

CATARACT SURGICAL TREATMENT

Dr Varshav Gore

Ophthalmology

MGMIHS

PRE-OPERATIVE ASSESSMENT

- OCULAR HISTORY
- SYSTEMIC HISTORY
- OCULAR EXAMINATION
- OCULAR INVESTIGATIONS
- LABORATORY INVESTIGATIONS

OCULAR HISTORY

- Ocular Symptoms Like Blurring Of Vision,coloured Halos,diplopia,glare
- Nuclear Cataract-distant> Near
- Posterior Subcapsular-near>distant
- Duration And Progression
- H/O Of Previous Intraocular Disease
- H/O Previous CataractSurgery
- H/O Intraocular Injuries

SYSTEMIC HISTORY

- H/o of all systemic diseases,current medications patient is on..
- Medications relevant to eye surgery
- Systemic alpha blockers(tamsulosin)-floppyiris syndrome
- Antiplatelets and anticoagulants
- Antihypertensives like diuretics-electrolyte imbalances
- Long term steroids-delayed healing
- Drug allergy to sulfonamides and other antibiotics

OCULAR EXAMINATION

- Visual acuity-distant and near vision
- Head posture & ocular posture-cover-uncover test
- Ocular movements
- Ocular adnexa-
blepharitis,ectropion,entropion,lagophthalmos
- Lacrimal sac syringing to r/o dacrocystitis
- Conjunctiva-congestion,scarring,symblepharon

- CORNEA-stromal opacity and prominent arcus senilis
- Decreased endothelial count as in corneal guttata-post op decompensation
- Specular microscopy and pachymetry to assess the risk and to take precaution
- If abnormal or C- thickness $> 600 \mu\text{m}$ is poor prognosis for corneal clarity.
- Endothelial deposits and keratic precipitates-uveitis or glaucoma
- First treat the intraocular diseases, symptom free period of 4-6 months for uveitis, steroids to prevent relapse.

ANTERIOR CHAMBER-

Shallow (intumescent of lens or forward displacement by posterior pathology).

Gonioscopy to rule out the angle abnormalities (synechia, neovascularization).

PUPIL

- Reacting promptly to light-both direct and consensual
- Presence of RAPD-Implies substantial additional pathology
- Readily dilating with mydriatics

LENS

- Size of lens nucleus and grading of nuclear sclerosis for planning size of incision and type of surgery

FUNDUS EXAMINATION

Retinal and optic nerve function must be assessed pre-op because if it is defective operation becomes valueless.

Pathology such as ARMD, RETINAL DETACHMENT can adversely affect visual outcome. Hence a thorough fundus evaluation is important.

OCULAR INVESTIGATIONS

- REFRACTIVE ERROR- to guide IOL implantation outcome
- INTRAOCULAR PRESSURE
- SAC SYRINGING
- BIOMETRY facilitate calculation of lens power likely to result in desired post op refractory outcome.
- It involves 1.Keratometry 2.ASCAN
- USG B SCAN – r/o vitreous haemorrhage, retinal detachment, intraocular tumour and posterior staphyloma

