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SHORT COMMUNICATION

Optical coherence tomography imaging of surgical resolution of bilateral vitreomacular traction syndrome related to incomplete posterior vitreoschisis: a case report

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PURPOSE. *To report a case of surgical resolution of bilateral vitreomacular traction syndrome related to incomplete posterior vitreoschisis as documented by optical coherence tomography (Stratus OCT, Carl Zeiss Meditec, Dublin, CA).*

CASE REPORT. *In both eyes of a 72-year-old man with bilateral blurred vision, OCT examination disclosed a relevant increase in mean foveal thickness (right eye = 714 µm; left eye = 757 µm) due to a vitreomacular traction syndrome. At the edges of the most highly elevated area of vitreo-macular traction, OCT scans showed a characteristic splitting of the hyperreflective signal in both eyes, usually identified as posterior vitreous cortex. Both eyes underwent vitrectomy with epiretinal membrane peeling. Postoperative OCT examination showed vitreomacular traction resolution in both eyes with an evident decrease in mean foveal thickness (right eye = 364 µm; left eye = 335 µm). Right visual acuity improved from 20/200 to 20/50; left visual acuity changed from 20/150 to 20/40.*

CONCLUSIONS. *OCT was a useful tool in identifying an unusual case of bilateral vitreomacular traction syndrome linked to incomplete posterior vitreoschisis and following a favorable course after surgical management. (Eur J Ophthalmol 2004; 14: 438-41)*

KEY WORDS. *Optical coherence tomography, Posterior vitreoschisis, Vitreomacular traction*

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INTRODUCTION

Posterior vitreoschisis is a clinical entity characterized by splitting of the posterior vitreous cortex that is usually associated with retinal vascular diseases. It was first reported by Green and Byrne, who discovered the condition ultrasonographically in patients with diabetic retinopathy with vitreous hemorrhage (1). Kakehashi et al described biomicroscopic findings of a case of idiopathic posterior vitreoschisis manifesting as a crescent-shaped optically empty space in the posterior vitreous cavity (2).

To our knowledge, we report for the first time a patient in whom the surgical resolution of a bilateral vitreomacular traction caused by incomplete posterior vitreoschisis was documented using an ultimate gen-

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eration optical coherence tomographer (Stratus OCT, Carl Zeiss Meditec, Dublin, CA). Our PubMed search did not demonstrate any previous published article referring to posterior vitreoschisis diagnosed and followed with optical coherence tomography (OCT).

Case report

A 72-year-old man had blurred central vision in both eyes. His best-corrected visual acuity levels were right eye: 20/200 and left eye: 20/150. Biomicroscopically, macular thickening and incomplete posterior vitreous detachment (PVD) with residual vitreomacular traction were evident in both eyes. OCT demonstrated an evident increase in macular thickness (mean foveal thickness: right eye = 714 µm, left eye = 757 µm; minimum foveal thickness: right eye = 758±173 µm, left eye = 768±173 µm; total volume: right eye = 13.88 mm^3, left eye = 13.48 mm^3) and cystic changes in the neuroretina in both eyes. At the vitreoretinal interface OCT scans showed a linear hyperreflective signal, usually referred as posterior vitreous cortex, adherent to the fovea causing vitreomacular traction. At the edges of the vitreomacular adhesion a split in the linear hyperreflective signal was evident, the outer layer being attached to the retina except for some bridging points, the inner one being detached from the retina and showing a "U-shaped" configuration (Fig. 1). The OCT findings were classified as vitreomacular traction syndrome due to incomplete posterior vitreoschisis.

