

This weekend [at SECO](#) in Atlanta, one of the speakers proclaimed that few ocular conditions have as many potential systemic disease associations and comorbidities as floppy eyelid syndrome (FES): The loss of lid rigidity is the main contributor to the associated Meibomian gland dysfunction, dry eye, papillary conjunctivitis, superficial punctate keratitis and corneal abrasions that we may see. However, FES patients are at risk for glaucoma, papilledema, non-arteritic anterior ischemic optic neuropathy (NAION) and several significant systemic conditions. Much of the FES section of this newsletter is from the NZ Optics monthly magazine, reproduced with their kind permission. To subscribe to NZ Optics, please [click here](#).

Happy reading!

Nina Kriel

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## Floppy Eyelid Syndrome

### Introduction

Floppy eyelid syndrome (FES) is a relatively recently recognised clinical entity, first described in 1981. This condition remains a challenge to diagnose as the signs and symptoms that characterise it are nonspecific. Most often, the patient will have embarked on long and disconcerting journey of unfruitful investigations and trials of therapy before the diagnosis is made. This article aims to bring light on this under-diagnosed and misunderstood pathology.

### So what exactly is floppy eyelid syndrome?

FES is characterised by excess laxity of the upper eyelid causing it to evert spontaneously during sleep. The bulbar and tarsal conjunctiva become exposed and suffer both from mechanical irritation as well as desiccation.

FES is most often associated with obese middle-aged men, though women, children and otherwise non-obese patients all have been described. Obstructive sleep apnoea is also linked with FES.

It is important to recognise that floppy eyelids alone do not establish the diagnosis of floppy eyelid syndrome - the presence of upper eyelid tarsal papillary conjunctivitis is also necessary.

### What are the signs and symptoms of FES?

The patient is likely to present with unilateral or bilateral eye irritation and burning sensation, dry eyes, watering, mucous discharge and red eyes all of which are common ophthalmological complaints. More specifically the patient will often note his irritation is worse in the morning. The differential diagnosis at this stage is wide and mimics frequently observed pathologies such as infective conjunctivitis, blepharitis or dry eye syndrome. The picture is made even more confusing as FES is often accompanied by the previous pathological entities. This explains why the diagnosis is often delayed.

The most easily recognisable sign of FES is the ease at which one can lift and evert the upper eyelid (Figure 1). (Dan Sutton, at [SECO suggested](#) pulling the eyebrows up while the patient tries to look down; the upper lids will evert.) The tarsal plate appears soft, malleable and stretchy as opposed to its usual rigid and tight structure. One can quantify the eyelid laxity by measuring the anterior distraction by gently pulling the eyelid anteriorly. Thick mucoid discharge is also common. Other features frequently observed are lash ptosis (Figure 2) and dermatochalasis, meibomian gland dysfunction and lower lid laxity.



When examining with a slit lamp the most striking finding of FES is the presence of superior tarsal papillary conjunctivitis. Bulbar conjunctiva injection, cornea punctate epitheliopathy and superficial corneal pannus may be seen predominantly on the superior aspect of the eye.

Signs are often asymmetric, and worse on the patients preferred side of sleeping. Patients who sleep face down more often have symmetrical pathology.

### What other conditions are associated with FES?

FES can be associated with OSA and obesity. About 23% of patients presenting with OSA are noted to have FES, which in fact is similar to the proportion of obese patients presenting the same condition. Conversely, the majority of patients with FES suffer from OSA. It ensues that FES is a strong positive predictor for developing or suffering from OSA.

#### OSA detour

OSA is serious enough to warrant a closer look. This section is not from the NZ Optics publication. First described about 50 years ago, OSA has become increasingly common. US reports suggest that up to 9% of Caucasian women and 24% of Caucasian men have OSA. Up to 80% of OSA sufferers may go undiagnosed. If we have a similar prevalence, it is a grossly underdiagnosed condition.

#### What is OSA?

The word apnoea is derived from the Greek: a (not/ without) and pnoia (breath/ air). In OSA the tissue of the soft palate collapses during sleep, partially occluding the airways. Occluded and irregular breathing lead to decreased O<sub>2</sub> saturation, so from time to time the patient will gasp for air. Snoring is extremely common. OSA is more than twice as common in males as in females. It is more prevalent in smokers and the risk increases with age.

