



# *Cataract Patient Care*

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Giovanni Caboto Club

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Department of Ophthalmology  
Hotel Dieu Grace Hospital



# Objectives

- ◆ Diagnose and differentiate between types of cataracts
- ◆ Know when to refer for assessment
- ◆ Basic knowledge of available intraocular lenses
- ◆ Basic understanding of technique
- ◆ Understand post-operative management and recognize major complications



# Outline

- ◆ Anatomy of the eye and lens
- ◆ Diagnosis of a Cataract
- ◆ History of Cataract Surgery
- ◆ Pre-operative Discussion
- ◆ Technique
- ◆ Intraocular Lenses
- ◆ Intraoperative Challenges
- ◆ Post-operative Management





# Anatomy of the eye

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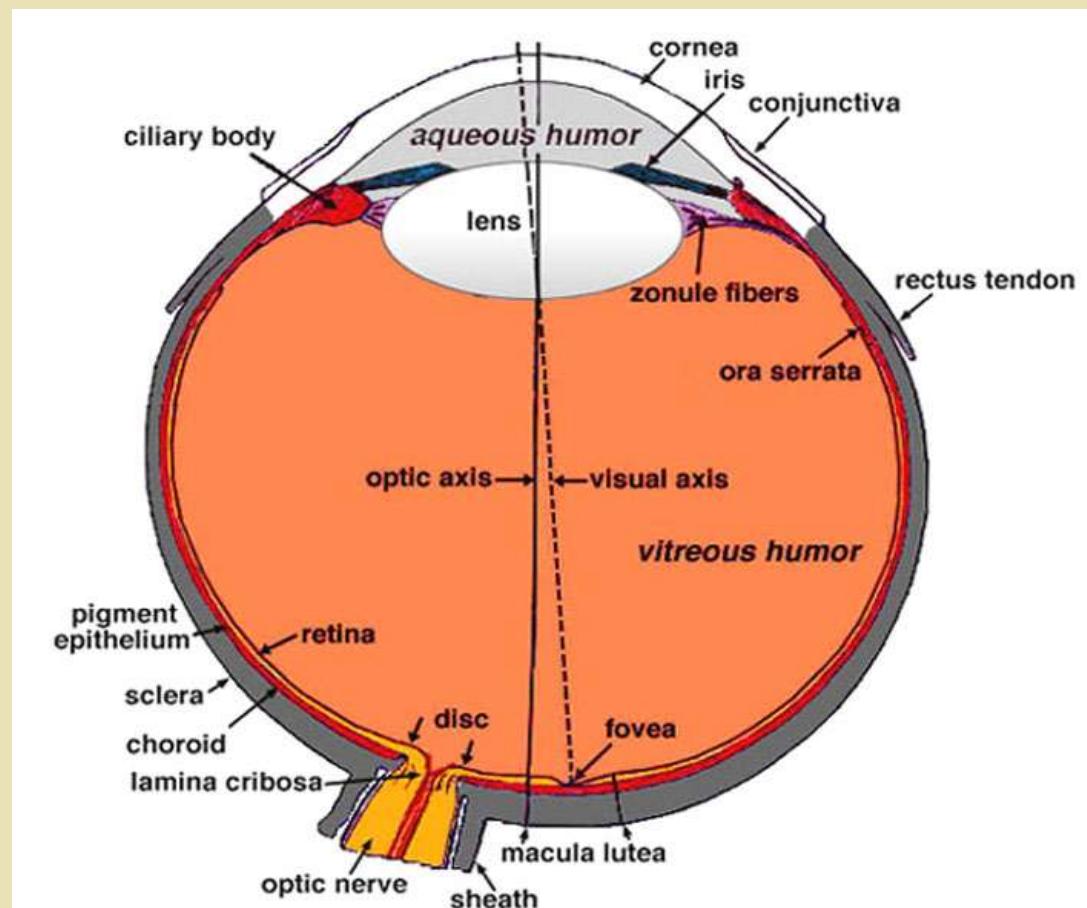
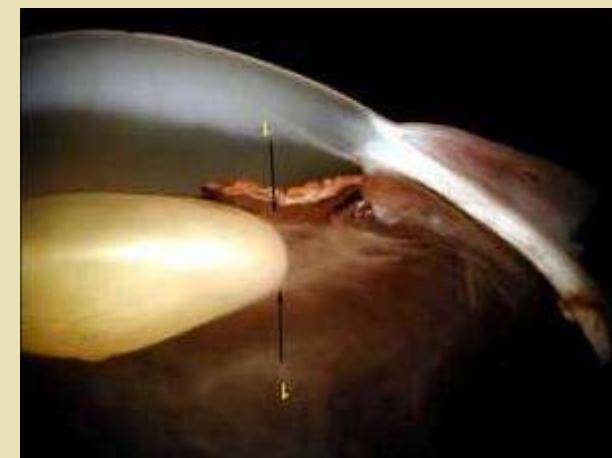
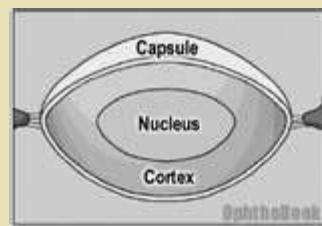


