

# 2.6 Acquired Cataract

## Plan:

Clinical anatomy

Definition

Etiology of cataract: congenial & acquired

Acquired cataract & types of acquired cataract

Different ways of classification

Clinical acquired cataract classification

Complications of cataract if not treated

Management

Conservative

Medical

Surgical

Preoperative assessment

Types of surgery

Steps of surgery

Complications of cataract surgery

Important

Please spend 5 minutes to understand objectives/plan

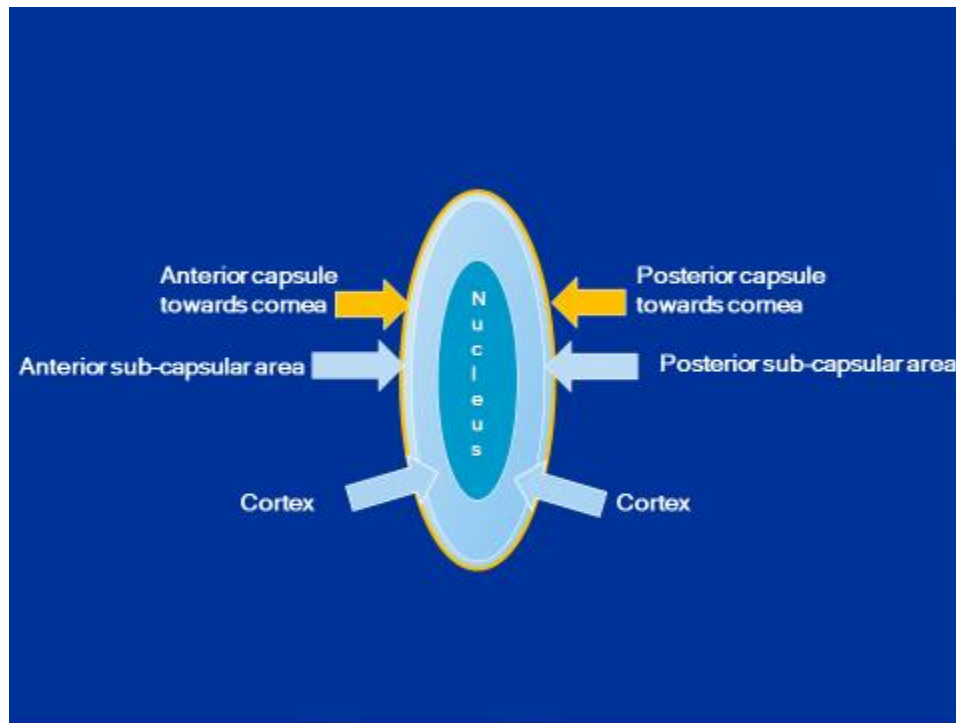
## CATARACT

- Any opacity in lens including capsule is called cataract (opacity may be in one or more layers) OR
- Loss of transparency of lens is



## Clinical anatomy of lens:

### Clinical anatomy of lens



## Definition of cataract

### CATARACT

- Any opacity in lens including capsule is called cataract (opacity may be in one or more layers)  
OR
- Loss of transparency of lens is



## Definition

Cataract is any opacity in lens including capsule. In lens opacity may be in capsule, subcapsular area, in cortex or in nucleus OR may be in more than areas.

## Etiology

### 1. Congenital cataracts

These will be discussed in childhood blindness module.

### 2. Acquired cataract means that lens was clear but later on in life becomes opaque. This is most common type of cataract.

Acquired has four etiological types.

**2a:** Evolutional or age related cataract is most common type of acquired cataract.

**2b:** Systemic diseases associated cataract like diabetes and atopic dermatitis

**2c:** Secondary cataract is 2<sup>nd</sup> most common type of acquired cataract. It could be secondary to other ocular diseases like uveitis, systemic diseases like diabetes, drugs like steroids and radiation.

**2d:** Traumatic cataract is 3<sup>rd</sup> most common type of acquired cataract.

## Clinical types of acquired cataract

**(means clinical types of evolutional, secondary and traumatic cataracts)**

If opacity in anterior capsule, then we name it anterior capsular cataract.

Causes are evolutional, secondary & traumatic cataract.

If opacity just beneath posterior capsule, we call it sub-capsular cataract.

