Pumped Up Retina: Persistent Pre-macular Cavity Secondary to Valsalva Retinopathy

Abstract:
Valsalva retinopathy occurs secondary to sudden increased intrathoracic pressure that is transmitted to the eye resulting in a pre-macular sub-ILM hemorrhage. The following case illustrates persistent pre-macular cavity evident on OCT following resolution of hemorrhage.

I. Case History
• A 14 year old white male presented for retinal evaluation with a chief complaint of sudden onset, moderate decreased vision and new floaters in both eyes following an episode of syncope while weight lifting with extreme strain four days prior to examination. The patient denied photopsias. The patient denied blunt trauma to the head as he was caught by his coach during the vasovagal episode. The patient’s ocular history was unremarkable with a history of corrective lenses for low myopic refractive error. The patient’s medical history was unremarkable with the exception of a broken thumb from weight lifting one week prior to examination. The patient denied use of systemic medications, vitamins, or supplements, and reported no known drug allergies.

II. Pertinent findings
• Initial Examination (04/02/14)
  o BCVA: 20/25 OD, 20/25 OS
  o Pupils: PERRL, (-)RAPD, EOM: Full OU, Confrontation Fields: FTFC
  o BP: 117/60 mmHg
  o SLE: Unremarkable
  o IOP: 15 mmHg OD, 18 mmHg OS
  o DFE: Vitreous hemorrhage inferior to the macula OU, dense pre-macular hemorrhage superior to the fovea OU
  o Color Fundus Photos OU
  o Macula OCT OU
    • OU: Convex dome-shaped, sub-ILM hyporeflective space consistent with hemorrhage located superior to fovea
  o **Assessment:** Valsalva retinopathy with vitreous hemorrhage OU
  o **Plan:** Observe for vitreous hemorrhage clearance. Sleep with head in elevated position. Avoid straining.
• Follow-up Visit (04/25/14)
  o BCVA: 20/25 OD, 20/25 OS
  o DFE: Dehemoglobinized inferior vitreous hemorrhage OU
  o **Assessment:** Valsalva retinopathy with resolving vitreous hemorrhage OU
  o **Plan:** Continue to observe.
• Follow-up Visit (05/23/14)
  o BCVA: 20/30+1 OD, 20/30+1 OS
  o DFE: Residual dehemoglobinized inferior vitreous hemorrhage OU; mild striae within macula OD
Macula OCT OU
- OD: elevated ILM unsealed from underlying retinal layers
- OS: normal foveal contour, all retinal layers in tact

Assessment: Valsalva retinopathy with resolving vitreous hemorrhage OU with slight decrease in vision OD
Plan: Continue to observe.

Follow-up Visit (08/08/14)
- BCVA: 20/40 OD, 20/25 OS
- DFE: Residual dehemoglobinized inferior vitreous hemorrhage OU, mild striae within macula OD
- Macula OCT
  - OD: elevated ILM unsealed from underlying retinal layers
  - OS: normal foveal contour, all retinal layers in tact
- Assessment: Valsalva retinopathy with resolving vitreous hemorrhage OU, with mild decrease in vision OD
Plan: Continue to observe.

III. Differential diagnosis
- The leading diagnosis for this patient based on presentation and history was valsalva retinopathy OU. Differential diagnoses included diabetic retinopathy, hypertensive retinopathy, posterior vitreous detachment, CRVO, BRVO, anemia, leukemia, or sickle cell retinopathy.

IV. Diagnosis and discussion
- Valsalva retinopathy is characterized by sudden, painless loss of vision following an episode of Valsalva maneuver. Valsalva maneuver is a forceful attempted exhalation against a closed airway and is associated with significant physical strain such as with forceful coughing, sneezing, strenuous exertion, emesis, sexual intercourse, or tenesmus. Valsalva retinopathy occurs secondary to sudden increased intrathoracic or intra-abdominal pressure that is transmitted to the eye. The rapid increase in intraocular venous pressure can cause rupture of the perifoveal capillaries resulting in a sub-ILM hemorrhage at the macula. Valsalva retinopathy classically presents as a solitary well-circumscribed premacular hemorrhage that can be unilateral or bilateral.

V. Treatment, management
- Treatment generally involves observation as hemorrhage usually is self-limiting over weeks to months. Visual prognosis is excellent. However if a large sub-ILM hemorrhage persists, a Nd:YAG laser can be directed at the ILM interface to drain the blood away from the visual axis to hasten recovery. Complications of surgical intervention with Nd:YAG laser membranotomy include epiretinal membrane, macular hole, retinal detachment, and persistent premacular cavity. As illustrated in this case, the ILM can remain unsealed from the underlying retinal layers even after the sub-ILM hemorrhage clears. OCT is useful in highlighting the structural changes with persistent premacular cavity, namely mild ILM contraction and loss of foveal contour, which can cause mildly reduced visual acuity.
VI. Conclusion

• OCT has played a pivotal role in understanding the location of premacular hemorrhages associated with valsalva retinopathy. Although the visual prognosis for valsalva retinopathy is excellent, this case illustrates persistent structural changes to the macula in the form of a premacular cavity. Persistent premacular cavity confirmed by OCT has previously been reported in the literature following valsalva retinopathy. This case gives further structural evidence of this unique disease process.


