



# COMMON BLINDING EYE DISEASES

## REGAINING VISION, PRESERVING SIGHT

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Millions of people around the world go blind from eye disease every year. Sight is so important yet, many people take it for granted until it is lost.

Blindness is one of life's greatest tragedies. There can be much suffering, anguish and pain living in darkness for the rest of our lives, not to mention the devastating loss of independence and self-esteem.

The leading causes of blindness in the world are cataract, glaucoma, age-related macular degeneration, diabetic retinopathy and cornea diseases. In Singapore, about 0.3 to 0.7% of people are blind, with 2.6% of people who are blind in 1 eye and 0.4% who are blind in both eyes.

In most situations, blindness can be prevented if the condition is detected and treated early. "Regular eye examinations can lead to early detection and diagnosis of blinding eye disease, resulting in timely interventions and treatment of these conditions, in order to prevent permanent blindness", said Dr Leonard Ang, Medical Director of Lang Eye Centre at Mount Elizabeth Novena Hospital.

The following common eye conditions will be discussed in greater detail.

### CATARACT

Cataract is the most common cause of blindness in the world. In Singapore, 35% of the population above the age of 45, and 80% of the population above the age of 60 suffer from some degree of cataracts.

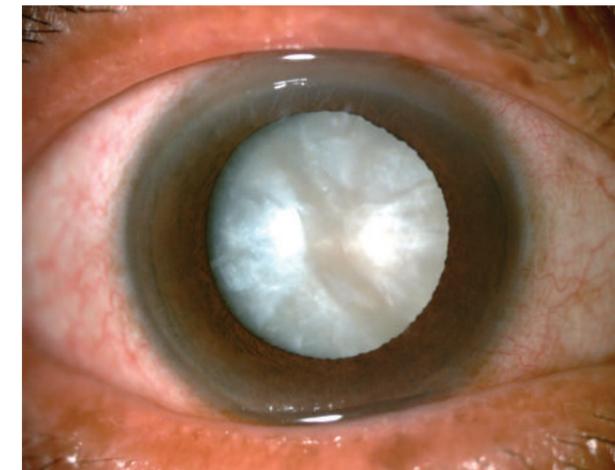


Figure 1.

A cataract is a condition where the natural clear lens of the eye becomes cloudy, which reduces the amount of light entering the eye (Figure 1). The most common symptom of cataracts is a gradual, progressive blurring of vision. The rate of progression is variable.

Cataract surgery is usually recommended if the cataract is impairing vision and affecting one's daily activities. With modern cataract surgery, it is not necessary to wait for cataracts to be dense or the vision poor before performing surgery. When cataracts are more advanced, complications may develop, such as glaucoma, and the risk of surgery increases.

Modern cataract surgery is performed safely and effectively using a method called phacoemulsification. This usually takes less than 20 minutes to complete and the wound that is only about 2mm in length, making the surgery even safer and the recovery even faster. An artificial intraocular lens is implanted immediately following the cataract removal.



Figure 2.

astigmatism and presbyopia or lao hua), so that patients

Modern advances in cataract surgery enable patients to achieve better vision and spectacle freedom. Bladeless cataract surgery, computer assisted imaging systems, and better machines help to make surgery more precise, efficient and safer. Newer intraocular lenses, can give patients sharper vision and correct all forms of refractive error (such as shortsightedness,

can reduce or eliminate the need to wear spectacles after surgery (Figure 2).

### GLAUCOMA

Glaucoma is the leading cause of irreversible blindness in the world. It results from an increase in eye pressure which causes progressive damage to the optic nerve (Figure 3). About 5 out of every 100 Singaporeans suffer from glaucoma, many of whom do not even realise that they have the disease. Glaucoma accounts for about 40% of registered blindness in Singapore.

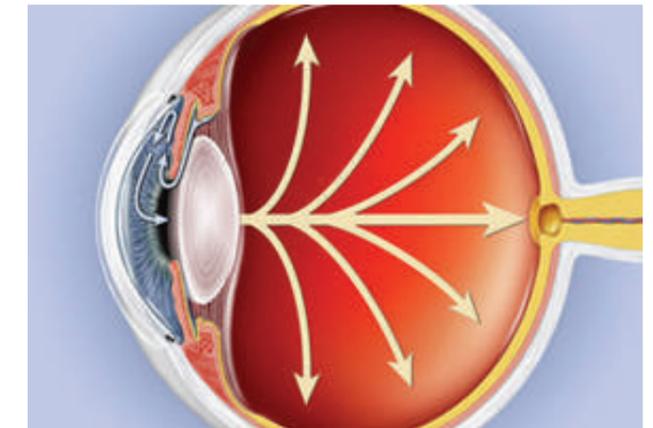


Figure 3.

