

# A rare case of repetitive bilateral suprachoroidal expulsive hemorrhage after anti-glaucoma surgeries

Xian Zhang<sup>1,2</sup>, Rong Liu<sup>1,2</sup>, Yang–Yang Du<sup>1,2</sup>, Chao Ye<sup>1,2</sup>, Ke Liu<sup>1,2</sup>, Yun Li<sup>1,2</sup>

<sup>1</sup>Department of Ophthalmology, The Second Xiangya Hospital, Central South University, Changsha 410011, Hunan Province, China

<sup>2</sup>Hunan Clinical Research Center of Ophthalmic Disease, Changsha 410011, Hunan Province, China

**Correspondence to:** Ke Liu and Yun Li. Department of Ophthalmology, The Second Xiangya Hospital of Central South University, Changsha 410011, Hunan Province, China. liukelc@csu.edu.cn; yun.li@csu.edu.cn

Received: 2024-09-05 Accepted: 2025-02-08

**DOI:10.18240/ijo.2025.09.23**

**Citation:** Zhang X, Liu R, Du YY, Ye C, Liu K, Li Y. A rare case of repetitive bilateral suprachoroidal expulsive hemorrhage after anti-glaucoma surgeries. *Int J Ophthalmol* 2025;18(9):1803-1805

**Dear Editor,**

We present the reported case of repetitive bilateral suprachoroidal expulsive hemorrhage (SEH) after anti-glaucoma surgeries. SEH is a rare but potentially devastating complication of intraocular surgery. Long-term ocular hypertension, high myopia, older age, arterial sclerosis, and aphakia have been reported as preoperative risk factors for developing SEH<sup>[1]</sup>. The prognosis for the visual acuity is poor without proper management. A suggested time for surgical drainage is said to be 10-14d when the hemorrhagic clot begins to liquefy<sup>[2]</sup>. But this delay in intervention may increase inflammation leading to irreversible damage, such as retinal adhesions, thus a poor final prognosis<sup>[3]</sup>. The present case described the prognosis of repetitive bilateral SEH after recombinant tissue-type plasminogen activator (r-tPA) injection and drainage surgery.

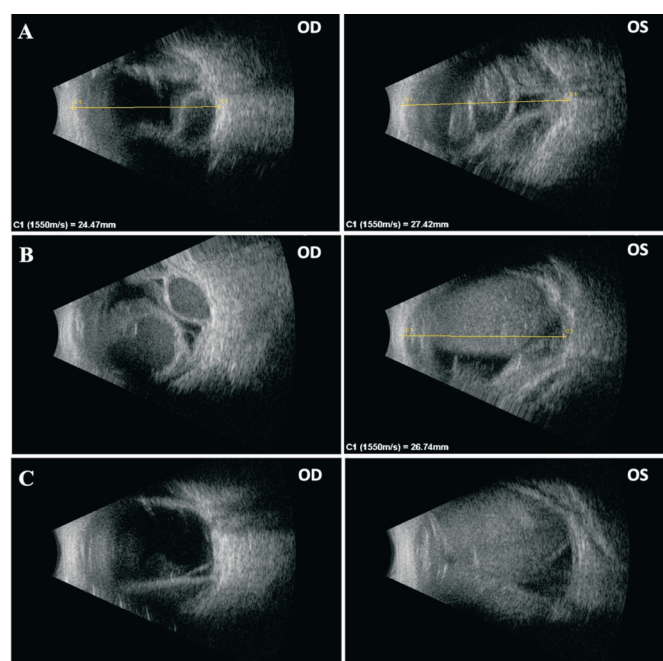
A 6-year-old boy was presented with high intraocular pressure (IOP) with unknown duration, which revealed during a routine examination. The patient underwent cataract surgeries due to congenital cataract when he was 3-month-old, with occasional follow up thereafter. His father has congenital cataract, and his mother has optic nerve atrophy of unknown reason. His best corrected vision was counting fingers in both eyes. The anterior segment was normal except for aphakia in both eyes.

Fundus examination revealed that the cup-to-disc ratio in both eyes reached 1.0, with pale optic disc and irregular margin. The ocular A-scan showed that the axis length of the right eye (OD) was 24.34 mm, and the left eye (OS) was 29.01 mm. Since his IOP kept over 40 mm Hg with three kinds of anti-IOP eyedrops (brinzolamide, bimatoprost and timolol maleate, and 2% carteolol), anti-glaucoma surgery was suggested.