Fig. 2. Sagittal horizontal section of the adult human eye.

# Anatomy of Human Lens





# Diagnosis of a Cataract



# Diagnosis of a Cataract

## ◆ SYMPTOMS

- Blurred vision
- Gradually progressive
- Painless

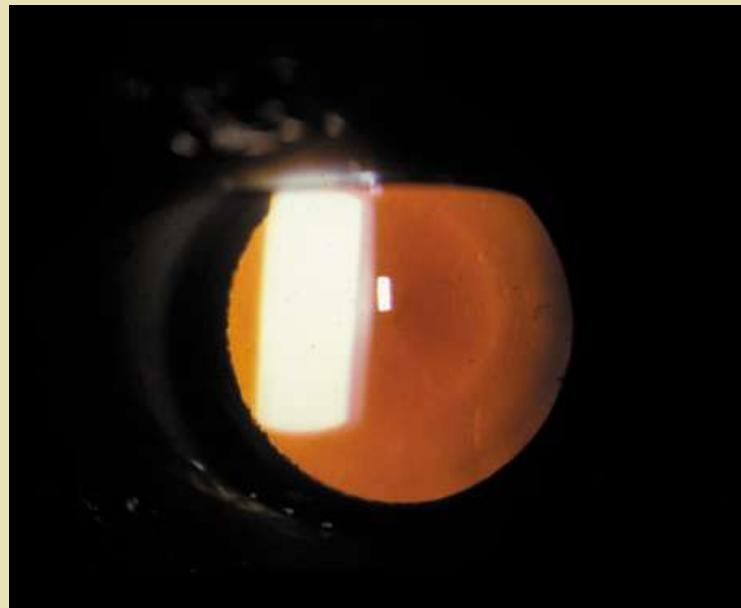
# Diagnosis of a Cataract

- ◆ Signs of Cortical Cataract
