DISEASES OF THE CORNEA

Department of Ophthalmology

Xerophthalmia

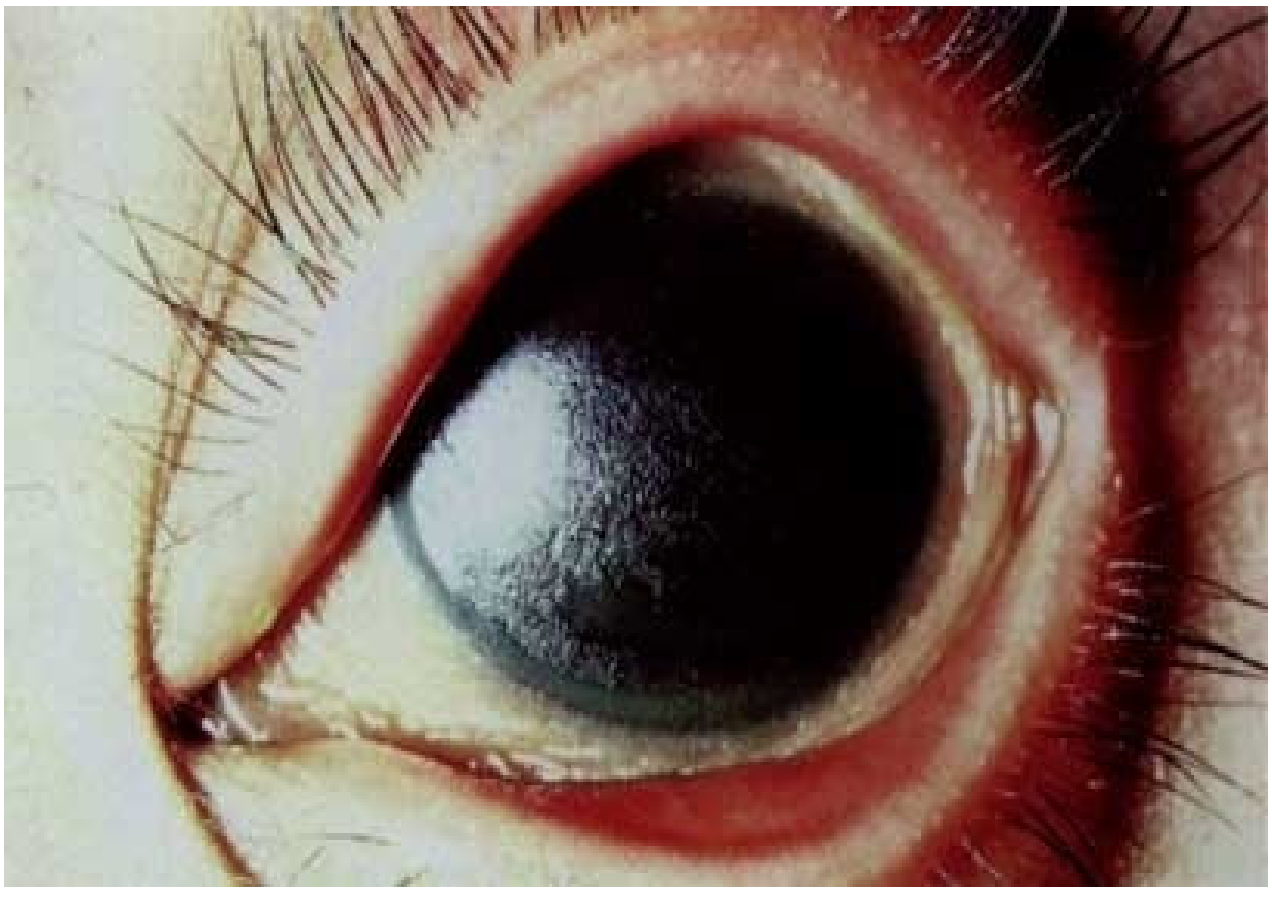
- Deficiency of vitamin A(dietary def. or defective absorption)
- Young malnourished children often in the 1st year of life
- Usually bilateral
- Absence of inflammation
- Precipitated by acute systemic illness

Xerophthalmia

- XN night blindness
- X1A conj. Xerosis
- X1B Bitots spots
- X2 Corneal xerosis
- X3A Keratomalacia<1/3
- X3B Keratomalacia>1/3
- XS Corneal scarring
- XF Xerophthalmia fundus

Bitot's spots (X 1B)

Corneal xerosis(X2)



Keratomalacia (X3B)

Treatment of xerophthalmia/ keratomalacia

- Local ocular therapy
- Vitamin A therapy - XN X3B

> 1 year 200,000 IU orally/100,000 IM

on day 0, 1, 2 weeks later

6-12 months or < 8kg half the dose

<6 mths 50,000 IU

Treatment of underlying condition

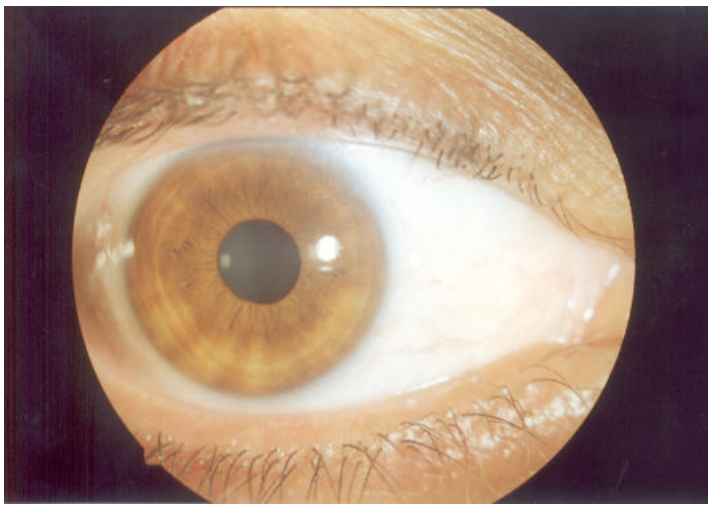
Prophylaxis against xerophthalmia

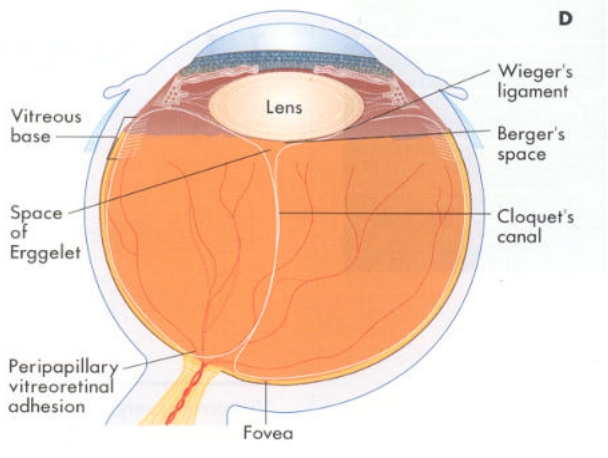
WHO recommendations

6-12 mths/ < 8kg	100,000 IU orally 3-6 monthly
>1yr <6yrs	200,000 IU orally 6 monthly
Lactating mothers	20,000 IU orally at delivery

WHAT IS AN EYE DONATION

It is donation of transparent glass (Cornea) fromdonorto recipient having Corneal opacity with normal posterior segment





Magnitude Of The Problem in India

- 20% of blind population of the world
- 15 million total blind in India
- 6-7 million are corneal blind
- 1 million bilateral blind

(90% below age 45 yrs including 60% children below 12 yrs)

Magnitude of The Problem

- Required collection – 2,00,000(50% utilization)

- Current Collection 2017– 52960

EBAI- 2017 Stats for INDIA(Unpublished data)

Magnitude of the Problem in India

- Required transplant – 1,00,000 cornea

- Current transplants (2017) – 25153

EBAI- 2017 Stats for INDIA(Unpublished data)

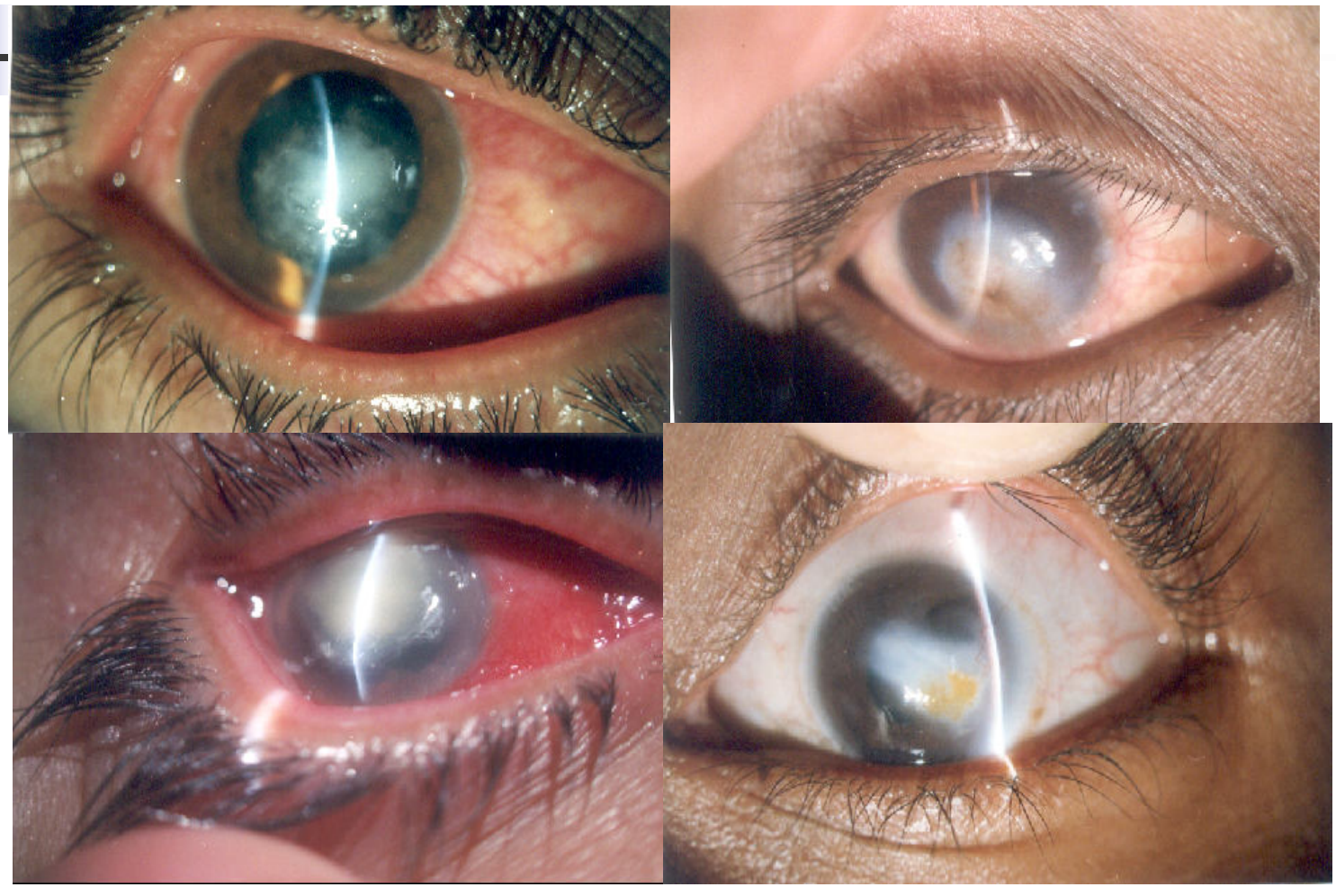
- We have achieved 0.25% of all deaths
  - 25 donation / 10,000 deaths

