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# Severe choroidal detachment with hemorrhagic suprachoroidal fluid associated with persistent leakage from a blade-created anterior chamber paracentesis wound after intravitreal aflibercept: a case report

**Akira Saitoh**

akirasaitohjp@yahoo.co.jp

Takamatsu Red Cross Hospital

**Ayumi Kondo Saitoh**

Takamatsu Red Cross Hospital

**Yuki Nakano**

Kagawa University

**Case Report**

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## Abstract

# Background

Persistent wound leakage after repeated needle-based anterior chamber paracentesis (ACP) has been reported. We describe progressive choroidal detachment (CD) with hemorrhagic suprachoroidal fluid associated with persistent leakage from a blade-created ACP wound. Procedural and repair videos, B-scan ultrasonography, and computed tomography documented wound findings and the clinical course.

# Case presentation:

A 63-year-old Japanese woman with a pseudophakic right eye underwent her 24th intravitreal aflibercept injection for neovascular age-related macular degeneration. A markedly tense globe during cotton-swab compression prompted ACP under an operating microscope using a straight microvitreoretinal knife (0.9-mm blade diameter) also used for corneal side-port creation during cataract surgery. The same surgeon had performed four previous ACPs, generally in the same temporal corneal region. Retrospective video review identified blade entry through a pre-existing focal corneal opacity. The next day, visual acuity was hand motions, Goldmann applanation pressure was below 5 mmHg, and the anterior chamber was shallow. The corneal wound was Seidel-positive, whereas the scleral injection site was negative. Ultrasonography and computed tomography showed extensive CD. Following referral arrangements, she was assessed at a university hospital six days after ACP; CD had progressed, and surgical repair was performed that day. Stromal hydration failed, but a single 10 – 0 nylon suture achieved watertight closure. External drainage of hemorrhagic suprachoroidal fluid was followed by pars plana vitrectomy with temporary perfluorocarbon liquid to facilitate drainage of residual posterior fluid. CD resolved by postoperative day 14. Over nearly 12 months, eight faricimab injections without ACP were administered without recurrent leakage, hypotony, or CD. Final best-corrected visual acuity was 0.15 (approximately 20/133), pressure was 15 mmHg, and macular intraretinal fluid persisted.

# Conclusions

Blade-created ACP wounds can remain non-self-sealing. Apparent cessation of aqueous egress does not confirm watertight closure. Persistent Seidel-positive hypotony, particularly with a shallow anterior chamber or early CD, should prompt consideration of early definitive wound closure and prompt posterior-segment assessment. For repeated ACP, deliberate selection of a different entry site, avoiding identifiable previous ACP wounds and visibly scarred or opaque tissue, is advisable.

## Background

Intravitreal anti-vascular endothelial growth factor (VEGF) injections can cause an immediate increase in intraocular pressure (IOP). Anterior chamber paracentesis (ACP) provides rapid decompression and is

generally considered safe when performed appropriately [1–3]. However, Shah et al. reported persistent wound leakage, profound hypotony, and choroidal detachment (CD) after repeated ACP with a 30-gauge hollow-bore needle, discussing compromised peripheral corneal integrity and wound architecture as possible contributors [4]. These cases improved with conservative treatment or corneal wound closure, without external drainage or vitreoretinal surgery.

Leakage from the scleral injection site has also been reported after intravitreal injection [5, 6]. CD or suprachoroidal hemorrhage has additionally occurred without confirmed leakage from a corneal ACP wound [7–9]. We report severe progressive CD with hemorrhagic suprachoroidal fluid associated with persistent leakage from a clear corneal ACP wound created with a blade under an operating microscope. Management comprised corneal suturing, external drainage, and subsequent pars plana vitrectomy (PPV) with temporary perfluorocarbon liquid (PFCL) to facilitate drainage of residual posterior fluid. Procedural and repair videos, clinical findings, serial imaging, and long-term follow-up are considered alongside previous reports to identify practical lessons in verifying wound closure and responding to persistent leakage.

