



An 11-Year-Old Girl Hit in Her Left Eye by a Soccer Ball

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Introduction:

An eleven year-old girl presented to our office four days after being hit with a soccer ball in her left eye. Her presenting visual acuity was 20/150. Her intraocular exam was normal with the exception of a small macular hole (Fig. 1). Notably, she did not have a posterior vitreous detachment (PVD). The options of observation versus surgery were presented to the patient and her family, who elected to observe. On follow-up ten days later, her vision had improved to 20/100 with an early bridge of retinal tissue closing the hole (Fig. 2). Over the next few months, foveal architecture was restored without intervention, and her vision improved significantly (Fig. 3).

Discussion:

Traumatic macular holes (TMHs) are uncommon, usually formed in younger patients with blunt ocular trauma. Though their pathogenesis is incompletely understood, the prevailing theory is a coup-contre coup mechanism whereby the thinnest point of the retina, the fovea, is stretched due to a temporarily decreased anterior-posterior diameter with equatorial expansion. TMHs

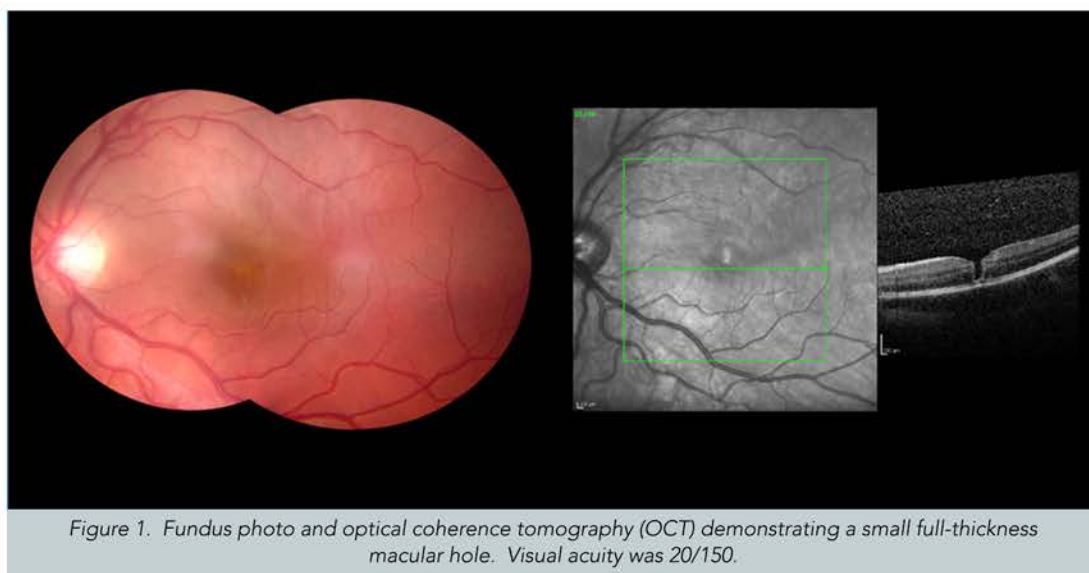


Figure 1. Fundus photo and optical coherence tomography (OCT) demonstrating a small full-thickness macular hole. Visual acuity was 20/150.

do not necessarily involve induction of PVD, and in fact the rates of concomitant PVD are low. Perhaps due to this intact vitreous, spontaneous closure of the hole is possible, with closure rates ranging from 10% - 70% in the literature, sometimes even months after the inciting injury. Patients with spontaneous closure tend to be younger - usually children - and those with smaller holes. Absence of PVD is another positive prognostic

