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SHORT COMMUNICATIONS & CASE REPORTS

Reactive keratoma of the central corneal epithelium

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PURPOSE. *The authors present a unique corneal tumor.*
METHODS. *A 75-year-old gardener presented with a 1-year history of a slowly growing central corneal lesion with progressive visual loss. We performed an ophthalmic examination, slit lamp photography, high-frequency ultrasonography, and culture with sensitivity (followed by therapeutic scrape biopsy).*
RESULTS. *Clinical examination revealed a gray-white central corneal tumor without extension to the limbus. No significant tumor neovascularization or intraocular inflammation was noted. High frequency ultrasound revealed no penetration of the corneal stroma. The tumor was removed with a platinum spatula. Histopathology revealed simple hyperkeratosis characterized by stratified hyperkeratotic corneal epithelium with metaplastic granular layer characteristic of epidermis. Few and focal clusters of passenger bacteria were found (as seen in cutaneous leukoplakia). Cultures revealed a few Gram-positive cocci and no fungus. A human papilloma virus wide-screen spectrum assay (in situ hybridization) was negative.*
CONCLUSIONS. *The authors present a benign keratoma of the central corneal epithelium. High frequency ultrasound and scrape biopsy histopathologic techniques were used to diagnose and treat this keratoleukoma caused by a reactive keratoma as well as improve his vision. (Eur J Ophthalmol 2009; 19: 484-6)*

KEY WORDS. *Benign keratoma, Central corneal epithelium, Keratoleukoma, Reactive keratoma*

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INTRODUCTION

Cytology and histopathology of the ocular surface has been used in the diagnosis, assessment, and management of ocular surface squamous metaplasia, conjunctival melanosis, dry eye syndrome, and other surface disorders (1). This case illustrates the use of scrape biopsy as an aid in the recognition and management of a corneal tumor. Prior to biopsy, high-frequency ultrasound was used to determine its posterior extent (depth of penetration) and then histopathology revealed a hyperkeratosis. Removal of the keratoma improved visual acuity.

METHODS

A 75-year-old man with no known systemic disease presented with a 1-year history of a painless, slowly enlarging central corneal lesion causing an enlarging “shadow” visual disturbance in his left eye. There was no history of ocular tumor, trauma, surgery, dry eye, ocular cicatricial disease, contact lens wear, or other past ocular history. There were no similar lesions on the fellow eye or elsewhere on his body. The patient had not been using any ocular medication (2). Ophthalmic examination revealed a best-corrected visual acuity of 20/80 in the left eye. Slit-

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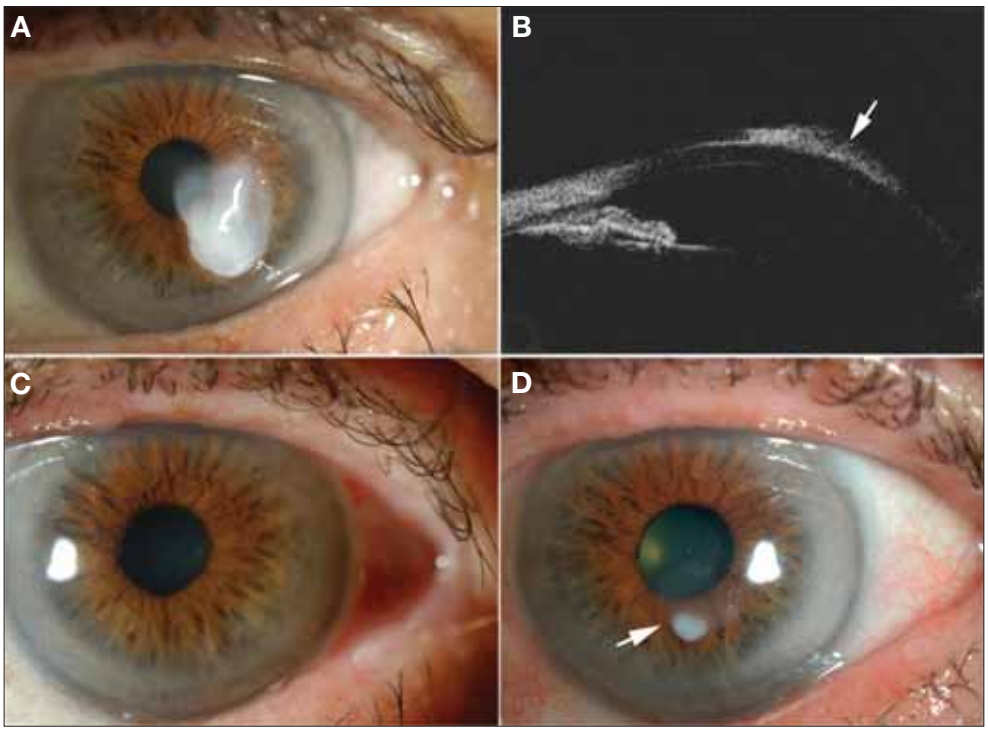

