



Case report

Spontaneous closure of bilateral macular holes

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ABSTRACT

Purpose: To present a case of a right eye spontaneous closure of a full thickness macular hole (FTMH), followed several years later by a left eye spontaneous closure of a FTMH, in an otherwise healthy woman.

Observations: We show the temporal changes and spontaneous resolution observed with Spectral-Domain Ocular Coherence Tomography (SD-OCT) of a FTMH in the right eye and a FTMH secondary to vitreomacular traction in the left eye of the same patient 5 years later, also with full spontaneous resolution. Following the resolution, SD-OCT demonstrated outer retinal layer disruption recovery and visual acuity improvement in both eyes.

Conclusions and importance: Spontaneous closure of macular holes is an uncommon event, with most descriptions in the literature being of single cases or very small series, including several reports in patients who have undergone vitrectomy for other causes, or in highly myopic eyes. Bilateral spontaneous closure of macular holes in the same patient is an even more uncommon event, described only once in one patient previously in the literature to our knowledge.

1. Introduction

Gass^{1,2} proposed a staging system ranging from impending to a full-thickness macular hole (FTMH), based on his biomicroscopic observations and Hee and Puliafito³ described the stages of FTMH on ocular coherence tomography (OCT) scans. In 2013 The International Vitreomacular Traction Study Group published an OCT-based anatomic classification system for diseases of the vitreomacular interface, focusing on vitreomacular adhesion (VMA), vitreomacular traction (VMT) and FTMH.⁴ Later on in 2015, Le Mer et al. proposed a classification for clinical use in France, also relating with the international classification.⁵

The prevalence of FTMH reported in the literature varies greatly between 0.2 per 1000 in the Blue Mountains Study⁶ to 3.3 per 1000 in the Baltimore Eye Study.⁷ The incidence of MH in a county in Minnesota (USA) was found to be 7.8 persons per 100,000 per year, with a female-to-male ratio of 3.3:1, and MH was bilateral in 11.7% of patients.⁸ The data on the incidence of bilateral MH vary considerably from 4.5% to 16.6%.^{9–13}

Although there are numerous case reports of spontaneous resolution of unilateral MH in the literature,^{14–24} bilateral spontaneous closure is rare, with only one case reported to date to our knowledge.²⁵

We report here a rare case of a 61 years old women who had a spontaneous resolution of bilateral FTMH. We demonstrate the temporal changes appeared on the OCT exam and the improvement of

visual acuity (VA).

2. Case report

Right eye description (Fig. 1): a 61 years old otherwise healthy women without ocular history other than glasses, presented to our department on June 2012 complaining of distorted and decreased VA on her right eye. On exam, VA was 6/21, OCT B-scan demonstrated a FTMH measured 252 μm (medium primary FTMH) with a formed operculum, 3 months later she had a spontaneous MH closure with a VA improvement to 6/12, and further follow up and continuing healing demonstrated by defragmentation and realignment of the posterior retinal layers. On July 2015 her OCT B-scan demonstrated complete resolution, and the eye had a VA of 6/7.5. Follow up until July 2017 yielded the same functional and morphological exams.

Left eye description (Fig. 2): on September 2012 the left eye was asymptomatic, and the OCT B-scan demonstrated a very narrow operculated FTMH with a VA of 6/6.5. On February 2016 there was a decreased VA to 6/12 with an elevation of the operculum by VMT and increase in FTMH diameter to 426 μm (large primary FTMH). On July 2016 the operculum was completely detached with VA worsening to 6/20 and the FTMH measured 320 μm (medium primary FTMH). At this time she was planned for vitrectomy surgery, however, due to logistics problems and availability of the operating room, the surgery was postponed. Five months later, on February 2017, on the scheduled day

