

## Ocular Surface Squamous Neoplasms: A Case Series

### Abstract

Neoplastic lesions of conjunctival and corneal squamous epithelium known as ocular surface epithelial dysplasia range from mild dysplasia, carcinoma *in situ* to invasive squamous cell carcinoma. Ocular surface squamous neoplasia (OSSN) has a predilection for mitotically active corneoscleral limbus (95%). The incidence of OSSN varies between 0.02 and 3.5/100,000 populations. The most frequent to be affected by these neoplasms are the elderly males of fifth to sixth decade. We highlight case series of five patients presenting with ocular surface neoplasms of which two were immunocompromised. The diagnosis of the few cases was made on cytology and confirmed on histopathology. These cases are discussed to emphasize on the increased incidence of these ocular surface neoplasms.

**Keywords:** *Carcinoma in situ, dysplasia, ocular surface squamous lesions*

### Introduction

The tumors of conjunctival and corneal squamous epithelium are the third most common primary ocular surface neoplasms after melanoma and lymphoma.<sup>[1]</sup> The average annual incidence of ocular squamous neoplasms is 0.02–3.5/100,000 populations.<sup>[2]</sup> Ocular surface squamous neoplasia (OSSN) is a disease usually affecting elderly males with an average age of 56 years and living in the equatorial region.<sup>[3,4]</sup> OSSN can involve cornea, conjunctiva individually but the most common site affected is limbus, a zone susceptible to dysplastic changes.<sup>[2,5]</sup> The lesions of OSSN mimic many indolent conditions such as keratoconjunctivitis, pannus, pterygium, pingueculum, or foreign body granuloma misleading the clinician to false sense of security, recurrence, and metastasis.<sup>[2,4]</sup>

### Case Reports

#### Case 1

A 55-year-old male patient presented to the ophthalmology outpatient department with the complaints of a progressive increase in the size of his pterygium in the right eye for 3 months associated with redness, watering, and foreign body sensation. The patient had pterygium in his eye for the last 10 years. The corrected visual acuity at the time of presentation was 6/36 and 6/12

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in the right and left eye, respectively. The anterior chamber was clear. The recorded intraocular pressure was 16 mmHg bilaterally. On slit lamp biomicroscopy, 5 mm, whitish pink, raised, fixed mass was noted at the nasal periphery of the cornea of the right eye. The lesion involved the superficial layer of the cornea without any visible extension to adjacent ocular tissue. The conjunctival areas showed congestion. The left eye was normal. There was no lymphadenopathy, and systemic examination was within the normal limits. Human immunodeficiency virus (HIV) and HBsAg status were negative. The patient was operated for pterygium, and the specimen sent for histopathological examination showed corneal/conjunctival intraepithelial neoplasm with intact basement membrane [Figure 1].

#### Case 2

A 40-year-old female patient presented to the ophthalmology outpatient department with complaints of painless, progressive mass over the right eye for the last 2 months. It was associated with redness, itching, and watering. Best-corrected visual acuity was at the time of presentation was 6/18 bilaterally. A 4 mm × 2 mm irregular white mass was noted on anterior segment examination at limbus of the right eye [Figure 2]. The left eye was normal. General and systemic examination was within normal limits. The serological tests performed revealed that the patient

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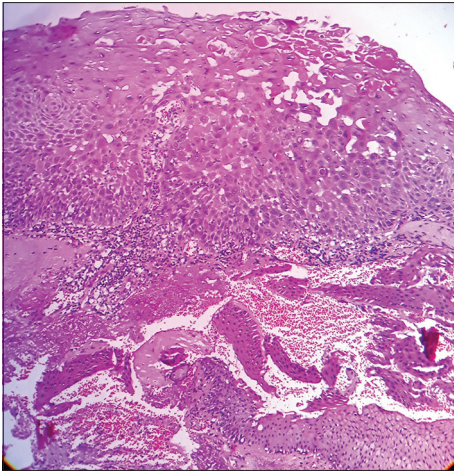
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**Figure 1: Photomicrograph showing corneal/conjunctival dysplastic intraepithelial lesion not invading the basement membrane**

