



Successful Closure of a Recurrent Full-Thickness Macular Hole with Intravitreal and Topical Therapy

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Introduction

A full-thickness macular holes (FTMH) is retinal defect centered in the fovea that results in decreased visual acuity. For a primary FTMH, the standard treatment is pars plana vitrectomy (PPV) with or without internal limiting membrane (ILM) peeling or flap and gas tamponade, achieving complete resolution in approximately 90% of cases or more.¹ However, the optimal management of recurrent or persistent macular holes following PPV remains a subject of ongoing debate.

Recent studies have explored non-surgical approaches, particularly topical therapies, for smaller FTMHs (≤ 250 μm).¹ A combination of topical steroids, nonsteroidal anti-inflammatory drugs (NSAID), and carbonic anhydrase inhibitors (CAI) have been gaining popularity in the management of smaller FTMHs, both idiopathic and recurrent.² While PPV has proven effective for closure of primary FTMH, refractory and recurrent FTMHs present several challenges when planning secondary surgical intervention, including limited or absent internal limiting membrane (ILM) available for peeling, technical difficulty performing an inverted ILM flap technique, and a generally lower success rate associated with repeat PPVs.¹ Additional limiting factors include patients who are poor surgical candidates, prefer to avoid further surgical intervention, or present during periods when elective procedures are restricted.²

Here we present a recurrent FTMH that was successfully closed following a combination of intravitreal triamcinolone, topical CAI, topical steroid, topical NSAID.

Case Report

A 73-year-old pseudophakic male with a PVD in both eyes, mild ERM in the right eye, lattice degeneration in the right eye, and a laser-demarcated retinal detachment in the right eye with several months of progressively worsening vision in his right eye. At presentation, corrected visual acuity was 20/60 with pinhole in the right eye and 20/20 in the left eye.

Optical coherence tomography (OCT) of the right eye revealed a FTMH with perifoveal edema (Fig. 1A). PPV and peeling of the ILM and placement of ILM flap over the hole with gas tamponade was performed. The FTMH closed. Six months postoperatively, mild cystoid macular edema developed but resolved without treatment. Visual acuity improved to 20/40 in the right eye with sustained closure of the FTMH.

