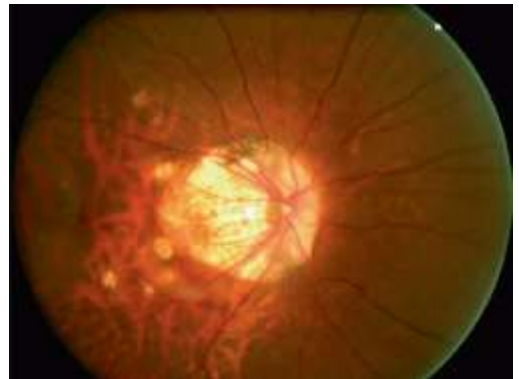


Cataract Surgery in High Myopes

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- *High myopia* refers to a spherical equivalent of -6.0 D or more or an axial length of 26.5 mm or more.
- It affects about 2% of the population. *Pathologic myopia* refers to a spherical equivalent of -8.0 D or more or an axial length of 32.5 mm or more.



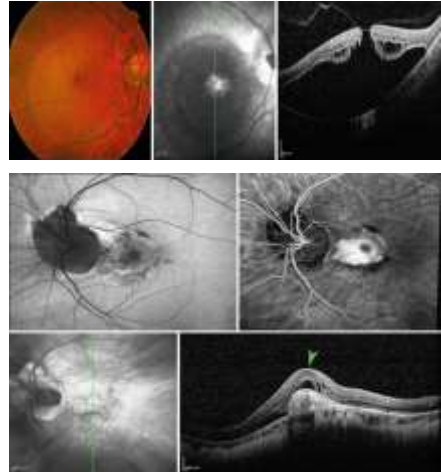
- There is an association between myopia and nuclear cataract.
- Moderate and high myopia, especially with onset prior to age 20, are associated with posterior subcapsular cataract formation.
- Patients with high myopia have 3 to 5 times increased risk of nuclear cataracts and a 30% increased risk of having posterior subcapsular cataracts.



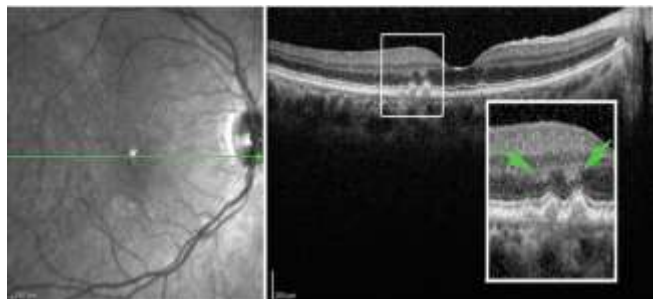
- Highly myopic cataract surgery is relatively complex and very challenging for ophthalmologists because of its association with poor fundus conditions and the difficulty of estimating the visual outcome
- High myopia has a higher risk of cataract, open-angled glaucoma, retinal detachments, foveo-macular schisis, staphyloma, chorioretinal atrophy, retinal detachment, and myopic retinopathy

Preoperative Evaluation

- **Assessing the past ocular history:**
- preoperative assessment should also include a detailed clinical examination of their lens status (e.g. cataract density and any zonular weakness) and refraction status of both eyes, as well as a dilated examination of the fovea and periphery for any retinal disorder (e.g. myopic choroidal neovascular membrane, macular schisis, retinal tears, or detachment).



- **Patient Expectations**
- An estimated 62% of myopic eyes have some degree of myopic or age-related retinal degeneration.



