

Double Anterior Chamber: Successful Resolution Of Large Descemet's Membrane Detachment Post Trabeculectomy

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Abstract

Purpose- To report a rare complication of large Descemet's membrane detachment (DMD) while doing trabeculectomy and its timely management.

Case Report- A 60-year-old female presented with pain, redness, and watering in the left eye for three weeks. Examination revealed conjunctival congestion, a mid-dilated fixed pupil, and multiple failed YAG peripheral iridotomies, with an intraocular pressure (IOP) of 40 mmHg despite maximal medical therapy. A diagnosis of unresolved acute angle-closure attack was made, and enlargement of the peripheral iridotomy (PI) was attempted but unsuccessful. The patient underwent trabeculectomy with mitomycin-C. Intraoperatively, a shallow DMD was noted during anterior chamber formation. Initial management with air failed due to leakage through the filtration ostium. On postoperative day 1, anterior segment OCT (AS-OCT) revealed a large DMD resembling a double anterior chamber. Descemetopexy using intracameral perfluoro-propane (C₃F₈, 12–14%) with temporary ostium blockade using high-density viscoelastic (Visco-partition) was performed. Two weeks later, the cornea was clear; DMD resolved completely, and IOP stabilized at 16 mmHg. The patient remained symptom-free with restored vision.

Conclusion: Timely recognition and intervention using intracameral C₃F₈ with Visco-partition can achieve full anatomical and functional recovery in rare post-trabeculectomy DMD cases.

Keywords: DMD, post trabeculectomy, Acute angle closure attack, AS OCT, C₃F₈ injection, Visco-partition

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I. Introduction

Descemet's membrane (DM) is the basement membrane for corneal endothelium which regulating fluid and solutes transport, providing structural support and maintaining corneal transparency. Detachment of Descemet's membrane occurs when the endothelium-Descemet's membrane complex separates, potentially leading to corneal oedema, decreased vision and corneal decompensation. Management of DMD in trabeculectomy is more challenging because the eye is no longer a closed system allowing tamponading agents to escape via the filtration ostium. Here, we report successful management of intraoperative DMD using intracameral C₃F₈ and Visco-partition.

II. Case:

A 60-year-old female presented with pain, redness, watering in the left eye (LE) since 3 weeks. Patient was using Brinzolamide+ Brimonidine TID, Iobet BD and Tab Diamox BD. On the day of presentation her Best Corrected Visual Acuity (BCVA) was RE 6/12, LE 6/60; IOP in LE was 40 mmHg despite maximum medical therapy. Examination revealed generalized congestion, corneal oedema, and a mid-dilated fixed pupil with multiple peripheral iridotomies (Fig 1). Both eyes showed senile immature cataracts. Fundus examination showed RE 0.4 cup disc ratio (CDR) and LE CDR 0.7 with inferior rim loss.

A diagnosis of RE Primary angle closure with S/P PI and LE Non-resolving acute angle-closure glaucoma was made. YAG Peripheral Iridotomy (PI) enlargement was tried but unsuccessful. She was advised for Trabeculectomy with MMC and performed accordingly. Intraoperatively, a shallow Descemet's membrane detachment (DMD) occurred during Anterior Chamber (AC) formation which was initially not noticed but noted after it got extended (Fig 2,3). Intraoperatively we tried to attach the DM using air bubble but air bubble was not

stable because of the presence of ostium.

On post operative Day 1, her BCVA was 20/200 with dense striate keratopathy and on Anterior segment OCT (AS OCT) revealed extensive DMD resembling double Anterior Chamber (Fig 4). Descemetopexy with C3F8 injection was planned immediately as it was long standing along with hourly steroids. But injection of C3F8 was quite challenging because of the presence of ostium. So before the injection of C3F8 viscoelastic was used to seal the ostium called Visco-partition to create a closed chamber (Fig 5). This ensures a better tamponading effect for the attachment of DM and also AC can be formed tightly for 2-3 hours (Fig 6,7). IOP was 16mmHg after 3 hours.