## Case presentation

A 63-year-old Japanese woman was receiving as-needed anti-VEGF therapy for neovascular age-related macular degeneration in the right eye. The eye was pseudophakic; the main incision for her previous cataract surgery had been a superior sclerocorneal incision. She had no history of glaucoma surgery, ocular trauma, or vitrectomy in that eye and no high myopia. She was not taking anticoagulant or antiplatelet medication and had no history of a bleeding tendency or hypertension. This was her 24th intravitreal aflibercept injection at our hospital. The records documented four previous ACP procedures. All previous ACPs and the index procedure were performed by the same right-handed surgeon, who generally used the same temporal corneal region for ergonomic reasons; the exact previous entry sites were not recorded. Immediately before injection, best-corrected visual acuity was 0.4 in decimal notation (Snellen equivalent, 20/50).

On July 29, 2025, aflibercept 2 mg in 0.05 mL was injected intravitreally through the superotemporal sclera, 3.5 mm posterior to the limbus, using a 30-gauge needle and a two-step scleral entry technique. After needle withdrawal, the globe felt markedly tense during compression of the scleral injection site with a sterile cotton swab. Although IOP was not measured quantitatively immediately after injection, concern about an acute pressure rise prompted clear corneal ACP under an operating microscope. A straight microvitreoretinal (MVR) knife, also used for clear corneal side-port creation during cataract surgery, was used (VK-20GF; blade diameter, 0.9 mm; KAI Industries, Seki, Gifu, Japan). Retrospective frame-by-frame review of the procedural video showed a focal white peripheral corneal opacity before blade contact and blade entry through that area (Fig. 1A, B). This spatial correspondence was recognized only after the complication developed. Clear-fluid egress was visible during blade withdrawal (Fig. 1C; Additional file 1). The temporal ACP entry site differed from the superior main cataract incision. The origin of the opacity could not be established because the exact previous ACP sites had not been

recorded. At the end of the procedure, visible fluid egress appeared to have ceased. However, post-ACP IOP was not measured quantitatively, and end-of-procedure Seidel testing was not documented; watertight closure was therefore not objectively established.

On July 30, right-eye visual acuity had decreased to hand motions. IOP measured by Goldmann applanation tonometry was below 5 mmHg. Slit-lamp examination showed a shallow anterior chamber and a positive Seidel test at the clear corneal ACP wound. The scleral intravitreal injection site was Seidel-negative. B-scan ultrasonography and orbital computed tomography (CT) showed extensive CD (Fig. 2A, B). Oral prednisolone 15 mg/day and a short period of observation were initially selected in anticipation of spontaneous wound closure. At review on July 31, visual acuity remained hand motions, with no improvement in hypotony, Seidel-positive leakage, anterior chamber shallowing, or extensive CD. Referral to a university hospital was initiated that day because external drainage or vitreoretinal surgery might be required.

Following referral arrangements over the intervening weekend, she was evaluated by the university vitreoretinal service on Monday, August 4, the earliest available appointment and six days after ACP. B-scan ultrasonography showed marked progression of CD. Heterogeneous echogenic material and hypoechoic fluid coexisted within the detached space, suggesting mixed hemorrhagic and serous components (Fig. 3A). Urgent surgical repair was performed that day.

At the start of repair, the same ACP wound was not watertight, and clear-fluid leakage was evident. Leakage persisted after stromal hydration (Fig. 4A) but stopped after placement of a single interrupted 10 – 0 nylon suture (Fig. 4B). Under anterior chamber infusion, an anterior scleral drainage window was created, and hemorrhagic suprachoroidal fluid was initially drained; red blood-containing components were visible in the effluent. Three 25-gauge trocars were then placed, and PPV was performed. Non-contact wide-angle fundus viewing demonstrated extensive residual posterior CD with hemorrhagic suprachoroidal fluid. A further posterior scleral drainage incision was considered technically difficult and potentially hazardous. PFCL was therefore temporarily injected to approximately the equator to displace residual suprachoroidal fluid anteriorly toward the drainage window. Additional bloody fluid exited through the existing window (Fig. 4C). A second scleral drainage window was created further anteriorly to obtain additional drainage. After wide-angle viewing confirmed marked reduction of CD, the PFCL was completely removed. The retina was attached, and no retinal tears or other findings requiring additional treatment were identified; neither fluid–air exchange nor gas tamponade was performed. Only mild peripheral residual CD remained at wound closure (Additional file 2).

