Central Serous Retinal Detachment as a Presenting Sign of Adult Lymphocytic Leukemia

Abstract: An initial presentation of a central serous retinal detachment with optic disc hemorrhages and cotton wool spots at follow up call for prompt blood work and lead to a diagnosis of adult lymphocytic leukemia.

Outline:
1. Case History
   • 51 year old African American Male
   • C/o sudden decrease in vision OD 7/18/2016
     – Complains of vision in the right eye suddenly becoming “dull” this weekend
     – Started to see a green blob centrally
     – No regression or progression since the weekend
     – Denies associated pain
   • Ocular History:
     – Lattice Degeneration s/p Laser Retinopexy
       ▪ 2010 OD, 2012 OS, 2013 OD
     – Peripheral Dot Blot Hemorrhages OU
       ▪ Suspect vitreo-retinal traction
     – Glaucoma Suspect OU
       ▪ Monitor without treatment
     – Keratoconous Suspect OS>OD
       ▪ H/o RGP wear, monitor without treatment
     – No Ocular Family History
   • Medical History
     – Eczema on scalp
       ▪ Clobetasol Propionate 0.05% topical solution
     – Schizoaffective Disorder
       ▪ Fluoxetine (Prozac), Olanzapine
     – Vitamin D Deficiency
       ▪ Vit D 1,000IU BID PO
     – Hyperlipidemia
       ▪ Atorvastatin
     – Hypertension
       ▪ HTC, Amlodipine, Losartan

2A. Pertinent Findings – INITIAL PRESENTATION
   • VAcc OD 20/400 PH 20/50, 20/25+ OS
   • EOMs, Pupils, CVF, Cover Test WNL
   • Manifest Refraction:
     – BCVA 20/50 OD, 20/20-2 OS
   • Slit Lamp: WNL
   • Tonometry: 10 mmHg OD, 10 mmHg OS
   • ONH: 0.70H/0.75V, pink NRR, sup and inf thinning OD, 0.80H/0.85V, pink NRR, sup and inf thinning OS,
   • (-)NVD/edema OU
   • Macula: swelling temporal to ONH (3DDx2DD), trace drusen OD, WNL (-)CSME OD
   • Posterior Pole: swelling temporal to ONH, trace druse OD, trace drusen OS, (-)NVE OU
   • Vessels: elevated course over area of swelling, mild tortuosity OD, mild toruosity OS
   • Vitreous: syneresis, (-)-heme/tobacco dust OU
Periphery: superior and inferior laser scars OD, inf laser scars, sup lattice w/o holes, sup WWOP

Images
  – Spectralis fundus OD, OS
  – Spectralis macular OCT OD, OS

3A. Differential Diagnosis

Diabetic Macular Edema
  – Pt is not diabetic, size of edema is not characteristic, no h/MA

CRVO/BRVO
  – Pt is hypertensive, but no hemorrhages

CNVM
  – Pt is African American so low suspicion for AMD
  – No retinal hemorrhage hemorrhage, no net on OCT
  – No angioid streaks or laquer cracks
    ▪ PEPSI Choroidopathies -- NO
    ▪ Degenerative Myopia – NO

Central Serous Retinopathy OD
  – Most likely diagnosis based on unremarkable systemic history and (+)steroid use
  – (+): topical steroid use, no other retinal findings
  – (-): age, relaxed patient personality
  – Referred to CLE Optom/Retina for evaluation and treatment

2B. Pertinent Findings – FOLLOW UP

• 7/28/2016 Retina consult
• Stable symptoms: purple circle while watching TV in the right eye
• New symptoms after further prompting:
  – Reports episode of dizziness and shortness of breath resulting in vomiting on Saturday after swimming outside
  – Lost 9 pounds in the past month
• VAcc 20/30 PH NI OD, 20/25 OS
  – Was 20/400 PH 20/50 OD, 20/25 OS at initial
• EOMs, Pupils WNL
• Slit Lamp: WNL
• Tonometry: 12mmHg OD, 14 mmHg OS
• ONH: 0.70h/v with **temporal disc hemorrhage** OD, 0.70h/v, temporal sloping with **in inferior disc hemorrhage** OS
• Macula: glinting, no edema visible, resolved without treatment OD, clear OS
• Posterior Pole: few CWS superior nasal to disc OD, 1 large CWS inferior, CWS inferior nasal to disc with adjacent DBH OS
• Vessels: moderate tortuosity OU
• Vitreous: syneresis OU
• Periphery: superior and inferior laser scars OD, inf laser scars, sup lattice without holes, superior WWOP OS

• Images
  – Spectralis Macular Oct
  – Fundus Photos OD, OS
  – Unremarkable FANG Photos OD, OS

3B. Differential Diagnosis

• HIV Retinopathy
  – Although associated with CWS, not usually associated with disc hemorrhages
No known history

- Normal Tension Glaucoma
  - Although associated with disc hemorrhages, not usually associated with CWS
  - Glaucoma Suspect status evaluated in February and considered stable
- Diabetic Retinopathy
  - Patient is not diabetic
  - No intraretinal hemorrhages, not usual presentation of diabetic retinopathy
- Hypertensive Retinopathy
  - Pt is a treated hypertensive
  - No intraretinal hemorrhages, not usual presentation of hypertensive retinopathy
- Combination of Etiologies?
  - Ex: HIV to account for CWS + NTG to account for disc hemorrhages
  - Possible, but more likely a diagnosis of exclusion

