Common Posterior Segment Disease

Joshua Hedaya, M.D.
Partner, Retina Institute of California
Outline

- **Vitreous**
  - Posterior vitreous detachment
  - Vitreous hemorrhage
- **Vitreoretinal interface**
  - Rhegmatogenous retinal detachment
  - Vitreomacular traction
  - Epiretinal membrane
  - Macular hole
- **Retinal Vessels**
  - NPDR
  - PDR
  - Retinal artery occlusion
  - Retinal vein occlusion
- **RPE/Bruch’s membrane**
  - Nonexudative (dry) ARMD
  - Exudative (wet) ARMD
  - Central serous retinopathy
Format

- Presentation
- Differential Diagnosis
- Management
Vitreous

“I cook with wine, sometimes I even add it to food.”

—W.C. Fields
Posterior Vitreous Detachment

- **Presentation:**
  - “cobwebs”, “bugs”, “tadpole”, “a ring”
  - flashes (temporally located) - “especially when it’s dim”
  - blurred vision
  - opacities float within the vitreous as eye moves side to side
  - associated with age, high myopia, after CE/IOL (esp. with vit. loss), uveitis, and trauma
Differential diagnosis:

- vitritis
- migraine (flashlight in a zig-zag pattern, lasts 20 minutes, +/- headache)
- asteroid hyalosis
- certain types of cancer
Management:

- dilated exam with scleral depression
- RD precautions
- referral to retina specialist
- B-scan to r/o RD if hemorrhagic PVD
- repeat exam at 2 wks., 3 mos., and 6 mos.
Vitreous Hemorrhage

- Presentation:
  - sudden, painless loss of vision
  - black spots with flashing lights
  - h/o DM, HTN, trauma, wet ARMD, sickle cell disease, others
  - RBCs or frank blood visible behind lens
  - chronic VH may have yellow ochre appearance
Differential diagnosis:

- vitritis
  - onset typically much less sudden
  - look for cells in AC or keratic precipitates
- RD
Management:
- depends upon etiology
  - history and examination of contralateral eye
  - no scleral depression if h/o trauma
- B-scan
- FA (if possible)
- elevate HOB
- bilateral patching (very effective)
- no ASA, NSAIDs, etc.
- treat underlying cause once identified
- PPV for nonclearing VH (immediate - 6 mos.)
- PPV if necessary treatment cannot be accomplished through VH
Vitreoretinal Interface

“Wine is constant proof that God loves us and wants to see us happy.”

—Benjamin Franklin
Rhegmatogenous Retinal Detachment

**Presentation:**
- PVD-like symptoms + curtain/veil/shadow
- h/o high myopia, trauma, lattice degeneration, recent (complicated) cataract surgery
- Fhx of RD and/or h/o fellow eye RD
- pigmented cells in the anterior vitreous, VH, PVD
- retinal break (may not be readily visible in pseudophakes):
  - HST, atrophic hole, decompensated schisis cavity, dialysis, MH
- lower IOP in affected vs. contralateral eye
- **retinal elevation**
  - corrugated, opaque appearance
  - fixed folds
  - non-shifting SRF
- pigmented demarcation line in chronic RD
Complicated forms of RD
Differential diagnosis:

- retinoschisis
- chronic VH
- exudative/traction detachment
- choroidal detachment
- scleral folds (hypotony)
- tumor
- ARN (or other retinitis)
- PVD
Management:

- Stabilize: barrier laser retinopexy/cryotherapy
- Repair: surgery—PPV / SB / pneumatic retinopexy
- Observe
Vitreomacular Traction

- Presentation:
  - blurred central vision
  - distortion
  - aneisokonia
  - asymptomatic (VMA)
Differential diagnosis:

- CME
- DME
- ERM
- stage 1 MH
- subretinal disease (CNV/CSR)
Management:
- vitrectomy
- Jetrea
- observation

