A Corneal Suture & Staphylococcus lugdunensis: Two Uncommon Causes of a Corneal Ulcer

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Abstract

A corneal ulcer due to an old corneal suture is cultured and is positive for Staphylococcus lugdunensis, a coagulase-negative, gram-positive bacterium rarely linked to infectious keratitis. This case reviews this uncommon bacterial origin.

I. Case History

A. 68 year old white male
B. Chief complaint: Redness & blur OS
   1. Onset 5 days prior
   2. Patient reports he had an earache at that time and was also coughing frequently
   3. Minimal pain OS; only “pressure” when he bends over
   4. He had not self-medicated
C. Ocular History
   1. H/o inferior retinal detachment OS x 9/2013 with resulting choroidal hemorrhage
      a. Secondary to blunt trauma OS
      b. Surgical treatment: choroidal drainage/pars plana vitrectomy/endolaser 360/silicone oil
      c. Vision was reduced to count fingers OS following the incident
   2. Aphakia OS x 10/2013
   3. Ocular hypertension OS
   4. Myopia/Presbyopia OU
D. Medical History
   1. Chronic ischemic heart disease with h/o myocardial infarct
   2. Paroxysmal atrial fibrillation
   3. Hypertension
   4. Hyperlipidemia
   5. Pre-diabetes
   6. Asthma/COPD
   7. Osteoarthritis
   8. Hypothyroid
   9. Atopic dermatitis
E. Medications
   1. Acetaminophen 500 mg TID
   2. Albuterol 90 mcg (CFC-F) 200D Oral inhale 2 puffs every 6 hours prn
   3. Aspirin 81mg QD
   4. Atorvastatin 80mg QD
   5. Budesonide 160/Formoter 4.5mcg 120D inhale 2 puffs bid
   6. Dorzolamide 2% ophthalmic solution BID OS only
   7. Furosemide 20mg 3 tabs PO BID
8. Hydrophor topical ointment BID
9. Levothyroxine 0.05mg tab PO QD
10. Lidocaine 5% ointment BID prn
11. Metoprolol 50mg BID
12. Mycophenolate 500mg BID
13. Omeprazole 40mg QD
14. Oxygen gas 2.5 L by nebulizer QHS
15. Tiotropium 18mcg inhl cap QD
16. Triamcinolone acetonide 0.1% ointment QD
17. Warfarin 2.5mg QD

II. Pertinent Findings
A. Clinical
1. BCVA: OD: 20/20-2, OS: LP (previously 10/500 OS in April 2015)
2. Pupils: OD: brisk reaction to light, OS: iatrogenic round fixed 5mm pupil, (+) APD OS on reverse testing – stable since retinal detachment OS
3. Anterior Segment
   a. Normal OD
   b. Cicatricial lower lid ectropion with an ectopic puncta OS
   c. Grade 4 bulbar hyperemia and chemosis OS
   d. Old corneal sutures at 3 and 6 o’clock OS
   e. 3x3mm corneal ulcer at 6 o’clock (with overlying epithelial defect, stromal thinning, and stromal infiltrate with smooth borders)
   f. Extensive anterior chamber reaction with grade 4 flare/cells/fibrin
4. IOP: 13/18 mmHg (dorzolamide BID OS)
B. Imaging
1. B-scan: clear OD, chronic retinal detachment OS
2. External photos taken
3. Anterior segment OCT is pending
B. Laboratory Studies
1. Mycology culture: saboraud dextrose agar
2. Bacteriology culture
   a. Blood agar
   b. Chocolate agar
   c. Anaerobic blood agar
   d. Thioglycollate broth
3. Antibiotic Susceptibility Report
   a. Clindamycin
   b. Erythromycin
   c. Gentamicin
   d. Oxacillin
   e. Penicillin
   f. Tetracycline
   g. Trimethoprim/Sulfamethoxazole
   h. Vancomycin
III. Differential Diagnoses

A. Primary: Bacterial corneal ulcer secondary to an old corneal suture

B. Secondary:
   1. Sterile infiltrate from staph lid disease
   2. Prior sterile infiltrate which has ulcerated
   3. Fungal corneal ulcer
   4. Viral corneal ulcer (herpes simplex)
   4. Bacterial ulcer secondary to ocular surface disease

IV. Diagnosis and Discussion

A. At initial presentation, the diagnosis of corneal ulcer was made vs. a less likely corneal infiltrate due to the clinical appearance. The epithelial defect size was equal to that of the underlying stromal opacification, there was generalized conjunctival hyperemia, and cells were present in the anterior chamber, all pointing towards the diagnosis of an infectious corneal ulcer.