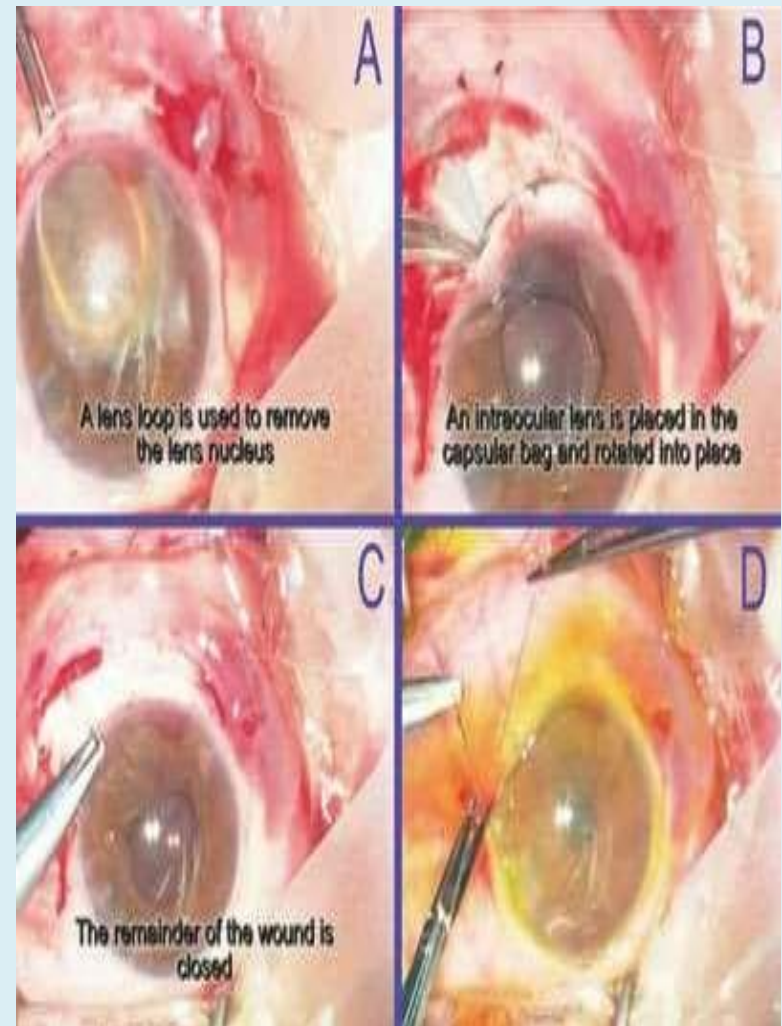
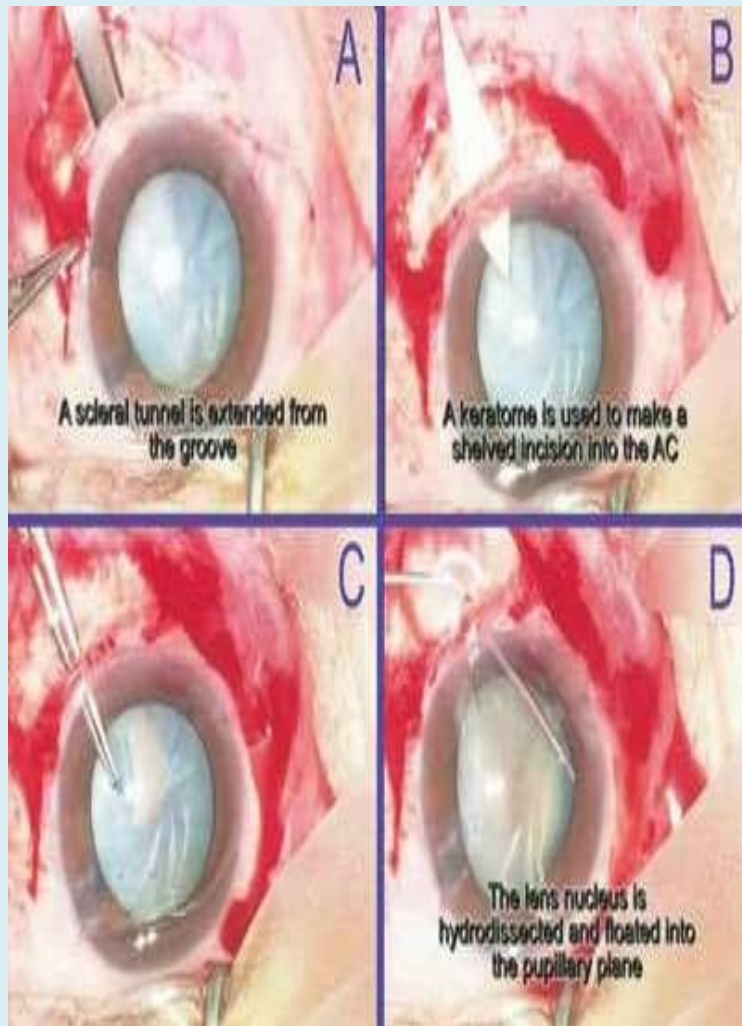
LAB INVESTIGATIONS

- NORMAL-CBC, HHH, RBS, BP, CXR ECG, SCREENING.
- XRAY, URINE R/E, BRE, RFT, APTT, PT INR-in patients with individual risk factors or planned for general anaesthesia.

