ABC of Eyes

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CATARACTS

Symptoms

DIFFICULTY IN

- Reading
- Recognising faces
- Watching television
- Seeing in bright light
- Driving

"Cataract" is the term used to describe any lens opacity from the smallest dot to complete opacification. The prevalence of cataracts increases with age; 65% of people aged 50 to 59 have opacities and all of those aged over 80. Only when these opacities seriously interfere with vision is operation contemplated.

Symptoms depend on whether the cataracts are unilateral or bilateral, and the degree and position of the opacity. If the cataract is unilateral the patient may not notice its effects until he has cause to cover the good eye. Patients may complain of difficulty in reading (which should be differentiated from the presbyopia that is normal in older people), in recognising faces, and in watching television. They may complain that their vision worsens in bright light, especially if the opacity is central. Occasionally patients experience monocular diplopia and see haloes round lights; this is due to the lens opacity interfering with light rays passing to the back of the eye. Some patients may even report that they can read without glasses. This happens when a nuclear sclerotic cataract increases the converging power of the lens, so making the patient myopic (short sighted).

Signs

The signs of a cataract are:

A reduction in visual acuity—The degree of visual impairment depends on the nature of the cataract and the conditions of testing. Visual acuity should also be tested with a pin hole to eliminate refractive errors.

A diminished red reflex on ophthalmoscopy—When the ophthalmoscope is used to view the eye from about two feet away the reflection of the fundus can be seen as a "red reflex." This is the troublesome reflex so often seen in photographs of people taken with a flashlight. If there is any opacity between the cornea and the retina this reflex will have opacities in it. The nature of the opacities in the reflex will depend on the position and extent of the opacities in the optical media. This reflex is more easily seen when the pupil is dilated.

A change in the appearance of the lens—If one shines a bright light on the eye the lens may appear brown, or even white if the cataract is more advanced.

Although cataracts are common they are not the only cause of visual problems. The patient with a cataract should be able to point to the position of a light. Lack of normal "projection of light" should lead one to suspect problems either in the posterior part of the eye or beyond. The pupillary reactions should also be normal. If they are not, retinal disease or an abnormality of the visual pathway should be suspected.

Blurred vision.

Red reflex.

Cortical cataract.

Nuclear sclerotic cataract.

**Children with cataracts
must
be referred immediately**

Cataracts occurring in children are much more serious, as the development of vision may be irreversibly impaired (visual deprivation amblyopia) even if the cataracts are removed later. Any child with suspected cataracts should be referred immediately. Cataracts in young children are detected by looking at the red reflex, and this should be a routine part of the examination of a young child.

Causes

- Age
- Diabetes
- Inflammation
- Trauma
- Steroids

There are many conditions that are associated with cataracts. Changes within the lens caused by aging are, however, the commonest cause of cataract. Cataracts also occur more often in patients with diabetes, uveitis, and a history of trauma to the eye. Prolonged courses of steroids, both oral and topical, can also give rise to cataracts. Children with cataracts need to be investigated to exclude treatable metabolic conditions such as galactosaemia.

Management

Extracapsular cataract surgery.

There is no effective medical treatment for established cataracts. The treatment is surgical.

Indications for operation

The decision to operate depends primarily on the effect of the cataracts on the patient's vision. There is no set level below which operation is essential, but most patients with a vision of 6/18 or worse in both eyes usually benefit from cataract extraction. Some elderly patients, however, are perfectly happy with this level of vision. Simple advice, such as the recommendation to use a good reading light that provides illumination from above and behind, may be adequate. On the other hand, a younger patient with more exacting visual demands may opt for operation sooner. (The minimum standard for driving is about 6/10; this is equivalent to a line between 6/9 and 6/12.) On the whole, the surgeon's advice should be tailored to the individual patient. The old concept of a "ripe" cataract no longer applies.