- Target is 1% of total deaths
  - 100 donation /10,000 deaths

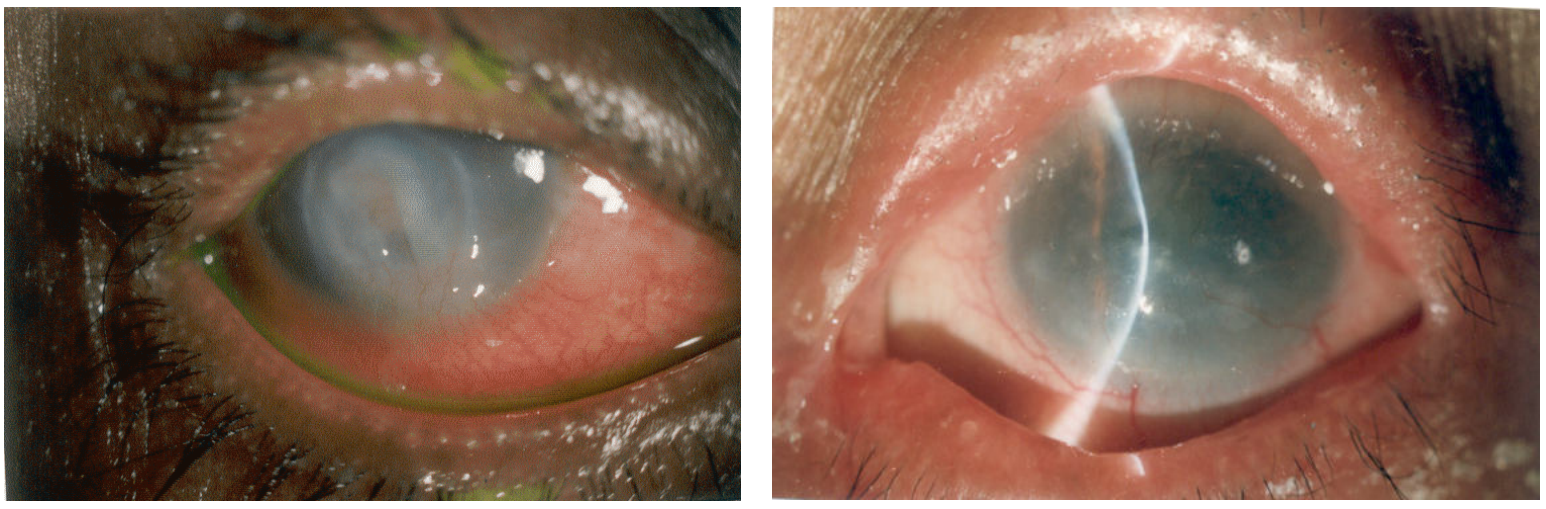
With a goal of 100,000 transplants and utilization of 50%