Preoperative medications

- * Topical antibiotics : tobramycin, gentamycin or ciprofloxacin QID for 3 days
- * Preparation of eye to be operated : eyelashes of upper lid should be trimmed at night
- * An informed and detail consent should be obtained
- * IOP should be lowered by acetazolamide 500mg stat 2 hours before surgery and glycerol 60ml mixed with equal amount of water or lemon juice 1hour before Sx or, IV mannitol 1gm/kg body weight half hour before Sx
- * To sustain dilated pupil
- * antiprostaglandin eye drops such as indomethacin or flurbiprofen TID 1day prior to surgery
- * Adequate dilation also by 1% tropicamide

Small Incision Cataract Surgery (SCIS)

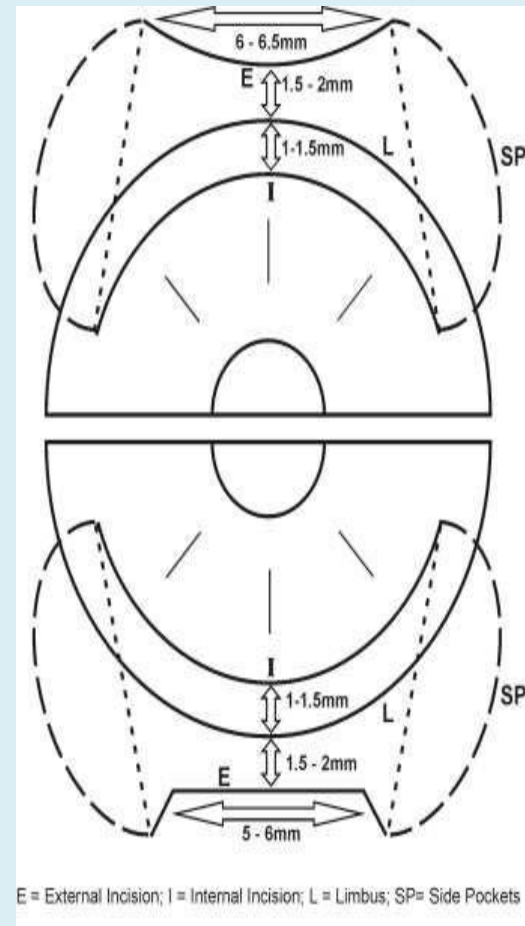


- In this technique ECCE with intraocular lens implantation is performed through a **sutureless self-sealing** valvular sclerocorneo tunnel incision.