  - Spokes in red reflex

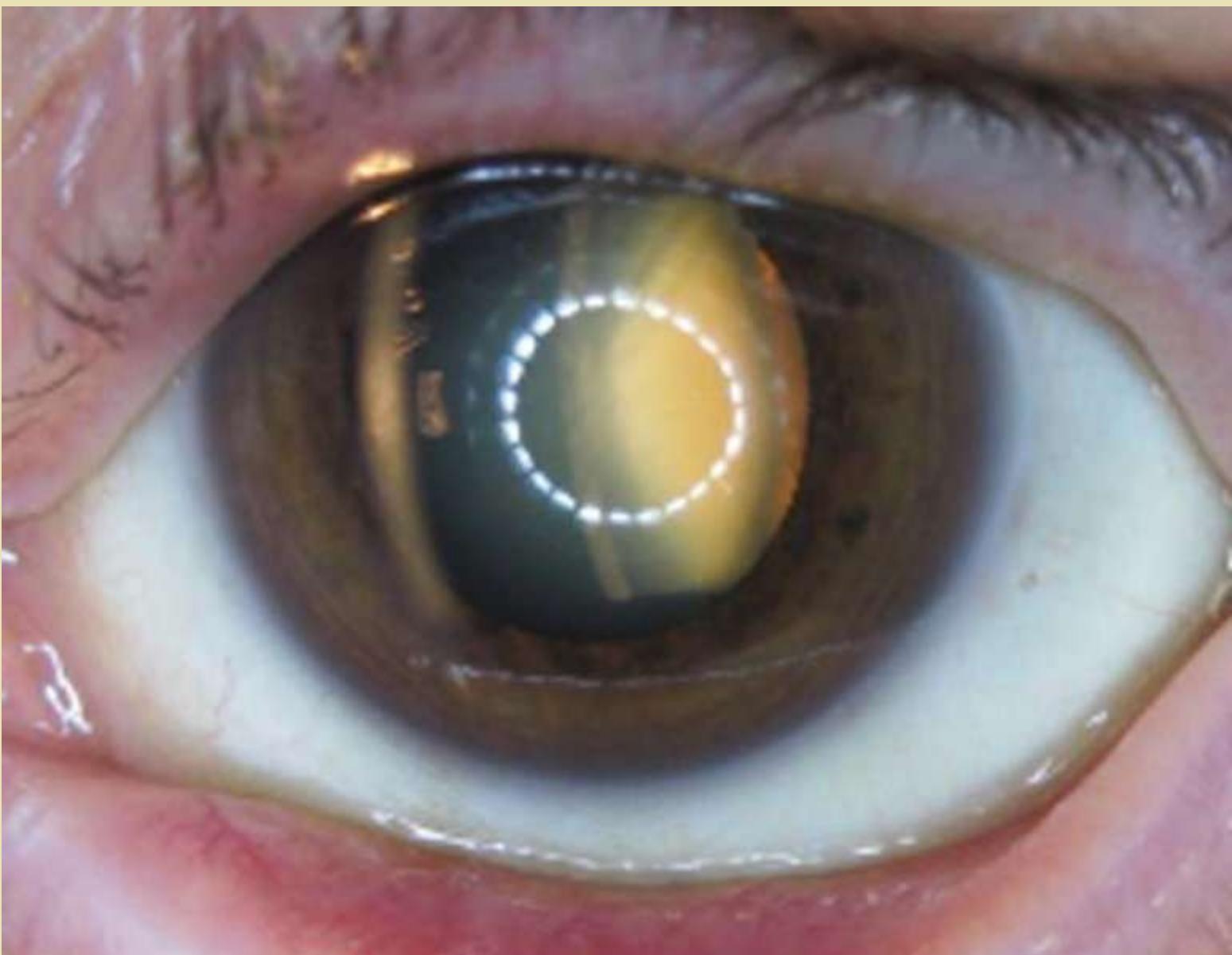


# Diagnosis of a Cataract

- ◆ Signs of nuclear cataract
  - Oil droplet red reflex



# Nuclear Cataract

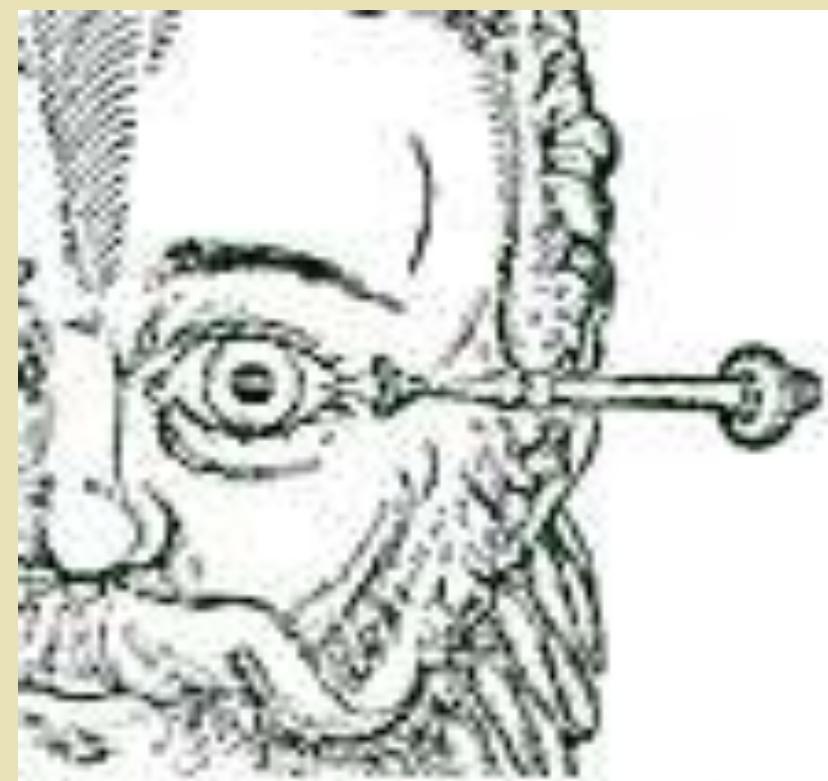
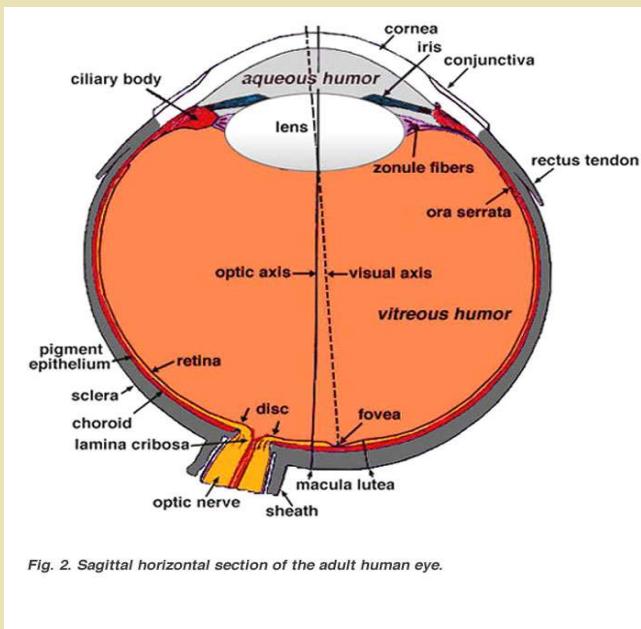