OSA has also been described as Pickwick syndrome, clearly by someone who has not read Dickens' novel because although Pickwick was described as portly, Joe had the more classic symptoms of being obese, snoring and constantly sleepy or tired in spite of having had 'a good night's sleep.' It is, of course, the quality of the sleep that is lacking, not the quantity. We can now assess sleep:

- The [Epworth Sleepiness Scale](#) is a simple self-reported assessment based on one's likelihood of falling asleep during activities such as watching TV, eating lunch, reading a book or riding in a car. Each activity is assessed on a scale and the total number suggests normal (<10), excessive daytime sleepiness (10-16) or

dangerously sleepy (16+) suggesting narcolepsy or idiopathic hypersomnolence.

- Diagnostic testing at home is now much more common. Several medical aids contribute towards the cost of the assessment.
- Polysomnography testing conducted during an overnight stay in a sleep laboratory is the most definitive way to diagnose OSA. During polysomnography the [apnoea-hypopnoea index](#), or AHI, is measured and calculated. This index scores the number of disordered breathing events per hour and then assigns a ranking that ranges from not clinically significant to severe OSA.

### Treatment (OSA)

Lifestyle modifications such as weight loss, exercise and avoiding alcohol and sleeping tablets may be all that's required. One of the least invasive options is a dental device, similar to a retainer, worn in the mouth which thrusts the lower jaw forward.

Alternatively there are surgical options aimed at reducing tongue size and tightening the soft palate.

The continuous positive airway pressure (CPAP) device is commonly prescribed, but does not seem to be well tolerated by patients. Effectively it's a mask, attached to a machine which introduces air under just enough pressure to keep the airways open. Fine tuning the fitting of the mask and the pressure required can be challenging. The noise of the machine, as well as the irritation to the nose and throat are further deterrents to compliance.

### Associated with OSA

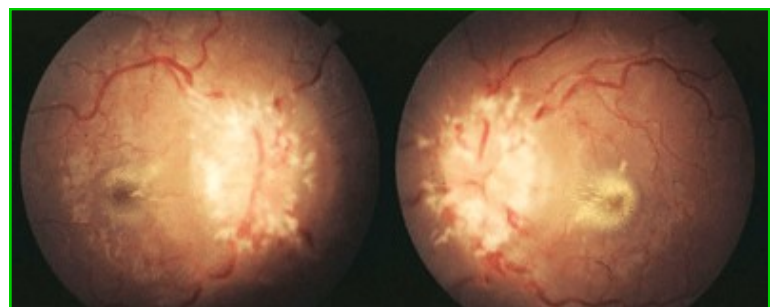
OSA deprives tissue and organs throughout the body of oxygen, so ischemic vascular diseases are often associated. OSA is found in:

- 50% of heart disease patients
- 60% of stroke patients
- 70% of obese individuals (often leading to type 2 diabetes)
- 80% of patients with difficult to control hypertension

### Papilledema

Papilledema is optic nerve head swelling, usually bilateral, resulting from elevated intracranial pressure (ICP). OSA patients experience overnight ICP increases, possibly due to venous dilation with the increase in [CO<sub>2</sub>] so may wake up with a headache.

Remember OSA in your differential diagnosis of unexplained papilledema, especially in men. In women, of course, pseudotumor cerebri is a more likely cause.



### Glaucoma

There is contradicting information, but it appears that glaucoma is more common in the OSA population, particularly normal tension glaucoma. At least one study has shown that IOP does not increase at night, so the higher prevalence may be the result of ischemia due to lower O<sub>2</sub> delivery. However, another study found that IOP

variations in OSA patients is significantly higher than others. Either way, OSA should be considered in any patient with progression despite adequately controlled IOPs.

### NAION

The association between NAION and OSA is well established. One study examined 27 consecutive patients presenting with NAION and found that 24 of them suffered from OSA. Another report revealed that 12 of 17 patients with NAION were diagnosed with sleep apnea after being evaluated, while just three of 17 matched controls were found to suffer from OSA. NAION damage to the optic nerve is the result of an ischemic event caused by poor perfusion, often in anatomically predisposed optic nerves with little or no cupping. Vision loss due to NAION is typically noticed first thing in the morning. Low [O<sub>2</sub>] at night probably contributes.