Causes of Corneal Blindness

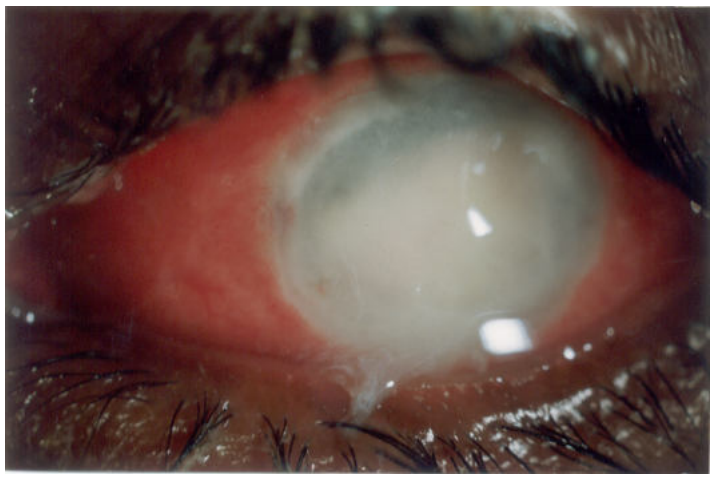
Corneal Infections

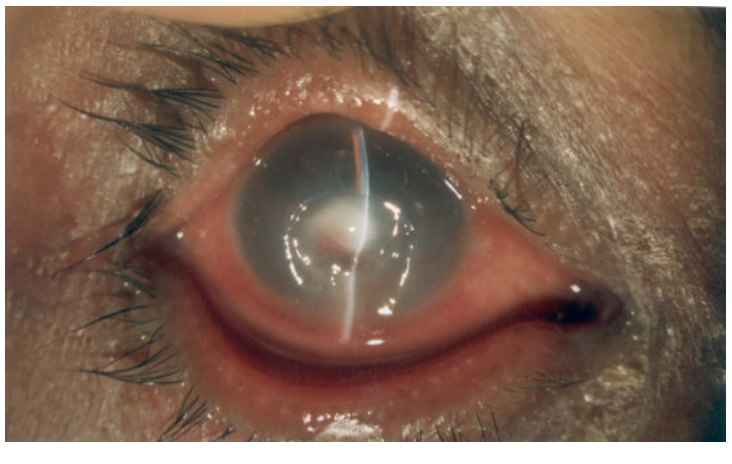


Vasculrized Corneas with thinning

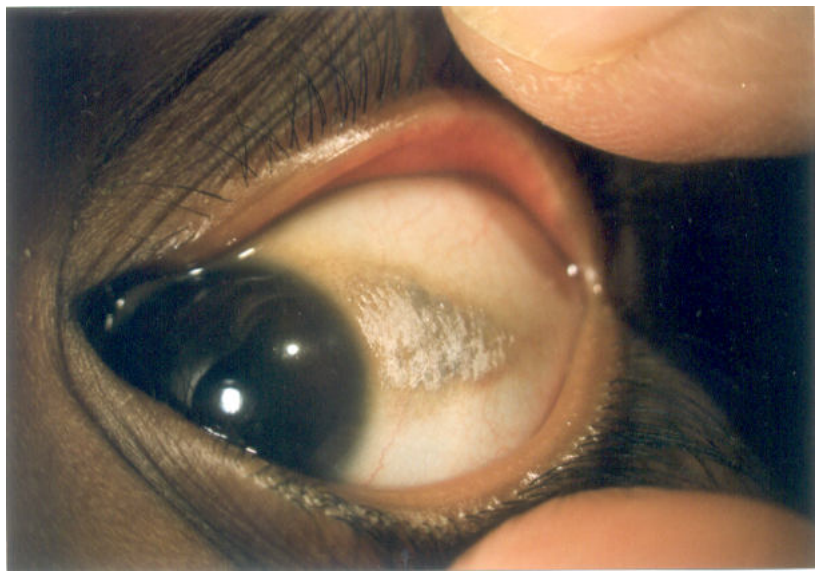


Sloughing Cornea with Perforation



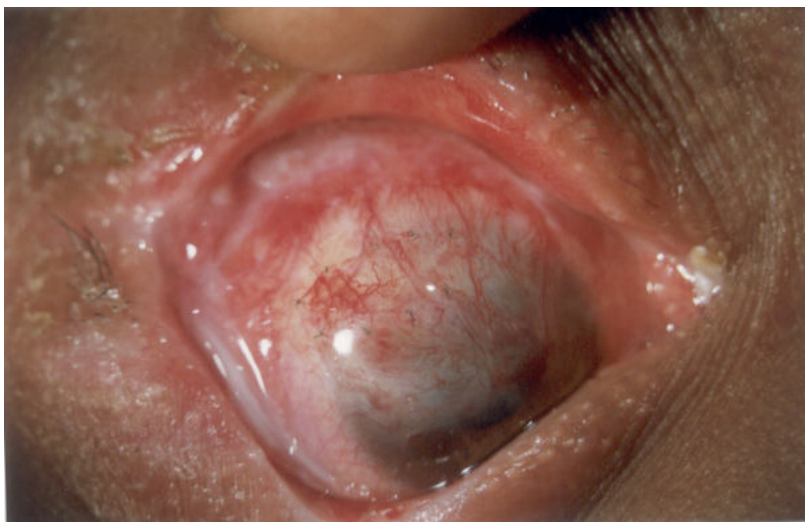



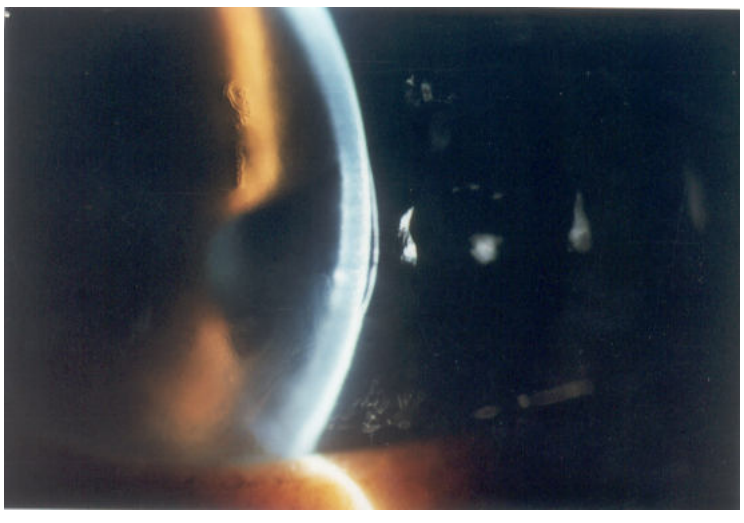
Vitamin A Deficiency



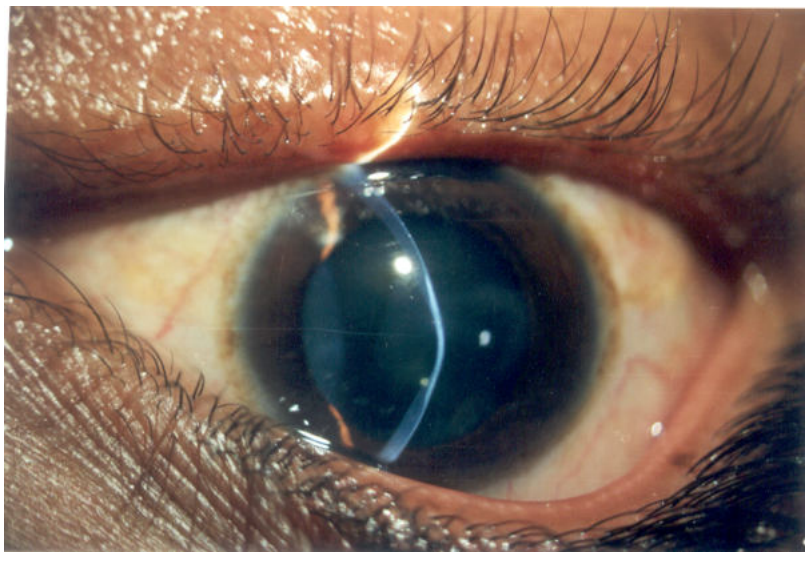
Traumatic Corneal Opacities

Chemical Burns

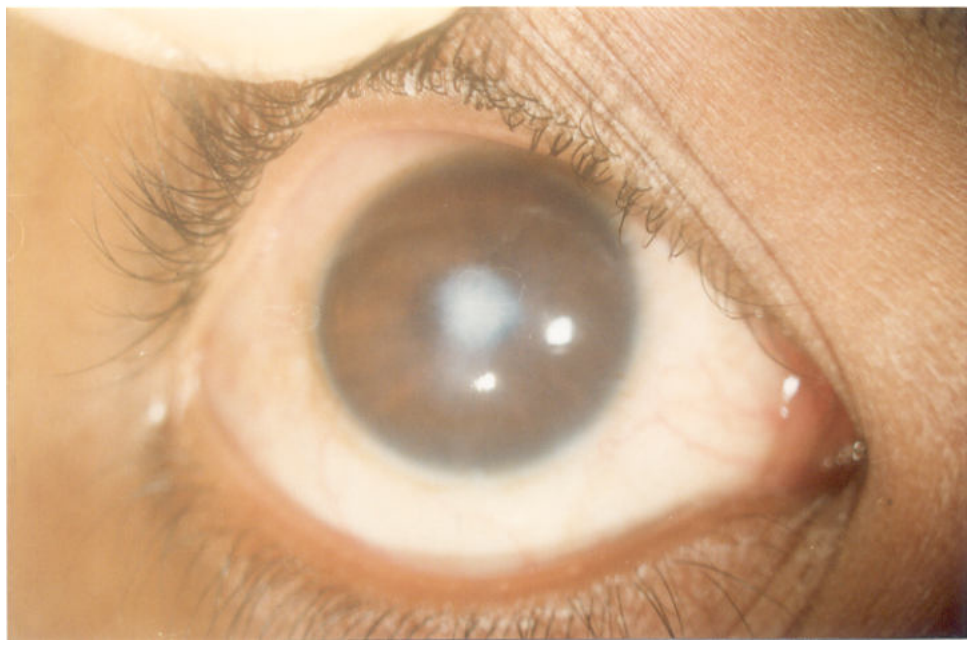




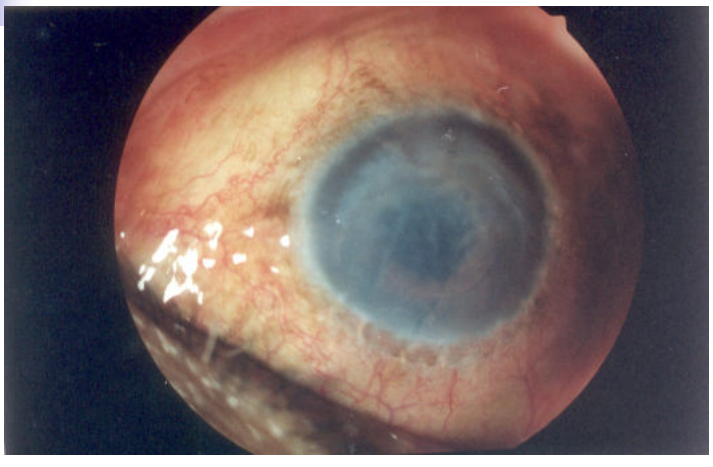
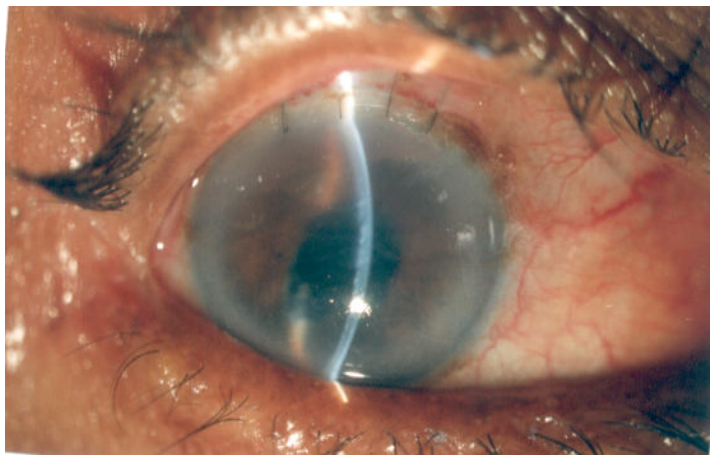
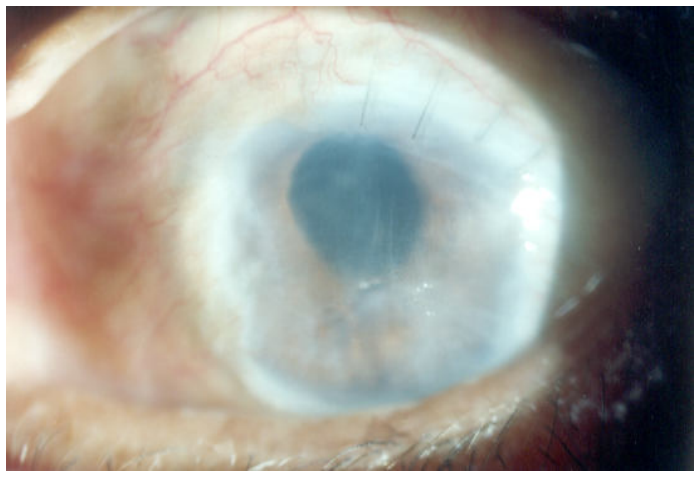
Corneal Dystrophies & Degenerations



Congenital Corneal Opacities



Surgical Trauma


Demand Vs supply of cornea

- 1 lakh Cornea needed per year