IOP was 20 mmHg on the first postoperative day. On August 18, 2025, best-corrected visual acuity was 0.15 (approximately 20/133), IOP was 18 mmHg, and B-scan ultrasonography confirmed complete resolution of CD (Fig. 3B). Intravitreal faricimab without ACP was initiated at the same university hospital on September 3 because the macular neovascularization was active. At that visit, best-corrected visual acuity was 0.2 (20/100), and IOP was 14 mmHg. After three loading injections, treatment continued using a treat-and-extend regimen. By August 26, 2026, eight faricimab injections had been administered

without ACP. Best-corrected visual acuity was 0.15 (approximately 20/133), IOP was 15 mmHg, and macular intraretinal fluid persisted. No recurrent hypotony, clinically evident corneal wound leakage, or CD occurred, and no further vitreoretinal surgery or wound-repair procedure was required. A clinical timeline is provided in Additional file 3.

## Discussion and Conclusions

ACP is generally considered safe. In a series of 560 slit-lamp ACP procedures, Trivedi et al. recorded four complications but no entry-site leakage or hypotony [1]. A 2025 systematic review and meta-analysis by Zaman et al. also supported the IOP-lowering effect and overall safety of ACP associated with intravitreal injections [2]. These findings, however, do not guarantee reliable closure of every ACP wound.

The most directly relevant report is that of Shah et al. In their selected series of five patients with complications associated with serial ACP, three developed profound hypotony from persistent ACP wound leakage; all three had CD, and one had mixed serous and hemorrhagic components [4]. These patients were treated with a pressure patch and cycloplegia, polyethylene glycol hydrogel sealant with a bandage contact lens, or corneal nylon suturing, respectively. None required external drainage, PPV, or PFCL. The fundamental association of persistent leakage after repeated ACP with profound hypotony and CD has therefore already been described.

Shah et al. performed ACP using a 30-gauge hollow-bore needle attached to a 1-mL syringe with its plunger removed, allowing passive aqueous outflow [4]. They discussed irregular wound tracts and stromal tissue loss from coring as possible mechanisms of persistent leakage. They also considered paracentesis knives or sharp blades, which may create more regular wounds, but did not recommend these alternatives because of concerns about wound enlargement, control of aqueous drainage, and iatrogenic injury. In the present case, persistent leakage occurred despite creation of a linear clear corneal ACP incision under an operating microscope using a straight MVR knife also used for cataract side ports. This observation shows that persistent ACP leakage is not confined to hollow-bore needle tracts and can occur in a blade-created wound.

Frame-by-frame review showed that a focal white corneal opacity was present before blade contact and that the blade entered through this area (Fig. 1A, B). Because the same right-handed surgeon had generally used the same temporal corneal region for previous ACPs, repeated instrumentation may have involved the current entry site or its vicinity. The superior sclerocorneal main cataract incision was at a different location. However, the relationship of previous ACP tracts or the cataract side port to the opacity could not be established, and local tissue biomechanics were not assessed. The origin of the opacity and its contribution to failed closure therefore remain uncertain. Given the concern about repeated corneal trauma raised by Shah et al. [4], it is prudent to deliberately select a different entry site for repeated ACP, avoiding identifiable previous ACP wounds, existing surgical wounds, and visibly scarred or opaque corneal tissue.

One practical lesson is that apparent cessation of visible aqueous egress should not be equated with confirmation of watertight closure. Experimental imaging of unhealed clear corneal cataract incisions showed tighter wound apposition at higher IOP and internal wound gaping at lower IOP [10]. Although this provides only indirect evidence for the present case, a reduced transcorneal pressure gradient after ACP could temporarily diminish visible egress despite incomplete wound apposition. Because post-ACP IOP was not measured and end-of-procedure Seidel testing was not documented, whether watertight closure had been achieved at that time is unknown.

Persistent leakage from blade-created corneal wounds has itself been reported previously. Stratas described a 1.4-mm clear corneal paracentesis wound made with a 1.0-mm diamond knife during bimanual phacoemulsification. Despite appearing watertight intraoperatively, the wound was Seidel-positive the following day, with an IOP of 4 mmHg, and was closed with one 10 – 0 nylon suture [11]. Wong et al. described reopening of recent clear corneal cataract wounds during vitrectomy 0–14 days after cataract surgery, with hypotony-associated CD and hemorrhagic changes [12]. These reports demonstrate that blade-created wounds can fail to close. The present case complements them by documenting procedural fluid egress and repair-time wound failure on video, together with the course of persistent leakage, profound hypotony, and progressive CD after ACP performed to decompress the eye following intravitreal injection.

