 moderate dysplasia (3.8%), 1 severe dysplasia (1.9%), and none showed carcinoma in situ. All patients are currently being followed up regularly after surgery & none have had any recurrences or other problems.

**Conclusion:** Results showed a significant rate of dysplasia in pterygium patients than suspected based on clinical examination. This finding suggests the need for routine submission of all pterygium specimens for histopathology analysis, so appropriate post-operative treatment and follow up can be instituted.

**Keywords:** Pterygium, Ocular surface squamous neoplasia, Pterygium surgery.

### Introduction

Pterygium is a common ocular surface disease consisting of a triangular wing-shaped, fibro-vascular growth of degenerated conjunctival epithelium encroaching the cornea across the limbus. It has a prevalence of 1.1% in the global population,<sup>1</sup> and 7.3% in those aged 49 year or older according to the Blue Mountains Study.<sup>2</sup> It is commoner in men, especially in populations engaged in farming and in geographical areas closer to the equator. Prolonged exposure to ultraviolet radiation is the single most important risk factor in the development of pterygium and conjunctival neoplasms.<sup>1, 3</sup> Several studies have shown that pterygia can tend to have tendencies to malignant change, although in a much smaller number.<sup>4</sup> Hirst et al. revealed the rate of OSSN to be 9.8% in a retrospective study of 533 pterygium specimens sent for histopathology, suggesting a much higher rate than previously thought, and a possible link between pterygium and OSSN.<sup>5,6</sup>

The Trichy region in Tamil Nadu has one of the highest recorded temperatures throughout South India in the recent past, with a population whose primary occupation is agriculture & livestock rearing, causing a lot of UV light exposure with microtrauma due to wind & dust. Hence it is expected to have a higher incidence of pterygia & other ocular surface abnormalities.

Indications for surgical removal include frequent inflammations requiring treatment with ocular steroids, encroachment on the cornea & blurring vision by causing

astigmatism or by growing onto the pupil and finally cosmesis. The current most commonly followed standard of surgical treatment is excision with auto-conjunctivo-limbal graft, as it aids healing and carries a low recurrence rate.<sup>7</sup> Adjunctive therapy such as mitomycin C, beta-irradiation and thiotepa to reduce recurrences have a variable success rate & considered options when conjunctivo-limbal autografting cannot be done. Various regimes of topical mitomycin C have been shown to be effective in treating OSSN, including 0.02-0.04% applied four times daily for 7-21 days, with same number of weeks off between repeated treatment cycles.<sup>8,9</sup>

The rate of OSSN found amongst pterygium in Southern India is not very well documented, this study aims to find this incidence in such patients presenting to a tertiary teaching hospital.

### Materials and Methods

Retrospective histopathology and review of hospital records was carried out for all patients undergoing pterygium surgery at Dhanalakshmi Srinivasan Hospital Medical College Hospital between Feb 2018 and Feb 2019.

All patients who underwent uncomplicated pterygium surgery between the above mentioned time period were selected. All patients underwent a detailed history & examination pre surgery. None of the selected patients were found to have any suspicion of OSSN by review of their records. All patients underwent the same procedure of

pterygium excision with conjunctival limbal autograft by one of the three operating surgeons (Dr. S.P/ Dr. H.J/ Dr. P.S.G), all of whom followed the same technique of excision & grafting. All patients have been regularly followed up after surgery over the last year.

OSSN was reported as mild dysplasia, moderate dysplasia, severe dysplasia and carcinoma in-situ according to the classification by Grossniklaus et al.<sup>10</sup> Patients were routinely followed up post-surgery on an outpatient basis. For statistical analysis, t-test was used to compare the means; Chi-square to compare proportions and Fischer’s exact test to compare proportions for sample sizes equal or less than 5.

**Results**

76 pterygium specimens were excised from patients between Feb 2018 and Feb 2019. The site of pterygium was nasal in all patients. The mean age of the patients was 54 years (range 20-88, SD 14.57). Of the 58 patients who were operated, 38 were male and 20 were female patients, with 28 being operated on the right & 26 on the left.

None of the pterygium cases were recurrent lesions & none showed any signs/ symptoms suggestive of OSSN. Of the 76 cases operated, 58 specimens were sent for histological analysis. OSSN was found in 7(12%), with 5 showing mild dysplasia (6.7%), 1 moderate dysplasia (3.8%), 1 severe dysplasia (1.9%), and no cases with carcinoma in situ.

Another similar analysis at our hospital showed that only 28.57% of the pterygia removed in 2017 were sent for histopathology (28 of 63). In 2016, the rate of routine histological analysis was 36% (27 out of 75). During these years there was no interest in investigation of the rates of dysplasia as the patients did not show any suggestive signs/ symptoms on follow up, nor was there any suspicion of such a condition pre surgery. There was no statistical significance in the rate of dysplasia in analyzed specimens between the two years (p 0.093). No statistically significant difference was found between normal and OSSN patient groups as far as age, gender and side of surgery were concerned (Table 1).

**Table 1: Statistics of patients with histologically determined OSSN and pterygia specimen.**

		Pterygia (%)	OSSN (%)	Total	p-value
Number of Patients	Number	51(87.93)	7(12.06)	58	0.45(t-test)
Gender	Female	16(27.58)	4(6.87)	20	0.131 (fischer’s exact test)
	Male	35(60.34)	3(5.17)	38	
Side of surgery	Right	25(43.1)	3(5.17)	28	0.877 (chi square test)
	Left	26(44.82)	4(6.87)	30	

**Discussion**

This retrospective study examined the rate of OSSN in pterygium specimens submitted for routine histopathology during the most recent 1-year period. The mean age of patients in this study was 54 years, with almost twice as many men undergoing pterygium surgery than women. Of all pterygium cases, none appeared suspicious clinically, but one case showed severe dysplasia. This shows the difficulty in clinically distinguishing benign from dysplastic lesions. Our findings, comparable to those of Hirst et al., demonstrated a much higher rate of OSSN in pterygium cases than suspected based on clinical examination.<sup>5</sup>

In addition, the rate of OSSN in this study population is much higher than previously documented in the general population.<sup>3</sup> None of the pterygium cases in this study represented a recurrent lesion, hence the recurrent rate of histologically normal pterygium and untreated OSSN in this study population is not known.

Under-diagnosis can lead to progression to more severe grades of dysplasia and may be associated with higher rate of recurrences. Thus causing increased morbidity and mortality.<sup>4</sup>

A histological report can identify those that require closer monitoring for neoplastic recurrences & such cases can then be followed up with greater caution, thus using resources more diligently, than following up all the cases. So it can be appropriately said that all specimens of pterygium removed at surgery be sent for histopathology

analysis for the detection of OSSN and necessary treatment and follow up to be performed.

**Conflict of Interest:** None

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