Depends on severity of symptoms (not OCT)!
Epiretinal Membrane

- **Presentation:**
  - blurred central vision
  - distortion
  - aneisokonia
  - most are asymptomatic
  - typically in middle-aged or elderly
  - 20% bilateral
- **Differential diagnosis:**
  - diabetic retinopathy (taut posterior hyaloid)
  - DME
  - CME

- **Associated disease?**
  - uveitis
  - retinal break/RD
  - PVD
  - after laser retinopexy/cryopexy
  - after surgery/trauma
  - retinal vascular disease
    - DM, HTN, RVO, etc.
  - idiopathic
❖ **Management:**

- vitrectomy
- observation
- treat underlying disorder
Macular Hole

- Presentation:
  - decreased central vision
  - distortion
  - central scotoma
  - more common in women
  - 6th–8th decade
  - 10% bilateral
Differential diagnosis:

- pseudohole
- CME/DME
- solar retinopathy
- lamellar hole
- subfoveal drusen
- CSR
- adult-vitelliform foveomacular vitelliform dystrophy
- stage 1
  - impending hole
- stage 2
  - full-thickness break
  - <400µm
- stage 3
  - vitreous detached over macula
  - ≥400µm;
- stage 4
  - stage 3 + complete PVD
Management:
- vitrectomy
- observation
- Jetrea
Retinal Vessels

“We are all mortal until the first kiss and the second glass of wine.”

—Eduardo Galeano
Nonproliferative Diabetic Retinopathy

- Presentation:
  - blurred vision (if CSME)
  - known DM, but ODs, MDs are sometimes first to diagnose
  - often asymptomatic
- Mild NPDR
- Dot-and-blot hemes
- Microaneurysms
- Hard exudates
- Moderate NPDR:
- Mild NPDR + CWS, venous beading, moderate CNP
- Severe NPDR (4:2:1 rule)
- 4 quadrants DBH
- 2 quadrants venous beading
- 1 quadrant intraretinal microvascular abnormalities (IRMA)
Widefield fluorescein angiography
Differential diagnosis:
- HTN retinopathy
- RVO
- OIS
- radiation retinopathy
- other causes of retinal bleeding
  - valsalva retinopathy
  - Terson’s syndrome
  - hematological/oncological
  - HIV retinopathy
- etc.
Clinically significant macular edema (CSME):

- thickening within 500µm of the center of the macula
- hard exudate within 500µm of the center of the macula if adjacent thickening
- thickening within 1DD of center of macula if at least 1DD in size

Imaging DR

DME but not CSME = “subclinical”

VA = 20/20
Management:

- Referral to PMD if not previously diagnosed with DM
- Check BP
- CSME treated with:
  - anti-VEGF
  - steroids
  - focal laser
- PRP (if severe ischemia)

NAVILAS
Proliferative Diabetic Retinopathy

- **Presentation:**
  - decreased vision (VH, CSME, ischemic maculopathy)
  - occasionally asymptomatic
  - NVD, NVE, NVI/NVA
  - bilateral, can be asymmetric
  - order carotid doppler US to r/o occlusion
Differential diagnosis:
- NV from RVO
- sickle cell retinopathy
- sarcoidosis
- OIS
- radiation retinopathy
● Management:
  ● PRP
  ● anti-VEGF injections
  ● PPV/TRD repair
Retinal Artery Occlusion

**Presentation:**

**CRAO:**
- unilateral, painless, acute vision loss
- h/o amaurosis fugax
- marked APD
- whitening of the superficial retina with cherry red spot
- box-carrying in arterioles
- CF-LP

**BRAO:**
- unilateral, painless, acute partial vision loss
Differential diagnosis:
- acute ophthalmic artery occlusion
  - no cherry red spot
  - vision LP/NLP
- Tay–Sachs or other storage disease
  - presents early in life
- Inadvertant intraocular injection of gentamicin

Etiology
- embolus
- thrombosis
- GCA
- CVD (SLE, PAN, etc.)
- hypercoagulable state
- trauma
● Management:
  ● time frame: within 90-120 minutes
  ● AC paracentesis
  ● ocular massage
  ● diamox or topical beta-blocker
  ● refer to internist for complete work-up
  ● repeat exam in 1-4 wks. to check for NVI/NVD
    ● 20% at 4 wks. (CRAO)
  ● PRP
Retinal Vein Occlusion

