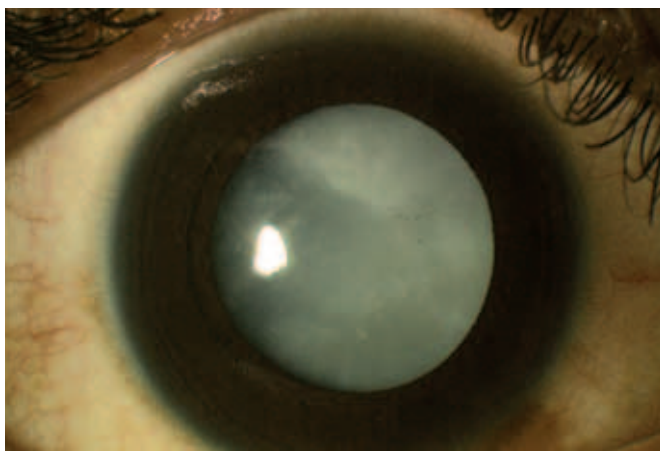


# Non-Retinopathy Ocular Manifestations in Diabetes Mellitus

*"The eyes are the window of one's soul"; so the saying goes. In ophthalmology speak, it translates into "the eyes are the window into one's general and circulatory health". In diabetes patients, the eyes often showcase the state of the disease, say Dr Daphne Han, registrar, and Dr Yeo Kim Teck, senior consultant, Singapore National Eye Centre.*

Diabetic retinopathy is the bugbear of diabetic eye disease; unfortunately it is not the only one. Apart from regular eye examinations to detect diabetic retinopathy and to treat it with laser photocoagulation, eye professionals also look out for cataracts, glaucoma and cranial nerve palsies, which this article aims to describe. Other problems such as visual field abnormalities from strokes and retinal arteriole occlusions can also occur, the former commonly and the latter more rarely.

## CATARACTS



Cataracts are common in the elderly population. In Singapore Chinese the incidence of cataracts is about one third for those aged 40 years old and above, and in those above 60 years old, it is close to 80%. Cataracts are found to be associated with

diabetes. Other risk factors are cigarette smoking, hypertension, exposure to UV light and lower socio-economic status.

The main symptoms of cataract are blurring or dimming of vision (either for distance or near or both) leading to difficulty with reading and seeing objects far away such as road signs, bus numbers and faces of acquaintances. Other complaints include increased short-sightedness, glare and occasionally double vision.

In the early stages of a cataract, visual loss may be very mild. However, when cataracts are very severe, vision can be as poor as perception of light only, which can cause difficulty with activities of daily living, leading to falls and fractures.

Prevention of cataracts has not been shown to be cost-effective. Management of mild cataracts involves accurate refraction and change of glasses, if necessary. Cataract operation is inevitable in the long term.

In diabetes patients, cataract operation carries a slightly higher risk of surgical complications than in a non-diabetic. Surgery may be made more complicated by poor pupil dilatation and epithelial problems common in diabetes patients. Care of diabetic retinopathy needs to be optimised before surgery.

Modern cataract surgery (phacoemulsification - which uses ultrasound energy to liquefy cataracts so they can be suctioned out under a constant flow of fluid) is commonplace and performed through a small sub-3mm wound.

Diabetic retinopathy is the leading cause of vision loss in adults of working age (20 to 65 years) in industrialised countries.

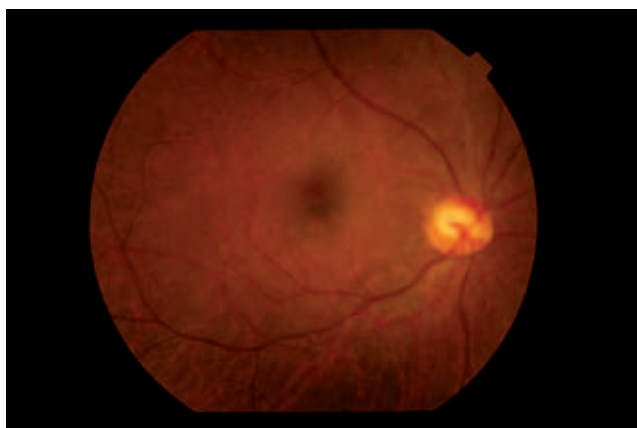
Extra-capsular cataract extraction (ECCE), however, still has a place in cases of very dense cataracts. Energy required by phacoemulsification could be potentially harmful to the cornea. Recovery from ECCE takes longer as the wound is longer and sutures may need to be removed, although studies have shown that the final visual acuity outcomes are similar for both techniques.

