Annals of Case Reports & Reviews

Case Report

Lu K. 2026(3): 1000460
doi: 10.39127/2574-5747/acrr: e460

Posteriorly Misdirected Hydrus Stent Causing Cyclodialysis and Migration Through Pars Plana into Vitreous Cavity

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Citation: Lu K (2026) Posteriorly Misdirected Hydrus Stent Causing Cyclodialysis and Migration Through Pars Plana into Vitreous Cavity. Annal Cas Rep Rev: ACRR-459.

Received Date: 15 March, 2026; **Accepted Date:** 23 March, 2026; **Published Date:** 27 March, 2026

Abstract

Purpose: *To report a rare complication of posterior misdirection of a Hydrus Microstent resulting in cyclodialysis and eventual localization through pars plana into vitreous cavity with eventual clinical stabilization.*

Observations: *A 68-year-old Asian American male with cataract and primary open-angle glaucoma underwent uncomplicated phacoemulsification with intraocular lens implantation and Hydrus Microstent placement in the left eye. During deployment, the stent was noted to track posteriorly rather than into Schlemm's canal. Postoperatively the patient developed hypotony, shallow anterior chamber, and transient intraocular lens (IOL) capture. Conservative management was pursued after partial spontaneous improvement. Two months later, fundus imaging demonstrated the distal Hydrus protruding through the pars plana into the anterior vitreous cavity, presumed anchored at a cyclodialysis cleft. Vision and intraocular pressure normalized without further intervention. At one year, the eye remained stable, off glaucoma medications.*

Conclusions and Importance: *Although minimally invasive glaucoma surgery (MIGS) devices have favorable safety profiles, malpositioning can produce atypical complications. Posterior misdirection of the Hydrus Microstent with cyclodialysis may occasionally stabilize without surgical removal, but careful intraoperative technique and postoperative surveillance remain essential.*

Keywords: *Hydrus Microstent complication, Posterior migration of Hydrus, MIGS complication, Glaucoma surgery.*

Introduction

Micro-invasive glaucoma surgery (MIGS) has expanded rapidly due to its favorable safety profile compared with traditional filtering procedures [1]. The Hydrus Microstent (Ivantis, Irvine, CA) is designed to scaffold approximately 90 degrees of Schlemm's canal to enhance aqueous outflow and reduce intraocular pressure (IOP) [2]. Clinical trials, including the 5-year HORIZON trial, have demonstrated effective IOP reduction with relatively low rates of serious adverse events [3,4].

Nevertheless, device malpositioning and angle trauma remain recognized risks. Reported complications include hyphema, iridodialysis, cyclodialysis cleft formation, improper stent positioning, and uveitis-glaucoma-hyphema syndrome.[5] Rare posterior migration events have not been well characterized in the literature. We report a case of posteriorly misdirected Hydrus Microstent causing cyclodialysis with eventual localization in the pars plana and favorable long-term outcome. To our knowledge, this is the first reported case of misplaced Hydrus Microstent in anterior vitreous.

Case Report

Preoperative Course

A 68-year-old Asian American male with visually significant cataracts and primary open-angle glaucoma in both eyes presented for surgery. He was treated with latanoprost and fixed-combination timolol–dorzolamide bilaterally.

Two months prior, the right eye had undergone uncomplicated phacoemulsification with Hydrus implantation. Preoperative IOP in both eyes were 10 mmHg on two medications.

Index Surgery

The patient underwent phacoemulsification of the left eye. Cataract removal was uneventful. A toric extended-focus intraocular lens (Clareon Vivity T3, +13.5 D, Alcon, Fort Worth, TX) was implanted in the capsular bag.

During Hydrus Microstent insertion, the device was released rapidly and appeared to track posteriorly rather than entering Schlemm's canal. An attempt to re-grasp the implant was unsuccessful because the proximal tip was poorly visualized. The case was otherwise concluded.

Postoperative Day 1

- UCVA: 20/40 Snellen, J1 near
- IOP: 4 mmHg (iCare tonometry)
- Anterior chamber: very shallow
- Temporal IOL capture by the pupil
- Wound: Seidel negative
- Retina: normal, no choroidal detachment

Cycloplegia failed to deepen the chamber. Aqueous misdirection through the stent into the vitreous cavity was

suspected. Observation was elected and glaucoma drops were discontinued.

Postoperative Day 2

- Vision declined to 20/100 Snellen, J1 near
- IOP: 3 mmHg
- Persistent shallow chamber and myopic shift
- IOL still captured temporally by pupil

The patient was scheduled for operative repositioning or removal of the Hydrus and IOL repositioning.

Return to the Operating Room (Postoperative Day 3)

In the supine position, the anterior chamber appeared significantly deeper and the IOL had spontaneously returned to proper capsular bag position.

Gonioscopy revealed:

- Small focal cyclodialysis cleft
- Proximal Hydrus not clearly visualized

Given improving anatomy, the decision was made to observe.

Subsequent Course

- **Post-op Day 4:** VA 20/80, IOP 5; AC improved
- **Post-op Day 8:** VA 20/100, IOP 9
- **Post-op Day 16:** VA 20/150, IOP 7; refraction −2.50 → 20/20

Observation continued.

Two-Month Visit

- UCVA: 20/20
- IOP: 12 mmHg off medications
- Anterior chamber depth normalized

Depressed dilated fundus examination revealed the Hydrus Microstent protruding through the pars plana into the anterior vitreous cavity (Figure 1, Optos ultra-widefield retinal imaging system, Optos, Dunfermline, UK). The proximal portion was presumed captured within the cyclodialysis cleft. The retina remained intact without tear or detachment.

