Review of pathophysiology and treatment options for vitreomacular traction including injection of ocriplasmin and vitreoretinal surgery.

Abstract:

The review and discussion of pathophysiology and treatment in vitreomacular traction during posterior vitreous detachment. Review of a patient with a visually significant epiretinal membrane in one eye and partial thickness macular hole in the other.

Case Report:

I. Case History

- 70 year old white male
- Blurred vision which was slightly worse than years before
- Primary Open Angle Glaucoma, Diabetic with history of CSME and treatment with Focal Laser in both eyes
- Current Medications:
  - Travatan Z
  - Diltiazem
  - Lorsartan
  - Prevastatin
  - Aspirin
  - Liraglutide
  - Testosterone
- Metabolic Syndrome: Diabetes for more than 20 years which is under poor control (last A1C 8.4 on 7/8/14); Hypertension; Hypercholesterolemia
- Coronary Artery Disease
- Chronic Renal Failure

II. Pertinent findings

- BCVA 20/20- and 20/70-
- Cataracts equal in both eyes: 2+ Nuclear Sclerosis, 1+ Cortical, Trace Posterior Subcapsular
- POAG:
  - IOP OD: 13, OS: 14
  - Stable Optic Nerve Head OCT and Fundoscopy in both eyes
  - C/D Ratio: 0.75 round in right eye/ 0.70 round in left eye
- Right eye: Vitreomacular adhesion with partial thickness hole seen on fundus photos and OCT, Mild NPDR, Partial PVD
- Left Eye: Focal laser scar in fovea of left eye causing decreased acuity; Significant epiretinal membrane and striae seen on fundus photos and OCT, Mild NPDR, Complete PVD

III. Diagnosis and discussion

- Right eye
  - Vitreomacular traction with partial thickness hole
- Partial Posterior Vitreous Detachment
- Mild Non-Proliferative Diabetic Retinopathy
- History of focal laser near macula due to Clinically Significant Macular Edema
- Stable Primary Open Angle Glaucoma

Left Eye
- Visually significant Epiretinal Membrane
- History of focal laser in fovea due to Clinically Significant Macular Edema
- Mild Non-Proliferative Diabetic Retinopathy
- Complete Posterior Vitreous Detachment
- Stable Primary Open Angle Glaucoma

### IV. Treatment, management

- Referral to retinal specialist for evaluation
- Possible treatment
  - Ocriplasmin injection in the right eye to decrease vitreomacular traction in the patient's better eye
    - After ocriplasmin injection 26.5% of patients had resolution of vitreomacular traction at 28 days (compared to 10.1% of placebo patients)\(^5\)
    - After ocriplasmin injection 17.7% of patients required vitrectomy to resolve vitreomacular traction (compared to 26.6% of placebo patients)\(^5\)
    - After ocriplasmin injection 40.6% of patients had closure of macular hole at 28 days (compared to 10.6% of placebo patients)\(^5\)
  - Epiretinal Membrane Peel in the left eye
    - Complications include cataract formation, retinal tear, retinal detachment, intraocular hemorrhaging, postoperative inflammation, or endophthalmitis\(^6\)
  - Monitor both epiretinal membrane and vitreomacular traction until ready for treatment

**Conclusion:**

The vitreous attaches to the retina in four areas. These attachments, in the order of attachment strength, are at the vitreous base, optic nerve head, macula, and the retina vessels. Over time the vitreous condenses and becomes less viscous in a natural aging process known as vitreous syneresis. The syneresis and collapsing of the vitreous is a process named a posterior vitreous detachment. As this happens, the vitreous starts to pull away at the retinal attachments. In certain individuals, the vitreomacular adhesion can have more strength which can cause visual disturbances as the vitreous pulls away from the retina.

In most individuals, this traction resolves without sequelae while in others it can cause visual disturbances. When vitreomacular traction spontaneously releases, it can also start the fibrocellular proliferation of glial cells at the level above the internal limiting membrane\(^2\). After this proliferation begins, it can develop an epiretinal membrane. Depending on the severity of the proliferation, it can become visually significant to the patient. Symptoms can include visual blur, photopsia, and metamorphopsia\(^4\). There are three potential treatment options for vitreomacular traction, the selection of which is determined on the severity of traction and the patient's acuity and symptoms. These
treatments consist of monitoring for possible spontaneous resolution, pars plana vitrectomy, or injection with Ocriplasmin.

In other instances the traction can pull on the retina and form a macular hole. These macular holes are categorized into four stages. Ocular coherence tomography is the easiest and least intrusive way to determine the stage and potential visual outcome of treatment\(^1\). The different stages of retinal holes and their treatment will be discussed in this report.

While some cases of mild vitreomacular traction can spontaneously resolve, others may continue to progress and need a vitrectomy and macular hole closure. Possible side effects of a vitrectomy may include retinal tear or detachment, inflammation, infection, or progression of cataracts. The relatively new treatment using injection of Ocriplasmin can aid in the release of vitreomacular traction with much less risk compared to a more invasive pars plana vitrectomy\(^5\).

References: