

## **CASE 10**

### **Patient history**

- 70 year old Asian female
- Presents to you with persistent irritation, burning, and foreign body sensation in both eyes of several months duration, gradually worsening in severity. No recent change in vision or other ocular symptoms. No recent change in medications.
- Past ocular history: primary open angle glaucoma – diagnosed 10 years ago, stable and well controlled on current treatment (Timoptol 0.5% BID OU), bilateral pseudophake
- Past medical history: Diabetes (type 2), Ischaemic heart disease
- Medications: Metformin, Aspirin
- Family history: nil of note

### **Examination**

- BCVA: 6/9 bilaterally (with glasses)
- IOP: OD 14 mmHg, OS 12 mmHg
- Optic discs: OD CDR 0.7, OS CDR 0.8 (no change)
- Fundi: mild dry ARMD
- Humphrey visual fields – stable
- Corneal pachymetry OD 540um, OS 550um

### **Questions**

**Question 1: Discuss your further examination of this patient with respect to her current symptoms**

**Question 2: What is your differential diagnosis?**

**Question 3: You suspect a diagnosis of dry eye syndrome, what clinical tests can be performed to support your diagnosis?**

**Question 4: What are the possible causes of dry eye syndrome?**

**Question 5: a) What is Sjogren's syndrome?  
b) What other symptoms are associated with this diagnosis?  
c) What investigations can be performed to exclude this diagnosis?**

**Question 6: What would be your initial treatment of this patient's dry eye syndrome?**

**Question 7: Despite your initial treatment, the patient presents several months later with no improvement in her symptoms, what management options are available to treat refractory dry eye?**

**Question 8: For patients on ocular hypotensives for open angle glaucoma**

- a) How common is dry eye compared to the general population?
- b) Is there a difference in rate of dry eye based on class of medication?
- c) What alternative treatment options are available for the management of the glaucoma?

## **Answers**

**Question 1: Discuss your further examination of this patient with respect to her current symptoms**

*The patient's symptoms suggest she has ocular surface disease. A systematic examination should be performed including:*

- *External exam: facial skin (rosacea), eyelid skin (allergic dermatitis)*
- *Eyelid exam: abnormal lid position, lid margin irregularity, punctal position and patency, blepharitis and meibomian gland dysfunction, trichiasis, blink (frequency, completeness of closure), lagophthalmos, retraction, proptosis*
- *Tear film: height of tear meniscus (normal 0.2-0.5mm, abnormal – irregular, thin or absent), mucous debris and strands, froth along the lid margin (suggests meibomian gland dysfunction)*
- *Bulbar conjunctiva: injection, chemosis, conjunctivochalasis, irregularities (eg pinguecula, pterygium)*
- *Palpebral conjunctiva: papillae, follicles, subepithelial fibrosis (cicatricial disease)*
- *Cornea: punctate epithelial keratopathy with fluorescein staining, filaments, mucin plaques, opacities, vascularity*

**Question 2: What is your differential diagnosis?**

*The diagnoses that need to be considered include:*

- *Dry eye syndrome*
- *Blepharitis/Meibomian gland dysfunction (including ocular rosacea)*
- *Allergy or toxicity from glaucoma eye drops*
- *Eyelid malposition (ectropion or entropion), trichiasis*
- *Superior limbic keratoconjunctivitis (SLK)*

**Question 3: You suspect a diagnosis of dry eye syndrome, what clinical tests can be performed to support your diagnosis?**

*There are several clinical tests that can be performed to assess a patient for dry eye, these include:*

- *Tear break up time (BUT): this is a functional measure of tear stability. A drop of fluorescein is instilled into the lower fornix, the patient is asked to blink several times then stop, and the interval between the last blink and the first dry spot on the cornea is measured. A BUT of less than 10 sec is abnormal.*
- *Schirmer test: this is a measure of tear production. Special filtering paper is placed in the inferior cul-de-sac, the eyes are closed for 5 min, and the amount of wetting of the paper strip is measured. Measurement of < 5 mm is abnormal and 5-10 mm is equivocal. Schirmer 1 test is performed without local anaesthetic and measures total secretion (basal and reflex); Schirmer 2 is performed with local anaesthetic and measures only basal secretion.*
- *Rose Bengal and Lissamine green staining: these stain dead and devitalised cells and also healthy cells that are not protected adequately by a mucin coating. They can detect early or mild cases of dry eye more easily than fluorescein staining. Typically there is central interpalpebral staining of the corneal epithelium in dry eye and inferior staining of the corneal and conjunctival epithelium in meibomian gland dysfunction. Corneal filaments and mucin plaques are also shown up more clearly by these stains.*

**Question 4: What are the possible causes of dry eye syndrome?**

*The causes of dry eye syndrome (keratoconjunctivitis sicca) can be divided into two categories: decreased aqueous tear production or increased evaporation of tears.*

*Decreased aqueous tear production:*

- *Primary age-related lacrimal gland deficiency - this is the most common cause*
- *Idiopathic lacrimal gland deficiency*
- *Medications- topical or systemic (eg preservatives in topical eye drops, oral contraceptive pill, antihistamines, beta-blockers, phenothiazines, anxiolytics, antiparkinsonian agents, diuretics, anticholinergics, antiarrhythmics)*
- *Reflex hyposalivation (eg age-related, diabetes, neurotrophic cornea, post corneal surgery, chronic contact lens wear)*
- *Obstruction of lacrimal ductules by severe conjunctival scarring (eg cicatricial pemphigoid, trachoma, chemical burn) or destruction of lacrimal tissue by tumour or inflammation (eg sarcoidosis)*
- *Sjogren's syndrome (primary or secondary - see question 5)*

*Evaporative dry eye:*

- *Meibomian gland dysfunction leading to loss of outer oil layer of tear film*
- *Disorders of lid aperture (eg ectropion), defective blinking, drug action (eg Accutane)*

- Question 5:** a) What is Sjogren's syndrome?  
b) What other symptoms are associated with this diagnosis?  
c) What investigations can be performed to exclude this diagnosis?

*Sjogren's syndrome is a chronic autoimmune disorder in which there is an immunological response against the lacrimal and salivary glands. Sjogren's syndrome may be isolated (primary) or associated with a connective tissue disorder (secondary) such as rheumatoid arthritis, systemic lupus erythematosus, scleroderma, primary biliary cirrhosis and polyarteritis nodosa. The classic symptoms are dry eyes and dry mouth. In addition, Sjogren's syndrome may cause skin, nose, and vaginal dryness, and may affect other organs including blood vessels (vasculitis), kidneys, lungs, liver, pancreas and brain.*

*In addition to dry eye symptoms, patients with Sjogren's syndrome may complain of: dry mouth, swallowing difficulties, dental decay/gum disease, mouth sores, and dry lips. Symptoms relating to involvement of other organ systems (as listed above) may also be present.*

*Investigations: serological testing for circulating autoantibodies (SS-A, SS-B) associated with Sjogren's syndrome. Serological testing for other connective tissue disorders may be required depending on clinical features (eg RF, ANA, and ANCA). A salivary gland biopsy is sometimes required to confirm the diagnosis of Sjogren's syndrome.*

**Question 6: What would be your initial treatment of dry eye syndrome?**

*The aim of treatment is to provide symptomatic relief by lubricating the ocular surface. Treatment is based on the severity of disease and should follow a step-wise approach.*

*For mild dry eye, initial treatment would be artificial tears QID (eg Refresh Tears, Systane, GenTeal, Polytears etc). If this initial treatment does not improve symptoms or the dry eye is more severe, increasing frequency of artificial tears will be required (eg Q2hrly) and a lubricating ointment (eg lacrilube nocte) should be used to provide treatment overnight. With this increased frequency of artificial tears, preservatives in the eye drops may cause toxicity and worsen a patient's symptoms, therefore preservative-free lubricating drops should be preferred if the frequency required is greater than QID (eg Refresh Plus, Bion tears, Culluvisc, Polytears minims).*

*It is also important to treat any concurrent blepharitis/meibomian gland dysfunction (lidcare, warm compresses, antibiotic ointment, tetracycline/doxycycline PRN). The patient should also be educated on general measures such as avoiding exacerbating factors – dry, smokey environments, air conditioning, and prolonged reading/computer use without resting the eyes. Wearing glasses may also help when aggravating environmental factors cannot be avoided. Using a humidifier can help by adding moisture to dry indoor air.*

*If this patient's symptoms continue despite the use of artificial tears then it may be necessary to consider changing the glaucoma treatment. Timoptol contains a preservative (Benzalkonium chloride) which may be an important contributing factor to the dry eye syndrome. Options include changing the patient to a preservative-free formulation (eg Timolol 0.5% minims) or trying another class of medication (eg Prostaglandin analogue).*

*Nb) If there is any suggestion of underlying systemic disease the patient needs to be referred to an immunologist/rheumatologist.*

**Question 7: Despite your initial treatment, the patient presents several months later with no improvement in her symptoms, what management options are available to treat refractory dry eye?**

*If the patient's symptoms fail to settle with the above measures then punctal occlusion should be attempted in conjunction with the use of preservative-free artificial tears during the day and lubricating ointment overnight. Temporary (collagen) or reversible (acrylic, silicone) punctal plugs are preferred to more permanent measures (thermal punctal cautery).*

*For severe dry syndrome that fails to respond to the above measures, cyclosporine ointment (eg Restasis 0.05% BD) may be used under specialist supervision. Cyclosporine is an immunosuppressive agent that has been approved for patients with dry eye syndrome in which the decreased tear production is secondary to ocular inflammation.*

*If mucous strands or filaments are present then a mucolytic agent (eg Acetylcysteine 10% QID) may be used to treat this. If all previous measures fail to treat dry eye syndrome then a surgical option includes performing a lateral tarsorrhaphy.*

**Question 8: For patients on ocular hypotensives for open angle glaucoma**

- a) How common is dry eye compared to the general population?**
- b) Is there a difference in rate of dry eye based on class of medication?**
- c) What alternative treatment options are available for the management of the glaucoma?**

*Dry eye syndrome is common in the general population with rates of 10-15% reported, increasing to 20% for those over 60 years of age.<sup>1-3</sup> Dry eye syndrome is significantly more common in females compared to males. For patients on glaucoma eye drops, reported rates of dry eye vary from 25-40%, decreasing to 15-20% with preservative-free eye drops.<sup>4,5</sup>*

*Dry eye occurs with all classes of medication used to treat glaucoma as it is largely due to the preservative contained within these eye drops. According to the NZ glaucoma eye drop study, reported rates of dry eye are similar for all classes of medication (approx 40%) with the highest rate for alpha agonists (46%).<sup>5</sup>*

*Alternative treatment options include the use of laser such as argon laser trabeculoplasty or selective laser trabeculoplasty, which may lead to the patient not requiring glaucoma eye drops. Another option is to change the patient to preservative-free formulation eye drops.*

**References**

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