

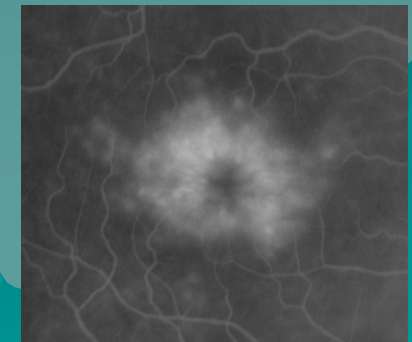
# CME

## in the Phaco era

### Myth or Reality

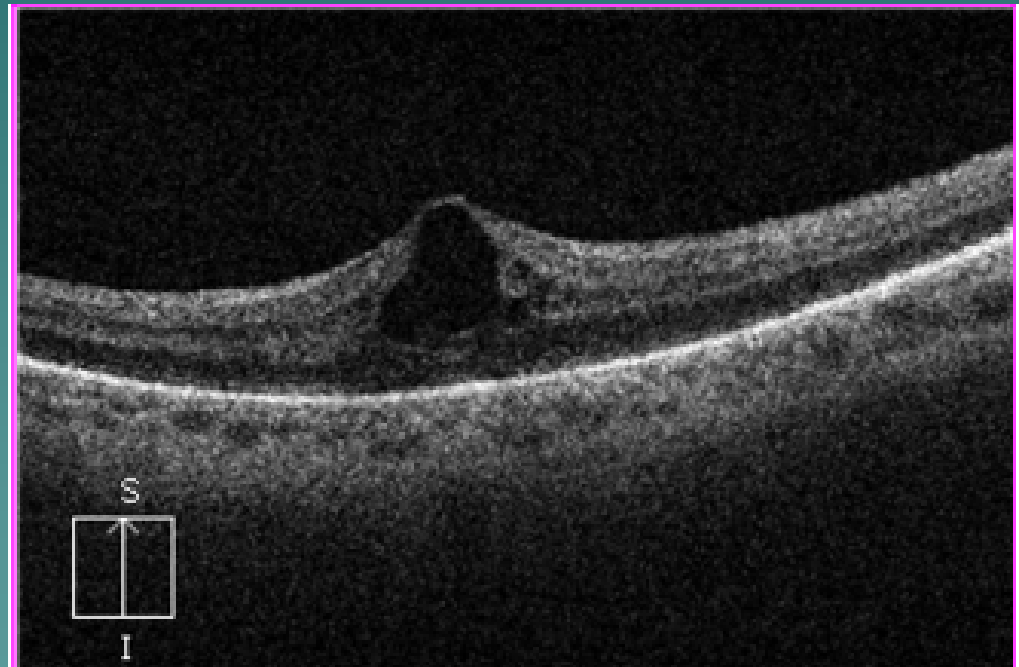
Nicholas Lee

Hillingdon & Western Eye



# Scope

- ◆ History
- ◆ Incidence
- ◆ Pathogenesis
- ◆ Treatments
  - None
  - Steroids
  - Acular
  - Yellox
  - Diamox
  - Anti-vegf
- ◆ Prevention
- ◆ Audit



# Irvine – Gass Syndrome

- ◆ Irvine described 1<sup>st</sup> 1953
- ◆ Gass Norton FFA 1966
- ◆ Irvine 1976 Survey of Ophthalmology review
- ◆ Over 100 Papers on the subject
- ◆ Medicare Estimate 47% increase in cost of cataract care if patients develops CME.

Irvine AR A newly defined vitreous syndrome following cataract surgery, interpreted according to recent concepts of the structure of the vitreous. AM J Ophthalmol 1953 36: 599-619

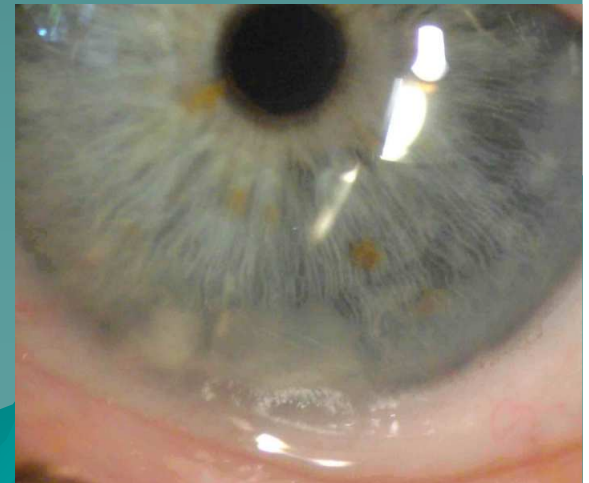
Gass JD Norton EW Cystoid macular edema and papilledema following cataract extraction: a fluorescein fundoscopic and angiographic study. Arch ophthalmol 1966; 76:646-681

