A Myriad of Coconspirators Leading to Ulcerative Keratitis

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Abstract: Peripheral ulcerative keratitis is a diagnosis attributed to a vast array of infectious, non-infectious, and immune etiologies. We present a patient with severe autoimmune disease and concomitant surface ocular disease leading to a peripheral ulcerative keratitis.

Case History

- A 47-year-old Hispanic female presents for evaluation of keratoconjunctivitis sicca secondary to Sjogren’s syndrome.
- Chief complaint: Decreased vision, photophobia and pain OS>OD that have worsened since starting new eye drops (FML 0.1% BID OU and Voltaren 0.1% BID OU) prescribed by ophthalmologist 2 weeks prior.
- Ocular history is remarkable for chronic keratoconjunctivitis sicca OU secondary to Sjogren’s syndrome as well as Epithelial Basement Membrane Dystrophy OU.
- Ocular Medications: Patient is currently using FML 0.1% BID OU, Voltaren 0.1% BID OU, Refresh Liquigel q2hrs OU, and Refresh Lacrilube qhs OU.
- Systemic history is remarkable for Sjogren’s syndrome diagnosed in 1999, MALT Lymphoma diagnosed in 2010, anemia and presumed discoid Lupus.
- Systemic Medications: Rituxan – one IV infusion in 09/2010 and 04/22/2011; Prednisone – 5mg qd; Tylenol Arthritis – 1300mg q8hrs as needed; Albuterol – one puff q4-6hrs as needed; Singulair – one tablet orally qhs; Iron Supplement; Folic Acid; B vitamin supplement.

Pertinent Findings

- Distance visual acuity without correction was 20/50 OD with no improvement on pinhole and 20/200 OS with improvement to 20/100 on pinhole.
- Pupils were equal round and responsive to light with no afferent pupillary defect OU
- Confrontation fields and extraocular motilities were unremarkable OU
- Biomicroscopy of anterior segment shows
  - Conjunctiva: white and quiet OU
  - Cornea: 4+ diffuse PEK with (+) NaFl and (+) RB staining OU; instant TBUT OU; 3.5mm round epithelial/sub-epithelial defect with surrounding edema superior nasal OS
  - Anterior Chamber: hazy view OU; appears deep and quiet OU
  - Iris: hazy view OU; appears flat OU
  - Lens: hazy view OU; appears clear OU
- Schirmer’s testing results were 4mm OD and 3mm OS
Differential Diagnosis

- Peripheral Ulcerative Keratitis secondary to Sjogren’s syndrome – usually results secondary to Rheumatoid Arthritis but few cases of PUK in primary Sjogren’s syndrome have been documented.  
- Sterile Corneal Ulcer secondary to keratoconjunctivitis sicca
- Recurrent Corneal Erosion secondary to Epithelial Basement Membrane Dystrophy – played a role in the dense keratitis, however, due to the presence of a round, peripheral, epithelial defect with trace stromal thinning, additional etiologies were investigated.
- Corneal Melt secondary to topical non-steroidal anti-inflammatory drug use (Voltaren)
- Corneal abrasion – usually presents with linear staining epithelial defect, limited in presentation and ocular discomfort.
- Neurotrophic keratopathy – patients will exhibit decreased corneal sensitivity with minimal pain on presentation. Oval lesion with rolled edges over lower one half of cornea.

Diagnosis and Discussion

- Peripheral Ulcerative Keratitis was diagnosed based on the clinical appearance as well as the patient’s systemic and ocular history.
- A corneal ulcer is defined as a disruption in the corneal epithelium with involvement of the stroma. This condition is usually related to inflammation, either sterile or infectious, or immune mediated.
- Autoimmune ulcerative keratitis is associated with connective tissue disease such as Sjogren’s Disease, Systemic Lupus Erythematosus.
- Immune related ulcers are generally peripheral, whereby sterile or infectious corneal ulcers can be either peripheral or central.
- Pathogenesis of autoimmune corneal ulcers is unknown. It has been proposed that the immune system is responding to unknown antigens, production of antibodies and activation of the complement pathway. Genetic and environmental agents also play a role.
- Sterile corneal ulcers can develop from multiple etiologies including chemical burns, thermal burns, keratoconjunctivitis sicca (Sjogren's), neutrotrophic, exposure, medicamentosa, atopic, basement membrane abnormalities.

- The etiology of the ulcerative keratitis presented in this case is multifactorial. The patient has severe autoimmune disease (Sjogren's and discoid lupus), a history of both corneal basement membrane abnormality (EBMD) and the use of topical NSAIDs (Voltaren), severe dry eye and an immunomodulating agent (Rituxan) associated with dry eye.

- Thus, the etiology is truly a combination of various ocular and systemic factors.

**Treatment and Management**

- Co-management with general ophthalmologist
- Discontinue current topical medication (FML and Voltaren)
- Instructed patient to use Tobrex ung TID OU with pressure patching of the left eye
- Follow up at 1 day showed an improving epithelial defect OS of 3mm compared to 3.5mm previously and modest improvement in patient symptoms.
- Follow up at day 3 showed full re-epithelialization of the epithelial defect OS with continued 4+ diffuse PEK and an immediate tear break up time. Patient symptoms continued to improve.
- Long term use of scleral contact lenses was recommended

**Conclusion**

Peripheral ulcerative keratitis is an entity attributed to multiple ocular and systemic diseases. We present a severe case of ulcerative keratitis, multifactorial in nature. The patient's autoimmune disease, corneal disease, and overall systemic health contributed to the severe nature of the presentation.

**Bibliography**