# Conjunctival-corneal intraepithelial neoplasia: Presenting as a pterygium

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## ABSTRACT

Ocular surface squamous neoplasia (OSSN) comprises a wide spectrum of dysplastic alterations of the squamous epithelium of the surface of the eye, for example, the cornea and the conjunctiva ranging from "precancerous" lesions to bona fide invasive carcinoma. The epithelial infiltration can range from mild to severe dysplasia (i.e. mild, moderate, or severe corneal intraepithelial neoplasia) to full thickness epithelial dysplasia. We are presenting a case of a 55-year-old male patient who presented with a sudden increase in the size of her pterygium for the last 3 months, which were finally diagnosed to be carcinoma *in situ*.

Key words: Carcinoma in situ, dysplasia, ocular surface squamous lesions

# INTRODUCTION

Ocular surface squamous neoplasia (OSSN) comprises a wide spectrum of dysplastic alterations of the squamous epithelium of the surface of the eye, for example, the cornea and the conjunctiva ranging from "precancerous" lesions to bona fide invasive carcinoma. In the former case they are classified as carcinoma *in situ* (CIS) lesions or conjunctival-corneal intraepithelial neoplasia (CCIN) and in the latter case invasive squamous cell carcinoma (SCC).

Ocular surface squamous neoplasia is a disease of the elderly<sup>[1]</sup> having predilection for the interpalpebral area mostly the corneoscleral limbus.<sup>[1]</sup> OSSN can involve the conjunctiva or the cornea individually but more commonly start in the conjunctiva and extend across the limbus to involve the adjacent cornea. It has a predilection for corneo-scleral limbus reinforcing the theory that transition zone is at increased

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susceptibility for dysplastic changes.<sup>[2]</sup> Lack of awareness, misinterpretation of OSSN as benign conditions such as keratoconjunctivitis, pterygium, papilloma, limbal dermoid, or foreign body granuloma and slow growth of lesion in relatively asymptomatic patient, may mislead the clinician into false sense of security with resultant recurrence and metastasis.

## **CASE REPORT**

A 55-year-old male presented in the Ophthalmology Department, with the complaints of a sudden increase in the size of his pterygium in the right eye from the last 3 months. The pterygium was present in his eye from the last >10 years. It was associated with redness, watering, and foreign body sensation. Best corrected visual acuity in right and left eye was 6/36 and 6/12 respectively. The anterior chamber was clear. Intraocular pressure was 16 mm of Hg in both eyes. On slit lamp biomicroscopy, a whitish pink, raised, fixed nodular mass of 5 mm diameter was noted at the nasal as well as temporal periphery of the cornea of right eye. The lesion involved the superficial layer of the cornea without any visible extension to adjacent ocular tissue. Conjunctival congestion was noted adjacent to the lesion. Left eye was normal. There was no lymphadenopathy, and systemic examination was within the normal limits. HIV and HBsAg status were negative. The patient was operated for pterygium, and the specimen was sent for histopathological examination.

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#### Histopathological examination

Sections studied revealed conjunctival epithelial thickening with full thickness dysplasia. Scattered cells with large, pleomorphic nuclei and scattered mitotic figures are present. However, the cells do not cross the basement membrane at any point. The submucosa showed focal areas of perivascular chronic inflammatory cell infiltrate and dilated congested blood vessels. Features are suggestive of conjunctival CIS (CCIN) [Figures 1 and 2]. Immunohistochemical examination was performed in this case to confirm the diagnosis that came out to be positive for panKeratin and human papilloma virus (HPV) [Figure 3].

#### DISCUSSION

Ocular surface tumors are relatively rare with an incidence of 0.13-1.9/100,000.[3,4] The highest incidence of OSSN occurs in men between the ages of 50 and 75 years.<sup>[3,4]</sup> OSSN is an umbrella term that encompasses dysplastic lesions involving the squamous epithelium of the conjunctiva or cornea, which includes squamous papilloma, CCIN, CIS, and invasive SCC. The epithelial infiltration can range from mild to severe dysplasia (i.e. mild, moderate, or severe CIN) to full thickness epithelial dysplasia CIS to invasive SCC, when tumor cells invade through the epithelial basement membrane.<sup>[3-5]</sup> Fortunately, of these conditions, invasive SCC is the least common. Fair skin, pale irises, high propensity to sunburn, and a history of skin cancer have all proven to be related risk factors.<sup>[5,6]</sup> Other risk factors for OSSN include chronic infection by HPV, HIV, or trachoma, vitamin A deficiency, xeroderma pigmentosum, chronic irritants, and chronic epitheliopathies.[1,4-6] Immunosuppression whether due to organ transplantation or secondary to AIDS, is a major risk factor, especially in conjunction with one of the above risk factors. It is estimated that the risk of conjunctival malignancies increases 13 fold in patients with HIV.[7] However, our case was immunocompetant and negative for HIV. OSSN lesions can frequently be distinguished from other conjunctival lesions, such as pterygia and conjunctival lymphoma. However, studies have shown it is very difficult to distinguish between the different types of OSSN; experienced physicians were only able to accurately diagnose OSSN stages 40% of the time.[4] Thus, a tissue specimen is needed for histologic diagnosis to distinguish CIN from invasive SCC. It is not unusual for invasive SCC to invade locally into the sclera, intraocularly, or into the orbit, with one study estimating incidence rates to be 37%, 13%, and 11% respectively.<sup>[8]</sup> In cases where extensive spread is suspected, it is important to assess the extent of the lesion with ultrasound biomicroscopy (to assess sclera or intraocular invasion), gonioscopy or gadolinium-enhanced magnetic resonance imaging scans (to assess orbital extension). Fortunately, even the most aggressive form of OSSN, invasive SCC, usually, is not associated with



Figure 1: Low power view of the conjunctival squamous epithelium with full thickness dysplasia of the epidermal layers and normal dermis (H and E, ×20)



**Figure 2:** High power view of the conjunctival squamous epithelium showing dysplastic arrangement of cells with a few mitotic figure (note that the dysplastic cells do not cross the basement membrane at any point) (H and E, ×40)



Figure 3: Positivity for human papilloma virus in the nuclei of squamous cells (×40)

regional or distant metastases, and only a few cases have been reported.<sup>[9,10]</sup> All forms of OSSN tumors are treated

3.

aggressively but with markedly different anticipated therapeutic endpoints; the goal of less invasive disease is complete eradication, while the goal of invasive disease is to minimize the spread of the disease. Depending on the lesion and histopathologic findings, treatment can range from topical chemotherapy or excision alone for smaller lesions versus a combination of surgical excision, cryotherapy, and chemotherapy for larger or invasive. Rarely, radiotherapy, and in extreme cases, enucleation and even exenteration, may be necessary.<sup>[6,11,12]</sup>

The patient was discharged after surgery and presently on close follow-up in the Department of Surgical Oncology.

# CONCLUSIONS

Ocular surface squamous neoplasia (CCIN) should be kept in mind while dealing with ocular biopsies, especially pterygium, not only in the elderly, but also in middle-aged as well as young individuals even in the absence of HIV and other immunosuppressive diseases.

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