

# Cataract

A cataract is the development of haziness or opacity in the lens of the eye. Early changes in lens clarity may have no noticeable effect on the vision, whilst a 'mature' cataract will reduce the vision to a level of blindness. Cataracts are indeed the world's leading cause of blindness.

## ***Causes of Cataract***

In the UK the majority of patients with cataract are in the older age groups and the progressive changes in lens clarity can be assumed to be an age-related deterioration in the function of the cells forming the lens of the eye. Many factors can affect the formation of lens opacities – cataracts are even found in some infants and this is often linked to infection or metabolic disease. Diabetes is an important metabolic condition which can cause cataracts in adults. Diarrhoea, dehydration, malnutrition and high levels of ultra-violet and infra-red radiation may all play a part in causing cataracts to form at an earlier age in countries where these conditions are prevalent. Cataracts are also seen following trauma to the eye.

## ***Treatment of Cataract***

At present there is no proven medical treatment to arrest or reverse the presence of cataract, but fortunately surgical treatment can now offer a cure with an extremely high success rate. In its simplest form, cataract surgery involves removal of the cloudy lens in its entirety, and repair of the entry wound with stitches. This can be a quick, simple and cheap operation but leaves the eye very much out of focus so that extremely thick and strong spectacles are required to see clearly. Modern cataract surgery requires not only removal of the cloudy natural lens, but its replacement by a plastic intraocular lens implant. This has the advantage of restoring the optical system of the eye to a near normal state. In general this means that after surgery the quality of vision should be good without the need for glasses. By choosing an intraocular lens implant of particular optical power, one can choose what the final optical state of the eye will be. Thus, patients who were previously very myopic (short-sighted) or hypermetropic (long-sighted) can have their optical defect corrected at the same time as the cataract is being treated.

## ***Ocular Biometry***

In order to calculate the correct intraocular lens implant power, pre-operative measurements of the eyes are made including an assessment of the length of the eye by ultrasonic biometry. This information allows the surgeon to predict with a fair degree of accuracy what the final optical state of the eye will be. The surgeon can then discuss the possibilities of the various optical outcomes from the surgery with the patient, and select an appropriate lens to achieve the desired result.

In people who have a significant amount of astigmatism as well as cataract, special toric (aspherical) intraocular lenses may be required to achieve the desired optical outcome, or incisions can be made in the cornea at the time of cataract surgery in order to reduce the

astigmatism (astigmatic keratotomy). Alternatively the cataract surgery can be followed by laser surgery to the cornea (e.g. LASIK), to correct the astigmatism.

### **Anaesthesia**

Most cataract surgery is carried with local anaesthesia – drops to anaesthetise the eye and injections beside the eye to stop the eyelid and eye movement during the surgery. Since local anaesthesia has little effect on the patient's general condition, they are fit to return home shortly after the procedure, and in-patient hospital stay is not usually necessary.

### **Phakoemulsification**

The natural lens of the eye has a diameter of around 12mm, so if it is to be taken out in one piece, the incision into the eye must be at least this long. When a large wound is created in the eye, there is almost always distortion of the corneal shape during the wound healing process and this creates optical distortion – astigmatism – which then necessitates spectacle correction. To overcome this problem it is preferable to remove the cataract through a small wound – say 3mm – and this can be achieved by breaking up the lens/ataract inside the eye and removing the lens matter a little at a time through a small incision. The phakoemulsification instrument has a small probe connected to an ultrasonic transducer. The ultrasonic vibrations fragment the hardened lens matter and the emulsified fragments are then aspirated through the small incision in a flow of saline solution. Once the lens matter has been removed, the intraocular lens implant must be introduced through the same small incision. Modern intraocular lenses are made from various deformable plastics and can be rolled or folded-up and injected into the eye. Once inside the capsular membrane (remnants of the natural lens) they unfold, and the optical part of the lens implant is held centrally behind the pupil by supporting loops or plates (haptics).

### **Complications**

In by far the majority of cases cataract extraction has a favourable outcome. Sometimes other eye conditions such as glaucoma or macular degeneration may limit the quality of the visual outcome. Very rarely the surgery may be complicated by problems such as inflammation or infection. Occasionally the function of the retina can be impaired by the cataract surgery – cystoid macular oedema can lead to persistently poor vision, and rarely retinal detachment may develop after cataract surgery, in which case further surgery will be necessary to repair this.

### ***If you have had your cataract operated on, can it come back?***

In phakoemulsification surgery 98% of the lens/ataract is removed, leaving only the outer lens capsular membrane. This membrane is used to support the intraocular lens implant. After some time, usually some years, in around 30% of patients the lens capsule can become hazy. When the problem arises it is simply remedied by the use of a YAG laser. This invisible infra-red laser beam is focused on to the capsular membrane and vaporises the tissue – so clearing the optical path for light rays to reach the back of the eye. A YAG capsulotomy takes only a few minutes to perform, is entirely painless, and ensures that the visual pathway remains clear of capsular membrane indefinitely.