

# Dr. Yousaf Jamal Mahsood

MBBS, CHPE, CMEJ, MHR, FICO (UK),  
MRCSEd (UK), FRCS (Glasg), FCPS

Fellowship in Glaucoma (Al-Shifa Trust, Pak)

Fellowship in Glaucoma (Univ. of Toronto, Canada)

Advance Fellowship in Glaucoma (BPOS, UK)

**Assistant Professor Glaucoma**

Department of Ophthalmology  
Khyber Girls Medical College  
Peshawar

# Complications of Cataract Surgery

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# Learning objectives

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- Discuss the etiology, clinical features, investigation, and management of Endophthalmitis.
- Discuss the etiology, clinical features, investigation, and management of Panophthalmitis.

# Introduction

- Frequently asked question
- Needs to be remembered on finger-tips
- No surgery is without complications
- Can be answered in many ways

# Usual classification



**Complications  
of anesthesia**



**Intraoperative**



**Early  
postoperative**



**Late  
postoperative**



## Complications of anesthesia

# General Anesthesia

- Respiratory complications
  - Laryngoscope & intubation
  - Respiratory obstruction & spasm (isoflurane)
  - Hypoxemia (N<sub>2</sub>O)
  - Hypercapnia / Hypocapnia
  - Hypoventilation
  - Aspiration pneumonia
  - Chest infections



## Cardiovascular complications

- Hypertension
- Hypotension
- Cardiac arrhythmias
- Death (halothane)



## Neurological complications

- Headache
- Delayed recovery
- Perioperative neuropathy
- Hallucinations & unpleasant dreams (ketamine)



## Postoperative nausea & vomiting (propofol, etomidate)

## Temperature changes

- Hypothermia
- Hyperthermia (atropine, halothane)

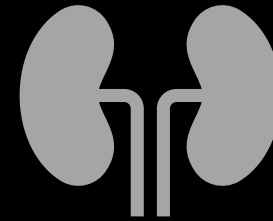
## Allergic drug reactions

- Itching
- Anaphylaxis
  - Hypotension, arrhythmia, tachycardia
  - Bronchospasm, cough, dyspnea



## Complications of positioning

- Air embolism
- Nerve palsies (Brachial plexus, Radial nerve, Ulnar nerve)
- Skin necrosis



## Miscellaneous

- Renal dysfunction (enflurane)
- Muscle pain (succinylcholine)

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# Regional Anesthesia



# Peribulbar / Retrobulbar Anesthesia

- Lids trauma (ecchymosis)
- Ptosis
- s/conj hemorrhage
- Muscles damage
- Globe penetration & its related complications
- Retrobulbar hemorrhage
- Optic nerve damage
- Putscher-type retinopathy \*
- Brainstem anesthesia

\* Lemagne, J.S., Michiels, X., Van Causenbroeck et al (1990). Putscher-type retinopathy after retrobulbar anesthesia. *Ophthalmology*, 97,859-61.

# Retrobulbar Hemorrhage

Common complication

Causes proptosis & raised IOP

Incidence of severe RBH = 0-3%

A reported case of CRAO \*

Management

- Continue with surgery if minimal
- Lateral canthotomy for severe cases



EyeBounde.org



# Brainstem Anesthesia

- Life-threatening
- Mechanism
  - Entry of agent in ON sheath & then subarachnoid space
- Onset = 2 min, duration = 10-20 min
- Manifestations
  - Confusion, cranial nerve palsies
  - Convulsions, hemiplegia, quadriplegia
  - CVS instability, respiratory arrest



# S/Conj. & S/Tenon Anesthesia

- Common

- Pain on injection (15-33%)
- Chemosis (6-100%)
- s/conj hemorrhage (7-100%)

- Rare

- Globe perforation
- Retrobulbar hemorrhage
- Hyphema
- Muscle trauma
- Diplopia
- Spread to CNS
- Retinal dysfunction
- Orbital cellulitis
- Chronic dilated pupils

