



Sterile corneal infiltrates

Contact lens case study – Eye series 8

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A 30 year old woman presented to her optometrist complaining of ocular irritation. The patient had also noticed a number of small, round whitish spots on the inferior section of her cornea (Figure 1). No discharge was noted. The eye, however, appeared more inflamed than usual. Testing confirmed no change to her vision. The optometrist made a provisional diagnosis of sterile corneal infiltrates secondary to soft contact lens use and referred the patient to you for antibiotic and anti-inflammatory drops to help resolve the condition.

Question 1

What causes sterile corneal infiltrates?

Question 2

Who is most at risk of developing this condition?

Question 3

Name the differential diagnoses.

Question 4

Has the optometrist suggested the correct treatment?

Question 5

When should this patient see an ophthalmologist?

Question 6

What other conditions can contact lens use lead to?

Question 7

Describe the proper regimen for contact lens wear.



Figure 1. White spots on the inferior section of the cornea



Figure 2. Scarring after Acanthamoeba keratitis

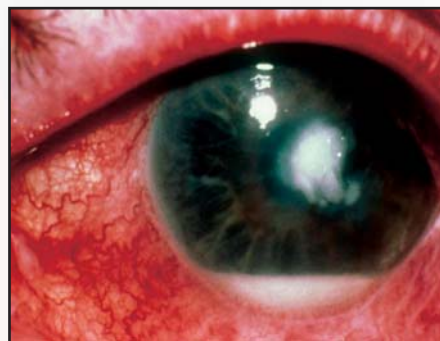


Figure 3. Hypopyon and central ulcer due to bacterial keratitis



Figure 4. Papillae due to GPC

Answers

Answer 1

Sterile corneal infiltrates represent an immunological reaction to low virulence pathogens introduced to the cornea. Exotoxins released by low virulence bacteria induce the corneal changes through the antibody – antigen reactions. The infiltrates are often bilateral on presentation and usually multiple and peripheral in location. Commonly, a clear area is seen between the infiltrates and the limbus.

Answer 2

Risk factors for development of infiltrates include:

- collagen vascular disease
- dry eye
- extended wear of contact lenses
- poor lens hygiene, and
- hypoxia.

The risk of infiltrates may be higher in disposable soft contact lens wearers due to frequent necessary manipulation and increasingly common poor cleaning.

Answer 3

Differential diagnoses include:

- bacterial keratitis (Figure 2)
- fungal keratitis
- viral keratitis, and
- Acanthamoeba (protozoan) keratitis (Figure 3).

Infectious infiltrates can be differentiated through both clinical signs and symptoms. The presence of significant pain, purulent discharge and anterior chamber inflammation are associated with infectious ulcers. Corneal oedema around the infiltrate is also a common sign of infection. Patients with microbial keratitis will present with acute pain, light sensitivity, purulent discharge and reduced vision. Microbial keratitis, unlike sterile corneal infiltrates, will usually show a significant epithelial defect overlying the infiltrates. Acanthamoeba keratitis often causes severe pain out of proportion to the clinical signs. If the diagnosis is in doubt the infiltrate should be treated as infectious.

Answer 4

A red eye in a contact lens wearer is almost always secondary to the lens or contact lens solutions. The first step is to remove the contact lens. Immediate treatment with topical antibiotics is appropriate to eradicate the bacteria causing sterile infiltrates and prevent potentially harmful complications of a significant sight threatening infection. If inflammation continues or increases in severity topical corticosteroids such as fluoromethalone should be added to the regimen. Care should be taken to avoid corticosteroids if an epithelial defect exists. The patient should not wear lenses until the infiltrates have healed and the patient counselled on lens care and cleaning regimens.

Answer 5

The patient should be referred to an ophthalmologist if the diagnosis of sterile infiltrates is not conclusive or, the condition does not improve with treatment. The presence of central lesions and/or epithelial defects should also warrant immediate referral.

Answer 6

Contact lenses affect (both directly and indirectly) the structures of the eye. Complications include:

- ptosis
- giant papillary conjunctivitis (GPC). Up to 3% of contact lens wearers will develop GPC as a result of lens wear. Deposits on the lens (such as protein build up) continually rub against the conjunctiva creating an immune response. This leads to further inflammation and subsequent papillae formation on the inside of the eyelid (Figure 4)
- allergic reaction to cleaning or storage solutions. This is mostly seen in soft contact lenses and is commonly due to the preservatives in solutions. Symptoms tend to resolve after the chemical disinfecting solution is discontinued. Changing to a preservative free hydrogen peroxide cleaning system will

help to prevent further symptoms

- ‘tight lens syndrome’. The lens ‘tightens up’ reducing the tear flow and oxygen supply to the cornea. Referral to an optometrist to refit the lens is necessary
- neovascularisation of superior limbal vessels. Although usually asymptomatic, this can lead to discomfort and possible visual distortion in extreme cases
- corneal warpage is more often seen in hard lens wearers and can cause deterioration of visual acuity. This should return to normal with the discontinuation of lens wear, but may take several weeks to months. Vision may fluctuate during this period
- corneal ulcer (as a result of trauma or contamination to the cornea).

Answer 7

Strict adherence to a cleaning regimen is vital to avoid complications. Contact lens care consists of:

- lens being stored in solution immediately after removal from the eye
- irrigating and gently rubbing clean the lens before the next use
- handling the lens carefully during cleaning to avoid tears or splits. Split lenses will cause irritation and possible epithelial damage to the cornea
- rinsing the lens thoroughly before placing onto the eye
- supplementing the tear film with non-preserved artificial tears
- changing storage solution frequently
- cleaning cases routinely or exchanging at monthly intervals avoids build up of harmful bacteria
- visiting an optometrist every six months to check for any changes.

Contact lenses are a highly effective and successful form of optical correction, but patients need to be careful with lens maintenance and vigilant about the warning signs of potentially serious complications.

Conflict of interest: none declared.

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