

Spontaneous closure of traumatic macular hole: followed up by optical coherence tomography

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Abstract

Two patients with traumatic macular hole without surgical intervention were followed-up using optical coherence tomography. The diameters of the 2 holes were 183 μm and 241 μm and the average thickness of the retinas around the hole were 130 μm and 362 μm . For the first patient, the macular hole closed 3 months after the injury and the visual acuity improved from 0.05 to 0.4. For the second patient, the macular hole closed 1 week after the injury, but there was no improvement in vision. There was vitreous traction and the presence of epiretinal membrane. This report describes how traumatic macular holes may close spontaneously and shows that optical coherence tomography is useful for following the progress.

Key words: Macular hole, Optical coherence tomography, Trauma

Traumatic macular hole is thought to occur as an immediate concussive tear or as a belated breakdown of trauma-induced cystoid change.¹ Immediate visual loss after injury is probably due to retinal dehiscence on concussion, whereas delayed visual loss is likely to indicate a secondary event of vitreoretinal interface changes.²

As a result of excellent visual recovery in some patients following surgery, surgical intervention for macular hole is increasing in popularity.³ However, for some patients with traumatic macular hole, observation is more advisable than immediate surgery. In this report, 2 patients with traumatic macular hole that closed spontaneously are described.

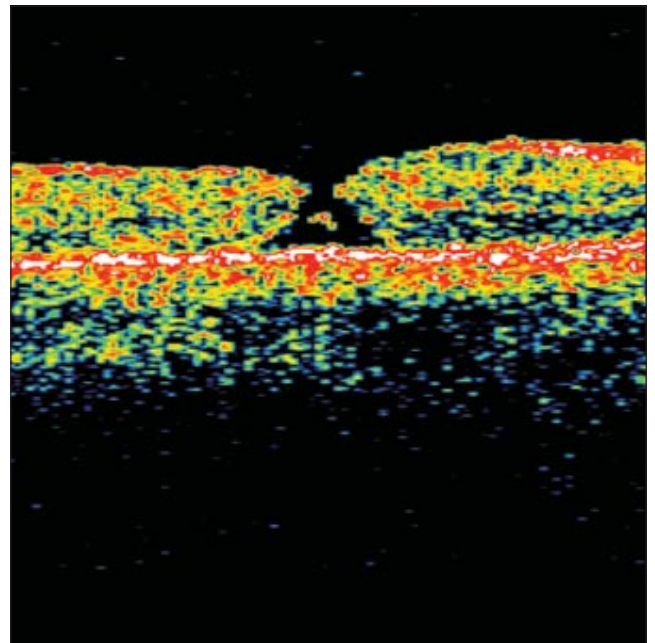


Figure 1. The traumatic macular hole of patient 1 with a diameter of 183 μm .

Case Report

Patient 1 was an 18-year-old man who experienced blunt trauma after being hit by a basketball on his left eye 1 week before seeing the ophthalmologist at the Department of Ophthalmology, Beijing Hospital. The visual acuity (VA) was 0.05 in his left eye and 0.5 in his right eye. Fundoscopy showed radial high reflection folds in the macular area and there was a small hole in the center. Optical coherence tomography (OCT) showed a defect in the neurosensory retina at the fovea and a high reflection band on the inner boundary (Figure 1). The diagnosis was traumatic macular hole (TMH).

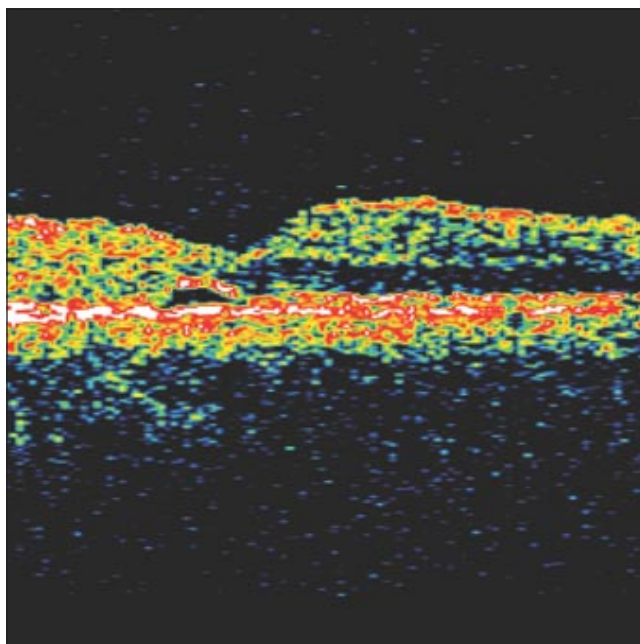


Figure 2. The traumatic macular hole of patient 1 that closed spontaneously with a small retinal pigment epithelium detachment.

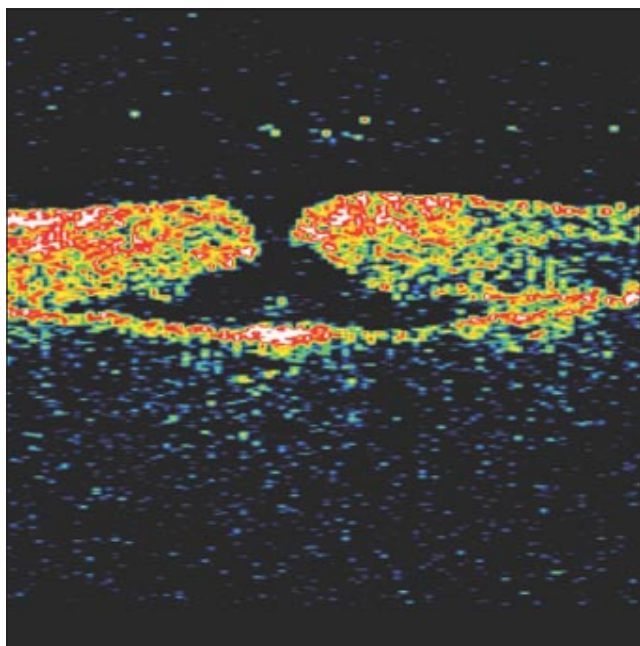


Figure 3. The traumatic macular hole of patient 2 with posterior vitreous detachment and vitreous hemorrhage and the diameter of hole was 241 μm.

