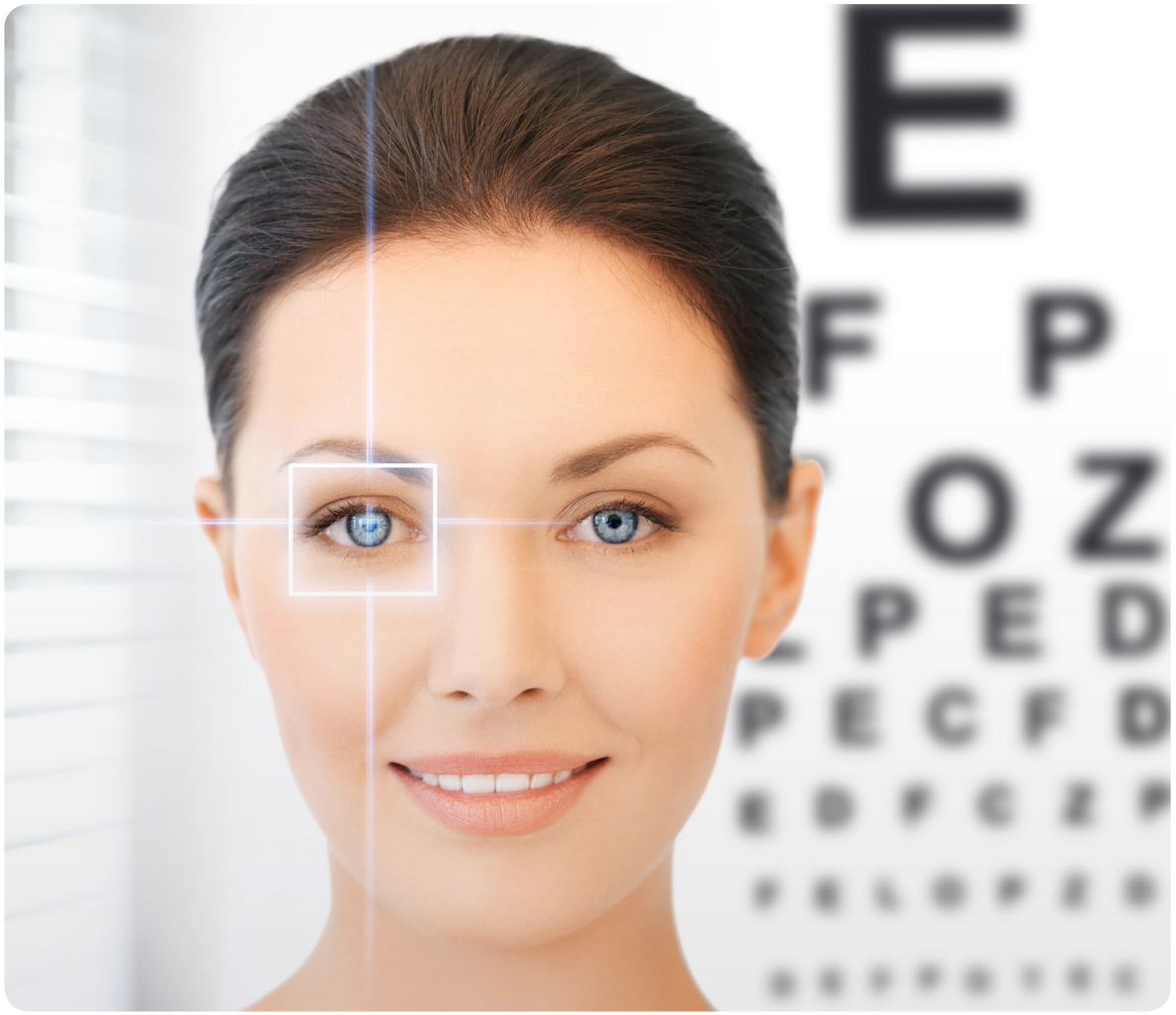

The Ageing Eye

Common Age-Related Eye Diseases

Millions of people around the world go blind from eye diseases every year. Of the five senses, sight is probably the most important of them all. Despite the sense of sight being so important, many people still take it for granted until it is lost. Many common blinding conditions occur after the age of 40. A simple eye examination with an eye specialist would be able to detect these conditions so that they can be treated. However, many people neglect to visit an ophthalmologist for routine eye checks as they get older.