5% of acquired cataracts.

Causes are evolutional, secondary & traumatic cataract.

If in cortex, then called cortical cataract.

70% Of acquired cataracts.

Causes are evolutional, secondary & traumatic cataract.

If opacity in nucleus, then called nuclear cataract or nuclear sclerosis.

25% of acquired cataracts.

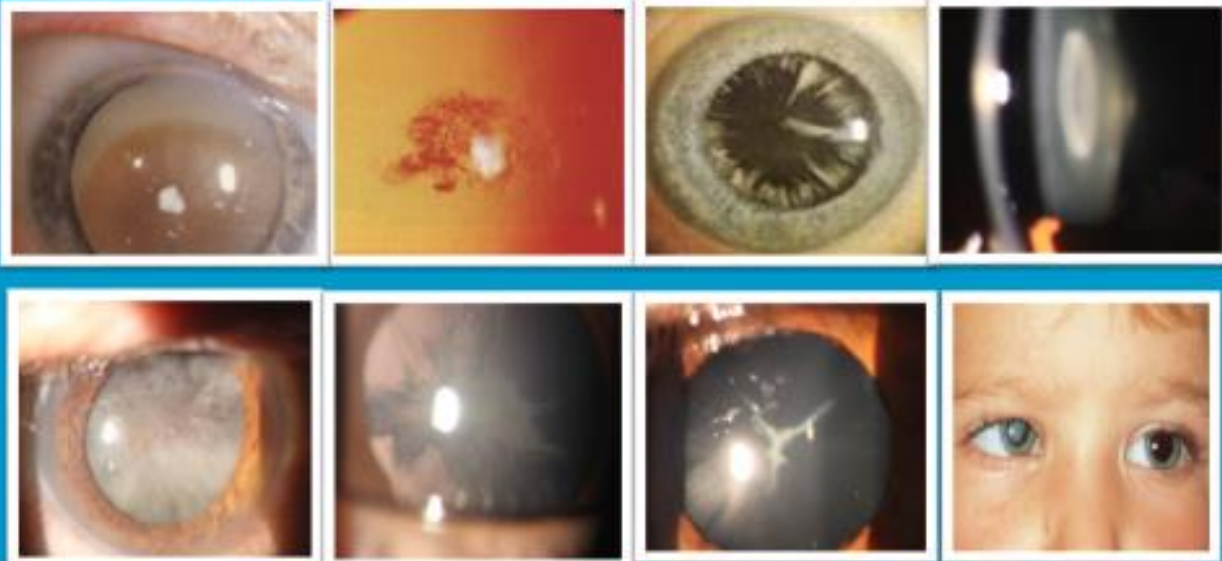
This type of cataract makes patient myopic and caused frequent changes in refraction as it matures.

Causes are evolutional, secondary & traumatic cataract.

## Classification of cataracts

Location	Maturity	Age of onset	Degree of opacity	Etiology
<ul style="list-style-type: none"> <li>■ Nuclear</li> <li>■ Cortical</li> <li>■ Capsular</li> <li>■ Sub-capsular</li> </ul>	<ul style="list-style-type: none"> <li>■ Immature</li> <li>■ Mature</li> <li>■ Hyper mature</li> <li>■ Intumescent</li> </ul>	<ul style="list-style-type: none"> <li>■ Congenital</li> <li>■ Infantile</li> <li>■ Juvenile</li> <li>■ Adult</li> <li>■ Age related</li> </ul>	<ul style="list-style-type: none"> <li>■ Mild</li> <li>■ Moderate</li> <li>■ Total</li> <li>■ White</li> </ul>	<ul style="list-style-type: none"> <li>■ Congenital</li> <li>■ Evolutional</li> <li>■ Traumatic</li> <li>■ Secondary</li> </ul>

Clinically used classification



**Clinically acquired cataract is classified on the basis of location and maturity.**

**Clinical types of acquired cataracts:**

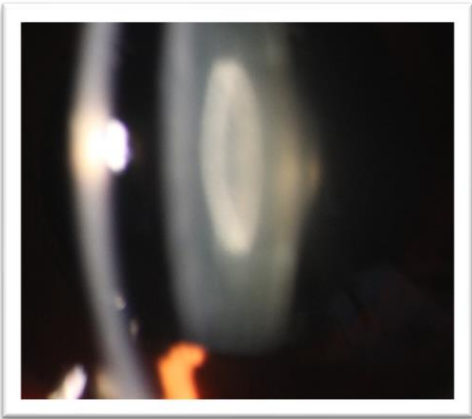
(evolutional, systemic, secondary, traumatic):