Risks and Informed Consent

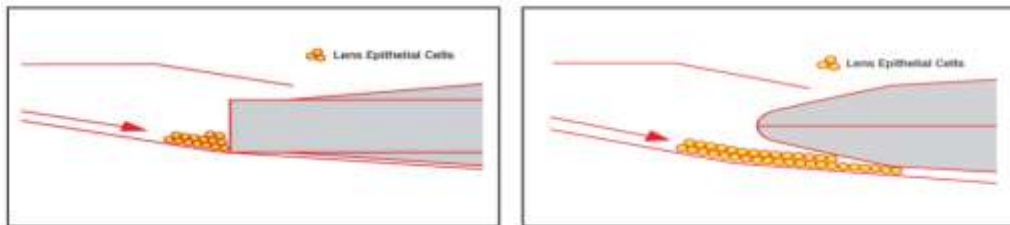
- Two of the most commonly discussed cataract surgery risks for highly myopic patients are:
 - 1- Increased risk of retinal detachment
 - 2- Variable postoperative refractive error.

IOL Calculations

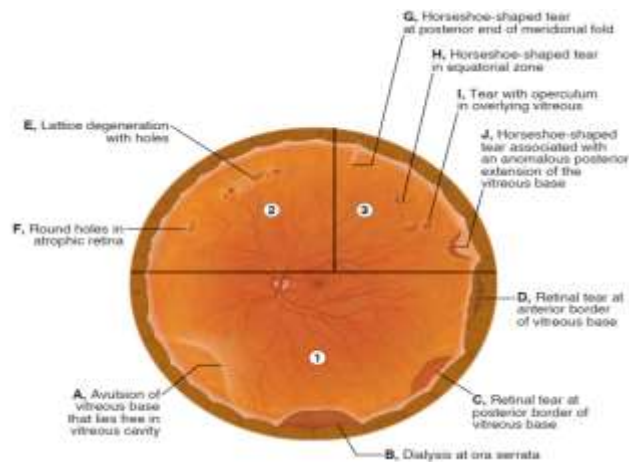
- As axial length increases, measurements may become less reliable.
- Traditionally, the SRK/T, a third-generation formula, is thought to be an accurate formula for patients with high axial length.
- The IOL Master was found to underestimate the power of the IOL for eyes with axial length > 27.0 mm and eyes receiving a negative power IOL.

IOL selection

- It is advisable to place an IOL rather than leave a highly myopic patient aphakic. The IOL acts as a barrier to vitreous movement and subsequent retinal traction. If the patient may undergo future retinal surgery, an acrylic lens implant would be preferable to a silicone lens.
- Use hydrophilic or hydrophobic acrylic IOLs with square-edged design to reduce posterior capsular opacification (optic diameter ≥ 6 mm)



How to deal with pre-operative retinal tears

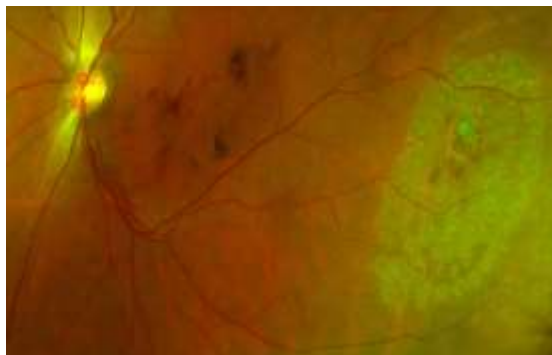


1-Horse Shoe tear:

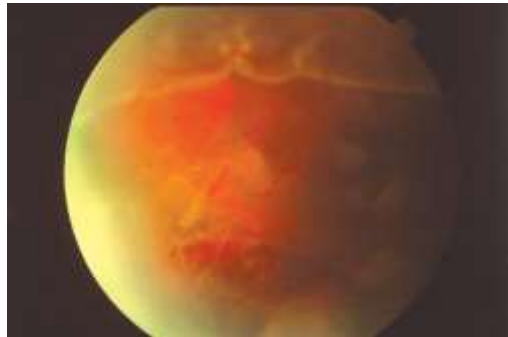
Asymptomatic horse shoe tear without subretinal fluid:
Consider treatment



- Symptomatic horse shoe tear without subretinal fluid:
Consider treatment



- 2- Asymptomatic lattice degeneration, with or without atrophic holes (no subretinal fluid): Often observed without treatment, but consider treatment



