COURSE DESCRIPTION

The course will highlight the methods of handling posterior capsule rupture, its effective management and various modalities of IOL implantation.
Early recognition and management of PC rupture is a key to prevent the sequential complications which can trail and have an adverse effect on the visual output. The following signs should be watched upon for early recognition of a PC rupture:

- Sudden deepening of anterior chamber with momentary dilation of pupil
- Sudden transitory appearance of red reflex
- Difficulty in rotating a previously mobile nucleus
- Undue tilting of one pole of nucleus

**BASICS**

- Lower down phaco parameters
- Low flow rate
- Moderate vacuum
- Low to moderate phaco burst energy to promote follow ability

**MANAGEMENT PROTOCOL OF PC RUPTURE AND IOL IMPLANTATION**

- In the context of a ruptured posterior capsule, the immediate reflex action to be observed is to withdraw the phacoemulsification probe momentarily from the eye. A dispersive OVD from the side port incision should be used to plug-in the posterior capsule defect and fill and stabilise the anterior chamber followed by withdrawal of the phacoemulsification probe.
- The posterior capsule rupture when small is converted into a posterior capsulorhexis with stable margin facilitating the implantation of a one piece foldable acrylic IOL in the capsular bag. But if the capsule rupture opening is large, sulcus fixation of an IOL is preferable in cases with adequate anterior capsular margin support. A three piece foldable IOL with foldable haptics is implanted in the sulcus when the anterior capsule opening is large. A glued intraocular haptic fixation of IOL is recommended. In cases of inadequate anterior capsule support, various methods of IOL implantation can be implicated like anterior chamber (AC) IOL, Iris claw Retention, Sutured scleral fixation and Glued intrascleral haptic fixation of IOL which imparts a very stable intrascleral fixation.
LEARNING OBJECTIVES
At the conclusion of this course, attendees will be able to judge,
• How to effectively handle a case of posterior capsular dehiscence?
• Do’s and Don’t’s upon recognition of PC rupture
• Management of vitreous and the importance and correct method of vitrectomy from anterior segment surgeons perspective
• Choice of Type and various methods of IOL implantation following PC rupture

TARGET AUDIENCE
The intended audience for this program are comprehensive ophthalmologists with an interest in anterior segment, and allied health personnel who are performing or assisting with cataract surgery.

COURSE OUTLINE
• Introduction to the surgical nightmare of intraoperative posterior capsular dehiscence
• Videos showcasing intraoperative PC rupture and ways to handle it judiciously
• Videos showcasing IOL implantation in the sulcus along with Optic capture
• Video showcasing Glued Intrascleral technique of IOL fixation (Glued IOL) and its modifications
• Videos showcasing IOL Scaffold and Glued IOL scaffold technique
HANDLING ASSOCIATED COMPLICATIONS OF PC RUPTURE

- Videos showcasing DMEK with Glued IOL
- Videos showcasing PDEK (Pre-Descemet’s endothelial keratoplasty) with Glued IOL
- Videos showcasing different modalities of vitrectomy
- Videos demonstrating how to handle dropped nucleus and dropped IOLs
- Videos demonstrating pupil re-construction when associated with a PC Rupture

TYPES OF VITRECTOMY - CONVENTIONAL ROUTE

- LIMBAL
- PARS PLANA

PARS PLICATA VITRECTOMY

PARS PLICATA ANTERIOR VITRECTOMY
VITREOUS STAINING

- Triamcinolone acetonide binds to vitreous & facilitates vitreous recognition and removal
- Reduces post-op inflammation
- Preservative free Triamcinolone is available
- Thorough removal is a must postoperatively

VITRECTOMY END POINT

- Normal round, regular shape of pupil
- No iris movement during vitreous aspiration
- Deep anterior chamber

SURGE

The inflow volume can be increased by either increasing the bottle height or by enlarging the diameter of the inflow tube. The intraocular pressure increases by 10 mm Hg for every 15 centimeters increase in bottle height above the eye. High steady-state IOPs increase phaco safety by raising the mean IOP level up and away from zero, i.e. by delaying surge related anterior chamber collapse. Air pump increases the amount of fluid inflow thus making the steady-state IOP high. This deepens the anterior chamber, increasing the surgical space available for maneuvering and thus prevents complications like posterior capsular tears and corneal endothelial damage. The phenomenon of surge is neutralized by rapid inflow of fluid at the time of occlusion break. The recovery to steady-state IOP is so prompt that no surge occurs and this enables the surgeon to remain in foot position through the occlusion break.
In-The-Bag placement  Sutural placement  Subluxated In-The-Bag IOL Complex with dislocated endocapsular ring & segment

The course highlights various intraoperative cataract complications like broken capsule, loss of zonular integrity, vitreous prolapse and vitreous loss through the incision, retained lens material and provides an update of techniques for handling complications.

Surgical Nightmare & Challenging Videos Will Be Showcased

Tackling Massive Zonulolysis & Subluxation
Lensectomy being done in a case of traumatic subluxated lens after creation of scleral flaps for Glued IOL.