It is usually a slowly progressive disease that affects middle-aged and elderly people. Patients with glaucoma are usually not aware that they have this condition until a late stage, because there are often no obvious symptoms at the beginning. The visual loss arising from glaucoma begins in the periphery and slowly progresses towards the centre when it is very advanced. Because there are very little symptoms in the early stages, glaucoma has been called the "Silent Thief of Sight". The damage from glaucoma results in permanent irreversible damage to the optic nerve that cannot be reversed (Figure 4).



Figure 4.

Glaucoma may be treated with eye drop medication, laser treatment or surgery. Modern medication is very safe and effective and most patients are managed with eye drops alone. Laser treatment may be required in certain types of glaucoma, especially the angle closure type of glaucoma.

Surgery is usually considered for patients whose glaucoma is not well controlled despite the use of multiple eye drops. Early detection and treatment is important in preventing blindness from glaucoma.

**DIABETIC RETINOPATHY**

Diabetes affects about 12% of the adult population in Singapore. People with diabetes may develop eye complications such as diabetic retinopathy or cataract which may cause severe vision loss or blindness. As many as one-third of diabetics, especially those who have had the condition for more than 10 years and whose blood glucose control is less than optimal, will develop complication of the eyes. About 10% to 15% of these are serious and sight-threatening.

The high sugar level in diabetics results in diabetic retinopathy, which refers to damage to the inner nerve layer of the eye (retina) and the retinal blood vessels as a result of diabetes (Figure 5). Abnormal blood vessels may grow over the retina and nerve, which can leak fluid and bleed.

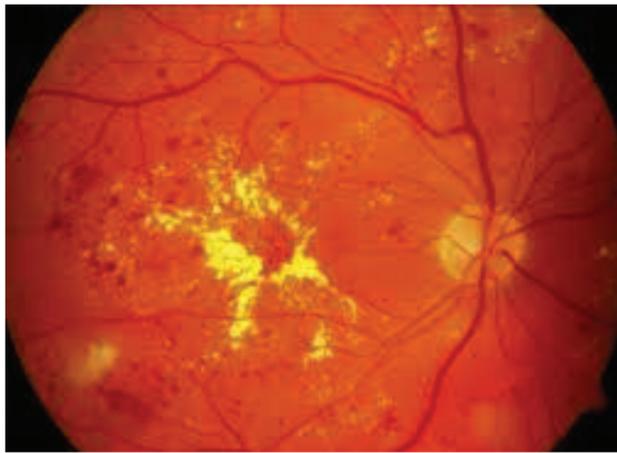


Figure 5.

Patients may not notice any eye symptoms until the disease is more advanced. Patients with diabetes should undergo regular eye checks. Laser treatment may be required to slow down the progression and prevent loss of vision. Leakage of fluid and swelling of the retina may require injections of special medication into the eye to help to reduce abnormal vessel growth and reduce fluid leakage. For more advanced cases where there is bleeding into the eye, scar tissue formation and retinal detachment, surgery may be required to salvage vision.

**AGE RELATED MACULAR DEGENERATION (AMD)**

The macula is the central part of the retina that is involved in central sharp vision. Age related macular degeneration is one of the leading causes of irreversible severe visual loss in individuals over the age of 50. In Singapore, it affects about 7 per cent of the population aged 40 years and above. The macula is progressively damaged as a result of age related changes that presents in 2 major forms:

**• DRY OR NON-EXUDATIVE AMD**

The dry form of AMD may be silent or cause mild blurring and distortion of the central vision.



Figure 6.

**• WET OR EXUDATIVE AMD**

This makes up 10% of cases of AMD and may cause devastating visual loss. It results from the development of abnormal leaky vessels or a membrane beneath the retinal layer (Figure 6). These abnormal vessels may bleed or leak fluid, proteins or fats.

In wet ARMD, there may be a sudden dramatic loss of vision. There may also be distortion of vision or a shadow over the central vision. The visual loss may be profound.

There is no proven treatment for dry ARMD. Certain lifestyle modifications such as stopping smoking may help reduce progression of the disease. The use of low vision aids may also help in the visual rehabilitation of patients.

For wet ARMD, new and improved treatments aimed at stopping abnormal blood vessel growth include drugs such as Eylea (aflibercept), Lucentis (ranibizumab) and Avastin (bevacizumab). These medications work by inhibiting proteins called vascular endothelial growth factor (VEGF), which stimulate the growth of new blood vessels in the body. VEGF is thought to contribute to development of macular degeneration by promoting the growth of abnormal blood vessels in the retina. Monthly injections of these medication have showed promising clinical results that were more positive compared to outcomes of past approved treatments.