Indian j ophthalmol 2006;54:77-84



# Intraoperative Complications

- Wound related
  - Iris prolapse
- Corneal
  - Descemet's membrane detachment
  - Corneal burns
- Anterior chamber
  - Iridodialysis
  - flattening of anterior chamber
  - Hyphema
  - Intraoperative floppy iris syndrome
- Lens related
  - Dropped nucleus
  - Retained lens mater
  - Posterior loss of lens fragments
- IOL related
  - IOL dislocation
- Posterior segment
  - Posterior capsule rupture
  - Cyclodialysis
  - Suprachoroidal effusion & hemorrhage

# Early Postoperative Complications

- Wound related
  - Wound leak
  - Iris prolapse
  - induced astigmatism
- Corneal
  - Corneal edema
  - Striate keratopathy
- Anterior chamber
  - AC reaction
  - Hyphema
  - TASS
  - Vitreous in AC
- IOP related
  - Raised
  - Low
- IOL related
  - Decentered
  - Dislocated
  - Tilted
  - Pupillary capture
  - Capsular block syndrome
- Acute Endophthalmitis

# Late Postoperative Complications

- Wound related
  - Astigmatism
- Corneal
  - Bullous keratopathy
  - Corneal decompensation
  - Corneal melting
  - Brown-McLean syndrome
  - Epithelial down growth
- IOP related
  - Glaucoma
- Anterior chamber
  - Chronic uveitis
  - UGH syndrome
  - Iris atrophy / cysts
- IOL related
  - Malposition, glare
  - PCO & Phimosi
- Posterior segment
  - Retinal light toxicity
  - Macular infarction
  - CME
  - R/D
- Chronic Endophthalmitis