Irvine AR Cystoid Maculopathy. Surv Ophthalmol 1976;21:1-17

2012 Reviews Conceicao Lobo Pseudophakic CME in Ophthalmologica Yoshihiro in [www.co-ophthalmology.com](http://www.co-ophthalmology.com)

# Aetiology and Risk factors

- ? Type of Cataract sugery
- ? Light toxicity
- ? Vitreo macular traction
- ? Inflammatory mediators
- ? Use of Adrenaline in BSS
- ? Intracamearl Drugs eg Cefuroxime
- ? Vitreous loss
- ? Integrity of capsule
- ? Hypertension
- ? Diabetes



# Light Toxicity

- ◆ ? To use Yellow Filter or NOT?
- ◆ Light occluder made no difference in study.
- ◆ UV Absorbing IOLS ?

◆ Kraff et al Effect of pupillary light occluder on CME J Cataract Refract Surgery 1996 22:770-774

◆ Nagpal post op CME Ophthalmol clin North Am 2001 :14 651-659

# Age

- ◆ Slight increase with age

Rossetti Cystoid Macuar Odema following cataract surgery. Curr Opin Ophthalmol 2000;11:65-72

# Vitreous

- ◆ PCR – Increase 10 – 20%
- ◆ PCR Less of increase than if Extra Cap
- ◆ Dropped Nuclei / retained nuclei fragments
- ◆ IOL exchange
- ◆ Iris Incarceration
- ◆ Vitreous to wound
- ◆ Yag Capsulotomy

Loewenstein Post surgical Edema Deve Ophthal Basel Karger 2010:  
47: 148-159

# Glaucoma medication

- ◆ Latanoprost /BAK
  - Arcieri 2005 RCT Increased risk
  - Law 2010 Retrospective 1253 eyes no increased risk
  - PB Stop Xalatan after, Restart if necessary
- ◆ ? Change glaucoma medication?
- ◆ Also RVO, and Epiretinal membranes  
Increase risk
  - OCT prior to Ct operation.



# Diabetics

- ◆ Increased Risk
- ◆ Even in R0
- ◆ Diabetic macular oedema VS Irvine-Gass – Co-exist
- ◆ Difficult to differentiate vs DME
  - Post op Hyperfluorescence of Optic disc on FFA
- ◆ Treat DME Prior to surgery
  - On table Anti-VEGF/Steroids.

Pollack CME Following catarct surgery in patients with diabetes BJO 1992:  
76: 221-224

Dowler The Natural history of CMO after Catarct surgery in diabetes.  
Ophthalmology 1999 106:663-668

# Uveitis

- ◆ More complicated Cataracts
  - Iris hooks, Prolonged operations
- ◆ Studies (Belair & Ram) show 8 to 21 even 50% Incidence
- ◆ Control Preoperative inflammation
  - Pre treatment with topical steroids reduces risk by x7 fold.

Ram. Phaco with IOL in Uveitis JCRS 2010

Belair Incidence of CME after Ct surgery with and without Iuveitis using OCT.

AJO 2009 148 128-135

# Incidence

- ◆ Depends on Methodology used to detect
  - FFA
  - OCT
  - Symptoms – Vision
- ◆ Prophylactic NSAID, Post op NSAID/Steroids
- ◆ Intracapsular Surgery – 60%
- ◆ Extracapsular Surgery – 20-30%
- ◆ Phacoemulsification
  - Routine cases
  - Complicated cases - 4 -13%

# 1994 St Georges Hospital Audit of Angiographically CMO after PCR

ECCE	Intact Vitreous face	Vitreous loss
CMO	2 (14%)	7 (15%)
NO CMO	14	46
Total	16	53

# Ocular Complications with Cataract surgery in US Veterans AAO 2012

## Study Objectives

- To investigate the prevalence and predictors of intraoperative and 90-day postoperative ocular complications from cataract surgery in the US Veterans Health Administration (VHA)
  - Ninety days - the follow up endpoint
    - Centers for Medicare and Medicaid Services (CMS) global surgical package



## Methods

- Retrospective cohort study
- Inclusion criteria
  - Veterans who had cataract surgery 10/1/05 – 9/30/07
    - One surgery within 90 days of the index surgery
- Exclusion criteria
  - Cataract surgery in the fellow eye within the 90-day period
- VHA administrative database
  - ICD-9 & CPT codes: National Patient Care Database



## Results

- 53,786 unique patients
  - 45,082 met inclusion criteria
- Demographics
  - Mean age: 71.8 years
  - 97.6% male; 76.0% white
- Most common comorbidities
  - Systemic: Diabetes mellitus (DM; 40.6%), chronic obstructive pulmonary disease (21.2%), DM with complications (14.2%)
  - Ocular: Age-related macular degeneration (14.4%), DM with ophthalmic manifestations (14.0%), glaucoma (13.6%)



Intraoperative Complication	Number (%); n = 45,082
Posterior capsular tear and/or vitreous loss	1,590 (3.5)
Retained lens fragments	73 (0.2)
Postoperative Complication	Number (%); n = 45,082
Posterior capsular opacification	1,893 (4.2)
Cystoid macular edema	1,469 (3.3)

Paul B. Greenberg, MD, Victoria L. Tseng, BS, Wen-Chih Wu, MD, Jeffrey Liu, MD, Lan Jiang, MS, Christine K. Chen, BA, Ingrid U. Scott, MD, MPH, Peter D. Friedmann, MD, MPH

# Studies

Veterans	2012	45,082	3.3%
Gallego-Pinazo	2011	250	4.4%
		250 Pegaptanib	0.4%
Lee pp	2011	125	3%
Hillingdon	2010	1200	3%

# Classification

- ◆ Angiographic CME – Normal Vision
  - Normal OCT
- ◆ Clinically Significant CME
  - Reduced vision, CME on OCT
  - With in 4 months of surgery Usually 4-6 Weeks
- ◆ Late on set CME  $>$  4 months
- ◆ Chronic CME Lasts  $>$  6 Months

# Natural history

- ◆ Most recovery spontaneously
- ◆ 50% - 75% achieving improving vision with in 6 months
- ◆ 1-3 % persist
  - Fluid corresponds to Symptoms



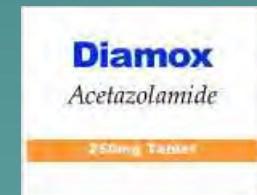
# Treatment Options - NSAID

- ◆ Multiple Reports Show effectiveness of NSAIDS
  - Ketorlac
  - Bromfenac
- ◆ Topical Corticosteroids synergistic

Heier Ketrolac VS prednisolone ... Am cade Ophthalmology 2000 107  
2034-2038

# Treatment Acetazolamide

- ◆ Stimulate RPE pump to pump excess fluid out of the macular
- ◆ Induces acidification of subretinal space increasing fluid absorption through RPE or choroid



Catler et al Advantages of Acetazolamide in cme J Fr Ophthalmol  
2005:28 1027-1031

# Pathophysiology

- ◆ Inflammatory mediators (prostaglandins, cytokines ..) Induce disruption of blood-retinal barrier after surgery, increasing permeability from the perifoveal capillaries with resultant fluid accumulation in perifoveal retina.
- ◆ Disruption of this barrier causes fluid accumulation
- ◆ Though the pattern is distinctive dependant on the cause eg Post surgery looks different to diabetic CMO or Vein occlusion CMO.

# Refractory Cases Bevacizumab

- ◆ VEGF well known to be associated with break down of blood-retinal barrier
- ◆ ? Role in Post op CMO?
- ◆ 2007 Pan American Collaborative group retrospective study showed 71% improvement by 2 lines at 6 months to those pts refractive to other rx.
  - Well tolerated, low side effects
- ◆ Spitzer et Al – However found no improvement