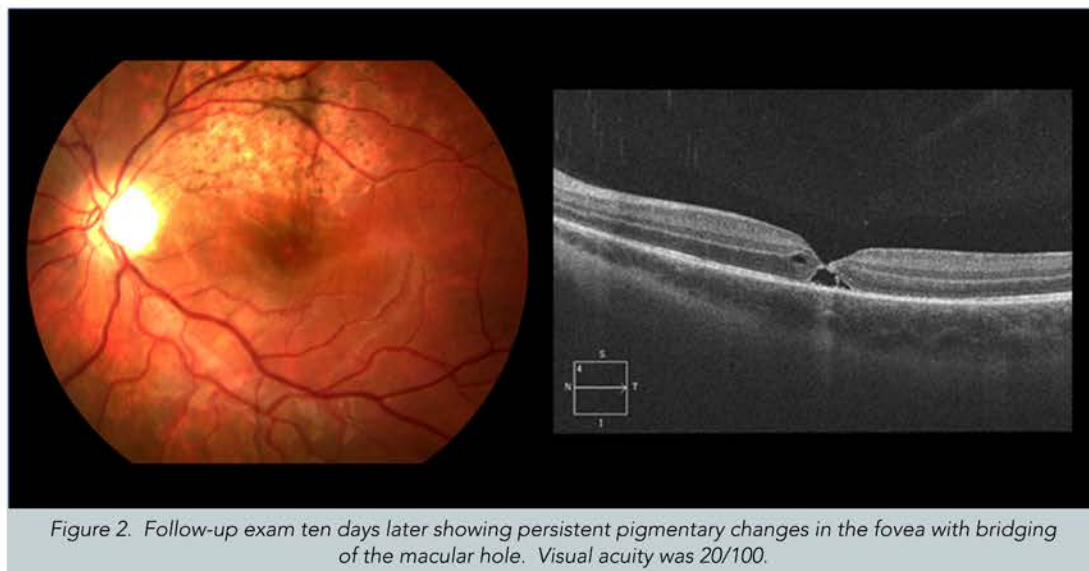


Figure 2. Follow-up exam ten days later showing persistent pigmentary changes in the fovea with bridging of the macular hole. Visual acuity was 20/100.

sign for TMHs, as is good presenting visual acuity. Though the closure mechanism is unclear, it is hypothesized that cells either from above (glial cells/epiretinal membrane) or below (retinal pigment epithelium) proliferate and fill the hole, or an epiretinal membrane provides contractile force to close the hole.

Surgery is indicated for non-closure or to prevent amblyopia in young children and relies on similar techniques to those employed in idiopathic macular holes, including peeling of surrounding internal limiting membrane (ILM) with gas or oil tamponade. Despite high anatomic success (45% - 100%) of hole closure following surgery, visual improvement of two or more lines does not always follow (27% - 100%). Adjunctive therapies during surgery including insertion of platelet concentrate, serum, and TGF- β 2 have been used, as well as ILM flap technique similar to that used in large idiopathic macular holes, all with varying degrees of success.

Finally, as the popularity of soccer grows, we suspect there will be a concomitant growth in ocular trauma. As a result, we discourage the teaching of heading the ball at an early age.

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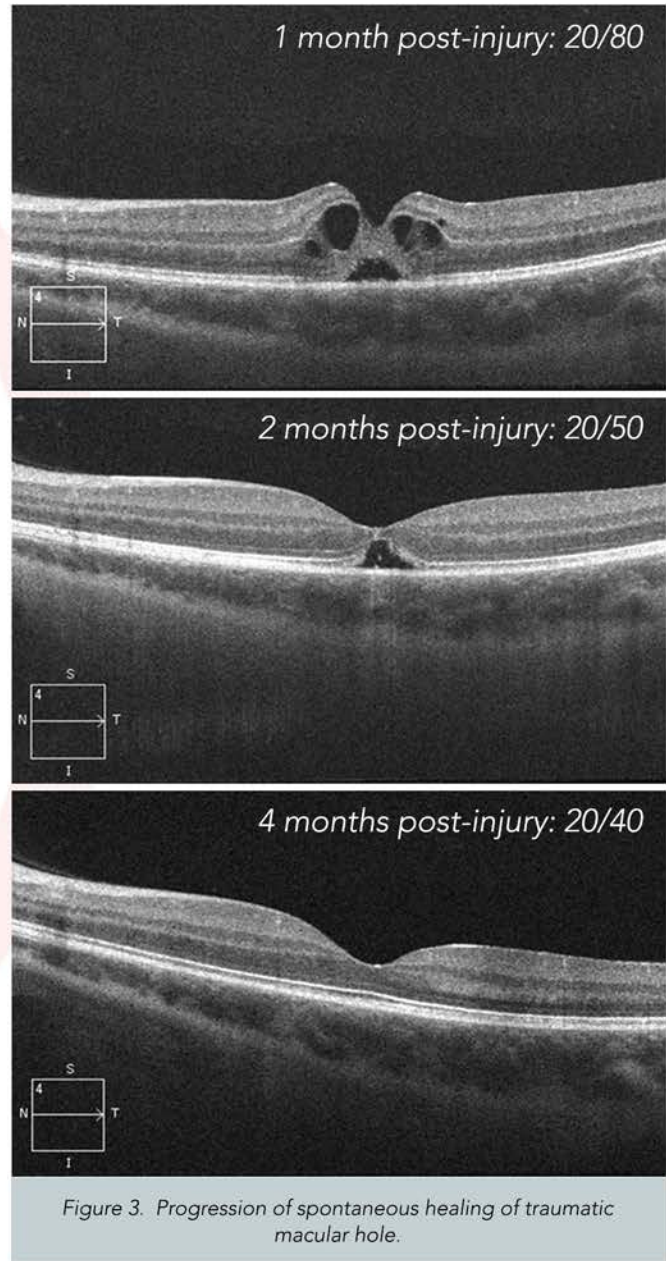


Figure 3. Progression of spontaneous healing of traumatic macular hole.

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