

Cataract surgery is recognised as a safe procedure with minimal complications and good outcomes. However, there is still a small risk of complications and the optometrist must be mindful of these as, if these complications are not managed appropriately, the effect on vision can be extreme.

Cataract



Part 4 - Postoperative complications

Michelle Hanratty describes some of the conditions that may present months or even years after cataract surgery, how to recognise them, and what the management is of each. **Module C15868**, one general CET point for optometrists and DOs

LATE COMPLICATIONS

Posterior capsular opacification (PCO)

This is the most common postoperative complication of cataract surgery, with incidence of over 40 per cent within five years of cataract surgery.¹ It is a multifactorial problem related to patient factors such as age, surgical factors and IOL design features. It is caused by residual lens epithelial cells which are left behind after extracapsular cataract surgery.

Residual lens epithelial cells around the edge of the anterior capsular surface undergo fibrosis and proliferation, which can be considered to be a normal wound-healing response following surgery. Where the anterior and posterior lens capsule surfaces meet, the cells can also migrate, causing a thickening and eventual clouding of the posterior capsule. Proliferation and fibrosis of these cells can create Elschnig pearls; droplet like formations on the posterior capsule (Figure 1) or a fibrous sheet-like opacification (Figure 2).

Patients who have significant PCO tend to complain of gradual deterioration in vision and difficulty with glare. Such patients can be referred for ophthalmologist assessment and potential YAG laser capsulotomy. YAG capsulotomy is carried out by vaporising parts of the capsule in a cross pattern,

the remnants of the central part of the lens capsule then break free to leave an opening over the pupillary area in the capsule (Figure 3). These fragments are dispersed into the vitreous where the patient may be aware of them as floaters. They are not generally problematic and resolve in a few weeks. Patients usually see an improvement in their vision immediately and can return to their normal daily activities more or less straight away.

Although YAG capsulotomy is a simple procedure which takes only a few minutes, it is not without risk. The power used to laser the capsule varies according to the density of the opacification and the higher the power of the laser, the greater the risk of complications and pitting damage to the IOL (Figure 4). As well as potentially causing a break in the retina, the shock waves generated by the laser pulse also stimulate the release of inflammatory mediators which may lead to cystoid macular oedema as well as an IOP rise during the first few hours following the procedure.

There is a well documented pressure rise of up to 31 per cent in

pseudophakic eyes that have undergone YAG capsulotomy. However, the IOP rise is rarely persistent and dissipates within 48 hours. Unfortunately, glaucoma patients are more susceptible to higher increases of up to 59 per cent and for a longer period of time leading to permanent vision loss.²⁻⁵ Therefore, optometrists should be more wary when measuring IOPs in glaucoma patients that have recently undergone YAG laser capsulotomy and refer for urgent assessment by a glaucoma specialist if IOPs appear to be significantly raised above the patient's normal reading.

Pseudophakic cystoid macular oedema (CMO)

When following cataract surgery, CMO is also known as Irvine-Gass syndrome and typically occurs 4-6 weeks after surgery, although occasionally it can occur months or years later. Incidence is up to 3 per cent⁶ and patients that have already had an episode of CMO with their first eye have a significantly increased risk (50 per cent) of the second eye also being affected. Optical coherence tomography (OCT) and/or fluorescein angiography are usually

