

# Hanging By A Thread...



Figure 1 : Dislodged lens



Figure 2 : Dislodged lens



Figure 3: Dislodged lens fixated in a well-centred position

*Mr W came to see me earlier this year with complaints of a precipitous drop in the vision in his right eye. He had undergone uneventful cataract surgeries years earlier, and had received multi-focal intra-ocular lens implants. These modern lens designs had afforded him excellent distance and near vision since the surgeries, but something had evidently gone awry...*

Cataract surgery is one of the most commonly performed surgical procedures in Singapore. The incidence of cataracts is expected to further increase in tandem with the ageing population, as age is the single largest causative factor for this degenerative condition.

Dating as far back as 800 B.C., cataract surgery by “couching”, where a sharp instrument is introduced into the eye to dislodge the cloudy lens into the vitreous cavity, is one of the oldest surgical procedures on record. If patients were lucky, they would see, albeit poorly; if they were less fortunate, they would gradually go blind as a result of a subsequent retinal detachment.

The procedure has evolved somewhat since then, to say the least. Modern surgical techniques, in combination with ever improving intra-ocular lens implant design, now deliver safe and predictable outcomes consistently. In 2016, patients do not just expect to see better, but they expect close to perfect vision, across all distances.

However, surgeons’ ability to meet these expectations is predicated on accurately predicting where the intra-ocular lens implant resides within the eye. For the vast majority of patients, this means implanting the lens within the lens capsule, essentially utilizing the natural lens-supporting apparatus (lens zonular fibres) to suspend the lens in position.

So what happens when this fails?

*When I examined Mr W at the slit lamp, the lens implant was only partially visible – dehiscence of the zonular fibres meant that the implant was no longer suspended in its intended position, i.e. centred behind the pupil – the lens was, literally, hanging by a few threads. Without the lens focusing images on the retina, Mr W’s vision was poor – he was only able to count fingers, and was unable to read any of the letters on the Snellen chart. To make things worse, vitreous gel had prolapsed through the pupil into the anterior chamber, and was causing persistent inflammation and elevation of the intraocular pressure...*

Zonular dehiscence can occur for a variety of reasons, ranging from inborn (congenital ectopia lentis) to secondarily acquired, such as pseudoexfoliation syndrome and Marfan’s syndrome, among others. Trauma and surgical complications from cataract surgery are other common contributing factors.

A subluxed or dislocated lens or lens implant can lead to a myriad of ocular complications. Aside from those experienced by Mr W, corneal decompensation and retinal detachments have been described, and symptoms may range from glare and diplopia, through eye redness and pain, to permanent and irreversible visual impairment / blindness.

Management of a subluxed lens has traditionally involved surgical removal of the vitreous gel (vitrectomy), followed by removal of the artificial lens. This would then be replaced by an anterior chamber intra-ocular lens (ACIOL) implant that is supported by the iris, as there is no longer any other support structure within the eye with which to hold a lens in position. While this is a quick and technically less-challenging procedure, ACIOL implants are associated with other yet complications, which make them unsuitable for some patients. It also necessitates creating a large (~ 7mm) incision in order to get the ACIOL into the eye.

Other options include suturing either the original lens or a new implant to the scleral wall (scleral fixation) or to the iris (iris fixation). These, too, are potentially fraught with challenges. Suture fixation is fiddly and technically more difficult; while suture failure or cheese-wiring of the suture through ocular tissues invariably mean that the lens would become dislodged again in 5-10 years.

More recently, an elegant technique using intra-scleral fixation has been described by Hungarian Ophthalmologist Dr Gabor Scharioth, which neatly avoids many of the problems mentioned above. Sutures are not required to secure the lens, and therefore there is no risk of subsequent suture failure. The intra-scleral tunnels support the haptics (arms) of the intra-ocular lens in the requisite position, and allows for excellent centration of the lens behind the pupil. This is of critical importance, as lens performance deteriorates dramatically if not positioned correctly, resulting in poor vision.

*Mr W’s multi-focal intra-ocular lenses presented an additional challenge. Generally, patients prefer to have the lenses of similar, or better yet, identical, design in both eyes. This generates similar images in both eyes, and hence less confusion and easier adaptation to the lenses. Besides, multi-focal lenses are expensive, and having paid for the lens once, it seemed a shame to deprive Mr W of continued use of the premium lens by exchanging it for a monofocal one. That meant having to rescue and re-use the subluxed lens by securing it in place using the Scharioth technique.*

*Thankfully, his surgery proceeded uneventfully and he made a quick recovery. By the end of the first week, his vision had recovered to 6/9, and at one month, that had improved further to 6/7.5, with near acuity of N5 – close to perfect vision for distance, and perfect vision for near.*

*A satisfactory outcome even in less complicated circumstances, but more so if you consider the fact that his vision had been hanging by a thread...*



**DR YONG SHAO ONN** graduated from the Royal Free and University College Medical School, University College London in 2000, having been awarded the degrees of Bachelor of Medical Science with 1st Class Honours, and MBBS with Distinction.

Following completion of his internship in London, Dr Yong returned to Singapore for his training in Ophthalmology, where he worked at Tan Tock Seng Hospital, Alexandra Hospital and the Singapore National Eye Centre.

Dr Yong completed his General Ophthalmology training in 2008, and was subsequently admitted as a Fellow of the Royal College of Surgeons of Edinburgh, as well as the Academy of Medicine Singapore. He then underwent subspecialty training in both Surgical and Medical Vitreoretinal diseases in Singapore and at the University of Toronto, Canada under a Ministry of Health HMDP Scholarship.

**Dr Yong’s clinical interests are in phacoemulsification cataract surgery and management of complicated cataracts / complications of anterior segment surgery, as well as vitreoretinal conditions such as retinal detachments, vitreomacular interface disorders (macular holes and epiretinal membranes), age-related macular degeneration (AMD), retinal vein occlusions (RVOs), diabetic eye disease and myopia control. He is also trained as a comprehensive ophthalmologist with extensive experience in treating other eye diseases.** He continues to serve as a Visiting Consultant to Tan Tock Seng and Ng Teng Fong General Hospitals.

Dr Yong was heavily involved in both undergraduate medical education as a Senior Clinical Lecturer at the NUS-YLL School of Medicine, as well as postgraduate training in Ophthalmology as a Clinical Core Faculty Member in the NHG-AHPL Residency Programme. He was the Deputy Head of Training and Education at the NHG Eye Institute - TTSH Ophthalmology Department, and is a current Member of the Examinations Committee for Ophthalmology at the Division of Graduate Medical Studies, YLL-School of Medicine, National University of Singapore.”