**Cortical / Mature cataract**

**Evolutional/white**

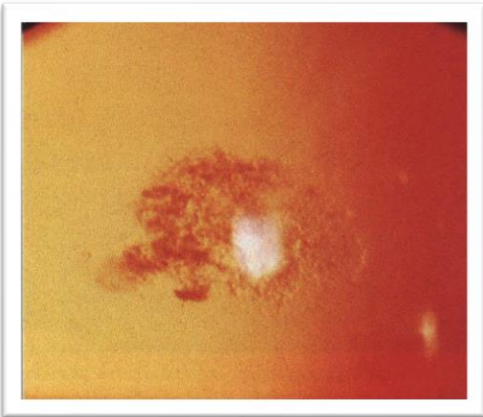
**70% of cataracts**



**Nuclear / immature cataract**

**Evolutional/moderate**

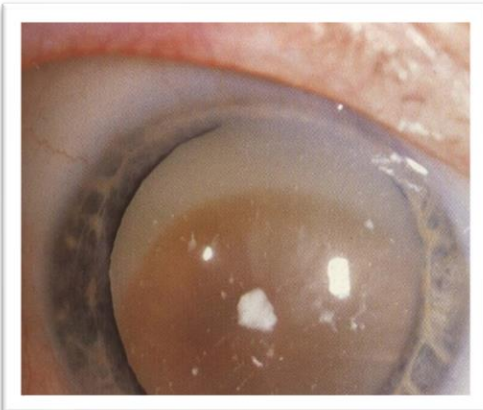
**25% of cataracts**



**Posterior sub-capsular / immature cataract**

**Evolutional/moderate**

**5% of cataracts**



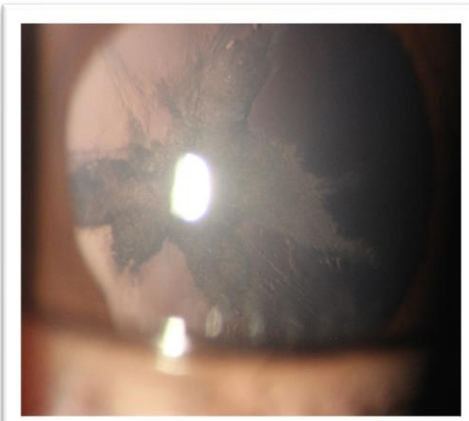
**Nuclear / hypermature cataract**

**Evolutional/moderate**

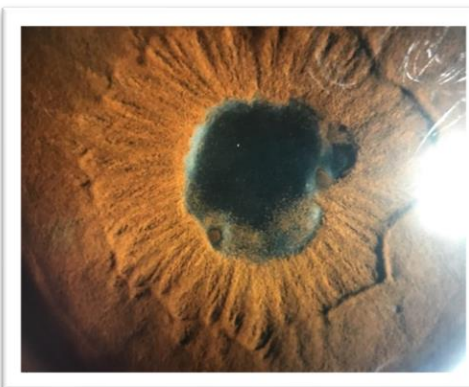
**May complicate if not treated**



**Cortical / immature cataract**  
**Evolutional/moderate**



**Anterior capsular / immature cataract**  
**Evolutional/moderate**



**Subcapsular & nuclear / immature cataract**  
**Secondary cataract**

## Fate of untreated cataract / complications:

### Subluxation / Dislocation:

Suspensory ligaments degeneration with age, congenital weakness or rupture with trauma may cause lens to dislocate in vitreous or anteriorly.

### Phacolytic glaucoma:

Proteins may leak from mature cataract and cause glaucoma.

### Phacomorphic glaucoma:

Mature lens swells and causes pupil block glaucoma.

### Phacoantigenic uveitis:

Trauma can rupture capsule with release of proteins causing antigenic reaction.

## Management

### Observation:

If not causing any symptoms then patient can be observed.

### Medical management:

There is no proven medical treatment for cataract.

