The Use of OCT in the Diagnosis of Vitreopapillary Traction Associated with Visual Field Loss

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Abstract
Vitreopapillary traction may cause physical damage that can mimic glaucomatous damage. Optical coherence tomography is an invaluable tool for diagnosis and differentiating between these two conditions.

I. Case History
An 84 year old white male K.T. came in to the Veterans Affairs (VA) eye clinic wanting new bifocals with no changes to distance or near vision. Ocular history included pseudophakia in both eyes (OU), corneal gutatta OU, and he was a low risk glaucoma suspect based on to disc asymmetry and a visual field defect in the left eye. Humphrey visual field central 30-2 threshold testing done previously revealed a superior arcuate defect OS and a full visual field OD. Intraocular pressures had been in the mid-teens, average corneal thickness of 606 microns right eye (OD) and 607 microns left eye (OS) with no family history of glaucoma, trauma, pigment dispersion syndrome or pseudoexfoliation. Spectralis optical coherence tomography (OCT) of the retinal nerve fiber layer (RNFL) previously had borderline superior temporal thinning OD, and the OS scan was unreliable.

K.T. had no known drug allergies. His medical history was significant for Type II diabetes mellitus for seven years with last Ha1C of 5.9%. He also suffered from hyperlipidemia, arthritis, hypertension, hypertrophy of prostate and colonic polyps. The patient current medication list included bisacodyl, colon electrolyte lavage, ferrous SO4, gabapentin, glipizide, lisinopril, metformin, niacin, omeprazole, sildenafil citrate, simvastatin, aspirin, and vitamin B.

II. Pertinent Findings
The patient’s best-corrected visual acuities (BCVA) were 20/40 in the right eye (OD) and 20/30 in the left eye (OS). Pupils were equal and round with no afferent pupillary defect. Ocular motility and confrontation fields were within normal limits. Slit-lamp evaluation showed 3+ gutatta OU with mild superior edema, contributing to decreased BCVA, and open anterior chamber angles. Intraocular pressure using Goldmann tonometry was 16mmHg in both eyes (OU). Dilated fundus exam showed mild posterior capsular opacification behind the lens implants in both eyes. Disc margins were distinct OD and blurred nasally OS. Cup/disc ratio was 0.20 round OD, 0.35 round OS with two dot hemes close to the superior
nasal rim. Rim tissue was healthy and pink in each eye and macula was clear and flat OU. There was no diabetic retinopathy and no holes, tears, and detachments in both eyes.

Spectralis OCT of the macula illustrated flat, normal anatomical structures OU, OCT RNFL circle scan was within normal limits in all quadrants OD, and showed irregular changes OS. More imaging with section shots on the OCT found peripapillary traction, more significant nasally, with cystic spaces and no sub-retinal fluid as seen in Figure 1.

III. Differential Diagnosis

The primary diagnosis was vitreopapillary traction OS due to clinical findings and confirmed with OCT imaging. Other differentials associated with an arcuate scotoma included glaucoma, congenital optic nerve coloboma, papillitis, and drusen of the optic nerve.

IV. Discussion

Vitreopapillary traction occurs when the posterior face of the vitreous is strongly attached to the optic nerve head during an incomplete posterior vitreous detachment. The mechanical shearing force of the traction can cause damage to the papillomacular bundle, decrease axoplasmatic flow and reduce perfusion in the posterior ciliary arteries. Traction can also cause intra and peripapillary hemorrhages around the disc area, which are found to be self-resolving with no increased association with retinal breaks or detachment. Prolonged vitreopapillary traction can eventually impact a patient’s visual field, causing non-specific field defects. Large visual field defects caused by traction are rarely reported, but should be ruled out. Namura described a case of an inferior altitudinal defect from vitreopapillary traction that was stable after one year of testing. In diabetics, the posterior vitreous is especially cohesive to the optic disc and traction is most often located on the nasal side.

Patient K.T. was followed as a glaucoma suspect secondary to disc asymmetry and a superior drance heme OS since his first eye exam at the VA in 2008. The visual field in 2011 revealed a superior arcuate defect not corresponding to disc appearance. The dot hemes at the disc...
margin seen at his most recent exam were also more likely from traction than diabetic retinopathy. The drance heme in 2008 possibly indicated the presence of traction dating longer than one year. However, it was the most recent OCT imaging which confirmed the diagnosis and the evidence was compelling enough to suggest that the visual field defect corresponded to the traction rather than glaucomatous damage.

V. Treatment/Management

Pars plana vitrectomy is the preferred surgical procedure which alleviates the mechanical force on optic nerve fibers, preventing potential optic neuropathy in patients who have vitreopapillary traction. Studies showed patients treated with vitrectomy have increased visual acuity and improved VEP latency and amplitude. Visual fields also remained stable after the surgery. K.T. was referred to a retina specialist and since his condition was stable and central vision not affected, the specialist elected to monitor the condition. The patient will be followed in 6 months for a dilated exam, visual field and an OCT.

VI. Conclusion

OCT imaging is a valuable tool in diagnosing vitreopapillary traction. In this case, it served to rule out glaucoma and the need for unnecessary glaucoma medication. The orientation of the OCT section was also important; a single linear section through the nerve revealed a more useful image of the traction, whereas previously, the circumferential sections taken were deemed unreliable. The superior arcuate defect warranted further investigation and if repeatable, may have spurred some practitioners to start glaucoma treatment. The suspicion of glaucoma has diminished for this patient since his visual field defect is consistent with the vitreopapillary traction.

References


