JAMA Ophthalmology Clinical Challenge

Pigmented Corneal Lesions After Cataract Surgery

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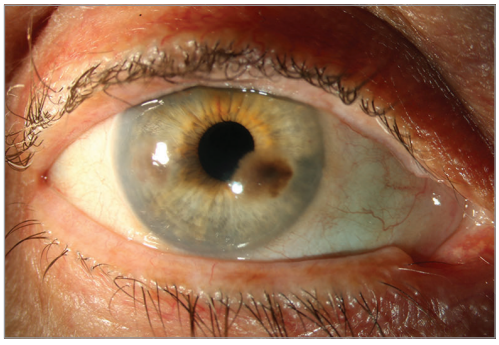
A Two darkly pigmented corneal lesions



B Location of the lesion on the right corneal endothelium and stroma

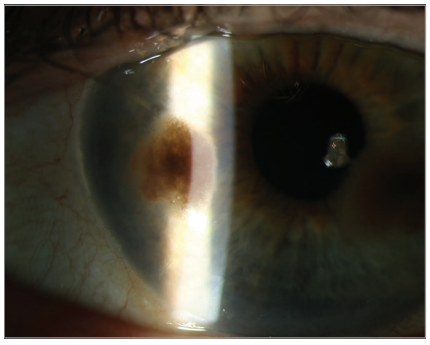


Figure 1. Slitlamp photographs of the right eye showing 2 darkly pigmented corneal lesions (A) and the location of the lesion on the right corneal endothelium and stroma (B). The third lesion is covered by the upper eyelid.

An 81-year-old woman was referred to our service for assessment of 3 darkly pigmented corneal lesions (**Figure 1**A). Two years ago, she underwent uncomplicated right cataract surgery at a different center. Her postoperative course had been complicated by persistent low-grade anterior uveitis for which she received maintenance loteprednol, 0.5%, eye drops on alternate days. She also used latanoprost eye drops at night in both eyes for primary open-angle glaucoma. Her medical history was only significant for hypertension, which was well controlled with ramipril. She denied any ocular trauma or recent travel outside of the country. Review of systems was unremarkable.

On examination, her visual acuity was 20/80 OD and 20/20 OS. Her intraocular pressures measured 17 mm Hg OD and 15 mm Hg OS. The right sclera and conjunctiva were white with 3 distinct hyperpigmented corneal lesions affecting the corneal endothelium and stroma (Figure 1B). There were 2+ cells in the anterior chamber and 1+ vitritis. Dilated fundus examination showed a normal retinal appearance.

WHAT WOULD YOU DO NEXT?

A. Increase the frequency of topical corticosteroids

B. Refer the patient to an ocular oncologist

C. Obtain aqueous fluid for fungal polymerase chain reaction

D. Obtain a vitreous biopsy for bacterial culture

Quiz at jamacmelookup.com

Diagnosis

Dematiaceous fungal keratitis

What to Do Next

C. Obtain aqueous fluid for fungal polymerase chain reaction

Discussion

The appearance of the pigmented corneal lesions is suspicious for a melanin-producing fungal infection. Dematiaceous fungi contain darkly pigmented hyphae and are ubiquitous in vegetation around the world. They are common causes of pigmented keratitis in tropical climates but uncommon in temperate regions.[1] Fungal infections should be considered in patients who are using long-term topical corticosteroids.[2,3] Other risk factors include diabetes, systemic immunosuppression, corneal decompensation, ocular trauma with plant material, and ocular surgery.[2,4] While fungal keratitis after cataract surgery, as in this case, has been described,[5] the true incidence of postoperative fungal keratitis and endophthalmitis is not known.

Intraocular fungal infections may have an insidious onset and can initially be misdiagnosed for an inflammatory pathology. It is not advisable to increase corticosteroid drops in the setting of suspected fungal keratitis without appropriate antifungal coverage[6] (choice A). Topical corticosteroids cause localized immunosuppression, leading to worse visual outcomes in patients with fungal keratitis.

