

ophthalmology

The Lens

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Objectives:

- 1. To Know the anatomy and physiology of the lens.
- 2. The most common ocular disorders related to the lens.
- 3. definition classification and management of cataract.
- Congenital disorders of the lens

Anatomy and physiology of the lens

1.Nucleus.

2.Cortex.

3.The capsule.

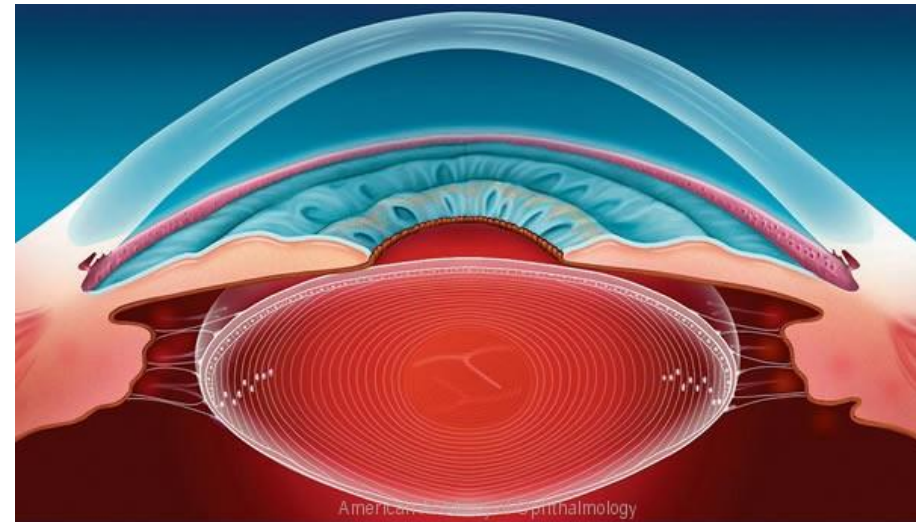
- The lens connected to the ciliary muscle via the zonules so contraction of the ciliary muscle lead to relaxation of the zonules and increasing the anteroposterior diameter of the lens to increasing the power of the lens as in a case of near vision.

In opposite to what occurs in a state of far vision

*** this process of changing the lens power for different distances called

Accommodation

-The lens grows in both anteroposterior and equatorial dimensions throughout



Symptoms and signs of diseases of lens (all are entirely related to vision)

1. Cataract: opacification of the lens
2. Presbyopia: decrease the accommodation of the eye as in a case of age above 40 there is difficulty of near vision
3. Nuclear sclerosis. usually presented as difficulty in far vision (secondary myopia)
4. Monocular diplopia: as in case of lens subluxation or immature cataract

CATARACT:

Classification of cataract

1. According to the site:

- a- Anterior sub capsular.
- b- Posterior sub capsular
- c- Cortical.
- d- Nuclear.