Cataract, glaucoma, age-related macular degeneration (AMD) and diabetic retinopathy are common age-related eye conditions that are the leading causes of blindness in the world. If these are not detected and treated early, they can eventually lead to blindness. In most situations, blindness can be prevented if the condition is detected and treated early. Regular eye examinations can detect and diagnose common blinding eye diseases, so that treatment can be started early to prevent loss of vision.

Let's take a closer look at the common age-related eye conditions that can lead to blindness.

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 cataract.

A cataract is a condition where the clear lens of the eye becomes cloudy, which reduces the amount of light entering the eye (see figure 1). The most common symptom of cataract is a gradual, progressive blurring of vision.

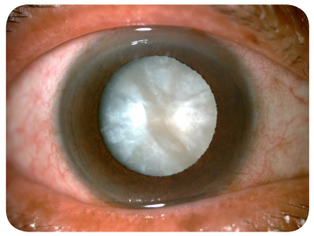

Figure 1: Cataract

Cataract surgery is required if the cataract is impairing vision and affecting one's daily activities. A common misconception is that one should continue to wait for the cataracts to "ripen" or for the vision to be significantly affected before going for surgery. The fact is: when cataracts are too "ripe" or severe, there is a greater risk of developing other eye diseases such as glaucoma. The surgical risk also increases when removing a denser cataract.

With modern cataract surgery, it is not necessary to wait for cataracts to be dense or the vision to become poor before performing surgery. Modern cataract surgery in the form of phacoemulsification is performed safely and effectively. This usually takes less than 20 minutes to complete and the wound is only about 2mm in length, making the surgery even safer and recovery even faster. An artificial intraocular lens is implanted immediately following the cataract removal.

Modern advances in cataract surgery enable patients to achieve better vision and spectacle freedom. Bladeless cataract surgery, computer assisted imaging systems and

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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, astigmatism, and presbyopia or "lao hua"), so that patients can reduce or eliminate the need to wear spectacles after surgery (see 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 2:
Multifocal artificial lens

(see figure 3). Glaucoma accounts for about 40% of registered blindness in Singapore. About 5 out of every 100 Singaporeans suffer from glaucoma, many of whom do not even realize that they have the disease.

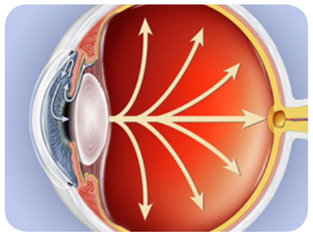

Figure 3: Rise in eye pressure from glaucoma

It is usually a slowly progressive disease that affects middle-aged and elderly people. In the early stages, there are no obvious visual symptoms. This is why glaucoma has been called the "Silent Thief of Sight". The visual loss arising from glaucoma begins in the periphery and slowly progresses towards the centre when it is very advanced (see figure 4). Patients with glaucoma are usually not aware that they have this condition until the disease has reached its late stage.

Figure 4: Loss of vision from glaucoma

Glaucoma causes permanent irreversible damage to the optic nerve and visual loss that cannot be reversed (see figure 5).

Figure 5: Damaged optic nerve from glaucoma

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. New methods of glaucoma surgery, known as Minimally Invasive Glaucoma Surgery (MIGS), utilize minimally invasive surgical techniques and modern minute devices/implants that can allow patients to recover faster from surgery than traditional surgery.

Patients with glaucoma require regular follow-up to monitor for progression of the glaucoma. The examination involves checking the eye pressure, and visual fields and optic nerve evaluation to check for optic nerve thinning. Ultimately, early detection and treatment of glaucoma is important in preventing blindness. Considering the prevalence and seriousness of glaucoma, early regular eye screening is important to detect and manage this serious eye condition.