# Bevacizumab Pan American Collaborative Retina study group

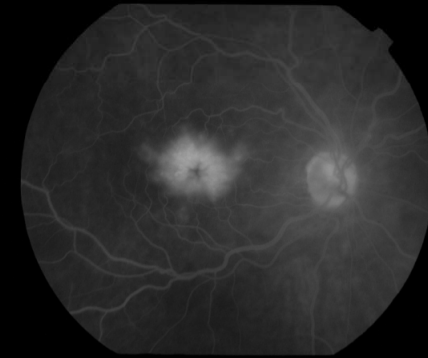
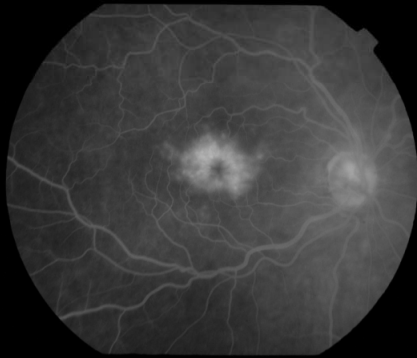
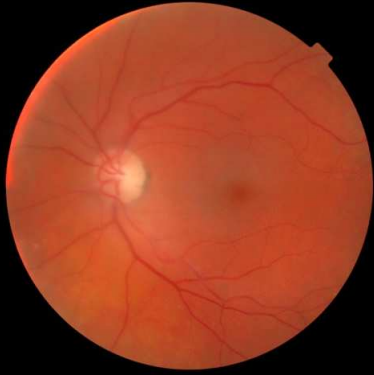
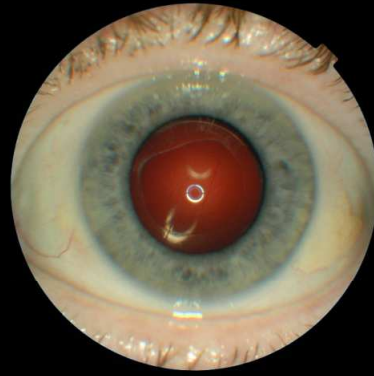
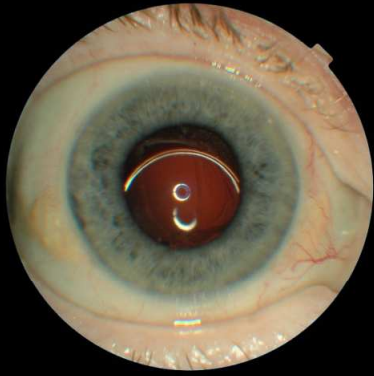
- ◆ Patients unresponsive to other rx.
- ◆ 71% - topical steroids
- ◆ 30% Intravitreal Trimacinolone
- ◆ 29% NSAID
- ◆ 13% periocular steroids
- ◆ 10% Systemic steroids

