

You're the Flight Surgeon

This article was prepared by Robert Kitz, M.D.

You're the flight surgeon at an advanced jet training wing. After clinic hours, you begin working on a list of waivers when a 24-yr-old Caucasian male student pilot walks into your office. "Hey Doc, can I talk to you about something?" Unsure what is coming next, you invite him to sit down. He then complains that his right eye has been red since last week. He tells you he just got back from a trip to Colorado, where he had been skiing in the dry air. So, he believes his symptoms may be due to a dry eye. However, he also states that he first noticed symptoms the day before he left. He reports itching and occasionally watery eyes, but denies any pain, foreign body sensation, crusting, or change in his vision. He denies any recent illnesses or having been around anyone else with similar symptoms. He does not wear contacts. As you are speaking, you notice injection throughout the right sclera. It appears his left eye is injected as well, but not as severely.

1. What should you do?

- A. Prescribe artificial tears.
- B. Prescribe an antibiotic ointment.
- C. Prescribe steroid drops.
- D. Perform a thorough eye exam.
- E. Refer him to optometry.

ANSWER/DISCUSSION

1. D. A thorough eye exam should be performed after taking an adequate history. While you may end up prescribing an antibiotic ointment or steroid drops, doing so without further examining the eye would be inappropriate, as serious diagnoses could be missed. During the eye exam, visual acuity should be checked even if the patient denies any changes to his vision, as changes could be subtle and indicate a serious and urgent condition. Remember to check each eye individually by covering the opposite eye, as unilateral visual acuity changes can go undiscovered if visual acuity is checked with both eyes open. Check that the pupils are symmetric, round, and reactive to light, the extra ocular muscles are intact, and there are no visual field deficits. Additionally, pay close attention to the external portions of the eye, looking for any gross abnormalities such as proptosis, growths, and periauricular lymphadenopathy.

A thorough eye exam should also include a slit lamp exam. A slit lamp is the best way to exam the eye because it allows you to see anatomical changes that cannot be seen with the naked eye or under fluorescent clinic lights. Using the slit lamp, seven aspects should be inspected: 1) the lids/lashes and lacrimal system (i.e., punctum and caruncle); 2) the conjunctiva/sclera; 3) the cornea; 4) the anterior chamber; 5) the iris; 6) the lens; and 7) the vitreous humor. If you are unfamiliar with the conditions of the eye or have limited experience with the slit lamp exam, consulting optometry or ophthalmology for a second opinion may be a good idea.

On further exam, the pilot's visual acuity is 20/20 in both eyes and his pupils are equal, round, and reactive to light. His extraocular muscles are intact and he has no visual field deficits. There are no gross abnormalities to the external anatomy of his eyes. Under the slit lamp, you see that the lashes have no crusting or inwardly directed eyelashes and that there are multiple small telangiectasias along the slightly thickened lid margins bilaterally. A string of frothy papules is also present along the posterior aspect of the lid margins. When flipping the lids, no cobblestoning is present. The conjunctiva/sclera contain increased vascularization that stops at the limbus, with the right more severe than the left. The cornea has small irregularly shaped areas of minor fluorescein uptake bilaterally. The anterior chamber has no infiltrates. The iris appears normal, and the lens and vitreous are unremarkable.

2. What is the most likely diagnosis?

- A. Acute viral conjunctivitis.
- B. Episcleritis.
- C. Blepharitis.
- D. Scleritis.
- E. Ocular rosacea.