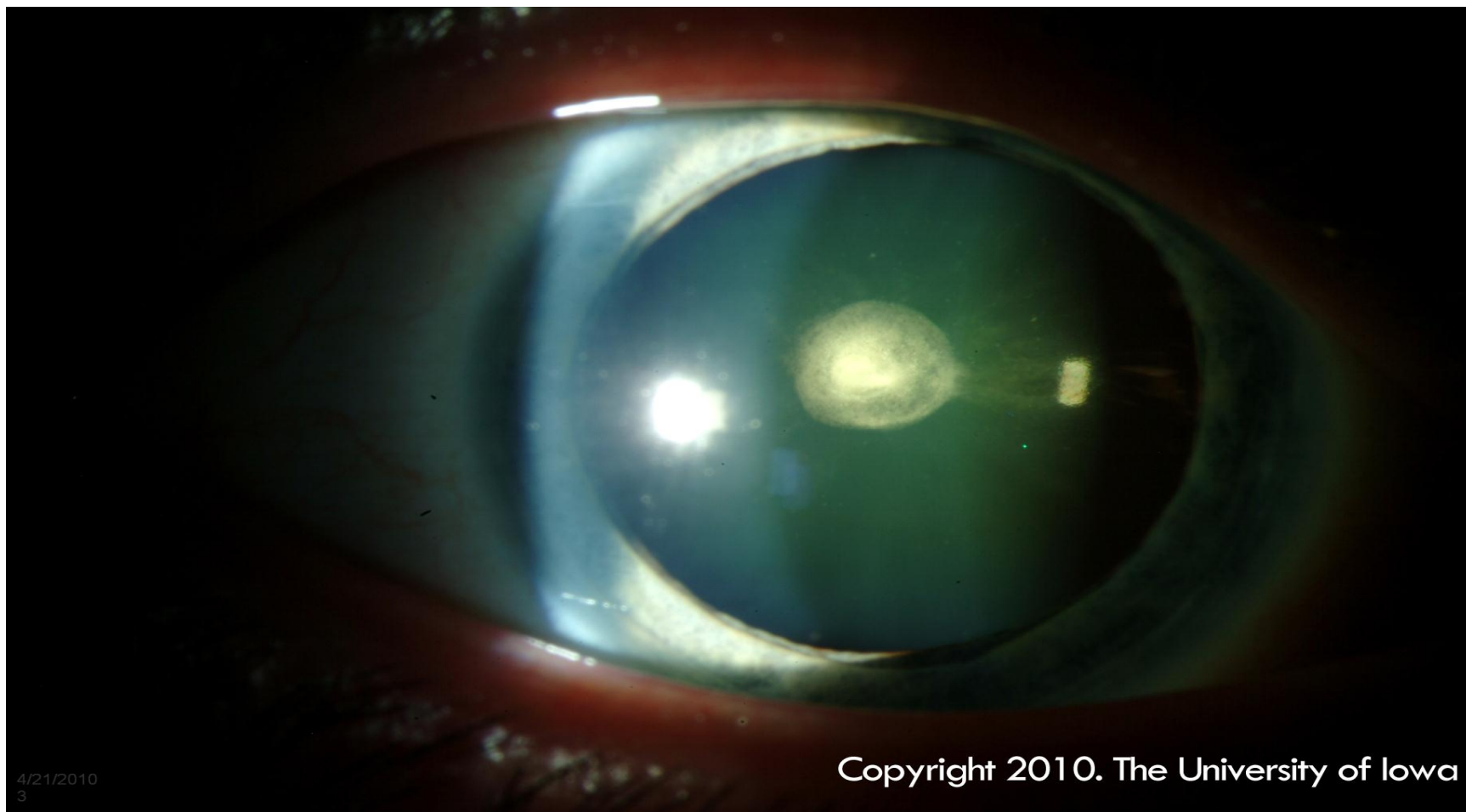
2. According to maturation:

- a- Immature.
- b- Mature.