Fig. 1 - *Keratoma of the central corneal epithelium.* **(A)** *Slit-lamp photograph demonstrates an avascular slightly nodular leukoplakic central corneal keratoma partially occluding the visual axis.* **(B)** *35-MHz high-frequency ultrasonography reveals a highly reflective epicorneal tumor with no evidence of corneal stromal extension (arrow).* **(C)** *Slit-lamp photography 4 months after superficial keratectomy, tumor biopsy; the visual axis is cleared and acuity has returned to 20/25.* **(D)** *Slit-lamp photography 21 months after removal; the keratoma is returning (arrow).*

lamp photography demonstrates a central elevated gray-white lesion without intrinsic vascularization or feeder vessels (Fig. 1). The intervening corneal periphery was clear without limbal or conjunctival involvement. Intraocular pressure was 10 mmHg. High-frequency ultrasound (35 MHz) revealed a superficial, solid corneal tumor, without stromal invasion and high internal reflectivity (3). Its largest dimensions were 4.5 mm in base and 1.0 mm in thickness.

The entire tumor was removed at the slit-lamp with a platinum spatula under topical anesthesia. This left an epithelial defect, with a clear and apparently unaffected subjacent corneal stroma. Histopathologic examination revealed hyperkeratosis with parakeratosis, cytoplasmic keratin accumulation, and focal granular layer formation with no dysplasia or mitotic figures (Fig. 2). There was no evidence of fungus, collagen, or amorphous amyloid deposition. Occasional clusters of Gram-positive cocci were identified in between keratin flakes. Cultures were positive for *Staphylococcus epidermidis*. However, a human papilloma virus wide-screen assay (in situ hybridization) was negative. Although 6 months after removal visual acuity was 20/25, with a trace persistent epithelial opacity (Fig. 1), 21 months after therapeutic biopsy keratoleukoma is starting to recur.

RESULTS AND DISCUSSION

The epithelium of the normal cornea consists of non-keratinizing squamous cells and hyperkeratosis of the cornea is relatively common (seen in pterygia, xerophthalmia, Stevens-Johnson syndrome, corneal keloid, and malignant corneal intraepithelial neoplasia) (3). However, these diseases are not found to present as pure hyperkeratosis of the central cornea without any limbal or peripheral corneal involvement (4).

In this case, idiopathic squamous metaplasia or transformation of mucosa into tissue with the characteristics of skin with subsequent hyperkeratosis of the corneal epithelium led to the leukoplakic appearance of this lesion. This was significant enough to cause opacity and decrease in visual acuity. However, the etiology of this keratoma is uncertain (5). The “passenger” staphylococcus seen in our specimens are commonly seen in cutaneous leukoplakia and not considered etiologic.

We used the scrape biopsy technique to rule out malignant corneal intraepithelial neoplasia and provide visual rehabilitation. However, in that evidence of penetration of subjacent tissues is integral to the diagnosis of malignancy, exfoliative cytology cannot replace a full thickness biopsy. In our clinical practice, scrape biopsy

