CASE REPORT

Blood, sweat and tears: androgenic-anabolic steroid misuse and recurrent primary post-tonsillectomy haemorrhage

Richard Fox, Kiran Varadharajan, Bhavesh Patel, Issa Beegun

Department of ENT, West Middlesex University Hospital, London, Middlesex, UK

Correspondence to

Dr Richard Fox,
richardfox@doctors.org.uk

Accepted 26 October 2014

SUMMARY

A 30-year-old male body builder and androgenic-anabolic steroid and insulin abuser was admitted for day case elective tonsillectomy (bipolar). He returned with primary post-tonsillectomy haemorrhage 18 h after the operation and required bipolar cautery to the multiple small bleeding points in the right and left tonsillar fossa. Thorough coagulation screen was normal. Recurrent primary haemorrhage occurred 3 h post-operatively requiring immediate surgical intervention, removal of the inferior poles, precautionary throat packs, intubation and observation on the intensive treatment unit (ITU). Re-examination in theatre revealed a bleeding left superior pole that was under-run to achieve haemostasis and the patient returned to ITU. Hypertensive episodes were noted in the emergency department and intraoperatively including one recording >200 mm Hg. Haemostasis was eventually achieved once the blood pressure was adequately controlled. A slow wean of steroids was also instigated and the patient was managed on a surgical ward for 2 weeks post-tonsillectomy.

BACKGROUND

- Post-tonsillectomy haemorrhage (PTH) is the most significant and potentially life-threatening complication of tonsillectomy.
- PTH can be divided into primary bleeds (PB within first 24 h postoperative) and secondary bleeds (SB after 24 h postoperative).
- Androgenic-anabolic steroid (AAS) use may not be volunteered by the patient but can have significant adverse cardiovascular effects.
- This case highlights the importance of a thorough holistic approach to preoperative assessment and consideration of illicit substance misuse and its potential complications.
- This case highlights a potential higher risk subgroup of an otherwise healthy population.
- This case may enable the surgeon to have an informed risk benefit discussion with the patient and encourage the patient to consider safe pre-operative cessation of AAS use with the involvement of the multidisciplinary team.
- This is the first case of recurrent primary post-tonsillectomy haemorrhage in an AAS user in the literature.

CASE PRESENTATION

A 30-year-old male body-builder had an elective tonsillectomy for recurrent acute tonsillitis. He had

no medical comorbidities, no family history of note, and was a non-smoker who rarely consumed alcohol. His preoperative assessment revealed no concerns and he was admitted for a tonsillectomy as a day case. He had been well in the preoperative period with no history of coryzal symptoms, sore throat, cough or any symptoms to suggest a recent upper respiratory tract infection. On examination in theatre the tonsils were noted to be symmetrical grade four in size. The tonsils were dissected with a bipolar technique with ties to the inferior poles. Haemostasis was achieved at the end of the operation with minimal intraoperative blood loss. The patient was discharged the same day with no concerns.

The patient subsequently presented to the emergency department with a primary tonsillar haemorrhage 18 h after the operation. At initial assessment the patient was clinically in grade I shock (pulse 121 and blood pressure 167/70) and noted to be hypertensive, with a large amount of blood in the oropharynx. Initial attempts using hydrogen peroxide gargles failed to stop the bleeding. Blood tests revealed a haemoglobin of 162 g/L, a normal coagulation screen and the patient was started on fluid boluses and intravenous coamoxiclav in the emergency department and made nil by mouth.

The patient was immediately taken to the operating theatre for examination under anaesthesia. A large clot was noted in the left tonsillar fossa that was suctioned, revealing a large bleeding vessel that was cauterised with bipolar diathermy (8 W). Multiple additional bleeding points were cauterised in the right tonsillar fossa. Full haemostasis was achieved at the end of the operation. A very swollen uvula was noted and the patient was started on dexamethasone intravenously for this. Intraoperative blood pressure was generally at an acceptable range although one reading 145/80 was noted, from a normotensive baseline. The patient was taken back to the ward for cautious observation and remained nil by mouth.

At this point the patient volunteered his history of prolonged AAS and insulin use to build muscle bulk that he had continued to use in the weeks prior to surgery. This included testosterone, human growth hormone and Humalog with Deca-Durabolin for the preceding 2 months.

After an initially uneventful first 3 h postoperatively the patient proceeded to have a large primary haemorrhage and was immediately taken back to the operating theatre for further assessment.

