deficiency in any layer of the precorneal tear film can lead to such a result. The AOA guideline states that ' a decreased TBUT usually indicates a mucin deficiency' [1]. However, it is our clinical experience that a lipid deficient dry eye associated with chronic blepharitis is a more common cause of a decreased tear break up time. This may merely represent an oversight due to the fact that other areas of the publication properly address the relationship between an abnormal lipid layer and decreased TBUT and correctly relate the rarity of a true mucin deficiency.

Fluorescein and rose bengal staining of the cornea and conjunctiva are also helpful in making a specific diagnosis. The ophthalmologic publication does not list fluorescein staining as part of the diagnostic workup which we feel is an integral part of diagnosing the problem. Also, neither guideline clarifies the fact that fluorescein stain highlights areas of damaged or missing cells while rose bengal dye stains devitalized, dying cells and mucus. Staining that occurs intrapalprebrally on the cornea and bulbar conjunctiva is more indicative of keratoconjunctivitis sicca or exposure while inferior staining is often seen in staphylococcal blepharitis and lagophthalmos. Other unrelated causes of staining include chemical keraotconjuntivitis, UV exposure, recurrent corneal erosion, and infectious etiologies.

The Schirmer test is used to measure aqueous tear production and can be performed with or without anesthetic. Both guidelines accurately list the Schirmer test as controversial since it produces such a high rate of false negatives. There is a 100% specificity with the test but only a 10% sensitivity [4]. Therefore, Schirmer testing should not be performed solely to diagnose keratoconjunctivitis sicca [6]. Sources also vary regarding performance of the test, specifically the amount of time to wait before measuring the strip and what constitutes a significant result. The AAO guideline suggests that less than 5 mm of wetting in five minutes is abnormal while the AOA makes no reference at all regarding the performance of the test. In borderline cases, other adjunct testing may prove beneficial. Listings in both guidelines include fluorescein clearance, tear osmolarity, impression cytology, tear lysozyme and lactoferrin. All of these tests are used less frequently than the other tests listed, and are less practical in a busy clinical setting.

4. Case report continued

The patient in the case report was placed on non-preserved tears every 2 h and lacrilube at night. This proved to be inadequate and she returned 6 months later in considerable distress. At this time, the dry eye symptoms were much worse and included foreign body sensation, photophobia, and burning, despite increased use of ocular lubricants. She also complained of dryness of her mouth and difficulty swallowing. The ocular examination was again positive for an extremely reduced tear break up time. Superficial punctate keratitis was present over each cornea which stained positively with both sodium fluorescein and rose bengal. Schirmer test results were 3-mm OD and 1-mm OS.

5. Discussion continued

Testing revealed that the patient had developed severe keratoconjuntivitis sicca since the last follow up visit. Given her history of dry mouth and joint pain associated with a dry eye, Sjogren syndrome should be suspected. Sjogren syndrome is mentioned in both guidelines, however the ophthalmological publication reviews the disease in greater detail. Neither guideline provides specific information regarding what steps should be taken if the practitioner suspects the disorder. Sjogren syndrome is often diagnosed based solely on the presence of the classic triad mentioned previously. A more definitive diagnosis of Sjogren syndrome can be made by testing the blood for serum antibodies to SS-A or SS-B nuclear antigens or through biopsy of a salivary gland to look for infiltration of lymphocytes and plasma cells. Referral to a rheumatologist who specializes in autoimmune disease is indicated in order to rule out any associated collagen vascular disorders, monitor the progression of the disease, and watch closely for systemic manifestations of the syndrome such as lymphoma or macroglobulinemia. A visit to a dentist is also warranted since Sjogren syndrome decreases saliva, leading to more problems with tooth decay and gum disease.

The mainstay of treatment for the ocular signs and symptoms of dry eye syndrome are artificial tear substitutes which are used to increase the thickness of the aqueous layer of the tear film. Mild to moderate cases are often amenable to a q.i.d. regimen of tear supplements with dry, hot compresses daily and avoidance of drafts and other environmental stressors. We find dry heat to be an underutilized treatment option and many practitioners are entirely unaware of its beneficial effects. We find it particularly useful because it not only provides comfort but serves to liquefy meibomian secretions. Wet, hot compresses are to be avoided because tap water serves only to dilute the basal tear film in a manner similar to reflex tearing. As the severity of signs and symptoms progress, tear therapy may be increased and an ointment can be introduced at bedtime. Lubricating drops and ointment used more than four times a day on a chronic basis should be non-preserved to prevent epithelial insult secondary to preservative toxicity. Un-

fortunately, unpreserved artificial tears are relatively expensive for long term use and most often inconveniently packaged in single use containers which are difficult for elderly patients to manipulate. These issues have been addressed with the recent addition of Ciba Vision's new lubricant GenTeal TM. This relatively inexpensive non-preserved tear substitute is packaged in a bottle with a specially formulated preservative that is converted to water and oxygen in the tear film upon instillation, thus effectively eliminating preservative toxicity.

