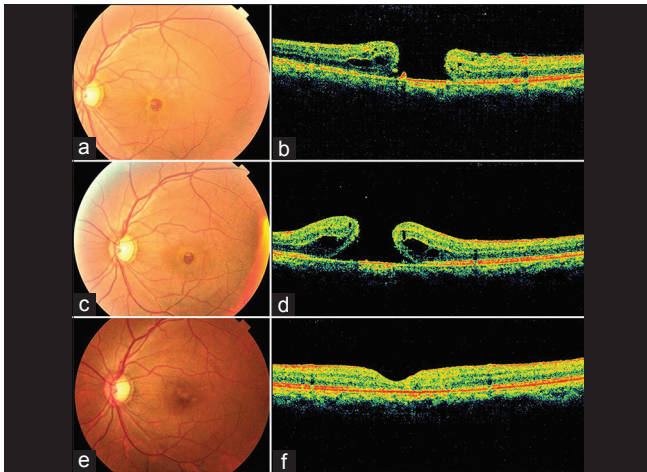


## Repeat fluid-gas exchange for failed primary macular hole surgery

Dear Sir,

We read with interest the article "Repeat gas insufflation for successful closure of idiopathic macular hole following failed primary surgery" by Rishi *et al.*<sup>[1]</sup> We describe two cases with failed primary macular hole (MH) surgery that closed following repeat fluid-gas exchange (FGE) and make some additional observations.

Case 1 was a 55-year-old male with a 2-month history of blurred vision in his left eye. Best-corrected visual acuity (BCVA) was 20/120 in this eye, with a stage IV MH. He underwent 23 gauge pars plana vitrectomy with internal limiting membrane (ILM) peeling and 14% C3F8 gas injection, with prone positioning. At 4 weeks postoperatively, the MH was open with a cuff of subretinal fluid (SRF). He underwent repeat FGE with 14% C3F8 gas and prone positioning. At 4 weeks following the second intervention, the MH was found to be closed, and BCVA increased to 20/40 [Fig. 1]. Case 2 was a 60-year-old male with a BCVA of 20/80 in his right eye and a stage IV MH of 1-month duration. Primary MH surgery resulted in a smaller but open MH with an elevated inferior edge at 1-month follow-up. Repeat FGE with 14% C3F8 gas



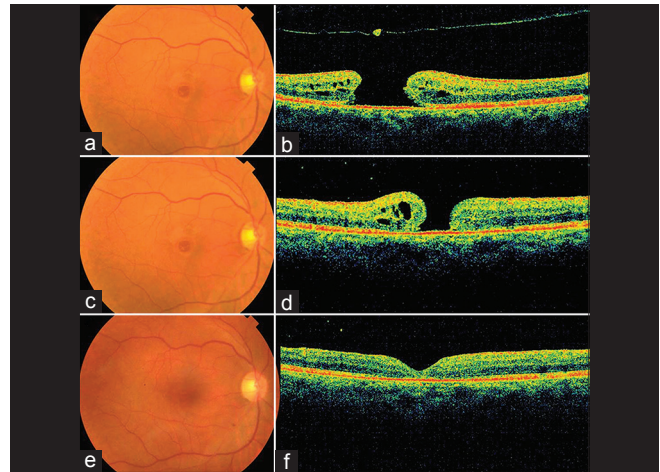
**Figure 1:** (a, b) Color fundus photograph and vertical spectral-domain optical coherence tomography scan of case 1 at presentation showing stage IV macular hole (MH). (c, d) One month following primary surgery, the MH was open with a cuff of subretinal fluid. (e, f) Following repeat fluid-gas exchange, type 1 closure occurred at 1-month follow-up

and prone positioning was carried out resulting in a closed MH and BCVA of 20/40 1 month later [Fig. 2].

Nonclosure or reopening of MH after a primary MH surgery can be managed by repeat ILM peeling,<sup>[2]</sup> additional FGE done externally (as an outpatient procedure)<sup>[3]</sup> or internally (repeat surgery).<sup>[1]</sup> Once the gas bubble has absorbed enough to allow adequate examination of the macula, an open MH with elevated edges and a cuff of SRF is unlikely to close or flatten without additional intervention.<sup>[3]</sup> The authors describe the MH following primary surgery as “type 2 closure of MH with cuff of SRF” [Fig. 2] and mention that the cuff of SRF was a factor favoring re-surgery in their case.<sup>[1]</sup> Type 2 closure is used to denote attachment of the entire rim of the MH to the retinal pigment epithelium (RPE) with flattening of the cuff of SRF, and persistence of a foveal defect of the neurosensory retina, while type 1 closure indicates that the foveal defect is closed.<sup>[4]</sup> Thus, the appearance of their case following primary surgery is incorrectly labeled as type 2 closure.

Postoperatively, careful inspection needs to be done to exclude any epiretinal membrane that may be preventing closure of the MH. If there is no such traction, then an early surgical failure should respond to FGE with a long-acting gas and prone positioning.<sup>[3]</sup> A gas tamponade in the vitreous cavity is believed to limit the movement of fluid into the hole, maintain apposition of the edges of the MH to the RPE and facilitate glial proliferation to seal the macular defect. The time taken for this wound healing response that leads to MH closure is probably variable.<sup>[5]</sup> So while some MH may close earlier, some may require renewal of the foveal tamponade that provides additional time for the process of MH closure.<sup>[3,5]</sup> The use of a long acting tamponade can keep the fovea isolated from the fluid without stringent prone positioning, which may not be possible in a subset of patients.

Thus, postoperative FGE with a long-acting gas to provide additional macular tamponade along with repeat patient counseling to ensure compliance with prone positioning appears to be a viable option after failed MH surgery.



**Figure 2:** (a, b) Color fundus photograph and vertical spectral-domain optical coherence tomography scan of case 2 at presentation showing stage IV macular hole (MH). (c, d) Following primary MH surgery, the size of the MH decreased but the inferior edge was elevated. (e, f) Repeat fluid-gas exchange was performed resulting in type 1 closure noted 1-month postoperatively

Successful closure of the MH is associated with improvement in visual acuity in these cases.

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