### Surgical management:

Only definite treatment is surgical.

## Preoperative assessment

### Detailed history:

Detailed history of illness, past history

### Ocular examination:

Any previous or present eye disease particularly lacrimal sac infection.

### General examination:

General ocular examination and general physical examination for fitness

### Investigation:

Biometry (axial length & corneal curvature), B-scan if retina not visible, OCT if suspicious macula

Hepatitis screening and other needed test for anesthesia

### Informed consent:

Patient should be explained benefits and risks

### Anesthesia:

Patient should be explained about anesthesia. Anesthesia may be topical, local or general anesthesia.

**Important**

**Important**

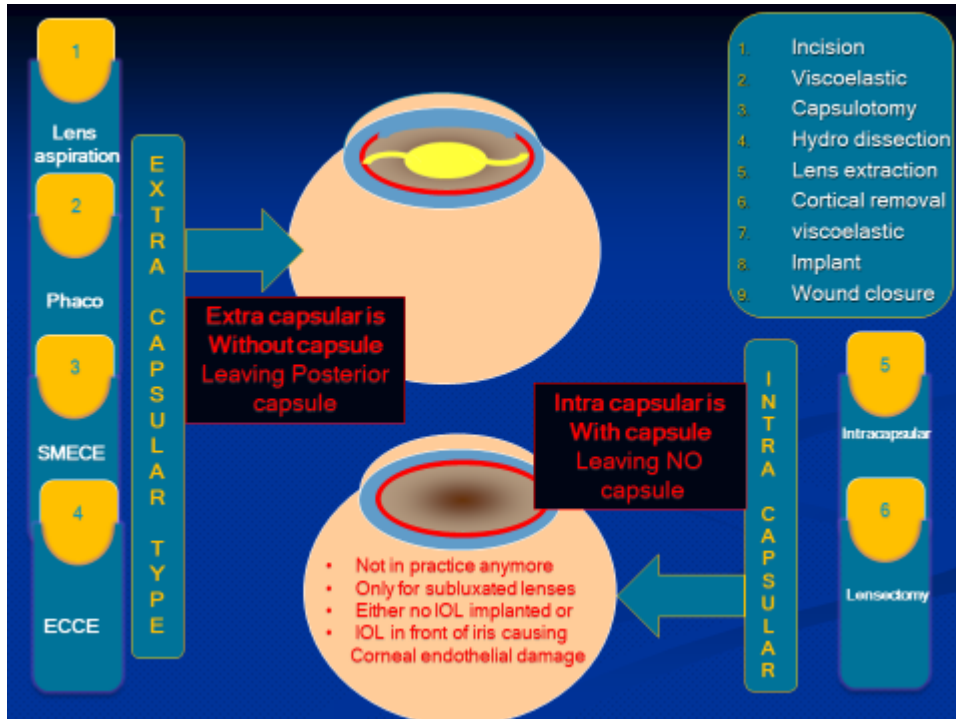
**Important**



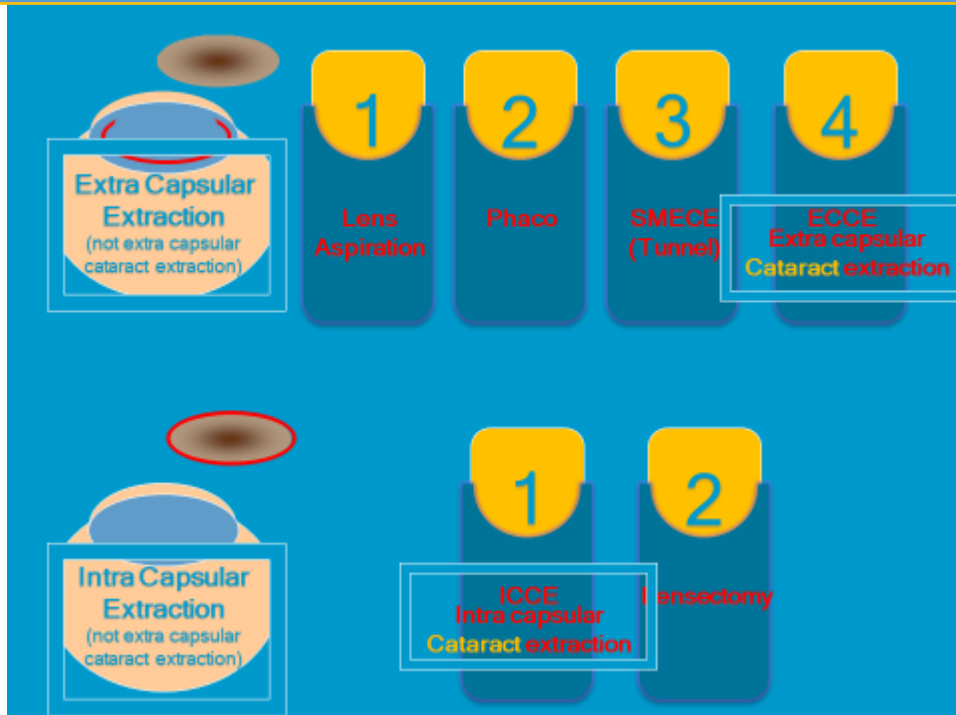
## Types of cataract surgery

Extracapsular: leaving posterior capsule inside eye

