ANGLE CLOSURE GLAUCOMA

Maryke N Neiberg OD FAAO
COPE 31939-GL

Case 1: MS. RC The Grateful Red

- Primary Exam
  - Blurry vision at near
  - Controlled HTN
  - History of migraines
    - Twice a week (Maxalt)
    - Severity 9/10
- Demographics
  - 50year old white redhead female

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Maxalt…

- Rizatriptan
- 5-HT1 agonist
- Migraine abortive medication
- Narrows blood vessels
- Not significant action an alpha or beta adrenergic receptors
- Significant pain and anti-nausea effects

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Case 1 MS. RC Exam Findings And Analysis

- BP: 131/90 RAS @10:45 am
  - Controlled HTN?
- Best corrected VA OD: 20/20 and OS: 20/20
- Low hyperopia with presbyopia
- Van Herrick < 1
- Nuclear sclerosis 2+ OD and OS
- IOP: OD 10 mmHg and Os 10 mmHg

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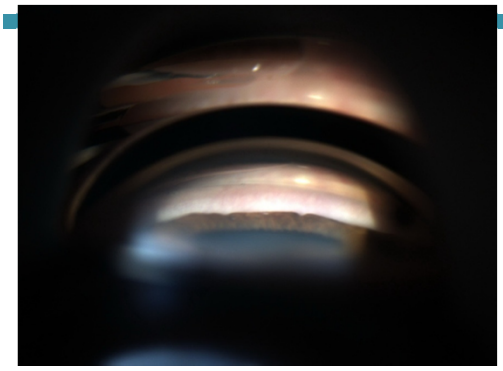
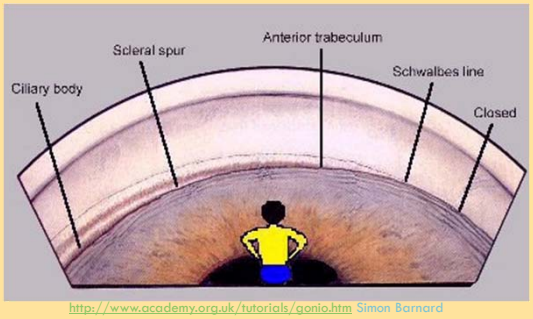
Case 1 MS. RC Gonioscopy Inferior OD



Case 1 Ms. RC Gonioscopy Superior OD

Gonioscopy



http://www.academy.org.uk/tutorials/gonio.htm Simon Barnard

Case 1 Ms. RC Review of Gonioscopy

- Dynamic
  - Tilting or sliding the lens towards the angle being viewed
  - Have patient look toward mirror being used
  - Perform carefully to not open angle
- Indentation
  - Differentiates between synechial and apositional angle closure
  - Pushes aqueous peripherally
  - Slide lens towards angle being viewed to reduce folds

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Gonioscopy Grading System

Van Herrick and Shaffer

Classification	Van Herrick	Angle Width	Angle Grade	Interpretation
Grade 4	> ½ /1	35-45 degrees	Wide open	Impossible closure
Grade 3	½ - ¼ /1	20-25 degrees	Wide open	Impossible closure
Grade 2	¼ /1	20 degrees	Narrow angle	Possible closure
Grade 1	< ¼ /1	<10 degrees	Narrow angle	Probable closure
Grade 0	nil		Partial /complete closure	Partial/total closure

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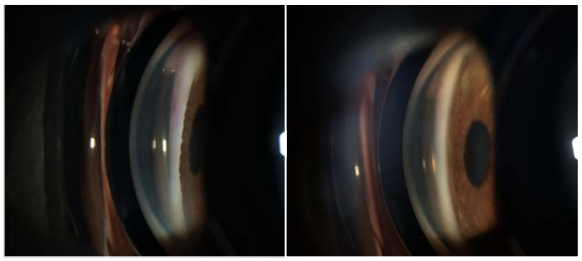
Case 1 Ms. RC Nasal with out and with dynamic gonioscopy (tilt)



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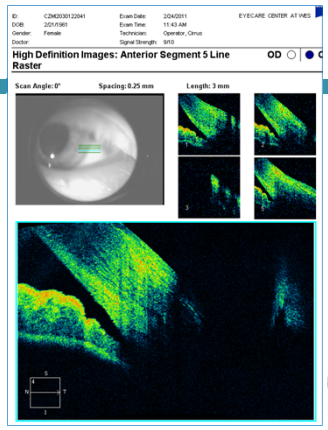

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Case 1 Ms. RC Risk Assessment

- Low IOP
  - No pressure lowering drops!
- CD 0.35 H and V OD, OS Direct Ophthalmoscopy
- No DFE today
- Provocative testing?

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Provocative Testing

- The idea is to see if IOP rises in "at risk" eyes in a controlled situation, not to precipitate a full blown attack
- These tests are meant to identify at risk eyes early and recommend laser iridotomy
- Two types of provocative tests:
  - Physiological tests that mimic natural events
  - Pharmacological intervention
- Better be ready to treat if you elicit an attack!
- Best not to do this in the State of California!

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Provocative Testing

- 1. Darkroom provocative test:
  - Patient placed in a dark room for 40-60 minutes
  - Attempt to induce a physiological dilation of the eye
  - Rise of IOP of 8 mmHg is considered positive
  - Elderly patients with age related miosis might need to stay in the dark longer
  - Patient must be kept awake, sleep induces physiological miosis
  - IOP must be measured in dim light so the pupil does not dilate and lower the pressure

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Provocative Testing

- 2. Prone Provocative test:
- Head placed face down in a horizontal orientation for 40-60 minutes
- The face forward position increases the likelihood of lens-iris diaphragm shifting forward and creating pupillary block increases
- Patient sits at a desk with their head rested on their hands
- Must be kept awake
- 3. Dark-room Prone provocative test:
  - Increases the chance of a positive response

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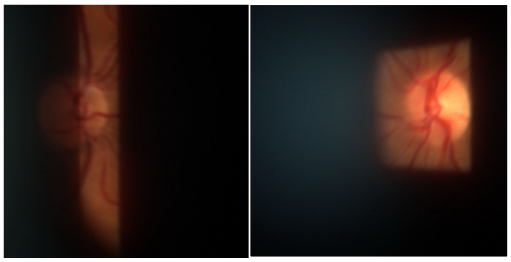
Provocative Testing

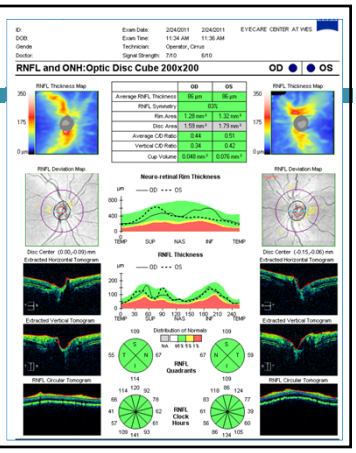
- 4. Mydriatic Provocative Test:
  - Sympathetic agonist stimulates the dilator muscle
    - Direct acting e.g. phenylephrine
    - Indirect acting like Paramyd
  - Cholinergic antagonists block constriction of the sphincter muscle
    - Tropicamide, homatropine, atropine
    - Tropicamide is short acting and most often used for this test

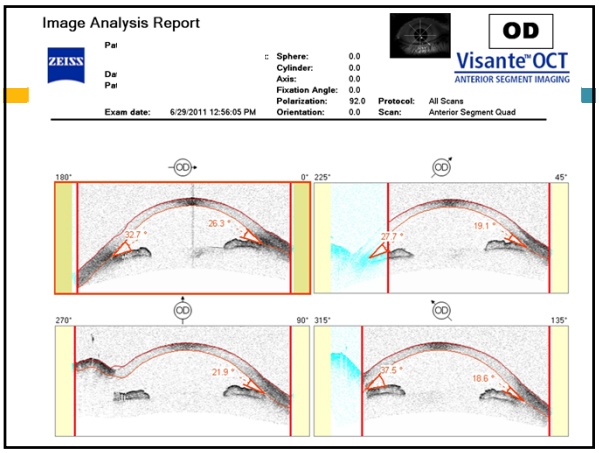
Case 1 Ms RC OD and OS Discs

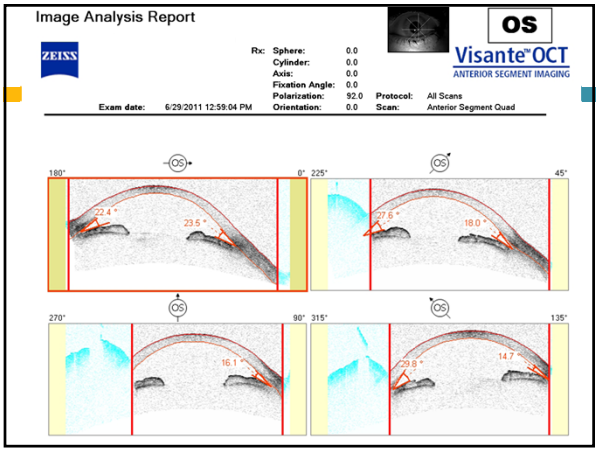
Undilated 9OD



Case 1 Ms. RC OCT







Case 1 Ms. RC Decision Making/Diagnosis

- Types of angle closure
  - Primary
  - Secondary
    - Most often unilateral
    - synechiae
  - Mixed Mechanism
    - Angle closure and open angle
  - Acute, Intermittent, Chronic

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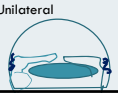
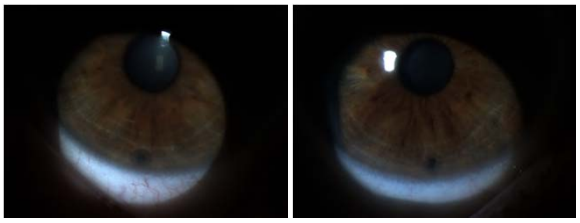
Type	Characteristics	Diagram	Sub types
Primary Angle closure with Pupillary block	•Shallow chambered eyes •Apposition of pupil on lens •Iris bombe	Bilateral 	•Acute •Intermittent •Chronic •Combined mechanism
Primary Angle closure without pupillary block (Plateau iris)	•Slit-like angle •No iris bombe •Normal depth anterior chamber •Anterior rotation of ciliary body	Bilateral 	
Secondary Angle Closure with pupillary block	•Posterior synechiae •Miotics •Pseudophacic/aphakic •Pars Plana vitrectomy/ intra-vitreal gas	Unilateral 	
Secondary Angle Closure without pupillary block Push/Pull mechanism	•Push: Caused by surgery •Peripheral anterior synechiae •Neovascular glaucoma, ICE syndrome, Epithelial down growth, Aniridia, iridoschisis	Unilateral 	Pull: caused by ciliary body anterior rotation/ choroidal effusion

Case 1. Ms RC Treatment and Management

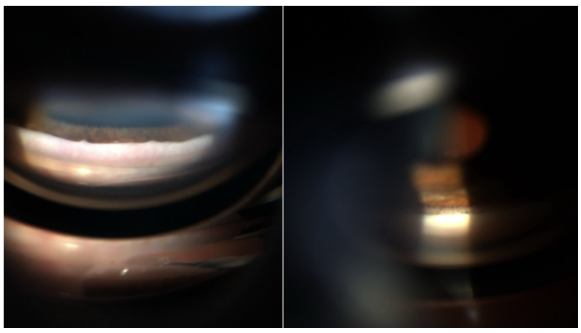
- Referral for LPI
- First Follow up visit



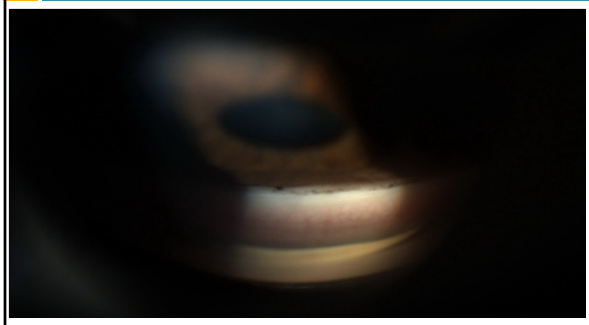
Case 1. Ms RC Treatment and Management

- Patency of LPI

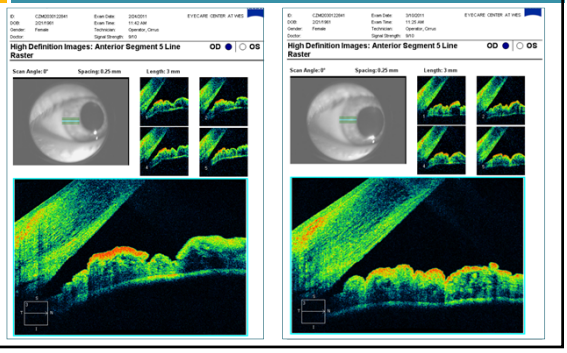
Case 1 Ms. RC Residual Angle Configuration Before and after LPI- Inferior OD



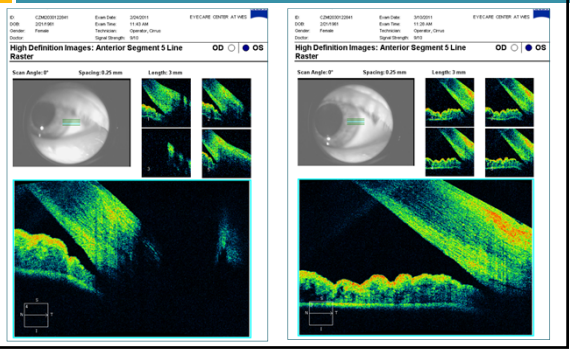
Case 1 Ms. RC Residual Angle Configuration after LPI- Inferior OS



Case 1 Ms. RC Temporal Angle Pre- and Post Surgical OD



Case 1 Ms. RC Temporal Angle Pre- and Post Surgical OS



Case1 Ms. RC Post LPI

- DFE uneventfully performed
  - Post dilation IOP
- Patient education
  - Return Visits
  - Medication
- Patient response
- Miraculous Migraine cure!

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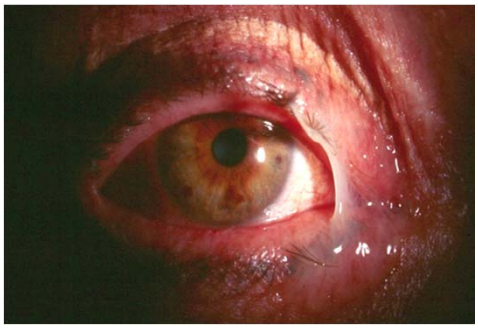
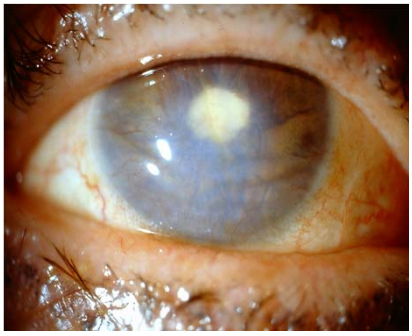
Case 2 Not so Lucky Garcia



- 63 year old Hispanic female
- Canaliculitis treated with Vigamox ® intra canular
- Narrow angles noted and referred for LPI
- Pt did not keep appointment

Case 2 Not so Lucky Garcia



Case 3 Jerry Slow Down

- Case History and Chief Complaint
  - Mildly blurred vision OU
  - Mild discomfort OU
  - Unremarkable Ocular Health History
  - Medical health history
    - Multiple food allergies
    - Anxiety disorder (Xanax ®)
- Primary Exam
  - Demographics:
    - 59 year old white female

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Case 3 Jerry Slow Down

- Exam findings and Analysis:
  - Best VA OD 20/20 and OS 20/20
  - Low plus: OD +2.75 and OS +2.50D
  - + APD OS
  - Abnormal motilities
  - IOP OD: 38 mmHg and OS 42 mmHg
  - Gonioscopy: ATM barely noted inferiorly OU
  - Defer DFE
  - Direct Ophthalmoscopy/undilated 90D: 0.9/0.9 OU

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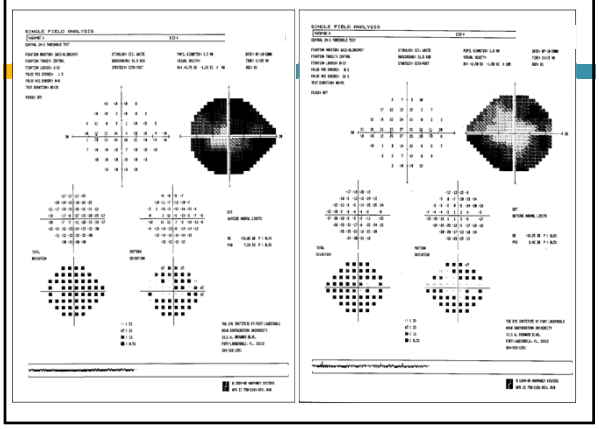

Case 3 Jerry Slow Down

- Differential diagnosis:
  - Primary or Secondary Angle Closure with (Iris Bombe) or without Pupillary Block (plateau iris)
  - Role of Xanax?
  - Role of Hyperopia?
  - Acute/intermittent/chronic?

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Xanax

- Xanax (Alprozolam):
- Benzodiazapine
  - Mydriasis
  - Contraindicated in patients with narrow angles

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Case 3 Jerry Slow Down

- Treatment and Management:
  - Bring down the IOP temporarily with medication
    - Allergies?
      - Avoid Alphagan
      - Avoid CAI (sulfa allergies)
    - Outflow?
      - Angle obstructed
    - Production?
      - Beta blocker
  - Refer for definitive surgical management
  - What about the Xanax?

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Case 4 The Case of KC Jones

Emergency Stabilization of Acute Angle Closure

- Primary Exam
- Case History and Chief Complaint
  - Pain in OD since last night
  - Red eye OD
  - Nausea/emesis
  - Photophobic
  - Blurred vision with haloes
- Demographics
  - 55 year old black female

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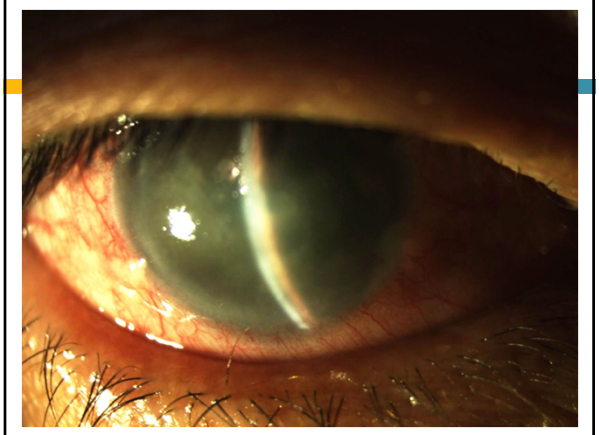

Case 4 The Case of KC Jones

- Exam Findings and Analysis
  - Mid-dilated pupil
  - "Steamy" cloudy cornea
  - Anterior segment inflammation
  - IOP OD 54 mmHg

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Case 4 The Case of KC Jones

- First, be sure of your diagnosis!
  - IOP
  - Gonio
- Entire angle involved
- Vision loss in days!
- PAS form quickly
  - May result in chronic IOP elevation after breaking attack and curing angle closure due to TM damage

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Case 4 The Case of KC Jones

- Treatment and Management
- Goals:
  - Lower IOP
    - Impression gonioscopy
    - Force aqueous into angle
      - Drain
      - Open the angle
      - Watch your shoes!
  - Alleviate pain
  - Clear cornea
    - Topical glycerin

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Caution!

- **Classical picture of acute angle closure is dramatic:**
  - Severe rise in IOP
  - Severe ocular and maxillary pain (CN 5 mediated)
  - Head, sinuses and teeth ache
  - Nausea and vomiting- due to 5th nerve PSNS involvement with CN X at the longitudinal fasciculus
  - Bradycardia and sweating as a result of the oculocardiac reflex
  - **Oculocardiac reflex:**
    - If pulling of the extra-occular muscles or pressure on the eye occurs, a reflex mediated by 5th and 10th nerve synapse at the visceral motor nucleus of the reticular formation in the brain stem, and then to the cardiovascular medulla of the heart. If stimulated causes decrease in sino-atrial node which leads to bradycardia. Dangerous in children and neonates.

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Case 4 The Case of KC Jones

- Topical drug Cocktail in office:
- Beta blocker:
  - Check for contraindications
  - Note pulse and BP
  - One dose 1gt 0.5% Timolol
  - Decreases aqueous production
- Alpha adrenergic agonist
  - One dose 1gt 0.2% Brimonidine tartrate
  - Decreases production and increases outflow

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Case 4 The Case of KC Jones

- IOP now 38 mmHg
- 1 gt Pilocarpine 1%
  - check for contraindications
    - no pseudophakia/aphakia!
    - If pseudophakia /aphakia: Instill q15 minutes:
      - 4 doses 2% cyclopentolate
      - 4 doses phenylephrine
  - Two doses 15 minutes apart
  - One dose pilocarpine in contralateral eye

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Case 4 The Case of KC Jones

- Topical steroid :
  - Four doses 1gt Pred acetate 1% q 15-30 minutes
  - Then q1hr
- In severe cases:
  - Consider acetazolamide 500 mg po
    - Diamox
  - Consider osmotic agent
    - Isosorbide

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Case 4 The Case of KC Jones

- Same day referral!
- Corneal edema postponed surgery:
- Until surgery, continue with:
  - Beta blocker 0.5% Timolol bid
  - Pilocarpine 1% qid
  - Pred acetate 1% q 2hrs (can go q1-6hrs)
  - Pilocarpine 0.5% in contralateral eye qid
  - Can use 500 mg acetazolamide sequel po bid
  - Can use 50-100 mg osmotic agent po

Case 4 The Case of KC Jones

- Definitive Treatment
  - Treat the underlying problem
  - B-scan is useful in diagnosis
- Pupillary block treatment progression:
  - LPI Yag/ Argon
  - Surgical iridectomy
  - Trabeculectomy
  - Filtering surgery
  - Manage PS due to inflammation with dilation!

Discussion…