ANSWER/DISCUSSION

2. C. Blepharitis is inflammation of the eyelid margins and commonly presents with one or more of the follow symptoms: itching, burning, a foreign body sensation of the eye, red eye, tearing, blurred vision, and photophobia. Pain, if present, is minor. On physical exam, the eyelid

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margins are commonly red, thickened, and contain prominent telangiectasia.^{1,5} The eyelashes often contain a flaky crusting, referred to as “scurf.” The bulbar conjunctiva is injected. The cornea may have associated abrasions, as seen in this case, or punctate keratopathy, which presents as pinpoint corneal epithelial defects that stain with fluorescein.^{1,3,5} Frequently, blepharitis presents with meibomitis, described as thickened and congealed meibomian glands, which usually appear as a string of frothy papules along the posterior lid margin. This is best seen on slit lamp exam. When meibomian glands are involved, it is classified as posterior blepharitis in contrast to anterior blepharitis, which involves only the anterior lid margins and eyelashes. However, both anterior and posterior blepharitis are often present in a presenting patient.^{1,3}

The cause of blepharitis is not totally understood and appears to be multifactorial.¹ Most agree that an increase in bacterial colonization (most commonly with *Staphylococcus*, *Propionibacterium*, or *Corynebacterium* species) and inflammation contribute to the pathology of anterior blepharitis.^{2,8,9} However, some cases of anterior blepharitis appear to be only seborrheic in nature.⁹ Posterior blepharitis is believed to result from meibomian gland dysfunction. Meibomian gland dysfunction causes a variety of symptoms (e.g., tear film instability, increased tear evaporation, tear hyperosmolarity, and meibomian gland obstruction) that are believed to create an environment prone to bacterial overgrowth, resulting in inflammation and damage to the eyelids and cornea.³

Some studies have identified an increase in fungal colonization of the eyelid in blepharitis patients and improvement of symptoms with antifungal use.⁴ Other studies have identified an association between blepharitis and the use of the acne medication isotretinoin, likely because the medication has been shown to cause an increase in conjunctival colonization with *Staphylococcus aureus* and disrupt tear film formation.¹ Some in the medical community argue that a species of Demodex (a common mite) can cause blepharitis, based on studies showing an increase of Demodex colonization in patients with blepharitis.^{1,3}

Acute viral conjunctivitis (commonly known as “pink eye”) often presents with similar features to blepharitis, including conjunctival hyperemia (usually quite significant), itching, burning, or a foreign body sensation. Also, patients often complain of discharge with the affected eyelid stuck shut that is worse in the morning. However, symptoms are usually associated with a recent upper respiratory tract infection or contact with someone else with a “pink eye,” which is not common in blepharitis. On physical exam, the following may be seen: watery discharge, red swollen eyelids, pinpoint subconjunctival hemorrhages, pseudomembrane formation in the palpebral conjunctiva, punctate keratopathy (pinpoint corneal epithelial defects that stain with fluorescein), corneal epithelial microcysts (multiple microscopic nodules over the cornea), and, in some cases, palpable preauricular lymph nodes.⁵ None of these symptoms were seen in this case.

Episcleritis can also represent as a red eye with mild or no pain. More commonly it presents with engorged episcleral vessels confined to a localized sector of the eye; less commonly it presents with diffuse engorgement of vessels in one or both eyes. On physical exam, vision is unchanged and there is often mild to moderate tenderness of the area of episcleral injection. Additionally, a nodule may be present that can be moved with a cotton swab over the underlining sclera.⁵

Episcleritis must be differentiated from scleritis, which is of a more serious nature and presents with deep (often severe) pain, decreased vision, and large, deep, and engorged scleral vessels that cannot be moved with a cotton swab after anesthetizing the eye and do not blanch with topical phenylephrine.⁵ None of these symptoms were seen in this case.

Ocular rosacea often presents with blepharitis, typically in middle age, and is associated with telangiectasias, pustules, papules, or erythema of the cheeks, forehead, and nose, which can be subtle,⁵ none of which were seen in this case.

3. What is the treatment for blepharitis?

- A. Antibiotic ointment.
- B. Steroid drops.
- C. Immunosuppressant.
- D. Warm compresses.
- E. Artificial tears.
- F. Eyelid scrubbings with baby shampoo.
- G. All of the above.