- **Presentation:**
  - painless, unilateral loss of vision
  - diffuse retinal hemorrhages
    - “blood and thunder”
  - tortuous vessels
  - disc edema and heme, CWS, optociliary shunt vessels on disc
  - NVD/NVE/NVI
  - h/o HTN
Etiology

CRVO

HTN

ONH edema

glaucoma

optic disc drusen

hypercoagulable state

drugs (OCPs, diuretics)

orbital tumor

vasculitis

BRVO

HTN (compression at AV crossing)
Figure 2. 15 days after unilateral intravitreal injections of ramucirumab (Lucentis) in the left eye, optical coherence tomography demonstrates regression of the neovascular complex in the right eye (fellow eye) and partial fluid absorption of the left eye (treated eye); there was improvement of vision in both eyes.
Differential diagnosis:

- OIS
- DR
- papilledema
- radiation retinopathy
- HTN retinopathy
Management:

- FA to determine extent of ischemia
- Systemic work-up (if under 50 yrs. or unusual presentation)
- Treat underlying disease
- Gonioscopy
- PRP if NV develops
- Steroids, anti-VEGF injections, and FLT to treat associated CME
RPE/Bruch’s membrane

“his lips drink water
but his heart drinks wine”

— e e cummings
Nonexudative (Dry) ARMD

- **Presentation:**
  - gradual loss of central vision
  - Amsler grid changes
  - may be asymptomatic
  - drusen, RPE clumping/atrophy
  - GA
  - bilateral (may be asymmetric)
Differential diagnosis:

- peripheral drusen
- myopic degeneration (no drusen)
- resolved CSCR
- retinal dystrophies
- toxic retinopathies
**Management:**

- AREDS2 vitamins
- Amsler grid monitoring
- low vision aids
- biannual examination (more frequently if monocular, unreliable, or confluent/extensive drusen)
- genetic testing (MaculaRisk, RetnaGene, etc.)
- implantable miniature telescope (IMT)
Figure 3. The IMT is implanted in place of the eye’s lens to help improve vision.
Subretinal Stem Cell Delivery Surgery
Exudative (Wet) ARMD

- **Presentation:**
  - distortion
  - rapid onset of visual loss
  - central/paracentral blind spot
  - drusen with CNVM (grayish/greenish membrane)
  - RPE detachment
  - hemorrhage (vitreous/retinal/subretinal)
  - lipid exudate
Risk factors for loss of vision:

- age
- family history
- soft drusen
- focal pigment clumping
- RPE detachments
- smoking
- HTN
- obesity
- high cholesterol
Wet AMD, note elevation of retina and abnormal membrane under retina
Differential diagnosis:
- any condition associated with CNV
  - POHS
  - angioid streaks
  - high myopia
  - PCV
  - traumatic choroidal rupture
  - idiopathic
  - tumors, laser scars, ONH drusen, others
Management:
- anti-VEGF agents
- bevacizumab (Avastin)
- ranibizumab (Lucentis)
- aflibercept (Eylea)
- PDT (“cold” laser)
- “hot” laser
- observation
- surgery for severe submacular hemorrhage
Central Serous Retinopathy

- **Presentation:**
  - unilateral blurred/dim vision
  - distortion
  - micropsia
  - “washed out” color vision
  - central scotoma
  - men>women
  - 25–50 yrs.
Differential diagnosis:

- ARMD
- optic pit
- RRD
- choroidal tumor
- PED
Management:

- ask about steroids (oral, skin creams, nasal sprays, etc.)

- in severe bilateral disease, look for endogenous source of increased cortisol

- observation

- intervention:
  - focal laser
  - reduced-fluence PDT
  - oral anti-aldosterone agents (epleronone, spironolactone, others)
“It is much more important to know what sort of a patient has a disease than what sort of a disease a patient has.”

-William Osler
Thank you!