# Vitreous

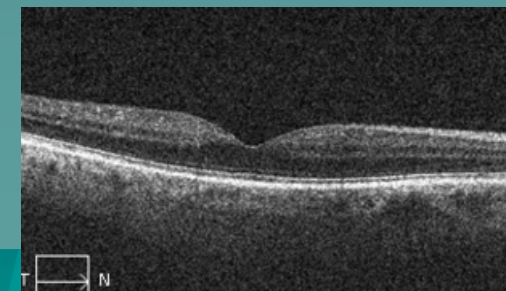
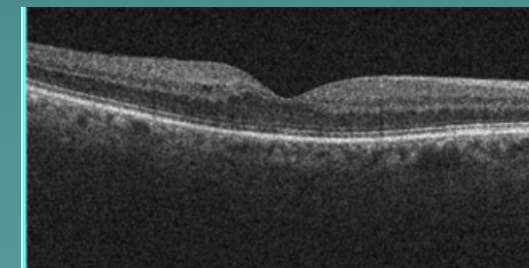
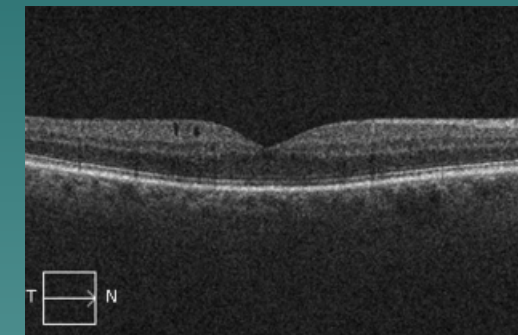
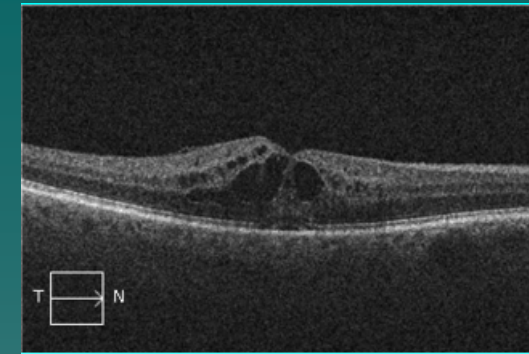
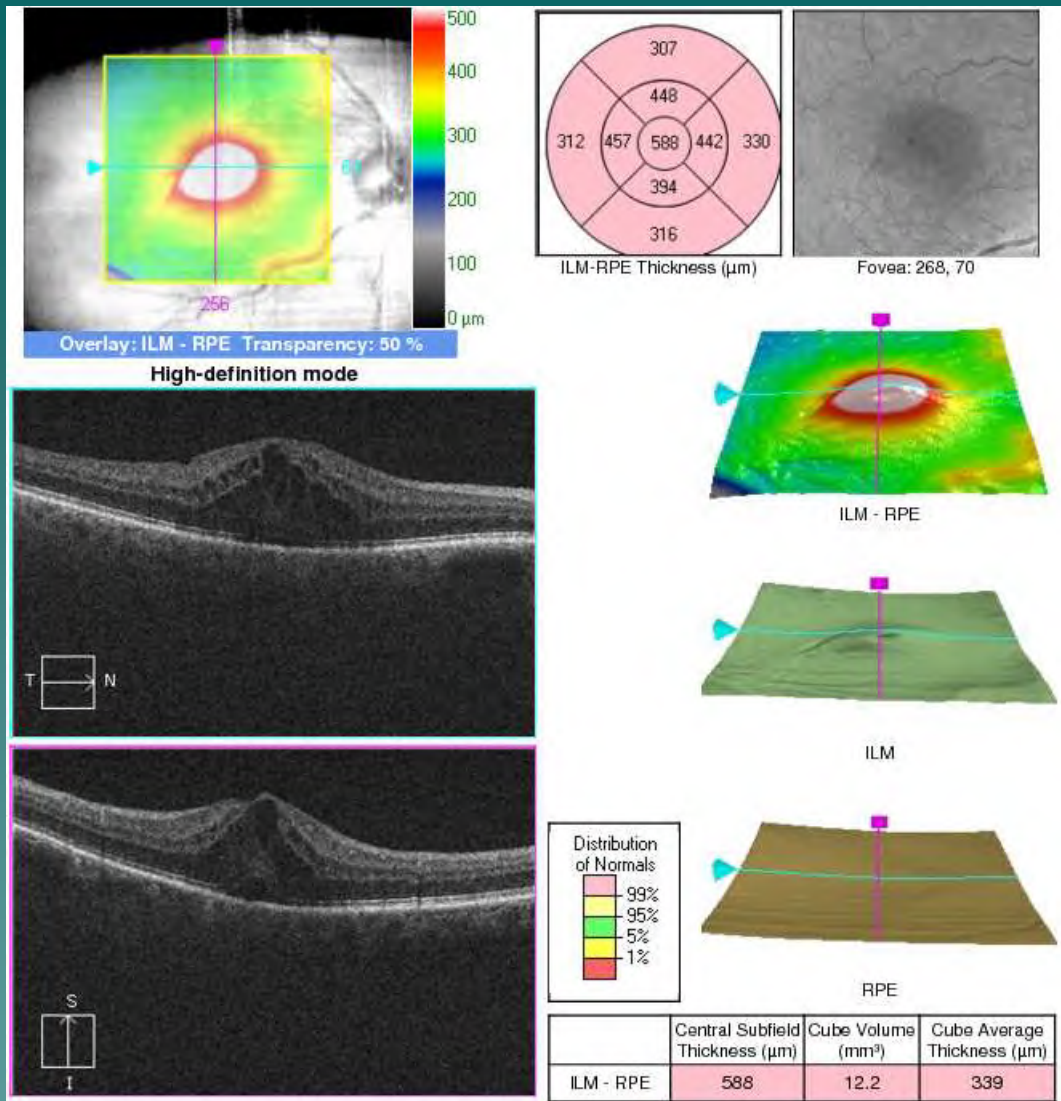
- ◆ Vitreous to the wound
  - Vitreolysis
  - VMT - Vitrectomy