Intracapsular: Removing nucleus, cortex, anterior & posterior capsule



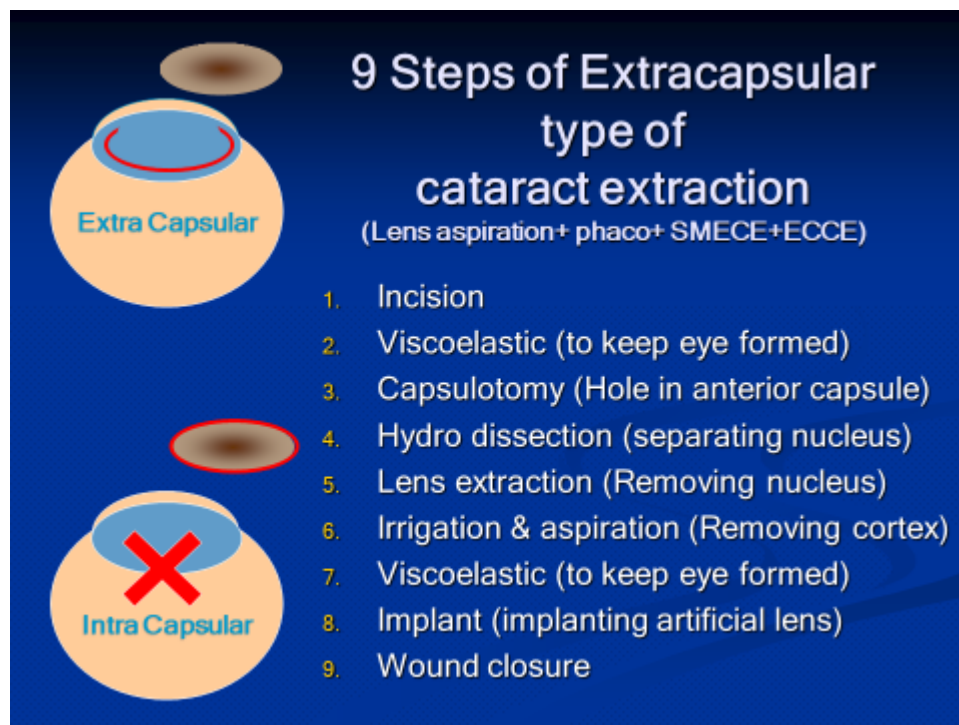
## Subtypes of extra capsular & intra capsular cataract extraction:





## Surgical steps with 9 key steps highlighted

01. Informed consent of patient
02. Checking identity of patient
03. Positioning of patient on table
04. Anesthesia: topical or local or general anesthesia
05. Cleaning lids and conjunctival sac with pyodine
06. Applying drape to isolate operating area
07. **Incision: corneal OR corneo-scleral tunnel**
08. **Injecting viscoelastic to keep eye formed**
09. **Capsulotomy: CCC or can opener capsulotomy**
10. **Hydrodissection: To separate lens from capsule**
11. **Lens (Nucleus) extraction**
12. **Irrigation & aspiration: Removal of cortex**
13. **Injecting viscoelastic to keep eye formed**
14. **Inserting intra ocular lens (IOL) in eye**
15. **Closing eye with sutures if needed**
16. Antibiotics
17. Antiseptic dressing

