

SHORT COMMUNICATION

# Vitreoretinal surgery of retinal detachment and macular hole associated with optic nerve pit: An optical coherence tomography study

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**PURPOSE.** *To describe the course of a case of macular elevation and a full-thickness macular hole associated with optic nerve pit.*

**METHODS.** *Case report. A 28-year-old woman who had laser-assisted in situ keratomileusis surgery 2.5 years ago presented with decreased vision, full-thickness macular hole, and macular detachment in association with optic nerve pit. Complete ophthalmic examination was done and optical coherence tomography (OCT) was performed before and after vitreoretinal surgery.*

**RESULTS.** *OCT showed that the macular elevation consisted of both separation of the inner and outer retinal layers with neurosensory retinal detachment. There was a full-thickness macular hole. After vitreous surgery and intraocular gas tamponade, the macular elevation completely resolved, and OCT showed the flattening of the outer and inner retinal layers but the macular hole was not closed.*

**CONCLUSIONS.** *OCT is a reliable technique to study macular elevation with a hole associated with optic nerve pit before and after vitrectomy and gas tamponade. (Eur J Ophthalmol 2004; 14: 355-7)*

**KEY WORDS.** *Macular hole, Optical coherence tomography, Optic nerve pit, Photorefractive surgery, Vitrectomy*

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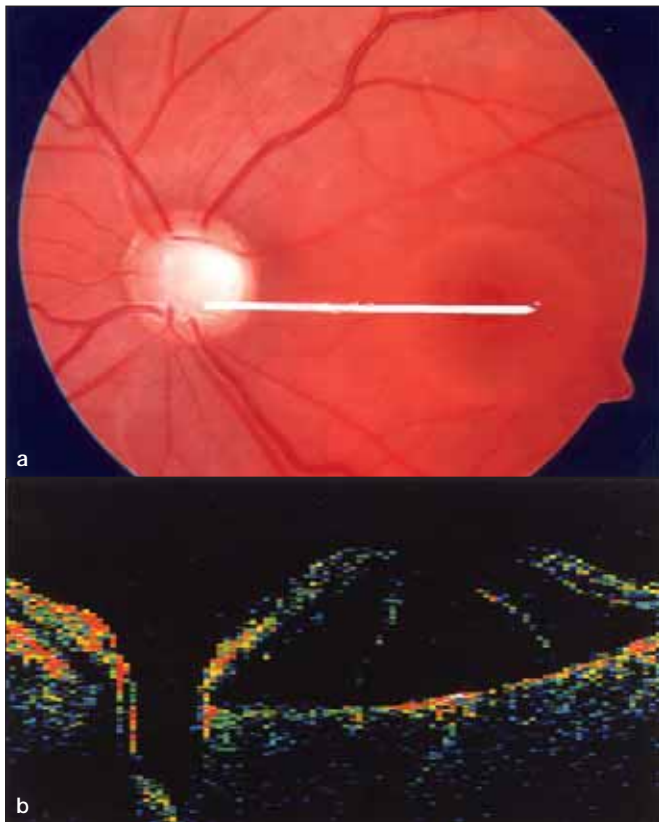
## INTRODUCTION

Macular involvement ranging from shallow serous detachment to macular hole associated with optic pits occurs in 30% to 50% of patients. Optical coherence tomography (OCT) studies confirmed that maculopathy starts with retinal schisis due to fluid passing at the level of the optic pit and then detachment of external retinal layers develops (1). Macular holes can develop following the degenerescence of the retinal layers within this area.

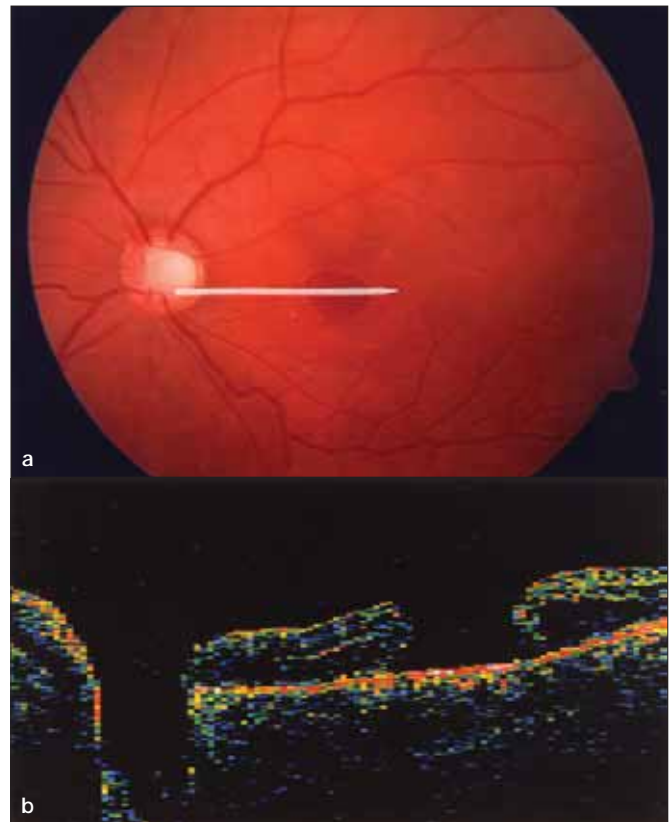
In this case presentation, tomographic features of macular detachment with a full-thickness hole in a patient with optic nerve pit were evaluated before and after surgery using OCT.