# Case Study.

- ◆ 76 F Vision 0.12 & 0.90
- ◆ May 2009 Left phaco Uncomplicated Vision improved 0.26
- ◆ July 2009 V Keen for Right eye Vision 0.4
- ◆ Oct 2009 Right Phaco, Topical, Squeezing, ST4
  - PCR at Chopping stage. Anterior vitrectomy, Lens in sulcus
  - Squeezing, Lens haptic in iris angle – bleeding
- ◆ Day 1 Post op HM, Intense Topical steroids
- ◆ Day 7 – repositioned IOL, Iris Dialysis noted.
- ◆ Day 30 – 0.62 vision
- ◆ 6 weeks – 0.26 – NO cmo
- ◆ 12 weeks 0.5 Vision CMO – Acular, Diamox, Maxidex







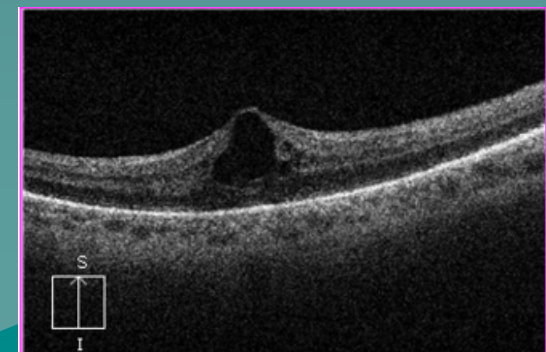
29 months ON still on Bromfenac and Dexamethasone alternate Days.  
Vision improved to 0.2 vs 0.0 Fellow eye

# Management

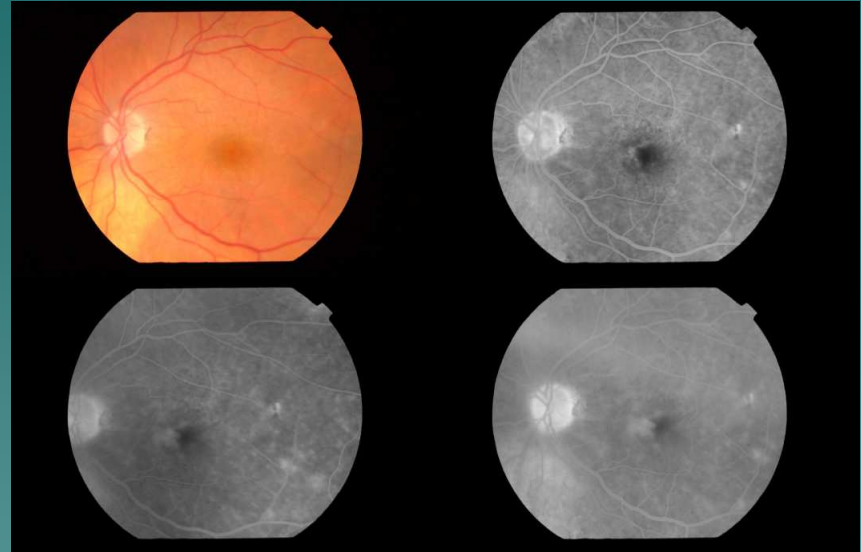
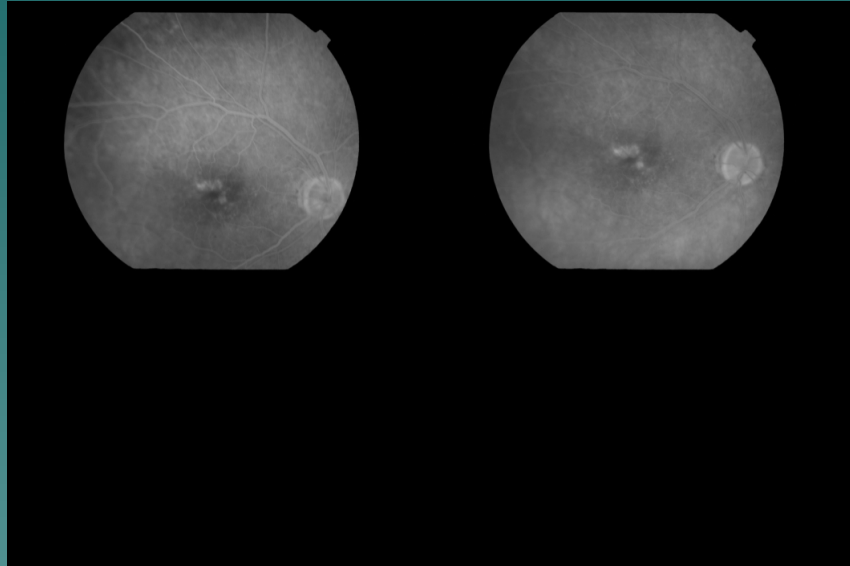
Treatment	Summary	Highest level of evidence
Topical Corticosteroids	1 <sup>st</sup> Proposed treatment May act synergistically with NSAID	Case Series
Topical NSAIDS	Multiple studies show effect in both prophylaxis and Treatment. More effective than Steroids ?any NSAID superior	Multicentre RCT Meta analysis
Sub conjunctival steroids Orbital floor	Data limited Used when refractory to other treatments and Chronic	Case series
Intravitreal steroids Dexamethasone implant	Anatomical and visual benefits but may be transient, multiple injections side effects	Case series, one RCT in diabetics showed improvement anatomically but not visually
Intravitreal Anti-VEGF	Option to refractory Cases 72% improved	Case series
Oral Acetazolamide	Effective but not well tolerated Second line	Case series