# History

# History

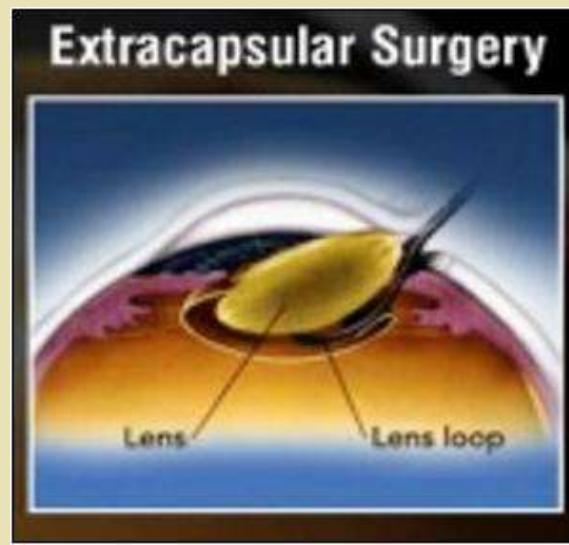
- ◆ India 600 BC



**A couching procedure  
from "Augendienst" by  
G. Bartisch (1535-1606)**

# History

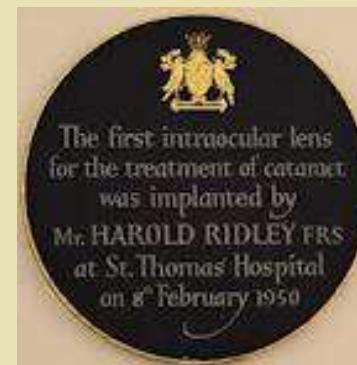
- ◆ Extracapsular cataract extraction
- ◆ Jacques Daviel
- ◆ Paris 1748



**Man restrained for eye surgery**  
from "Augendienst"  
by G. Bartisch (1535-1606)

# History

- ◆ 1940's
- ◆ Sir Harold Ridley
- ◆ Intraocular lenses



# History

- ◆ Phacoemulsification
- ◆ Charles Kelman
- ◆ New York 1960's



# History

- ◆ Viscoelastics
- ◆ Foldable IOLs





# Pre-operative Discussion

# Pre-operative Discussion

- ◆ Age
- ◆ Health (i.e. able to lie on back)
- ◆ Medication (Alpha-blockers)
- ◆ Visual needs
- ◆ Refractive error (myopes will need reading glasses)





# Pre-operative Discussion

- ◆ Informed consent
  - Risks
  - Benefits
  - Alternatives



# Pre-operative Discussion

## ◆ IOL selection

1. Monofocal (foldable vs. rigid)
  - Toric
  - Aspheric
  - Filtering
2. Multifocal
  - Toric
  - Aspheric
  - Filtering
3. Accommodative

# Pre-operative Discussion

- ◆ Pre-treatment with topical medication
  - Antibiotic
  - NSAID





# Technique





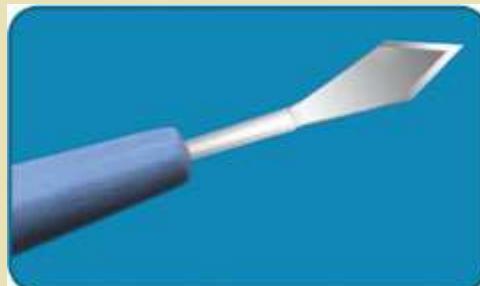
# Video

CATARACT SURGERY PART 1

# Technique

## ◆ Instrumentation

- Blades (keratomes, paracentesis etc.)
- Visco devices
- Second instruments (choppers, spatula etc.)