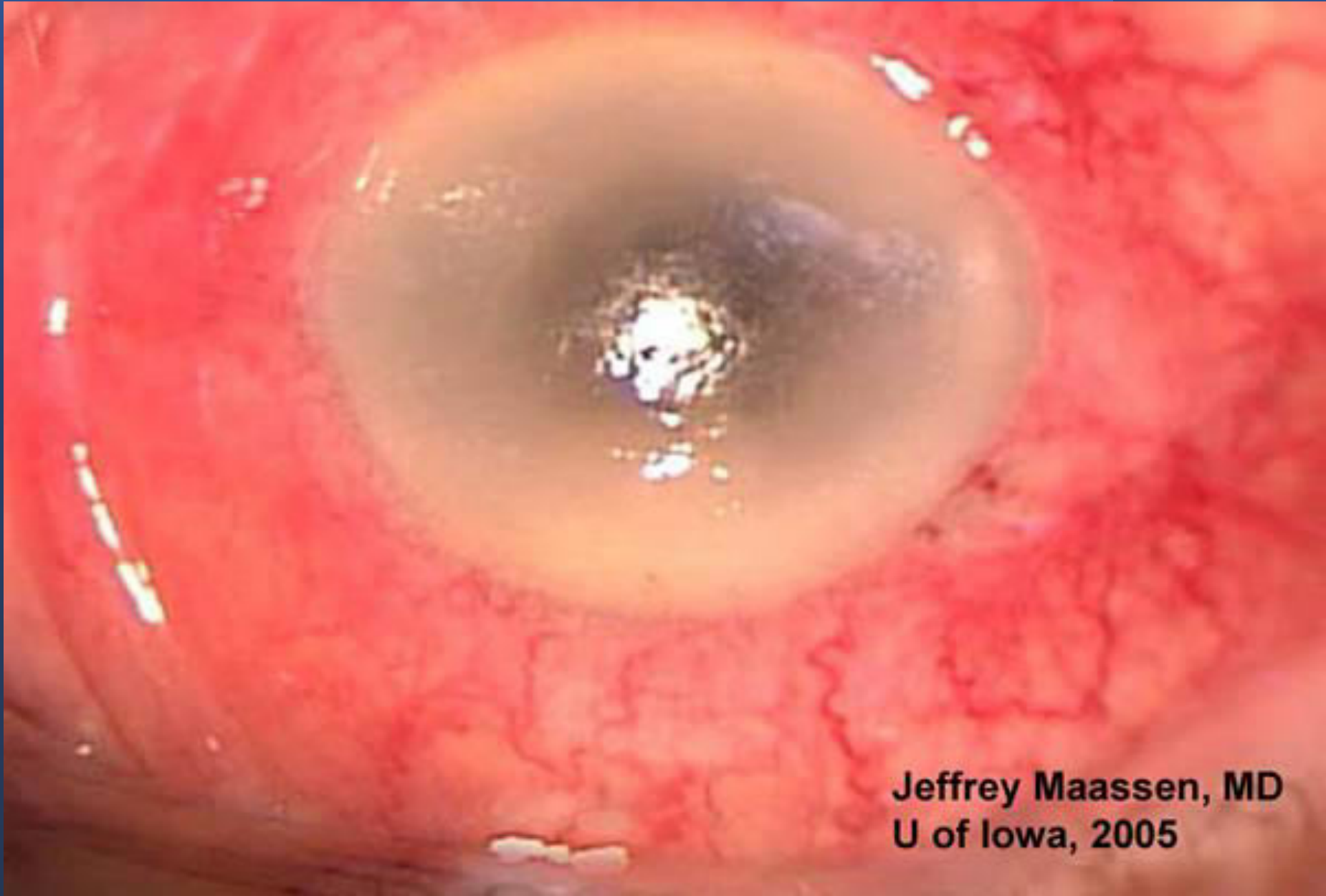
# Endophthalmitis

- An inflammatory condition of the intraocular cavities (aqueous or vitreous) usually caused by infection
- Estimated incidence...0.15%
- Risk factors
  - Age > 80 yrs
  - DM, secondary IOL implantation
  - PCR, combined surgery

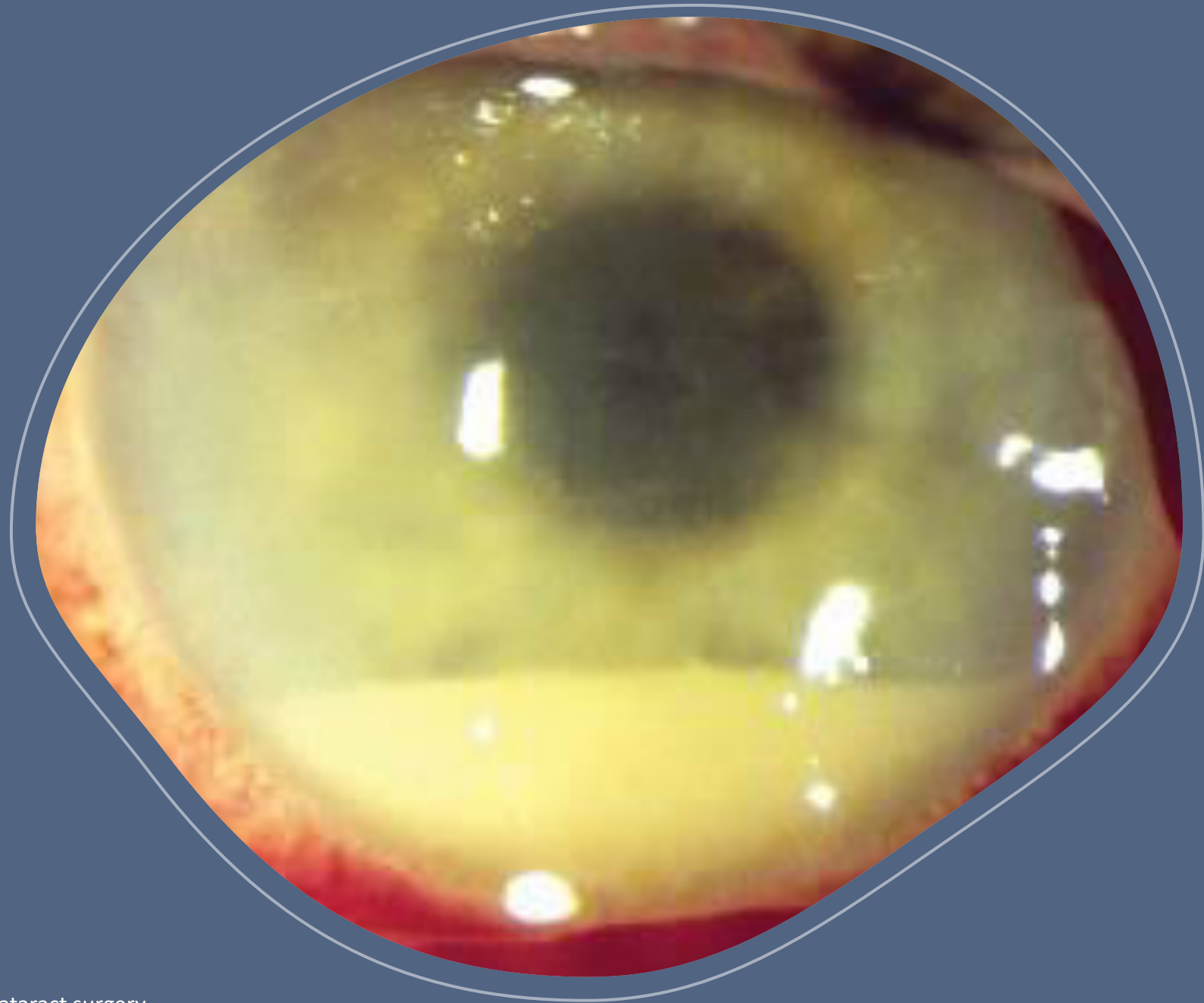
- Pathogenesis
  - Lids & conjunctival flora...most common source
  - Contaminated instruments & solutions
  - Theater environment, surgeon & other staff
- Organisms
  - Gram +ve...85-90%
    - *S. epidermidis*...70%
    - *S. aureus*, streptococcus spp & other gram +ve..15-20%
  - Gram -ve...5-6%
    - *Pseudomonas*, proteus, *P.acnes*