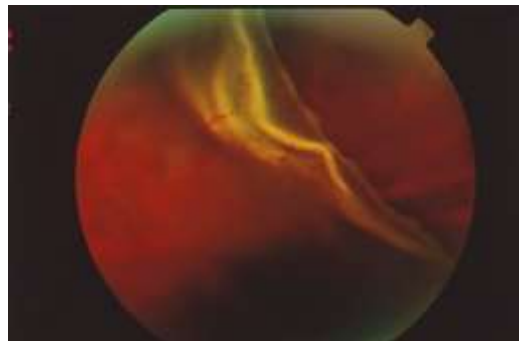
- 3- Asymptomatic operculated hole: consider treatment



4- Asymptomatic atrophic hole:
Often observed without
treatment, but consider treatment
in specific clinical circumstances



5- Asymptomatic dialysis : No
consensus guidelines, but
consider treatment

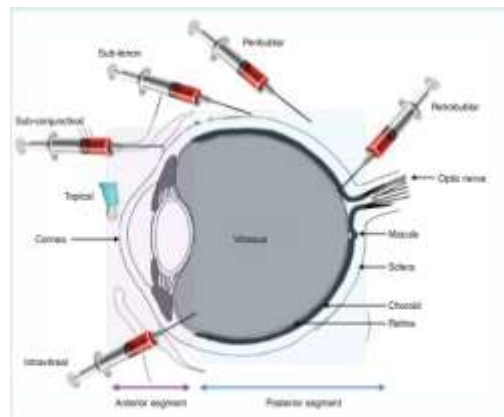


6- Eyes with lattice degeneration, atrophic holes, or asymptomatic retinal tear where the fellow eye has had a retinal detachment :

No consensus guidelines, but consider treatment

Anesthesia

- Retrobulbar and peribulbar anesthesia carry the risk of perforation of the globe in a long, myopic eye.
- Topical anesthesia is safer, but the patient may experience more discomfort due to iris movements during surgery.
- A Subtenon's block can also be considered for local anesthesia and does not carry the risks of a retrobulbar block.



Surgical Technique

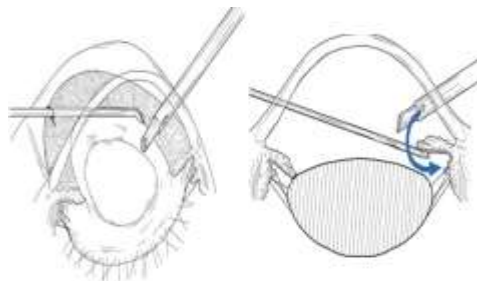
- Minimizing incision leakage and repeated collapse of the anterior chamber to prevent excessive movement of the iris and vitreous.
- Ensuring adequate pressurization of the anterior chamber during capsulorhexis with an ophthalmic viscosurgical device (OVD) to prevent capsule tears.

- Due to the increased depth of the anterior chamber, floppy and large capsular bag and zonular weakness may occur in some cases.
- When the surgeon introduces the phaco tip into the anterior chamber of a highly myopic eye, the chamber may deepen dramatically, making lens manipulation difficult.
- Most surgeons place considerable emphasis on maintenance of intraocular pressure in eyes with pathologic myopia that are susceptible to rapid fluctuations in pressure due to a lack of scleral rigidity.