- 30-40,000 new Corneal blind are added every year
- 50,000 eyes collected in India every year
- 8-9 million death occur every year in India
- To clear the backlog we need at least 277,000 corneas

Eye Bank

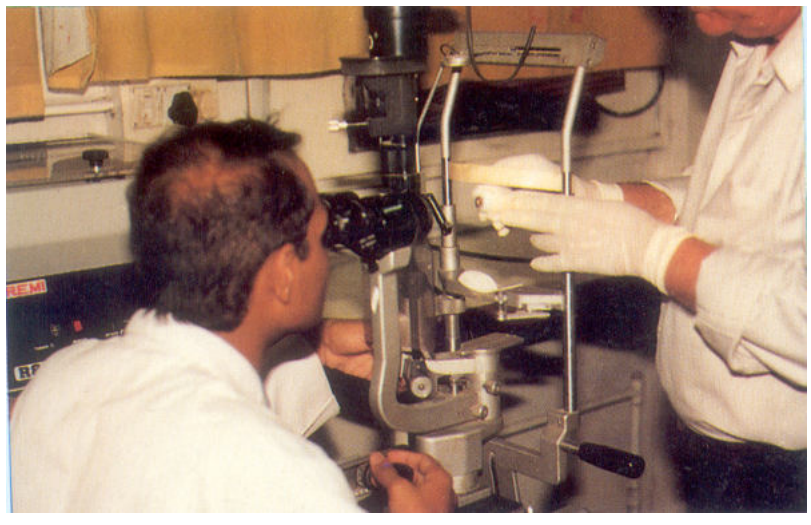
- Is an organization which deals with
  - Collection
  - Storage
  - Distribution

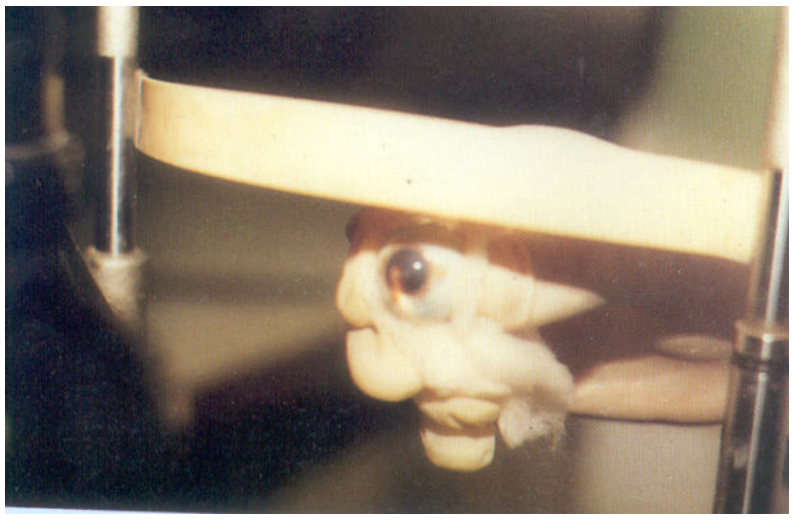
For the purpose of corneal grafting and research

Functions of Eye Bank

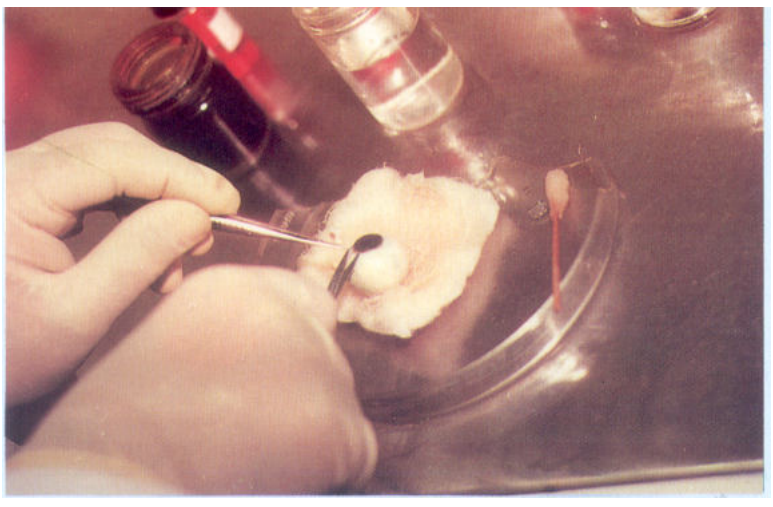
- **To promote eye donation**
- **Registration of pledger for eye donation**
- **Collection and processing of eyes as per Eye Bank standards**
- **To evaluate the quality of tissue before use**
- **Preservation of Tissue**
- **Distribution of tissue**
- **Research activities**