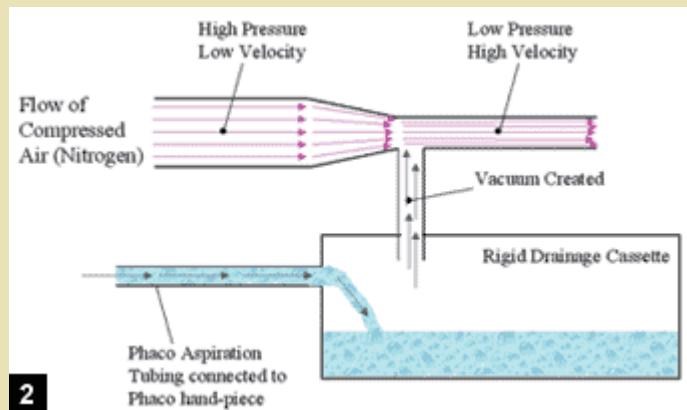


# Technique



# Technique

- ◆ Instrumentation
  - Phacoemulsification machines
    - Venturi-type pump





# Technique

## ◆ Nuclear Removal

- Phaco chop
- Divide and conquer
- Chip and flip



B-465

Procedure Room

# Video

CATARACT SURGERY PART 2-Nuclear removal



# Intraocular Lenses



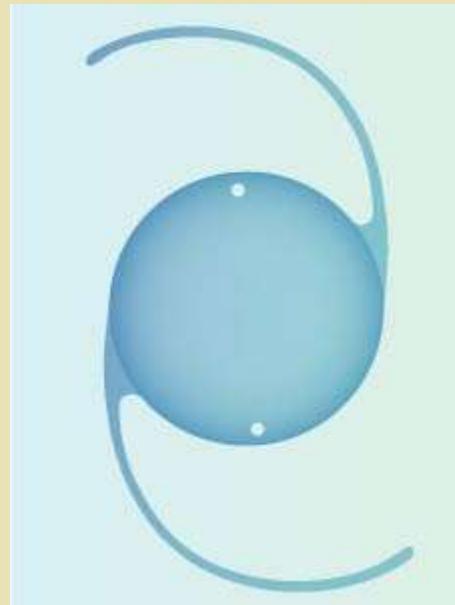
# Intraocular Lenses

1. Monofocal (foldable vs. rigid)
  - Toric
  - Aspheric
  - Filtering
2. Multifocal
  - Toric
  - Aspheric
  - Filtering
3. Accommodative



# IOL selection

- ◆ Rigid
  - Polymethylmethacrylate (PMMA)



# IOL selection

- ◆ Foldable
  - Silicone
  - Acrylic





# Toric Lenses



# Toric Lenses

- ◆ Designed to correct corneal astigmatism
- ◆ Available in cylinder powers from 1.5 to 6.00 diopters

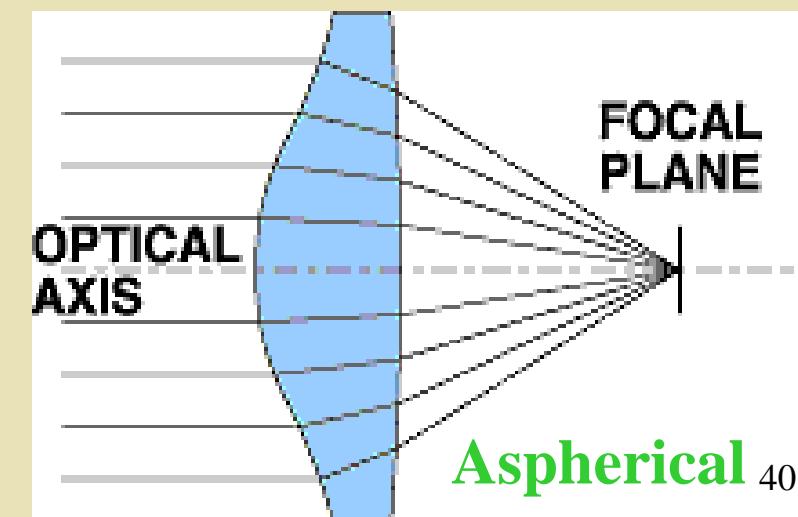
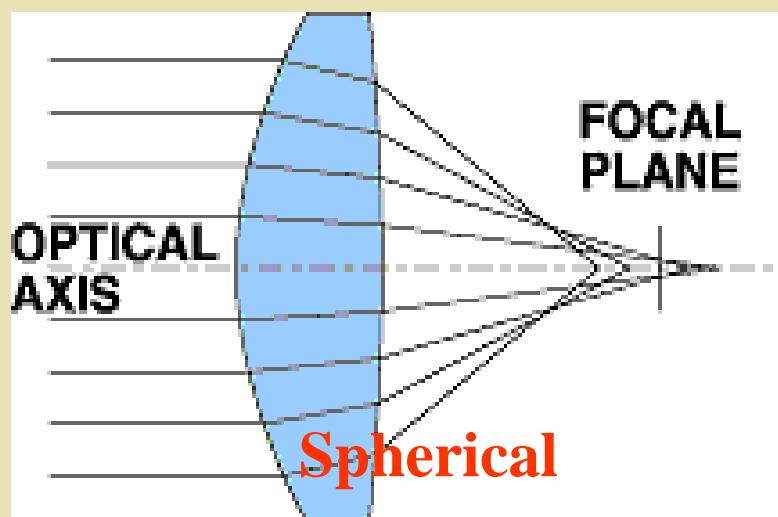