CrossMark

To cite: Fox R, Varadharajan K, Patel B, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2014-207111

Necrotic anterior pillar material was removed. One bleeding point was noted in the left tonsillar fossa that was cauterised. The inferior poles were removed with their ties and re-cauterised with diathermy. After watchful intraoperative waiting for 10 min there was no further bleeding. The haemoglobin was checked intraoperatively and noted to be 135 g/L. Intraoperative blood pressure was controlled with one systolic spike of 148 mm Hg. The patient was not extubated following the second arrest of the post-tonsillectomy bleed due to slow reversal of the anaesthesia and the patient required high levels of ventilator support. It was therefore decided that the safest option was to keep the patient ventilated and sedated overnight. As a matter of caution and given the frequent recurrence of bleeding the patient had two throat packs for tamponade and haemostasis. The patient was taken to the intensive care unit (ITU) while intubated and observed overnight and a throat swab was taken.

The following day the patient was taken to theatre from ITU for repeat examination under anaesthesia. The pack was removed and a bleeding vessel noted in the left upper pole of the tonsillar fossa. This could not be cauterised and a vicryl suture was under-run to transfix the vessel. Again haemostasis appeared to be achieved, however on extubation the patient had a systolic blood pressure spike to >200 mm Hg and then coughed up a large clot and had a recurrent haemorrhage. The patient was reintubated and a single bleeding point cauterised. However, the patient had the throat repacked and was taken back to the ITU for observation.

At this point we sought the input from the multidisciplinary team to investigate the cause of his recurrent bleeding. A thorough coagulation screen was performed and returned as normal including a normal Von Willebrand factor. The only two abnormalities in the patient were a history of AAS, insulin abuse and an occasionally high-blood pressure. The haematology team felt that there was no link between the steroid use and the bleeding. Random blood glucose levels remained persistently elevated between 11 and 18, the medical team did not advocate any treatments while the patient was admitted.

He was taken to theatre again for examination, where slight ooze was noted in the right tonsillar fossa that settled after the blood pressure was controlled intraoperatively. The patient was then extubated successfully.

Of note *Escherichia coli* was grown on the throat culture (sensitive to coamoxiclav which he had received during his stay).

INVESTIGATIONS

- ▶ Initial haemoglobin of 162 g/L which dropped to 135 g/L following the second PB
- ▶ Coagulation screen was normal
- ▶ *E. coli* +ve throat culture

DIFFERENTIAL DIAGNOSIS

- ▶ Hypertension (secondary to AAS)
- ▶ Undiagnosed coagulopathy
- ▶ Infection

TREATMENT

Three returns to theatre were required to eventually achieve haemostasis. The fourth examination under anaesthesia showed no further bleeding. The patient received intravenous coamoxiclav for a total of 1 week and a further week of oral was given.

OUTCOME AND FOLLOW-UP

Following the fourth return to theatre, the patient was transferred to the ward for observation, allowed to eat and drink and

eventually discharged home with no further episodes of haemorrhage. He was seen 2 weeks postdischarge for a review of the histology, this demonstrated benign disease, and features suggestive of recurrent infection.

DISCUSSION

We present a case of a young male athlete who was listed for elective tonsillectomy for recurrent acute tonsillitis and required multiple returns to theatre with primary PTH. His preoperative assessment failed to highlight any concerns and he passed this with flying colours. He was young and fit with no medical comorbidities. He was an enthusiastic body-builder and reported prolonged use of AAS and insulin to build muscle bulk. We suspect these factors were implicated in the pathogenesis of this turbulent postoperative period through a combination of hypertension and hyperglycaemia resulting in poor wound healing.

Elective tonsillectomy remains one of the most commonly performed operations in otolaryngology. Bleeding continues to be the most significant complication, the severity of which can vary considerably, from requiring simple measures such as hydrogen peroxide gargles to a return to theatre under general anaesthesia.¹ The definition of PTH can divide patients into two clinical groups: those who bleed within the first 24 h postoperatively (PB) and those who bleed after 24 h (SB).¹

PB occurs in <1% (0.6%) of cases and may occur while under hospital observation, with access to medical attention and resources to hand in order to achieve haemostasis if required.¹ SB however typically occurs 5–7 days postoperatively and complicates approximately 3% of tonsillectomy cases.¹ In SB the patient may be remote to medical attention and these bleeds may pose a greater threat to life. However, the majority of elective tonsillectomy is performed as a day case, therefore both PB and SB can occur in the community.

