

## Real World Retina

- I. Introduction: Objectives
  - a. Discuss common “real world” retinal disorders and how they impact our patients
  - b. Identify classic appearances of these conditions through interpreting multimodal imaging
  - c. Review common management options for these conditions
  
- II. Retinal vascular disorders
  - a. Retinal Artery Occlusion
    - i. BRAO
      1. Occlusion of a branch arteriole leading to ischemic vision loss. Usually embolization, Ischemia of the inner retina
      2. Opacification → “whitening” downstream of the blockage
      3. Usually retain good VA 20/40 or better in 75%
      4. Neovascularization Risk < 1%
    - ii. CRAO
      1. Occlusion of the Central Retinal Artery leads to diffuse ischemia of the inner retina
      2. Thrombosis at the level of the nerve (80%)
      3. Embolus (20%)
      4. There is no RNFL/ganglion cell layer at the fovea so the intact choroidal circulation stands out in contrast to the surrounding opacified retina
      5. Rare- 8.5 cases per 100,000
      6. Presenting vision usually poor 20/400 or worse in 66%, 20/40 or better in 18%\*
      7. Risk for neovascularization ~18%
      8. CRAO with cilioretinal artery sparing- Anatomically, only 15% of cilioretinal arteries feed the central macula
    - iii. Stroke Protocol
      1. Send to the ER/stroke center for work up
      2. Cardiac monitoring / EKG
      3. Carotid Doppler
      4. Echocardiogram
      5. Neuroimaging
      6. Aggressive management of risk factors
      7. Increased risk of developing stroke within 1 week (44.5x increased risk) and 30 days (6.82x increased risk) of onset of CRAO
      8. 89% have “silent strokes” detected by MRI
  - b. Retinal Vein Occlusion
    - i. Interruption of VENOUS outflow typically at AV crossings leads to:
      1. Blood Leakage (IRH)
      2. Fluid Leakage (CME)

3. Poor Blood Flow (Ischemia)
- ii. BRVO
  1. Usually involves the ST quadrant (~60%)
  2. Since there are more A-V crossings
  3. Typically unilateral (95%)
  4. Typically > 50 years old
  5. Ischemic BRVO > 5 disc areas of retinal ischemia by fluorescein angiography, **40% risk for neovascularization**
  6. Typical presentation in patient > 50 years old
  7. Atypical presentation needs further work up
    - a. < 50 years old
    - b. Bilateral BRVO
    - c. Numerous BRVOs
  8. Most with good prognosis- VA 20/40 or better in 60%
  9. Of patient with CME- 18% resolve without treatment after 4.5 months
  10. Initial VA is important- Patients with initial VA worse than 20/200 have worse prognosis
- iii. CRVO
  1. Classified as Ischemic or Non-Ischemic
  2. 75% non-ischemic- VA 20/200 or better
  3. 25% ischemic- VA worse than 20/200
  4. Ischemic CRVO > 10 disc areas of retinal ischemia by fluorescein angiography
  5. Ischemic CRVOs are bad- 50% risk for NVI (100 day glaucoma)
- iv. Updates on management of RVO
  1. Anti-VEGF
  2. Steroids
  3. Laser
- c. Diabetic Retinopathy
  - i. Leading cause of blindness in USA adults- 4.1 million with DR. Overall prevalence of DR in the general population ~4%
  - ii. **Ischemia → VEGF upregulation → CME + neovascularization**
  - iii. Type 1 – first exam within 5 years of diagnosis
  - iv. Type 2 – first exam within 1<sup>st</sup> year of diagnosis. **1/5 have retinopathy at 1st exam**
  - v. Onset of gestational diabetes during pregnancy- No screening exam required
  - vi. Diabetic who plans / becomes pregnant. Screen prior to pregnancy or in first trimester. Screen in every trimester and 1 year post-partum
  - vii. Medical Management- Intensive Glycemic Control + BP control (DCCT, UKPDS)
    1. Reduces risk of newly diagnosed diabetic retinopathy
    2. Reduces progression of existing retinopathy
    3. 1 point reduction of A1c reduces risk of progression by 35%
  - viii. Updates on management in PDR/DME
    1. Anti-VEGF
    2. Steroids
    3. Focal laser

#### 4. PRP

#### d. Retinal Artery Macroaneurysm

- i. Acquired outpouching of (mainly) second order retinal arteriole
- ii. Typically
  1. 90% unilateral
  2. Usually at one of the first three bifurcations
  3. Usually superotemporal
- iii. Risks
  1. Female > Male
  2. > 60 yo
  3. HTN
  4. Heart Disease
  5. Hyperlipidemia
- iv. Prevention
  1. BP control
  2. Lipid control
- v. Majority will spontaneously regress
- vi. Management
  1. Anti-VEGF
  2. Laser
  3. Surgery

### III. Macular pathology: AMD and the great *Masqueraders!*

#### a. Update on Age Related Macular Degeneration

- i. Review of anti-VEGF and new medications
  1. Beovu
    - a. May last longer, not inferior to eylea
    - b. However cases have been reported of occlusive vasculitis with devastating irreversible visual loss
    - c. Still a role, but limited
  2. Vabysmo
    - a. Anti-VEGF and anti-ANG 2
    - b. Increased durability- May last longer than eylea up to 16 weeks
    - c. No cases of occlusive vasculitis
    - d. Also FDA approved for DME
- ii. Vitelliform Dystrophy
  1. Clinically mimics AMD
  2. Symptoms similar with blurry vision and metamorphopsia
  3. Anatomically hyperreflective material under RPE
  4. Close Observation recommended
  5. Can be associated with CNV, but incidence is very low
- iii. Central Serous Chorioretinopathy
  1. Ask a thorough history to include history of any steroid use, stress, caffeine intake, hormone therapy such as testosterone/estrogen, supplements
  2. Imaging- look for guttering on FAF
  3. Treatment modalities include

- a. Avoiding offending agent
- b. Focal laser for hot spots
- c. PDT- photodynamic therapy
- d. Oral medication such as eplerenone
- e. Anti-VEGF if associated with CNV (rare)

#### IV. Surgical Intervention

- a. Technological advancements- Heads up surgery
  - i. Set up for 3D surgery
  - ii. Benefits of using NGENUITY including ergonomics, better visualization and depth of field, educational tool
- b. Retinal Detachment
  - i. Retinal detachment → fluid in subretinal space and elevation of retina from RPE  
Rhegmatogenous, Exudative, Tractional, Proliferative vitreoretinopathy
  - ii. Tips for ID of RD on exam
    - 1. Low IOP (unless chronic- could have a/c inflammation from RPE fragments)
    - 2. +APD
    - 3. Anterior pigmented cell (Shafer's sign or tobacco dust)- focus behind the lens with narrow beam
    - 4. Retinal tear- start and end exam superiorly- most likely to have a tear near 12:00
    - 5. Chronic- pigmented demarcation line
    - 6. Indirect exam- Dynamic scleral depression
  - iii. Management of RD
    - 1. If focal tear laser → photocoagulation versus cryotherapy
    - 2. More extensive → surgery
    - 3. Acute operate within few days, if chronic within few weeks
    - 4. Surgery: pneumatic retinopexy, pars plana vitrectomy, scleral buckle
    - 5. Tamponade: gas or oil
    - 6. Post op considerations
      - a. Lens Feathering from vitrectomy and tamponade
      - b. Restrictions: ok to read and use the eye
      - c. Intraocular gas
      - d. Restrictions on travel/elevation due to risk of bubble expansion
      - e. Positioning
      - f. Watch IOP
- c. Macular hole
  - i. Most commonly occurs when adherent vitreous separating from macula (VMT).  
Less common direct blunt trauma
  - ii. If small-medium hole and duration <6 months, more likely to close with surgical intervention
  - iii. OCT Radial scans for imaging can clearly demonstrate full thickness hole
  - iv. Surgical intervention
  - v. Face down positioning
- d. Visually significant vitreous opacities
  - i. Surgical indications for vitrectomy for visually significant floaters
  - ii. Pseudophakia, PVD, symptoms for at least 6 months

- iii. Rule out uveitis, other mimickers
- iv. Some of the happiest patients after surgery. "Cloud is finally lifted"
- e. Intraocular lenses
  - i. Dislocated intraocular lenses becoming much more prevalent. Patients are now 20-50 years post cataract surgery presenting with dislocated IOL
  - ii. No clear consensus on the "best IOL" to place. Lot of great options depending on the clinical scenario
  - iii. NO to 1 piece IOL in sulcus
    - 1. Complications include CME, pigment dispersion/iris chaffing, UGH syndrome- uveitis/glaucoma/hyphema syndrome
  - iv. ACIOL- tried and true
    - 1. Newer lenses with excellent outcomes
    - 2. Great option for elderly population with conjunctival pathology/thin sclera where sutured IOL may not be ideal
    - 3. Avoid in advanced glaucoma or corneal endothelial pathology
  - v. Sutured IOL
    - 1. 4 point fixation allowing excellent centration, minimal tilt
    - 2. Ideal for aphakic patients with shallow AC or corneal pathology
    - 3. 25ga sclerotomies can also be used to perform simultaneous vitrectomy
    - 4. Sutured in place with goretex 5-0ePTFE 8K10 CV-8 suture (7-0 equivalent)