ANSWER/DISCUSSION

3. G. Although usually not all these modalities are necessary, they have all been described in the treatment of blepharitis. In the initial presentation, there is often a bacterial component that responds well to topical erythromycin or bacitracin ointment.^{5,12} However, if the symptoms are mild, antibiotics may not be necessary. Eyelid hygiene consisting of warm compresses twice a day for 5 to 10 min, two to four times a day, followed by gentle eyelid massage and gently scrubbing the eyelid margins with tearless baby shampoo on a clean cotton swab or washcloth is an effective therapy.^{3,5,7} Eyelid hygiene should be maintained after symptom resolution several times a week for prevention of further symptoms, since blepharitis is not a curable disease. If symptoms are associated with dry eyes, artificial tears should be used four to eight times a day. If symptoms are severe and bothersome, low-grade steroid drops can be used in combination with the antibiotic to relieve itching and burning. If dry eyes are a prominent feature and meibomitis is present, an immunosuppressant, such as cyclosporine 0.05% drops twice a day, can be considered.⁵ In cases of chronic symptoms refractory to typical treatment, antifungals such as ketoconazole 2% creams may prove effective.^{4,8} Additionally, tea tree oil has been shown to be effective in treating blepharitis symptoms due to its antibacterial, antifungal, and antidemodex properties.^{7,8}

4. What is the aeromedical disposition for blepharitis?

- A. Issue an upchit.
- B. Temporarily ground until symptoms resolve.
- C. Ground aviator until waiver is approved.

ANSWER/DISCUSSION

4. B. The Federal Aviation Administration’s Guide for Aviation Medical Examiners, the U.S. Army’s Flight Surgeon’s Aeromedical Checklists, and the U.S. Navy Aeromedical Reference and Waiver Guide do

not address blepharitis specifically, but the U.S. Navy Aeromedical Reference and Waiver Guide does discuss allergic conjunctivitis and the concern that symptoms of itching, burning, eyelid edema, and blurred vision can interfere with flight.^{6,10,13} Since these symptoms are also often present in blepharitis, it is appropriate to temporarily ground the aviator during initial treatment until symptoms that could interfere with flight have resolved. Also, the Air Force Waiver Guide discusses dry eye syndrome, which is often associated with blepharitis. It states that mild symptoms do not require waiver action; however, moderate symptoms controlled with medications will require a waiver. If moderate symptoms are uncontrollable or if symptoms are severe, the condition is generally considered disqualifying.¹¹

In this case, the patient did not have pain or any change in vision and only mild itching. As such, he was left in flying status during treatment without complication. Symptoms significantly improved after 48 h of treatment with antibiotic ointment, eyelid cleanses with baby shampoo, warm compresses, and artificial tears.

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You are the flight surgeon at the home of the C-17 and C-5. It is Tuesday afternoon and you are the only flight surgeon in the clinic. Your colleagues are currently deployed around the globe, and the Chief of Aerospace Medicine is in a 3-h-long executive committee meeting. The afternoon clinic is winding down, signaling the end of another day. As you sit at your desk, finishing the last of your charting, you hear a knock at your door. One of your medical technicians informs you that there is a walk-in aircrew member who has come in and would like to be seen. Informing the technician to check the patient into a room, you grab your stethoscope and head to the exam room to log onto the computer system. Once the log-in process is complete, you open up the Department of Defense's electronic medical record system, the Armed Forces Health Longitudinal Technology

Application. Turning, you greet the patient, a 27-yr-old Caucasian male C-17 loadmaster. He reports that he moved to the area 3 mo ago and has a nagging cough that won't go away. He says that everyone in the family (wife, 4-yr-old daughter, and twin 6-mo-old boys) had a "cold" a few weeks ago, which has resolved, but he has continued to have a cough for the last 2 wk. He denies a fever, chills, or shortness of breath or that the cough is worse in the morning or when lying down. He coughs 2–3 times per hour and reports it does not affect his ability to do his job. On physical exam his blood pressure is 114/72, pulse is 72, respiratory rate is 14, he is afebrile, and oxygen saturation is 98% on room air. Nasal mucosa is clear and

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