Follow up: One week later most of DM was reattached; but vision was 20/160 improving to 20/100, IOP 18 mm hg. Patient was on topical steroids and Hypersol (Fig 8). Two weeks post procedure, the cornea was clear, DM fully attached on AS-OCT. (Fig 9,10,11). Her vision improved to 6/12 and IOP maintaining at 16mmHg.

III. Discussion

Descemet's membrane detachment (DMD) is a rare but potentially sight-threatening complication following intraocular surgeries, commonly seen in cataract extraction. However, its occurrence after trabeculectomy is exceedingly uncommon and often underreported. In the present case, DMD developed intraoperatively during anterior chamber formation in a patient with a prolonged history of acute angle-closure glaucoma and markedly elevated intraocular pressure (IOP). Several predisposing factors in this scenario likely contributed to the event, including the presence of a shallow anterior chamber secondary to acute angle closure, corneal oedema with endothelial compromise due to chronic high IOP which loosens the adhesion between endothelium and DM, accidental insertion of the instruments between stroma and DM, blunt keratomes, inadvertent injection of saline or OVD between the deep stroma and DM.²

Management of DMD in a post-trabeculectomy eye poses a unique challenge because eye is no longer a closed system. The presence of a filtration ostium allows the escape of tamponade agents through the ostium, making them less effective for attaching DM. Small DMDs may resolve spontaneously or by conservative management; large detachments frequently need to be repaired surgically. Various methods have been reported for reattachment, including intracameral air or gas tamponade with non expansile concentration of SF6 (15-20%), Perfluoro-propane (12-14% C3F8), viscoelastic-assisted reattachment, and Trans-corneal suture fixation of DM in refractory cases. In our case, a combined technique using viscoelastic (Visco-partition) to temporarily occlude the ostium followed by intracameral C3F8 injection was employed successfully. This innovative step created a temporarily closed chamber, allowing adequate pressure to facilitate Descemet's reattachment.^{3,4}

Gradual resolution of corneal oedema and restoration of vision confirmed successful reattachment, highlighting the effectiveness of this combined approach even in complex post-trabeculectomy scenarios. Previous literature suggests that early recognition and prompt intervention are critical to prevent permanent corneal decompensation. This case reinforces that meticulous intraoperative observation and timely intervention are essential in identifying and treating atypical postoperative presentations.^{5,6}

IV. Conclusion

Descemet's membrane detachment following trabeculectomy is an uncommon but potentially vision-threatening complication. Small, planar detachments can be managed medically but larger ones need surgical intervention. Early diagnosis using AS-OCT and timely intervention with innovative techniques such as Visco-partition combined with long-acting gas tamponade can result in complete anatomical and functional recovery.⁷

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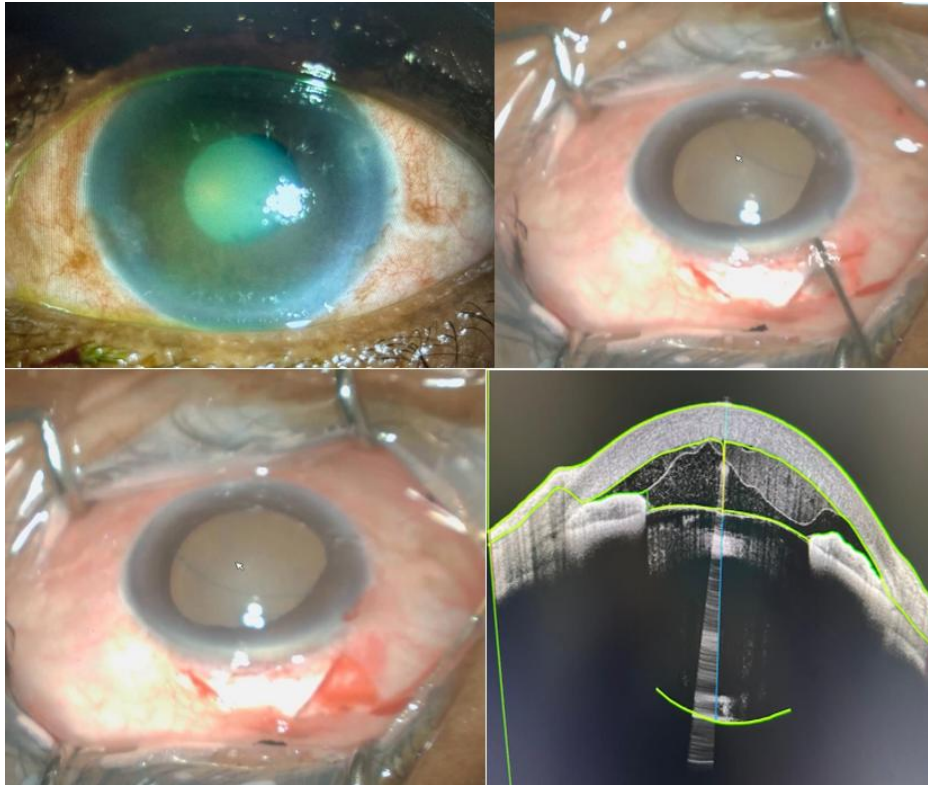