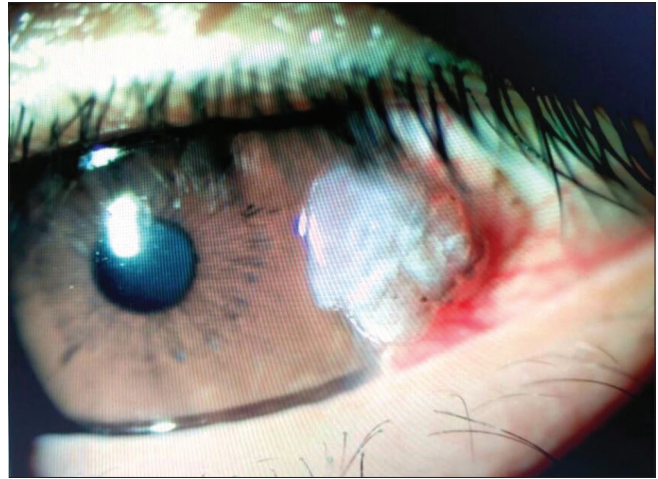
was positive for HIV. Imprint cytology performed from the mass showed moderately cellular smear showing malignant squamous cells lying singly and in small clusters suggestive of squamous cell carcinoma (SCC) [Figure 3]. The histopathological evaluation of the mass confirmed the cytological diagnosis of well-differentiated SCC.

### Case 3

A 64-year-old male patient came to the Department of Ophthalmology with complaints of nodule over the left eye nasally for 1 month associated with foreign body sensation and intermittent watering. The patient had a history of trauma to same eye while driving. The visual acuity at the time of presentation was 6/18 on the left side and 6/12 on the right side. On anterior segment examination, a mass of size 3 mm × 2 mm was noted at limbus extending 1 mm – 2 mm on cornea. The other eye was normal. The general and systemic examination was noncontributory. The serological tests showed that the patient was HIV negative. Imprint cytology performed was inconclusive. The histopathology of the surgical specimen was suggestive of conjunctival intraepithelial neoplasm.

### Case 4

A 40-year-old male patient presented to the outpatient Department of Ophthalmology with progressive nodule over the corneoscleral limbus of the right eye for 2–3 months. It was painless and was associated with foreign body sensation, reddening of the conjunctiva, and watering. There was presence of the pterygium nasally. There was no contributory medical history. The visual acuity in the right eye was 6/36 and that in the left eye was 6/18. A mass of size 2 mm × 1 mm was noted temporally at the limbus extending on to the cornea as noted on slit lamp examination. The left eye at the time of presentation was normal. The general and systemic examination performed showed no abnormality. The HIV status of the patient was negative. The patient was operated, and the excised tissue



**Figure 2: An irregular white, raised mass at limbus**

of the nodule on histopathological examination showed ocular surface squamous neoplasm.

### Case 5

A 44-year-old HIV-positive male presented to the ophthalmology department with mass over corneal surface of the left eye for 3 months. It was associated with redness, itching, and watering. There was no other significant medical history. The corrected visual acuity in the right and left eye was 6/9 and 6/36, respectively. The anterior chamber examination unveiled a mass lesion of size 0.5 cm diameter over the limbus just touching the cornea nasally. The right eye examination was within normal limit. General and systemic examination was within normal limits. The scrape cytology performed from mass was suggestive of OSSN [Figure 4]. The histopathology confirmed the cytology diagnosis [Figure 5].

### Discussion

OSSN is an umbrella term that encompasses dysplastic lesions involving the squamous epithelium of the conjunctiva and/or cornea. These lesions include squamous papilloma, conjunctival-corneal intraepithelial neoplasia, carcinoma *in situ* (CIS), and invasive SCC.<sup>[6]</sup> The lesions in which dysplasia involves less than full thickness are the corneal or conjunctival intraepithelial neoplasms. The lesions are called CIS when full thickness of epithelium show dysplastic changes.<sup>[2]</sup> OSSN has a predilection for intrapalpebral fissure mainly limbus, a zone of long living, and highly proliferative stem cell.<sup>[4]</sup> Elderly males are predominantly affected. The common etiological agent responsible for development of OSSN is solar ultraviolet B radiation exposure. It causes damage to epithelial cell DNA and subsequent neoplasia.<sup>[1,7]</sup> The infection with human papillomavirus 16 and HIV are strongly associated with development of OSSN.<sup>[4,8]</sup>

Approximately 30% of the cases of OSSN are asymptomatic. In symptomatic cases, the duration of

