

CASE REPORT

DELAYED PRESENTATION OF AN INTRA-ABDOMINAL ARTERIOVENOUS FISTULA

ILL Davies¹, G Keightley¹, ML Davies¹, G Davies¹, RI Dowdle², MH Lewis²

Departments of Surgery, ¹Radiology and ²Medicine; Royal Glamorgan Hospital, Ynysmaerdy, Llantrisant

This case report is the full report of the winning poster from the Military Surgery Conference 2008; abstracts of the best oral presentations are included later in this edition.

Introduction

This case presentation describes a rare presentation of iatrogenic arterio-venous fistula, its investigation, and subsequent treatment. There is a discussion of pointers to aid accurate diagnosis together with investigative options.

Case Description

A 42 year old housewife was referred to cardiology outpatients in August 2007 with a ten month history of worsening palpitations. This was accompanied by shortness of breath with moderate or average tasks such as walking up a gradual hill or climbing fewer than three flights of stairs which equates to grade 2 exertional shortness of breath. On further questioning, she described pain in her right leg and groin and a cold foot.

On examination her heart rate was 100 beats per minute with equal blood pressures of approximately 140/60 bilaterally. Venous pressures were normal. A soft systolic murmur was audible at the apex, and more impressively, a loud harsh continuous bruit was audible posteriorly from the tip of the left shoulder down to the midline spine at the level of L4. Anteriorly the murmur was audible over her chest and abdomen. It was most prominent at the base of her spine and radiated to the groin. Femoral pulses were easily palpable but collapsing in nature with a bruit on the right side.

Initial investigations included an ECG that was normal and a PA chest radiograph that demonstrated cardiomegaly. Subsequently the patient underwent an abdominal CT angiogram that suggested an arterio-venous fistula between the right internal iliac artery and vein close to the aortic bifurcation. The patient was referred for vascular surgery opinion.

The patient was discussed at a joint radiology meeting and a diagnostic arteriogram of the lower limbs was organised. The investigation revealed a high flow fistula between the distal right Common Iliac Artery (CIA) and the postero-lateral aspect of the Inferior Vena Cava (IVC) with considerable expansion of the right common iliac vein (Figure 1). The track was small and appeared to arise from a focal origin. On screening it was immediately adjacent to the lateral aspect of the L4/L5 disc space. The aorta was normal.

Potential causes for her fistula were discussed. Her past medical history included smoking (ceased 25 years ago), hypertension for 12 years, and hypercholesterolaemia for 3 years with a strong family history of cardiovascular disease. Significantly, a review of

the patient's medical records revealed an L4/L5 discectomy performed in December 2002 for a large symptomatic disc protrusion following a fall. The procedure had been complicated by persistent extradural bleeding that was eventually controlled using bone wax only.

She underwent formal surgery in October 2007 after cardiac optimisation. The intraoperative findings were consistent with the arteriogram. Briefly, the procedure was as follows:

- The aorta, CIA, IVC and ureter were all identified and dissected.
- The CIA was controlled and clamped above and below the fistula (Figure 2A).
- The fistula opening was dissected from the IVC and the IVC defect was sutured with 5/0 prolene.
- Damage to the fistulous segment of the CIA was not suitable for direct repair, therefore the segment was replaced with a 8mm PTFE graft 3cm in length (Figure 2B).
- Anastomoses were performed proximally and distally and the graft was washed out with hepsal prior to releasing the clamps.
- An omental patch was sutured with 3/0 vicryl between the IVC and CIA graft to minimise risk of subsequent fistula formation.

Immediately following repair of the venous defect the central venous pressure fell from 20mmHg to 10mmHg.

The patient recovered well, spending one precautionary night on the high dependency unit before returning to the general vascular ward. She was discharged on day six and on subsequent outpatient review all cardiac failure symptoms had resolved and she remained asymptomatic at three months.

Discussion

Intra abdominal AV fistulae are rare. They most commonly occur as a result of penetrating trauma [1], including gunshot wounds [2,3]. They are rarely associated with AAA rupture into the IVC [4]. Rarer causes include congenital [5] and retroperitoneal malignancy [6]. It is also thought that cardiovascular risk factors such as hypercholesterolaemia may cause a spontaneous fistula on rare occasions.

This case describes a fistula almost certainly caused iatrogenically during spinal surgery. Vascular injuries occur in less than 1% of spinal procedures and the literature includes only three cases of AV fistula following spinal surgery [7]. However, several examples of AV fistulas post nephrectomy are described [8].