These may be combined with laser treatment to seal off the abnormal vessels and prevent leakage of fluid from these vessels. These treatments may help to slow down the progression of the disease and prevent further visual loss.

**PREVENTION OF AMD**

It has been shown that the sun's high-energy visible (HEV) radiation, also called "blue light" may increase one's long-term risk of macular degeneration. As such, it is best to protect your eyes from the sun's harmful UV and HEV rays with good quality sunglasses that block UV and HEV rays outdoors.

Reducing smoking and blood cholesterol, controlling high blood pressure and cardiovascular risk factors, and having a healthy

diet of green leafy vegetables and coloured fruits can help to reduce the progression of AMD. Lutein, nutrients such as beta carotene (vitamin A) and various vitamins C and E have also been shown to prevent or slow the progression of AMD.

**CORNEA DISEASE**

The cornea is the central clear transparent window of the eye. Corneal blindness is one of the leading causes of treatable blindness in the world, with more than 20 million cases globally.

Various diseases can affect the cornea and cause visual impairment. This includes:

1. Cornea scarring and haze from infections and injury.
2. Cornea infections, such as viral or bacterial infections. A common cause of bacterial infection is contact lens-related infection which is potentially very serious.
3. Cornea inflammation, which may result in melting or thinning of the cornea.
4. Swelling and cloudiness of the cornea due to damage or ageing of the innermost layer of cells of the cornea (known as the corneal endothelial layer) (Figure 7).
5. Hereditary conditions that may affect the shape of the cornea (keratoconus), or that have opacities that block vision (dystrophies).



Figure 7.

In cornea infections and inflammation, patients may experience eye pain, redness, tearing and loss of vision. If the disease is not well treated or is more chronic, this often results in permanent scarring or haziness of the cornea which may cause a permanent impairment of vision.

As for cornea infection or inflammation, they may be treated with medication, such as antibiotics or anti-inflammatory eye drops. For more severe cases that are not treatable with medication or in cases where the cornea becomes scarred or hazy, surgery in the form of cornea transplantation may be required to restore vision.

Cornea transplantation is the most frequently performed transplant procedure and it is the most successful solid

organ transplant. When all the layers of the cornea are involved, a full thickness corneal transplant is performed (Penetrating Keratoplasty) (Figure 8).

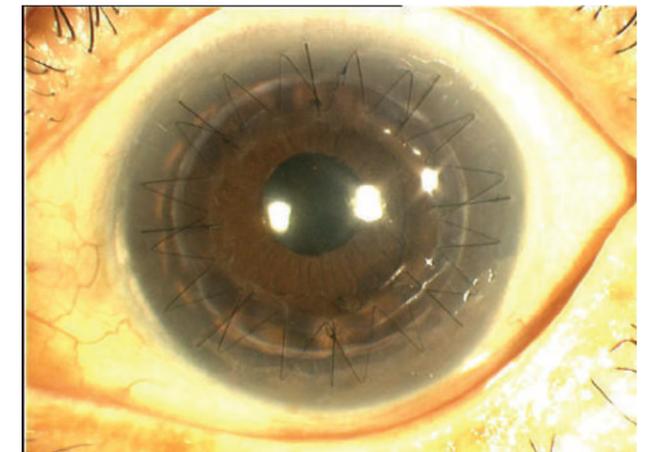


Figure 8.

Recent advances in cornea transplantation enable us to replace the specific part of the cornea that is diseased, when the disease has not extended to all the layers of the cornea. This form of targeted cornea replacement is known as a Lamellar Keratoplasty. This improves our ability to treat many corneal diseases more effectively. This has led to better visual outcomes, lower graft rejection risk and longer graft survival following corneal transplantation. These advances in cornea transplantation surgery have improved our ability to treat many corneal diseases more safely and effectively.

**CONCLUSION**

About 80% of blindness is preventable if the eye disease is detected and treated early. Early detection and treatment of cataract, glaucoma, diabetic retinopathy and other eye diseases is the key to preventing blindness. Because many of the common blinding conditions start off with minimal symptoms and gradually cause visual loss, many patients do not realise they have eye disease till it is more severe.



Eye disease treatment is very advanced now, with safer and more effective treatments. As such, patients should not wait for their eyes to be severely affected before seeking treatment. It is wise to undergo an eye screening with an eye specialist for those above 45 years of age. This can help to pick up diseases in the early stage so that treatment can be instituted earlier to prevent visual loss. **PRIME**