- Types of incision in SICS-

1. Frown incision

2. Straight incision



Steps in manual SICS

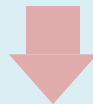
SUPERIOR
RECTUS
BRIDLE
SUTURE



CONJUNCTIVAL
FLAP



SCLERAL
INCISION



SCLERO-CORNEAL
TUNNEL WITH
CRESENT KNIFE



SIDE PORT
ENTRY AND
ANTERIOR
CAPSULOTOMY

ENTRY INTO
ANTERIOR
CHAMBER FROM
TUNNEL AND ITS
EXTENSION



HYDRODISSECTION AND
HYDRODELINATION



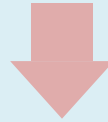
NUCLEUS
PROLAPSE
INTO
ANTERIOR
CHAMBER



NUCLEUS
DELIVERY



IRRIGATION
AND
ASPIRATION OF
THE CORTEX



PCIOL
IMPLANTATION
IN THE
CAPSULAR BAG



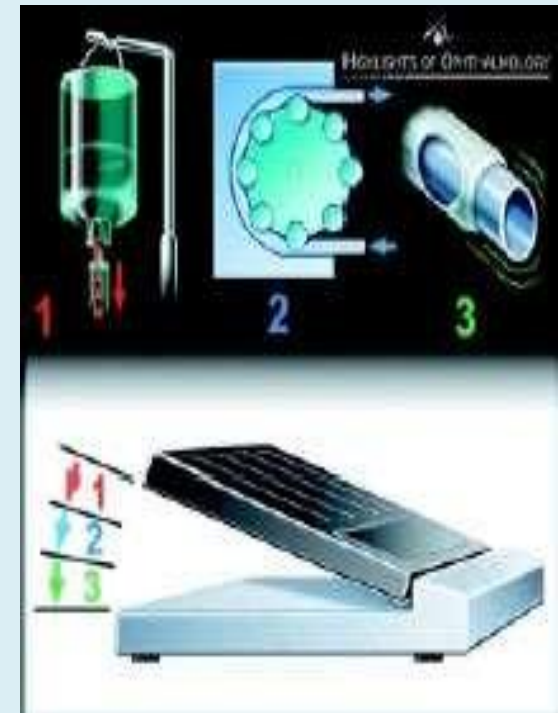
WOUND
CLOSURE



VIDEO

PHACOEMULSIFICATION

- Phacoemulsification, introduced by Kelman in 1967, is undoubtedly one of the most important innovations in ophthalmology.
- This allows the removal of cataract through a 3.0 mm incision, thus eliminating many of the complications of wound healing related to large incision surgery and greatly shortens the recovery period.
- Cataract is emulsified using ultra-sonic energy.
- Ultrasonic power is most often produced by enclosed piezoelectric crystals which convert electricity into mechanical vibration.
- Normal frequency of various phaco machines ranges from 20,000 to 80,000 (20-80 KHz) Hertz.
- Phaco machines come with a foot switch to control functions of the machine.



STEPS IN PHACOEMULSIFICATION



CLEAR
CORNEAL
INCISION



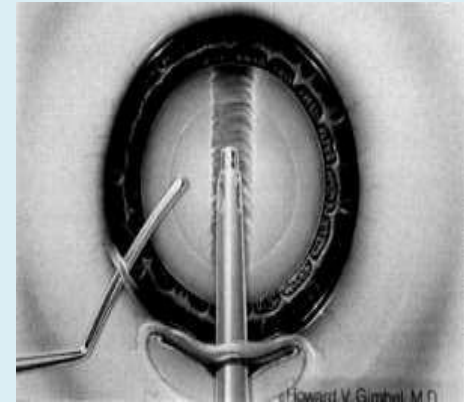
SIDE PORT
ENTRY



CAPSULOTOMY



INITIAL
TRENCHING



FOUR
QUADRANT
DIVIDE AND
CONQUER



PHACO CHOP

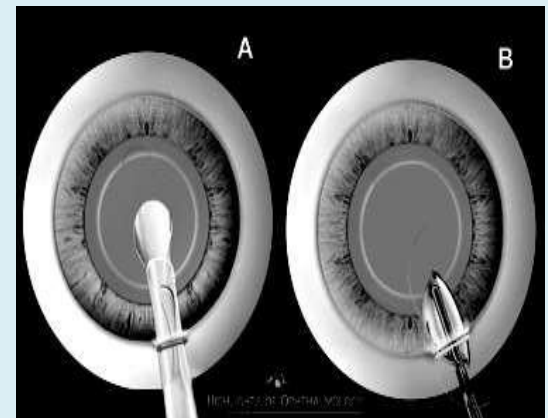
IRRIGATION
AND
ASPIRATION



PCIOL
IMPLANTATION
(MOSTLY
FOLDABLE IOL)



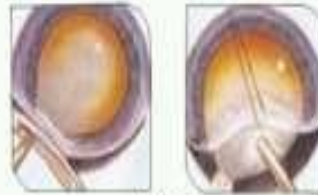
WOUND
APPOSITION
BY HYDRO



VIDEO

MICS- MICRO INCISIONAL CATARACT SURGERY

- Micro incision cataract surgery (MICS) is an approach to cataract surgery through incision less than 1.8 mm with the purpose of reducing surgical invasiveness, improving at the same time surgical outcomes.
- The main confirmed advantages of MICS are the control and avoidance of surgically induced corneal astigmatism and the decrease of postoperative corneal aberrations.
- Microincision cataract surgery (MICS) was described first time by one of the authors named Jorge Alió in 2002 in Spain
- Agarwal *et al.* and Tsuneoka *et al.* described in parallel this surgical approach to cataract surgery with other denominations such as Phacovit or bimanual phacoemulsification-aspiration.



