Double Trouble: When Corneal Ulcers go from Bad to Worse

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Abstract

Fungal keratitis is an aggressive and difficult to treat condition that often requires surgical intervention for complete resolution. This case outlines the progression of treatment for fungal keratitis and potential complications that can arise.

Summary

A. Case History
   a. Patient Demographics
      i. 54 year old white female
   b. Medical History
      i. Severe Neuritis
      ii. Systemic Autoimmune Vasculitis
      iii. Raynaud’s
   c. Ocular History
      i. Severe Meibomian Gland Dysfunction
         1. Treated with:
            a. Intense Light Pulse Therapy
            b. Restasis
            c. Autologous Serum Tears
      ii. Blepharitis
      iii. Verisyse IOL OS
      iv. Hx of Scleritis OS in fall of 2015
         1. Taking oral prednisone

B. Pertinent Findings
   a. Clinical/Physical/Laboratory Findings
      i. 10/27/15: patient presents with pain/light sensitivity
         1. Diagnosed with peripheral corneal ulcer OS
         2. 4+ Staphylococcus aureus, 2+ Pseudomonas aeruginosa. (on 11/3/15 appointment)
         3. 11/9/15: start doxycycline due to corneal thinning
      ii. 3/23/16: Central corneal ulcer OS with 1.5mm hypopyon
         a. 3/28/16: culture 4+ Coag Negative Staph
         b. Resistant to multiple abx including PCN, Levoflox, Cipro, Cefazolin, Tetracycline, Erythromycin
      iii. 5/18/16: Penetrating Keratoplasty OS
         1. Culture taken at time of surgery grew 4+ candida parapsilosis
      iv. 7/29/16: Likely infection of PKP
         1. Unsure of infective etiology, cultures obtained today
      v. 8/1/16: OD Follow up visit due to increased discomfort
1. Patient taking natamycin q2h
2. Patient presented with Kontur lens and amniotic membrane in place
   vi. 8/9/16: Repeat PKP

C. Differential Diagnoses
   a. Bacterial Keratitis – Primary
   b. Fungal Keratitis
   c. Acanthamoeba Keratitis

D. Diagnosis and Discussion

Fungal Keratitis is an aggressive, difficult to treat ocular condition. Although the exact incidence is unknown, it is believed to be more common in warm climates. The most significant risk factor associated with fungal keratitis is ocular trauma, specifically with vegetative material but can also be caused by immunosuppression and use of oral steroids. Patients often present with redness, photophobia, tearing and/or mucopurulent discharge, and significant pain. Although clinical appearance varies based upon the type of infective organism, patients will often present with white corneal infiltrates with feathery borders, and there are frequently satellite lesions on other areas of the cornea. In addition, the patient will often exhibit signs of conjunctival injection, anterior chamber reaction, and possibly hypopyon.

There are multiple organisms that are known to cause fungal keratitis including Fusarium, Aspergillus, Cephalosporium, and Candida. With the exception of Candida, most of the organisms are native to warmer regions. Determination of the type of fungus causing the infection can be determined using laboratory evidence. Popular laboratory tests used to isolate the infective organism include Sabouraud’s agar without cycloheximide, Periodic acid-Schiff Stain (PAS), Gram Stain, and Gomori’s Methanamine Silver (GMS). Once cultured, Fusarium, Aspergillus, and Cephalosporium have a multicellular appearance whereas Candida is unicellular yeast.

In the case of our patient, it is believed that the initial fungal infection arose due to her autoimmune disease, compounded by the fact she was using long-term oral steroids. Because her cornea was already compromised from the initial bacterial keratitis as well as neurotrophic keratitis, the infection was difficult to treat topically and surgical intervention was necessary. Cultures taken at the time of surgery indicated a robust candida infection as the cause of the fungal keratitis.
E. Treatment, Management

Initiation of treatment should be swift and aggressive to ensure the best visual outcome. Typical treatment of fungal keratitis consists of topical antifungal medications every one to two hours around the clock. If the infection is severe enough, oral antifungal medications may be warranted. It is vital to note that use of topical steroids is contraindicated in the treatment of fungal keratitis. Patients undergoing treatment should be followed daily until improvement is seen, however full resolution may take weeks to months. In severe cases, penetrating keratoplasty (PKP) may be the best course of treatment however; research suggests that, in the absence of perforation, topical and oral treatment should be used for seven to ten days before considering PKP. Approximately 12-38% of fungal keratitis cases are treated with PKP.

Healing of the PKP was typical after the procedure, however after a few months, she developed another presumed fungal keratitis. The patient was started on an aggressive course of topical Natamycin and fortified Vancomycin to treat any concurrent bacterial infection. Cultures obtained on July 29th verified a recurrent candida infection. Due to her poor response to topical treatment, repeat PKP was performed. To prevent further infection, the patient continued use of Natamycin post-operatively and began oral Fluconazole. As an added precaution, the surgeon performed an anterior chamber rinse with both Amphotericin B and Voriconazole during the surgery.

It is estimated that approximately 5-14% of patients treated with PKP for fungal keratitis have a recurrent infection. There are a few factors that have been shown to increase the risk of fungal keratitis including, preoperative hypopyon, corneal perforation, and infection that extends to the limbus. In this case, the patient did present with a hypopyon at the time of initial infection; however, the surgeon believes the likely cause of repeat infection in this case is colonization of candida from the lids onto the compromised corneal epithelium. Other factors that may have contributed to recurrent candida infection in this patient include her history of autoimmune disease and steroid use; it is also possible that the initial graft was not large enough to eradicate all of the infected tissue. At the time of her last follow up, the patient was not showing any signs of fungal infection.

F. Conclusion

This case illustrates the unique challenges that arise when treating fungal infections. The course of treatment used follows the traditional progression; beginning with use of topical drops, following with the addition of oral medication, and finally to surgical intervention. This case also exemplifies potential complications that can arise when dealing with fungal keratitis, even after penetrating keratoplasty. Because complications can be so visually devastating, close follow up is critical. It is important to educate patients on the length of time treatment can take before resolution of fungal infections is achieved as well as manage their expectations for visual outcome.
G. Bibliography


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