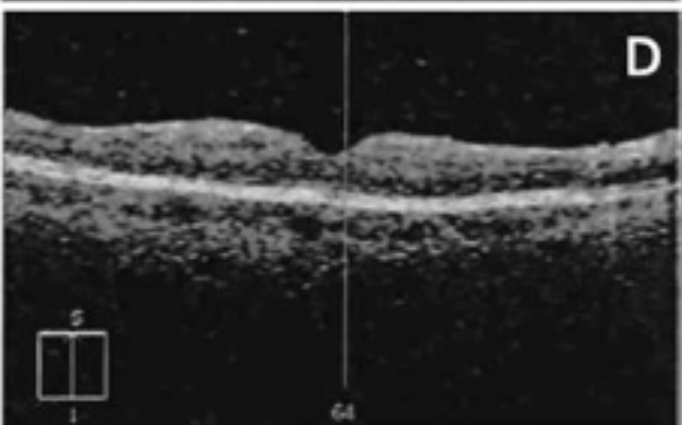
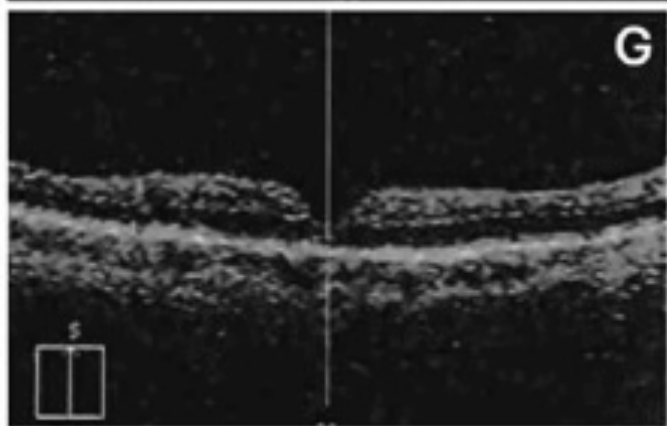
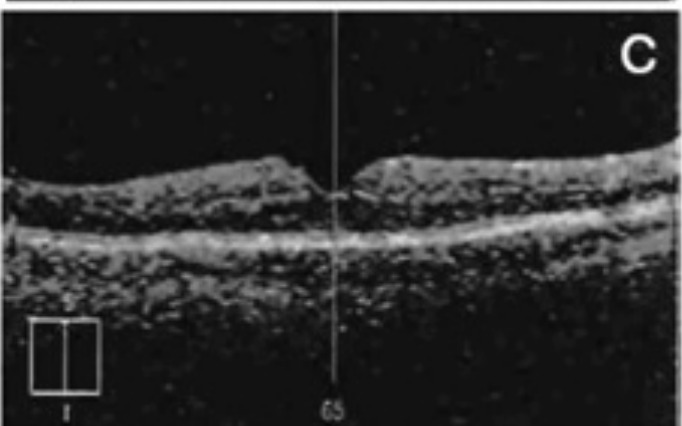
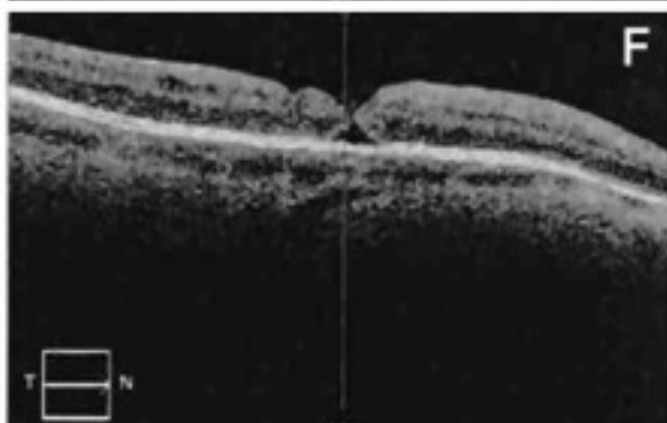
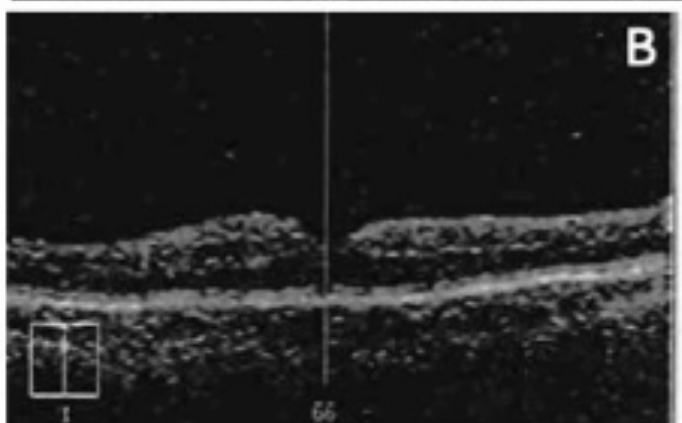
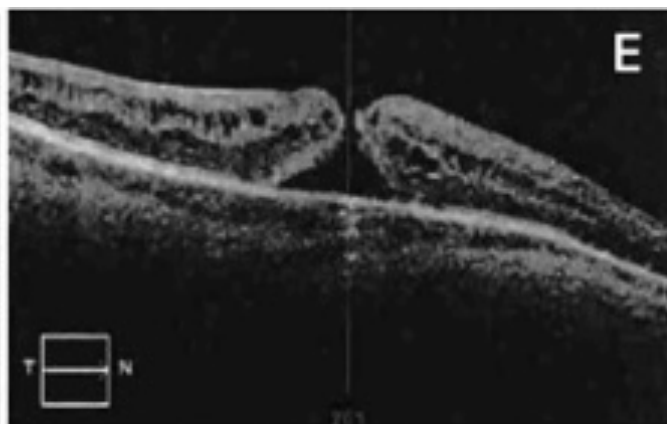
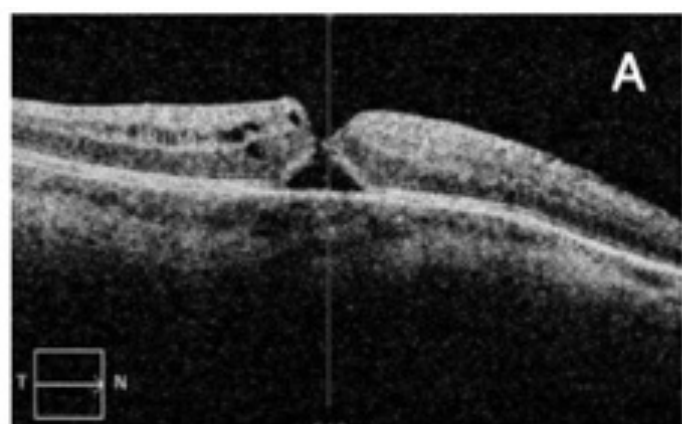


