SURGEON'S CORNER

Pterygium and Associated Ocular Surface Squamous Neoplasia

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Objective: To measure the rate of histopathologically identified ocular surface squamous neoplasia (OSSN) in pterygium specimens.

Methods: All pterygium specimens collected from consecutive patients between April 8, 2003, and February 6, 2008, were submitted for histopathologic examination, and the rate of OSSN was calculated.

Results: The rate of OSSN was 9.8% (52 of 533) in sequential pterygium specimens.

Conclusions: This rate of unsuspected OSSN suggests that all specimens of pterygium should be submitted for histopathologic examination and that patients in whom OSSN is noted should be examined at more frequent intervals so any clinical OSSN that develops can be identified at an early stage.

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PTERYGIUM IS A COMMON OCULAR surface disease in Australia, with a prevalence of 7.3% in a population-based study in Blue Mountains, New South Wales, Australia.[1] A pathology-based incidence study[2] of ocular surface squamous neoplasia (OSSN) in the state of Queensland demonstrated a rate of 1.9 new cases per 100 000 residents. Because both of these ocular surface conditions are strongly related to sunlight exposure,[3,4] it could be expected that both might occur in the same individual. We examined this hypothesis by using histopathologic examination to identify OSSN in pterygium tissue samples removed during surgery.

METHODS

This retrospective study examined the pathologic results of excised tissue from all patients with pterygium who underwent surgery consisting of excision and autoconjunctival transplantation. The procedures were all performed by 1 of us (L.W.H.) between April 8, 2003, and February 6, 2008. The indications for surgery were primarily the presence of pterygium greater than 3 mm on the cornea, vision loss attributable to pterygium, and, in some patients, a concern about the appearance of the eye. All specimens were submitted for routine pathologic examination in formalin fixation, which involved paraffin embedding of the entire pterygium specimen. Multiple serial sections, 4 µm thick, were cut. Three or 4 sections stained with hematoxylin-eosin were mounted on each slide, and 4 slides were examined per specimen. One pathologist (R.A.A.) examined all the specimens in an open manner because the interpretations were made and documented during the initial pathologic examination for routine diagnosis of the submitted specimens. If a patient had a pterygium removed from the opposite eye, it was considered to be a separate event; if a nasal pterygium and a temporal pterygium were excised from 1 eye, only the first pterygium removed was included in this study. Findings of OSSN were reported as mild dysplasia, moderate dysplasia, severe dysplasia, and carcinoma in situ according to an accepted classification.[5]

All the patients were followed up for at least 1 year after pterygium surgery. The possible difference in OSSN incidence between primary and recurrent pterygium specimens was tested using a χ^2 test. This study was approved by the Human Research Ethics Committee of Princess Alexandra Hospital.

RESULTS

Five hundred thirty-three consecutive pterygium specimens were excised from patients between April 8, 2003, and February 6, 2008. In 3 patients, there was some slitlamp evidence of clinical OSSN expressed as well-demarcated corneal epithelial clouding emanating from the head of the pterygium. Otherwise, there was no

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clinical suspicion of OSSN. The male to female distribution of patients was 1.82:1.0, the mean (SD) age was 50 (12.8) years (range, 18-85 years), and the ratio of right to left eyes was 0.93:1.00. There were no significant differences in any of these variables in patients with pterygium and no evidence of OSSN compared with the group with histopathologic evidence of OSSN.

Fifty-two specimens (9.8%) revealed OSSN, of which 33 (63.5%) were graded as mild dysplasia, 10 (19.2%) as moderate dysplasia, 5 (9.6%) as severe dysplasia, and 1 (1.9%) as invasive squamous cell carcinoma. In 3 specimens, dysplasia was ungradable. None of the OSSN-positive specimens were from bilateral pterygium excisions. Forty-six of 437 primary pterygium specimens (10.5%) and 6 of 96 recurrent pterygium specimens (6.3%) revealed OSSN. There was no significant difference between these groups (relative risk, 1.68; 95% confidence interval, 0.74-3.83; $P=.20$; $\chi^2_1=1.63$). No OSSN was evident in any patients via slitlamp evaluation during the 1-year follow-up.

COMMENT

We investigated the frequency of association of OSSN with pterygium specimens. To our knowledge, there have been no reports of this association. A population-based study[2] has identified a rate of 1.9 new cases of OSSN per 100 000 residents per year, but this was thought to be a gross underestimate of the true incidence rate. The much higher rate of OSSN found in this study may be readily explained by the common causal association with sunlight exposure for both diseases.[3,4]

Pterygium surgery is generally undertaken at a younger age than is treatment for OSSN,[6,7] and so it is not surprising that few, if any, of these patients had clinical evidence of OSSN at the time of pterygium evaluation. The most obvious explanation for the association between these 2 diseases is the common factor of sunlight exposure. The pathogenic process that may follow sunlight exposure is likely to be the overexpression of p53, whereas the role of human papillomavirus is unclear.[8]

This high rate of OSSN in patients with pterygium is sufficient justification for a pathologic audit of all pterygium specimens so that patients can be warned of the possible recurrence of OSSN at a later time. The results of this study also suggest that routine examination of patients with pterygium and histopathologically diagnosed OSSN should probably occur at more frequent intervals than might otherwise be undertaken. No data, at present, indicate whether nonclinical OSSN will ultimately result in clinical disease; however, at least 1 patient in the present series had invasive squamous cell carcinoma, which suggests that severe consequences could result.

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