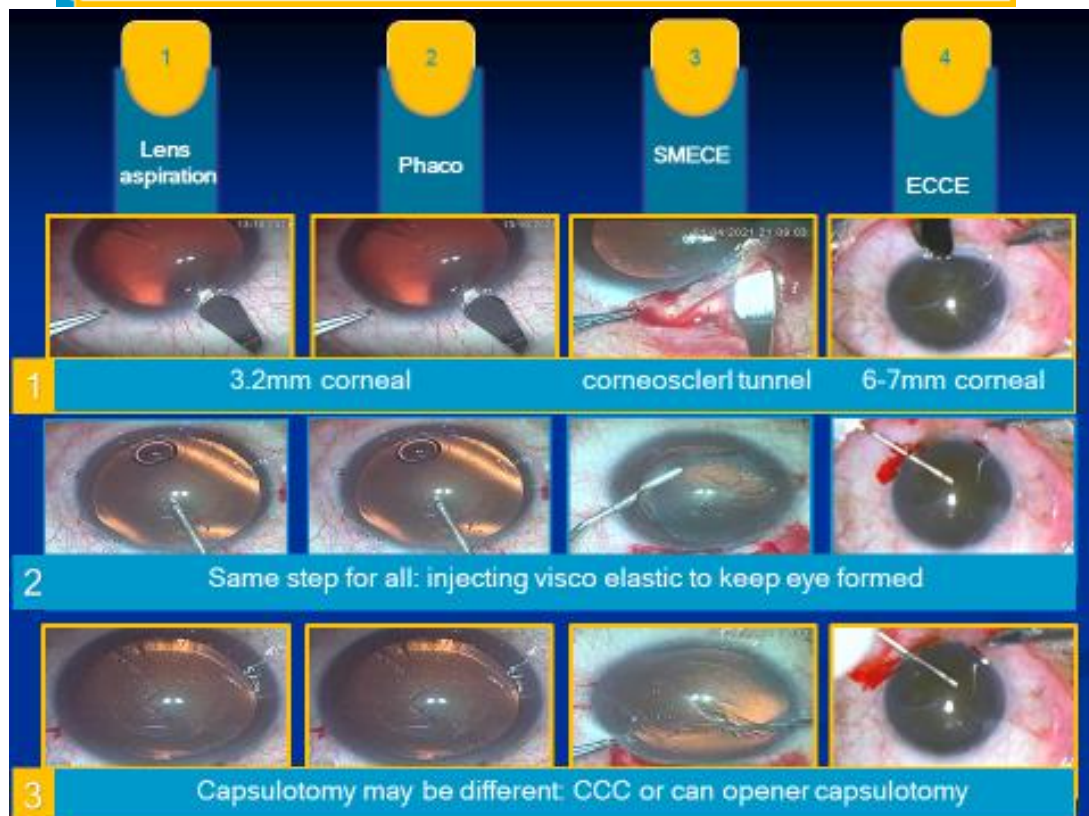


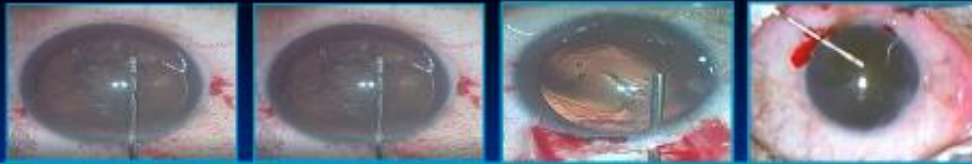
## 9 key steps

Blue coded steps same in all types of extracapsular extraction

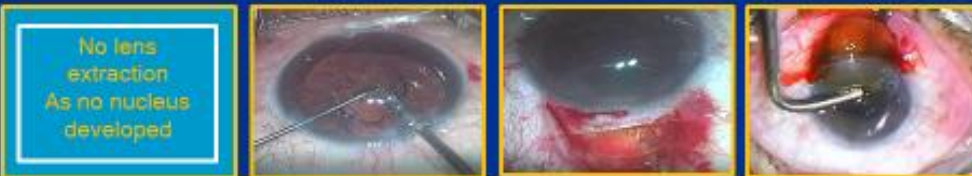
Yellow coded may be different

		1 Lens aspiration	2 Phaco	3 SMECE/Tunnel	4 ECCE
1	Incision	Cornea 2-3 mm	Corneal 2-3 mm	Corneo-scleral 6 mm	Corneal 6mm
2	Visco injection	yes	yes	yes	yes
3	Capsulotomy	CCC	CCC	CCC/canopener /envelope	CCC/canopener/ envelope
4	Hydro dissection	Yes	Yes	Yes	Yes
5	Lens extraction	No	In small pieces	Whole lens	Whole lens
6	Cortical removal	yes	yes	yes	yes
7	Visco injection	yes	yes	yes	yes
8	Implant	Foldable	Foldable	Foldable/Rigid	Foldable/Rigid
9	Wound closure	NIL	NIL	NIL	sutures





4 Same step for all: Hydrodissection to separate capsule from lens

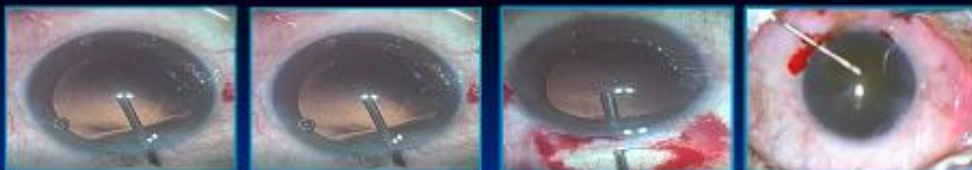


No lens extraction  
As no nucleus developed

5 No nucleus      Nucleus with phaco      Nucleus removed as whole



6 Same step for all: Removing cortex with irrigation & aspiration



7 Same step for all: injecting visco elastic to keep eye formed



8 Same step for all: Inserting intra ocular lens (IOL) in eye



9 No sutures as incision is 3.2 mm      No stitches as tunnel      Corneal stitches

## Complications of cataract surgery

We explain complications of cataract surgery to patient as common, occasional, rare and anesthesia related complications but clinically we describe them as complications before operation, during operation, shortly after operation and late complications.

Most common complications are

- Stinging, watering, foreign body sensation, photophobia
- Striate keratitis

Most devastating complications are

- Endophthalmitis
- Capsular rupture
- Vitreous loss with or without lens drops

**Complications**

**For patient understanding**

- Common
- Occasional
- Rare
- Anesthesia related

