



Cataract



Part 3 - Clinical assessment and early postoperative complications

In the latest in our series on cataract, **Michelle Hanratty** discusses the examination of the patient before and after surgery. **Module C14846**, one general CET point for optometrists and DOs

In 2005 direct referral for cataract surgery from optometrists was just starting to happen, with patients being able to choose a hospital from a list of potential providers. These providers would have contracted with local primary care trusts (PCTs) to provide cataract services at the NHS tariff price. In 2010, true patient choice is still limited via the optometrist direct referral route as optometrists can only refer to providers on their PCT list. If a patient wants to go to a different facility, they can only do so via their GP and with the agreement of the local PCT on a case by case basis. Still, this is a vast improvement for patients who can decide where to have surgery based upon convenience, waiting times and hospital reputation.

Once a patient has been referred to hospital, they should be contacted and given an appointment for a preoperative assessment. Waiting times vary from hospital to hospital, but most cataract providers are contractually required to have no more than 4-6 weeks from referral to first outpatient appointment, and then surgery within 12 weeks of that first appointment.

Preoperative assessment

At the preoperative assessment, all aspects of the patient's care is evaluated. Taken from the Royal College of Ophthalmologists Guidelines for Cataract Surgery,¹ a summary of the purpose of this appointment can be seen in Table 1. A social and medical history is elicited which highlights if there are any general health considerations or contraindications for surgery. Social care needs are also taken into account. Some elderly patients live alone and do not have anyone to stay with them for the first 24 hours after surgery or do not have the dexterity to administer their own eye drops. In such cases, arrangements need to be made for a relative to stay overnight and, sometimes, for a district nurse to attend the patient for the duration of

the postoperative period that the patient requires eye drops.

The patient's mobility is also evaluated as to whether or not they are able to co-operate with the procedure and lie reasonably flat during surgery. It is also important to identify those patients with potential communication issues such as hearing loss or not understanding English. It is imperative that the patient is able to understand and follow any instructions that the surgeon may give during the operation. If necessary, an interpreter is provided. Blood pressure, pulse rate, blood sugar and sometimes urine tests are also carried out at this stage.

For the ophthalmic workup, the measurements required are the patient's unaided vision, best corrected vision and pinhole vision. Spectacle refraction prior to cataract formation is also useful as it may influence the refractive end point aimed for. Refraction is carried out at the preoperative assessment if the patient does not have significant cataract and the decision for surgery is borderline, or if another pathology is suspected. Refractive information is also useful where the patient has already had one eye treated and is not emmetropic.

Biometry (keratometry and axial length measurement) of the eye is then carried out to enable calculation of the lens implant power required. In most cases, the intention is to leave the patient near to emmetropia unless contraindicated. For those patients with significant corneal astigmatism, limbal incisions can be effectively used to reduce even high levels of astigmatism. Results do vary with surgeon experience and skill, but no more than 1.00DC of astigmatism should be induced by the procedure. Intraocular pressure measurements and pupil function are also checked at this appointment.

The surgeon carries out an anterior eye examination on every patient at this appointment. Blepharitis is a significant risk factor for postoperative endophthalmitis^{2,3} and should be treated prior to surgery. If a patient does not comply with any lid hygiene measures introduced, it may lead to their surgery being cancelled at the last minute.⁴ A dilated fundus examination is also carried out as some retinal conditions (eg diabetic retinopathy) may be exacerbated by cataract surgery. If no fundus view is visible, a B scan or retinal projection testing can be used to give a crude assessment of

TABLE 1

Summary of outpatient episodes

Preoperative appointment	Postoperative review
<ul style="list-style-type: none"> ● Confirm the diagnosis of visually significant cataract ● Ensure the cataract is the cause of the visual symptoms ● Determine if there is co-existing ocular pathology ● Ensure the patient wishes to undergo surgery and understands the risks ● Formulate a surgical care plan ● Ensure the patient is fit for surgery ● Put a care plan in place (this can be helped by the use of an integrated care pathway) 	<ul style="list-style-type: none"> ● Review progress and medication ● Collect outcome data ● Discuss second eye surgery where appropriate ● Arrange follow-up for co-existing eye disease ● Provide advice on spectacle prescription (which can be prescribed approximately four weeks following phacoemulsification)