Our ability to predict those at greater risk of PTH is relatively limited. Our understanding comes primarily from observational studies that have identified a number of risk factors. These include patient factors such as age and sex, intraoperative factors, including the technique employed and the experience of the surgeon and postoperative factors, most notably pain score and return to normal diet.² The presence of these factors does not reliably predict a patient's PTH risk and it remains important to consider a holistic approach to preoperative assessment.

While surgical technique has been implicated in the occurrence of primary versus secondary bleeds, the evidence supports a reduced rate of primary bleeds with bipolar cauterisation and this was the method employed in this case.¹ There is no evidence that recurrent PTH has any relation to a particular method used for haemostasis.¹

To date, there are no documented cases of primary PTH in an AAS user however the adverse cardiovascular effects of misuse that might be implicated in this case are known.³ There is strong evidence associating AAS use with hypertension and cardiac dysfunction.³ With each of the three returns to theatre with acute PB at least one systolic spike in blood pressure was noted. The patients' blood pressure was accurately controlled during the final return to theatre for examination under anaesthesia and no further bleeding was noted. It is unclear whether the repeated surgical interventions undertaken or absence of hypertensive spikes were responsible for finally achieving haemostasis however these hypertensive episodes are likely to have at least exacerbated the complication.

A normal initial coagulation screen was demonstrated preoperatively. This was extended to exclude undiagnosed

coagulopathy which some advocate.⁴ Undiagnosed coagulopathy in the context of PTH appears to be very rare, it was successfully excluded in this case, but some suggest extending the coagulation screen is of little additional clinical significance, even in recurrent severe PTH.⁵

The patients' throat swab grew *E. coli* sensitive to coamoxiclav, which had been started at initial presentation to the emergency department. While considered a factor in SB, we do not consider it was implicated in the acute PB, so soon after initial operation, nor the returns to theatre that were required.⁶

Overall the patients' recognised risk factors for PTH were his sex and age with concomitant use of AAS also implicated. We hope this case highlights a potential higher risk subgroup of an otherwise healthy population. This may enable the surgeon to consider an informed risk benefit discussion with the patient and encourage a discussion about safe preoperative cessation of androgenic-anabolic steroid use, and preoperative optimisation with the input from an endocrinologist and anaesthetist and may warrant a prolonged period of postoperative observation.

This case also highlights the chronic hypertensive and hyperglycaemic effects of steroid and insulin abuse. This should be borne in mind when reviewing any patient with excessive muscle bulk. Questions regarding drug abuse should be asked when reviewing gym enthusiast in order to identify those at risk who would otherwise be deemed 'fit and well'.

Contributors This manuscript was written by RF. The manuscript was reviewed and edited by KV, BP and IB who were all involved in the case.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

Learning points

- ▶ Androgenic-anabolic steroid (AAS) misuse may increase an individual's risk of post-tonsillectomy haemorrhage through adverse cardiovascular effects, in an otherwise healthy individual.
- ▶ This case highlights a potential higher risk subgroup of an otherwise healthy population.
- ▶ A prolonged period of observation may be required following tonsillectomy in a AAS user.
- ▶ A holistic approach to preoperative assessment is advocated even in apparently fit and healthy individuals.
- ▶ Non-prescription medications may not be volunteered by the patient but must be considered as this may impact their perioperative risk.

REFERENCES

- 1 Windfuhr JP, Verspohl BC, Chen YS, *et al.* Post-tonsillectomy hemorrhage-some facts will never change. *Eur Arch Otorhinolaryngol* 2014 Apr 16 (Epub ahead of print).
- 2 National Prospective Tonsillectomy Audit Final Report 2005. 2005. <http://www.rcseng.ac.uk/surgeons/research/surgicalresearch/docs/national%20prospective-%20tonsillectomy%20audit%20final%20report%202005.pdf/view>
- 3 Pereira Dos Santos MA, Coutinho de Oliveira CV, Silva AS. Adverse cardiovascular effects from the use of anabolic-androgenic steroids as ergogenic resources. *Subst Use Misuse* 2014;49:1132–7.
- 4 Windfuhr JP, Ches YS, Rmmert S. Unidentified coagulation disorders in post-tonsillectomy hemorrhage. *Ear Nose Throat J* 2004;83:28, 30, 32 passim.
- 5 Kontorinis G, Schwab B. Significance of advanced haemostasis investigation in recurrent, severe post-tonsillectomy bleeding. *J Laryngol Otol* 2011;125:952–7.
- 6 Ashan F, Rashid H, Eng C, *et al.* Is secondary haemorrhage after tonsillectomy in adults an infective condition? Objective measures of infection in a prospective cohort. *Clin Otolaryngol* 2007;32:24–7.

Copyright 2014 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow