To the best of our knowledge, this is the first national wellness survey among Canadian ophthalmology resident physicians. Our study revealed that a large proportion of resident physicians met the criteria for depression or burnout within a year prior to taking the survey. Unfortunately, some residents believed that their state of fatigue, burnout, or depression had adversely affected a medical outcome or judgement.

Coinciding with high levels of burnout and depression, many residents believed that there was minimal or no emphasis placed on promoting a culture of resident wellness within their respective training program. Furthermore, most residents did not have or were unaware of formal wellness programs intended to mitigate burnout. Moreover, aggression and intimidation at work was common, in addition to safety concerns while on call.

Based on the results of our study, more emphasis must be placed on Canadian resident physician wellness. One possible solution to better promote resident wellness would be to mandate the inclusion of wellness programming within ophthalmology training programs, with guidelines for development and continued evaluation. Increased promotion of resident wellness may allow for environments that are more conducive to learning and may reduce adverse patient outcomes secondary to resident physician stress and fatigue.

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Footnotes and Disclosure

The authors have no proprietary or commercial interest in any materials discussed in this correspondence.

Kodamea ohmeri keratitis

Kodamaea ohmeri is a yeast-like fungus and a rare but emerging pathogen.[1] It has been identified as the causative organism in fungemia, funguria, endocarditis, cellulitis, and peritonitis, often with high fatality rates.[1] To the best of our knowledge, there is only 1 previous report of *K. ohmeri* keratitis in the literature.[2]

A 43-year-old man working in the agricultural industry presented following minor trauma to his left eye by a fingernail. He complained of progressive vision reduction, redness, photosensitivity, and pain. The right eye had a long-standing history of poor vision secondary to corneal scarring following presumed microbial keratitis in childhood. Past medical history included severe eczema requiring immunosuppression with azathioprine and topical corticosteroid. At presentation, visual acuity was count fingers at 3 feet and 20/60 in the right and left eyes, respectively. Dense stromal infiltrate involving the left inferior midperipheral cornea, with an overlying epithelial defect, anterior chamber cells, and fibrin was noted (Fig. 1). The intraocular pressure and fundal examination were within normal limits. The right cornea had dense stromal scarring and neovascularization but showed no sign of active infection or inflammation. Scrapings of the left cornea demonstrated polymorphs, but no organisms were identified on microscopy or culture.

Emperical treatment with topical cefuroxime 5% and tobramycin 1.36% was commenced hourly. Topical prednisolone 1% administered 4 times daily was added 24 hours later. Initial symptomatic improvement was noted, but the epithelial defect and infiltrate failed to resolve. Owing to social circumstances, the patient missed follow-up appointments and re-presented 1 month later still using topical steroid with a reduction in visual acuity to 20/2000 OS. The corneal stromal infiltrate and epithelial defect had enlarged and were obscuring the visual axis. Further corneal scrapings showed no fungal elements, with only a light growth of *Staphylococcus aureus* on culture. Corticosteroid was discontinued and intensive fortified antibiotics resumed.

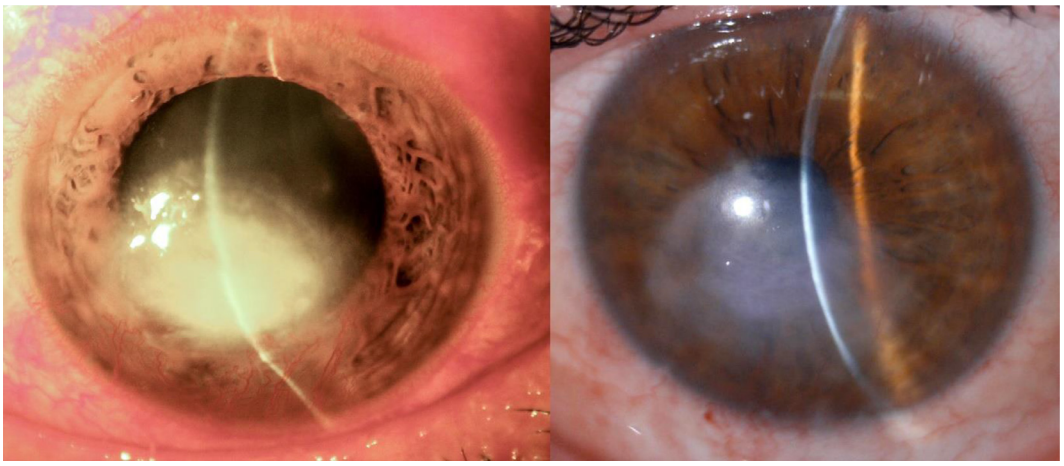

Fig. 1—(A) A large stromal infiltrate with irregular edges can be seen at presentation. There is a ring surrounding the infiltrate, with central stromal thinning and inferior neovascularization. (B) Following resolution of the keratitis, a large stromal scar remains affecting the visual axis.

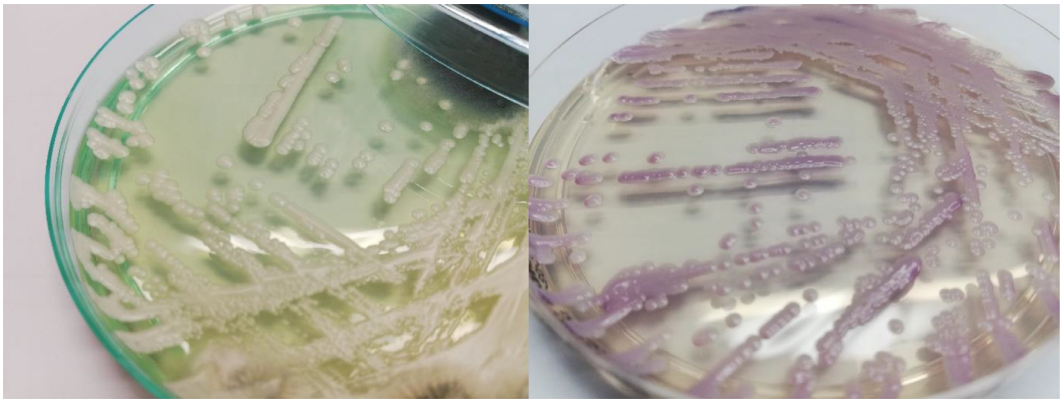

Fig. 2—Appearance of *K. Ohmeri* on (A) Sabourad dextrose agar and (B) chromogenic medium.