The rarity of the pathology, and the fact that presentation may occur many years after a seemingly irrelevant traumatic event, risks delay in diagnosis, or even over-looking the diagnosis completely. The important diagnostic pointers include heart failure, palpitations, AF, chest pain, and shortness of breath in an otherwise young fit person.

Corresponding Author: Mr M.H. Lewis FRCS MD,
Department of Surgery, Royal Glamorgan Hospital,
Ynysmaerdy, Llantrisant
Tel: 01443 443443
Email: mike.lewis@pr-tr.wales.nhs.uk

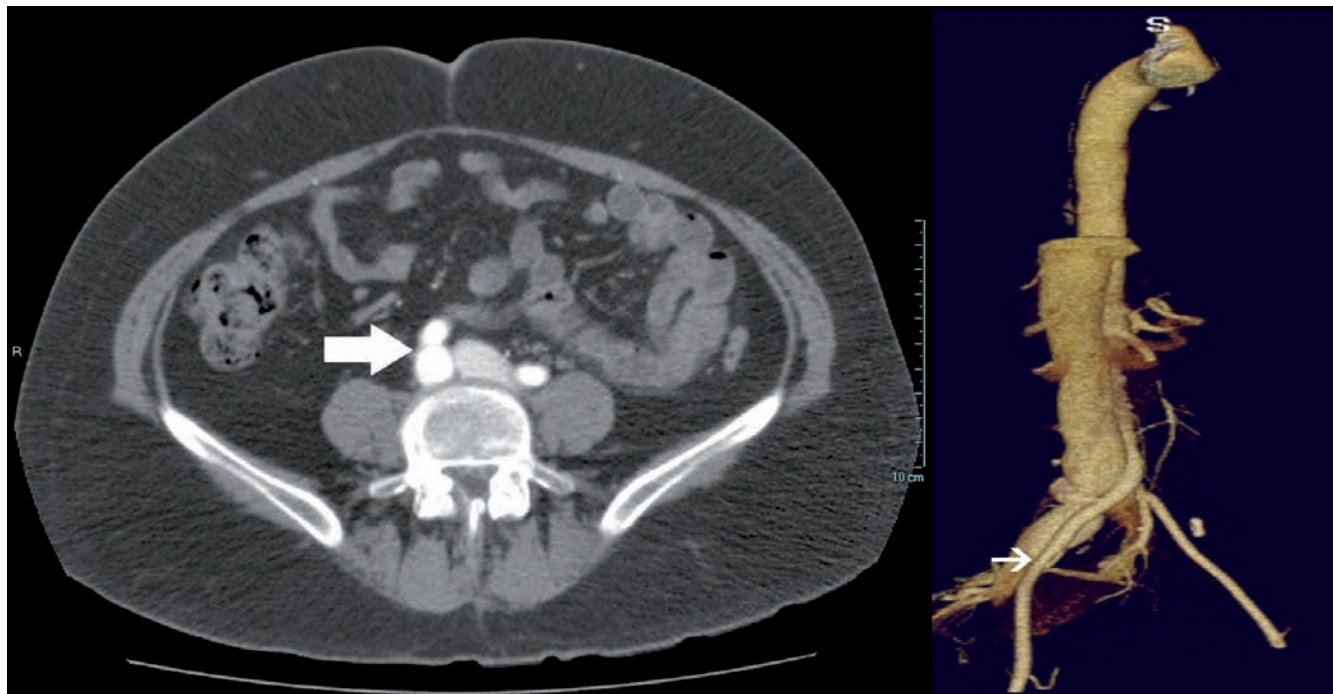


Figure 1. Arterial phase computed tomography demonstrating simultaneous contrast enhancement of both the common iliac arteries and the right common iliac vein (large arrow, left hand image) and 3-dimensional reconstruction demonstrating site of arterio-venous fistula (small arrow, right hand image).

Specific imaging investigations include ultrasound or duplex ultrasonography, which may demonstrate a cause if an aneurysm is visible. Abnormal vascular flow may be evident, however its use in imaging proximal lower limb vessels is limited due to overlying bowel gas [9]. The investigation is also highly operator dependant. CT is accurate and provides good anatomical modelling, especially with modern MDCT and reconstruction software [10] (Figure 2). Arteriography was required in our case

to demonstrate exact defect location.