In both eyes a three-port pars plana vitrectomy was

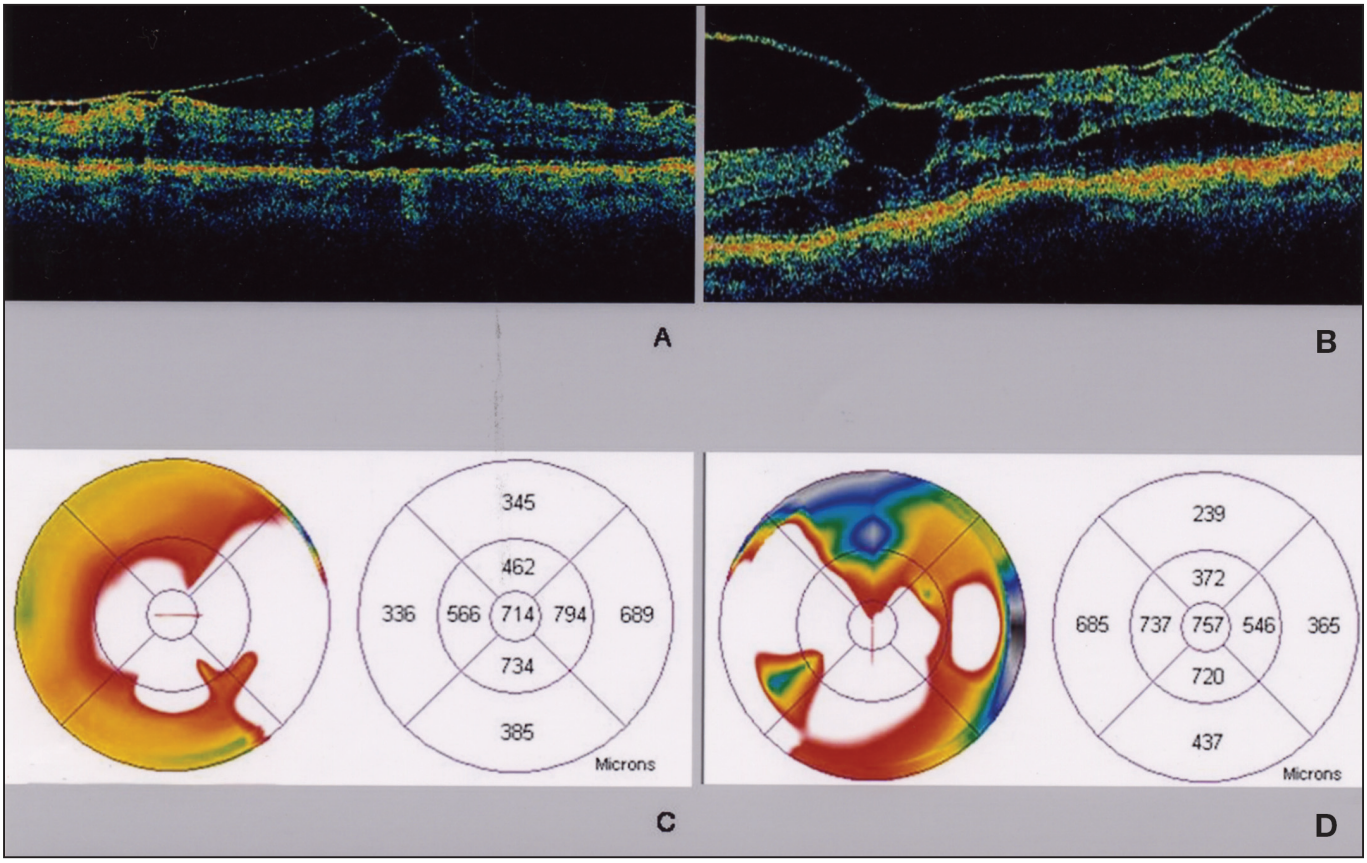

Fig. 1 - *(Top: A, B) Optical coherence tomography (5-mm-long horizontal section) shows an increase in macular thickness in both eyes with microcystic spaces in the neurosensory retina. Vitreoretinal interface is characterized by a hyperreflective signal (usually referred as posterior vitreous cortex) adherent to the neurosensory retina at the level of macular traction. At the edges of vitreomacular traction splitting of the hyperreflective signal is evident, the inner signal resembling an incomplete posterior vitreous detachment, the outer signal remaining attached to the neurosensory retina except for some short bridging tracts. (Bottom: C, D) Optical coherence tomography macular map (6-mm-diameter area) shows an evident increase in macular thickness in both eyes.*