A second lesson concerns management after persistent leakage is identified. On July 30, 2025, this patient already had Seidel-positive leakage, IOP below 5 mmHg, a shallow anterior chamber, and extensive CD. Short observation was initially selected in anticipation of spontaneous closure. The findings remained unimproved on July 31, when referral was initiated; evaluation and same-day surgery followed on August 4, the earliest available university appointment after the weekend. In retrospect, the July 30 findings favored earlier definitive mechanical wound closure rather than reliance on spontaneous sealing. The course emphasizes the importance of addressing the leak source early and promptly assessing the posterior segment when similar findings occur.

At repair, leakage persisted after stromal hydration but stopped immediately after a single interrupted 10 – 0 nylon suture (Fig. 4A, B; Additional file 2). This response supports local mechanical wound-closure failure and successful control of the leak source by direct wound apposition. No recurrent leakage, hypotony, or CD occurred during more than 12 months of postoperative follow-up, including nearly 12 months of faricimab treatment without ACP. This non-recurrence followed both wound suturing and a change of drug and does not constitute a rechallenge.

CD or suprachoroidal hemorrhage after intravitreal procedures has also been reported with different or incompletely established mechanisms. These include scleral injection-site leakage [5, 6], cases without confirmed corneal ACP leakage [7–9], and hypotony with CD associated with leakage from an Ozurdex transscleral entry wound [13] (Table 1). Here, the corneal ACP wound was Seidel-positive the following day while the scleral injection site was negative, and failure of the same corneal wound to close was confirmed at repair. These findings support the corneal ACP wound as the principal source of leakage

underlying persistent hypotony. Fluid egress recorded during ACP is an expected consequence of decompression and does not, by itself, prove ongoing leakage after the procedure. Ultrasonography and CT documented extensive CD, while serial ultrasonography recorded progression and subsequent resolution after surgical repair (Figs. 2 and 3), objectively illustrating the clinical course.

Table 1
Comparison of selected previous reports and the present case

| Report | Procedure / suspected leakage source | Principal findings | Relevance and distinction |
|---|---|---|---|
| Shah et al., 2022 [4] | Planned repeated ACP after intravitreal injection using a 30-gauge hollow-bore needle | Selected series of five patients with complications: three had profound hypotony from persistent ACP leakage; all three had CD, one with mixed serous and hemorrhagic components | Irregular wound architecture and stromal coring were proposed. Treated with pressure patch/cycloplegia, hydrogel sealant plus bandage lens, or corneal suturing; no external drainage, PPV, or PFCL. |
| Wickremasinghe et al., 2008 [5] | Scleral bevacizumab injection site | Next-day hypotony from wound leakage; spontaneous closure | Scleral injection wound rather than a blade-created corneal ACP wound. |
| Jones et al., 2017 [7] | Intravitreal injection; leakage source not documented | Suprachoroidal hemorrhage in a previously vitrectomized eye | Posterior complication without confirmed corneal wound leakage. |
| Sato et al., 2022 [8] | Aflibercept injection during nivolumab treatment | Annular CD without hypotony; inflammatory mechanism discussed | Same anti-VEGF agent, but a different proposed mechanism. |
| Schönbach and Freeman, 2023 [9] | Faricimab injection | Hypotony-associated CD / suprachoroidal hemorrhage | Leakage from a blade-created ACP wound was not documented. |
| Stratas, 2005 [11] | 1.4-mm clear corneal paracentesis wound created with a 1.0-mm diamond knife during bimanual phacoemulsification | Apparently watertight intraoperatively; Seidel-positive the next day with IOP 4 mmHg; closed with one 10 − 0 nylon suture | Persistent blade-wound leakage and single-suture closure are established; the clinical setting and posterior course differ. |
| Wong et al., 2010 [12] | Vitrectomy with recent clear corneal cataract wounds, 0–14 days after cataract surgery | Leakage with minor scleral manipulation in all five eyes; hypotony-related CD in four, hemorrhagic in three | Supports the corneal leak–hypotony–CD pathway, but involved reopening of recent cataract wounds during vitrectomy. |
| Hussain et al., 2025 [13] | Ozurdex transscleral wound in a previously vitrectomized eye | Seidel-positive scleral leakage, hypotony, and CD | Supports the leak–hypotony–CD pathway, but through a larger scleral wound. |