Thorough vitrectomy. Leading haptic of 3-piece foldable IOL grasped with Glued IOL forceps.

GLUED IOL FIXATION – NO ASSISTANT TECHNIQUE (NAT)

Leading haptic lies free & trailing haptic is flexed into the anterior chamber.

Tip of trailing haptic is grasped. Both haptics are externalized followed by tucking & sealing the flaps with Fibrin glue.

IOL SCAFFOLD
SOEMMERRING RING MANAGEMENT WITH ASSOCIATED PC RUPTURE


• IOL SCAFFOLD is a technique wherein following a PC rupture, the nuclear/cortical remnants are levitated into the anterior chamber with the help of viscoelastic. A 3-piece foldable IOL is injected below the cortical remnants in a way that the leading haptic lies on the anterior surface of the iris and the trailing haptic is extruded at the corneal incision. The foldable IOL acts as a scaffold, acting as a scaffold, thus compartmentalizing the anterior and posterior chamber. The nuclear fragments are then emulsified with the help of phacoemulsification probe. Post-emulsification, the IOL is dialed into the sulcus and stability is achieved.

• The IOL scaffold technique effectively compartmentalizes the anterior and posterior chamber with a foldable IOL following a posterior capsular rupture thereby preventing the drop of any nuclear fragment into the vitreous cavity.

• The IOL is placed directly in the definitive position decreasing the surgical trauma to an already compromised eye. As it is a closed chamber technique, all the advantages of a small incision cataract surgery are retained.

GLUED IOL SCAFFOLD

• Glued IOL and IOL Scaffold are two independent techniques employed for IOL fixation in cases of posterior capsular rupture with the difference that Glued IOL is done in cases of insufficient capsular support where sulcus fixation is not possible whereas IOL scaffold is done in cases of posterior capsule rupture with large chunk of nucleus still left over for emulsification. In IOL scaffold, the IOL is either placed over the iris or the anterior capsular rim from where the IOL scaffold acts as a scaffold compartmentalizing the anterior and posterior chamber thereby preventing the nuclear fragments from dropping into the vitreous cavity. IOL scaffold cannot be performed in cases of iris deficiency or malformation or absence of anterior capsular rim. In such a scenario, Glued IOL scaffold comes into play. It is a technique which amalgamates both the above described techniques and is employed in cases of posterior capsular rupture with insufficient (incomplete) capsular support. Glued IOL is performed initially followed by IOL scaffold; the initial IOL fixation acts as a scaffold followed by fragmentation of the nuclear chunks with the phacoemulsification probe.
**Disaster Management**

**Dropped Nuclear Techniques:**
- Posterior assisted levitation
- Phacofragmentome assisted emulsification of nucleus
- Phaco-tip assisted levitation of dropped nucleus.

**Sleeveless Phaco Tip Assisted Levitation of Dropped Nucleus (SPAL)**

Clinical outcomes of sleeveless phaco-tip assisted levitation of dropped nucleus.


SPAL technique is employed following an incidence of dropped nucleus. In this technique the vacuum is generated when phacotip is close to the dropped nucleus. A moderate amount of vacuum setting is enough to lift the nucleus adequately into the mid-vitreous cavity; followed by initiation of phaco power for adequate embedment. The advantage of holding the nucleus with a sleeveless phacotip enables a firm grip and the nucleus does not tend to fall back into the vitreous cavity. The firmly embedded nucleus is then easy to levitate into the anterior chamber. The recommended technique for employing ultrasound energy in the vitreous cavity is to lift the nucleus fragment away from the retinal surface by aspiration in the mid/anterior vitreous cavity, thereby limiting exposure of the posterior pole to ultrasound energy. Followed by successful levitation into the anterior chamber, the dropped nucleus is then managed with either IOL scaffold or glued IOL, depending on the status of sulcus support.
HANDLING CORNEAL DECOMPENSATION

Pseudophakic bullous keratopathy is a known corneal complication following a cataract surgery. Various endothelial keratoplasty techniques have been explained in the past including DMEK, DSEK, DMAEK, Ultra thin DSEK …….

WE INTRODUCE A NEW VARIANT IN TO THE ARENA

PDEK: PRE-DESCEMET’S ENDOTHELIAL KERATOPLASTY

DROPPED IOL


- Technical handling of a posteriorly dislocated IOL requires lot of surgical expertise to avoid the risk of retinal traction and creating an iatrogenic tear.
  - Removal of the silicon sleeve of extrusion cannula gives a wider access of the bore of the cannula to create an effective suction around the IOL. The vacuum created by the sleeveless-extrusion cannula is strong enough to hold the optic of an IOL in the vitreous cavity.
- This technique is effective for dislocation of any type of IOL including the plate haptic IOLs which are often difficult to grasp with a retinal forceps.
SUMMARY

• Anticipate and prepare for complicated cases
• Retro-pupillary removal of cortical matter and vitreous management allows a more efficient and complete removal of vitreous
• Do not hesitate to acknowledge your limitations & refer to an expert in case of difficulty

SUGGESTED READING

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