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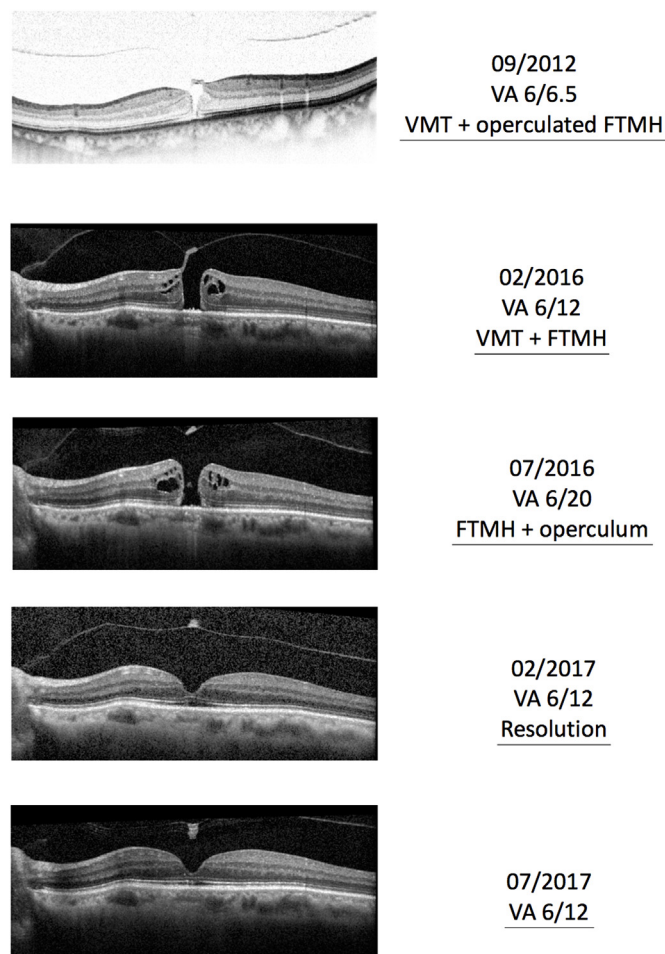
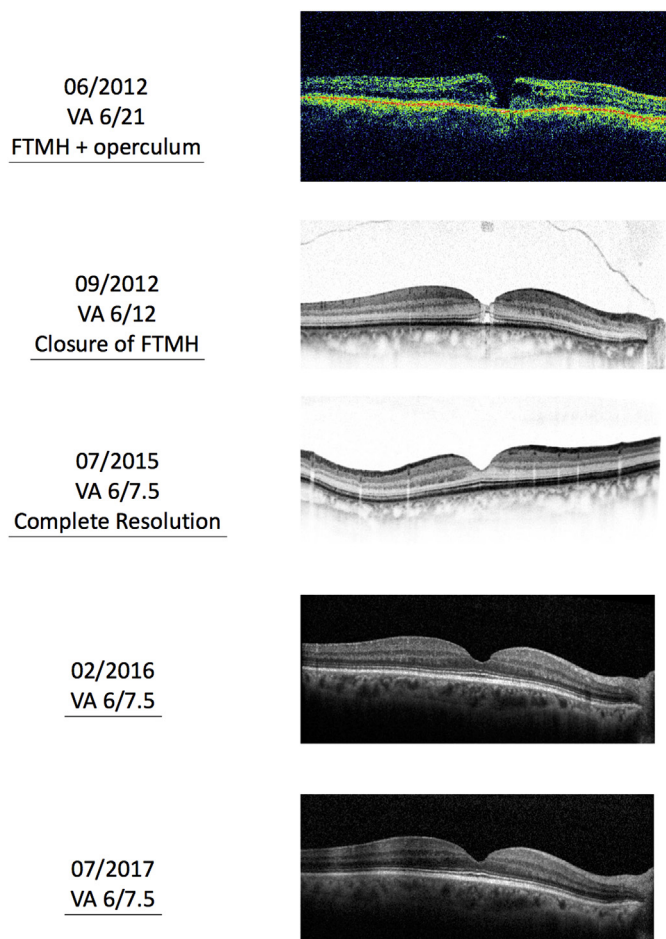


Fig. 1. Right eye clinical course of spontaneous FTMH closure without surgical intervention. The left column contains the date the exam was taken, visual acuity (VA) and the status of the macular hole. The right column contains the B-scan OCT images. The upper image represents the time-domain OCT B-scan demonstrating a FTMH measured 252 μm (medium primary FTMH) with a formed operculum. All other 4 consecutive images represent the spectral-domain OCT B-scan demonstrating FTMH closure and defragmentation and realignment of the posterior retinal layers with VA improvement.

for operation, a new OCT exam demonstrated a spontaneous MH closure with a VA improvement to 6/12, and the surgery was canceled on the spot. Five months later OCT B-scan images showed further posterior retinal layer re-organization, with less outer retinal layer disruption and a stable VA.

3. Discussion

We show here the temporal changes and resolution of bilateral FTMH. According to the International Vitreomacular Trtraction Study Group classification,⁴ our patient's RE was defined as a medium size primary FTMH (stage 2–3) which by their recommendations had a high probability of closure success with vitrectomy surgery. Her LE was classified as a large size primary FTMH (stage 3) which by their recommendations, have a slightly less probability of successful closure with vitrectomy surgery. OCT imaging clearly demonstrated a VMT mechanism preceding hole formation on the patient's left eye. OCT of the right eye demonstrated a good regeneration and defragmentation of the posterior retinal layers leading to a good VA, whilst VA of the left eye did not return to baseline, probably due to some residual disorganization of the posterior layers.

Beside observation only, there are other interventional means to release VMT and treat macular holes. Yu et al.²⁶ showed in their case

Fig. 2. Left eye clinical course of spontaneous FTMH closure without surgical intervention. The right column contains the date the exam was taken, visual acuity (VA) and the status of the macular hole. The left column contains the spectral-domain OCT B-scan images. The upper image demonstrates a very narrow operculated FTMH which later increases to a FTMH diameter of 426 μm (large primary FTMH) with an elevation of the operculum by VMT. Later on, an operculum detachment occurred with VA worsening and the FTMH measured 320 μm (medium primary FTMH). Finally, the FTMH closes spontaneously with only observation demonstrating posterior retinal layers re-arrangement and VA improvement.

series and meta-analysis that pneumatic vitreolysis resulted in a higher rate of VMT release compared with intravitreal ocriplasmin injection at Day 28 and had a similar risk profile as pars plana vitrectomy and intravitreal ocriplasmin without any reported cases of retinal breaks, tears, or detachments. Pneumatic vitreolysis also resulted in a higher rate of MH closure.

Spontaneous closure of macular holes is an uncommon event, with most descriptions in the literature being of single cases or very small series, including several reports in patients who had undergone vitrectomy for other causes, or in highly myopic eyes.^{14–24} Spontaneous closure of macular hole has also been described in a patient with macular telangiectasia type 2, showing that even in glial disease there is some capacity for remodeling and healing.²⁷

Bilateral spontaneous closure of macular holes in the same patient is an even more uncommon event, described in only one patient previously in the literature²⁵ to our knowledge. In our case, bilateral VMT release was probably the contributing factor for spontaneous FTMH closures, raising the suspicion that perhaps some cases of spontaneous hole closure had at some point release of VMTs which was missed between follow-up visits.

4. Patient consent

This report does not contain any patient identifiers.

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Conflicts of interest

The following authors have no financial disclosures: A.O, A.R.

Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

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