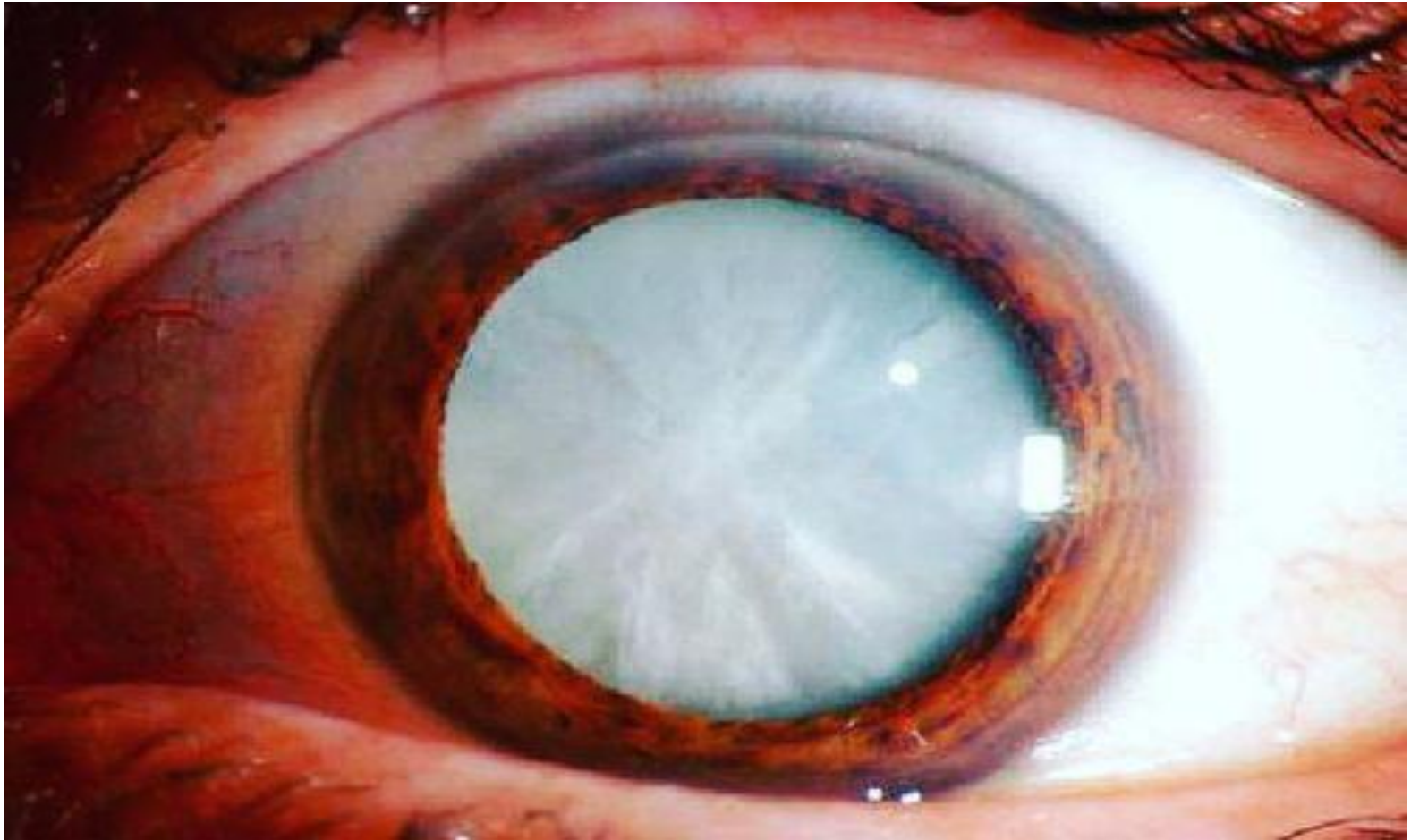
3. According to occurrence:

- a- Congenital
- b- Acquired.

Posterior subcapsular cataract



Dense Mature Cataract



Acquired cataract, cause;

1. Age-related cataract. more than 60 years old age
2. Pre-senile cataract.
 - a- Diabetes Mellitus.
 - b- Myotonic dystrophy.
 - c- Atopic dermatitis.
 - d. Neurofibromatosis 2
3. Traumatic cataract: the most common unilateral cataract
 - a. Penetrating injury.
 - b. concussion.
 - c. Ionizing radiation.
 - d. Infrared radiation.
 - e. Electrical radiation.

. 4- Drug induced

- A. Steroids.related to the dose and duration of Rx.e.g. daily 10 mg prednesolon for 4 years is not cataractogenic.
- B. Clorpromazine.
- C. Amiodaron
- D. Gold
- E. Allopurinole.

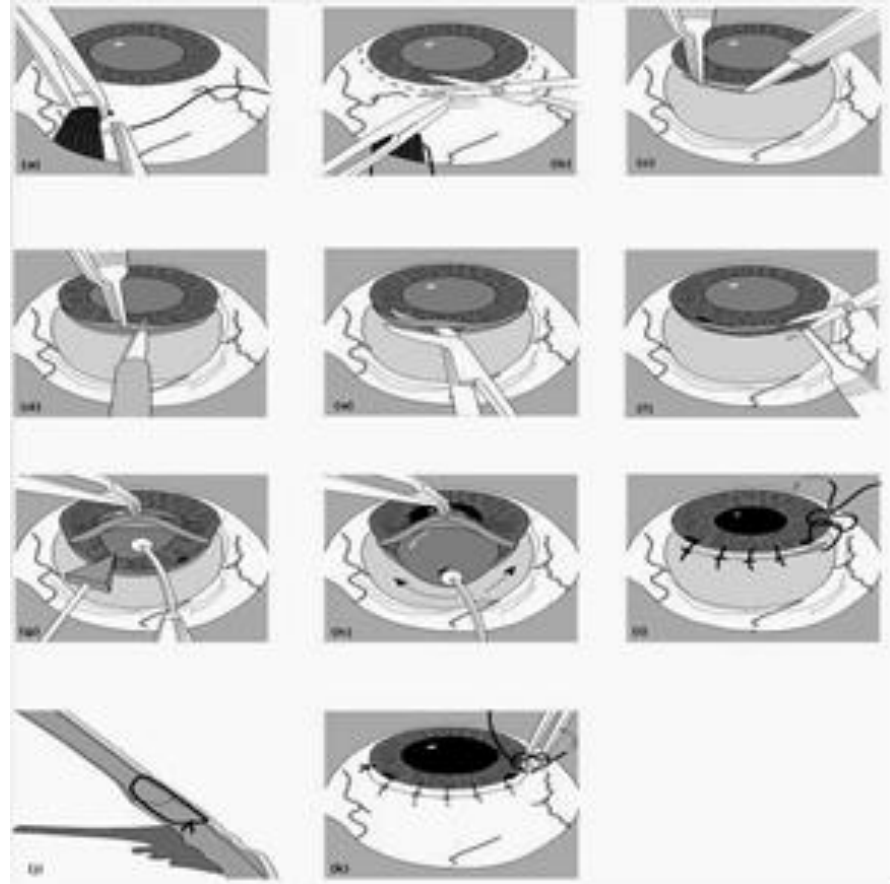
. 5- Secondary cataract:

