
Imprint Cytology: A Key to Diagnose Ocular Surface Squamous Neoplasia**Buch Archana C¹, Agrawal Neekita S², Karia Kunjal M³, Harsh Kumar⁴**¹Professor in Pathology, Dr. D. Y. Patil Medical College, Hospital & Research Centre, Dr. D. Y. Patil Vidyapeeth, Pimpri, Pune-18, India²Post Graduate Junior Resident in Pathology, Dr. D. Y. Patil Medical College, Hospital & Research Centre, Dr. D. Y. Patil Vidyapeeth, Pimpri, Pune-18, India³Post Graduate Junior Resident in Pathology, , Dr. D. Y. Patil Medical College, Hospital & Research Centre, Dr. D. Y. Patil Vidyapeeth, Pimpri, Pune, India⁴Professor in Pathology, Dr. D. Y. Patil Medical College, Hospital & Research Centre, Dr. D. Y. Patil Vidyapeeth, Pimpri, Pune-18, India***Corresponding author**

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Abstract: Neoplastic lesions of ocular surface epithelium have a spectrum ranging from simple dysplasia to carcinoma in situ to invasive squamous cell carcinoma (SCC) involving the conjunctiva as well as the cornea. The most common site for ocular surface squamous neoplasia (OSSN) is limbus which is a transition zone with greatest mitotic activity. OSSN has a wide geographical variation, ranging from 0.13 to 1.9 per 100,000 population. It predominantly affects the elderly males. We highlight a case of 40 year female who presented with whitish mass over right limbal area along with nasal pterygium. Imprint cytology performed revealed well differentiated squamous cell carcinoma. The same was confirmed histopathologically. This case is reported to emphasize the utility of simple, rapid and minimal invasive technique of imprint cytology to diagnose OSSN.**Keywords:** Imprint cytology, Limbus, Ocular Surface Squamous Neoplasm, Pterygium

INTRODUCTION:

Ocular surface squamous neoplasia is the third most common ocular tumour after melanoma and lymphoma [1]. Squamous cell carcinoma (SCC) of eye has the average annual incidence of 17 to 20 cases per million persons per year [1, 2]. It arises most commonly in the limbal region. It occurs particularly in males of sixth and seventh decade living in geographic areas exposed to high levels of Ultraviolet-B radiation [3]. Ocular surface squamous neoplasia (OSSN) mimic many common indolent lesions like pterygium, papilloma, keratoconjunctivitis and foreign body granuloma [4]. Herein, we report a case of OSSN in a 40 year old female presenting with right eye corneo-scleral lesion associated with nasal pterygium. The article emphasizes on the use of imprint cytology for easy and rapid diagnosis of OSSN.

CASE REPORT

A 40 year old female presented to the ophthalmology outpatient department with complaints of painless progressive mass over right eye since 2 months associated with redness, itching and watering. At the time of presentation, visual acuity was 6/18 partial bilaterally. Anterior segment examination revealed 4x2mm irregular white mass at limbus of the right eye with nasal pterygium and clear cornea (Figure 1a). Left eye was normal. General and systemic examination was within normal limits. Imprint cytology was performed from the mass which revealed moderately cellular smear showing squamous cells lying singly and in small clusters with high nuclear-cytoplasmic ratio, hyperchromatic nuclei and moderate amount of eosinophilic cytoplasm suggestive of squamous cell carcinoma (Figure 1b and 1c). Later histopathological evaluation of the mass confirmed the cytological diagnosis of well differentiated squamous cell carcinoma (Figure 1d).

