

Spontaneous inferior subconjunctival haemorrhages in association with circumferential drainage blebs

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CLINICAL STUDY

Abstract

Aim To describe an association of spontaneous inferior subconjunctival haemorrhages in eyes with circumferential drainage blebs following trabeculectomy.

Methods Observational case series. Patients with multiple episodes of spontaneous inferior subconjunctival haemorrhage following trabeculectomy (with or without antimetabolite) and circumferential blebs are presented. All patients described had multiple episodes. A possible mechanism is discussed.

Results The number of spontaneous haemorrhages ranged from two to more than 10. All individual haemorrhages resolved spontaneously without adverse sequelae.

Conclusions A new clinical presentation of inferior subconjunctival haemorrhage in association with circumferential blebs is described.

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Introduction

Dysfunction of an established filtering bleb in trabeculectomy may take many forms,¹ including leakage and discomfort. Circumferential drainage is commonly seen, and may be associated with tear film disturbance, hyperfiltration, and dysaesthesia.

We describe a small series of patients that exhibited multiple spontaneous inferior subconjunctival haemorrhages in association

with a circumferential glaucoma filtering bleb (Figures 1, 2 and 3). The majority of these patients were from the Moorfields/Medical Research Council 5-Fluorouracil (5-FU) Trabeculectomy Randomised Controlled Trial. Patients in this trial were randomised to receive either 5-FU or placebo delivered as a 5 min application during the surgery.

In all patients, trabeculectomy surgery was performed superiorly, with a modified Cairns - Watson method. In all, 10-0 nylon sutures were applied to the 4 × 4 mm² scleral flap, and the conjunctiva was closed with either 8-0 vicryl sutures in limbus-based flaps or 10-0 nylon for fornix-based flaps.

The following case reports are summarised in Table 1.

Case report: Patient 1

LB, an 80-year-old Caucasian male, had a history of treated hypertension and myocardial infarction, and was taking 75 mg of aspirin daily. He had no history of bleeding problems. He was diagnosed with pseudoexfoliation syndrome associated glaucoma in 1986, and was initially treated medically with combinations of timolol, adrenaline, and pilocarpine drops.

In August 1998 he had a routine right trabeculectomy with intraoperative 5-FU or placebo (as part of a randomised controlled trabeculectomy trial) and a limbus based conjunctival flap. IOP in the first 12 postoperative weeks was managed with local massage and suture release. He used chloramphenicol drops for 6 weeks and Pred Forte for 12 weeks after surgery. There was circumferential aqueous drainage and an IOP in

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the mid-teens from 6 months after surgery. Visual acuity recovered to 6/5.

Between 4 and 6 months postoperatively, he had five episodes of spontaneous inferior subconjunctival haemorrhage. Each one of these resolved with no treatment in approximately 3 days. APTT and INR were within normal limits. At 31 and 33 months after surgery he had two further spontaneous inferior subconjunctival haemorrhages, which also resolved spontaneously



Figure 1 Inferior subconjunctival haemorrhage at one day post bleed (Patient 3).



Figure 2 Patient 1, one week after spontaneous inferior subconjunctival haemorrhage with reabsorbing blood. Note that the lateral (left) side of the inferior conjunctiva is bullous and is overhanging the lower lid margin.

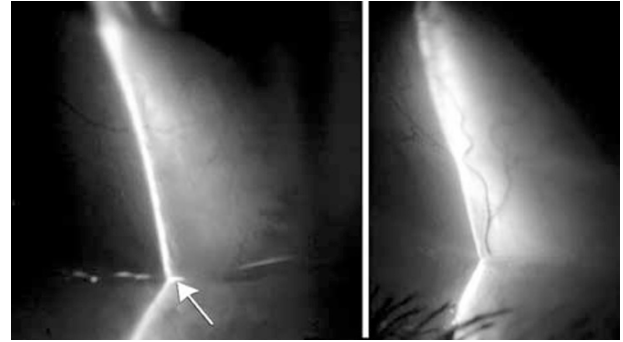


Figure 3 Left: Patient 1, lateral inferior lid margin and adjacent conjunctiva showing extension of bleb and overhanging conjunctiva. The conjunctival surface is separated from the globe as it leaves the limbus, meets the lower lid margin, and then turns posteriorly to follow the lower lid contour (arrow) to the globe. Right: Patient 1, conjunctival blood vessels following the conjunctival contour.