A corneal biopsy was performed and demonstrated spherical yeast cells on microscopy. Colonies resembling *Candida* were grown on culture (Fig. 2). *K ohmeri* was identified as the causative organism using VITEK mass spectrometry (MS) matrix-assisted laser desorption ionization time-of-flight (MALDI-TOF) technology (bioMérieux Inc, Durham, NC). Hourly topical amphoterecin B 0.15% and oral fluconazole 200 mg daily were commenced. Rapid improvement with decreased infiltrate and resolution of the epithelial defect followed. Treatment was tapered over 2 months. Visual acuity improved to 20/60 OS but was limited by residual central corneal scarring.

K. ohmeri is a yeast-like fungus used for fermentation in the food industry and can also be found in pools, sand, and plant materials.[1] Previously known as *Pichia ohmeri* and *Yamadazyma ohmeri*, it is a teleomorph of *Candida* that usually presents as an opportunistic infection in immunocompromised patients.[1]

In the only other case of keratitis owing to *K. ohmeri* found in the literature, there was preceding trauma by vegetative material in a patient with uncontrolled diabetes mellitus.[2] There are limited data on the risk factors, laboratory analysis, treatment, and prevention of *K. ohmeri* infection. However, ocular trauma with vegetative material is a major risk factor for any fungal keratitis.[3] Other risk factors include humid and tropical climates, contact lens wear, steroid use, keratoplasty, ocular surface disease, systemic immunosuppression, HIV/AIDS, and diabetes mellitus.[3,4] Although this patient had no history of direct trauma from vegetative material, there was trauma from a fingernail and the patient's occupation was in the agricultural industry. Furthermore, severe eczema requiring immunosuppression may have increased his risk.

Clinically, fungal keratitis can be difficult to distinguish from other causes of microbial keratitis and requires a high index of suspicion. Specifically, yeast-like fungi often mimic bacterial keratitis with a discrete infiltrate and overlying epithelial defect.[3] The lesions may appear elevated, firm, and white with feathery margins.[3] Satellite lesions, hypopyon, and ring infiltrates also may be present.[3]

Diagnostic testing based on samples collected from corneal scrapings, biopsy, and anterior chamber paracentesis can be used to confirm the diagnosis.[3] Direct microscopy of samples for fungal hyphae or yeast cells is undertaken using smears and stains such as potassium hydroxide, Gram, Giemsa, periodic acid–Schiff, and calcofluor white.[3]

Samples are also routinely cultured on blood, chocolate, and Sabouraud dextrose agar, although growth may take weeks.[3] Polymerase chain reaction has emerged as a rapid, sensitive, and specific test for fungal keratitis, but it is not widely available and remains primarily a research tool.[3]

Unfortunately, the diagnosis of fungal keratitis remains elusive and challenging in the clinical setting, resulting in treatment delays, as was the case for our patient with 2 previous corneal scrapings with no evidence of fungi found on microscopy or culture. In the previously documented case of *K. ohmeri* keratitis, there was also no growth on Sabouraud dextrose agar, and *K. ohmeri* was isolated using the commercial yeast detection kit API 20c (bioMérieux Inc, Durham, NC).[2] Noninvasive imaging modalities such as confocal microscopy and anterior segment optical coherence tomography have emerged as useful tools in the identification and monitoring of fungal keratitis but are not yet widely available.[3]

The treatment of fungal keratitis remains challenging because it often leads to deep stromal infections that are difficult to eradicate. Amphoterecin B, a polyene antifungal, has good coverage against *Candida* and related species and good ocular penetrance and bioavailability, thereby making it the treatment of choice in this case.[1,4] Systemic fluconazole was added because multiple agents are often required in the management of aggressive and persistent fungal keratitis.[4] In the previously reported case of *K. ohmeri* keratitis, a combination of fluconazole and amphoterecin B was also used with good response.[2] In systemic infections, *K. ohmeri* is generally susceptible to amphoterecin B but commonly resistant to fluconazole.[1]

Despite prolonged courses of antifungal agents, treatment success may be limited in fungal keratitis because of the fungistatic nature of the antifungal medications.[4] Penetrating keratoplasty has been shown to be an effective treatment in patients in whom antifungal agents fail to eradicate infection.[5] Recurrence following penetrating keratoplasty may be as high as 6.7%.[5] Risk factors include larger infiltrates, the presence of hypopyon, corneal perforation, lens infection, or corneal infection expanding to the limbus and preoperative steroid use.[5] Our patient eventually required a penetrating keratoplasty because of extensive scarring in the visual axis. To date, there has been no evidence of recurrence.

In conclusion, *K. ohmeri*, is an emerging pathogen that can cause severe keratitis in patients who are immunocompromised. As with other causes of fungal keratitis, the diagnosis and management can be challenging, and it is important to maintain a high index of suspicion.

Supplementary Materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.jcjo.2021.09.009.

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Footnotes and Disclosure

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