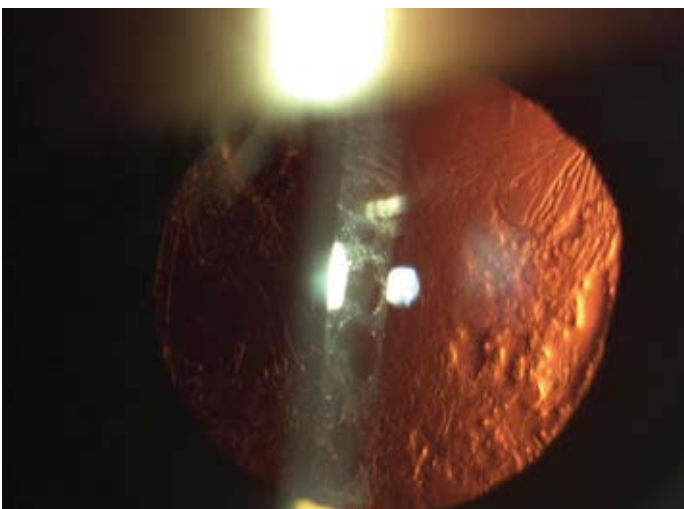


Figure 1 Elschnig pearls on the posterior lens capsule

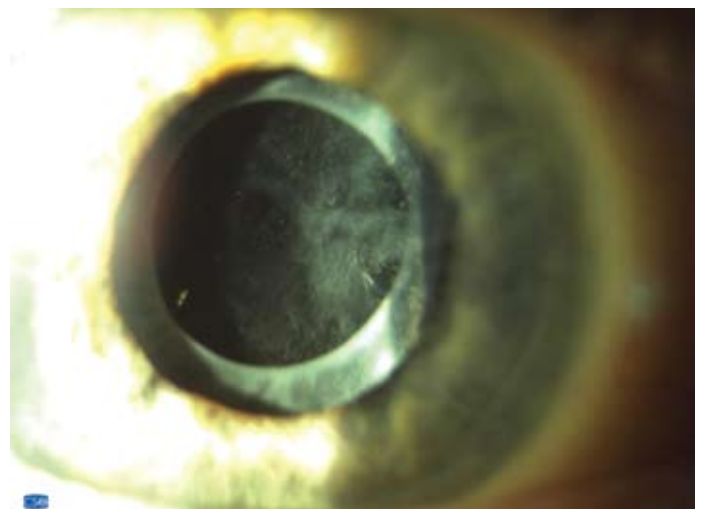


Figure 2 Fibrosis of the anterior and posterior capsule following surgery

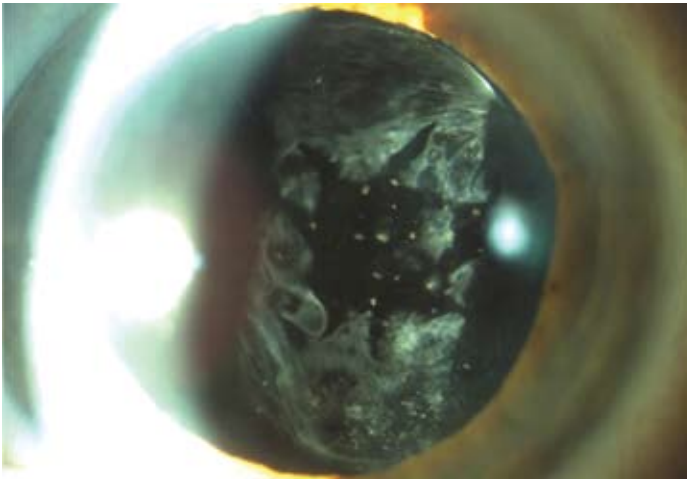


Figure 3 YAG laser has cleared the opacification that would fall within the non-dilated papillary area

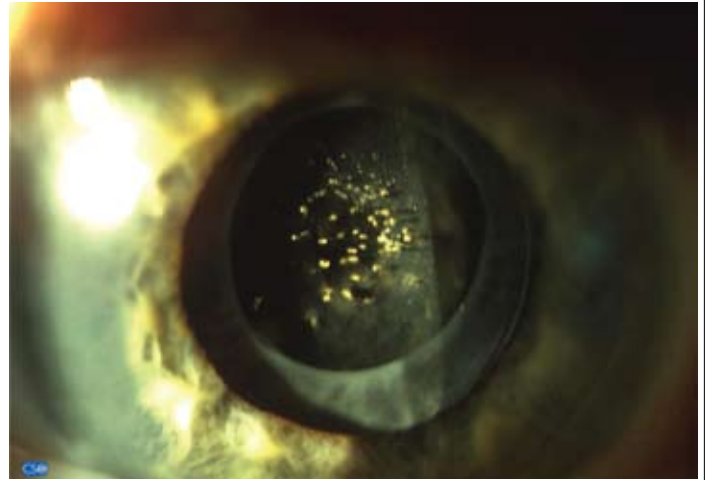


Figure 4 Pitting damage to the IOL due to a high power YAG laser

used to confirm diagnosis, with OCT clearly showing the fluid-filled cysts (Figure 5). However, fluorescein angiography is able to identify even very mild cases of CMO, as leaking perifoveal capillaries give rise to a flower petal like appearance on imaging. It is known that approximately one in five patients⁷ will have this 'angiographic' CMO which resolves spontaneously.