ACP, anterior chamber paracentesis; CD, choroidal detachment; IOP, intraocular pressure; MVR, microvitreoretinal; PFCL, perfluorocarbon liquid; PPV, pars plana vitrectomy.

| Report | Procedure / suspected leakage source | Principal findings | Relevance and distinction |
|---|---|---|---|
| Present case | Clear corneal ACP after aflibercept, using a straight MVR knife (0.9-mm blade) under an operating microscope | Entry through a pre-existing opacity and procedural egress recorded; same-site persistent leakage, profound hypotony, progressive severe CD, and blood-containing drainage | Next-day and repair findings, a negative scleral Seidel test, and durable closure after suturing support the corneal wound as the leak source. No recurrence after eight subsequent injections without ACP. |

ACP, anterior chamber paracentesis; CD, choroidal detachment; IOP, intraocular pressure; MVR, microvitreoretinal; PFCL, perfluorocarbon liquid; PPV, pars plana vitrectomy.

Abrupt ocular decompression during intraocular surgery can precipitate suprachoroidal hemorrhage [14]. The video in this case shows clear, brisk aqueous egress during ACP (Fig. 1C; Additional file 1), raising the possibility that an abrupt pressure reduction contributed to the development of CD and hemorrhagic changes. However, the magnitude and rate of IOP reduction and the volume of aqueous loss were not quantified. The relative contributions of initial decompression and subsequent hypotony from persistent wound leakage cannot therefore be distinguished.

External drainage, with or without PPV, has been described for extensive hemorrhagic suprachoroidal collections [14, 15]. Preoperative B-scan ultrasonography showed heterogeneous echogenic material and hypoechoic fluid within the detached space, suggesting mixed hemorrhagic and serous components (Fig. 3A). During surgery, red blood-containing components were directly visible in the suprachoroidal fluid drained through an anterior scleral window (Fig. 4C). Initial external drainage through the first anterior window was followed by PPV. Because extensive posterior elevation remained, temporary PFCL was used to facilitate anterior drainage. PFCL has previously been used as an intraoperative adjunct in the surgical management of suprachoroidal hemorrhage [16, 17], and its use here represents an application of established surgical principles. Because several procedures were combined during the same operation, their individual contributions to posterior-segment recovery cannot be separated.

Although CD resolved and IOP normalized, final best-corrected visual acuity remained 0.15 (approximately 20/133), below the pre-injection value of 0.4 (20/50). Persistent macular intraretinal fluid at the final visit suggests that the underlying neovascular age-related macular degeneration may have limited visual recovery. The contribution of this complication and its persistence to the final visual outcome cannot be isolated. Whether earlier closure would have prevented posterior-segment progression or improved final vision cannot be determined from this case.

This report is a retrospective description of a single case without a comparator. It cannot establish the relative safety of blade-based and needle-based ACP or support extrapolation to small-gauge needle ACP. Its contribution lies in the video and clinical documentation of wound-closure failure and the

resulting lessons in wound management. Reporting was guided by CARE; the completed checklist identifies both reported and unavailable items (Additional file 4).

In conclusion, persistent leakage and failure of self-sealing can occur after blade-created clear corneal ACP. For repeated ACP, deliberate selection of a different entry site, avoiding identifiable previous ACP wounds and visibly scarred or opaque tissue, is advisable. Apparent cessation of aqueous egress is not equivalent to confirmed watertight closure. Persistent Seidel-positive hypotony, particularly with a shallow anterior chamber or early CD, warrants consideration of early definitive wound closure and prompt posterior-segment assessment.

## Abbreviations

ACP, anterior chamber paracentesis; CD, choroidal detachment; CT, computed tomography; IOP, intraocular pressure; MVR, microvitreoretinal; PFCL, perfluorocarbon liquid; PPV, pars plana vitrectomy; VEGF, vascular endothelial growth factor.