Ahmed glaucoma valve implantation was applied to the right eye, together with gonioscopy-assisted transluminal trabeculotomy in the left eye. The operation went well. Unfortunately, the anterior chamber disappeared the next day after surgery. The ocular B-ultrasonography revealed SEH in both eyes (Figure 1A). Emergent surgery was done to rebuild the anterior chamber with viscoelastic agent injection. However, the situation got worse according to the ocular B-ultrasonography (Figure 1B), showing “kissing choroid”, a term that describes suprachoroidal hemorrhage with retinal apposition. r-tPA (25 µg/0.1 mL) was injected into the suprachoroidal space in order to accelerate clot lysis. Two days later, when the clot was fully liquefied measured by the B-ultrasonography (Figure 1C), a 1 mm posterior draining sclerotomy was made 3 to 4 mm from the limbus in a radial fashion in the quadrant that contained the largest collection of blood. In the video, we could clearly see that the clots had been fully evacuated from the sclerotomy (Video 1; online supplementary).

On the first day post-drainage, the child had IOP of 17 mm Hg OD and 18 mm Hg OS. The B-ultrasonography showed that the choroidal detachment obviously reduced in OS (Figure 2A). While hemorrhage recurred in the suprachoroidal space OD (Figure 2A). Under the microscope, we could see the two brown-red spherical chorioretinal bulges from the nasal and temporal sides with a large area covered the optic disc and the macular area (Figure 2B). Considering the risk of repetitive hemorrhage, we determined to use conservative treatment instead of operating another drainage. He was discharged with anti-inflammatory therapies (*i.e.* prednisolone acetate eye drops, prednisone acetate tablets).

One week later, the patient went back for follow-up. The ocular B-ultrasonography indicated that the choroidal detachment obviously reduced in OD, leaving a mild retinal

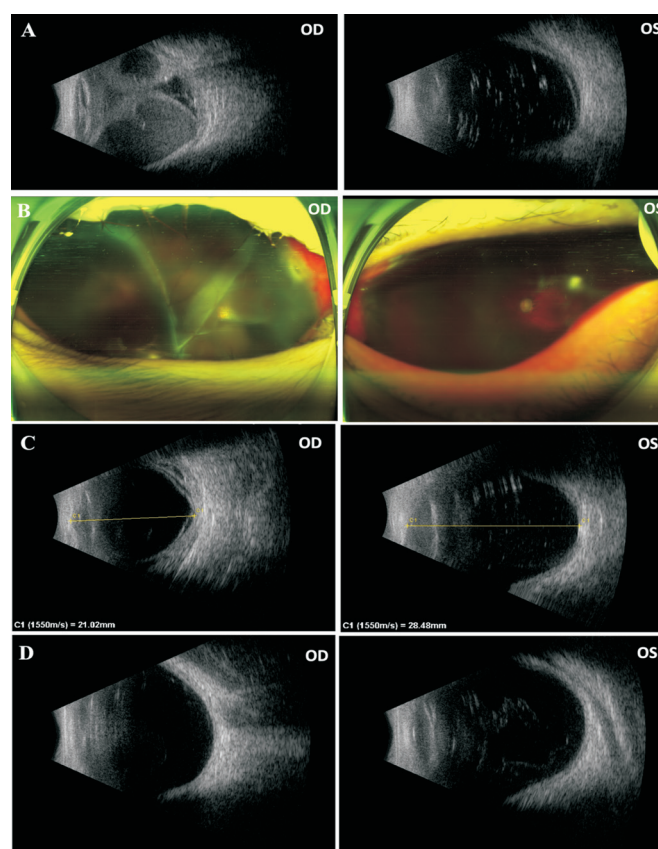


**Figure 1 Ocular B-ultrasonography changes** A: The next day of anti-glaucoma surgeries. Massive suprachoroidal expulsive hemorrhage was shown in the both eyes. B: Ocular B-ultrasonography showed aggravated suprachoroidal hemorrhage on the following day. C: Two days after r-tPA injection, the clots had fully liquefied in the right eye. There was no obvious clot liquefaction in the left eye. r-tPA: Recombinant tissue-type plasminogen activator.

detachment (Figure 2C). There was no abnormal sign in OS on B-ultrasonography (Figure 2C). On the two-month follow-up, the B-ultrasonography showed flat fundus in both eyes (Figure 2D). The IOP of both eyes remained at normal levels (under 18 mm Hg). Moreover, his vision acuity returned to counting fingers, and he was able to go back to the school.

This case suggests that pre-alert of underlying risk factors, necessary prevention, and timely intervention are important for better prognosis. Low intraoperative or postoperative IOP and persistent low IOP are considered to be one of the preconditions for SEH. A retrospective study reported that the incidence of developing postoperative SEH after undergoing glaucoma filtration surgeries was higher in the pediatric age group than that in the older group<sup>[4]</sup>. As the studies suggested higher risk of SEH in children undergoing glaucoma filtration surgery, it's not recommended to operate both eyes simultaneously as that in our case.