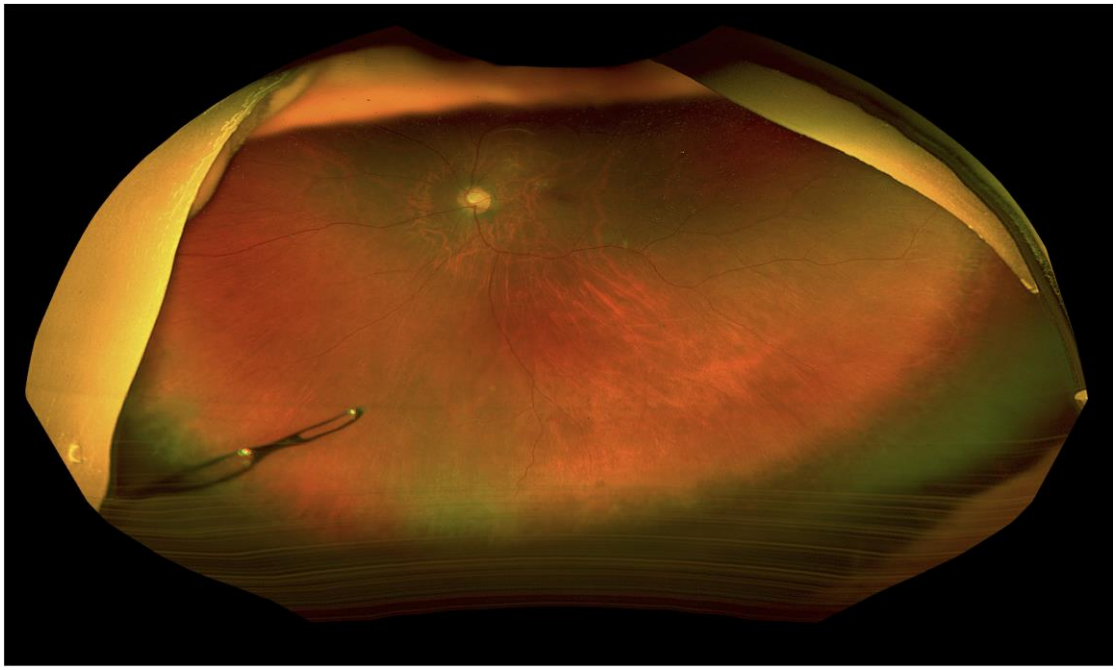

Figure 1: Optos ultra-widefield retinal imaging (Optos, Dunfermline, UK) showing the Hydrus Microstent protruding out of pars plana into anterior vitreous cavity.

One-Year Follow-up

- UCVA: 20/30, J1
- IOP: 10 mmHg off medications
- Eye remained anatomically stable

Discussion

MIGS procedures are widely adopted because they generally provide meaningful IOP reduction with lower complication rates than traditional filtering surgery [2]. The Hydrus Microstent in particular has demonstrated durable pressure lowering and reduced medication dependence in randomized trials [2].

However, proper placement within Schlemm's canal is critical. Malpositioned Hydrus implants have been associated with complications such as uveitis-glaucoma-hyphema syndrome and the need for explantation.[5] Angle trauma including cyclodialysis has also been reported among potential intraoperative complications.

This case illustrates several important teaching points:

1. **Posterior misdirection can create a cyclodialysis pathway**

The rapid release of the device likely allowed the stent to traverse posteriorly, creating a focal cyclodialysis cleft that communicated with the vitreous cavity, producing hypotony and forward displacement of the lens-iris diaphragm.

2. **Spontaneous partial recovery may occur**

Despite initial hypotony and IOL capture, the eye gradually re-equilibrated. The stent ultimately rested in the pars plana without causing retinal pathology or persistent hypotony.

3. **Not all malpositioned MIGS devices require immediate removal**

Prior reports describe cases requiring explantation when malposition leads to persistent inflammation or mechanical complications [4]. In contrast, our patient achieved excellent visual and pressure outcomes with observation alone.

4. Vigilance remains essential despite MIGS safety profile

While MIGS procedures are often perceived as low risk, angle-based surgery still carries the potential for significant anatomic disruption. Surgeons must maintain careful gonioscopic visualization, controlled deployment, and readiness to manage unexpected device trajectories. Surgical pearls and technique have been proposed to improve proper implantation.[6] This involves approaching the trabecular meshwork in a tangential fashion, with a shallow and slightly anteriorized aim to avoid hitting the outer wall of the Schlemm's canal, which tends to drive the tip of Hydrus stent posteriorly.

Had the device migrated further into the posterior vitreous cavity, pars plana vitrectomy and removal would likely have been required. Fortunately, the implant assumed a benign and stable configuration. Since there were no stent-related complications, such as uveitis, corneal decompensation, or retinopathy, removal was not entertained. If the myopic shift had persisted, corneal refractive surgery could have corrected the vision. Fortunately, anatomy and vision were restored without further intervention. Interestingly, the IOP reduction persisted, probably from the cyclodialysis.

Conclusions

Posterior misdirection of the Hydrus Microstent is a rare but potentially significant complication of MIGS. Cyclodialysis with pars plana localization may, in select cases, stabilize without surgical intervention and still yield good visual and IOP outcomes. Nonetheless, meticulous angle visualization, controlled deployment, and close postoperative monitoring are critical as MIGS adoption continues to expand.

Acknowledgement: The author would like to acknowledge the patient for understanding of this complication.

Conflict of Interest: The author has no financial interest in any products mentioned in this article.

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