In optometric practice, the patient with 'clinical' CMO usually presents with a drop in vision having had a good visual outcome initially. Reading vision is also disproportionately affected. There are rarely any other presenting symptoms, although occasionally the patient may have a slightly pink eye and report some mild discomfort or photophobia. On examination, the anterior chamber may have some mild activity and the macular reflex may look a little dull, be absent or slightly irregular according to the severity of

the oedema. In more advanced cases it may be possible to see a honeycombed appearance with red-free light due to the presence of fluid-filled cysts. Where CMO is suspected, referral to an ophthalmologist for the patient to be reviewed within a few days is indicated. Mild cases of CMO cause transient vision loss and resolve without intervention within a few weeks, although persistent cases can take up to 12 months to resolve.

While the exact aetiology of CMO is uncertain, it is known that it does generally respond to anti-inflammatory therapy. Where treatment is indicated, the patient is usually given a topical non steroidal anti-inflammatory such as ketorolac (eg Acular) or diclofenac (eg Voltrolol) to use four times a day for several weeks in conjunction with a steroid such as prednisolone (eg Pred-Forte). This is eventually tapered off as the symptoms resolve. If the CMO

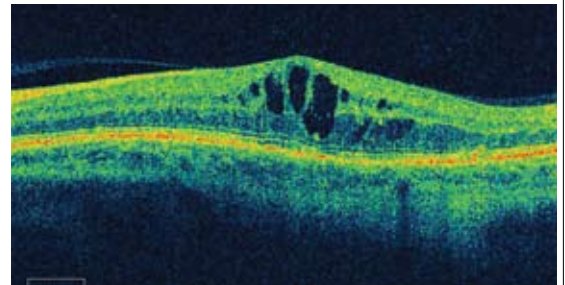


Figure 5 OCT image of macular oedema showing fluid filled cysts at the macula

does not respond to topical therapy, an intra-vitreous injection may be required. In cases of severe oedema or where therapy is not started soon enough, the vision may be permanently compromised.

Post vitreous detachment (PVD) and retinal detachment (RD)

Many patients report an increase in floaters after cataract surgery, and sometimes it is simply because their



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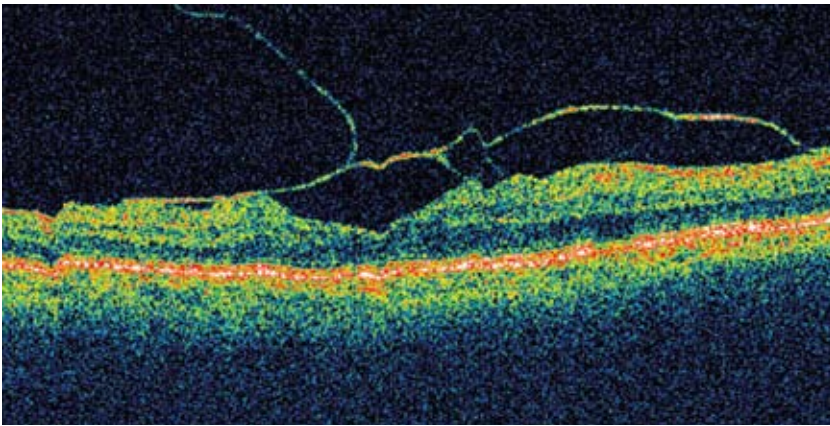