with epiretinal membrane. The patient's parents refused surgery and the macular hole was observed conservatively. Three months later, his visual acuity improved to 0.4. Repeat OCT showed normal foveal curvature and there was retinal pigment epithelium detachment in the perifoveal region (Figure 2).

Patient 2 was a 21-year-old man who was hit by a football on his right eye. He came to the Department of Ophthalmology, Beijing Hospital, immediately after the injury. There was vitreous hemorrhage and a hole in the foveal area. The best

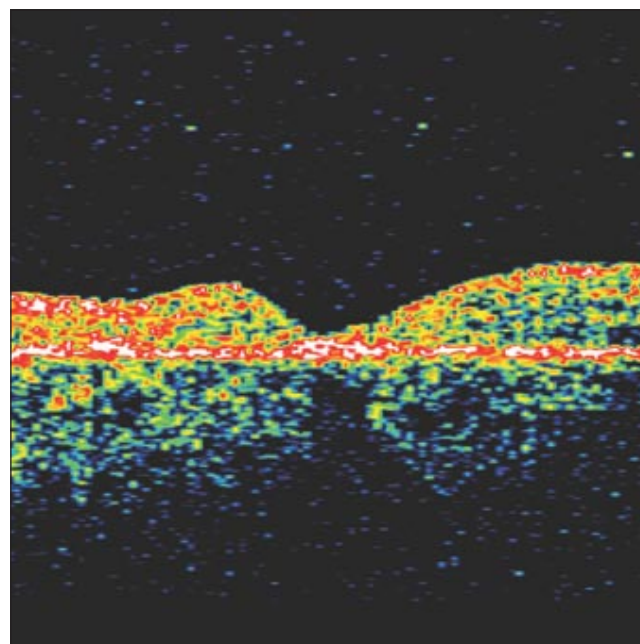


Figure 4. The traumatic macular hole of patient 2 that closed spontaneously with persistent macular hemorrhage.

corrected visual acuity of his right eye was 0.05 and 0.8 in his left eye. OCT showed high reflection spots in the vitreous cavity and a full thickness retinal defect on the fovea (Figure 3). One week later, repeat OCT showed spontaneous closure of the macula hole with reappearance of the fovea curvature and thickened high reflection in the fovea area (Figure 4). The macular hemorrhage persisted and there was no improvement of his visual acuity.

Discussion

OCT provides a non-invasive, non-contact imaging technique capable of producing optical cross sectional images of ocular structures in vivo with a theoretical maximum longitudinal resolution of approximately 10 μm.⁴ OCT can help to follow the anatomical structural changes of macular hole and provide information on the vitreomacular relation. After the proposal by Gass and Johnson that tangential vitreofoveal traction may lead to formation of idiopathic full thickness macular hole,^{5,6} it is suggested that tractional force exerted by vitreofoveal adhesion may cause slow macular hole formation and that its release can lead to spontaneous hole closure.⁷ Yamashita suggested there may be 2 distinct mechanisms of traumatic macular hole formation, depending on whether the posterior hyaloid is attached or detached.²

Further studies are justified using optical coherence tomography to explore whether there are 2 clinically and pathogenetically distinct types of traumatic macular hole, 1 type that causes immediate visual loss due to primary dehiscence of the fovea, and the other type that leads to delayed visual loss due to dehiscence of the fovea secondary to persistent vitreofoveal adhesion.² In these 2 patients with traumatic macular holes, case 1 had complete posterior vitreous detachment (PVD) with the macular hole and the other did

not have PVD, but had a small retinal pigment epithelium detachment when the hole closed spontaneously. These 2 patients with traumatic macular hole show that OCT is useful in following the course of macular hole trauma.

Although surgical release of vitreo-foveal traction can result in restoration for the normal foveal architecture and improvement in visual function, observation of spontaneous closure is recommended.

References

1. Yanagiya N, Akiba J, Takahashi M, et al. Clinical characteristics of traumatic macular hole. *Jpn J Ophthalmol* 1996; 40:544-547.
2. Yamashita T, Uernara, A, Uchino E, Doi N, Ohba N. Spontaneous closure of traumatic macular hole. *Am J Ophthalmol* 2002;133:230-235.
3. McDonnell PJ, Fine SL, Hillis AI. Clinical features of idiopathic macular cysts and holes. *Am J Ophthalmol* 1982; 93:777-786.
4. Toth CA, Narayan DG, Boppart SA, et al. A comparison of retinal morphology viewed by optical coherence tomography and by light microscopy. *Arch Ophthalmol* 1997;115: 1425-1428.
5. Gass JD. Idiopathic senile macular hole. Its early stages and pathogenesis. *Arch Ophthalmol* 1988;106:629-639.
6. Johnson RN, Gass JD. Idiopathic macular holes. Observations, stages of formation and implications for surgical intervention. *Ophthalmology* 1988;95:917-924.
7. Uchino E, Uemura A, Doi N, Ohba N. Postsurgical evaluation of idiopathic vitreomacular traction syndrome by optical coherence tomography. *Am J Ophthalmol* 2001;132: 122-123.