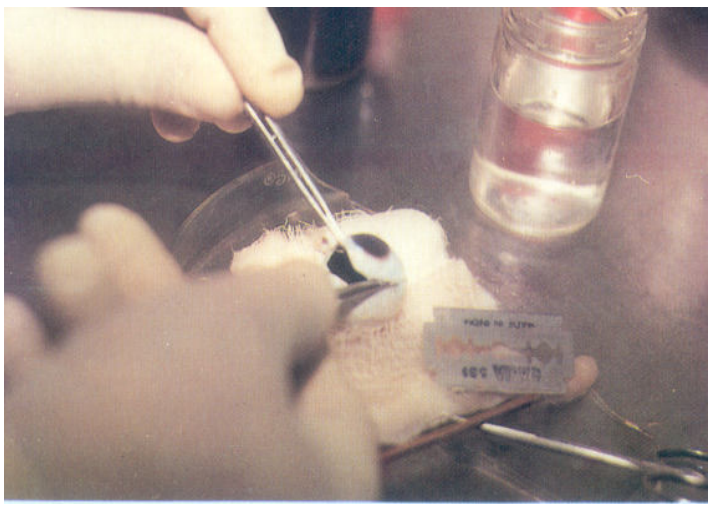
Assessment of Donor Cornea



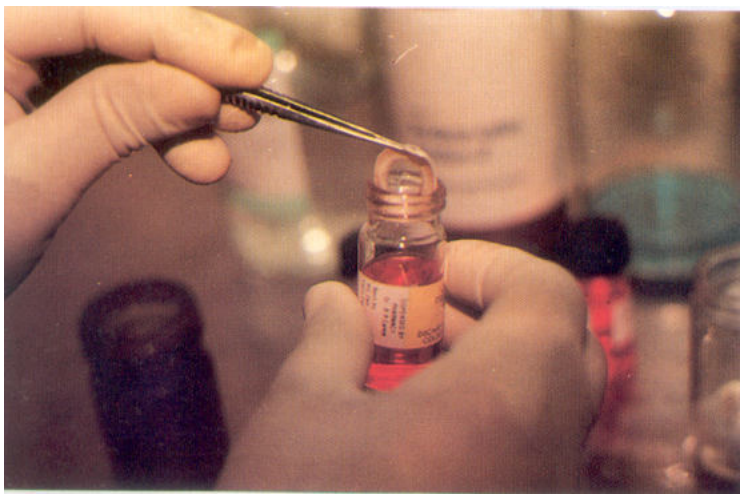


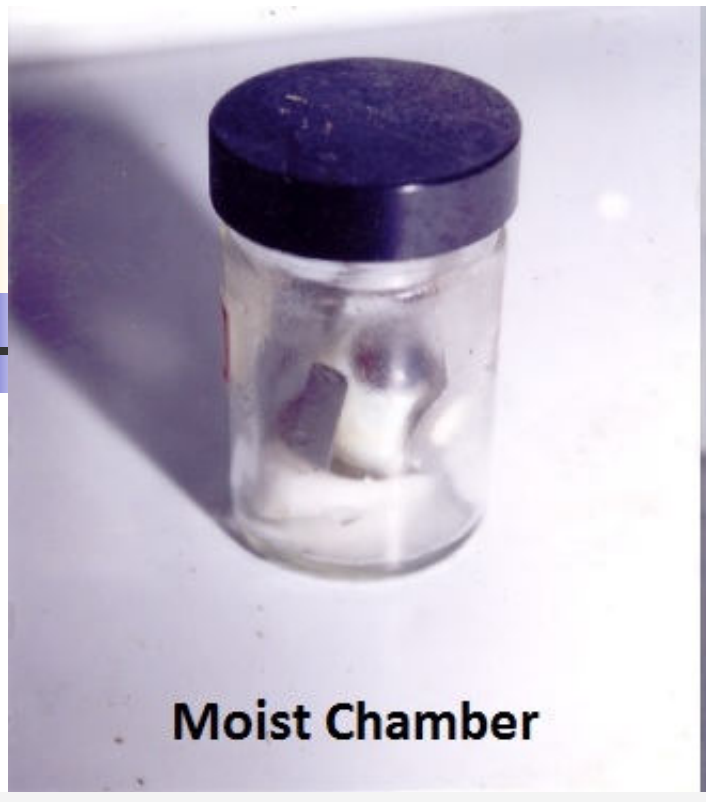
Preparing a Corneo-Scleral Button





Placing Donor Cornea in MK Medium for Preservation



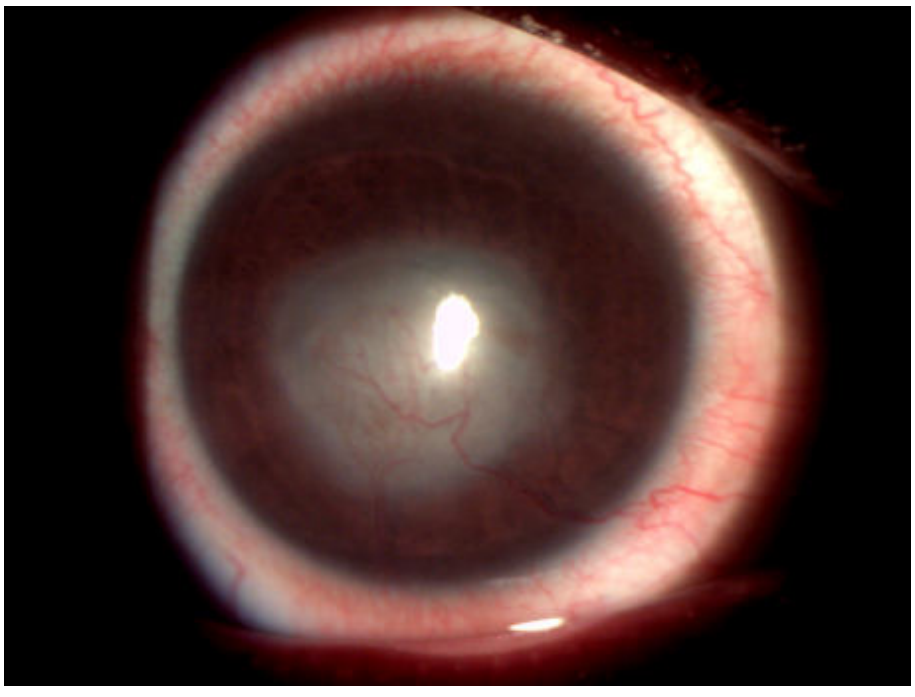


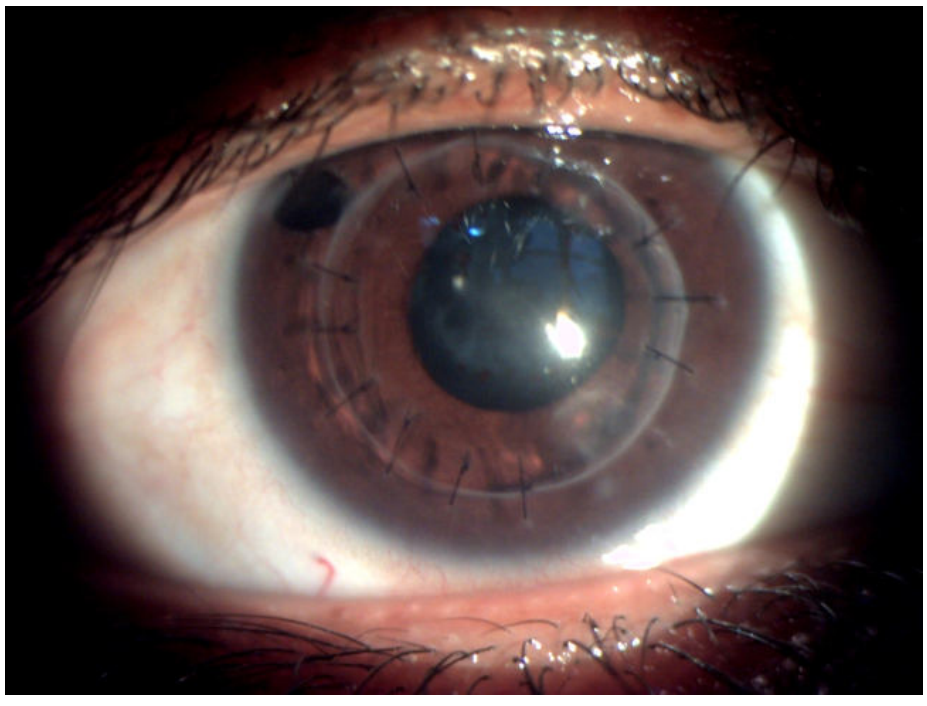
Moist Chamber

MK Medium

14 days
corneal Storage Media

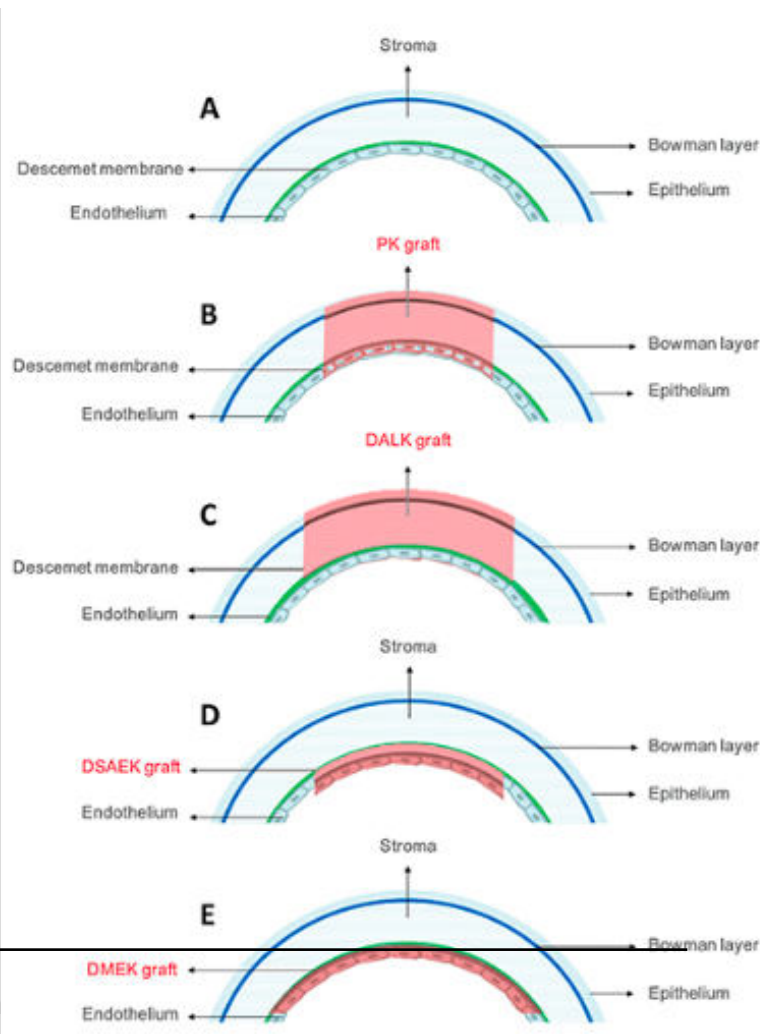
Keratoplasty



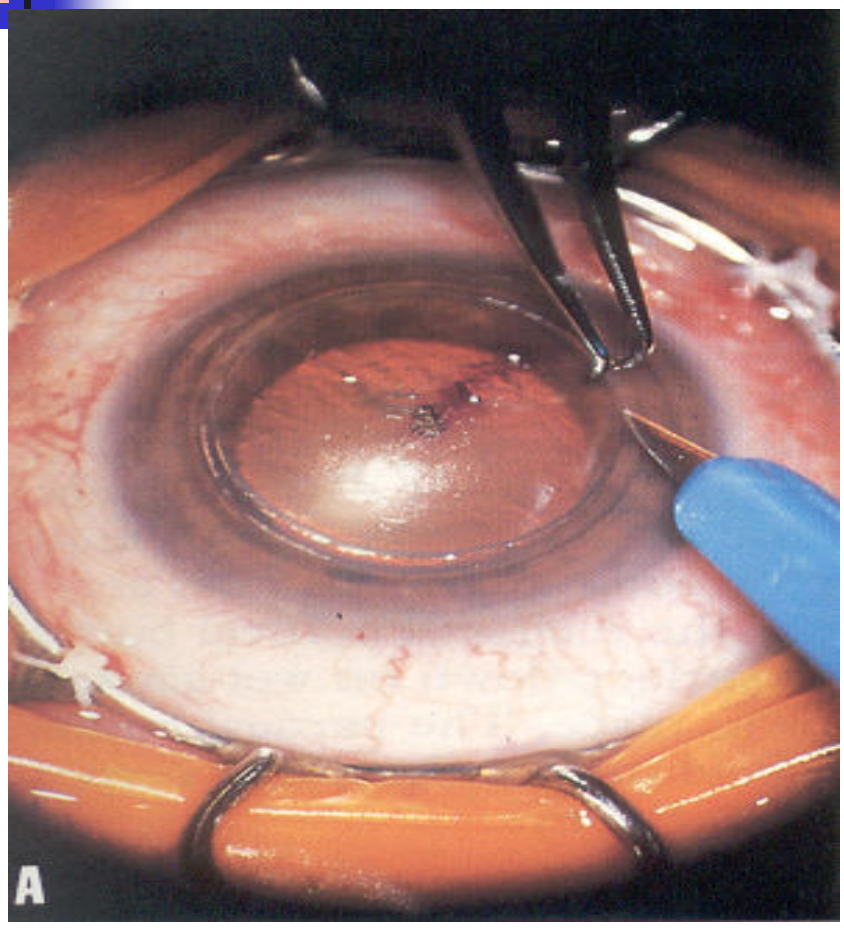


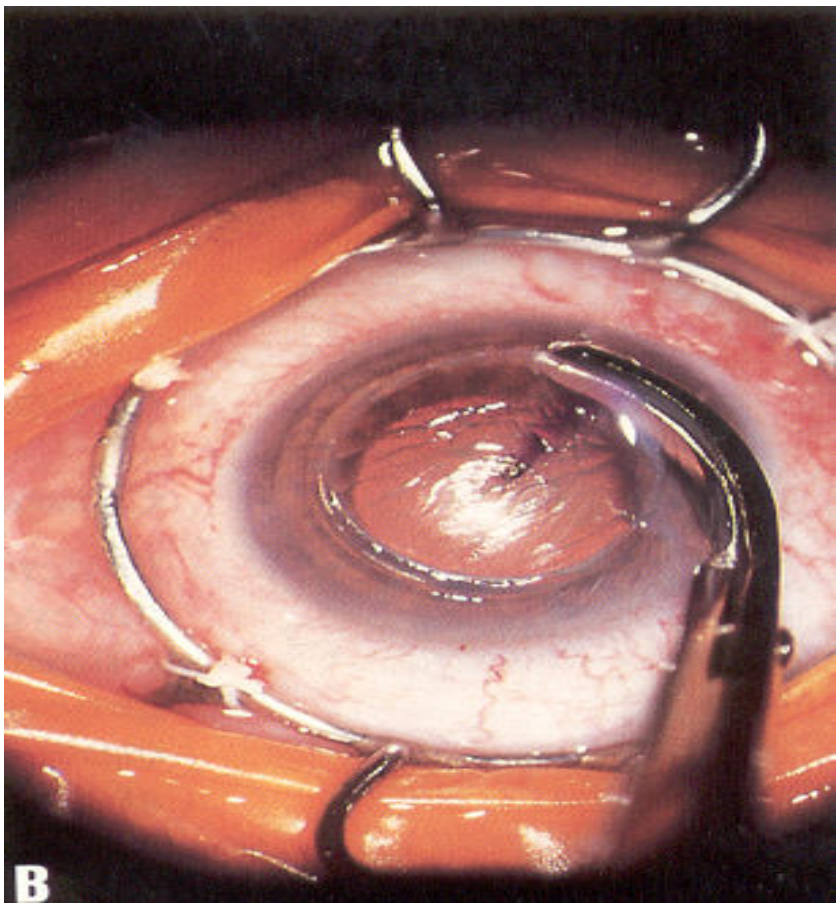
Types of keratoplasty

- Lamellar SALK
  DALK
  DSEK
  DMEK
- Penetrating
  optical
  therapeutic
  tectonic
- Rotational autografts