## Case report

A 28-year-old woman presented with decreased vision in her left eye for 4 weeks. Her medical history revealed that she had -3.0 diopters of myopia and underwent laser-assisted *in situ* keratomileusis



**Fig. 1 - a)** Macular hole and serous retinal detachment associated with optic nerve pit in the left eye. Visual acuity: counting fingers at 1 m. The horizontal arrow indicates the scanning line of optical coherence tomography. **b)** Horizontal optical coherence tomography scan through the fovea shows inner and outer retinal separation with a full-thickness hole.



**Fig. 2 - a)** Posterior pole 1 month postoperatively. Macula appears flat but macular hole is not closed. Visual acuity: 1/10. The horizontal arrow indicates the scanning line of optical coherence tomography. **b)** Optical coherence tomography of the same eye postoperatively shows that the retinal elevation has diminished but macular hole persists.

(LASIK) surgery 2.5 years ago. At her initial examination, best-corrected visual acuity was counting fingers at 1 meter (left eye) and 10/10 (right eye). Slit-lamp biomicroscopy revealed bilateral optic nerve pit. Extending from the disc, a transparent elevation of the inner layers involving the macula extended to the upper and lower temporal vascular arcades in the left eye. Macular hole was present in the fovea and an opaque outer layer detachment of 1.5 disc diameter in size surrounded the macular hole (Fig. 1, top). The macula in the right eye was normal.

OCT disclosed a nonreflective cavity, representing the large schisis cavity within the outer retina. A horizontal scan through the macula disclosed the central outer detachment surrounded by the larger schisis cavity, and an outer and inner retinal break (Fig. 1, bottom).

The patient underwent a standard three-port pars plana vitrectomy, removal of posterior hyaloid, peeling of the internal limiting membrane, fluid-gas exchange, and 16% perfluoropropane (C3F8) injection. Postoperatively, the patient remained in face-down position for 2 weeks. Gas injection was repeated 15 days later because the hole was still open.

One month postoperatively, retina in the posterior pole appeared flat, but the edges of the macular hole were still visible and elevated (Fig. 2, top). The visual acuity had improved to 1/10 in the left eye. OCT of the macula showed the disappearance of inner and outer macular detachments but full-thickness macular hole was still evident (Fig. 2, bottom). Fundus appearance did not change 3 months later, and the patient refused further operation.

## DISCUSSION

In 1988, Lincoff and Kreissig proposed that the primary macular lesion is an inner retinal schisis-like separation that communicates with the optic pit (2). They suggested that the macular detachment is a secondary occurrence, typically localized to the central macula. After the introduction of OCT, Rutledge et al (1) and Lincoff et al (3) also confirmed the concept of two-layer structure of optic disc maculopathy. OCT also enables monitoring macular structural changes after surgery.

In this study, we used OCT imaging before and after vitrectomy. Before surgery, OCT revealed bilaminar structure of the maculopathy with a full-thickness hole. Within the schisis-like separation of optic disc maculopathy, macular holes can develop as a secondary change because of the accumulated intraretinal fluid. Most of these holes are located within the external retinal layers. Our case had a macular hole including both inner and outer retinal layers. She had a history of previous excimer laser, and macular hole might have developed as a result of this procedure. It was reported that vitreomacular interface changes occurring after LASIK or photorefractive keratectomy may predispose certain myopic eyes to form a macular hole (4).

The result of treatment in this case was disappointing because macular hole was still evident. Bechmann et al reported that in cases of macular hole associated with optic pit, installation of silicone oil should be considered in the first surgical procedure if no epiretinal membrane or internal limiting membrane peeling is possible intraoperatively (5). In our case, peeling of the internal limiting membrane was possible and 16% perfluoropropane (C3F8) was injected.

We concluded that examination with OCT allows confirmation of the macular involvement associated with optic nerve pit, helps to explain its pathogenesis, and demonstrates the anatomic improvement after surgery.

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