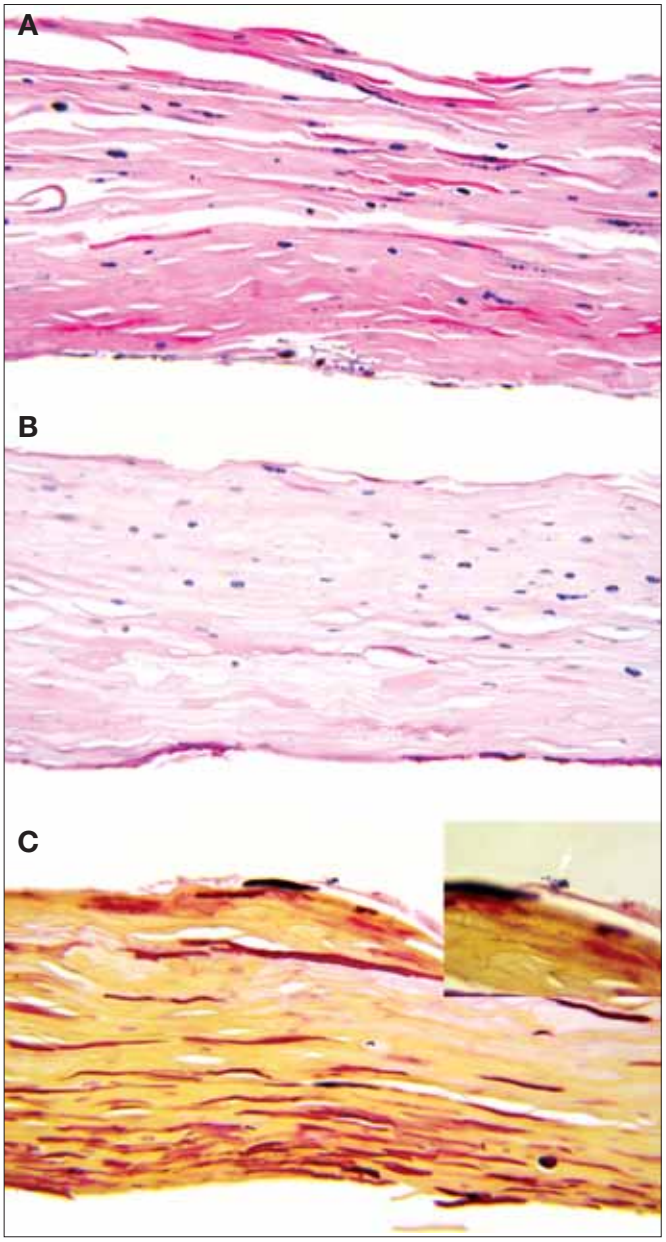

Fig. 2 - *Keratoma of the central corneal epithelium.* **(A)** *Hematoxylin and eosin demonstrates marked hyperkeratosis with patchy parakeratosis and focal granular layer formation in large keratinocytes displaying pink, ropy, cytoplasmic keratin deposits (hematoxylin and eosin x40).* **(B)** *Periodic acid-Schiff reveals a lack of fungal organisms and no evidence of cytoplasmic inclusions (periodic acid-Schiff x40).* **(C)** *Gram-positive cocci in small clusters (inset, oil immersion x100) in superficial keratin layers (Gram stain x40).*

cytology plays an indispensable role for the diagnosis and management of select patients with ocular surface neoplasia.

This case demonstrates the use of clinical history, ophthalmic evaluation, high frequency ultrasound, and outpatient histopathologic analysis for the diagnosis and in management of a unique corneal tumor.

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REFERENCES

1. Spinak M, Friedman AH. Squamous cell carcinoma of the conjunctiva: value of exfoliative cytology in diagnosis. Surv Ophthalmol 1977; 21: 351-5.
2. Wright P. Squamous metaplasia or epidermalization of the conjunctiva as an adverse reaction to topical medication. Trans Ophthalmol Soc UK 1979; 99: 244-6.
3. Finger PT, Tran HV, Turbin RE, et al. High-frequency ultrasonographic evaluation of conjunctival intraepithelial neoplasia and squamous cell carcinoma. Arch Ophthalmol 2003; 121: 168-72.
4. Basti S, Macsai MS. Ocular surface squamous neoplasia: a review. Cornea 2003; 22: 687-704.
5. Brown HH, Glasgow BJ, Holland GN, Foos RY. Keratinizing corneal intraepithelial neoplasia. Cornea 1989; 8: 220-4.