Presumed Hyperviscosity Syndrome
- Most likely diagnosis based on retinal findings and generally unremarkable systemic history
- Retinal ischemia and hemorrhage may result from changes in blood viscosity and flow
- Concern for impending critical systemic complications
- Order blood work STAT

3C. Follow Up Continued

- Blood Tests
  - Complete Blood Count (CBC) – WBC Count is 165,000! (should be 3.5-11)
  - Erythrocyte Sedimentation Rate (ESR) - WNL
  - Basic Metabolic Panel (BMP) - WNL
  - Hepatic Panel – WNL
  - Urinalysis – WNL/negative
  - Urine Toxicity - negative
  - Anti-Nuclear Antibody (ANA) - negative
  - C-Reactive Protein (CRP) – also elevated to 30.30 (should be 0-10)
- Interpretation of WBC:
  - “Normocytic hypochromic anemia with polychromasia. Thrombocytopenia Marked leukocytosis and lymphocytosis with 2 populations of abnormal lymphocytes one small with cleaved nuclei and one large with pleomorphic convoluted nuclei. Granulocytes are almost absent. No blasts observed. BONE MARROW BIOPSY IS RECOMMENDED.”
- Pt admitted to hospital after consulting with hematology and oncology
  - Based on outcome of bloodwork and severely elevated WBC count
  - Hematology/Oncology to perform bone marrow biopsy to confirm suspected diagnosis of Leukemia
    - Confirmed “pre-B cell ALL” with tumor lysis syndrome
  - “CT chest/Abd/Pelvis - Enlarged axillary and mediastinal lymph nodes are suspicious for lymphoproliferative disorder. Large spleen. Enlarged abdominal pelvic lymph nodes.”
  - Chemotherapy initiated August 5th for 14 day course

- Pt discharged from hospital 8/23 with WBC 5.26!
  - “Set up return for cycle 2” of chemotherapy

4. Diagnosis, Discussion and Treatment

- Adult Lymphocytic Leukemia
  - Characterized by an increase in immature white blood cells (lymphocytes) in bone marrow, peripheral blood, and extramedullary sites (outside the spinal cord)
    - Lymphocytes are produced by the bone marrow
    - Excess number of cells being produced cause an excess number in the blood
    - This interferes with blood flow and normal cellular function
– Common symptoms are fatigue, lack of energy, dyspnea, dizziness, bleeding, easy bruising, and infections
– It is the most commonly diagnosed childhood acute leukemia, but can also affect adults
– Prognosis based on immunophenotype
  • All WBCs come from either B or T cell lineage
  • Plus or minus certain antigens
  • Plus or minus Philadelphia Chromosome
    o Genetic marker for leukemia
    o Worst prognosis
    o Ex: “Ph-negative pre B cell ALL”
    o Image to elaborate on lineage
  • 75% of adults diagnosed with ALL have a 25% chance of disease-free survival (DFS)
    • Adverse prognostic features include older age, leukocytosis, delayed response to therapy, cytogenic abnormalities, and immunophenotype
  • Treatment includes chemotherapy (vincristine) plus corticosteroids initially
    • Goal is rapid restoration of hematopoiesis = normal formation and development of blood cells
    • Phases of treatment are induction, consolidation, intensification, and maintenance
    • GOAL = Achieve “CR” (complete remission)

• Tumor Lysis Syndrome
  o Metabolic complications from excessive number of cells in the blood
  o Responsible for acute symptoms such as nausea and vomiting

• Leukemic Retinopathy
  – Retinopathy occurs due to direct infiltration of ocular structures or from changes in blood consistency and flow
  – Occlusion of the retinal vascular results in hemes, ischemic CWS, and serous leakage
  – SRD develops when the excess cells infiltrate the choroid and disrupt the RPE
  – Occurs in 90% of patients with Leukemia, but fundus findings are often preceded by a diagnosis
  – Typical signs are flame hemorrhages with white centers (Roth Spots), intraretinal hemorrhages, cotton wool spots, and vascular sheathing
  – Vitreous hemorrhage, CRVO/BRVO, retinal venous tortuosity
  – Serous retinal detachments have been documented in several cases:
    • Younger patients with ALL
    • A presenting sign that led to a diagnosis of ALL
    • FANG can differentiate from Central Serous Choroidopathy
  • Any Hyperviscosity or Hypercoaguable condition can manifest similar ocular findings
    – Hyperviscosity Testing: CBC, CMP, Serum Viscosity, Total Protein – Albumin
  • Treating the systemic condition can improve vision but ultimately systemic health is main priority

6. Conclusion
• Sometimes “think unicorns”
  – Investigation for hematological abnormalities may be warranted when retinal vascular changes are observed without known systemic causes
• Use the tools at your disposal to aid in your diagnosis
  – OCT, EDI, FANG, ICG
  – Order blood tests

7. References