Fig 1- On the day of presentation with mid dilated fixed pupil with failed attempts of YAG PI

Fig 2- DMD originated inferonasally while forming Anterior chamber

Fig 3- DMD extended only sparing supero temporal cornea

Fig 4- Extensive DMD noted appearing like a double anterior chamber in AS OCT on first postoperative day

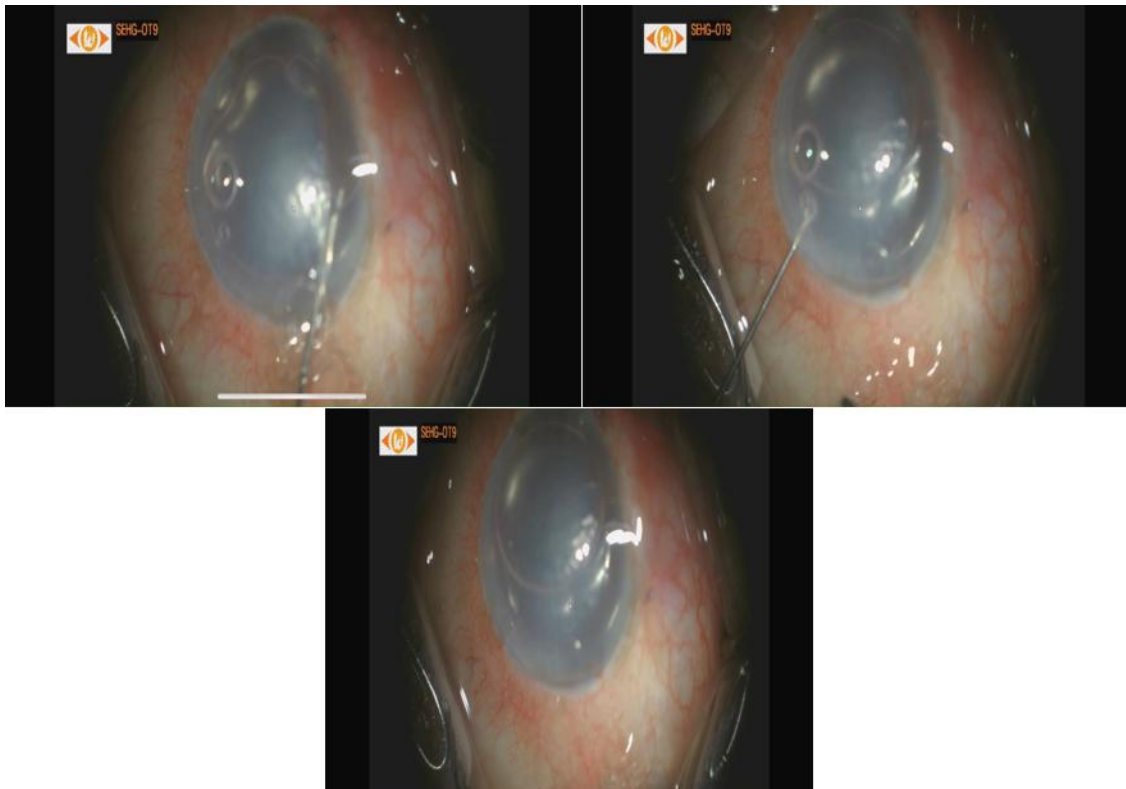


Fig-5-Blocking the ostium with viscoat-Viscopartition