TABLE 2
Cataract postoperative complications

Ocular area	Postoperative complication
Incision	Wound leak Wound dehiscence
Cornea	Astigmatism Oedema/bullous keratopathy
Anterior segment	Pressure rise Endophthalmitis Capsule block syndrome
Capsule	Late tear with IOL Posterior capsule opacification
Zonules	IOL/bag decentration Sunset syndrome
Iris	Pupil capture Epithelial ingrowth
IOL	Opacification Inflammation
Retina/vitreous	Cystoid macular oedema Retinal detachment Choroidal haemorrhage

retinal function. The latter is useful if the patient has a very mature cataract with vision of perception to light only. A pen torch is shone from different directions of gaze and the patient asked to identify which direction the light is coming from. Once the patient has had their suitability for surgery confirmed, the surgeon will explain in detail the potential benefits and risks. This consent process is critical in ensuring that the patient fully understands the nature of the surgery so that they can decide whether or not to proceed.

Surgery

Most cataract surgery in the UK is carried out as day case surgery under local anaesthesia. This involves the use of several agents with some surgeons

using purely topical anaesthetics and others using a combination of topical eyedrops and ocular injections. General anaesthesia or other sedation is only used where patients cannot keep still or are excessively nervous.

In the UK, phacoemulsification and IOL implant is now the procedure of choice for most surgeons undertaking cataract surgery. Although the procedure is more complex than intra- or extracapsular cataract extraction and requires more training and skill, the intraoperative risks are lower and the postoperative recovery of the patient is faster in terms of both ocular integrity and visual function. The smaller incisions needed for phacoemulsification and foldable lens implants mean that induced astigmatism is much lower than with previous methods.

Postoperative follow up

Once the patient has undergone surgery, a postoperative assessment is carried out between two and four weeks later, depending upon local protocols. Table 1 summarises the purpose of the appointment. A normal eye is expected to have a best corrected visual acuity (BVCA) of 6/12 or better, to be within 1.00DS of target sphere and to have no more than a 1.00DC increase in astigmatism. While current guidelines quote the audit results of postoperative BCVA, there is now a movement for greater emphasis to be placed upon the patient's uncorrected acuity. When auditing outcomes of surgery, the uncorrected acuity will be a reflection of the accuracy of the preoperative biometry and the placement of the limbal incisions for correcting astigmatism.

Examination of the anterior eye will check that the eye is recovering as normal. The incision sites should be sealed and clear. The Seidel test can

be used to check that the wound is not leaking. This is when fluorescein is introduced into the tear film and if there is a wound leak, the anterior vitreous can be seen washing the fluorescein away from the wound site. At two weeks postoperatively it is not uncommon to see some mild oedema particularly if the phaco-emulsification time was prolonged in surgery (due to a very mature cataract), but by three or four weeks the cornea should have settled down. The anterior chamber should be fairly quiet, with few or no cells. After this postoperative visit, the patient is usually discharged back to their optometrist for routine eye care.

Postoperative complications

Occasionally patients can have postoperative complications. The very early ones are less commonly seen by community optometrists. However, as patients do not have ready access to their hospital clinic, their first course of action if they think they have a problem could be to seek the opinion of their own optometrist. The information in Table 2 is taken from the Royal College of Ophthalmologists Guidelines¹ and lists the possible complications that can occur postoperatively. This next section will not cover all of these complications but will focus on the ones that are potentially the most serious or are most likely to be seen by optometrists.

Early complications Endophthalmitis

This is potentially the most devastating of all postoperative complications. If it is not detected and treated effectively, it can ultimately lead to blindness and even enucleation. It is a severe intraocular inflammation resulting from infectious organisms entering the vitreous cavity during intraocular



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surgery. Fortunately, it is a rare complication with a reported incidence of between 0/08 to 0.68 per cent.⁵

A patient with endophthalmitis typically presents with a red, swollen eye that has become progressively painful and a worsening of the vision (Figure 1). Slit-lamp examination of the eye reveals eyelid oedema, conjunctival hyperaemia, limbal injection, corneal oedema and anterior chamber activity. Severe acute cases frequently have a hypopyon. Indirect ophthalmoscopy following pupil dilation also shows inflammatory cells in the vitreous. As the condition progresses, the invading microorganisms stimulate a series of vascular changes that may ultimately lead to retinal inflammation and haemorrhaging. This can have a devastating effect on vision, with acuities of hand movements or less in the worst cases.

Emergency referral to an eye unit is imperative in such cases and the patient is likely to be treated with an intravitreal injection of multi-spectrum antibiotics in addition to topical antibiotics. Where the vision is severely compromised, a pars plana vitrectomy is also carried out. A microbiological investigation is always undertaken out to identify the source of the infection.