This patient was treated successfully with prosthetic interposition graft. Alternative options include endovascular stenting in more elderly frail patients [11]. Surgical repair was chosen due to the patient's young age and her relative fitness. Surgical correction was felt to be low risk and was likely to cause fewer problems than an endovascular technique in the long term. To date this patient remains well.

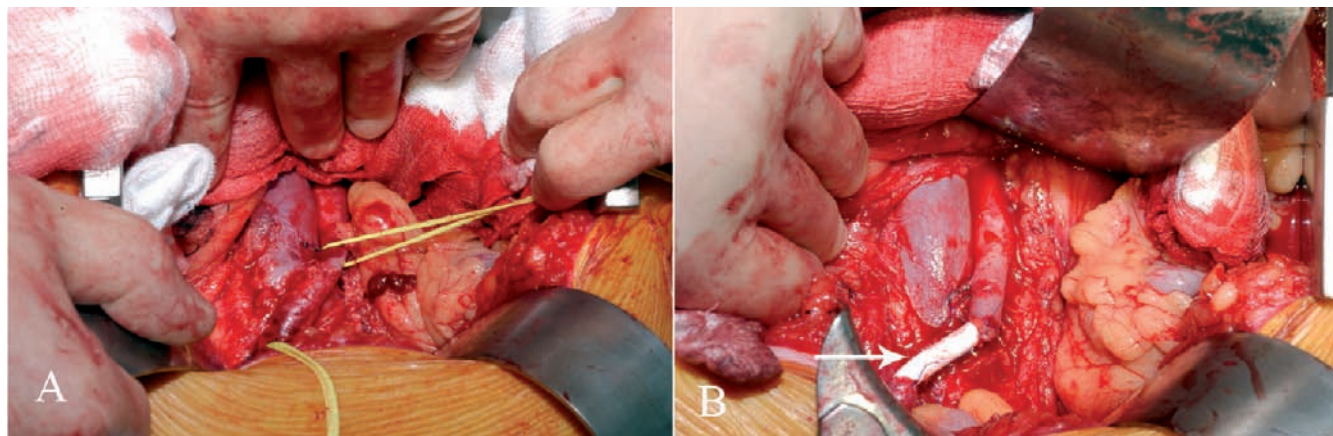


Figure 2. Intraoperative images; A – Image demonstrates right common iliac artery (slung) and dilated common iliac/caval venous system with adherent segment of artery at site of the fistula; B – Image of interposition PTFE graft (arrowed) note that the venous system has already collapsed.

References

- Pincu M. Traumatic aortocaval fistulas of late diagnosis. *J Vasc Surg.* 19(6):1097-8 1994.
- de Andrade Junior DR, Wood CA, Tedesco J. Aortocaval fistula due to remote gunshot wound. *American Journal of Medicine.* 113(8):699-700 2002.
- Sigler L, Gutierrez-Carreno R, Martinez-Lopez C, Lizola RI, Sanchez-Fabela C. Aortocava fistula: experience with five patients. *Vascular Surgery.* 35(3):207-12 2001.
- Dauphine C, Kovar J, Donayre C, et al. Abdominal aortic aneurysm with aortocaval fistula and a separate retroperitoneal rupture. *Vascular* 12(4):266-70 2004.
- Godart F, Houmany M, Francart C. Congenital aortocaval fistula responsible for congestive heart failure. Closure with the Amplatzer duct occluder. *Cardiology in the Young.* 14(6):676-7 2004.
- Krause U, Richter HJ, Lohr E, Eigler FW. A rare cause of aorto-caval fistula: malignant fibrous retroperitoneal histiocytoma. *Chirurg.* 53(9):591-3 1982.
- Szolar DH, Preidler KW, Steiner, H, et al. Vascular complications in lumbar disk surgery. *Neuroradiol.* 38(6):521-5 1996.
- Shida T, Gan K, Shio K, Takemura Y. A case of postnephrectomy arteriovenous fistula. *Japanese Journal of Surgery.* 19(6):738-9 1989.
- Dunath FM. Traumatic aorto-caval fistula: ultrasound diagnosis. *J clin ultrasound.* 19(6):370-3 1991.
- Unterweger M, Weisner W, Petre R et al. Spiral CT in an acute spontaneous aorto-caval fistula. *European Radiology.* 10(5):733-5. 2000.
- Duxbury MS, Wells IP, Roobottom C, Marshall A, Lambert AW. Endovascular repair of spontaneous non-aneurysmal aortocaval fistula. *Euro J Vasc Endovasc Surg* 24(3):276-8 2002.