- . Chronic anterior uveitis.
- . ACACG (acute congestive angle closure glaucoma)
- . High myopia (pathological)
- . Hereditary fundus dystrophies.

Types of cataract syrgery

1. Intracapsular cataract extraction (+) AC IOL:

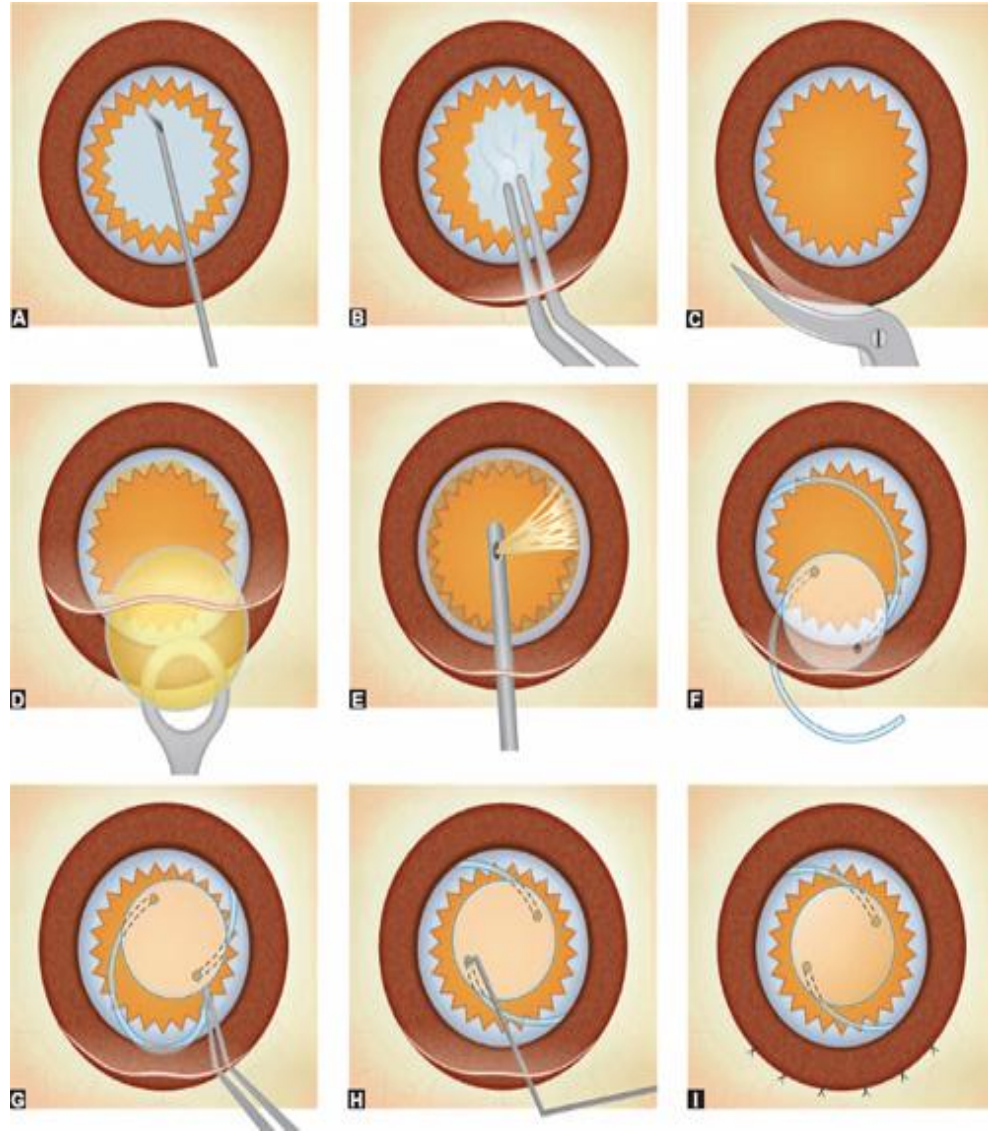
- a. Lid & fixation.
- b. Corneoscleral section.
- c. Sutures.
- d. PI.(peripheral iridectomy)
- e. Removal of the lens.
- f. with or without implantation of artificial lens in the anterior chamber
- g. Closure. By suturing