Toxic anterior segment syndrome (TASS)

This typically presents within the first 24 hours after surgery and unlike endophthalmitis, it is not caused by an infective organism. The causes are thought to be linked to the preservatives in the intraoperative drugs or sterilisation chemicals used.⁶

Patients with this condition typically present with blurred vision and severe anterior segment inflammation. Although limbal to limbal corneal oedema and hypopyon are often present, the inflammation is usually confined to the anterior chamber. The condition responds well to topical steroids and generally resolves within six weeks. It can be difficult to differentially

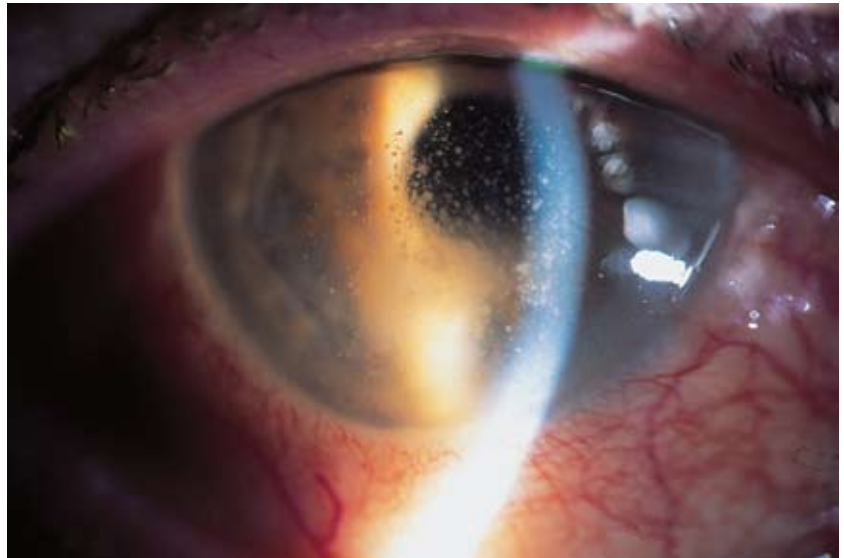


Figure 1 Endophthalmitis presents as a red, painful eye. Image courtesy of J Kanski, *Clinical Ophthalmology*, 4th edition, Butterworth-Heinemann

diagnose between this condition and infectious endophthalmitis and so it is best to refer the patient for urgent review by an ophthalmologist. Table 3 summarises the difference between the two conditions.

Anterior uveitis

This is commonly seen in the short-term postoperative period despite the use of corticosteroids to dampen down the inflammatory response to surgical trauma. Immediately after surgery it is normal to see some corneal oedema, conjunctival hyperaemia and cells in the anterior chamber. Using the Kanski grading scale (Table 4), it is not uncommon to see cells grade +/- at two weeks postoperatively, especially in patients with dark irides. By four weeks there should be no cells present. Patients with dark irides are more likely to suffer from anterior chamber inflammation following phacoemulsification.⁷ These patients often have a greater amount of inflammation which often takes longer to resolve and is more likely to recur once steroid therapy has been stopped. They also require more intensive steroid therapy and are followed up

TABLE 4

Grading scale for inflammatory cells in the anterior chamber - using a slit beam 3mm long, 1mm wide with 25X magnification

Cells per field	Grade
0	-
1-5	+/-
5-10	+
10-20	++
20-50	+++
50+	++++

for a longer period of time. The risk of rebound uveitis is minimised by tapering the steroids down slowly over a longer period of time.

Intraocular pressure (IOP) rise

Cataract surgery involves significant disruption in the anterior chamber and as a result, glaucoma sufferers can encounter additional problems which can lead to visual loss. IOP spikes following cataract surgery are well documented in literature and although healthy optic discs may tolerate this transient IOP rise, glaucomatous discs may not. One study documents deterioration in visual field defects in 9.7 per cent of its glaucomatous patients.⁸ It is therefore essential for the surgeon to manage the IOP of glaucomatous patients carefully when planning cataract surgery.

