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Images in Clinical Tropical Medicine

Rapidly Progressing Fungal Keratitis with Endophthalmitis Post-Severe Acute Respiratory Syndrome Coronavirus 2 Infection

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A 56-year-old male farmer presented with a 1-week history of painful visual loss after trauma with a rice husk to his right eye. He had no history of diabetes or immune dysfunction. He was hospitalized a month previously for COVID-19 and...
had received five injections of intravenous methyl prednisolone (500 mg). At presentation, his visual acuity was perception of light. The cornea showed a full-thickness infection (Figure 1A). Ultrasonography showed a clear vitreous cavity (Figure 1B). Microbiology from corneal scrapings revealed fungal filaments (Figure 1C). Natamycin 5% eye drops hourly and oral ketoconazole 200 mg twice daily were started. However, the infection progressed rapidly (Figure 1D and E), and an urgent corneal transplant was done. Because the lens was also infected, cataract extraction was also performed (surgery 1). Despite this, the condition worsened over 2 weeks. The infection spread deeper to the posterior segment of the eye (endophthalmitis) (Figure 1 F and G), necessitating vitrectomy and injections of amphotericin B (50 µg) and voriconazole (100 µg) (surgery 2). Corneal tissue grew Fusarium solani (Figure 1H). Histopathology showed deep invasion (Figure 1I–L). Over the next 2 weeks, there appeared to be improvement; hence, topical prednisolone acetate 1% was started (4 weeks after transplant or 2 weeks after vitrectomy) (Figure 2A–D). At 5 weeks post-transplant, the patient seemed better; but, suddenly at 6 weeks, he presented with recurrence of infection in the graft (Figure 2E–H). As a last effort, repeat transplantation with intraocular wash was performed (surgery 3). One month later (Figure 2 I and J), the infection had resolved but the eye was already shrinking (phthisis). Histopathology again revealed fungal filaments (Figure 2K–N).

Fungal keratitis can worsen rapidly when associated with predisposing factors such as trauma, topical corticosteroids use, or uncontrolled diabetes mellitus.1,2 Therapy for COVID-19 infection often includes systemic glucocorticoids, among other agents, for acute respiratory involvement.3 Our patient developed infection 1 month after having COVID-19. His condition worsened despite aggressive medical and surgical

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**Figure 2.** (A) Four weeks after the first surgery, there was improvement. Graft edema persisted, but the epithelial defect and hypopyon had both decreased. Topical steroids were started because the condition was better. (B) The corresponding ultrasound shows a clear vitreous cavity and a detached, thickened choroid. Five weeks later, there is (C) further retraction of the hypopyon and clearing of the graft, with (D) corresponding ultrasound showing decreased choroidal thickening. (E) Six weeks postoperatively, the slit-lamp photograph of the graft shows recurrence of the infection superiorly. (F) The corresponding ultrasound shows a uniform increase in vitreous echoes suggestive of vitreous hemorrhage. (G) A week later (7 weeks after surgery), the graft is completely infected. (H) The corresponding ultrasound shows exudates and vitreous hemorrhage. (I) Four weeks after the second transplant, there is dense edema of the graft and blood in the anterior chamber (hyphema), but no infection. (J) Ultrasound shows persistent vitreous hemorrhage. Histopathology of the second corneal specimen shows (K) edematous, densely infiltrated tissue with neutrophilic exudates (hematoxylin–eosin stain, ×10 magnification) and (L) Descemet fragmentation (asterisk) (hematoxylin–eosin stain, ×10 magnification). Gomori methenamine silver stain shows the presence of fungal filaments (asterisk) (M) at the posterior stroma in a background of necrosis (×10 magnification); these filaments are also noted at the level of the Descemet’s membrane (N) (asterisk) (×20 magnification). This figure appears in color at www.ajtmh.org.
management. Decreased production of CD4+ T cells and CD8+ T cells, and decreased cytokines in COVID-19 have been associated with systemic immunosuppression, predisposing to secondary opportunistic infections (especially fungal).4,5 Fusarium infection itself is a poor prognostic factor because it is known to progress to endophthalmitis, which invariably has a poor outcome.2 We postulate that the weakened host immunity and the use of glucocorticoids in COVID-19 may have been an additional risk factor for the poor outcome in our patient.

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