Figure 6 OCT image showing traction at the macula from a PVD

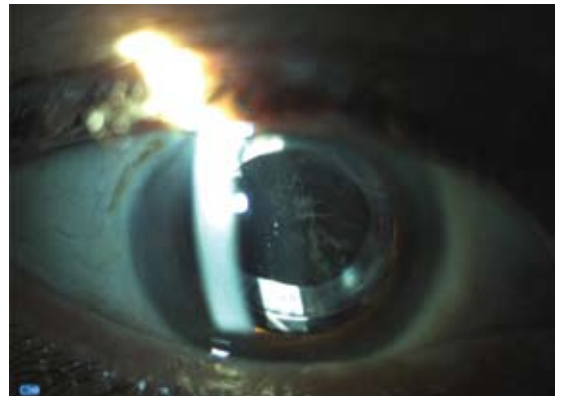


Figure 7 The detached vitreous can be seen to move with blinking after pupil dilation

ocular media is now clear enough for them to see pre-existing floaters. However, PVD and RD are more likely to occur in individuals that have undergone any form of intraocular surgery. PVD is common following cataract surgery and can occur at any time from early days postoperatively to months afterwards.

Patient symptoms of PVD include flashing lights and the appearance of floaters which may or may not be accompanied by a blurring of vision. A diagnosis of PVD can be confirmed by the presence of a Weiss' ring. On examination, this appears as a floater with a hole that corresponds to where the vitreous was attached to the optic nerve head previously. In retro illumination, the thickened attachment site on the loose vitreous has a dark ring-like appearance. The patient may also be able to see a large floater. As the vitreous collapses on itself, collagen fibres coalesce to give rise to visible floaters.

Patients presenting with an acute PVD should be re-examined periodically for up to six weeks if they are continuing to see flashes as this is a sign of vitreous traction which may cause a retinal tear. Figure 6 shows an OCT image of a PVD with traction over the macular area. Figure 7 shows an eye that underwent cataract surgery two years ago. Within the circle of the dilated brown iris, a white ring can be seen. This is the fibrosed anterior lens capsule and vitreous detachment can be seen within the pupillary area. Movement of the vitreous could be seen with eye movements.

Retinal detachment is a rare (1-2 per cent),⁸ but potentially serious, complication of cataract surgery. The incidence is much lower with phacoemulsification and small incision surgery than that found after intracapsular cataract extraction. Optometrists should look for Schafer's

sign in patients with suspicious symptoms. Schafer's sign or tobacco dust is the presence of pigment in the anterior vitreous and is a sign that a retinal break may have occurred. The likelihood of a tear occurring is also far higher in patients with haemorrhagic PVDs compared with those without haemorrhage. Urgent referral for ophthalmologist opinion is indicated for any patient with symptoms or signs suggestive of a retinal tear as symptomatic retinal breaks often require same-day treatment.

LESS COMMON COMPLICATIONS

Lens dislocation

This is a rare complication with the patient complaining of blurred vision, glare and possibly diplopia. Even without dilation of the pupil it may be possible to see the decentration of the lens, which is evident by the edge of the optic being within the undilated pupillary margin or in severe cases, the haptic is visible. A well-placed IOL implant sits normally in the capsular bag but can become displaced over time by asymmetrical thickening or fibrosis of the lens capsule. This can cause high degrees of astigmatic error as well as higher-order aberrations and glare. This complication is also associated with trauma and previous vitreo-retinal surgery.⁹ Another cause of displacement can be due to weakening of the zonular fibres which support the lens capsule. Conditions such as pseudoexfoliation syndrome which weaken those fibres could cause the lens to dislocate. If the visual symptoms are disabling to the patient, referral is indicated for possible repositioning of the lens, or lens exchange surgery.

Capsule block syndrome

Also known as capsular bag distension, it occurs after cataract removal and

placement of a posterior chamber IOL and is classified according to its time of onset. Typically a patient reports blurred vision which is usually found to be due to an induced myopic shift, although a hyperopic shift or no refractive change has also been reported.¹⁰⁻¹² On examination an accumulation of fluid within a distended capsular bag can be seen. It is thought that this fluid is due to residual lens epithelial cells that have undergone metaplasia and proliferation to produce collagen and extracellular matrix which accumulates in the capsule. Additional slit-lamp findings include narrowing of the anterior chamber and occasionally there is a persistent uveitis. YAG capsulotomy is usually performed to release the fluid which disperses into the vitreous cavity and vision is restored.

