

High Myopia: Why Glasses Aren't the End of the Story

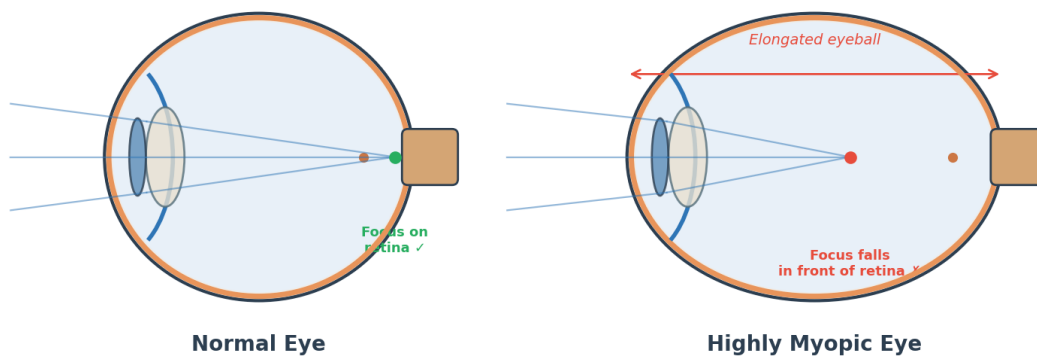
By Dr Chee Wai Wong, Vitreoretinal Surgeon

If you are very short-sighted (say, 500 degrees or more), you probably think of it as an inconvenience. You need thick glasses or contact lenses. Maybe you have considered LASIK. But high myopia, as we call it in medicine, is more than just a refractive error. It is a condition that can have serious implications for the long-term health of your eyes.

In Singapore and across East Asia, myopia has reached epidemic proportions. It is estimated that up to 80–90% of young adults in urban East Asian populations are myopic, and a significant proportion of these have high myopia. Globally, high myopia is projected to affect nearly 10% of the world's population by 2050. This is not just an optical inconvenience; it is a major public health concern, because high myopia is associated with sight-threatening complications that can affect people in the prime of their working lives.

What Happens to the Eye in High Myopia?

Normal Eye vs Highly Myopic Eye



Stretching and thinning of retinal tissues → Risk of macular degeneration, retinal detachment, traction maculopathy

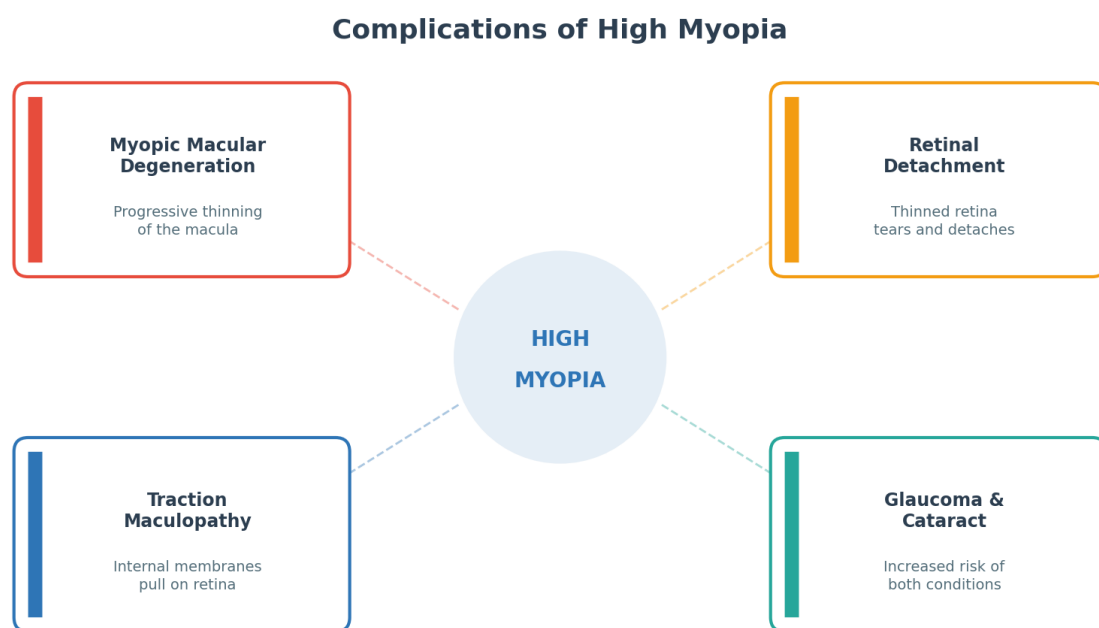
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In a normal eye, light focuses precisely on the retina. In myopia, the eye is elongated, meaning it is longer from front to back than it should be, so light focuses in front of the retina, causing distant objects to appear blurred. Glasses, contact lenses, and refractive surgery correct this focusing error, and for most people with mild to moderate myopia, that is the end of the story.

But in high myopia, the eye is significantly elongated. This stretching has consequences. Imagine inflating a balloon beyond its intended size: the rubber becomes thinner and more vulnerable. Similarly, the tissues at the back of the eye (the retina, the choroid, a blood vessel layer beneath the retina, and the sclera, the white outer coat of the eye) all become stretched, thinned, and weakened.