In this case, maximum tear therapy did not appear to alleviate the patient's symptoms or improve epithelial staining. Temporary and then possibly reversible or permanent punctal occlusion is an excellent option for the patient at this point. Both guidelines review punctal occlusion briefly. The AOA's discussion in this area entails only a listing of the various punctal occlusion procedures available. The AAO recommends thermal cautery for permanent punctal occlusion and does not discuss temporary or reversible occlusion in any detail. Considering that many of our patients benefit greatly from punctal occlusion and how common it is in our practice modalities, we feel more guidance is needed in both publications regarding the issues of temporary, removable, or permanent punctal occlusion.

We begin by occluding all four puncta with collagen plugs and continue the patient's current artificial tear regimen in order to provide the most dramatic impact on the patient's dry eye symptoms. Controversy does exist with collagen plugs regarding their ability to accurately indicate whether silicone plugs or permanent occlusion will alleviate dry eye complaints or cause epiphora [7]. In spite of this controversy, we feel that this is very useful when considering more permanent means of punctal occlusion and, in fact, many insurance companies demand it before they will reimburse a practitioner for permanent occlusion. During follow up one to two weeks later, the patient should be asked if they felt any relief from their symptoms or experienced epiphora during the first few days after occlusion. We would then proceed by placing silicone plugs in the two lower puncta if the patient was happy with the collagen plugs and/or objective improvement in signs was noted. Later the two upper puncta would be occluded if necessary. Artificial tear therapy can then be adjusted as needed to reduce symptomotology. The frequency of follow up examinations will then be dictated by the patient's complaints and the severity of the dry eye.

Blepharitis treatment strategies are also discussed in both guidelines. Warm compresses with lid scrubs, and a topical antibiotic with good coverage against staphylococcus applied to the lid margins are usually enough to control mild forms of blepharitis. In moderate to severe cases where inflammation becomes more of a component, a topical antibiotic/steroid ointment applied to the lid margins is often helpful in managing the acute phase of blepharitis. Corneal involvement can manifest with lid disease and cause such problems as punctate epithelial keratitis, marginal infiltrates or ulcers and phlyctenules [8]. This issue is touched upon only briefly in AOA guideline and AAO publication does not discuss corneal involvement at all.

Patients with posterior marginal blepharitis (e.g. meibomian gland dysfunction) will need a lid hygiene regimen of warm compresses followed by gland expression, then lid scrubs as well as topical and oral antibiotics. Tetracycline or its prodrug derivative doxycycline are the oral drugs of choice. Not only do these drugs have antimicrobial effects, more importantly they decrease free fatty acids and inhibit keratinization [8]. Tetracycline is also useful in treating other sebaceous gland disorders such as rosacea or acne valgarius which can lead to ocular surface disease. Clinically we prefer doxycycline over tetracycline because of increased patient compliance due to once a day dosing and fewer side effects, especially if the patient must remain on a maintenance dose to manage the problem. We normally begin with a regimen of 100 milligrams of doxycycline once or twice daily for one month, then taper as signs and symptoms allow. The most common side effects are gastro-intestinal in nature.

Discussion of blepharitis in the AOA guideline breaks the disorder down into eight different types. It gives a description and then reviews the signs and treatment of each type. The AAO, on the other hand, talks in more general terms and only differentiates posterior blepharitis from other forms of the condition. While the information in the optometric publication is detailed and accurate, we clinically do not find it necessary to differentiate blepharitis into this many different categories in order to effectively manage the disease.

Follow up examinations are only briefly mentioned in the ophthalmologic guideline which states that their frequency should be determined by the severity of the lid disease. The optometric guideline gives more definite suggestions on follow up care. They suggest twice a week follow up for the various types of blepharitis except for the seborrheic form for which they recommend weekly follow ups. It is our feeling that follow up care should be more contingent upon the severity of the disease rather than the specific type and often does not need to be as frequent as suggested in the optometric guideline. We often schedule follow up for mild to moderate cases of chronic blepharitis, where there is no corneal involvement, one to two weeks after the initial visit versus