## Declarations

# Ethics approval and consent to participate

This study was conducted in accordance with the Declaration of Helsinki. The Institutional Review Board of Takamatsu Red Cross Hospital approved this case report (approval No. 26-004). Written informed consent to participate was obtained from the patient.

# Consent for publication

Written informed consent was obtained from the patient for publication of this case report and the accompanying clinical images and videos.

# Availability of data and materials

The data supporting the conclusions of this report are included in the article and its additional files. Further de-identified clinical information may be available from the corresponding author on reasonable request, subject to institutional policies and patient privacy restrictions.

# Competing interests

The authors declare that they have no competing interests.

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# Authors' contributions

AS conceived the case report, collected the clinical data, and drafted the manuscript. AKS provided intellectual input and critically revised the manuscript. YN performed the surgical repair, contributed clinical information, and supervised interpretation of the intraoperative findings. All authors read and approved the final manuscript.

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Generative artificial intelligence tools, Gemini (Google LLC) and ChatGPT (OpenAI), assisted with drafting, Japanese–English translation, language editing, manuscript organization, consideration of discussion wording, and preparation of submission materials. No clinical observations or patient data were generated by these tools, and no synthetic clinical images or videos were created. Clinical findings and operative details were established from the clinical records and original recordings. The authors reviewed and revised the AI-assisted content and take responsibility for the accuracy and integrity of the manuscript, including its interpretations and references.

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# Figures

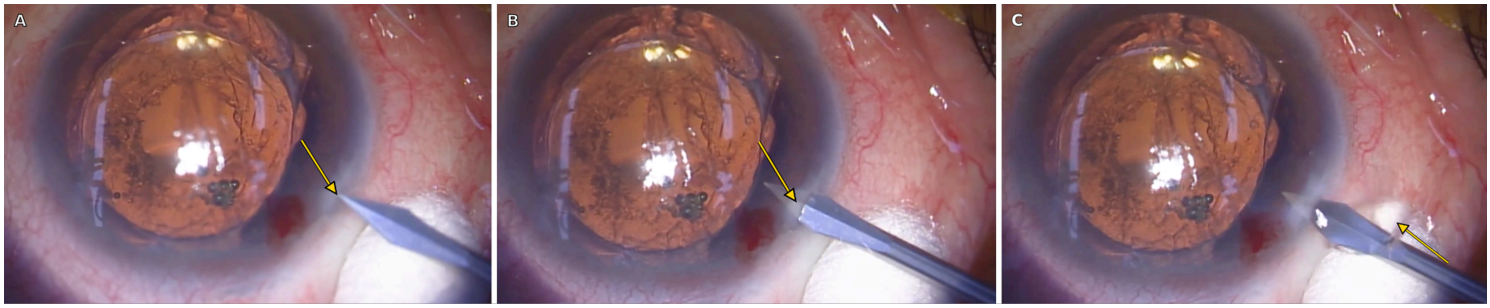



**Figure 1**

Video stills of anterior chamber paracentesis after intravitreal aflibercept injection

(A) Immediately before corneal contact, a focal white opacity is visible in the peripheral cornea near the blade tip (arrow). (B) A straight microvitreoretinal (MVR) knife with a 0.9-mm blade diameter enters through the opaque area; the arrow indicates the corneal entry site. (C) During blade withdrawal, clear-fluid egress is visible at the paracentesis wound (arrow). The spatial correspondence between the opacity and entry site was recognized only during retrospective frame-by-frame video review (Additional file 1).