Techniques of operation

Extracapsular method—The anterior capsule is cut open and the contents of the lens aspirated after the nucleus has been expressed. Years ago surgeons waited until the cataract was mature or "ripe" (when the contents became liquified) because this made aspiration of the contents of the lens easier. With advances in microsurgery, however, there is now no longer any need to wait for the cataract to mature. The extracapsular technique has increased considerably in popularity over the past few years, partly owing to the increasing use of posterior chamber implants, which can be used only with the extracapsular method. It is also used in younger patients, in whom the vitreous is more strongly attached to the back of the lens capsule so that removal of the whole lens by the intracapsular technique can be hazardous. It is also used in short sighted patients to reduce the risk of retinal detachment, because in this technique the vitreous is held back by the remaining posterior capsule of the lens.

Intracapsular cataract surgery.

Possibly no implant if

- Intraocular inflammation
- Severe diabetic retinopathy

- Steroid drops (inflammation)
- Antibiotic drops (infection)
- Dilating drops (adhesions)

No bending

Cataract glasses: thick, heavy, expensive, with magnified image and reduced field of vision.

Intracapsular method—The entire lens is removed within its capsule, usually with a cryoprobe, after the suspensory ligaments have been dissolved by the enzyme α chymotrypsin. An iridectomy has to be performed to stop the forward movement of the vitreous blocking the flow of aqueous through the pupil. After this an anterior chamber lens is often implanted.

Intraocular implants

An intraocular lens has the optical advantage of being placed in the eye like its natural counterpart, thus overcoming the problems associated with spectacles and contact lenses. The final refractive state of the eye after operation can be chosen by taking into account the curvature of the cornea and the length of the eye (measured by ultrasonography) and then implanting a lens of appropriate power. Patients are usually left slightly short sighted so that they can read without glasses yet still manage to see reasonably at a distance. There are many designs of intraocular lens available but they come in three main categories according to whether they are fixed in the anterior chamber, clipped on to the margin of the pupil, or implanted in the posterior chamber. If a lens is to be implanted in the posterior chamber, the extracapsular method of extraction must be used so that the posterior capsule is left to support the lens.

Contraindications—A lens can be put into nearly every eye, but intraocular inflammation and advanced diabetic retinopathy are conditions that may militate against the success of an implant. Many surgeons would not use an implant in such circumstances.

Postoperative care

Most patients are treated for several weeks with steroid drops to reduce inflammation and antibiotic drops to prevent infection. Patients are advised not to bend or undertake strenuous exercise for a few weeks after the operation. If an extracapsular extraction has been performed the remaining capsule may thicken and this may need to be divided. This can be done surgically or with the cutting laser, which avoids the need to incise the eye.

Optical correction after operation

Removal of the lens results in an eye with a large hypermetropic refractive error. This can be corrected with spectacles or a contact lens as well as with an implant.

Spectacles—The natural lens has great refractive power and consequently the spectacles required to correct the refractive error are thick and heavy even when they are made of plastic. The corrected image is about 30% larger than that seen by the normal eye. This means that the image cannot be fused with that from the unoperated eye. Objects are also perceived to be closer than they are, often resulting in accidents—for example, pouring tea into one's lap rather than into the cup. The field of vision is restricted, and there is a "blind" area all round within this field because of the optical aberrations inherent in such powerful lenses. The effects of these problems can be minimised by the use of contact lenses or an intraocular lens implant.

Contact lenses—The size of an image with a contact lens is only 10% larger than the image in the “normal” eye. The brain can fuse this discrepancy and thus both an operated eye and an unoperated eye may be used simultaneously. Most patients, however, are elderly and problems may arise because of an inadequate tear film, difficulties with handling, and infection.

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Medicine and the Media

WE HAVE A fair idea of what medicine is going to be like by the year 2000—ever more complex and expensive technology reaching ever more people—but what about health, the elusive state that all this technology is meant to maintain? *A Dream of Health* (BBC2, 15 June) showed how things would be in developed countries if the World Health Organisation had its way.