Fig-6- Descemetopexy with C3F8

Fig 7- Tight AC with gas tamponade

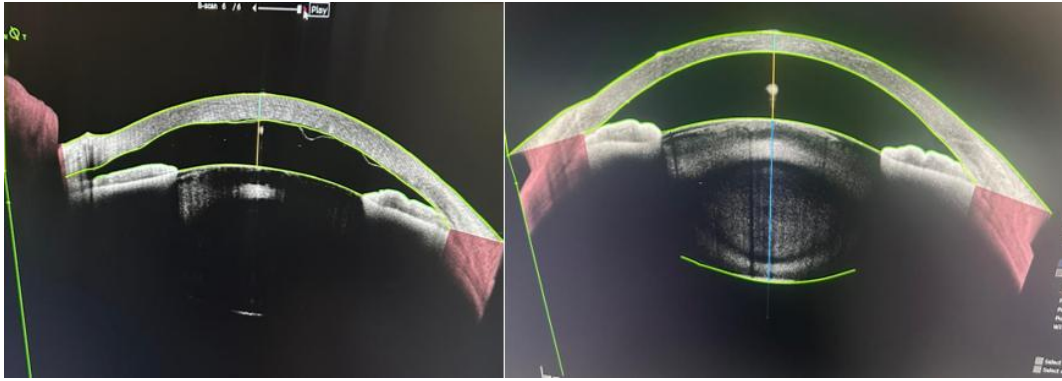


Fig 8- AS OCT showing partially attached DMD at 1week post descemetopexy

Fig 9-AS OCT showing fully attached DMD at 2 week post descemetopexy

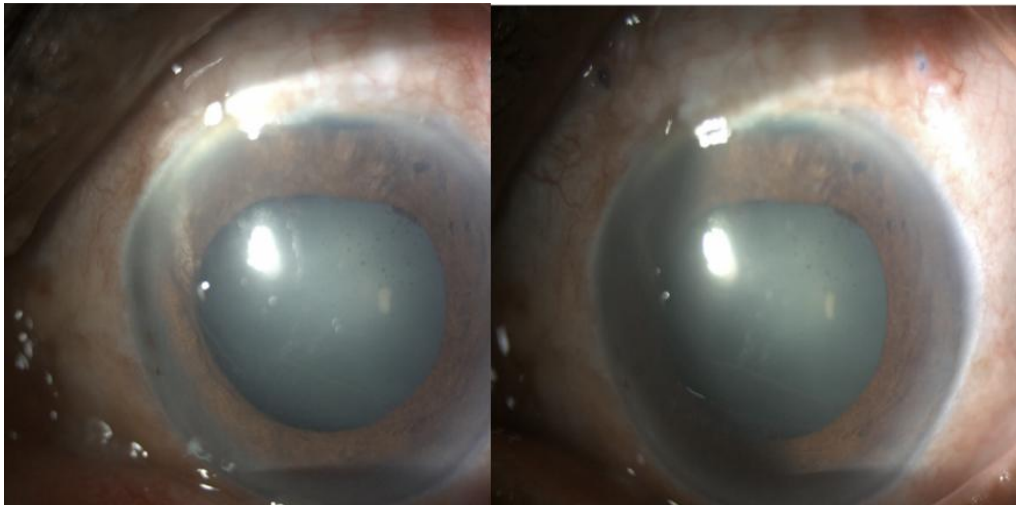


Fig 10, Fig 11- At 2 weeks post C3F8 Anterior segment photo showing clear cornea and elevated bleb with surgical PI .