B. Surprisingly, the patient was not in a significant amount of pain. This was due to longstanding corneal hyposthesia, likely from the patient’s ocular surface disease and history of ocular surgery.

C. The corneal ulcer was immediately cultured for bacteria and fungi. The primary differential was a bacterial etiology rather than fungal because the borders of the corneal ulcer were smooth rather than hyphate. In addition, there was no history of vegetative exposure and fungal ulcers are less common in this part of the country. We are still awaiting the 4 week results of the fungal culture, but currently, no growth has occurred.

D. An ulcer due to herpes simplex virus was less likely as there was no prior history of HSV, there were no stromal vessels, there were more white cells than lipid/edema, and the lesion did not have a dendritic appearance.

E. The bacterial culture results were positive for Staphylococcus lugdunensis, a coagulase-negative, gram-positive bacterium. Culturing ruled out the most common bacterial agents including Staphylococcus epidermidis (40% of corneal ulcers), Staphylococcus aureus (22%), and Streptococcus pneumoniae (8%). S. lugdunensis is found on the skin as part of our normal flora, but has been linked to opportunistic infections such as post-operative endophthalmitis, endocarditis, urinary tract infections, and intravascular catheter infections. There is less in the literature on S. lugdunensis compared to other commensal bacteria, in part, because it was not identified as a distinct species until more recently in 1988. To date, there have been 3 documented cases of S. lugdunensis isolates causing corneal ulcers.

F. One of the corneal sutures from the patient’s cataract surgery in October 2013 served as the entry site for the infectious agent. This is a fairly uncommon cause of corneal ulcers. One study found that sutures left in following penetrating keratoplasty caused an infectious keratitis in 12 out of 361 grafts (3.3%), and the average time of onset was 30.8 months after the surgery. None of the 12 documented cases were from S. lugdunensis.

G. The patient also had lower lid ectropion and corneal exposure, predisposing him to ocular dryness and irritation of the corneal surface.
V. Treatment and Management

A. At initial presentation, the patient was started on topical Vigamox 1 gtt Q 2 hours OS, a fourth generation fluoroquinolone that is potent against gram-negative bacteria and most gram-positive. He was also started on erythromycin 0.5% ung QHS OS for gram-positive antibiotic coverage during the night. These antibiotics were chosen based on broad-spectrum coverage since we did not yet have the culture results back. Once cultured, the susceptibility reports came back indicating *S. lugdunensis* is pan-sensitive to all antibiotics tested, and the therapy was maintained. An aggressive antibiotic course is recommended in order to achieve the best visual prognosis when treating corneal ulcers.

B. Atropine 1% ophthalmic solution was prescribed BID OS for comfort.

C. Because the corneal suture was the entry point for the bacteria, both corneal sutures were removed in-office.

D. Once the epithelium had healed 1 week later, Vigamox and erythromycin were discontinued and Flurometholone QID OS was initiated to treat the residual stromal infiltrate and any inflammatory component.

E. Lacrilube ointment was prescribed QHS OS and preservative free artificial tears were prescribed 6x/day OS in order to maintain ocular hydration.

F. The patient is still being followed closely. He has a consult with our oculoplastics specialist with the recommendation of lid repair for ectropion. The goal is to eliminate the ocular exposure while sleeping in order to reduce the possibility of recurrence.

VI. Conclusion

*Staphylococcus lugdunensis* is rarely reported as a cause of corneal ulcers yet must still be considered in your list of differentials. Culturing the ulcer is expected to narrow down the causative agent in order to treat the infection most effectively. This coagulase-negative, gram-positive bacterium is pan-sensitive to antibiotic treatment, which should be started immediately and aggressively for the best visual outcome. Unfortunately, this patient had a history of a prior retinal detachment in the same eye, so while his vision did improve after treatment of the corneal ulcer, it is still limited. Importantly, the old corneal suture had served as the entry site for infection. This is an example of why removing the sutures following surgery is recommended, with the average infection occurring 30.8 months after surgery. The dry eye component should also not be overlooked, as ocular dryness is another predisposing factor to corneal ulcers.

Bibliography


