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A case of chronic ocular irritation associated with progressive corneal opacification

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Editor,

Localized and progressive opacification of the cornea may be associated with infection (Souza et al. 2003), deposition or precipitation of minerals or proteins (Schlötzer-Schrehardt et al. 1999; Gartry et al. 1989), or various corneal dystrophies (Waring et al. 1978). We present a case of opacification that does not fit the pattern of known dystrophic or pathologic conditions. A 42-year-old woman has for over 20 years suffered from intermittent chronic ocular irritation, with a burning sensation and grittiness in both eyes. Over time, a progressive opacification of the mid-peripheral cornea has developed bilaterally.

Slit lamp observation in 1992 revealed discrete microcyst-like deposits within or beneath the corneal epithelium, distributed in a 2mm-wide concentric band in the mid-periphery of both corneas. Dense, fibrous tissue was additionally present in the subepithelial region (Figure 1A, B). Upon systemic examination, Cogan's syndrome and metabolic lipid disorders were excluded. Ocular symptoms were suppressed using two drops of 0.1 % dexamethasone without preservatives (Opnol, Clean Chemical Sweden AB, Borlänge, Sweden) applied 15min

apart, to each eye. The effect of these drops lasted several days and drops were given one to two times per week.

In 2001, ocular irritation persisted and treatment continued. Glaucoma was excluded, and visual fields and papillae were normal and unchanged from previous examinations. The fibrous corneal tissue took on a degenerative appearance bilaterally (Figure 1C, D). The microcysts observed initially had either disappeared or were obscured by the denser fibrotic tissue.

In 2008, the ocular irritation and treatment continued. The mid-peripheral corneal lesions coalesced into a yellow-gold colored band extending from 2 to 10 o'clock along the outer rim of the fibrous area (Figure 1E, F). Anterior segment optical coherence tomography (Visante ASOCT, Carl Zeiss Meditec, Jena, Germany) indicated a mean central corneal thickness of 598 μm (range: 593 – 603 μm) in the left eye and 601 μm (range: 595 – 610 μm) in the right eye. The fibrous regions extended 300– 350 μm into the stroma (Figure 1G), and the cornea in these regions was thinned (mean thickness 550 – 570 μm).

Corneal morphology by in-vivo confocal microscopy (Heidelberg Retinal Tomograph, HRT3-RCM, Heidelberg Engineering, Heidelberg, Germany) revealed needle-shaped structures within the central stroma (Figure 2). Fibrous regions contained visible keratocyte nuclei and frequently extended into the epithelium resulting in localized epithelial thinning. Yellow-gold areas were opaque subepithelial lesions protruding into the epithelium. Bowman's layer was completely obscured in affected areas.

The corneal surface has never stained with fluorescein. Visual acuity has always been good, although a minor refractive error has developed over the past few years (Table 1). The patient's general health is good, and apart from the eye drops no other medication is used. The skin is unaffected, and the patient has no family history of corneal abnormalities.

The color and distribution of the opacifications in this case is unusual. Localized peripheral corneal thinning is believed to have caused the progressive minor refractive error in recent years. A peripheral biopsy specimen could be taken if the condition worsens or spreads to the visual axis, and may provide insight into the nature of the opacification.

