



Squamous Cell Carcinoma of Cornea: Diagnosed on Cytology

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Abstract:

Squamous cell carcinoma (SCC) of eye has a predilection for corneo-scleral limbus which is a transition zone with greatest mitotic activity. Almost all dysplastic lesions of cornea and conjunctiva involve corneo-scleral limbus. Isolated cases of SCC of cornea are rare. SCC may masquerade as benign lesions like squamous papilloma and pterygium. These lesions though removed are usually not submitted for histopathological examination leading to complications like recurrence and metastasis.

Here, we report a case of 35 year old male who presented with whitish mass on cornea which was diagnosed as SCC on cytology and later on was confirmed on histopathology. This case is reported for its rarity and for emphasizing that rapid, simple and minimally invasive technique like scrape cytology can be effective in pre or intra operative diagnosis of ocular surface squamous neoplasia thus helping in intra operative decisions regarding resection margins and post operative management.

Key words: Squamous Cell Carcinoma, Cornea, Eye Neoplasms, Pterygium, LimbusCorneae.

Introduction

Ocular surface squamous neoplasia (OSSN) is a spectrum of dysplastic lesions of cornea and conjunctiva ranging from simple dysplasia to carcinoma in situ [conjunctival –corneal intra epithelial neoplasia (CCIN)] to invasive squamous cell carcinoma (SCC) [1]. Incidence of OSSN ranges from 0.02-3.5 per 1,00,000 population and varies geographically with greater frequency near equator [2]. OSSN predominantly occurs in elderly males with an average age of 56 years [1]. It has predilection for corneo-scleral limbus reinforcing the theory that transition zone is at increased susceptibility for dysplastic changes [3]. Lack of awareness, misinterpretation of OSSN as benign conditions like 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.

Isolated squamous cell carcinoma of cornea is rare with few case reports [4-8]. Here, we report a case of squamous cell carcinoma of cornea without involvement of limbus, diagnosed on scrape smear cytology, for its

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Received: January 4, 2013 | Accepted: January 16, 2013 | Published Online: January 25, 2013

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Conflict of interest: None declared | **Source of funding:** Nil | **DOI:** <http://dx.doi.org/10.17659/01.2013.0011>

rarity. Need for rapid pre or intra operative cytological diagnosis is emphasized for adequacy of resection margins and post operative management. Rapid, simple, reliable and minimally invasive cytological procedure like scrape cytology may be of help to ophthalmic surgeon in decision making and post operative management of OSSN like instillation of mitomycin C or cryotherapy application.

Case Report

35 years old male patient presented with whitish mass at right cornea associated with watering and foreign body sensation since last 3 months. Initially mass was small in size but gradually increased to present size (5 mm in diameter). Best corrected visual acuity in right and left eye was 20/60 & 20/30 respectively. There was against the rule astigmatism of 1.5 dioptre (D). On slit lamp biomicroscopy, a whitish pink, raised, fixed nodular fungating mass of 5 mm diameter was noted at the temporal periphery of cornea of right eye [Fig.1]. The lesion involved the superficial layer of 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 normal limits.

Intra operative scrape cytology was performed. The lesion was scraped gently with the help of sterile scalpel blade (No.15) under operating microscope after instilling local anaesthetic. Smears revealed atypical squamous cells having hyperchromatic nuclei, irregular nuclear membrane and moderate amount of eosinophilic cytoplasm [Fig.2]. Diagnosis of SCC was rendered within 15 minutes. In the light of cytological diagnosis, cryotherapy was administered to the patient after excision of mass with wide surgical margins. Specimen was sent for histopathology which confirmed cytological diagnosis [Fig.3]. Excision was successful but led to permanent macular grade corneal opacity at 6 months follow up. There was decline in astigmatism from 1.5D to 0.5D with the rule astigmatism.

Discussion

OSSN includes precancerous and cancerous lesions of conjunctiva and cornea. Conjunctival/corneal intraepithelial neoplasia refers to dysplasia involving less than full thickness of epithelium and carcinoma in situ (CIS) refers to full thickness changes [9]. SCC of cornea breaks through epithelial basement membrane into Bowman's layer and stroma. OSSN has predilection for corneo-scleral limbus as it is transition zone with greatest mitotic activity. Isolated SCC of cornea may occur due to centripetal movement of abnormal epithelial cells from limbus which becomes neoplastic after migration [10].

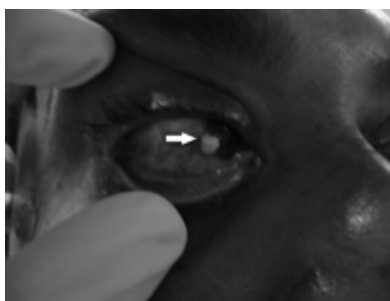


Fig.1: White nodule on temporal side of cornea.

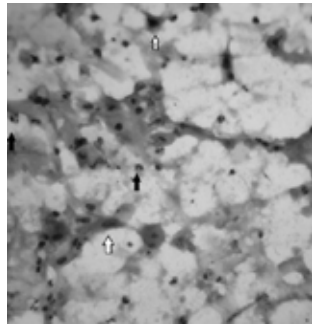


Fig.2: Cytology smear – Atypical squamous cells with enlarged & hyperchromatic nuclei and eosinophilic cytoplasm (white arrow). Background shows inflammatory cells (black arrow). (H&E X 500).

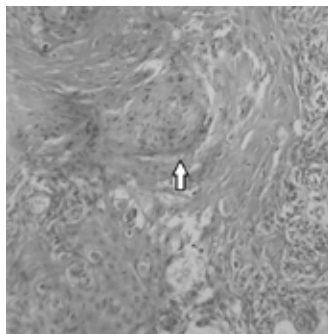


Fig.3: Histopathological section: Dysplastic squamous epithelium forming squamous pearls (H&E X 250).

Although advanced malignant lesions frequently exhibit clearly invasive features, in-situ or superficially invasive lesions typically resemble their benign counterparts quite closely and are difficult to identify clinically. These lesions are often misdiagnosed for a variety of benign lesions and though removed, are not usually subjected to histopathological examination. Recurrence rates are naturally high in such cases (5-50%) which are mainly related to the adequacy of resection margins at initial excision [11]. The criteria of differentiation between CIN III/ CIS and invasive carcinoma are cellular pleomorphism, hyperkeratinised cells, large number of inflammatory cells and tumour diathesis in the background [11].

Complications like recurrence and metastasis can be avoided by pre or intra operative cytology. Intra operative scrape cytology requires expertise for scraping and making the smear. It should be attempted in centers where close cooperation between ophthalmic surgeon and pathologist is possible. Scrape cytology offers better cell yield even in keratinizing lesions and small focal lesions in comparison to impression cytology (IC). However, sensitivity of IC for the diagnosis of intraepithelial neoplasia can be increased by repeated applications of IC [12]. Scrape cytology offers good morphological details, if smear is fixed immediately. Disadvantages of scrape cytology are loss of cell to cell relation, sampling from superficial layers and smaller area restricted to the lesion. Scrape cytology is a traumatic procedure [11]. It can be used for rapid intra operative diagnosis when a definitive diagnosis is not available or is discrepant with clinical impression.

Conclusion

Cytological diagnosis if positive can help surgeon in decision making especially in regard to margin of excision and follow up management of OSSN like application of cryotherapy or instillation of topical mitomycin C. It will also obviate the need for more invasive biopsy procedure for primary diagnosis and diagnosis of recurrence.

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