CASE REPORT

Spontaneous ruptured iliac artery aneurysm causing acute secondary AV fistula

Katherine-Helen Hurndall,¹ Holly Carpenter,² Jack Sandeman,² Roland Fernandes³

¹Surgery, Tunbridge Wells Hospital, Tunbridge Wells, UK
²Surgery, Tunbridge Wells Hospital, Tunbridge Wells, UK
³Surgery, Medway Maritime Hospital, Kent, UK

Correspondence to

Dr Katherine-Helen Hurndall,
 khurndall@doctors.org.uk,
 katherine-helen.hurndall@nhs.net

Accepted 9 April 2017

SUMMARY

A 73-year-old woman presented with a 6-hour history of sudden onset lower abdominal pain. Her comorbidities included chronic obstructive pulmonary disease and hypertension. She was under surveillance for a known thoracoabdominal aneurysm. On presentation, she was hypotensive with a systolic blood pressure of 50 mm Hg and a pulse of 60 beats per minute. On examination, she had a pulsatile mass with bruit in her right lower abdomen. Pedal pulses were palpable in both feet. Blood gas analysis revealed a metabolic acidosis with a pH of 7.21 and a lactate of 7.1. Haemoglobin remained stable between 90–100 g/dL. Her other routine blood tests were unremarkable, and blood cultures were negative. Imaging showed a ruptured right common iliac artery aneurysm into the right common iliac vein with secondary arteriovenous fistula communication. Surgical intervention was discussed with the patient but due to her frailty, it was deemed not in the patient's best interests.

BACKGROUND

This case represents an unusual complication of an acutely ruptured aneurysm which led to an unusual physiological clinical state of hypotension without tachycardia and no blood loss. The slow formation of arteriovenous (AV) fistula may not necessarily lead to a high output cardiac failure, bleeding or unstable signs. However, in this scenario the AV fistula was acute as it was not present on imaging 5 months prior as part of the patient's surveillance for her thoracoabdominal aneurysm.

CASE PRESENTATION

A 73-year-old woman presented with a 6-hour history of sudden onset lower abdominal pain radiating down to both her knees. Her comorbidities included chronic obstructive pulmonary disease, hypertension and hypothyroidism. The patient had previously undergone a cholecystectomy and hysterectomy several years ago. She was also under surveillance for a thoracoabdominal aneurysm and consequently had undergone recent CT angiograms which were used as a baseline for comparison. Although it was known that she had a right iliac artery aneurysm, her comorbidities precluded invasive treatment and no fistula formation was identified on imaging 5 months ago. There were no predisposing factors for her aneurysm formation and blood cultures excluded an infectious aetiology.

On presentation she was hypotensive with a systolic blood pressure of 50 mm Hg and a pulse of 60 beats per minute. On examination, she had a pulsatile mass with bruit in her right lower abdomen. Pedal pulses were palpable in both feet, and both lower limbs seemed well perfused but there was a degree of mottling across her right leg and lower abdomen. Examination of power and sensation in the lower limbs was unremarkable.

Her blood gas analysis revealed a metabolic acidosis with a pH of 7.21 and a lactate of 7.1. This was consistent with her acute renal failure and end-organ damage. Haemoglobin remained stable between 90–100 g/dL.

INVESTIGATIONS

The CT scan with contrast revealed a ruptured right common iliac artery aneurysm into the right common iliac vein with secondary AV fistula communication. There was no extravasation of contrast (figures 1, 2 and 3).

OUTCOME AND FOLLOW-UP

Surgical intervention was discussed with the patient but due to her frailty, comorbidities and clinical state it was deemed not in the patient's best interests.

DISCUSSION

This patient presented with hypotension, pain and a pulsatile mass in her lower abdomen consistent with an acutely ruptured aneurysm. However, she neither mounted a tachycardic response nor dropped her haemoglobin levels which are expected in major haemorrhage.

The imaging modalities revealed that her ruptured right common iliac artery aneurysm had created an AV fistula with the right common iliac vein. The lack of extravasation of contrast explained why her haemoglobin levels remained stable as she was not actively bleeding and she was hypotensive because her arterial blood was flowing into her venous system thus reducing her total peripheral resistance. There was still a degree of blood flowing into the right lower limb as exemplified by the presence of pedal pulses. When her images were compared with recent scans as part of her aneurysm surveillance, it demonstrated that her rupture and AV formation were acute events, thus correlating with her clinical presentation.

The patient was in a critical clinical state and was not fit enough for an operation to surgically repair the aneurysm with correction of the fistula.

CrossMark

To cite: Hurndall K-H, Carpenter H, Sandeman J, et al. *BMJ Case Rep* Published Online First: [please include Day Month Year]. doi:10.1136/bcr-2016-218863

Figure 1 Ruptured right common iliac artery aneurysm into the right common iliac vein with secondary arteriovenous fistula communication.

An AV fistula between the iliac artery and vein is rare.¹ The prevalence of AV fistula formation from abdominal aortic aneurysms has been quoted as 0.2%–1.3%.² However, the incidence of ruptured iliac artery aneurysms leading to AV fistula formation seems to be considerably lower than this.³ There is a reported triad of high output cardiac failure, pulsatile abdominal mass with bruit and venous congestion or unilateral ischaemia in ruptured iliac artery aneurysm with AV fistula.⁴

In slow AV formation, it is both feasible and published in the literature that high output cardiac states may not occur and

Figure 2 CT of pelvis illustrating secondary arteriovenous fistula communication.

Figure 3 Contrast evident in the common iliac vein as well as artery, indicating communication between the two vessels via the arteriovenous fistula.

haemodynamic instability ensues. However, a literature search has not yielded another case of an acute AV fistula caused by a ruptured iliac aneurysm which has not resulted in profound haemodynamic instability in the context of end-organ damage.

Learning points

- ▶ Arteriovenous (AV) fistula formation is a rare complication of an aneurysm rupture.
- ▶ End-organ damage can ensue despite perceived cardiovascular stability.
- ▶ Slow AV formation may not produce a high output cardiac state.
- ▶ Iliac artery aneurysms are rare.
- ▶ A lack of a haemoglobin fall does not exclude rupture of an aneurysm.

Contributors RF: guarantor, literature review. K-HH: cowrote report, literature review, edited submission. HC: cowrote report. JS: literature review.

Competing interests None declared.

Patient consent Consent obtained from next of kin.

Provenance and peer review Not commissioned; externally peer reviewed.

© BMJ Publishing Group Ltd (unless otherwise stated in the text of the article) 2017. All rights reserved. No commercial use is permitted unless otherwise expressly granted.

REFERENCES

- 1 Wills JS, Herrera L, Kester R. Spontaneous arteriovenous fistula between common iliac artery and vein. *Cardiovasc Intervent Radiol* 1982;5:246–8.
- 2 Alexander JJ, Imbembo AL. Aorta-vena cava fistula. *Surgery* 1989;105:1–12.
- 3 Takano T, Goto H, Ichinose H, et al. A case of iliac arteriovenous fistula presenting with iliac artery aneurysm preoperatively diagnosed by ultrasonography. *Ann Thorac Cardiovasc Surg* 2009;15:133–6.
- 4 Cheung A, Shuman WP, Kohler TR. Diagnosis by computed tomography of arteriovenous fistula complicating ruptured iliac artery aneurysm. *J Vasc Surg* 1987;6:605–8.

Copyright 2017 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