It started traditionally enough. Four horsemen of the contemporary apocalypse—heart attack, stroke, cancer, and (curiously) suicide—were sighted several lengths ahead of any satisfactory technological solutions, with the gap unlikely to narrow in the foreseeable future. The tragedy of it all, as WHO's director general, Dr Halfdan Mahler, pointed out, was that most of these diseases were actually preventable. But how to prevent them?

What followed was a detailed account of WHO's changing philosophies over the past 40 years. Some ludicrously stilted black and white archival footage (1957) of a case of suspected smallpox showed old style prevention. These techniques were fine for those diseases, but WHO has since eradicated smallpox from the face of the earth, and anyway our problems are quite different from those of 40 years ago, the voiceover intoned. “Our health problems are related to the lifestyles we choose for ourselves.”

Next came a community intervention project in the Lithuanian city of Kaunas: children in nurseries woken from their midday snooze for exercise sessions led by a plump middle aged woman, their parents urged to undergo health screening. (If any bad habits are found they're sent off for corrective treatment. In Kaunas “there are counselling rooms for almost every vice.”) But it has not been a success—so far only a few people have given up smoking.

Dr Mahler doubted whether educational programmes on their own could ever succeed. Their didactic, schoolmasterly approach is the very opposite of WHO's philosophy, which sees self determination as a prerequisite of health. Its approach to the diseases of Western civilisation, more radical than either simple prevention or education, is “health promotion”—that is, creating an environment that makes it easy for people to make healthy choices.

Heartbeat Wales was held up as the best realised local version of this strategy. In practice this means encouraging butchers to stock leaner cuts of meat and supermarkets to label their products so people can see what they are eating. It means gently persuading people to adopt healthier lifestyles of their own accord.

At the cutting edge of WHO's preventive health programme is the Healthy Cities project, which acknowledges that health cannot be achieved entirely by the actions of individual people and

communities: it is often affected by political forces seemingly beyond their control. What can be done was shown in Barcelona, the largest of the 24 designated healthy cities. Success depends on improving the participation of people in decisions about their environment and making political structures more responsive to their needs. Part of WHO's role in this is to provide scientific support for those who are trying to improve their environment.

As promotion for the work of WHO in Europe *A Dream of Health* was excellent, and in its 48 minutes it covered a lot of ground—the port of London, Lithuania, Wales, Barcelona, from prevention through to healthy cities. It never maintained any distance, however, from its subject—one that threw up many questions at this financially troubled time in WHO's existence. Its current overtly political programme to “empower people to take control over their own lives” and to challenge the “many sectors contributing to unhealthy public policies” makes problems for itself in a world committed to very different values. (WHO's radical consumerism is worth comparing with the pallid variety being peddled in Britain at present, which has as its supreme goal the right of people to a doctor, hospital, and treatment of their own choice.)

It is easy to set up and knock down some of the assumptions of the medical model of illness (the sick body as a broken down car, hospitals as garages), but WHO's dream of health has its own assumptions, which remained unexamined by this programme. Would exercise and proper diet in a world free of cigarettes and other pollutants really mean an end to disease as we know it? If experts are going to stop hectoring people can we be sure that they will instinctively choose the healthy option? Left to their own devices will the fair skinned avoid excessive sunbathing, will the sexually promiscuous practise safe sex?

Underlying all this is the belief that innocent man will make the right choices, that it is civilisation and progress (for which read technology) that lead humankind astray. This was highlighted in the programme by the head of the Lithuanian project trying to recreate thin, happy countrydwellers in town and the practice of some cities that are rethinking their policies to ask for their children's opinion. (In Seattle the children wanted better signposted restaurants and more playgrounds.)

WHO's dream of health is a fine one, but whether it ever becomes reality in a hostile world depends on features other than its inherent goodness. A bit of distance and a hint of scepticism (not even a healthy dose) might have helped us assess what sort of chances it has of making it.

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