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A CLOSER LOOK AT OCULAR SURFACE SQUAMOUS NEOPLASIA: CASE PRESENTATION AND MANAGEMENT STRATEGIES

Ophthalmology

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ABSTRACT

Background: Ocular Surface Squamous Neoplasia (OSSN) represents a spectrum of conjunctival and corneal epithelial neoplasms ranging from mild dysplasia to invasive squamous cell carcinoma. **Purpose:** To highlight the importance of early detection and management of OSSN through a case study. **Methods:** A 74-year-old male with a vascularized, gelatinous conjunctival lesion underwent clinical examination, AS-OCT imaging, and surgical intervention with histopathological analysis. **Results:** Histopathological analysis confirmed moderately differentiated squamous cell carcinoma. Postoperative monitoring revealed no recurrence. **Conclusion:** This case underscores the efficacy of a multimodal approach combining surgical excision, cryotherapy, and adjunctive techniques in OSSN management.

KEYWORDS

OSSN, Ocular Surface Squamous Neoplasia, OSSN and Anterior Segment-OCT

INTRODUCTION

Ocular Surface Squamous Neoplasia (OSSN) refers to a range of pre-cancerous and cancerous lesions affecting the epithelial layer of the conjunctiva and cornea. This spectrum includes Dysplasia, Carcinoma in-situ (CIS), and Invasive Squamous Cell Carcinoma (SCC). CIS makes up 39% of all conjunctival premalignant and malignant cases. The incidence of invasive SCC varies from 0.02 to 3.5 per 100,000 individuals. Approximately 75% of these cases are seen in males, older patients, and occur predominantly at the limbus.[1]

OSSN is mostly unilateral and is seen in middle age and older patients. Rarely, it is bilateral in immunocompromised patients. Risk factors for OSSN include prolonged ultraviolet (UV) light exposure, infections with human papillomavirus (HPV) and human immunodeficiency virus (HIV). Additional contributing factors are advanced age, heavy tobacco use, male gender, and light skin tone.

There are no consistent clinical criteria for distinguishing CIS from invasive SCC. The presence of feeder vessels, intrinsic vascularity and a nodular lesion raise suspicion of invasive SCC. Clinically, OSSN often appears as a raised, gelatinous or papillomatous growth, typically located in the interpalpebral region. Common patient complaints include eye redness, swelling, and discomfort. In more advanced cases, the lesion can invade the cornea or sclera and rarely the tumor may extend into the orbit causing proptosis.[2]

The preferred treatment involves complete surgical excision with a 4 mm margin clearance, utilizing the no-touch technique. Cryotherapy is commonly applied to the margins of the bulbar conjunctiva to reduce the risk of recurrence.

Lee and Herst reported a 17% recurrence after excision of conjunctival dysplasia, 40% after excision of CIS and 30% for SCC of conjunctiva. Recurrence rates for OSSN range from 15% to 52%, but advanced surgical methods have decreased recurrence rates to below 5%. The prognosis for OSSN is generally favorable, with a minimal chance of metastasis.[3]

Case Presentation

A 74-year-old male patient from Kolhapur, Maharashtra, presented to the ophthalmology outpatient department at D.Y. Patil Medical College, Kolhapur, with complaints of redness and swelling in his right eye persisting for six months. The onset of symptoms was gradual, with the patient reporting persistent redness, irritation, and occasional watery discharge, though he denied experiencing any pain or vision loss. His ocular history was unremarkable, with no prior surgeries or similar conditions. Additionally, he had no significant systemic illnesses. Upon general examination, his systemic parameters were normal. Ophthalmic examination revealed a visual acuity of 6/24 in the right eye, which was correctable to 6/18, while the left eye had normal visual acuity at 6/6. A slit-lamp examination of the right eye showed conjunctival congestion with a visible lesion, though the cornea remained clear adjacent to the lesion.

Lesion Characteristics:

Well-defined gelatinous mass, elevated at the nasal limbus (clock hours: 2–6). Feeder vessels noted, suggestive of vascular involvement. Positive staining with Rose Bengal. No ulcerative changes. (fig 1)

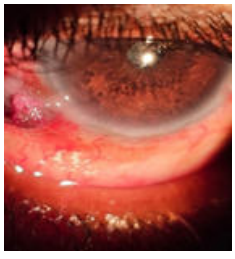
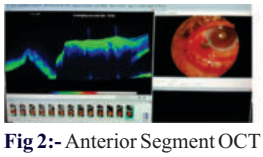


Fig 1:- Lesion Characteristics

Anterior Segment Optical Coherence Tomography (AS-OCT) (fig 2)
The scan showed increased thickness of the epithelium with hyperreflective areas and distinct transition zones, indicating stromal invasion.



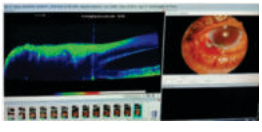


Fig 2:- Anterior Segment OCT

Management Plan

Surgical intervention involved excision of the lesion with 4 mm clear margins using the "No-Touch Technique" to prevent direct handling. To reduce the risk of recurrence, cryotherapy was applied to the base of the lesion. Following excision, the defect was repaired with an amniotic membrane graft, which was secured using 10-0 Ethilon sutures. Postoperatively, the patient was prescribed topical antibiotics and steroids. Histopathological analysis revealed squamous cell carcinoma with stromal invasion, characterized by a high nuclear-to-cytoplasmic (N:C) ratio, confirming the malignant nature of the lesion.

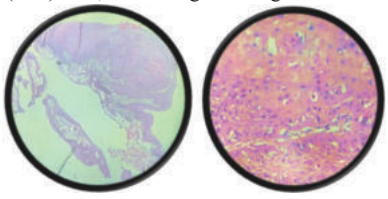


Fig 3:- Histopathology Analysis

DISCUSSION

OSSN represents a spectrum of neoplastic conditions requiring a high index of suspicion for accurate diagnosis. Anterior Segment OCT is a valuable non-invasive tool for differentiating OSSN from benign conjunctival lesions.

The no-touch technique minimizes tumor seeding during surgery. Adjunctive treatments like cryotherapy and mitomycin-C help to lower recurrence rates. Advanced imaging techniques, along with histopathological analysis, are essential for the diagnosis and management of OSSN. Despite careful surgical removal, studies show a recurrence rate of 5–22%.[9] This case highlights the effectiveness of a combined approach, including accurate excision, cryotherapy, and the use of an amniotic membrane graft.

CONCLUSION

Each mass should be meticulously investigated with tools like Anterior Segment OCT to exclude the possibility of neoplastic lesions. Effective management involves precise surgical methods and histopathological analysis, which contribute to a better prognosis and lower recurrence rates."

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