### Other ocular conditions associated with OSA

OSA patients are more likely to have retinal vein occlusions.

Diabetic patients with retinopathy proliferate and develop macular edema more readily if they have OSA.

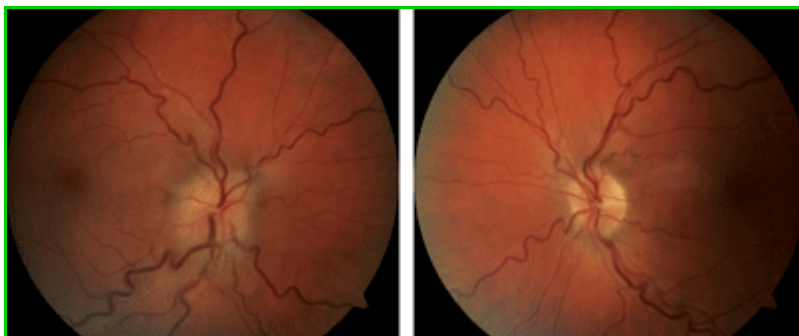
Ideopathic central serous chorioretinopathy is more common in OSA patients, and resolves quicker once the OSA is treated.

Use of the CPAP device can have ophthalmic complications. Air can leak around the mask, with a desiccating effect on an already at risk cornea. The air, recycled around nose and mouth in a closed environment can increase the risk of conjunctivitis. Using the CPAP mask can also elevate the IOP by up to 8 mmHg. Once patients have been diagnosed with OSA, question them regularly about their symptoms and comfort.

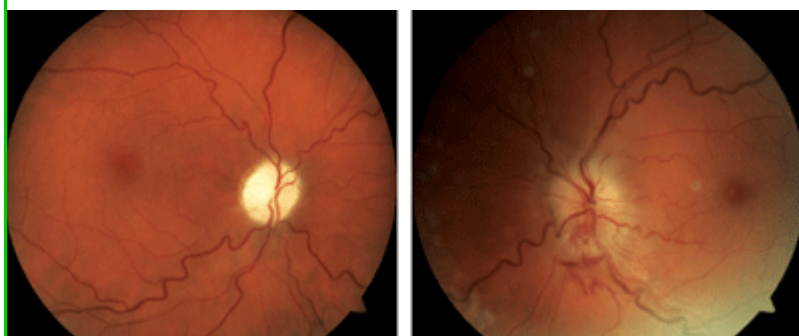
### What other conditions are associated with FES?

(Discussing conditions associated with FES had put us on the OSA tangent, you'll recall. We're back with the NZ Optics article now.)

Keratoconus has also been demonstrated to be linked to FES in 7% of cases. It has long been known that the onset of keratoconus is linked to chronic eye rubbing. During their sleep, patients suffering from FES are prone to constant rubbing of the tarsal conjunctiva of the upper lid and of the cornea. The floppy upper eyelid is simply incapable of holding it's natural position when submitted to external forces such as rubbing, in this case on pillows or sheets. It follows that the patient's preferred sleeping side is more likely to develop the keratoconus.



*Sequential NAION in a patient with sleep apnea. The patient presented with NAION OD (top) and was then found to have OSA. She could not tolerate CPAP therapy, and weeks later experienced NAION OS (bottom)*



## Why does the eyelid go floppy?

FES remains a complex pathology that is incompletely understood. Studies regarding the ultrastructural architecture of the tarsal plate have given some answers regarding the excess laxity.

The tarsus consists mainly of extracellular matrix composed of collagen I and III, elastin and is interspaced by the meibomian glands. Elastic fibers confer the tarsal plate with resilience, deformability and recoil properties. Collagen fibers provide tensile strength. First of all, the proportion of elastic fibres contained in the tarsal plate [of OSA patients] has been shown to be reduced compared to normal tarsal plates. A reduction of elastin has also been demonstrated around the ciliary roots, explaining the lash ptosis observed in some patients. Until recently, collagen fibres had not been shown to be involved in the pathogenesis of FES. However, a recent study demonstrated that the total collagen I-III quantity is increased compared to normal tarsal tissue. This is seen in tissues sustaining major physical stress such as in tendons.