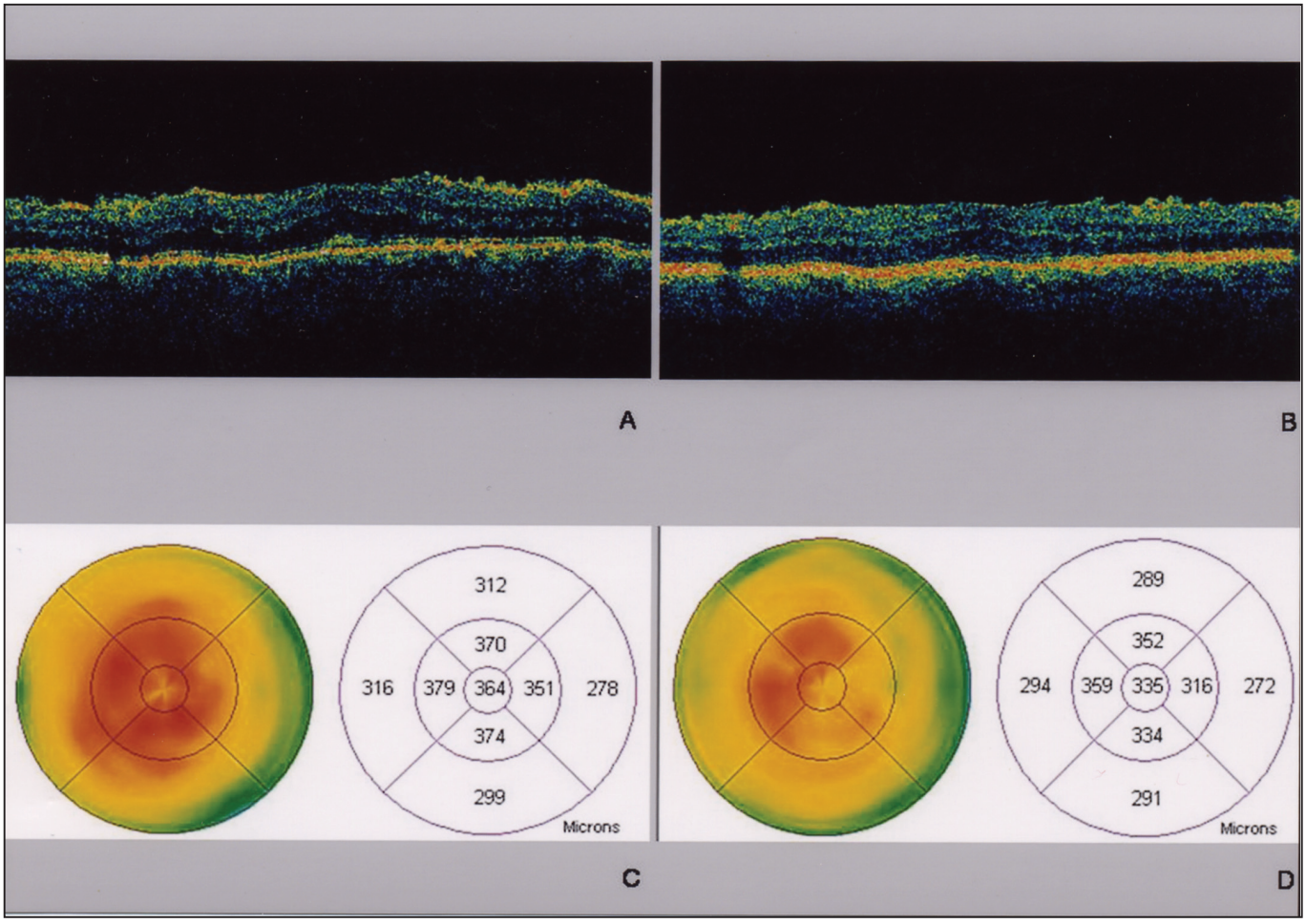

Fig. 2 - *(Top: A, B) One month after surgery optical coherence tomography (5-mm-long horizontal section) shows an evident decrease in macular thickness in both eyes with disappearance of microcystic spaces in the neurosensory retina. The hyperreflective signal at the vitreoretinal interface and the vitreomacular traction are no longer detectable. (Bottom: C, D) One month postoperatively optical coherence tomography macular map (6-mm-diameter area) shows an evident decrease in macular thickness in both eyes.*

performed. Removal of the inner wall of vitreoschisis was obtained during premacular vitrectomy; the outer wall was accurately peeled by means of Eckardt forceps. Only after outer wall removal did the cellophane-like macular aspect disappear.

One month after surgery best-corrected visual acuity levels improved to 20/50 in the right eye and 20/40 in the left eye. OCT examination demonstrated an evident decrease in macular thickness (mean foveal thickness: right eye = 364 µm, left eye = 335 µm; minimum foveal thickness: right eye = 341±10 µm, left eye = 316±7 µm; total volume: right eye = 8.99 mm^3, left eye = 8.48 mm^3) and the disappearance of macular cystic changes. The vitreomacular traction and the double-layered linear hyperreflective signals at the vitreoretinal interface were no longer detectable (Fig. 2).

DISCUSSION

Posterior vitreoschisis is the spontaneous splitting of the outer posterior vitreous cortex. Any vitreoretinal condition that induces vitreous shrinkage may cause posterior vitreoschisis in presence of a strong vitreous adhesion to the retina (2). Echographically, posterior vitreoschisis is easily misdiagnosed as PVD when the outer thin membrane is still attached to the retina (3). Azzolini et al (4) identified undiagnosed pos-

