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USE OF CORONAL SIMULTANEOUS OPTICAL COHERENCE TOMOGRAPHY/SCANNING LASER OPHTHALMOSCOPY TO DEMONSTRATE CYSTOID MACULAR EDEMA SECONDARY TO EXTRAFOVEAL RETINAL HOLE

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Abstract

Purpose—To describe a clinical appearance of macular edema secondary to extrafoveal retinal hole using coronal (en-face) optical coherence tomography/scanning laser ophthalmoscopy (OCT/SLO) imaging.

Method—Case report.

Results—A 76-year-old man developed an extrafoveal retinal hole in his right eye after pars plana vitrectomy and epiretinal membrane removal 1 year after surgery. He complained of decreased central vision. Coronal scan showed extrafoveal retinal hole with multiple retinal cysts surrounding the retinal hole and communicating with the macular area.

Conclusion—The OCT/SLO ophthalmoscope can be useful in understanding pathophysiology of macular edema.

Epiretinal membrane surgery rarely leads to retinal breaks.¹ Retinal breaks near the macula occur in <1% of operated eyes and can also lead to retinal detachment.^{1,2} Macular holes³ and pseudoholes⁴ following epiretinal membrane peeling have also been described. However, extrafoveal posterior pole holes in eyes without high myopia are stationary and rarely cause complications.

We recently were referred a patient with cystoid macular edema distal to such a postoperative extrafoveal break after epiretinal membrane removal. We used an imaging technology of combined scanning laser ophthalmoscopy/optical coherence tomography for coronal (en face) imaging of this pathologic finding.

Case Report

A 76-year-old man was referred for evaluation of persistent decrease in vision in the right eye. Corrected visual acuity was 20/100 in the right eye and 20/30 in the left eye, not improving with pinhole. He previously underwent trans-pars plana vitrectomy with epiretinal membrane removal in June 2003 and cataract extraction with intraocular lens implantation in March 2004 on the right eye at an outside center. Fundus photography showed a small extrafoveal retinal hole with exudation temporal to the macula (Fig. 1).

Early-phase fluorescein angiography (Fig. 2A) showed a window defect. In the late phase, leakage of fluid was noted with circular accumulation around the retinal hole that reached the macular area (Fig. 2B). Optical coherence tomography revealed a full-thickness retinal hole with absence of vitreous over the hole and presence of intraretinal cysts and a cuff of fluid on either side of the hole (Fig. 3). Nasal to the extrafoveal retinal hole was continuation of intraretinal cysts up to the end of the scan (total scan length, 6 mm). We used combined scanning laser ophthalmoscopy/optical coherence tomography to assess coronal scans, which showed an extrafoveal hole with multiple retinal cysts surrounding the retinal hole and communicating with the macular area (Fig. 4).

Discussion

Posterior pole round breaks with a cuff of fluid after vitrectomy are rare. We previously described two patients who developed extrafoveal full-thickness retinal holes months after surgical removal of the foveal epiretinal membrane.⁵ The holes were non-progressive, and the patients were asymptomatic. The description included optical coherence tomography documentation showing a substantially smaller cuff of subretinal fluid compared with full-thickness macular holes. In this case, analogically, we presume a similar mechanism possibly leading to hole formation (i.e., a mechanical force from membrane removal that resulted in delayed dehiscence of the retina). Unlike in our previous cases, this extrafoveal hole with the surrounding cuff of fluid had adjacent cystic changes reaching the macular area and leaking fluorescein dye. The vitreous cavity is the most likely source of intraretinal fluid after mechanical trauma. This report provides additional information on the behavior of postsurgical full-thickness extrafoveal retinal holes, which could be possible causes of decreased vision. The use of coronal (en face) scans helped us to understand the pathophysiology of cystoid macular edema and decreased central vision in our patient.

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Fig. 1. Color fundus photograph of the posterior pole of the right eye of a 76-year-old patient after vitrectomy with epiretinal membrane removal. Temporal to the macula is a retinal hole (white arrow) surrounded by a cuff of fluid.

Fig. 2.
A, Early-phase fluorescein angiogram showing an extraretinal foveal hole (white arrow). **B**, Late-phase fluorescein angiogram showing an extraretinal foveal hole (white arrow) and macular edema.

Fig. 3.

A, Optical coherence tomography image of an extrafoveal retinal hole with prominent intraretinal cysts after epiretinal membrane removal surgery. Retinal cysts continue nasally toward the macular area. **B**, Orientation scan through the extrafoveal retinal hole in a temporonasal horizontal direction (white arrow).

Fig. 4. Combined scanning laser ophthalmoscopy (left half)/optical coherence tomography (right half) scan showing an extrafoveal hole (arrowhead) and intraretinal cysts (arrow) in the macular area (M).