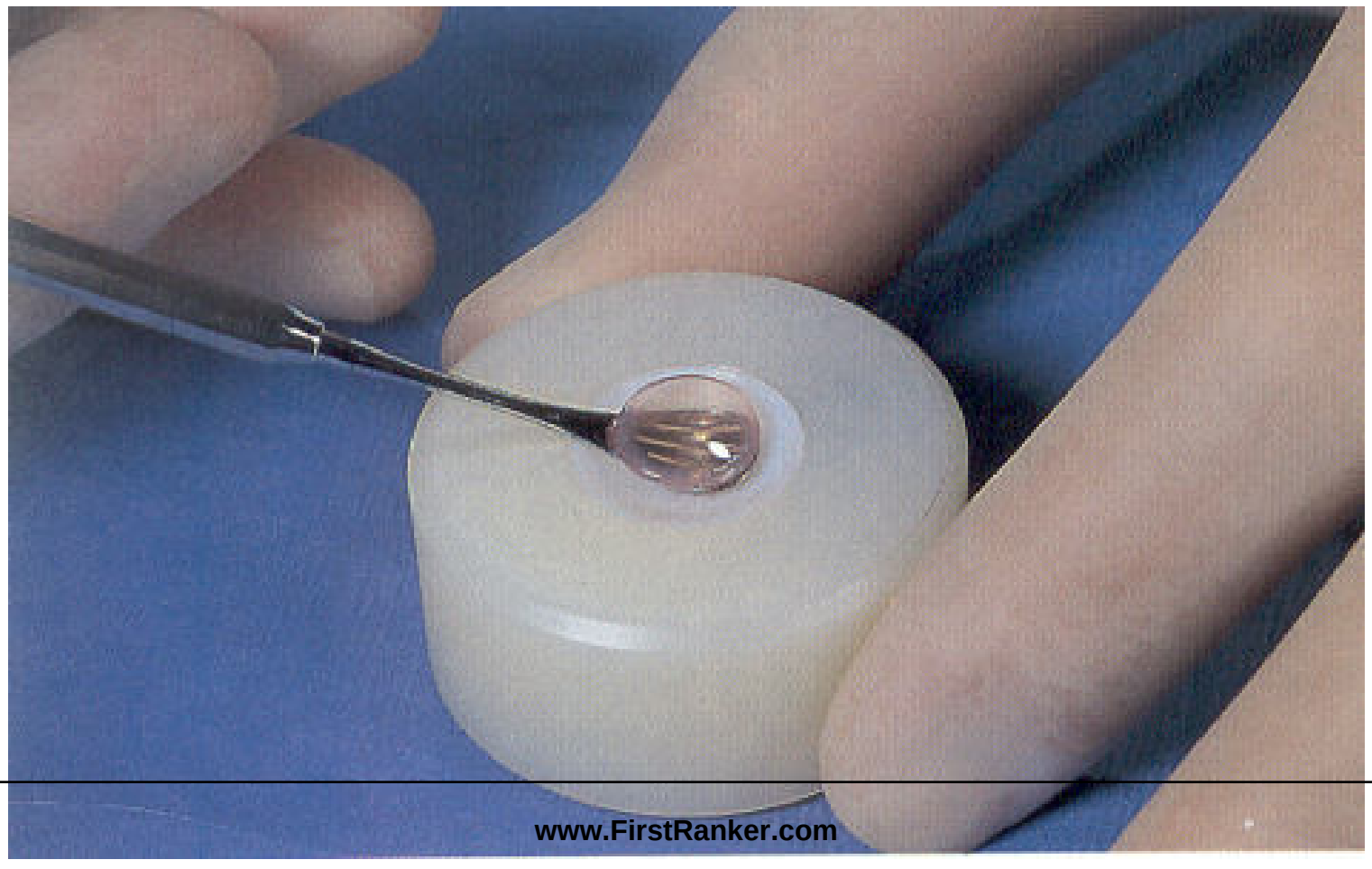


Removing diseased host corneal button

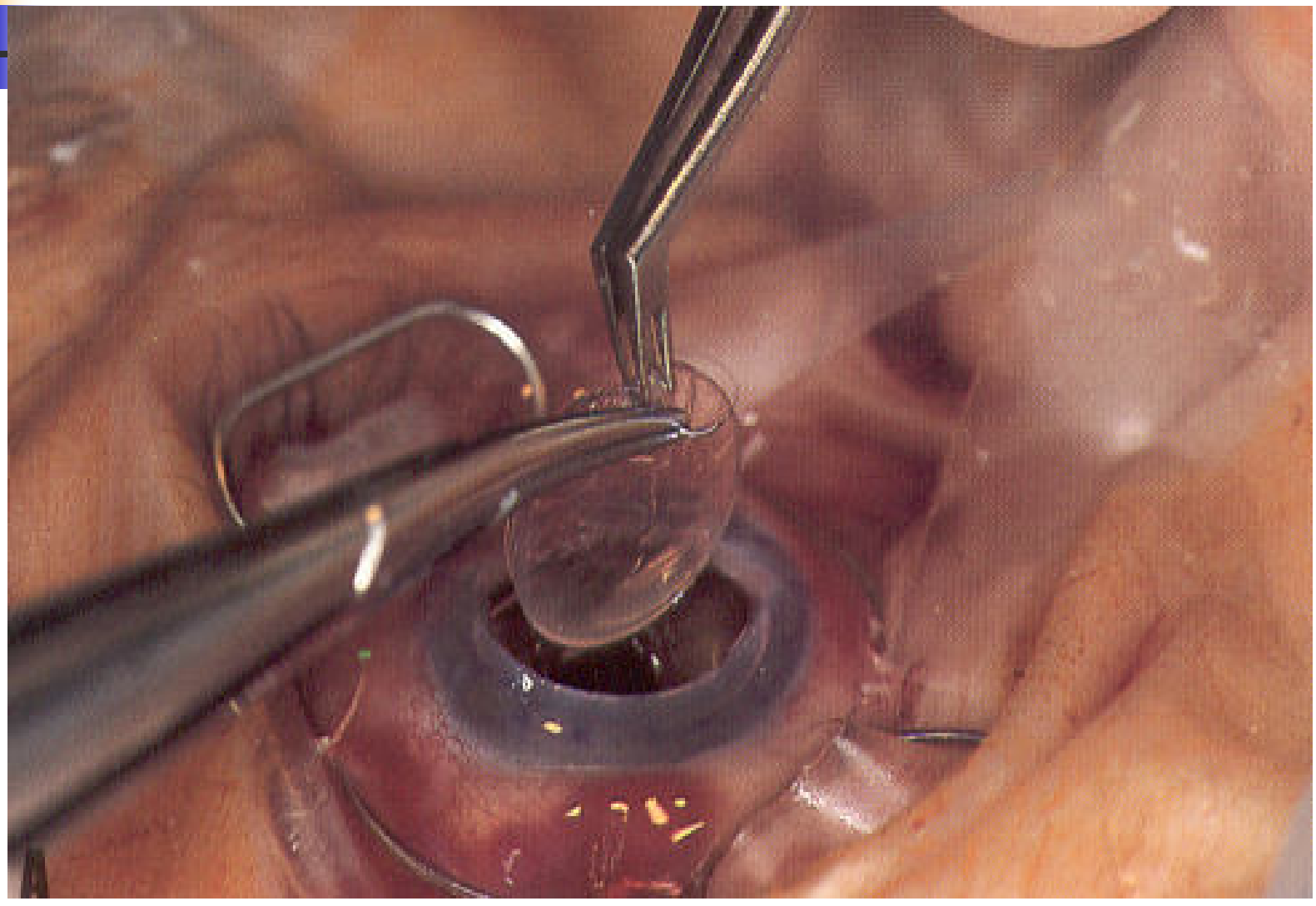




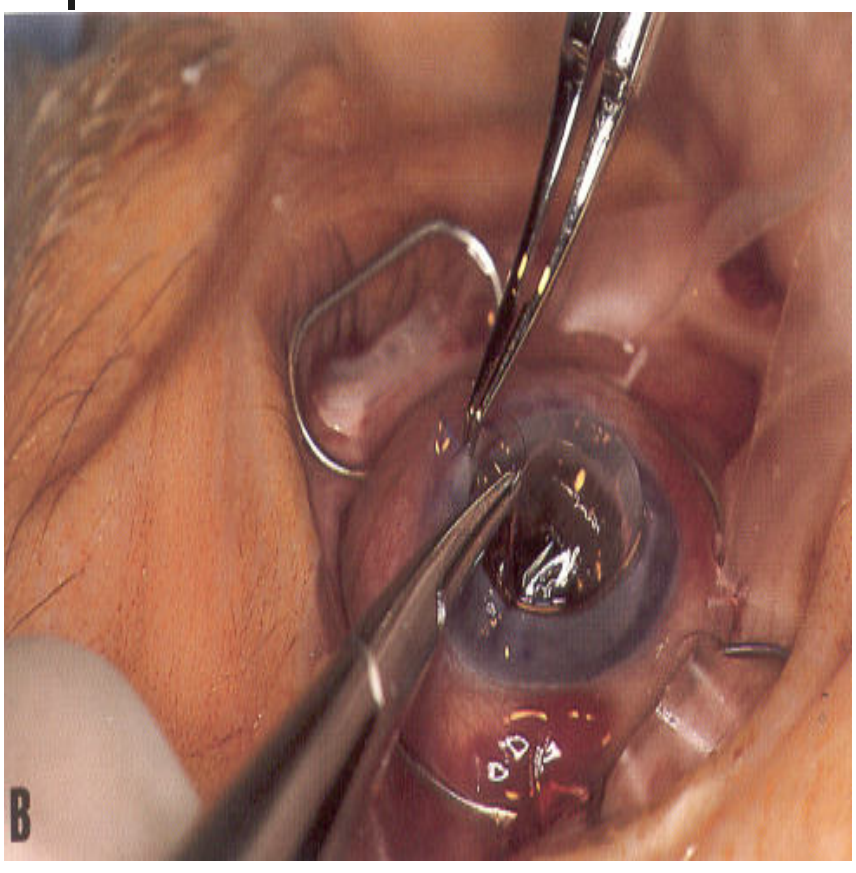
Donor corneal button

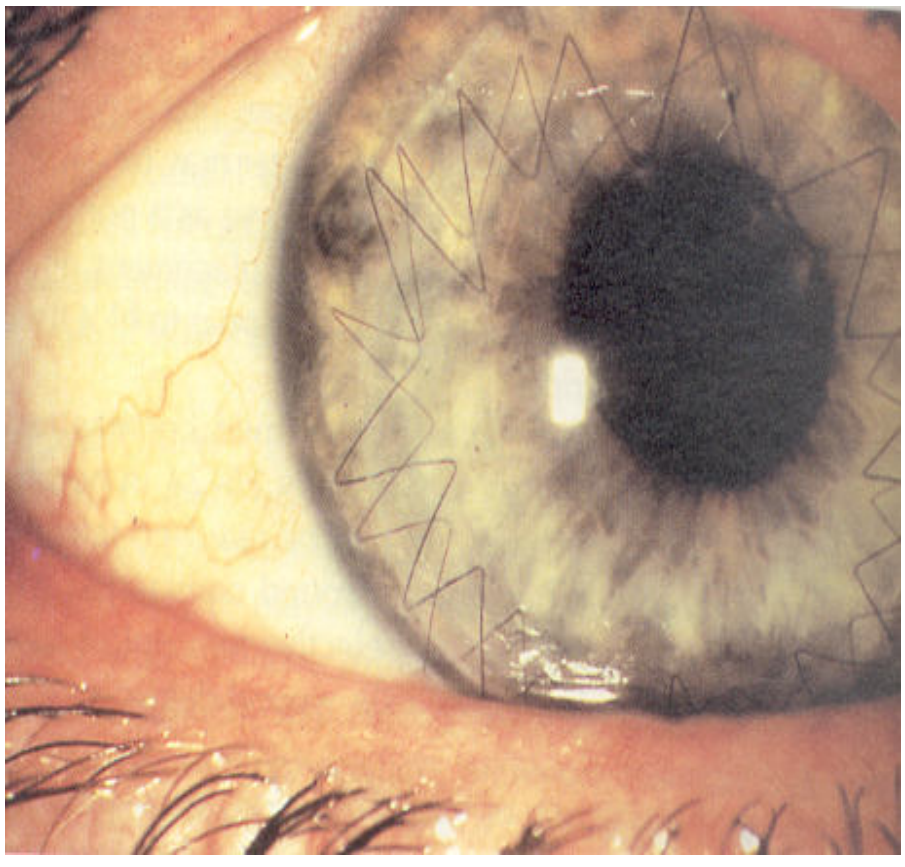


Placement of graft over the recepient eyeball



Corneal Graft in place



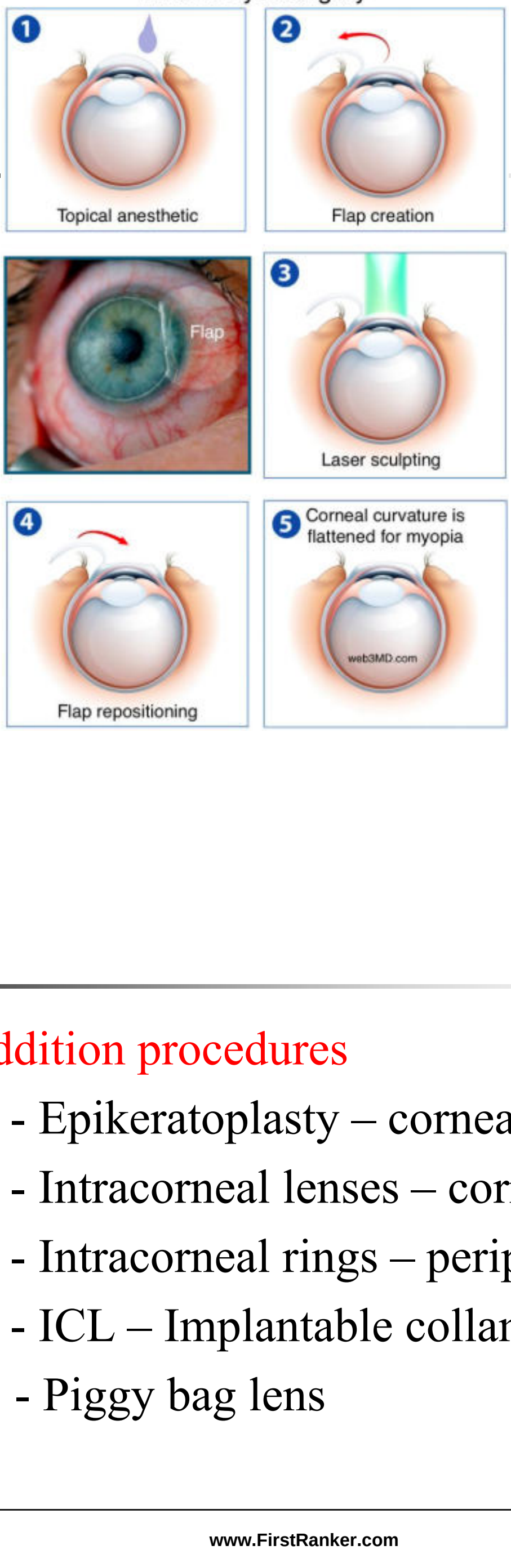


Refractive corneal surgeries

- Substraction procedures

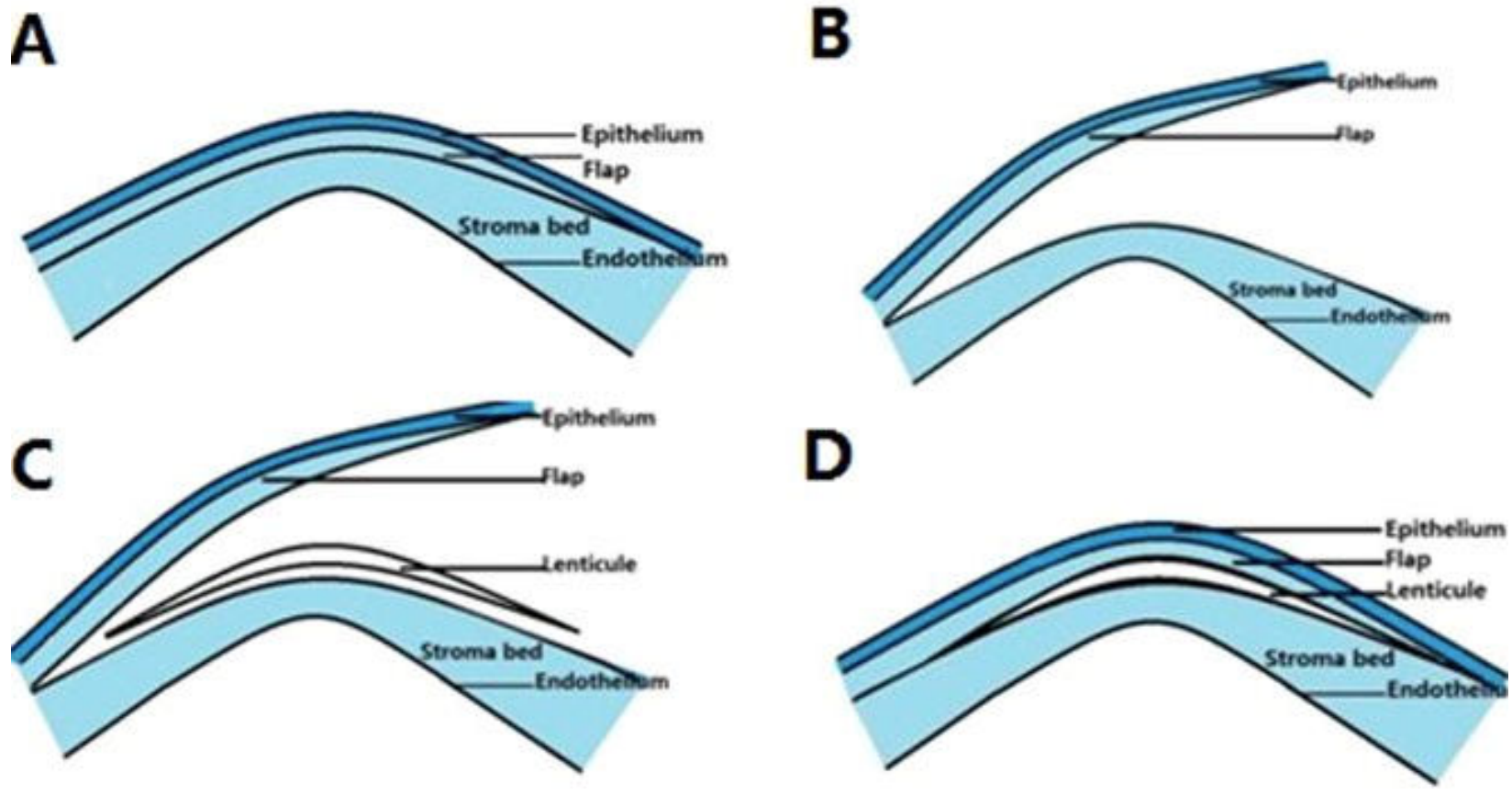