# Conclusions/Recommendations

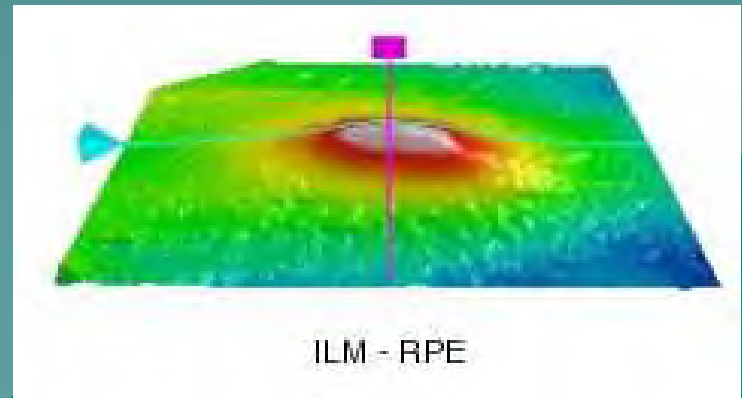
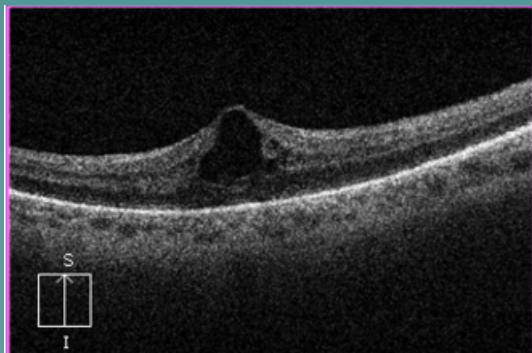
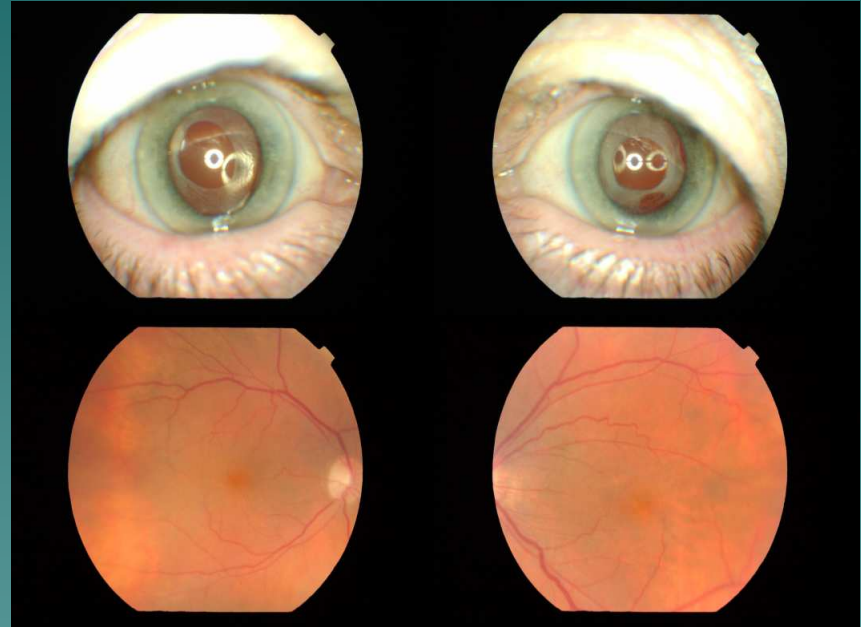
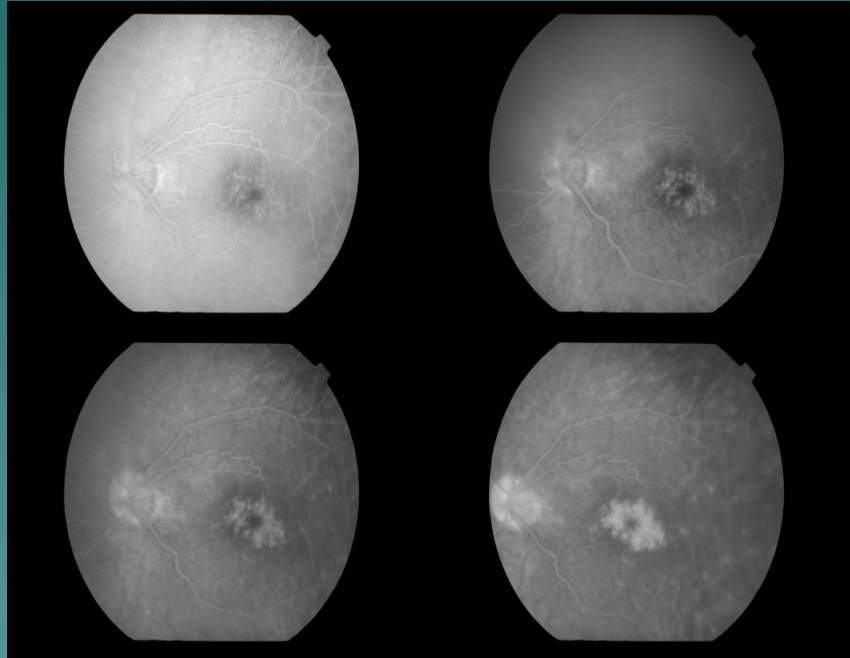
- ◆ Pre Op evaluation of Patient
  - Minimise risk factors, treat Uveitis, DME
- ◆ Prophylactic Treatment NSAID for first month with Topical Steroids which can be reduced after first 2 weeks.
  - Lobo 2012 – Adopted as Hillingdon Regime 2011
- If CME is Diagnosed
  - Topical NSAID & Steroids reintroduced for 1 month
  - OCT VA at one month
    - No improvement
      - Acetazolamide
      - Periocular Corticosteroids
      - Intravitreal Triamcinolone
      - Intravitreal Anti-VEGF
    - If there is vitreous Incarceration
      - Vitrectomy