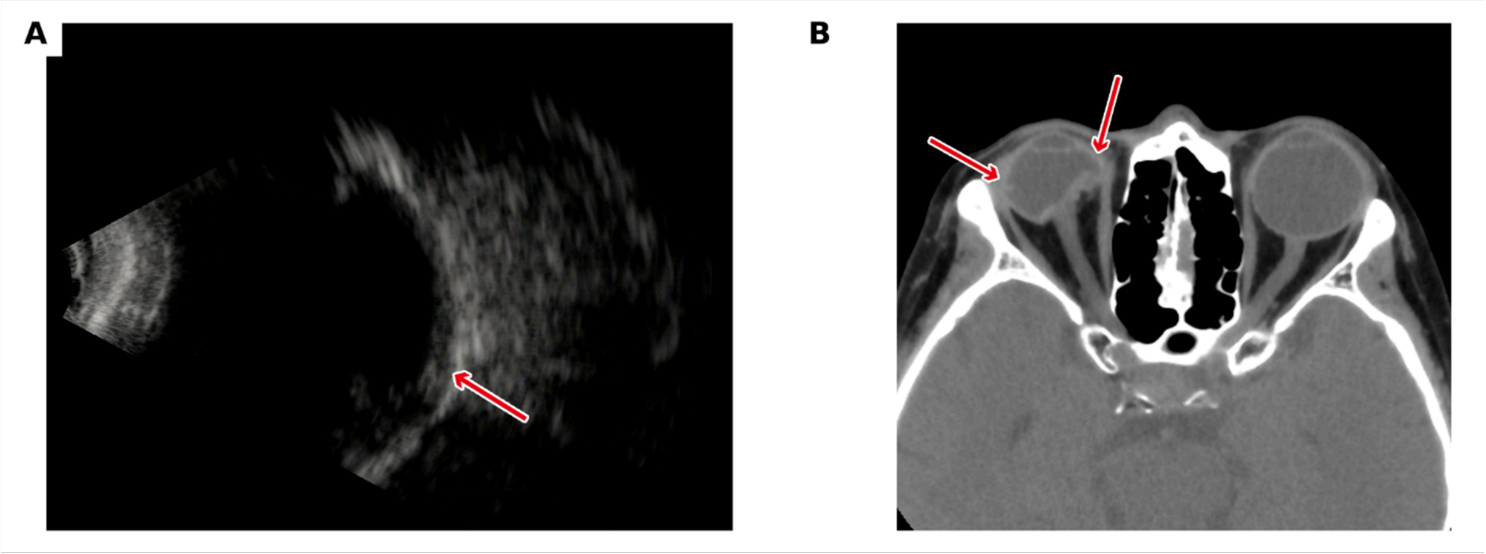



**Figure 2**

Imaging the day after intravitreal aflibercept injection

(A) B-scan ultrasonography and (B) orbital computed tomography on July 30, 2025, show extensive choroidal detachment (arrows).