# Aspheric Lenses

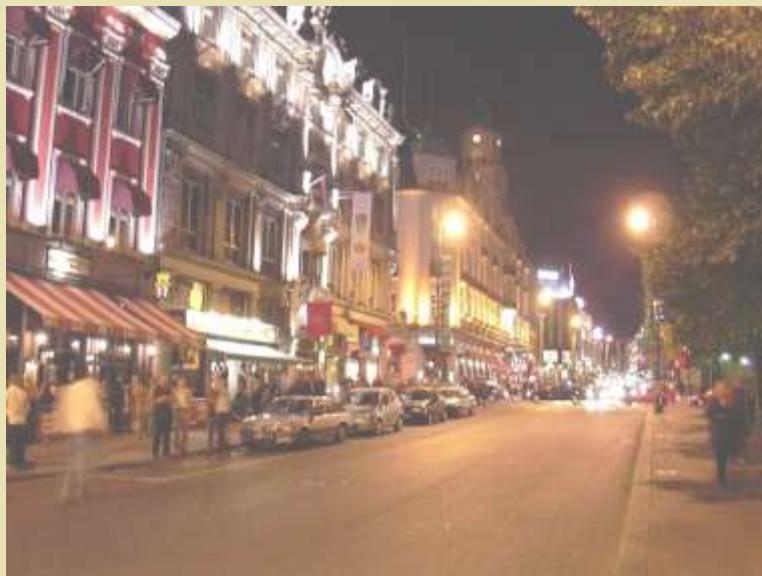
# Basis for Aspheric IOLs

- ◆ Minimize positive spherical aberration inherent in conventional IOLs
- ◆ Improve image quality over that of conventional IOLs



# Real world IOL results

- ◆ 25% reduction in contrast sensitivity with a spherical IOL vs. aspheric IOL



Spheric IOL



Aspheric IOL



# Reduced Contrast Sensitivity

- ◆ Leads to difficulties in:
  - Driving at night, or in rain or fog
  - Judging distances
  - Walking down steps
  - Recognizing faces
  - Reading instructions on a medicine container
  - Navigating unfamiliar environments



# Filtering Lenses



# Filtering Lenses

- ◆ Cataract extraction removes eye's natural blue light filter
- ◆ Retina exposed to higher levels of blue light than before
- ◆ Filtering lenses block much of the blue/violet wavelength similar to the normal non-cataractous human lens





# Accommodative Lenses



# Accommodative Lenses

- ◆ Accommodative IOLs have hinges to mimic the accommodative process of the natural lens
- ◆ Reduce dependence on reading glasses