**For medical professional**

1. Before operation
2. During operation
3. Shortly after operation
4. Long after operation

### Complications before operation:

1. Anesthesia reaction: It is general body reaction to drugs used for enesthesia
2. Peribulbar hemorrhage
3. Increased pressure
4. Intraocular hemorrhage
5. Perforation of eye ball



### **Complications during operation:**

1. Posterior capsular rupture
2. Vitreous loss and/or lens drops
3. Endothelial damage
4. Hemorrhage in anterior chamber
5. Iris damage

### **Complications shortly after operation:**

1. Stinging, watering, foreign body sensation, photophobia
2. Striate keratitis: It is seen after difficult and prolonged surgery. Cornea becomes cloudy and it mostly clears in few days.
3. Endophthalmitis: This is very drastic and damaging complication. Pathogens may enter eye during or soon after surgery. It causes not only infective reaction in anterior segment but infection rapidly progresses to vitreous. Patient typically presents with pain and decrease vision on 2-3 days after cataract surgery. Endophthalmitis causes severe damage to vision and should be treated as emergency. Treatment is fortified antibiotics, intravitreal injections of anti- microbial and pars-plana vitrectomy (PPV).
4. Iris prolapse
5. Wound leakage/shallow anterior chamber
6. Intra ocular lens (IOL) decentration
7. Retained lens matter
8. Hyphema: This is blood in anterior chamber and mostly resolves in few days.
9. Pupil stuck in wound/irregular pupil
10. Excessive inflammation

### **Complications long after operation:**

1. Posterior capsular opacification. It is very common complication. Transparent posterior capsule becomes opaque or white. This causes decrease in vision. Treatment is YAG laser capsulotomy which makes hole in opaque posterior capsule
2. Decentered IOL
3. Secondary glaucoma