Suprachoroidal haemorrhage (SCH) drainage using suprachoroidal tissue plasminogen activator (t-PA) after complicated cataract extraction (two-staged procedure): early intervention could mean better vision

Haseeb Akram , Mohammad Samir Dowlut, Aman Chandra

Ophthalmology, Southend University Hospital NHS Foundation Trust, Southend-On-Sea, UK

Correspondence to

Dr Haseeb Akram;
haseeb.akram5@gmail.com

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DESCRIPTION

Tissue plasminogen activator (t-PA) is a thrombolytic agent that converts plasminogen to active plasmin. Rapid thrombolysis can restore blood flow or assist drainage. Therapeutic recombinant t-PA (rt-PA), first trialled in humans in 1984¹; benefits from superior half-life, specificity to fibrin and resistance to inactivators compared with its native counterpart.²

In ophthalmology, rt-PA can help clear submacular haemorrhage, often in combination with other treatment modalities.³

To the authors' knowledge this is the second case report concerning rt-PA use for suprachoroidal haemorrhage (SCH) drainage following cataract surgery.⁴

An 85-year-old woman was referred following left eye cataract surgery complicated by massive SCH.

At presentation (day 4), the best corrected Snellen visual acuity was 6/12 (right) and perception of light (left). Examination revealed a leaking cornea, kissing SCH (figure 1) and an intraocular pressure (IOP) of 4 mm Hg.

A two-staged approach for early drainage involved first injecting 100 µg/0.1 mL Alteplase into the suprachoroidal space, superotemporally; 5 mm from the limbus. Followed by drainage under local anaesthetic, 3 hours later. Superior and inferior rectus bridle sutures helped manoeuvre the eye. Anterior chamber infusion maintained IOP.

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Video 1 Superior Sclerostomy showing free drainage (site of t-PA injection)

An inferior sclerostomy (8 mm from limbus) allowed limited drainage of SCH, revealing several clots. A supero-nasal sclerostomy video 1 resulted in free-flowing drainage with no clots. A complete 25-gauge pars plana vitrectomy was undertaken.

Six weeks postoperatively, the patient was aphakic and achieved a best corrected visual acuity of 6/120 (Refraction DS+12.00 DC-8.00 @ 180), and attached retina.

SCHs are potentially devastating complications associated with intraocular surgery.⁵ An estimated 0.04%–0.6%⁶ of cataract surgery may complicate with SCH. Controversy remains on the timing of surgery for SCH—some authors suggest waiting 10–14 days for clot liquefaction; others advocate earlier intervention for a better outcome.

Several animal studies have experimented with clot dissolution using t-PA. Kwon *et al*⁷ demonstrated quicker dissolution of induced SCH in rabbits using t-PA compared with saline.

Fei *et al*⁴ used a two-staged procedure similar to ours. 10 µg/0.2 mL rt-PA was injected in each quadrant, 5 days after SCH developed during complicated cataract surgery. Proceeded by pars plana vitrectomy and lens fragment removal the day after. Final visual acuity was 30/60 after secondary IOL implantation, 10 months later. Our case, however, involved a higher concentration of rt-PA (100 µg/0.1 mL) that was injected in a single quadrant only, as opposed to four. Furthermore, this was done a few hours before surgery on the same day, allowing the whole procedure to be completed in a single visit.

Figure 1 B-Scan showing kissing choroidals.

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Kunjukunju *et al*⁸ described suprachoroidal rt-PA in a patient with Valsalva induced SCH 12 days after vitrectomy for retinal detachment repair. rt-PA was injected intracamerally and in suprachoroidal space, then drained 45 min later. The patient achieved 20/40 vision.

Choroidal anatomy would suggest a continuous space once expanded by blood. However, we experienced drainage at the superior site of injection to be easier than the inferior sclerostomy (blood clots expressed). Other reports of this technique may clarify this phenomenon.^{4 8–11}

To our knowledge, there are less than five case reports showing a two-staged procedure for SCH drainage involving suprachoroidal t-PA in humans. This novel method helps to achieve earlier intervention, which may reduce visual morbidity. Further research is required into optimum dosage, site and timing of suprachoroidal t-PA use.

Learning points

- ▶ Tissue plasminogen activator can help to drain suprachoroidal haemorrhage earlier, possibly better visual outcome.
- ▶ An increased infusion pressure and rectus traction can help in better drainage.
- ▶ Care should be done for uveal tissue extrusion, be gentle and patient. Use sutures if necessary.

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ORCID iD

Haseeb Akram <http://orcid.org/0000-0002-1699-3313>

REFERENCES

- 1 Collen D, Topol EJ, Tiefenbrunn AJ, *et al*. Coronary thrombolysis with recombinant human tissue-type plasminogen activator: a prospective, randomized, placebo-controlled trial. *Circulation* 1984;70:1012–7.
- 2 Gurman P, Miranda OR, Nathan A, *et al*. Recombinant tissue plasminogen activators (rtPA): a review. *Clin Pharmacol Ther* 2015;97:274–85.
- 3 Casini G, Loiudice P, Menchini M, *et al*. Traumatic submacular hemorrhage: available treatment options and synthesis of the literature. *Int J Retina Vitreous* 2019;5:48.
- 4 Fei P, Jin H-Y, Zhang Q, *et al*. Tissue plasminogen activator-assisted vitrectomy in the early treatment of acute massive suprachoroidal hemorrhage complicating cataract surgery. *Int J Ophthalmol* 2018;11:170–1.
- 5 Chandra A, Williamson T. Surgical management of suprachoroidal hemorrhage. *Retinal Physician* 2014;11:65–9.
- 6 Ling R, Cole M, James C, *et al*. Suprachoroidal haemorrhage complicating cataract surgery in the UK: epidemiology, clinical features, management, and outcomes. *Br J Ophthalmol* 2004;88:478–80.
- 7 Kwon OW, Kang SJ, Lee JB, *et al*. Treatment of suprachoroidal hemorrhage with tissue plasminogen activator. *Ophthalmologica* 1998;212:120–5.
- 8 Kunjukunju N. CG-CO, 2011 undefined. recombinant tissue plasminogen activator in the treatment of suprachoroidal hemorrhage., 2020. Available: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3045062/>
- 9 Matsumoto K, Matsumoto CS, Shinoda K, *et al*. Tissue plasminogen activator-assisted vitrectomy for ruptured eye with suprachoroidal hemorrhage. *Case Rep Ophthalmol* 2012;3:258–61.
- 10 Murata T, Kikushima W, Imai A, *et al*. Tissue-Type plasminogen activator-assisted drainage of suprachoroidal hemorrhage showing a kissing configuration. *Jpn J Ophthalmol* 2011;55:431–2.
- 11 Valero AM, Vozmediano RG, Mateos AA. PP-025 treatment for suprachoroidal haemorrhage with intraocular alteplase: a case report. *Eur J Hosp Pharm* 2014;21.

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