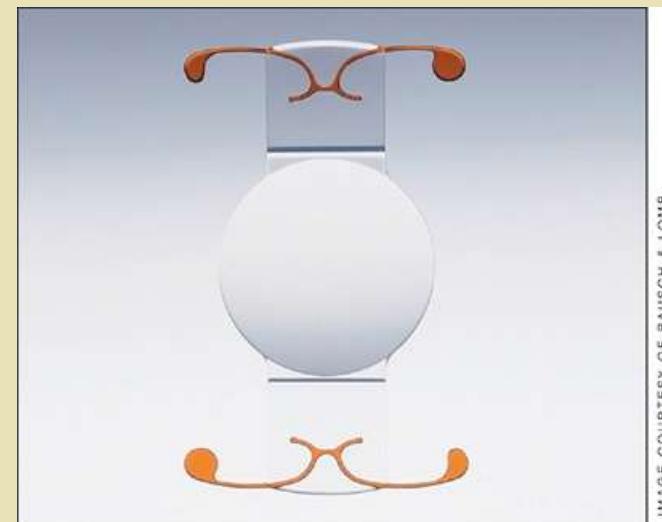


IMAGE COURTESY OF BAUSCH & LOMB

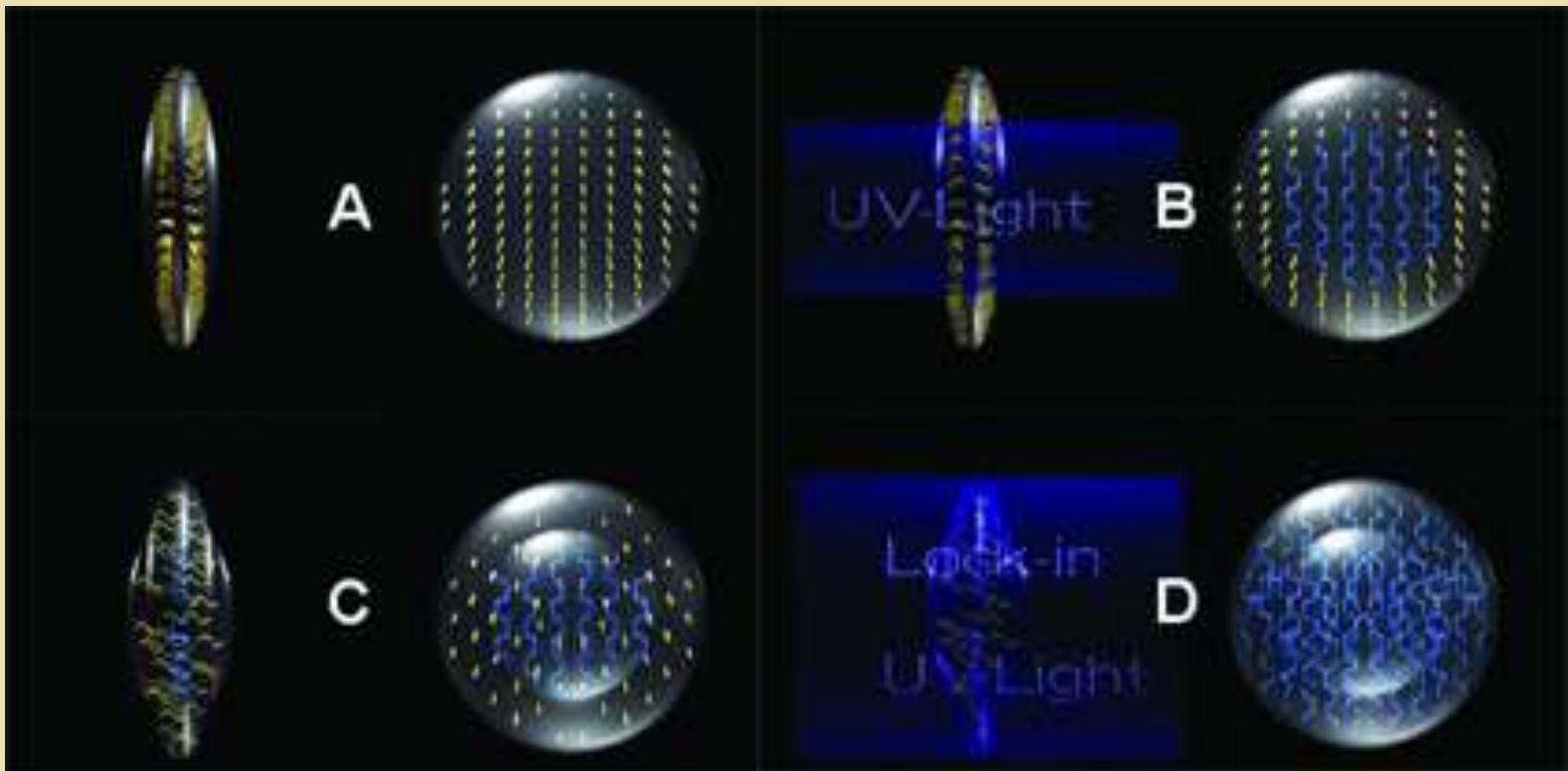
# Accommodative Lenses

## DUAL OPTIC IOL

- ◆ Dual optic IOL will likely provide enhanced amplitude of accommodation
- ◆ Will require highly precise pre-operative biometry calculations