AGE-RELATED MACULAR DEGENERATION (AMD)

Age-related macular degeneration (AMD) is a chronic irreversible eye condition that results from damage to the central retina (the macula), resulting in loss of central vision. AMD is one of the leading causes of irreversible severe visual loss in individuals over the age of 50. In Singapore, it affects about 7% of the population aged 40 years and above. Smokers and those with cardiovascular diseases are more prone to developing AMD.

The macula is progressively damaged as a result of age-related changes that present in two major forms:

Dry or Non-Exudative AMD

The dry form of AMD is associated with yellow deposits (called drusen) over the macula as well as progressive thinning and degeneration of the macula. The condition may not be noticeable at the beginning, with little visual symptoms initially. As it progresses, there may be progressive blurring and distortion of the central vision.

Wet or Exudative AMD

This makes up about 10% of AMD cases and may cause devastating visual loss. It results from the development of abnormal leaky vessels or a membrane beneath the retinal layer (see figure 6). These abnormal vessels may bleed or leak fluid, proteins or fats. In wet AMD, there may be a sudden dramatic loss of vision. There may also be distortion of vision or a shadow over the central vision (see figure 7). The visual loss may be profound.

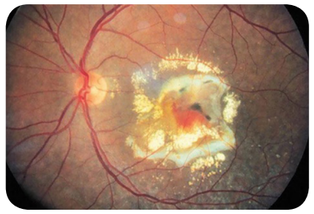

Figure 6: Wet AMD

Normal Vision | **Vision with Age-related Macular Degeneration (AMD)**

Figure 7: Visual loss from AMD

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

For wet AMD, new and improved treatments are able to slow or stop the progression of the disease by stopping abnormal blood vessel growth. This includes the use of medications such as Eylea (aflibercept), Lucentis (ranibizumab) or 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.

These medications 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.

Reducing smoking, controlling blood cholesterol levels, lowering high blood pressure and reducing cardiovascular risk factors as well as 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 vitamins C and E have also been shown to prevent or slow the progression of AMD.

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, will develop complication of the eyes. About 10-15% of these are serious and sight-threatening.

Figure 8: Diabetic retinopathy

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 (see figure 8). Abnormal blood vessels may grow over the retina and nerve, which can leak fluid and bleed.

There are usually no symptoms in the early stages of diabetic retinopathy. The vision may not be affected until the disease is more severe. An eye examination is often the only way to diagnose this condition. Thus, regular eye examination is recommended for everyone suffering from diabetes.

When there is significant diabetic retinopathy, an out-patient laser treatment may be required to slow down the progression and prevent loss of vision. Laser treatment can help to reduce swelling of the retina by targeting the abnormal leaky vessels as well as reduce the risk of formation of abnormal new vessels that could bleed easily and cause sudden visual loss.

Leakage of fluid and swelling of the retina may require injections of medication into the eye to help to reduce abnormal vessel growth and reduce fluid leakage. Surgery is usually the last resort for more advanced cases where there is bleeding into the eye (see figure 9), scar tissue formation and retinal detachment.

At the same time, it is important for the patient to control their blood sugar level, blood pressure and cholesterol level. This could help to prevent the rate of progression of the disease.

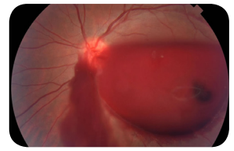

Figure 9: Bleeding from diabetic retinopathy

PREVENTABLE BLINDNESS

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

Eye disease treatment is very advanced now, with safer and more effective treatments. Modern treatments not only prevent visual loss, but can also improve one's vision and quality of life. As such, patients should not wait for their eyes to be severely affected before seeking treatment.

It is advisable to undergo a detailed eye examination with an eye specialist for those above 45 years of age. The eye examination can help to detect and diagnose potentially blinding eye diseases in the early stage, so that treatment can be instituted early. Regular eye screening is important to prevent visual loss. PRIME

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