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Figure Captions

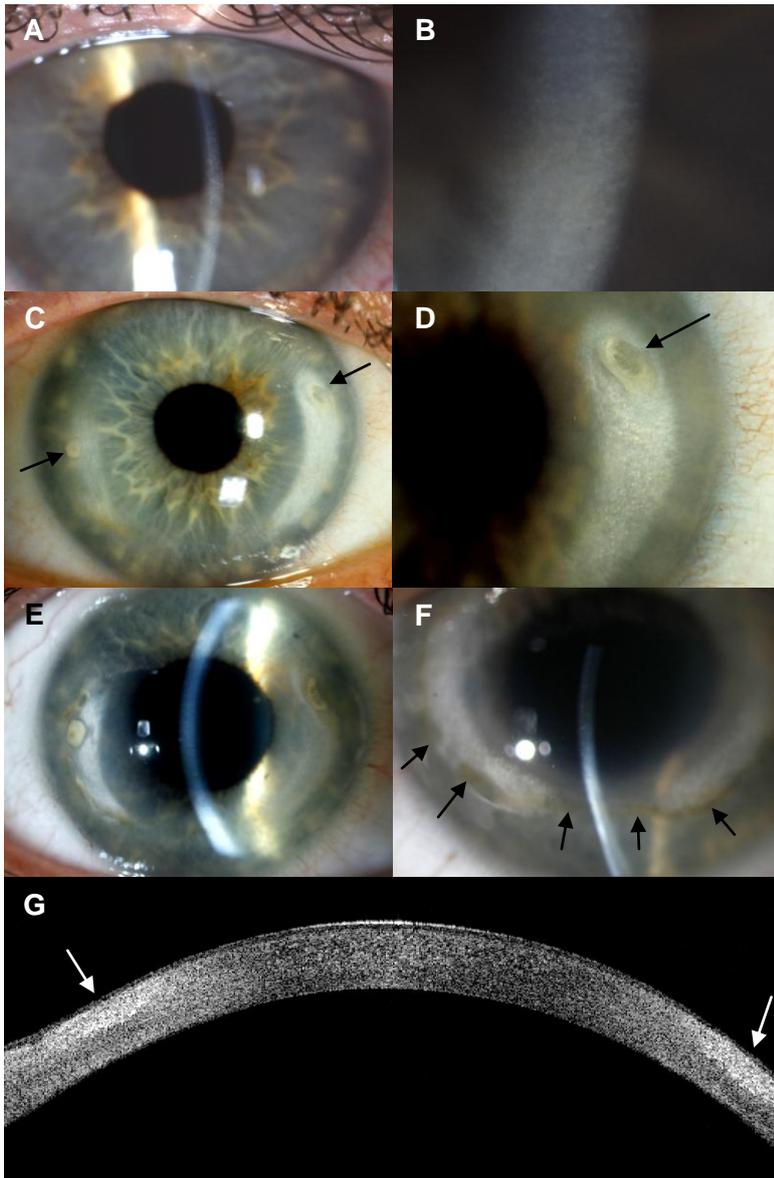


Figure 1. Corneal appearance over a 16-year period. In 1992, (A) circumferential, mid-peripheral band of involvement obscures iris details. (B) Close-up view of subepithelial fibrous tissue. In 2001, (C) pronounced densification of fibrous tissue in nasal and temporal regions. In certain regions the tissue appeared degenerative, with rounded, yellowish lesions (arrows). (D) Close-up view of fibrous material with lesion. In 2008, (E) an increase in size and number of yellow-gold colored corneal lesions. (F) Close-up view of ring of corneal lesions (arrows). (G) OCT image (2008) with bright areas (arrows) representing stromal opacification.

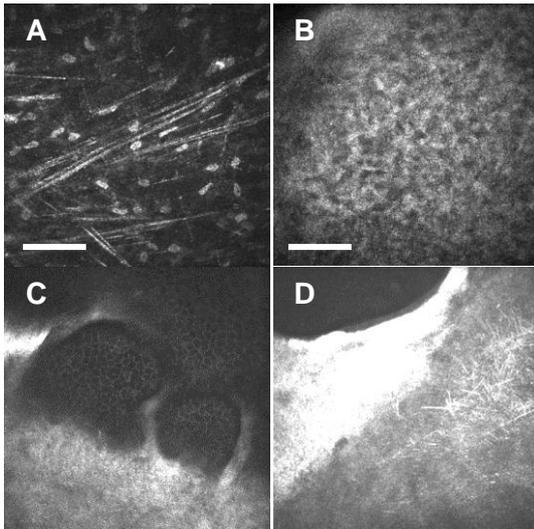


Figure 2. In-vivo corneal morphology in 2008. (A) Needle-shaped structures in the central corneal stroma (observed bilaterally), present from a depth of 150 μ m below the corneal surface down to the endothelium. (B) Keratocyte nuclei visible within the fibrous tissue in the mid-periphery. (C) Oblique image of lesion, consisting of fibrous tissue extending into epithelium. (D) Oblique section, with fibrous structures and dense, reflective material protruding into the epithelium. Scale bars = 100 μ m.