Commotio Retinae and Spectral-Domain Optical Coherence Tomography Associated Changes

Jessica Mai, O.D.
Nina Tran, O.D.
Michelle Matson, O.D.
VA Southern Nevada HCS

Abstract: A patient with acute blunt ocular trauma presents with commotio retinae at the macula. Spectral-Domain Optical Coherence Tomography (SD-OCT) images document transient alterations of the retinal layers from onset to gradual resolution of the condition.

I. Case History
- Patient demographics: 66 year old Asian male
- Chief complaint: blurred vision OS
- Ocular history
  - Blunt trauma from a tree stump OS
- Medical history
  - Diabetes mellitus
  - Hypertension
  - Hyperlipidemia
  - Gastroesophageal reflux disease
  - Prostate cancer
  - Posttraumatic stress disorder
  - Depression
- Medications
  - Atorvastatin
  - Citalopram
  - Lisinopril
  - Metformin
  - Omeprazole
  - Sildenafil
  - Zolpidem

II. Pertinent Findings
- Clinical
  - VA: OD 20/30, OS 20/80
  - Conjunctival edema and subconjunctival hemorrhage OS
  - Traumatic iritis OS
  - Posterior vitreous detachment OS
  - Commotio retinae at the macula OS
- Physical
  - Left periorbital contusion
  - Left upper eyelid laceration
- Other
  - Macula SD-OCT: OCT demonstrates hyperreflective thickening of the inner segment-outer segment (IS/OS) junction immediately following trauma, which leads to the development of irregular retinal pigment epithelial (RPE) and outer photoreceptor segment layers with disruption of the IS/OS junction. Follow up images reveal the
eventual reappearance of the hyporeflective optical space and an improvement of visual acuity OS to 20/20.
  o Fundus photos: Serial photos document commotio retinæ at the time of trauma and its subsequent resolution.
  o CT of head and face: Unremarkable, except for swelling overlying the left frontal bone.

III. Differential diagnosis
  • Primary: commotio retinæ
  • Others: retinal detachment, branch retinal artery occlusion, white without pressure, myelinated nerve fiber layer

IV. Diagnosis and discussion
  • Commotio retinæ resulting from blunt ocular trauma can be correlated to changes in the RPE and photoreceptor layers as seen on SD-OCT imaging.
  • Commotio retinæ is a retinal opacity that develops opposite to the site of coup injury.
  • Acute traumatic maculopathy with characteristic retinal opacification is referred to as Berlin’s edema.
  • Histological studies suggest retinal opacification is secondary to intracellular edema of the Müller, RPE, nerve fiber, and photoreceptor cells. The major site of injury is likely at the junction of the photoreceptor outer segment and RPE.

V. Treatment, management
  • Commotio retinæ is self-resolving and requires no treatment. Follow up should be in one to two weeks to monitor for resolution.
  • Gonioscopy should be done to rule out angle recession.
  • IS/OS and RPE abnormalities are not observed in all cases; however, those with changes demonstrate resolution on follow up images.
  • Mild cases of commotio retinæ show transient hyperreflectivity of the outer retina, which is associated with good visual outcome.
  • Traumatic iritis is managed with topical cycloplegics and topical corticosteroids.
  • Bibliography

VI. Conclusion
  • Patients with commotio retinæ should have documented fundus photos and macula OCT imaging performed. Serial scans display a pattern of changes in the retinal layers that correspond with the gradual resolution of commotio retinæ.