(Figures 2 and 3). The patient started warfarin therapy in association with cardiac surgery 2 years and 2 months after his right trabeculectomy; he had already had five bleeds when he began warfarin.

He was seen in our clinic 3 years after right trabeculectomy, with a total of seven episodes. His visual acuity remained 6/5, IOP ranged between 14 and 20 mmHg between 1 and 3 years after surgery, and the aqueous drainage bleb remained circumferential.

Case report: Patient 2

Mr SG was a 71-year-old Caucasian male. Primary open-angle-glaucoma (POAG) was diagnosed in the left eye in March 2000; xalatan was prescribed but IOP control was inadequate and he was booked for trabeculectomy. He had no significant medical history, was not hypertensive, had no history of bleeding problems, and no other ocular pathology except for bilateral medial pingueculae.

He had a routine left trabeculectomy with limbus-based conjunctival flap. On the day after surgery, a 1 mm hyphaema was noted; this resolved prior to his

Table 1 Summary of cases

Case	Age, sex	Race	Episodes	Antimetabolite ^a	Conjunctival flap
1	80, M	Caucasian	7	5-FU or placebo ^b	Limbus based
2	71, M	Caucasian	>10	5-FU or placebo ^b	Limbus based
3	76, F	Caucasian	5	Anti-TGF- β /placebo ^c	Fornix based
4	67, F	Caucasian	2	Anti-TGF- β ^c	Fornix based
5	64, M	Caucasian	4	5-FU	Fornix based

^aPeroperative antimetabolite use. ^bPatients in MRC/Moorfields 5-FU trabeculectomy trial were randomised to intraoperative application of either 5-FU or placebo. ^cPatient in a clinical trial of anti-TGF- β (Lerdelimumab).

next visit 2 days later. A conjunctival wound dehiscence required return to the operating theatre 1 day after surgery. At 5 days following trabeculectomy, he had a small superior subconjunctival haemorrhage, which resolved 3 weeks later. Visual acuity returned to 6/6 within 4 weeks. He was prescribed topical chloramphenicol qid, and Pred Forte six times a day, in the operated eye for 6 weeks following surgery. At 12 weeks after the left trabeculectomy, he was noted to have a diffuse bleb with temporal circumcorneal extension.

At 5 months after the left trabeculectomy, Mr SG described several episodes consistent with spontaneous inferior subconjunctival haemorrhages. At 9 months after surgery he presented with a large inferior subconjunctival haemorrhage having experienced multiple episodes over the previous 6 months, often as little as 10 days apart. Investigations revealed normal blood pressure, FBC, INR, and APTT. He was not taking anticoagulant medication or nonsteroidal anti-inflammatory medications.

At the 16 month follow-up appointment, his IOP was 16 mmHg, and the bleb was large but no longer circumferential, with the inferior bulbar conjunctiva adherent to the globe and no recurrences of the inferior subconjunctival haemorrhage.

Case report: Patient 3

Patient SS had primary open-angle glaucoma diagnosed in 2000 and, despite medical treatment with timolol, xalatan, and alphagan, there was poor IOP control and progression of visual fields. Right trabeculectomy with a fornix-based conjunctival flap and four perioperative subconjunctival injections of either placebo or anti-TGF- β human monoclonal antibody (Lerdelimumab, Cambridge Antibody Technology, Granta Park, Cambridge, UK) were performed in April 2002.

On day 1 after surgery there was a conjunctival buttonhole and IOP of 4 mmHg. At 1 week after surgery the conjunctival hole had closed, but choroidal effusions were present; the choroidal effusions resolved in the following week and the IOP was 7 mmHg. Postoperative medications included cyclopentolate 1%, chloramphenicol and maxidex.

At 6 weeks after surgery the patient presented with a large inferior subconjunctival haemorrhage (Figure 1). Four subsequent episodes of inferior subconjunctival bleeding occurred after this, between 12 and 22 weeks after surgery. At a clinic visit 6 months after trabeculectomy the drainage bleb was noted to be very large with an associated dellen. After

2 weeks the dellen had resolved and the IOP was 12 mmHg.

Case report: Patient 4

Mrs DO was a 67-year-old Caucasian female, also with bilateral POAG. She presented in 1997 and managed with topical medications, but required trabeculectomy in the right eye in January 1999 despite trusopt, betagan, and xalatan treatment. This surgery was performed with a fornix-based conjunctival flap and four subconjunctival injections of anti-TGF- β human monoclonal antibody (Lerdelimumab) were given perioperatively. No antimetabolite adjunct was used, and a prescription for Pred Forte for 8 weeks with Chloramphenicol for 6 weeks was given.