Therapies for SEH include conservative managements and surgeries. Sclerotomy is widely used to drain the blood from suprachoroidal space for such patients<sup>[1]</sup>. There is no consensus on the best timing for drainage. It is usually recommended to proceed with drainage within 1 to 2wk after diagnosis to allow clot liquefaction<sup>[2]</sup>. While waiting for spontaneous resolution could result in the formation of giant retinal tears and rhegmatogenous detachment secondary to traction on



**Figure 2 The ocular B-ultrasonography and fundus changes post posterior draining sclerotomy** A: Hemorrhage recurrence in the subchoroidal space of the right eye. Choroidal detachment reduced a lot in the left eye. B: Ultra-widefield funduscopy showed two brown-red dome shaped chorioretinal detachment in the nasal and temporal sides covering the posterior the right eye. The fundus looked flat in the left eye, with visible optic disc. C: One week after posterior draining sclerotomy, the B-ultrasonography indicated that the choroidal detachment obviously reduced in the right eye, leaving a mild retinal detachment. There was no abnormal sign in the left eye on B-ultrasonography. D: On the two-month follow-up, the B-ultrasonography showed flat fundus in both eyes.

the incarcerated vitreous. In the present case, considering the increasing risks in children, like retinal adhesions and other irreversible damage, we decided to perform scleral drainage as soon as possible. The use of exogenous fibrinolytic agents to accelerate clot lysis and to allow an earlier drainage of SEH is promising. r-tPA has already been tried and described in several case reports and case series<sup>[5-7]</sup>. A typical dose of r-tPA for suprachoroidal injection has been in the range of 25 to 100  $\mu\text{g}/0.1\text{ mL}$ <sup>[5-6]</sup>. Animal studies have experimented with clot dissolution using r-tPA, indicating that at low clinical equivalent doses corresponding to 25  $\mu\text{g}/0.1\text{ mL}$  in humans, intravitreal r-tPA is not toxic for healthy rat retinas<sup>[8]</sup>. Before performing the r-tPA suprachoroidal injection in our patient, we convened a multidisciplinary team meeting to thoroughly evaluate the safety and feasibility of r-tPA use. Based on

the specialists' clinical experience and previous studies, we determined that a dosage of 25 µg/0.1 mL was appropriate for this case. The principles outlined in the Declaration of Helsinki (2024) were followed. Written informed consent was obtained from the patient prior to the procedure. The ocular B-ultrasonography was performed to observe clot liquefaction and aid in surgery time selection.

To summarize, SEH is a vision-threatening severe complication with guarded prognosis. Prompt recognition and appropriate management could provide a better visual outcome. Based on this case study, in which our patient has a fortunate outcome, we hypothesize that further study is warranted regarding the use of r-tPA in the timely treatment of SEH in the pediatric population.

#### ACKNOWLEDGEMENTS

**Foundations:** Supported by National Natural Science Foundation of China (No.82171087; No.82201228); Natural Science Foundation of Hunan Province (No.2024JJ6570); the Scientific Research Launch Project for new employees of the Second Xiangya Hospital of Central South University.

**Conflicts of Interest:** Zhang X, None; Liu R, None; Du YY, None; Ye C, None; Liu K, None; Li Y, None.

#### REFERENCES

1 Jiang HY, Gao Y, Fu WZ, *et al.* Risk factors and treatments of suprachoroidal hemorrhage. *Biomed Res Int* 2022;2022:6539917.

- 2 Shekhar M, Menon RP, Rajendran J, *et al.* Clinical features, management, and outcomes of expulsive choroidal hemorrhage during cataract surgery: 13-year experience of a tertiary eye center. *J Cataract Refract Surg* 2022;48(9):1037-1043.
- 3 Fan J, Hudson JL, Pakravan P, *et al.* Outcomes in patients with suprachoroidal hemorrhage after anterior segment surgery. *Clin Ophthalmol* 2022;16:4199-4205.
- 4 Wijesinghe HK, Puthuran GV, Gedde SJ, *et al.* Incidence and outcomes of suprachoroidal hemorrhage following aurolab aqueous drainage implant in adult and pediatric glaucoma. *J Glaucoma* 2021;30(6):497-501.
- 5 Akram H, Dowlut MS, Chandra A. Suprachoroidal haemorrhage (SCH) drainage using suprachoroidal tissue plasminogen activator (t-PA) after complicated cataract extraction (two-staged procedure): early intervention could mean better vision. *BMJ Case Rep* 2021;14(5): e241705.
- 6 Yeung SC, Mason RH, Minaker SA, *et al.* A stepwise approach to the surgical management of hemorrhagic choroidal detachments. *J Vitreoretin Dis* 2022;6(2):111-115.
- 7 Kunjukunju N, Gonzales CR, Rodden WS. Recombinant tissue plasminogen activator in the treatment of suprachoroidal hemorrhage. *Clin Ophthalmol* 2011;5:155-157.
- 8 Wewers MD, Herzyk DJ. Alveolar macrophages differ from blood monocytes in human IL-1 beta release. Quantitation by enzyme-linked immunoassay. *J Immunol* 1989;143(5):1635-1641.