ICCE

Incision Size 12 mm



ECCE

Incision Size 12 mm



Standard Phaco

Incision Size 3-4 mm



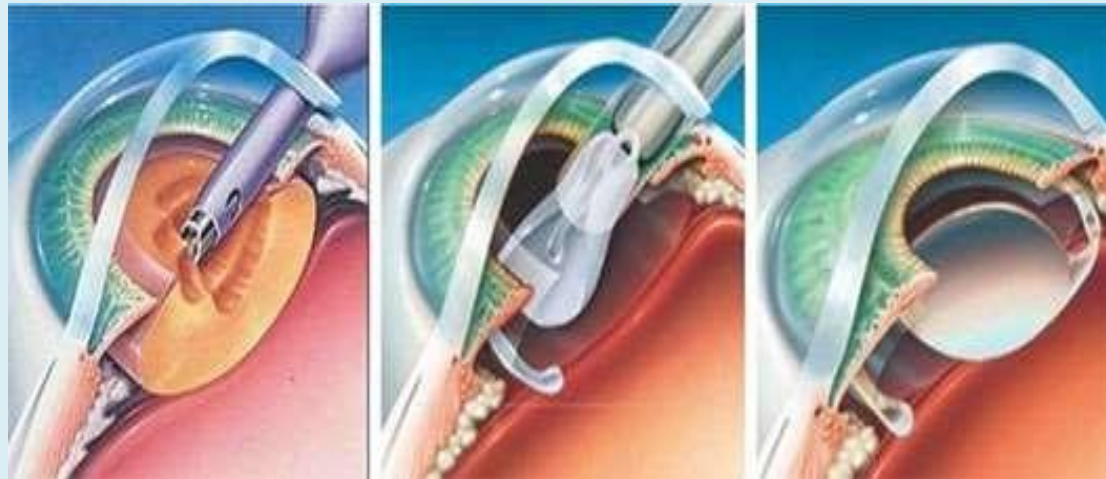
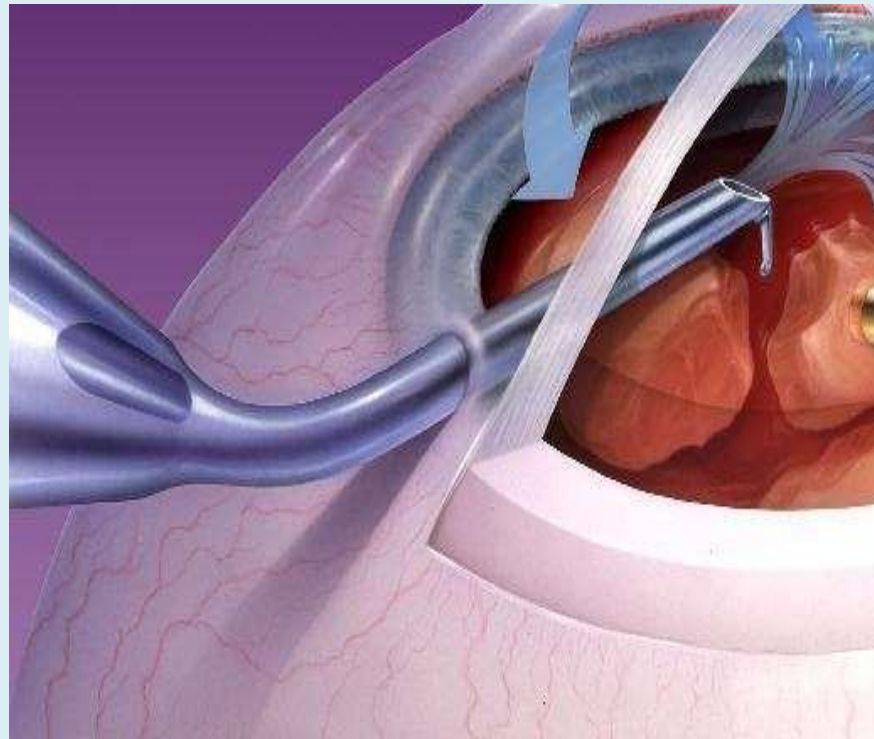
Cold Phaco

