
Occult Hypotony Maculopathy Diagnosed With Optical Coherence Tomography

Three patients with hypotony had decreased vision and normal ocular examination results. Evaluation of the macula by optical coherence tomography (OCT) demonstrated hypotony maculopathy, which resolved after increasing the intraocular pressure (IOP). Several weeks after normalization of intraocular pressure, OCT showed resolution of folds in the neurosensory retina and choroid. The anatomic resolution corresponded well with the clinical findings of an increase in IOP and improved visual acuity. Optical coherence tomography is a valuable tool for diagnosing hypotony maculopathy and assessing restoration of normal anatomy following appropriate treatment to raise the IOP.

Optical coherence tomography (Zeiss Meditec, Dublin, Calif) has been shown to be helpful in diagnosing a variety of retinal conditions, including cystoid macular edema, macular hole, epiretinal membrane, and diabetic macular edema.1 We report 3 cases of hypotony maculopathy diagnosed using OCT that was not seen clinically as well as resolution of the maculopathy after the IOP was normalized.

Report of Cases. Case 1. A 61-year-old non-Hispanic white woman with normal-tension glaucoma underwent combined phacoemulsification cataract extraction with intraocular lens implantation and trabeculectomy with mitomycin C in the right eye. The IOP remained in the 2- to 3-mm Hg range for 2 years postoperatively, but the patient experienced a slowly progressive decrease in best-corrected visual acuity from 20/30 to 20/300 OS. There were no corneal folds on slitlamp examination, and retinal examination showed a flat macula with no apparent retinal or choroidal folds. A retinal subspecialist did not find any macular abnormalities. Owing to the unexplained decrease in vision and chronic hypotony, the patient was sent for Stratus OCT (Zeiss Meditec, Dublin, Calif) imaging of the macula, which showed retinal and choroidal folding consistent with hypotony maculopathy (Figure 1A). Closure of the sclerostomy site with a scleral patch graft resulted in an increase in IOP to 23 to 24 mm Hg and improvement in visual acuity to 20/30 OS. Subsequent sequential laser suture lysis lowered the IOP to the 8- to 10-mm Hg range, and the visual acuity remained stable. Repeated Stratus OCT performed in the same axis showed resolution of the retinal and choroidal folds (Figure 1B).

Case 2. An 80-year-old Hispanic man with primary open-angle glaucoma underwent combined phacoemulsification, intraocular lens implantation, and trabeculectomy with mitomycin C in the right eye. The intraocular pressure ranged from 2 to 5 mm Hg postoperatively with a best-corrected visual acuity of 20/40 OD until 3 years after surgery, when the patient developed an IOP of 1 mm Hg and best-corrected visual acuity of 20/70 OD. The ocular examination results were normal, including examination of the cornea and retina. Stratus OCT of the macula was conducted, which revealed retinal folds (Figure 2A). A trabeculectomy revision was performed to raise the IOP using direct closure of the trabeculectomy flap with 9-0 nylon sutures, which raised the IOP to 20 mm Hg. The visual acuity improved to 20/40 OD, and the retinal folds resolved on OCT (Figure 2b). Sequential laser suture lysis resulted in an IOP between 6 and 8 mm Hg, and the patient’s vision has remained stable.

Case 3. A 61-year-old non-Hispanic white woman with primary open-angle glaucoma and cataract underwent phacoemulsification cataract extraction with intraocular lens implantation and peripheral iridectomy in the left eye. The IOP was 11 mm Hg with glaucoma medications. The patient’s vision has remained stable.

Figure 1. Serial optical coherence tomography (OCT) before and after surgical correction of hypotony maculopathy from mitomycin C trabeculectomy. A, Macular scan using Stratus OCT (Zeiss Meditec, Dublin, Calif) showing folding of the retinal and choriocapillaris layers consistent with hypotony maculopathy. B, Three weeks postoperatively, OCT scan obtained in same meridian shows straightening of retina and choriocapillaris. Vision improved from 20/300 to 20/30 OD with normalization of intraocular pressure. Both scans were performed in the 210° axis.
ued, but the IOP remained low and the visual acuity dropped from 20/30 to 20/60 OS. Gonioscopy revealed a cyclodialysis cleft in the area of the surgical iridectomy. The retinal examination findings were noted to be normal by the glaucoma and retinal subspecialists. Stratus OCT showed retinal folding consistent with hypotony maculopathy (Figure 3A). The patient was given 1% atropine, and the IOP increased to 52 mm Hg with presumed closure of the cyclodialysis cleft. The use of glaucoma medications reduced the IOP to 16 mm Hg. After the glaucoma medication was tapered, the IOP stabilized in the 11- to 13-mm Hg range. Best-corrected visual acuity improved to 20/30 OS with resolution of retinal folds on Stratus OCT (Figure 3B).

**Comment.** Hypotony, defined as "low pressure in an individual eye leading to functional changes and structural changes," is an uncommon complication of glaucoma filtration surgery. However, a recent review suggests that the incidence is increasing, most likely due to increased use of antifibrotic agents in trabeculectomy. Hypotony can reduce vision by producing corneal edema, induced astigmatism, cystoid macular edema, or hypotony maculopathy. However, some patients may have unexplained visual loss associated with hypotony that improves with normalization of intraocular pressure. It is possible that such patients have subclinical hypotony maculopathy that goes undiagnosed by fundus examination, as in the current case series. Subtle cystoid macular edema may also be identified with OCT.

Optical coherence tomography can be helpful in diagnosing suspected hypotony maculopathy in patients with reduced visual acuity and normal ocular examination results associated with ocular hypotony. Because retinal folds are typically oriented in the 0° to 180° axis, careful review of all radial line scans may be necessary to diagnose this condition.

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**Fluorescein Interference With Homocysteine Testing**

Measuring plasma homocysteine levels is increasingly common in the evaluation of patients with retinal vascular disease for a possible hypercoagulable state. Fluorescein administered in angiographic studies may interfere with blood tests using fluorescein-labeled reagents, as...