

Glaucoma

青光眼



But the eyes of the LORD are on those who fear Him,
on those whose hope is in His unfailing love.

Psalm 33:18

What is Glaucoma?

There is a thin layer of tissue at the back of the eye called retina, which consists of light-sensitive cells (photoreceptors) to collect the light signals. The cells then transmit the light signals to the brain through the optic nerve (Figure 1). Glaucoma is a disease of the optic nerve (Figure 2), which progressively damages the optic nerve. It, in turn, affects the signal transmission to the brain leading to deterioration of the vision and visual field.

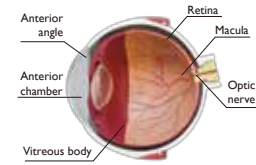
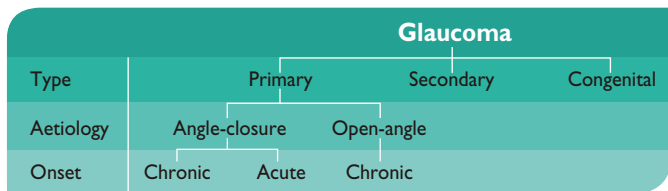


Figure 2. Appearance of the optic nerve. The green arrow indicates the position of the optic nerve. Optic nerve head appears to be pale in glaucoma patient (left) while it looks pink in healthy people (right).

Classification of Glaucoma



Angle-closure Glaucoma

The underlying cause of angle closure glaucoma is narrowing or closure of anterior chamber angle (Figure 3). As a result, the aqueous fails to leave the eye properly and the eye pressure increases.



Figure 3. Scanning of the anterior chamber angle. The green arrow shows the exit of aqueous humor. The figure on the left shows an open anterior chamber angle and the right shows a closed anterior chamber angle.

Open-angle Glaucoma

Open-angle glaucoma is related to the imbalance of aqueous secretion and absorption. The eye pressure is raised and damages the optic nerve and retinal nerve fiber layer (Figure 4).

The normal range of eye pressure of a healthy person is from 10 to 21 mmHg. However, some of the patients whose eye pressure falls below 21mmHg may still suffer from glaucoma. This type of glaucoma is called "normal tension glaucoma (NTG)" or "low tension glaucoma". The underlying etiology of NTG is unclear but may be related to systemic or vascular diseases.

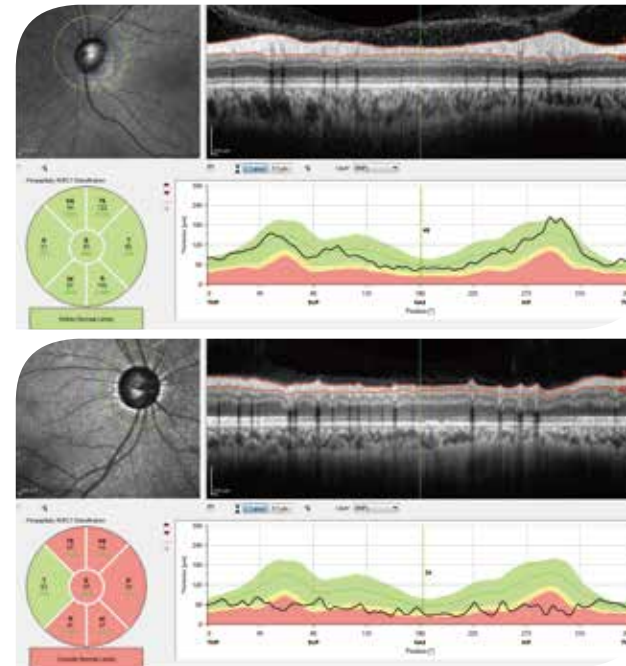


Figure 4. Report of retinal nerve fiber layer thickness scanning. The black line shows the thickness of the retinal nerve fiber layer. The green zone indicates the normal range while the red zone indicates the abnormal range. The figure on the top shows the thickness of the retinal nerve fiber layer in a healthy person (top) and the bottom one is taken from a glaucoma patient.

Secondary Glaucoma

This type of glaucoma is caused by other eye diseases like cataract, iritis, tumor, trauma, post-surgical complications, or improper use of steroid.

Congenital Glaucoma

Congenital glaucoma is developed at birth because of either inherited or developmental abnormalities of the eye.

Symptoms

The symptoms of glaucoma depends on the type and stage of the diseases.

Chronic glaucoma	Acute glaucoma
Early stage May be asymptomatic, some of the patients have mildly reduction in vision. Usually being diagnosed during routine eye examination.	Rapid deterioration of vision
Late stage Constricted visual field leading to frequent colliding of nearby object	Eye pain
	Headache
	Vomiting
	Red eye
	Cloudy cornea



Figure 5. The visual field report of a healthy person (left), middle stage glaucoma patient (middle) and late stage glaucoma patient (right). Peripheral visual field is affected at the early stage of the disease (middle), while only central visual field is left at the late stage of the disease (right).

How to Treat Glaucoma?

Nowadays, the aim of glaucoma drugs or surgery is to reduce the rate of optic nerve damage. It cannot restore the function of the damaged retinal neurons.

In general, doctors usually use the glaucoma eyedrops at the beginning. When the condition of glaucoma cannot be controlled, eye doctors will recommend patients to receive the laser surgery or drainage surgery. The goal of these surgeries (Figure 6) is to facilitate the outflow of the aqueous so as to lower the eye pressure.



Figure 6. Doctor performs the laser surgery to treat glaucoma.

Risk factors

- Aged 40 or above
- High myopia
- Family history of glaucoma
- Patients suffered from diabetes, hypertension, heart disease or migraine
- Current or history of steroid treatment

Glaucoma Check-up

- Visual acuity test
- Anterior chamber angle examination
- Intra-ocular pressure
- Visual field test
- Fundus and vitreous examination
- Retinal nerve fiber layer (Figure 7) and anterior chamber angle scanning
- Optic nerve head examination



Figure 7. Doctor performs the retinal nerve fiber layer scanning using optical coherence tomography.

Please feel free to contact your eye doctor if you have any enquiries about the above information.

Service Hours (By appointment only)

Monday to Friday : 8:00am to 6:30pm
Saturday : 8:00am to 4:30pm
Closed on Sunday and Public Holiday

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