The expression of matrix metalloproteinases (MMP - elastin cutting proteins) by tarsal and dermal fibroblasts have also been shown to be more abundant in FES tarsal plates. The presence of these enzymes is usually closely associated to the presence of inflammatory infiltration though the presence of such leucocytes has only been demonstrated beneath the conjunctival surface. In other words, inflammation does not appear to be the trigger of the MMPs upregulation. In fact, MMPs are known to be upregulated in chronically strained tissues such as tendons where constant remodeling of the extracellular matrix is going on. The mechanical stress undergone by the already stretched tarsus could therefore explain this increase in expression.

Interestingly, elastin tissue depletion is also observed in the nasopharyngeal tissues of patients with OSA. The loss of elastic recoil as well as the increased fatty volume of neck tissues is thought to be the cause of upper airway collapse occurring in OSA. A study recently demonstrated elevated plasma leptin levels in patients with FES. 'Leptins concentrations have been found to be higher in obese patients. Also leptins are thought to play a role in upregulating MMPs systemically. This, as well could be consistent with the extracellular remodelling found in the FES tarsus.

## Treatment and management of FES

The first step towards managing FES is to make the patient aware of his condition and the ties it holds with OSA. OSA has a high rate of morbidity and mortality as it is associated to hypertension, heart failure, stroke and road traffic accidents due to diurnal fatigue. A patient with FES should therefore be referred to a respiratory medicine unit for assessment if there is any suspicion of OSA.

The initial treatment regarding the ocular condition is conservative: Taping/ shielding the eye at night and using lubricating drops offers protection against exposure and mechanical abrasion and brings symptomatic relief but these measures fail to address the underlying upper eyelid laxity. Wearing a stiff mask can help prevent spontaneous eyelid eversion, although wearing a mask with a CPAP device can get tricky. Ensure the CPAP mask fits optimally so air does not flow past into the patient's eyes.

Cylindrical or 'dog bone' shaped cushions can allow the patient to rest their head/ cheek on the pillow, but not compress the eyes.

More definitive treatments involve surgery. The aim of surgical correction is to provide the upper lid with more tension. This can be achieved by removing a wedge of tarsus such as performed when removing an eyelid basal cell carcinoma. Other procedures consist of tightening the upper lateral canthal tendon in a similar fashion to what is done for lower lid ectropion and entropion correction. All of these techniques have shown good surgical outcomes though a recent study has shown superiority of medial canthal and lateral canthal plications and lateral tarsal strips over full thickness wedge resections. Interestingly, it is postulated that tarsal surgery might make the problem worse in the long term as it increases the mechanical load on an already stretched tarsus. Wedge resections will also reduce the number of meibomian glands, which may adversely affect the precorneal tear film, and therefore ocular surface integrity.

### Major learning points

Floppy eyelid syndrome is a rare and under-diagnosed condition. Its aetiologies remain incompletely understood. The diagnosis is often delayed due to the low specificity of ocular signs related to it. However, with careful examination and a more targeted history one can readily identify subtle signs pointing towards the underlying cause.

It is important to refer a patient to an ophthalmologist for further assessment if FES is suspected. The ophthalmologist in turn will have to make sure the patient is adequately oriented to sleep apnoea specialists as sleep apnoea is related to significant morbidity and mortality.

### Source:

Floppy Eyelid Syndrome (Chris van Issum & Brian Sloan)

[May 2013](#) NZ Optics Magazine

### Charging interest

Your patient has her spectacles, but has not paid for them. Six weeks later she is still giving your staff the run around. In desperation you threaten to start charging interest at the maximum rate, but what is that rate, and can you even charge interest? If your agreement with her is contractual, even if the contract does not specify that you will charge interest, you are entitled, as a creditor, to do so. You can claim interest for the loss you suffered as a result of not having received the money on the due date. In [legalese](#): 'A party who has been deprived of the use of capital for a period of time suffers a loss and must be compensated by an award of interest.' If the contract specifies the date of payment, no further demand is necessary and interest is payable from that due date. If the contract gives no date when payment is due, a demand for payment within a reasonable time must be sent before interest starts running. A week is probably sufficient in this case. If the interest is not covered in the contract, interest can be claimed at the legal rate of 15.5%. These principles were confirmed in the case of [Crookes Brothers Limited v The Regional Land Claims Commission, The National Department of Land Affairs and the Government of the RSA](#) where the government ended up paying over R22 million in interest.