Incision Size 2.8 mm



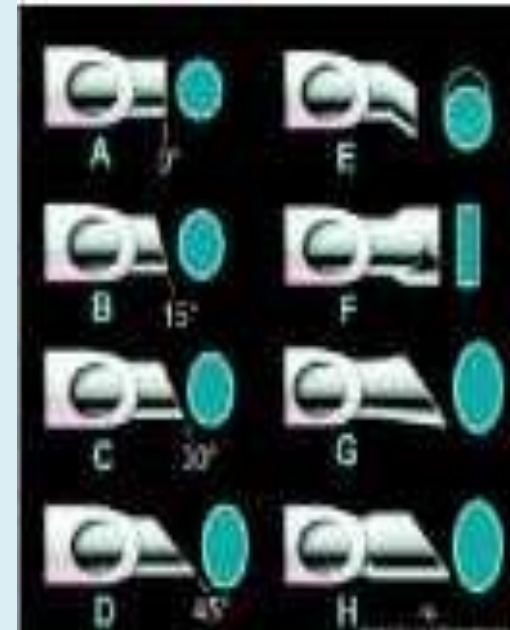
S-MICS

Incision Size 1.8mm



Phaco probe tips-

- These are made up to titanium.
- It can have an opening angulation of 0° , 15° , 30° , and 45° .
- Greater angulation facilitates sculpting whereas lower angle is good for occlusion.
- The tip is covered with silicon sleeve that insulates and protects the tissue at the incision site.



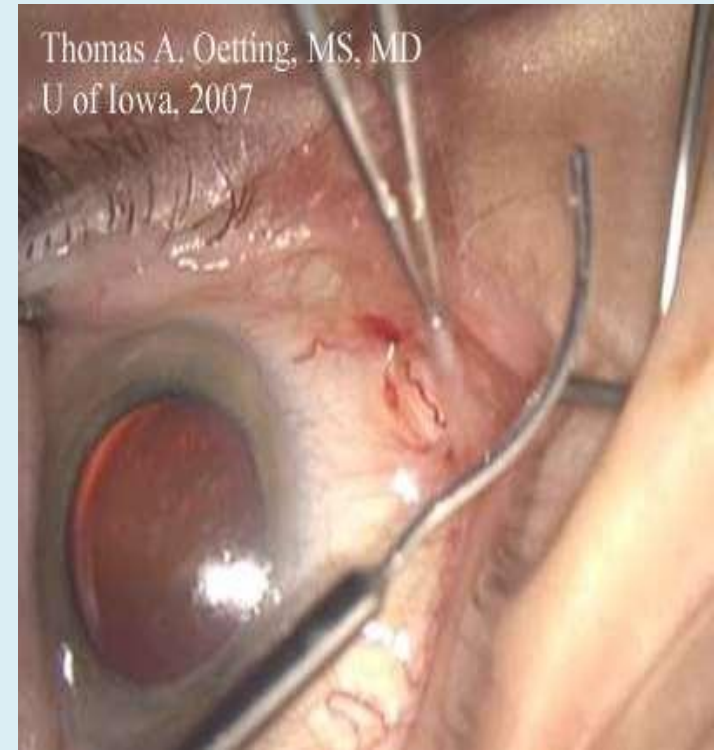
FEMTO SECOND CATARACT SURGERY

- Current femtosecond laser technology systems use neodymium:glass 1053 nm (near-infrared) wavelength light.
- This feature allows the light to be focused at a 3 mm spot size, accurate within 5 mm in the anterior segment
- It works on the principle of photodisruption.
- Uses-
 1. CLEAR CORNEAL INCISION
 2. ARCUATE INCISION
 3. CCC
 4. LENS FRAGMENTATION

COMPLICATIONS OF CATARACT SURGERY

Intra Operative Complications

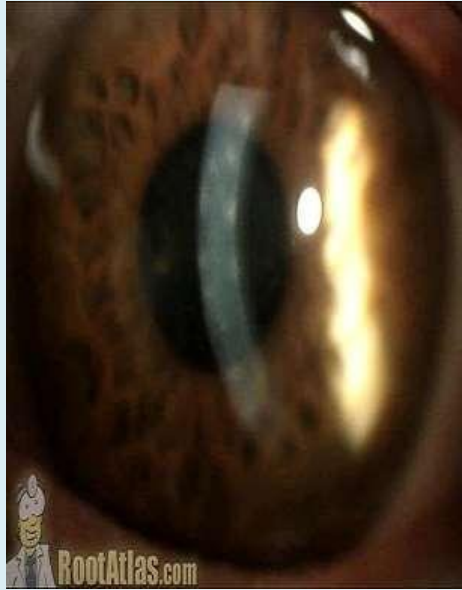
- Bridle Suture Perforation of the globe
- Stripping of Descemet's Membrane
- Damage to ciliary body
- Posterior loss of lens fragmentation
- Rupture of posterior capsule
 - ❖ Without vitreous loss
 - ❖ With vitreous loss