This stretching leads to a range of structural changes collectively known as pathologic myopia or myopic macular degeneration (MMD). These changes are not corrected by glasses or LASIK, as they are consequences of the physical elongation of the eye.

What Are the Complications?



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Myopic Macular Degeneration

The macula is the central part of the retina responsible for detailed vision: reading, recognising faces, driving. In highly myopic eyes, the stretching causes progressive thinning and damage to the macula. This can manifest as:

- **Tessellated fundus:** The earliest sign, where the stretched retina becomes thin enough to reveal the underlying blood vessels. Population-based studies have found that a tessellated fundus is one of the strongest predictors for developing more serious myopic macular degeneration in the future.
- **Diffuse and patchy atrophy:** Progressive thinning and loss of the retinal layers and underlying tissue.
- **Lacquer cracks:** Breaks in the membrane beneath the retina (Bruch's membrane), which appear as fine, irregular lines.

- Myopic choroidal neovascularisation (CNV): New, abnormal blood vessels growing under the retina, which can leak fluid and blood, causing sudden central vision loss. This is one of the most treatable complications; anti-VEGF injections can be highly effective if treatment is started early.
- Staphyloma: A localised bulging of the back of the eye, which further distorts the retinal architecture.

Longitudinal research following myopic adults over 12 years has found that about 1 in 10 eyes with early myopic macular degeneration progressed to more severe forms over that period. The key risk factors for progression were older age, higher degree of myopia, and longer axial length (the measurement of the eye's length).

Retinal Detachment

Highly myopic eyes are at significantly increased risk of retinal detachment because the stretched, thinned retina is more prone to developing tears. In published clinical studies, myopia was present in over half of all retinal detachment cases. The good news is that retinal detachment can be successfully treated with surgery in the vast majority of cases, but early detection remains crucial.

Myopic Traction Maculopathy

In some highly myopic eyes, the internal membranes of the eye (the vitreous and epiretinal membranes) exert traction on the stretched retina, causing it to split into layers. This condition is called myopic foveoschisis or retinoschisis. This can progress to macular holes or localised retinal detachment, both of which threaten central vision. Population-based studies have found myopic traction maculopathy in about 7% of highly myopic eyes. In many cases, this condition can be monitored, but when it progresses, vitrectomy surgery to relieve the traction can help stabilise or improve vision.

Glaucoma and Cataract

High myopia is also associated with an increased risk of open-angle glaucoma and earlier development of cataracts. These conditions are treatable but require regular monitoring.

What Can You Do?

For Parents: Slowing Myopia Progression in Children

The most effective strategy is prevention: slowing myopia progression during childhood, when the eye is still growing. Several interventions have shown benefit, including atropine eye drops, specialised spectacle lenses, orthokeratology (overnight contact lenses that reshape the cornea), and increased outdoor time. If your child is myopic, particularly if there is a family history of high myopia, I would strongly encourage discussing myopia control strategies with your eye doctor.

For Adults with High Myopia

If you already have high myopia, the priority shifts to monitoring and early detection of complications:

- Regular dilated eye examinations: At least once a year, and more frequently if your doctor identifies risk factors. A dilated examination allows your eye doctor to carefully inspect the retina for tears, thinning, or early signs of macular degeneration.
- OCT scans: Optical coherence tomography provides detailed cross-sectional images of the retina and can detect early changes such as foveoschisis or subtle macular degeneration that may not be visible on clinical examination alone.
- Know the warning signs: Sudden floaters, flashes of light, a shadow in your vision, or distortion of straight lines (where straight edges appear wavy or bent) should prompt an urgent visit to your eye doctor.
- Amsler grid self-monitoring: A simple grid you can use at home to check for distortion in your central vision. Your doctor can provide one and show you how to use it.

Treatment When Complications Arise

The good news is that many complications of high myopia are treatable, especially when caught early:

- Retinal tears can be sealed with laser in the clinic before they progress to a full detachment.
- Retinal detachment can be repaired surgically with high success rates.
- Myopic CNV responds well to anti-VEGF injections. These are given in the clinic and can preserve and even restore vision if started promptly.
- Myopic traction maculopathy can be addressed with vitrectomy surgery when indicated.
- Cataract can be removed with standard cataract surgery, and with careful measurement, excellent visual outcomes can be achieved even in highly myopic eyes.

The Bottom Line

High myopia is more than a number on your spectacle prescription. It is a condition that changes the structure of your eye and puts you at risk for serious complications throughout your life. But with regular monitoring and timely treatment, most of these complications can be managed effectively. The key is awareness: understanding that your myopia requires ongoing attention, even after your glasses prescription has stabilised.

If you are highly myopic, make regular eye check-ups a priority. And if you are a parent of a myopic child, take active steps to slow the progression now. The decisions made in childhood can have a profound impact on eye health decades later.

Dr Chee Wai Wong is a vitreoretinal surgeon practising at Asia Pacific Eye Centre, Gleneagles Hospital, Singapore. He has a special interest in high myopia and its complications. This article is for informational purposes and does not replace professional medical advice. If you have concerns about your eyes, please consult an ophthalmologist.