Figure 1. (A-F) Optical coherence tomography images of the extended clinical course of a full-thickness macular hole. A. Right eye at initial presentation of first macular hole. B-D. Five months, eleven months, and five years postop, respectively, from pars plana vitrectomy demonstrating closure of full-thickness macular hole. E. Recurrent full-thickness macular hole six years after initial pars plana vitrectomy. Intravitreal triamcinolone acetonide 2.0 mg/0.05 mL was given, and dorzolamide-timolol 2%/0.5% drops twice a day were initiated. F. Three months later, a smaller but persistent full-thickness macular hole was present. G. Resolution of full-thickness macular hole approximately two months after addition of topical ketorolac 0.4% and prednisolone acetate 1% four times per day.

Six years after the initial PPV, the patient reported several months of worsening blurry vision in the right eye. Visual acuity was 20/80. Examination revealed reopening of the FTMH with perifoveal edema (Fig. 1E). An intravitreal injection of triamcinolone acetonide 2.0 mg/0.05 mL was given, and dorzolamide-timolol 2%/0.5% drops twice a day were started. Three months later, the edema had improved, but the FTMH persisted (Fig. 1F). Topical ketorolac 0.4% and prednisolone acetate 1% drops four times daily were added to the dorzolamide-timolol 2%/0.5% drops twice daily. Two months later, the FTMH had closed (Fig. 1G), and visual acuity improved to 20/70 with pinhole testing in the right eye.

Discussion

This case demonstrates the successful closure of a recurrent FTMH using sequential intravitreal and topical anti-inflammatory therapy in an eye with a complex ocular history. Although PPV remains the most widely accepted and effective treatment for primary FTMH, FTMHs reopen in up to 10% of cases.¹ Management of recurrent FTMH is challenging as repeat vitreous surgery may not always be feasible or desired by the patient.

Recurrent FTMH is increasingly understood to result from both mechanical and inflammatory mechanisms. Factors such as incomplete ILM peeling, ERM formation, or inadequate glial bridging may lead to persistent tractional forces that predispose the fovea to dehiscence.¹ In addition to these mechanical contributors, inflammation and cystoid macular edema are implicated in the recurrence of FTMH as well. Edema-induced retinal swelling may weaken foveal tissue and disrupt the realignment of retinal layers thus impairing closure.^{3,4} Further, chronic postoperative inflammation may impair Müller cell-mediated gliosis, which is critical for hole sealing.² This evolving understanding emphasizes that recurrent FTMH is not merely a surgical failure but may reflect a multifactorial process involving both residual traction and impaired retinal repair capacity which can be targeted by topical therapies.

The exact mechanism by which topical therapies facilitate FTMH closure has not been confirmed. However, it is theorized that by targeting the macular edema and inflammation, retinal tissue approximation and healing are promoted, ultimately leading to FTMH resolution.⁵ Several recent studies have explored topical therapies as an alternative for smaller FTMH. Wang et al. reported a 36.7% closure rate using a combination of topical steroids, CAI, and NSAID for smaller idiopathic FTMH.³ Similarly, Niffenegger et al. observed closure in 89% of secondary FTMH treated with topical therapy.⁴ Several studies also highlighted the increased likelihood of successful closure with medical management in eyes with smaller FTMHs.³⁻⁵

The success in this case adds to the growing body of literature that suggests that smaller FTMH can be successfully managed non-surgically for select patients.

Conclusion

This case underscores the potential of topical therapy as an effective non-surgical option for managing a smaller FTMH, particularly in eyes with recurrent FTMH and complex ocular histories. Further research is needed to standardize optimal treatment duration and guidelines for tapering topical therapies to prevent risk of recurrence.

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Statement of Ethics

This case report adheres to patient confidentiality and ethical principles in accordance with the guidelines of the Declaration of Helsinki and relevant local regulations. Consent was obtained from the patient for the publication of this case report.

Conflict of Interest Statement

The authors declare no conflicts of interest related to this topic.

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