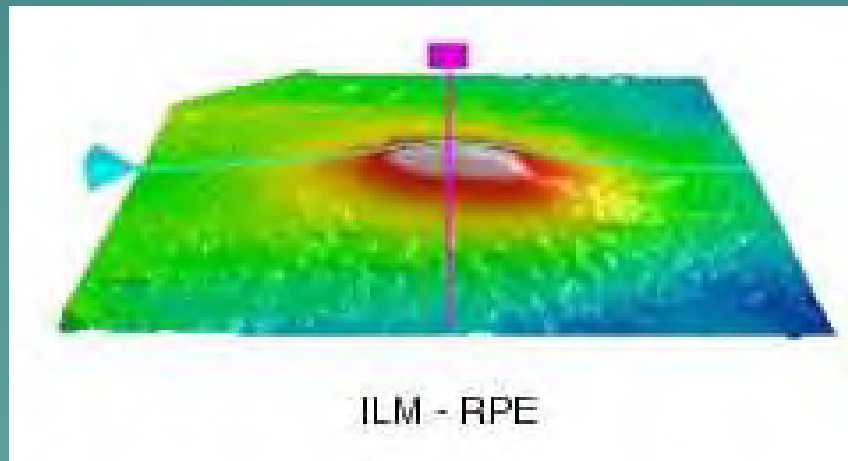
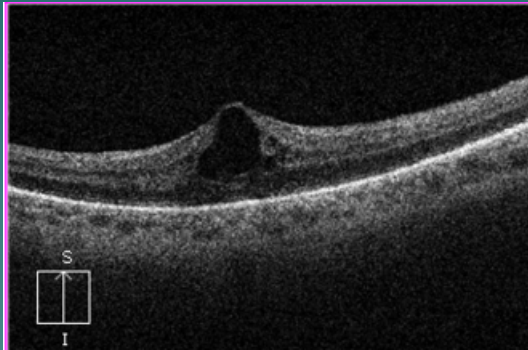








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