

Your Glaucoma Eye Examination: Part 2

Your Optic Disc

In the last issue of Eyelights we discussed the significance of eye pressure measurement in glaucoma care. This time we look at the importance of examining the optic disc.

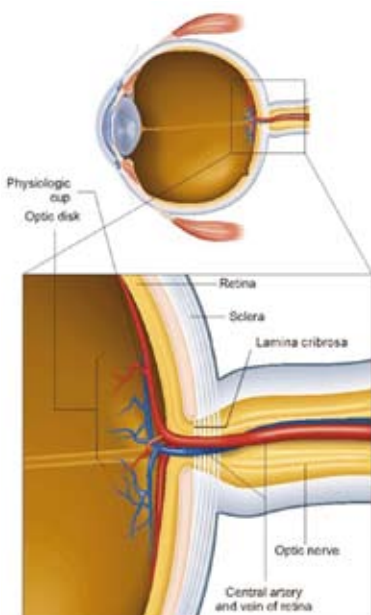
What is the optic disc?

The optic disc or optic nerve head is the portion of the optic nerve which can be seen on examination of your eye.

The optic nerve begins in the eye and is composed of 1,200,000 tiny nerve fibres that send signals from the eye to the brain. It is these nerve fibres that can be seen, almost end-on, within the eye.

Each nerve fibre receives visual signals from a certain area of retina and thus represents an area of your field of vision.

The typical optic disc is a circular structure where the nerve fibres exit the eye. The optic disc is, on average, only 1.5 mm in diameter. The disc area is larger than the area taken up by the nerve fibres leaving the eye, so a small area of the central optic disc is left “unfilled” forming a small depression, called the cup.



The blood supply of the optic nerve is through tiny blood vessels that surround and penetrate into the optic nerve, supplying the nerve and optic disc with blood, nutrients and oxygen.

What happens in glaucoma?

Glaucoma causes damage to the nerve fibres and although the exact mechanism is still unknown, there are two main theories that may explain glaucoma damage.

The mechanical theory proposes it is the effect of eye pressure that damages the nerve fibres. It is thought that the nerve fibres are compressed at their exit point and continued, long-term damage causes the nerve fibres to atrophy or slowly die.

The vascular or “blood flow” theory proposes that the pressure of the eye has an effect on blood flow to the optic nerve. If the nerve fibres are starved of blood, nutrients and oxygen, then they undergo atrophy.

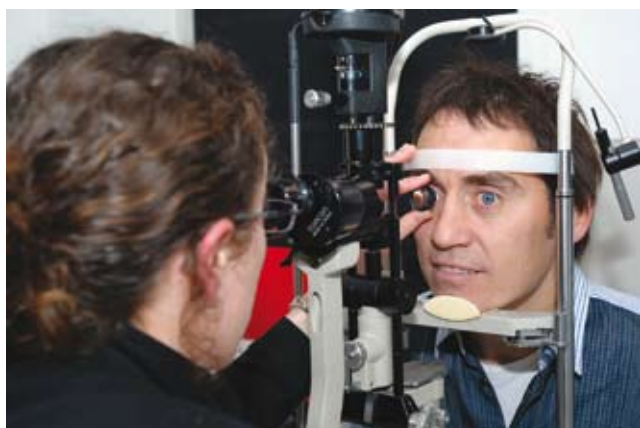
The loss of nerve fibres means that there will be a corresponding loss or defect in the visual field and a “blind spot” may be detected on visual field testing.

At the present time, treatment of glaucoma is dependant on reducing eye pressure, to prevent further loss of the remaining nerve fibres.

How is the optic disc examined?

Eye care practitioners use special instruments to look at the back of your eye – a slit lamp or an ophthalmoscope. They are able to assess the health of your optic nerve by looking at the cup, colour and contour of your optic disc.

The size of the optic cup compared to the size of the disc is expressed as a cup-to-disc ratio (C-D ratio). There can be a wide range of “normal” C-D ratios. The cup can be circular or slightly ovoid in appearance.



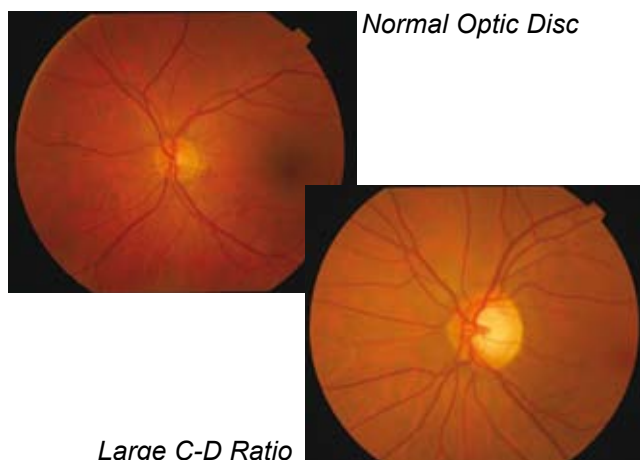
The colour of the nerve fibres is assessed. They are normally an orange-yellow colour, with the cup appearing more yellow-white.

The contour of the optic disc is determined by the evenness or regularity of nerve fibres around the cup.

What optic disc appearances would suggest glaucoma?

As the nerve fibres are damaged and their supportive tissues atrophy, there will be fewer of them at the optic disc. Eye care practitioners are looking for evidence of this loss of nerve tissue when examining your optic disc. They will also want to know if there is a corresponding loss in your visual field.

With less nerve tissue taking up less room at the optic disc, the cup appears larger. Thus, a large C-D ratio is suggestive of glaucoma.



As the nerve fibres atrophy, the colour of the optic disc appears less orange. This would be noted as a yellowing of the disc or pallor. However, glaucoma is not the only cause of nerve pallor.

Damage to the nerve fibres is seldom equally distributed. Often, glaucoma damage is seen earlier at the upper and lower borders of the nerve, rather than the sides. This localised loss of nerve fibres leads to a thinning of the rim, and is referred to as “notching”.

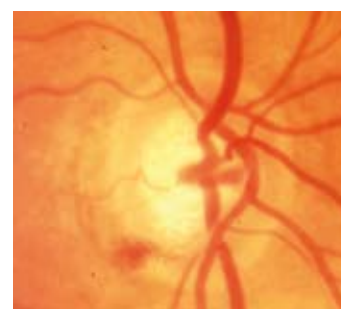
Notching of a disc usually results in an arc-shaped blind spot. If this is severe or large you may notice it yourself even without a visual field test. Scans using modern technologies such as an “OCT” may also show thinning of the nerve fibres.

Glaucoma is a chronic (long term) disease, so a diagnosis of glaucoma is usually made if there is documented proof of:

- Increase in the C-D ratio and, to a lesser extent, pallor.
- The appearance of a notch.

In order to see these potentially slow changes, your eye care practitioner will compare the current appearance of your optic disc to previously recorded diagrams or “stereophotographs” (that give a 3D view). Once again, modern scans are also being used to help in the detection of these changes.

Small bleeds of the optic disc are also an indicator of glaucoma damage. The appearance of a disc haemorrhage usually indicates active damage is occurring.



Next time you have an eye examination don't be afraid to ask your eye care practitioner what they observe about your optic discs and whether there are changes.

In the next issue of Eyelights the third instalment of this series will cover testing of the visual field.