To confirm a diagnosis of fungal keratitis or endophthalmitis, a microbiology specimen should be obtained. Lesions affecting the corneal epithelium and anterior stroma may be scraped and plated on Sabouraud agar or sent for fungal culture in brain-heart infusion.[4,7] In cases with posterior corneal involvement, as seen in this patient

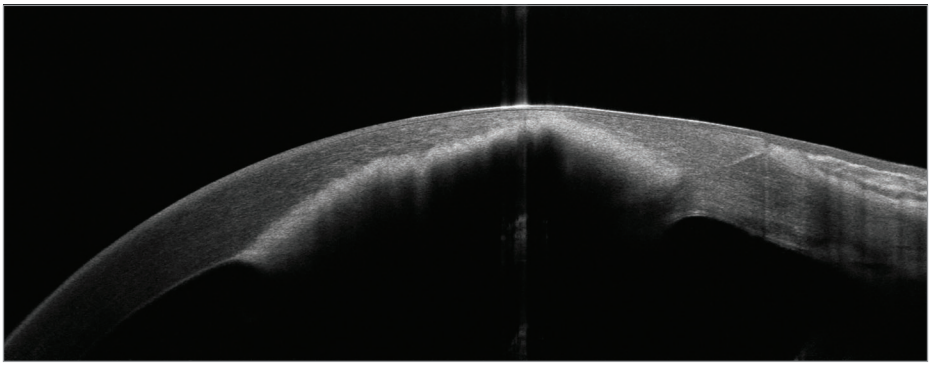


Figure 2. Anterior segment optical coherence tomography through the nasal pigmented corneal lesion showing the depth of fungal invasion through the corneal stroma and its location in relation to the corneal incision from previous cataract surgery.

(**Figure 2**), the corneal endothelium may be scraped and aqueous fluid should be sent for fungal polymerase chain reaction (PCR) (choice C).[7] Only a small sample is required for PCR to provide rapid results, which can help to initiate treatment while fungal culture results are pending.[4,7]

In vivo confocal microscopy is another useful noninvasive diagnostic adjunct. The presence of hyphae on In vivo confocal microscopy is suggestive of filamentous fungal keratitis. However, this user-dependent imaging modality does not replace microbiologic investigations as it cannot determine the fungal subspecies and antifungal sensitivities.[4,7] Vitreous biopsies may aid in the diagnosis of fungal endophthalmitis, especially in cases with chorioretinal involvement and vitritis.[8] While a vitreous sample may also be sent for bacterial culture (choice D), the pigmented corneal lesions are more suggestive of a fungal etiology and fungal PCR should be prioritized. Following a diagnosis of fungal keratitis, treatment options include topical, intrastromal, intraocular, and systemic antifungals.[2,5] Up to 40% of cases require surgical intervention such as a penetrating keratoplasty, but recurrence rates may be as high as 15%.[2]

The differential diagnosis for pigmented corneal lesions includes malignancies. Primary acquired corneal melanosis and corneal melanomas are very rare. In contrast to this case, they are not associated with intraocular inflammation and typically arise from the corneal epithelium.[9,10] In the absence of conjunctival melanosis or known ocular melanoma, it is essential to rule out an infective process before referring the patient to an ocular oncologist (choice B).

Patient Outcome

Aqueous fluid yielded a positive PCR result for *Botryosphaeriales* species, a dematiaceous filamentous fungus. The patient underwent a tectonic penetrating keratoplasty with a 9.25-mm graft and intracameral amphotericin B and voriconazole. Postoperatively, she was treated with oral voriconazole, topical natamycin, 5%, and topical voriconazole, 1%. Ciclosporin, 0.1%, eye drops were used instead of topical corticosteroids to reduce corneal graft rejection in the context of fungal keratitis. Unfortunately, 1 month later, she developed a recurrence. A combined sclerocorneal graft and intraocular lens explantation were performed and the patient is recovering from this procedure.

ARTICLE INFORMATION

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