Early Post-operative Complications



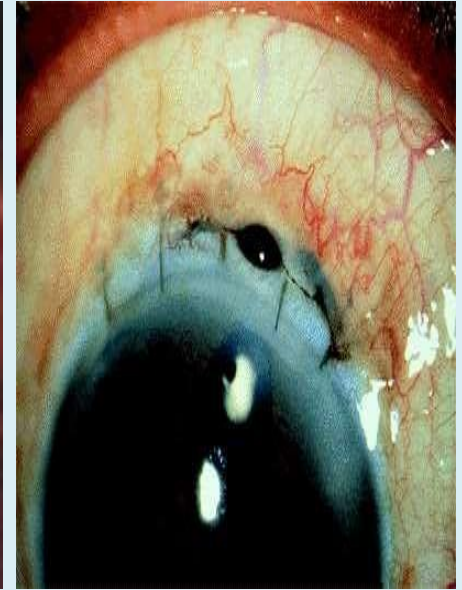
Iris
prolapse



Striate
keratopathy



Hyphe
ma

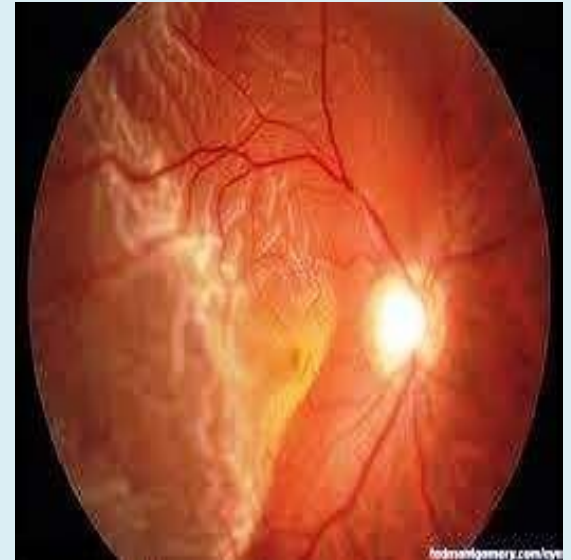
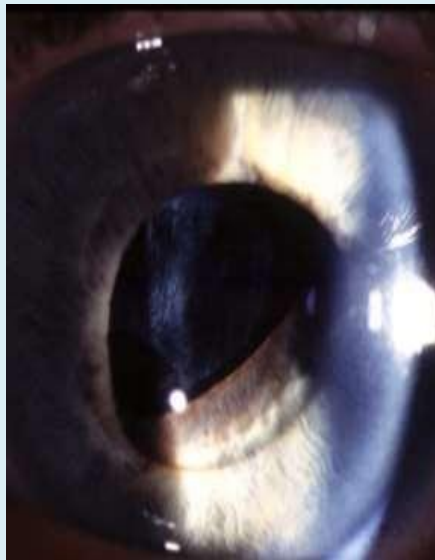
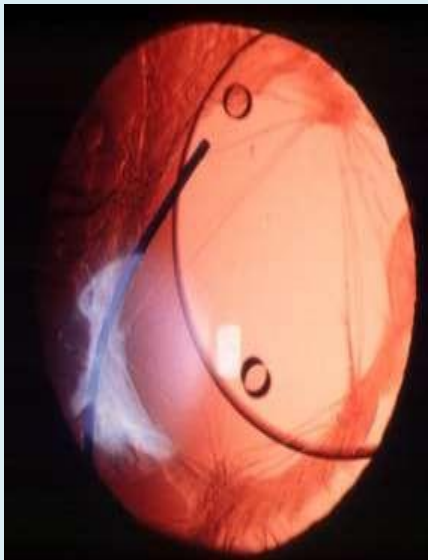


Wound
leak

-Acute bacterial endophthalmitis

Late Post-operative Complications

- Chronic endophthalmitis
- Posterior capsule opacification
- Malpositioning of IOL
- Retinal detachment
- Corneal decompensation



THANK YOU