She had a diffuse and noninflamed bleb following the immediate postoperative period with shallow circumferential drainage. At 31 months after the right trabeculectomy, she presented with a spontaneous inferior subconjunctival bleed that resolved with no treatment over 3 days. Shallow circumferential drainage from the drainage bleb was still present following resolution of the haemorrhage. There is no history of coagulopathy or anticoagulant medications, and a coagulation screen was normal. After 2 weeks she presented again with a recurrence of the bleed in a similar but slightly smaller distribution. This also resolved without treatment.

Case report: Patient 5

Mr PF was 64-years-old, and had left trabeculectomy with intraoperative 5-FU in May 1995 since Pilocarpine and Betagan were inadequately controlling his IOP. He was treated with Maxidex and Chloramphenicol topically after surgery. He had no history of coagulopathy or anticoagulant medications, but his ocular history also included a spontaneous subconjunctival bleed in his right eye in May 1993 and another in 1996. Following trabeculectomy in the right eye, a thin cystic bleb developed and no further bleeding occurred in this eye.

The left trabeculectomy was performed with a fornix-based conjunctival flap, and intraoperative 5-FU. Following the left trabeculectomy with postoperative focal massage and two 5-FU injections adjacent to the bleb, there was a circumferential drainage bleb in that eye. Mr PF had four episodes of spontaneous inferior subconjunctival bleeding in this eye, all of which spontaneously resolved. The first of these was recorded 42 months after trabeculectomy and the most recent was 77 months following trabeculectomy. His IOP remains well controlled at 14 mmHg, and visual acuity is 6/6.

Discussion

Circumferential drainage blebs associated with subconjunctival haemorrhage have not been reported in the literature to our knowledge. All of these patients with spontaneous subconjunctival bleeding had circumferential filtering blebs at the time of the bleeding. In these patients chemotic or bullous conjunctiva was noted adjacent to the lower lid before and after the bleed occurred. This appears to be a relatively uncommon complication of glaucoma surgery; we became aware of these cases over approximately 1 year while conducting clinical trials of glaucoma surgery totalling almost 400 patients.

A possible explanation is that the bulge of bullous conjunctiva Figure 4 (Diagram 1) was formed into a fold between the lids during blinking (Diagrams 1 and 2), and that conjunctival vessels folded and compressed during the blink (Diagram 3) were damaged and bled. The propensity for the redundant conjunctiva to be folded on the lower lid by the descending upper lid might be increased by tear film disturbances and associated decreased tear lubrication, and altered conjunctival contour. Other possible explanations include eye rubbing



Figure 4 Diagrams. Diagram 1: Upper lid closing during blink. There is a trabeculectomy in cross-section superiorly, and a fold of conjunctiva (bleb) elevated by aqueous resting on the lower lid. Diagram 2: With lid apposition the fold of conjunctiva is compressed. Diagram 3: A close-up of the compressed conjunctival fold, showing a conjunctival vessel crimped in the fold.

associated with irritated conjunctiva, and traction on a trapped conjunctival fold during REM sleep.

In each episode of bleeding, the blood reabsorbed within a maximum of 2 weeks with no apparent sequelae. In Patient 2 the inferior conjunctival chemosis disappeared after the last recorded bleed. The injection (or liberation by YAG laser to episcleral vessels²) of autologous blood into the subconjunctival space has been suggested to manage hypotony and bleb leaks,³ with variable success. Haematologic factors that promote healing liberated in the bleeding episodes may eventually result in adhesion of the conjunctiva to the globe, removing the propensity for further episodes.

Surgical reattachment of conjunctivochalasis has been reported⁴⁻⁷ in both the presence and absence of filtering blebs. The use of surgical or laser techniques to treat the oversized bleb, which may give rise to subconjunctival haemorrhages, may be justifiable in some cases. In such cases we advise the use of multiple fixation sutures, which work well.⁸

Close monitoring of patients with subconjunctival haemorrhage in the presence of a functioning filtering bleb is important because of the possibility of secondary increases in intraocular pressure,⁹ but since these bleeds tend to be well away from the filtration site the risk is probably quite low. None of these patients has loss of control of their intraocular pressure and in all cases the superior part of the bleb was unaffected.

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