- The anterior chamber is even less stable in a previously vitrectomized high myope patient.
- Anterior chamber maintainer may be a useful adjunct

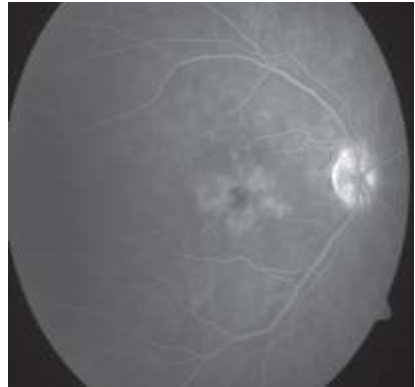


- Highly myopic eyes are also at increased risk for anterior chamber depth fluctuations and **lens-iris diaphragm retropulsion syndrome**, characterized by 360 degrees of irido-capsular contact leading to reverse pupillary block, pupil dilation, and pain. Zonular weakness predisposes to this condition
- Manual separation of the iris from the anterior capsule rim using a side port instrument like a spatula, cannula, or Sinskey hook to elevate the pupil margin to allow fluid to flow past the pupil corrects the situation



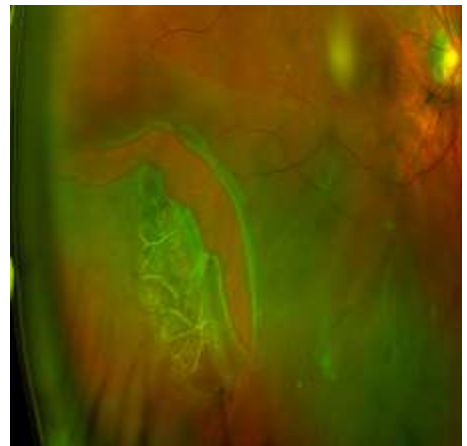
Postoperative Management

- **Medications**
- Regardless of refractive status, surgeons usually prescribe topical steroids and NSAIDs to curb inflammation and decrease the risk of postoperative cystic macular edema (CME).
- Patients also usually use a topical fluoroquinolone antibiotic



Late Complications

- The incidence of retinal detachment after cataract surgery is between 0.5 and 1.0%, but in high myopes this increases to between 0.4% to around 5.0% .
- Risk is increased in myopes, with lattice degeneration and particularly if there has been vitreous loss.
- Retinal breaks had an incidence of 1.1% for axial length greater than 30.0mm, and vitreous hemorrhage had an incidence of 0.6% for axial length greater than 30.0 mm

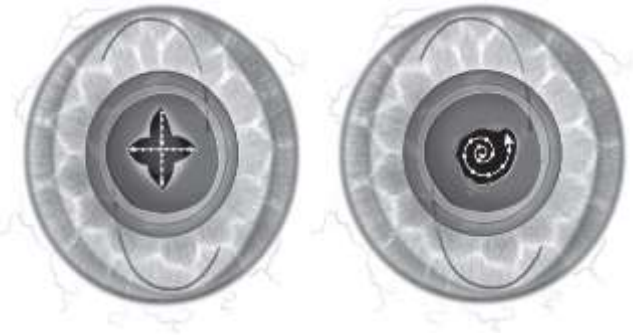


- Hyperopic error appears to increase with axial length, especially in patients receiving a negative power lens. This phenomenon is most likely due to less accurate axial length measurement, especially in the presence of posterior staphyloma or poor fixation due to macular disease.
- CNV or CNV related macular atrophy and LMH were the macular complications significantly associated with low vision after highly myopic cataract surgery.

- If a sulcus intraocular lens is inserted, it is also more likely to be unstable or decenter because of the larger sulcus size.
- IOP usually decreases following cataract surgery. Nonetheless, lower speed of IOP reduction with an unstable IOP value in the first 30 days has been observed in highly myopic eyes



- Following standard phacoemulsification, subsequent YAG laser capsulotomy is associated with increased rates of retinal detachment in eyes with high axial length



Follow Up

- Periodic dilated fundus exams to assess for retinal breaks are important in the postoperative management of the highly myopic patient.
- If the other eye has a cataract, timely surgery would be important to reduce the duration of anisometropia for the patient

Take Home Messages

- IOL power revision is a crucial step.
- Meticulous preoperative fundus examination.
- Don't hesitate to treat retinal tears properly.
- Regular good postoperative follow up.



Thank You