  - Photorefractive keratectomy (PRK): eximer laser is used in the center optical zone.

- Laser assisted in situ keratomileusis (LASIK):
  - 130-160micron flap is raised
  - mid stromal tissue is ablated by eximer laser
- Clear lens extraction

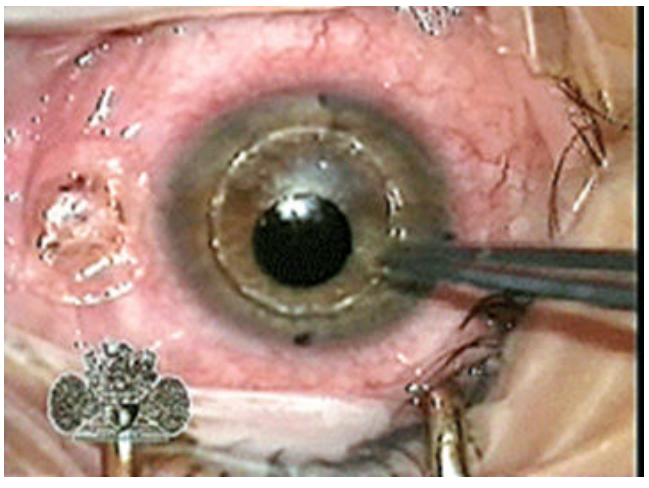


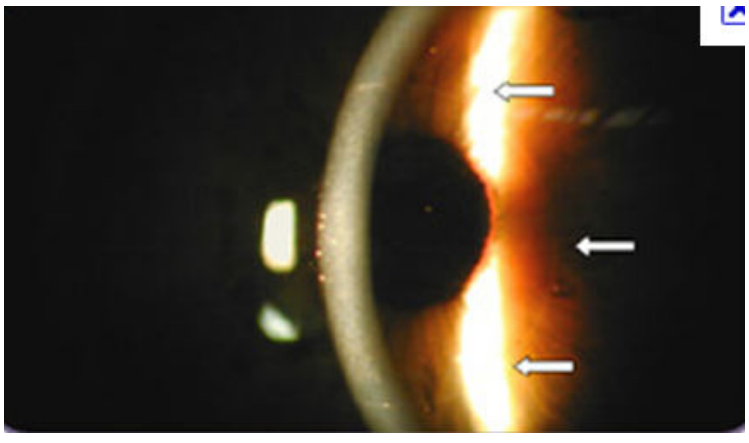
- Addition procedures
  - Epikeratoplasty – corneal surface
  - Intracorneal lenses – corneal stroma
  - Intracorneal rings – peripheral cornea
  - ICL – Implantable collamer lens
  - Piggy bag lens