Cataract extraction is coupled with the implant of an artificial intra-ocular lens (IOLs) in most instances, with rare exceptions. A wide array of IOLs is available nowadays, and choices can be bewildering. For diabetes patients, a wide lens optic (clear central disc) that is made of acrylic is preferable as it aids retinal examination and treatment.

Newer lenses such as the aspheric and some accommodative lenses may provide better vision, provided diabetes has not affected the macula. After cataract surgery, a close watch needs to be kept as diabetic retinopathy can worsen from increased inflammation.

Laser treatment may need to be initiated or enhanced shortly after a cataract operation.

**GLAUCOMA**



The incidence of glaucoma increases with age, similar to the incidence of diabetes, hence the two diseases often co-exist. Glaucoma is often called “the thief of sight” as its onset can be insidious. Patients can be practically blinded by the disease before even realising it. It is associated with high intra-ocular pressure and visual field loss.

By far, primary open angle glaucoma (POAG) is the commonest form of glaucoma. In Asia, especially in Orientals, there is evidence that chronic angle closure glaucoma (CACG) is more prevalent than in other parts of the world. Both forms of glaucoma can be picked up early by screening conducted by eye professionals. Early detection of these often asymptomatic disease means that treatment can be initiated before blindness occurs.

In POAG, treatment is usually medical involving eyedrops such as timolol, alphagan, trusopt and xalatan before resorting to laser treatment (trabeculoplasty) and surgeries such as trabeculectomy or tube-shunt operations. In CACG, laser treatment has a role in preventing acute attacks and further deterioration of the condition, while surgery is sometimes indicated.

In cases of poorly controlled diabetic retinopathy, another form of glaucoma called neovascular glaucoma (NVG) can occur. Diabetes results in poor oxygenation of eye tissues, causing new and fragile blood vessels to grow in various parts of the eye. When this affects the iris, new and leaky blood vessels grow and extend into the “angles”, or the drainage pathway, therefore increasing intra-ocular pressure.

The definitive treatment of NVG is pan-retinal photocoagulation. This helps to reduce the oxygen demand of the eye and treats the root of the problem. Treatment of eye pressure is also important.

However, NVG usually represents a severe stage of diabetic eye disease, and is often associated with a poor prognosis. Cyclodiode therapy may be performed to destroy the ciliary body (which produces the aqueous humor or intra-ocular fluid in the front part of the eye). This can help to control the IOP, before surgery is contemplated.

**OCULAR MOTOR NERVE PALSIES**

This is a form of microvascular disease when diabetes affect the tiny blood vessels (vasa vasorum) that supplies the cranial nerves. Eye wise, this can manifest as a sudden onset of a new squint. The eyes lose their usual alignment.

The most common is third nerve palsy, where the affected eye assumes a down and out position. As a result, horizontal or diagonal double vision (diplopia) ensues, and can be so troubling for some patients as to cause falls, vomiting and headache.

Fourth nerve palsy and sixth nerve palsy can also occur, causing vertical diplopia and horizontal diplopia respectively. Treatment is conservative; management of diabetic control and other vascular risks being paramount. Troubling double vision can be treated by orthoptic correction such as patching the eye to eliminate the second image or wearing a prism to fuse the two images.

Most nerve palsies resolve to a lesser or greater degree by six months, but some leave behind a permanent squint. When this is stable (usually after at least one year), squint operation may be considered.



It is estimated that more than 2.5 million people worldwide are affected by diabetic retinopathy.