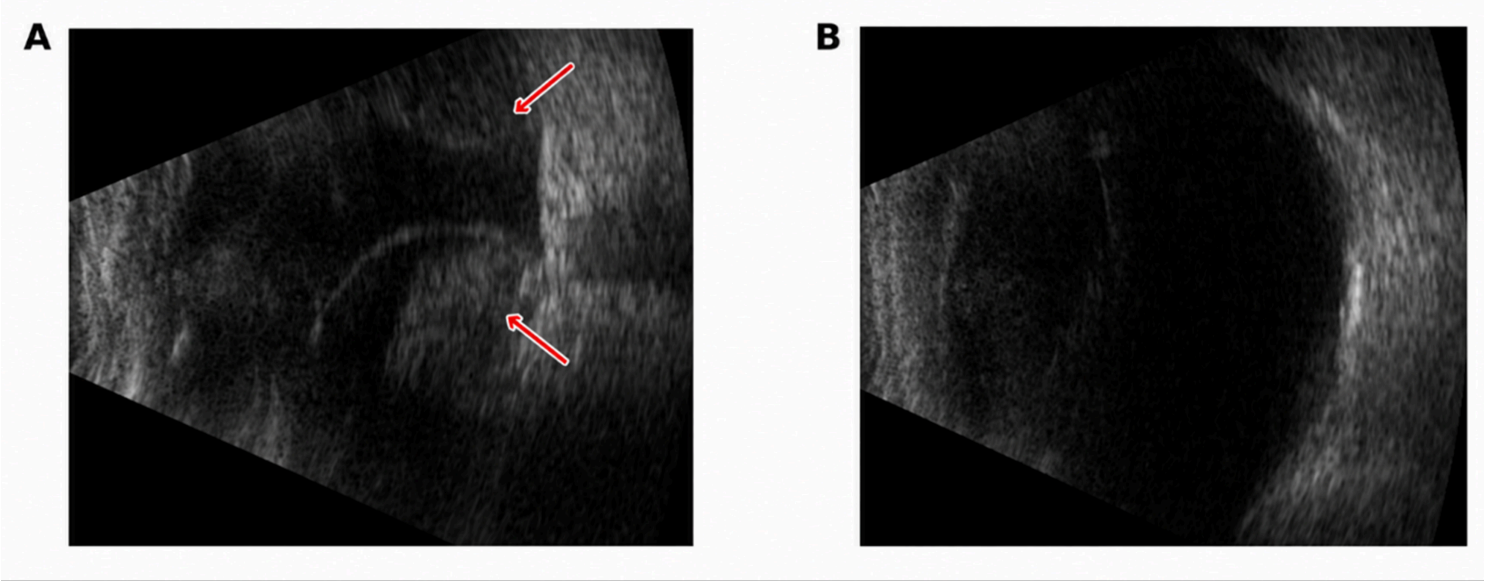



**Figure 3**

Serial B-scan ultrasonography of choroidal detachment

(A) On August 4, 2025, choroidal detachment had markedly progressed. Heterogeneous echogenic material and hypoechoic fluid coexisted within the detached space (arrows), suggesting mixed hemorrhagic and serous components. (B) On August 18, 2025, after surgical repair, the detachment had completely resolved.

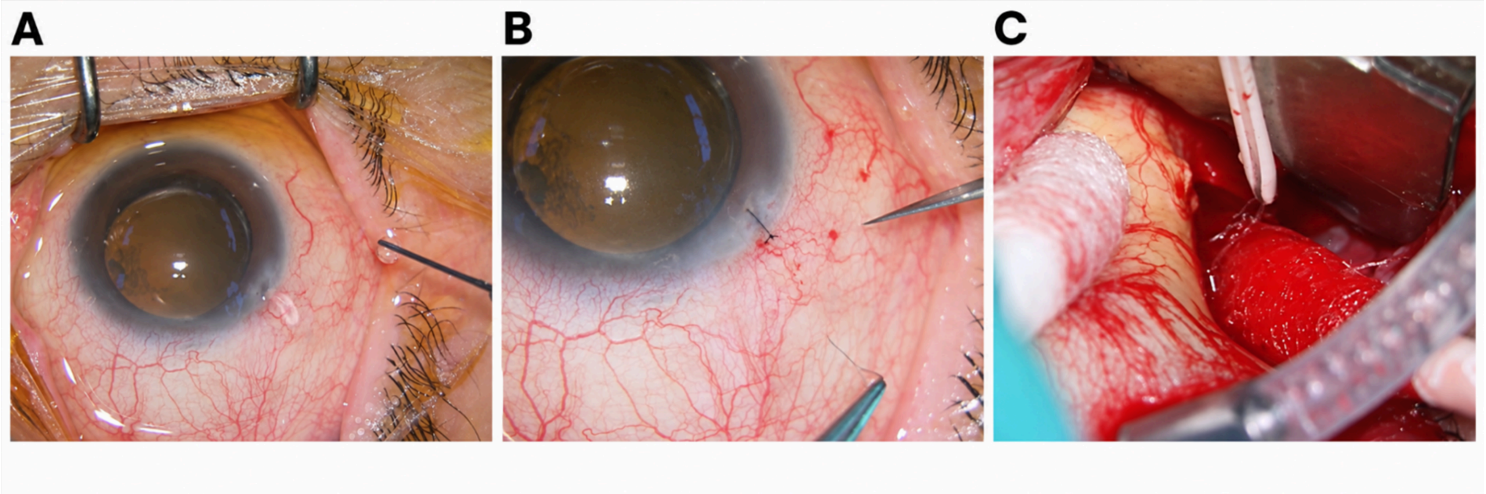



**Figure 4**

Suture closure of the paracentesis wound and drainage of hemorrhagic suprachoroidal fluid

Still frames from the repair video. (A) The paracentesis wound after stromal hydration, with persistent leakage. (B) The wound after placement of a single 10-0 nylon suture, with no further leakage. (C) Hemorrhagic suprachoroidal fluid draining through an anterior scleral window. Persistence of leakage

after hydration and its cessation after suturing are demonstrated in the intraoperative video (Additional file 2).

## Supplementary Files

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