Epikeratoplasty

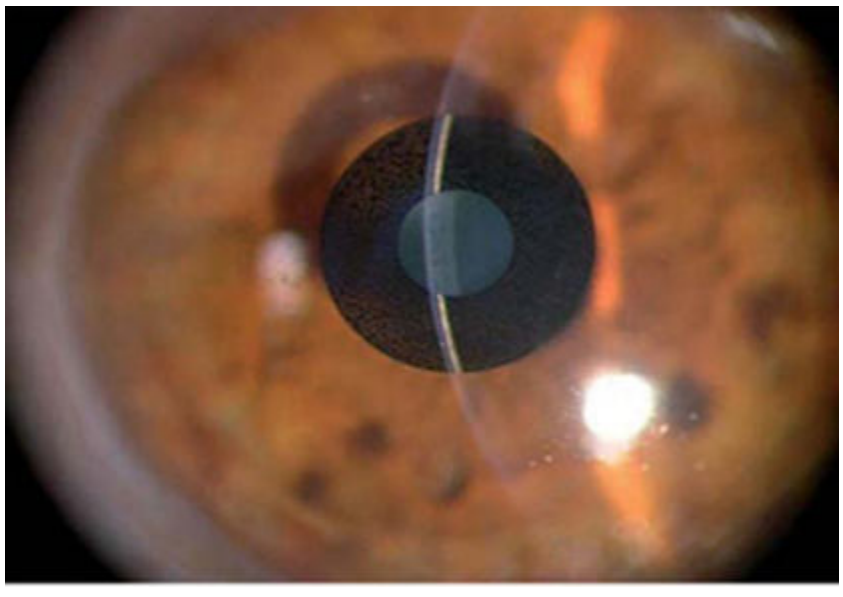


Intra corneal lenses

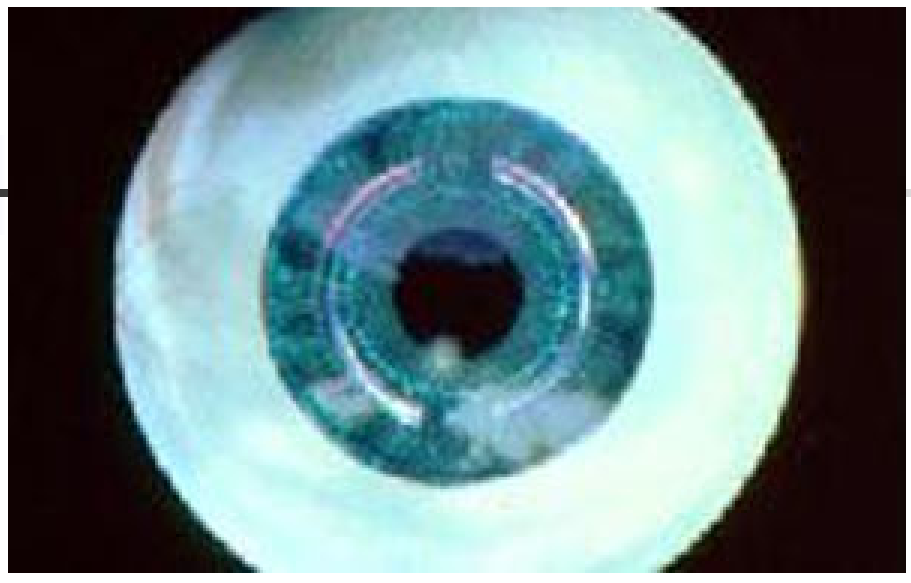




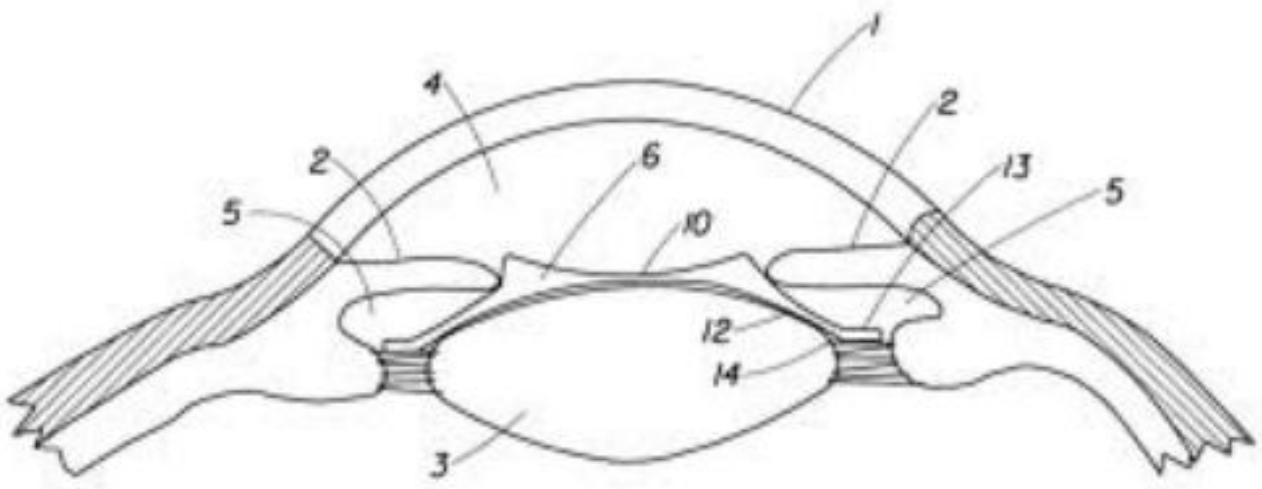
Intracorneal lens for presbyopia

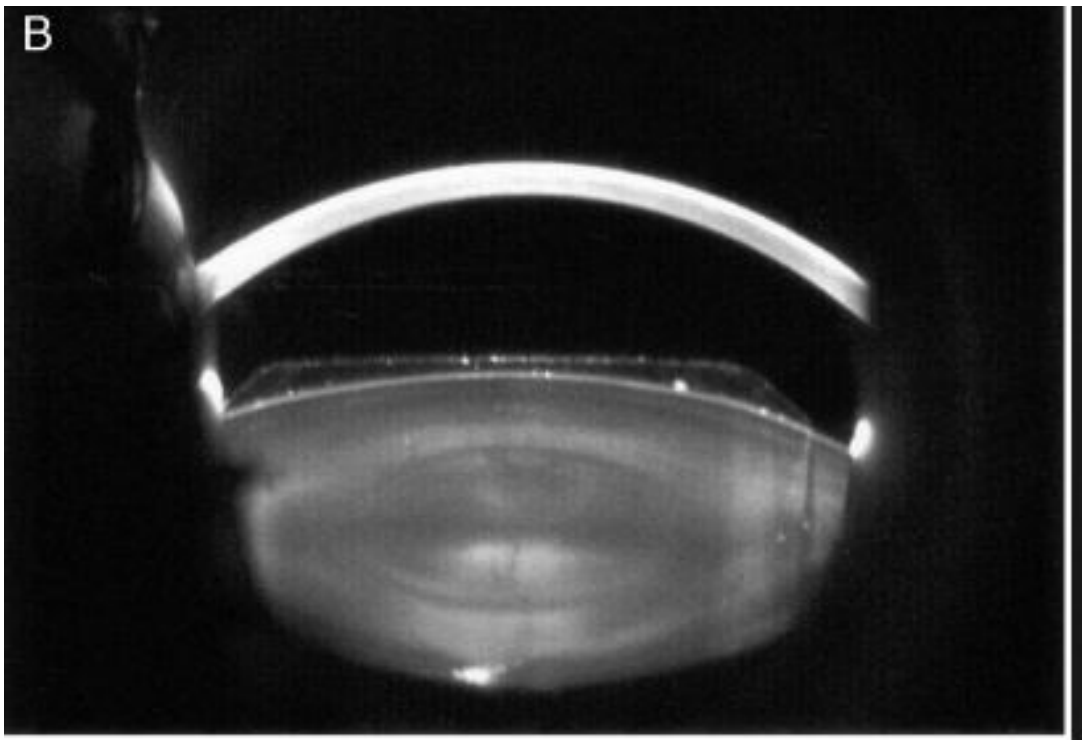


Intracorneal rings

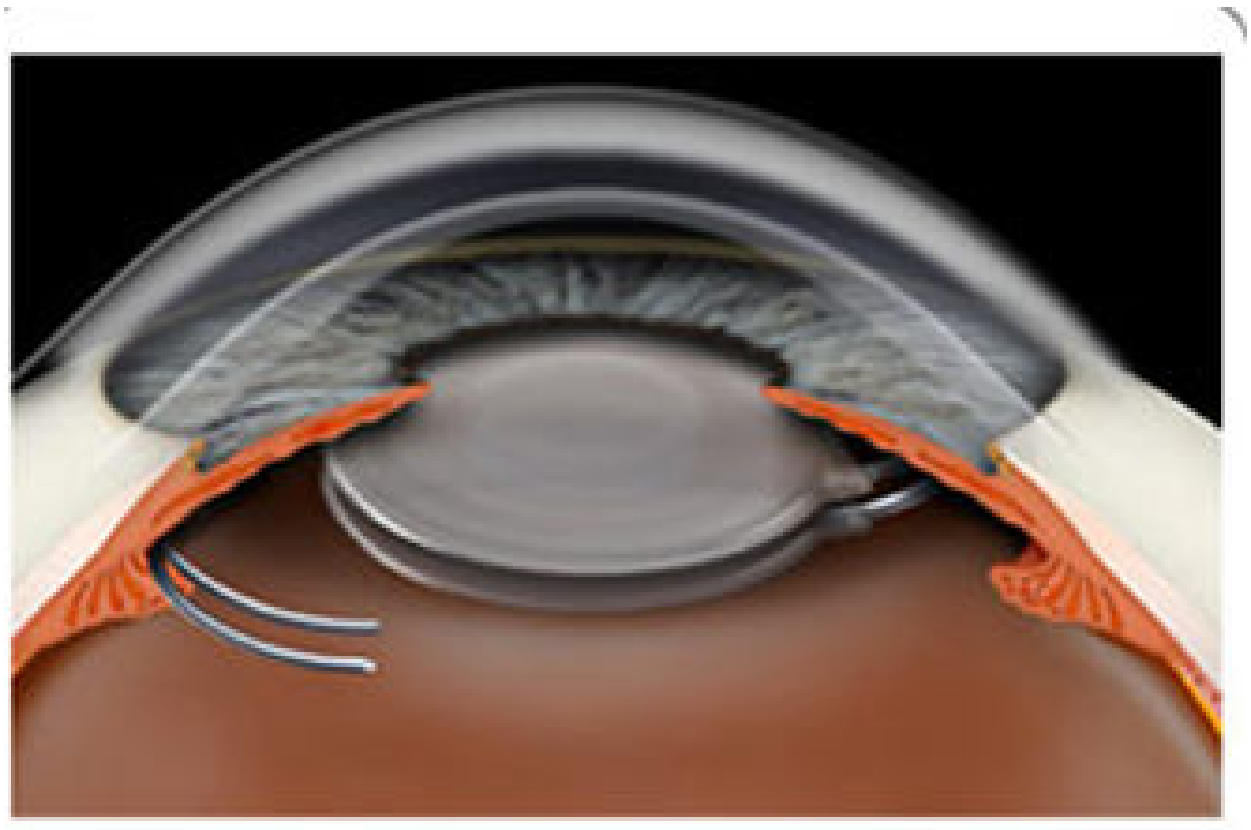


ICL





Piggy bag IOL

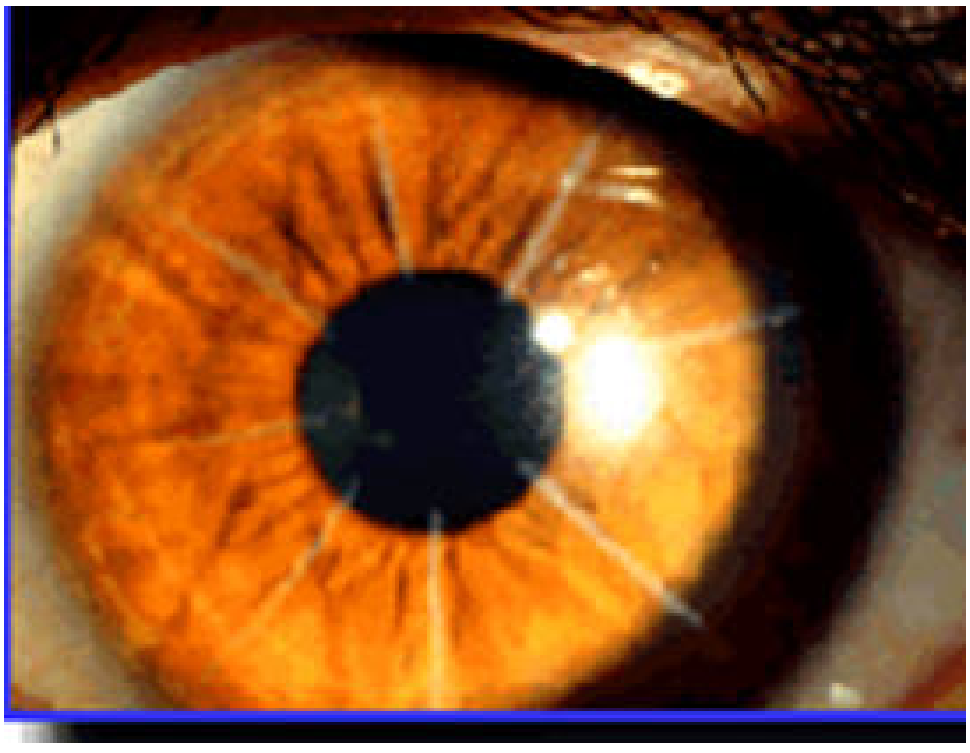


- Relaxation procedures

  - Radial Keratotomy - peripheral corneal stroma (6D)

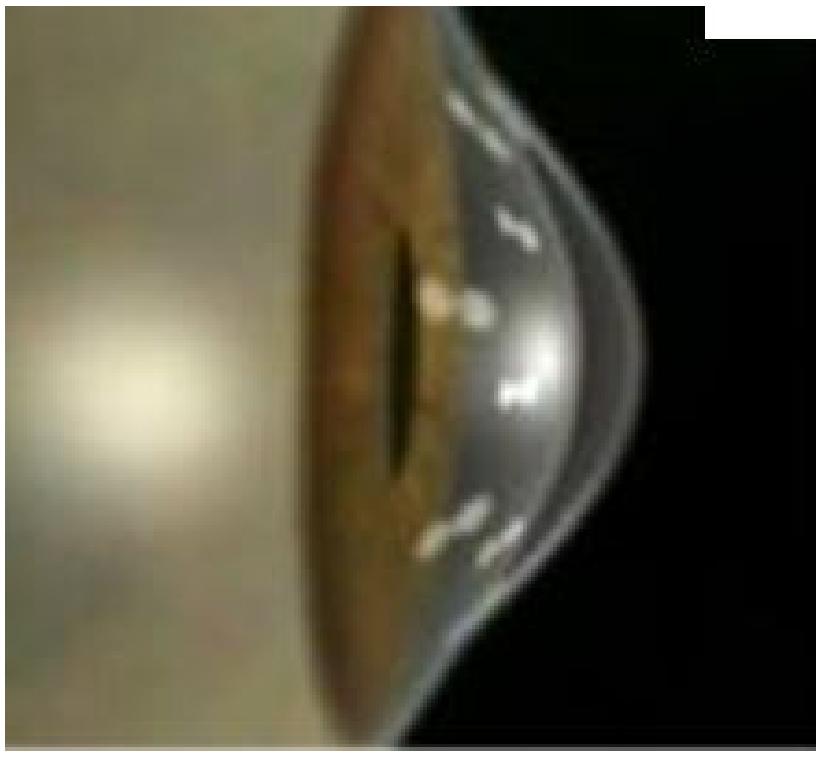
  - Astigmatic keratatotomy – peripheral corneal stroma

Radial keratotomy



- Coagulation – compression procedures
  - Thermokeratoplasty : peripheral cornea (4D of hyperopia)
  - Compression sutures : peripheral cornea

Thermokeratoplasty



Myopia

- PRK – 6D
- LASEK- Laser epithelial keratomileusis
- LASIK – Laser in situ keratomileusis(8-12 D)
- Clear lens extraction
- Phakic posterior chamber contact lenses- ICL(Implantable Collamer surgery) - -3 to -15D

Hypermetropia

- PRK
- LASEK
- LASIK – 4D
- Conductive keratoplasty(CK)
- Intracorneal inlays
- ICL

Astigmatism

- Limbal relaxing incisions
- PRK – 3D
- LASEK- 3D
- LASIK- 5D
- TORIC IOL
- Conductive keratoplasty- 3D

Presbyopia

- IOL- multifocal, bifocal or accomodating
- LASER induced monovision
- LASIK- corneal multifocality
- Intracorneal inlays