[Click here](#) for the case report

## Pupillary distance

My trusty pupillometer recently gave in after more than a decade of daily use.

While waiting for the replacement, I reverted to the good old PD ruler... and noticed that my findings did not always correspond with my recorded PDs (taken with the pupillometer.) Sometimes a mm does not make a difference, but sometimes it does.

### Is the PD part of the spectacle Rx?

Patients have the right to access findings recorded in the patient card—provided they have paid for their examination, of course. Patients have every right to ask for their prescription and get their spectacles elsewhere. Should you include the PD when you give the Rx? The Optometrists' Association of Australia says in a [position statement](#) that the PD *'is part of the optical dispensing process and as such is not specified as part of an optical prescription. A PD measurement is just one part of a 'suite' of measurements which occur at the time that optical dispensing takes place. Other measurements include lens heights and vertex distance – both of which are potentially far more critical to the production of a wearable pair of spectacles than a PD measurement. To ask that a PD measurement be specified in isolation to other, equally critical, measurements, puts the optometrist at risk of claims that spectacles were fabricated incorrectly as a result of the optometrist's error. In such cases the error might very well have been caused by the fact that a professional optical dispensing process did not occur and not as a result of any error on the optometrist's part. However it is the optometrist who will be faced with the claim for a spectacle remake.*

*It is every patient's right to obtain a copy of their spectacle prescription and to have that dispensed wherever they choose, including through internet outlets. Equally, however, if a patient chooses to utilise internet outlets then they must accept that there are some shortcomings and risks to that process – including the fact that they will not be able to enjoy the expertise offered in the course of a professional optical dispensing process.*

Online sales of spectacles/ contact lenses is against HPCSA regulations. However, it is challenging and expensive to pursue international suppliers who market directly to our patients. As these suppliers are not registered optometrists, they do not fall within the HPCSA's jurisdiction. Infringing on the scope of an optometrist or dispensing optician is a criminal offence, yet criminal jurisdiction is technically difficult to prove if the supplier is based outside the country.

The [Australian statement](#) closes with: *We reiterate our advice that a PD measurement is part of the optical dispensing process and as such does not form part of an optical prescription.'*

We probably all agree that ideally the patient should be assisted, measured and fitted by a professional throughout the entire process. Withholding information that should be measured by an appropriately trained professional is one way to try and encourage that. For the tenacious bargain basement spectacle shopper without a PD, there are still alternatives. [This site](#) explains how to measure your own PD, as well as how a friend can measure it.



## Questions: Issue 3 of 2014

1. Floppy Eyelid Syndrome, as the name suggests, is diagnosed on the basis of eyelids that lack rigidity.
2. FES is more common in middle aged, overweight men.
3. Common symptoms of FES such as burning, irritation, dryness, watery or mucous discharge can make it difficult to distinguish from allergic conjunctivitis.
4. About 24% of patients with OSA are undiagnosed.
5. OSA sufferers are highly likely to be insomniacs, which contributes to their daytime tiredness.
6. The CPAP mask worn by OSA patients mechanically maintains eyelid closure.
7. Glaucomatous progression is quicker in FES patients due to the weakness of the cribriform plate.
8. Matrix metalloproteinases break down elastin, so the upregulation of MMPs causes loss of structure and rigidity in the tarsal plate.
9. A creditor may charge interest at the rate of 15.5% pa once the debtor has been informed of his indebtedness.
10. The Health Professions Council requires a PD to be added to the prescription so that patients who choose to get their spectacles online can do so.

Please visit [www.synapse.org.za](http://www.synapse.org.za), log in and submit your answers online. A certificate will be emailed on completion.

## Events

### May

May 2-4 San Diego  
New Technologies

15-18 May Warsaw  
[European Academy of Optometry and Optics](#)

### June

June 19-22 Orlando  
New Technologies

June 16-18 Maputo  
[World Council of Optometry](#)

June 25-29 Philadelphia  
[American Optometric Association Congress](#)

New Technologies

June 6-9 Birmingham  
[British Contact Lens Society](#)

### July

July 17-20 Minneapolis  
New Technologies

### August

21-23 August Ho Chi Minh City  
[Vietnam Optica 2014](#)

### September

September 12-14 Washington DC, New Technologies

September 17-20 Las Vegas  
[Vision Expo West](#)

September 28-29 London  
[SECO Education Destination](#)



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