# Acute Endophthalmitis

- Presents...2-5 days post surgery up to 6 weeks
- Fulminant course, Gram +ve organisms mainly
- Features
  - Severe pain & visual loss
  - Chemosis, conjunctival injection & discharge
  - RAPD
  - Corneal haze
  - Fibrinous exudates, Hypopyon
  - Vitritis, poor fundus view



**Jeffrey Maassen, MD**  
**U of Iowa, 2005**





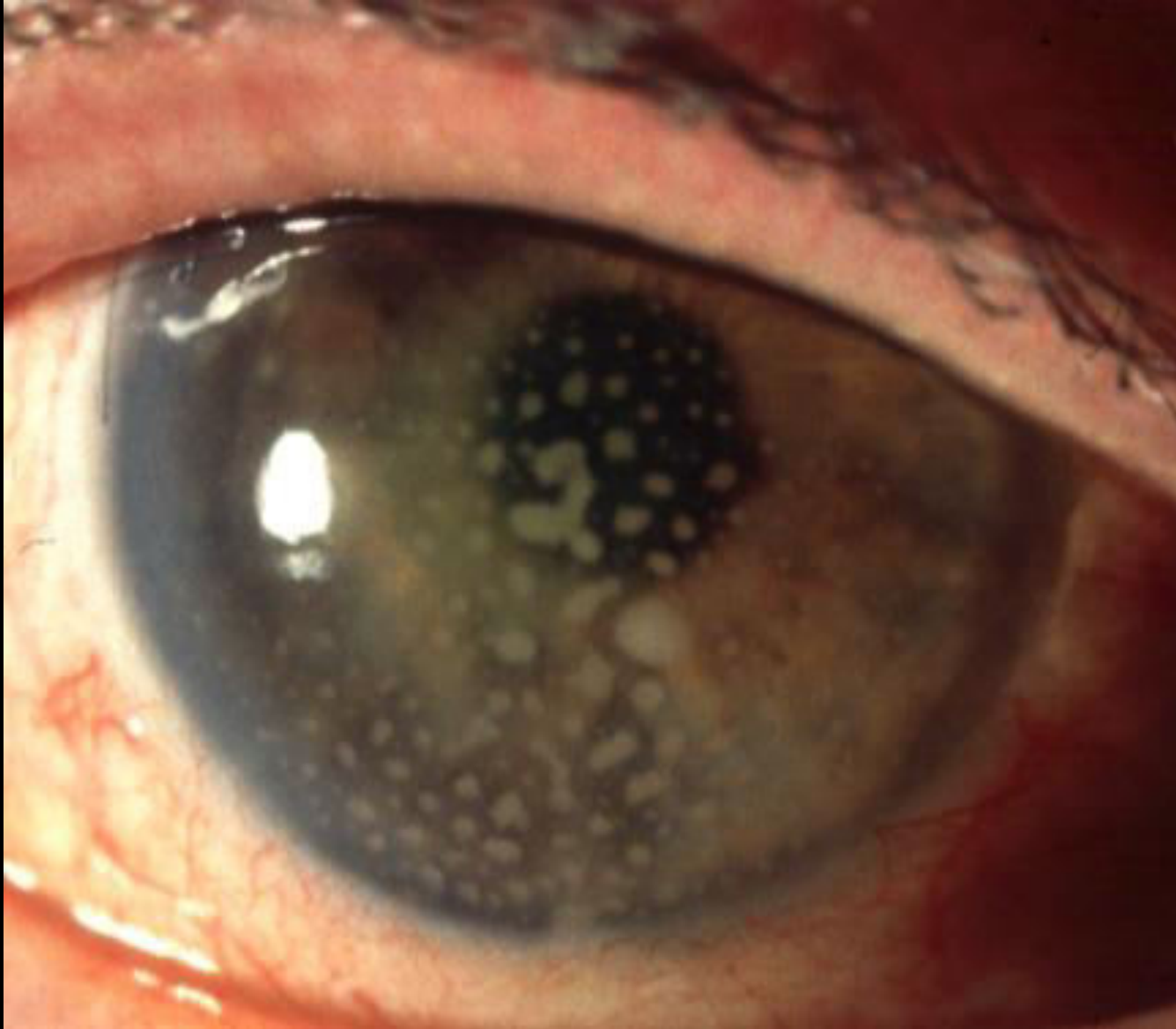


## Management

- Vitreous  $\pm$  aqueous samples
- Antibiotics
  - I/vit, periocular, topical, oral
- Steroids
  - Oral...when fungal infection is excluded
  - Topical...for ant uveitis
  - Periocular...if systemic steroids contraindicated
- PPV

# Chronic Endophthalmitis

- Presents...weeks to months to years (9 months)
- Low virulence organisms
  - *P. acnes*...mainly
  - *S. epidermidis*, corynebacterium, Candida
- Features
  - Mild or no pain
  - Visual loss
  - Low grade ant uveitis, mutton fat KPs
  - Vitritis common but not Hypopyon



Complications of Cataract surgery

## Management

- Vitreous ± aqueous samples
- Antibiotics
  - I/vit
- Topical steroids
- Removal of capsular bag, IOL, residual cortex
- PPV

# Prevention of Endophthalmitis

- Preoperative
  - Treatment of pre-existing infections
    - Blepharitis, conjunctivitis, CDC, fellow eye
  - Topical quinolone 3 days preoperative...controversial
- Perioperative
  - Proper eye, adnexa & nearby organs swab
  - Povidone-iodine 5% drops in the conjunctival sac
  - Proper draping
  - Aseptic technique & instruments
  - Intracameral cefuroxime at the end, water-tight closure

# Panophthalmitis

- Intense purulent inflammation of the whole eyeball
- Symptoms
  - Severe ocular pain n headache
  - Complete loss of vision
  - Profuse watering
  - Purulent discharge
  - Marked redness and swelling

# Signs

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- Proptosis And Painful Movement Of Eyeball
- Lid Edema
- Chemosis
- Corneal Edema N Clouding
- Anterior Chamber Full Of Pus
- IOP
- Globe Perforation



# Complications

Orbital  
cellulitis

Cavernous  
sinus  
thrombosis

Meningitis



# Treatment

- Anti-inflammatory and analgesic
- Broad spectrum antibiotic
- Evisceration

# TAKE HOME MESSAGE



Complication-free surgery is impossible all the time...**BUT**



Surgeons must be aware of complications & their proper management



Proper anesthesia techniques, sterilization & patient preparation...mandatory

# Learning objectives

- Discuss the etiology, clinical features, investigation, and management of Endophthalmitis.
- Discuss the etiology, clinical features, investigation, and management of Panophthalmitis.

Thank you,  
Any questions?

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## MCQ

3. Which of following preoperative measures has proven most effective in reducing risk of Endophthalmitis
- a. Administering oral amoxicillin 3 days before surgery
  - b. Topical antibiotics for 2 weeks following surgery
  - c. Decreasing duration of surgery
  - d. Administering topical 5% Povidone-iodine solution at time of surgery
  - e. Injecting Vancomycin into the I/A solution

Ans. d