Ptosis

This is a very rare complication of cataract surgery and usually occurs several months after the event. Often a patient will notice ptosis after surgery because they are more aware of their eyes after undergoing a procedure. It is important to take a detailed ocular history as it is possible that ptosis may have been present prior to surgery but not noticed.

This form of ptosis is usually transient and unilateral, affecting the eyelid of the eye that has undergone surgery, with the age of the patient and previous ocular and eyelid surgery making the patient more susceptible. It improves over the short-term postoperative period without intervention and tends to be caused by eyelid oedema or haematoma, foreign body reaction, ocular inflammation, and anaesthesia effects. Causes of persistent or chronic ptosis usually involve damage to the levator muscle due to toxic effects of anaesthesia, prolonged oedema, trauma from direct injection into the muscle or use of a lid speculum during surgery.



Many cases resolve within 6-12 months and surgical intervention is not usually required.

Late-onset endophthalmitis

Endophthalmitis is a rare complication, with most cases occurring within a week of surgery, although it can occur at any time. Late-onset endophthalmitis is usually due to low-grade microorganisms that manifest themselves weeks or months after surgery and often just after postoperative medications have been stopped. Patients tend to present with a red eye and discharge and it is worth noting that the symptoms of late-onset endophthalmitis are usually less dramatic than acute cases. This is accompanied by cells in the anterior and posterior chambers of the eye. Immediate urgent referral to hospital is needed where the patient is likely to undergo vitrectomy followed by an intravitreal injection of an antibiotic and or steroidal agent. In most cases the causative agent is bacterial, but fungal infections are also a possibility.

Late-onset endophthalmitis is a particular risk for glaucoma patients that have undergone a trabeculectomy procedure. This is because the surface of the globe is weakened and bacteria may enter the eye via the filtering bleb. This is a risk over the patient's entire lifetime but poses an increased risk after cataract surgery, with 23 per cent of patients developing a bleb-related complication that could lead to endophthalmitis within five years.¹³

Summary

Although the final parts of this series have looked at some serious complications, it is worth bearing in mind that modern cataract surgery is generally a brief procedure with very few complications. For those patients that are unfortunate enough to suffer problems postoperatively, the effect on vision can be minimised by timely referral and remedial surgery. ●

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MULTIPLE-CHOICE QUESTIONS - take part at opticianonline.net

1 What is the number of patients that are likely to develop posterior capsular opacification within five years of cataract surgery?

- A One in 10
- B One in four
- C Three in 10
- D Two in five

2 Which of the following is not a potential feature of PCO?

- A Elschnig pearls
- B Fibrosis
- C Narrowing of the anterior chamber angle
- D Increasing astigmatism

3 Which of the following is a possible complication after YAG laser capsulotomy?

- A Uveitis
- B IOP rise
- C Macular oedema
- D All of the above

4 Which of the following is not true about CMO?

- A It usually presents 4-6 weeks post cataract surgery
- B Angiographic CMO affects up to 20 per cent of patients
- C Clinical CMO is unlikely to affect distance acuity
- D CMO responds well to anti-inflammatory therapy

5 Which of the following statements is not true?

- A Retinal detachment is more common following cataract surgery
- B PVD is common following cataract surgery
- C YAG capsulotomy increases the risk of retinal detachment
- D Vitreo-retinal traction following cataract surgery is unlikely to affect vision

6 Which of the following statements is not true?

- A The presentation of late-onset endophthalmitis is similar to that of early onset endophthalmitis
- B The risk of endophthalmitis is greater in patients that have undergone filtration surgery for glaucoma
- C Late-onset endophthalmitis may present several months postoperatively
- D Late-onset endophthalmitis is treated with both antibiotics and anti-inflammatories

Successful participation in this module counts as one credit towards the GOC CET scheme administered by Vantage and one towards the Association of Optometrists Ireland's scheme.

The deadline for responses is March 10