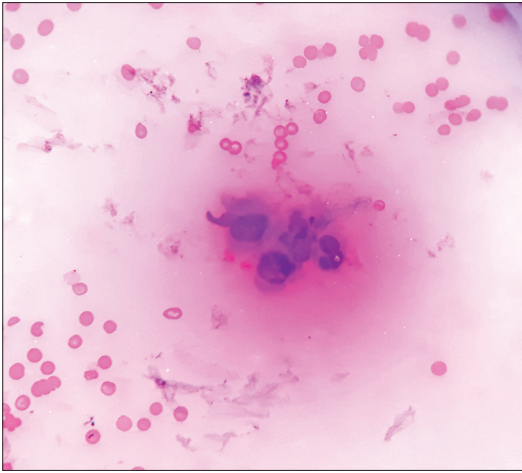


Figure 3: Imprint cytology showing a small malignant squamous cells cluster suggestive of squamous cell carcinoma

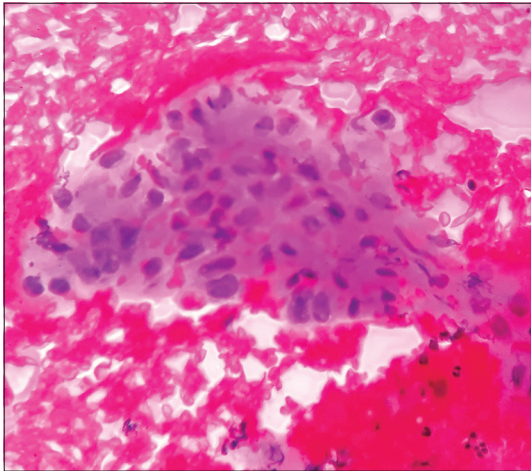


Figure 4: Photomicrograph of scrape cytology showing a dysplastic cluster of cells suggestive of ocular surface squamous neoplasia

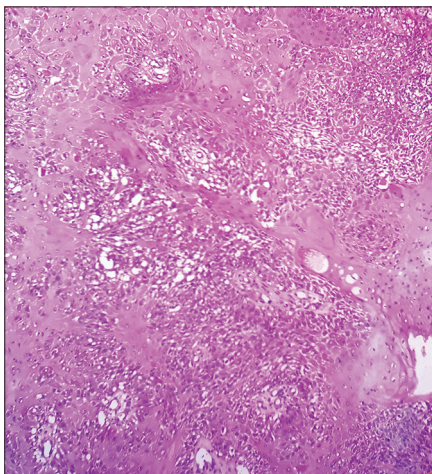


Figure 5: Photomicrograph showing well-differentiated squamous cell carcinoma (Case 5)

symptoms ranges from 2 weeks to 8 years. Majority of the cases present within 6 months of onset of symptoms.<sup>[1]</sup> The patient presents with foreign body sensation, redness,

irritation, and occasionally diminution of vision.

OSSN clinically presents as a gelatinous, papilliform or leukoplakic growth on the ocular surface. These lesions have a pearly gray appearance and are slightly elevated with or without well-defined borders.<sup>[3]</sup> The lesions of OSSN should be distinguished from amelanotic malignant melanoma, corneal pannus, papilloma, pingueculum, pterygium, Vitamin A deficiency lesion, pyogenic granuloma, dermoid, benign intraepithelial dyskeratosis, fatty degeneration of the cornea, viral keratitis, intraepithelial sebaceous neoplasia, lymphoproliferative process, and scar tissue.<sup>[1,2]</sup>

The cytological diagnosis of these lesions as benign and malignant preoperatively helps in planning of surgery.<sup>[3]</sup> The gold standard for diagnosis and grading of OSSN is histopathological examination.<sup>[6]</sup>

The most traditional method of treatment of OSSN is surgical excision which is having a recurrence rate of 15%–52%. The rate of recurrence has decreased to 0% to 12.3% with the combination of surgical excision and cryotherapy. Other treatment modalities for OSSN include brachytherapy, topical chemotherapy using mitomycin C, 5-fluorouracil, and interferon alfa-2b.<sup>[3,5]</sup> Intraocular invasion may be encountered in 2% to 8% cases of OSSN.<sup>[9]</sup> Metastasis with OSSN is extremely rare. The preauricular, submandibular, and cervical lymph nodes, the parotid gland, lungs, and bones are sites involved when OSSN undergoes metastasis.<sup>[3]</sup>

## Conclusion

The incidence of ocular surface squamous neoplasms is increasing, thus early diagnosis with prompt treatment helps in the complete remission. As OSSN mimics many benign and inflammatory ocular lesions, it should be kept in mind during ocular as well as histopathology examination.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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## Conflicts of interest

There are no conflicts of interest.

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