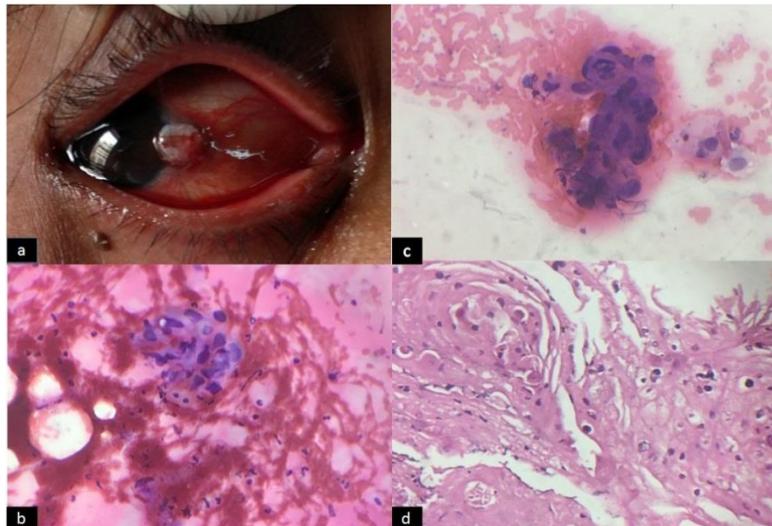


Fig-1a:) Whitish mass over right limbus; 1b & 1c: Cytology smears showing squamous cells having hyperchromatic nuclei with moderate amount of cytoplasm (H and E x100), (H and E x 400); 1d: Photomicrograph showing sheets of squamous cells with large and hyperchromatic nuclei and eosinophilic cytoplasm with keratin pearls. (H and E, x 400)

DISCUSSION

OSSN is a recently introduced term for precancerous and cancerous epithelial lesions of conjunctiva and cornea [2, 5]. It is considered to be a low-grade malignancy [2]. It has a predilection for limbus because of presence of long living and highly proliferative stem cells at this corneoscleral junction [6, 7]. It may or may not involve the cornea [4]. It usually masquerades as a scar tissue or as a pannus or can appear in association with pterygium [6, 8]. Older males are more commonly affected. The commonest etiology is exposure to solar radiations leading to DNA damage of epithelial cells. Human papilloma virus (HPV), mainly type 16, has also been demonstrated in tissue specimens of OSSN while HIV infection has been shown to accelerate the development of OSSN [2, 4].

About 30% of the cases are asymptomatic. The duration of symptoms vary from 2 weeks to 8 years. Most of the cases have been reported within 6 months of onset [2]. The patient usually presents with symptoms like foreign body sensation, redness, irritation and rarely, diminution of vision due to high astigmatism or involvement of visual axis. Clinically OSSN presents as a gelatinous, papilliform or leukoplakic growth on the ocular surface. These lesions are slightly elevated and have a pearly grey appearance, with or without well-defined borders [2]. They need to be differentiated from amelanocytic malignant melanoma, corneal pannus, dermoid, benign intraepithelial dyskeratosis, viral keratitis, intraepithelial sebaceous neoplasia, lympho proliferative process, papilloma, pingueculum, pterygium, vitamin A deficiency, pyogenic granuloma and scar tissue [7]. Imprint cytology and scrape cytology can be used in such cases for rapid diagnosis.

In 1974, Egbert and co-workers developed the technique of imprint cytology by studying the removed surface layers of conjunctival epithelium using cellulose acetate filter paper. It was successfully applied for establishing the diagnosis of OSSN by Nolan, Hirst and co-workers in the year 1994 [9]. The advantage of imprint cytology is that it is simple and non-traumatic. It assists in differentiating benign and malignant lesions of the surface epithelium [2]. It is used for follow up of the patient to determine recurrence after treatment [10]. DNA of a cell can be evaluated for diagnosis and therapy if required.[2] Additionally, it preserves the limbal stem cells, that are responsible for renewal of corneal epithelium [10]. In this technique cell to cell relationship is maintained. The only disadvantage is the superficial nature of the sample, thus preventing assessment of degree of tumor invasion [2].

The cytological diagnostic criteria for OSSN include nuclear enlargement with raised nuclear-cytoplasmic ratio, hyperchromasia with coarsely clumped nuclear chromatin, irregular nuclear membrane, nuclear pleomorphism and prominent nucleoli [10].

Surgical excision of the lesion is the most traditional method of treatment of OSSN with recurrence rates of 15%-52%. With the combination of surgical excision and cryotherapy, recurrence rates have been decreased to 0% to 12.3%. Brachytherapy has also been used for many years in treating OSSN. Recently topical chemotherapy using mitomycin C, 5-FU, and interferon alfa-2b has been popularly used [2].

Intraocular invasion, although rare, may occur in OSSN. Metastasis is extremely rare. Sites of metastasis include the preauricular, submandibular, and

cervical lymph nodes, the parotid gland, lungs, and bones [2].

CONCLUSION

Imprint cytology positivity aids in rapid diagnosis of OSSN. It assists in further management and follow up after treatment. It will preclude the need of using invasive technique for establishment of primary diagnosis.

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