Steroid responders are another group of patients that need to be monitored more closely postoperatively. Studies have shown that the use of prescribed topical

TABLE 3

Differential diagnosis between TASS and endophthalmitis

Toxic anterior segment syndrome	Endophthalmitis
Onset within 12-24 hours	Onset usually 4-7 days
Mild discomfort, little pain	Progressively increasing pain
Anterior segment inflammation	Anterior and posterior segment inflammation
Responds to intense steroid therapy	Does not respond well to steroids and requires antimicrobials



steroids over four to six weeks results in an increase in IOP of more than 16mmHg in 5 per cent of the population and an increase of between 6 and 15mmHg in 30 per cent of the population.⁹ A moderate IOP rise for the duration of steroid use does not generally cause any problems but the patient should be reviewed two to three weeks post cessation of topical steroids to ensure that IOP returns to a normal level.

Corneal oedema

Surgical trauma following phacoemulsification can result in corneal oedema which usually resolves within two weeks. If the endothelium is compromised in any way, either by age, physical trauma or a dystrophy (eg Fuch's endothelial dystrophy), the oedema takes much longer to resolve. In cases of severe oedema, folds in Descemet's (Figure 2) membrane can be seen all over the cornea and loss in corneal clarity can result in hand movement vision. There is little that can be prescribed to improve the speed of recovery and patient management is mainly observation and reassurance at this stage. Occasionally, sodium chloride drops are prescribed in an attempt to speed up recovery. This can

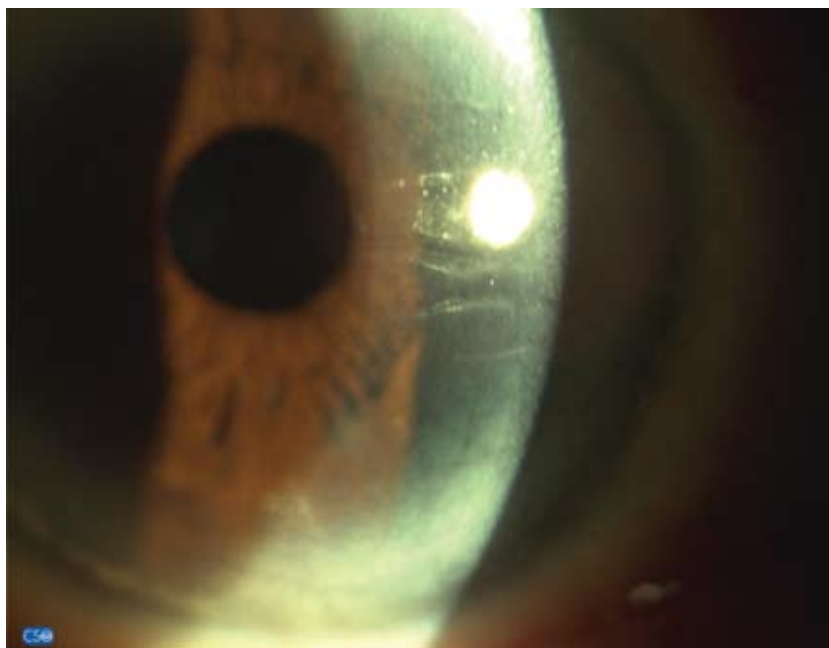


Figure 2 Corneal oedema is commonly seen after cataract surgery and can persist for several weeks

take several months and in rare cases where corneal clarity does not return, a corneal transplant may be needed.

Later-onset complications are more likely to be seen by community optometrists and will be covered in the next article. ●

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1 Which of the following is not part of a standard preoperative assessment for cataract surgery?

- A Keratometry
- B Axial length
- C Refraction
- D Topography

2 Which of the following is a contraindication for cataract surgery?

- A Glaucoma
- B Diabetic retinopathy
- C Blepharitis
- D Wet AMD

3 The typical onset for endophthalmitis is?

- A Within one day
- B Within one week
- C Within one month
- D Within one year

4 Which of the following does not respond to steroid treatment?

- A Toxic anterior segment syndrome
- B Endophthalmitis
- C Uveitis
- D None of the above

5 Which of the following is not normal two weeks postoperatively?

- A Up to five cells in the anterior chamber
- B Minimal anterior chamber flare
- C Subconjunctival haemorrhage
- D Corneal oedema

6 Which of the following statements is false?

- A Patients with dark irides are likely to have uveitis for a longer postoperative period
- B Steroid responders need to be given a NSAID alternative
- C Topical steroid use for 4-6 weeks can cause an IOP rise of over 15mmHg in 30 per cent of the population
- D Steroid responders should have their IOPs checked two weeks post cessation of topical steroids

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 November 4 2010