terior vitreoschisis as a frequent cause of poor ultrasound prediction of PVD and stated that vitreoschisis is correctly detected by ultrasonography only when the outer layer is detached from the retina. Then, Sebag hypothesized that in many cases the thinness of the walls of the vitreoschisis cavity may fall below the level of resolution in standard echography (5).

OCT has been identified as a useful diagnostic tool for vitreoretinal interface pathologies (6, 7). Our recent PubMed research found no published article regarding OCT diagnosis and follow-up of posterior vitreoschisis.

In our case report of bilateral vitreomacular traction syndrome, biomicroscopically the inner layer of the posterior vitreous cortex induced an erroneous diagnosis of incomplete PVD. OCT examination was useful in demonstrating the splitting of the posterior vitreous cortex at the edges of the area of vitreomacular traction and in identifying the outer layer of posterior vitreous cortex almost completely attached to the retina. The OCT findings were interpreted as incomplete posterior vitreoschisis leading to vitreomacular traction.

Differential diagnosis between PVD and posterior vitreoschisis is important owing to the surgical implications. Failure to recognize schisis of the posterior vitreous cortex could lead to erroneous surgical evaluation to remove the whole posterior hyaloid, which, in reality, is only the inner layer of the vitreoschisis. Consequently, during pars plana vitrectomy, the outer layer of posterior vitreous cortex is likely to remain intact and contribute to residual tangential tractional forces on the retinal surface. The recently available OCT scanner can be a useful diagnostic tool in recognizing posterior vitreoschisis and in differentiating this vitreoretinal interface disorder from PVD. The recognition of posterior vitreoschisis may advance the vitreoretinal surgeon's ability to perform a successful delamination and a complete removal of posterior hyaloid during pars plana vitrectomy.

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