2. Extracapsular cataract extraction

± PC IOL:

- 1. Lids and fixation.
- 2. Section.
- 3. Capsulotomy.
- 4. Corneoscleral section is now completed.
- 5. Viscoelastic substance injection.
- 6. Expression of the nucleus.
- 7. Irrigation-aspiration.
- 8. Implantation of the artificial lens
- 9. Suturing.



3-PHACOEMULSIFICATION

Ultrasonic shock waves used to cut the pacified lens(cataract) material for small pieces then removal by suction irrigation maneuver.

Then injection of a foldable artificial lens through the same small self seal (suture less) incision.

Better visual outcome and less postoperative rehabilitation course required

Treatment of cataract:

SURGERY●

there is NO effective medical treatment

Indications of cataract surgery:

- 1. Visual improvement.:** according to the patients visual requirement e.g. the requirement of an old farmer much less that it of a medical student the later need earlier intervention
- 2. Medical indication:** hypermature cataract complicated by intumescant or pholytic or phacoanaphylactic glaucoma
- 3. Cosmetic indication. Rare**

- **Aphakia**

- Congenital or acquired absence of the lens from the eye, An aphakic eye is usually strongly hypermetropic where parallel rays of light are brought to a focus behind the retina.
- Correction of aphakia:
 - 1-Glass wearing mostly +10DS.(30% magnification).
 - 2- Contact lens (1% magnification).
 - 3- primary or secondary intraocular lens implantation. is the best way of correction as there is no magnification at all

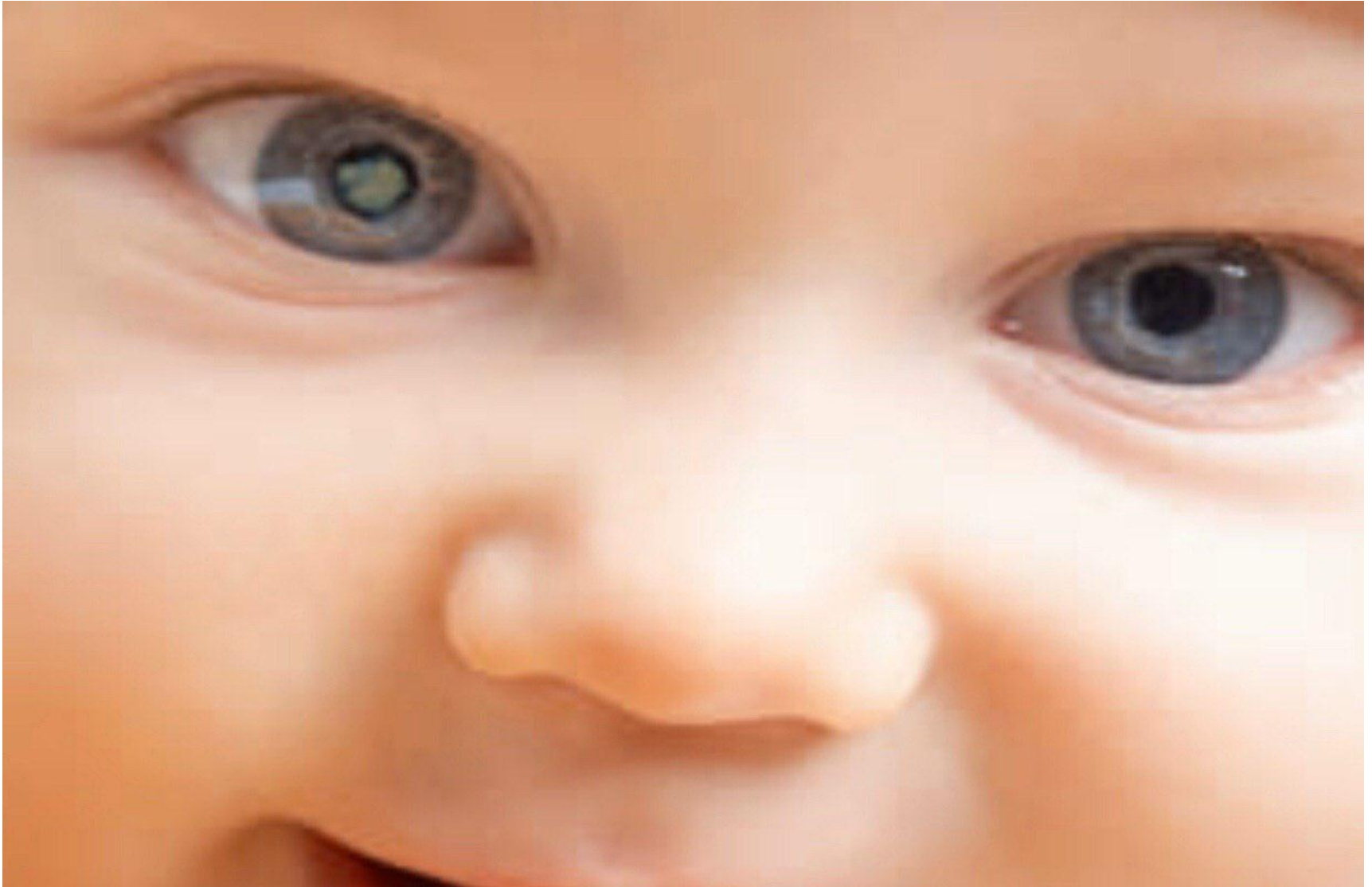
Congenital cataract

- Causes:
- 1. Isolated hereditary cataracts.25% of all cases(AD,AR,or X_Linked)**
- 2. Metabolic cataract:**
 - a- Galactosemia.
 - b- Lowe's (oculocerebral syndrome)
- 3. Prenatal infection.**
 - a- Congenital Rubella.within the 1st 8 weeks of gestation
 - b- Others: Cytomegalovirus,Herpes simplex and Varicella.
- 4. Chromosomal abnormalities:**
 - a- Down syndrome(Trisomy 21).
 - b- Others: Patau syndrome(Trisomy 13), Edward s.



Bilateral dense mature congenital cataract

Unilateral dense congenital cataract



Patient with rubella cataract treated by cataract extraction and correction with high degree glasses
***hearing aid for deafness also caused by congenital Rubella



Timing of surgery of congenital cataract

- **1.** Bilateral dense mature. Before the age of 6 weeks.
- 2.** Bilateral partial. According to the visual obscuration.
- 3.** Unilateral dense. surgery with aggressive amblyopia therapy.
- 4.** Partial unilateral. According to the visual acuity

Ectopia lentis:

Is refers to a displacement of the lens from its normal position. The lens may be completely dislocated "*Luxated*" (complete destruction or cut of zonules) or partially dislocated "*Subluxated*".

Causes:

1. Acquired:

- Trauma.
- Large eye.suh as in myopia
- Tumor.
- Hypermature cataract.

2. Congenital:

- AD, AR, or with aniridia.
- Systemic association e.g.Marfan's s.,Weill-Marchesani s.,Homocystinuria,Ehlers-Danlos s.

Complications of ectopia lentis:

- 1. Refractive errors**
- 2. Glaucoma.**
- 3. Endothelial touch.**
- 4. Lens induced uveitis**

- Mx of the following;
- 1- medical student with dense mature cataract.
- 2. 80 years farmer with cataract his visual acuity is 6/36.
- 3. neonate with premature cataract

Thank you