# Light Adjustable Lens





# Video

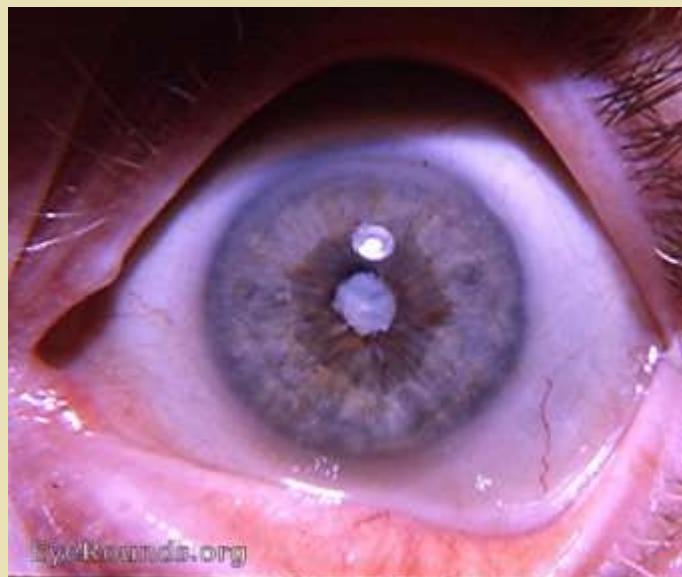
## CATARACT SURGERY PART 3- Intraocular lens implantation



# Intraoperative Challenges

# Intraoperative challenges

- Small pupil
- Dense cataract



# Intraoperative Challenges

- ◆ Management of small pupil  
**MECHANICAL/SURGICAL**
  1. Two-instrument Iris Stretch (Kuglen or Y-Hooks)
  2. Iris Stretch: Beehler Device(2 or 3 pronged instrument)

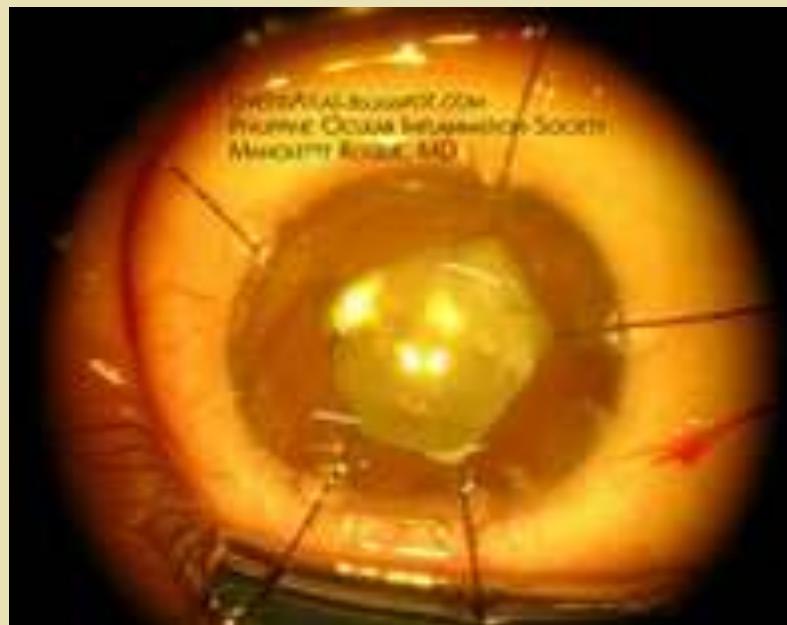


# Intraoperative Challenges

- ◆ Management of small pupil

## Iris Retractors/Hooks

- Iris retractors (silicone or titanium) use silicone cinches to adjust the iris position



# Intraoperative Challenges

- ◆ Management of dense cataract
  - Capsular dyes (vision blue)





# Post-operative management



# Post-operative management

- ◆ Follow-up
  - One day
  - One week
  - One month

# Post-operative management

## ◆ Topical medication

- Antibiotic
- Nsaid
- steroid





# Post-operative complications

# Post-operative complications

- ◆ Iris prolapse
  - Iris repositioning
  - Pupil constricting injection

FIGURE 1 COURTESY UDAY DEVGAN, M.D., F.A.C.S.



# Post-operative complications

- ◆ Post-operative inflammation
  - Steroid
  - Manage IOP



# Post-operative complications

## ◆ Endophthalmitis

- Endophthalmitis vitrectomy study
  - Vitreous tap and intravitreal antibiotic injection
  - Vitrectomy and intravitreal antibiotic injection







# References

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2. Aarnisalo EA. Effects of yellow filter glasses on the results of photopic and scotopic photometry. Am J Ophthalmol 1988;105:408-11.
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# THANK YOU