Emergency management of retroperitoneal haemorrhage using covered stents

Introduction

Retroperitoneal haemorrhage is a life-threatening complication of coronary angiography using the femoral approach. Post-procedural fluoroscopic examination of the femoral artery is now routinely performed before deployment of closure devices and allows operators to identify contrast extravasation from the ilio-femoral artery. Prompt corrective measures may be lifesaving.

Discussion

Cardiac catheterization from the femoral approach is complicated by retroperitoneal haemorrhage in approximately 0.5% of cases, particularly when the arterial puncture site is above the middle third of the femoral head (Ellis et al, 2006; Tiroch et al, 2008). It is more common in women than men and is associated with 4–12% mortality (Sajnani and Bogart, 2013). In the present case, the haemorrhage was identified immediately after the catheter procedure during a femoral angiogram performed routinely to guide deployment of an arterial closure device. Immediate deployment of a covered stent to stem the haemorrhage prevented a catastrophic fall in blood pressure and the need for blood transfusion.

There are no randomized trials to guide treatment of retroperitoneal haemorrhage and options include conservative management, surgery and device interventions (Trimarchi et al, 2010). The authors believe that deployment of a covered stent immediately after cardiac catheterization has not been previously reported but is an attractive option for contemporary practice when femoral angiography is performed routinely after cardiac catheterization to guide deployment of closure devices. This has the potential to improve outcomes by allowing early diagnosis in the catheter laboratory (Trimarchi et al, 2010) where interventional devices and staff with the necessary skills are available to stem the haemorrhage and prevent haemodynamic collapse. BJHM

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Figure 1. Extravasation of contrast at the right femoral puncture site (arrowed) tracking upwards into the retroperitoneal space.

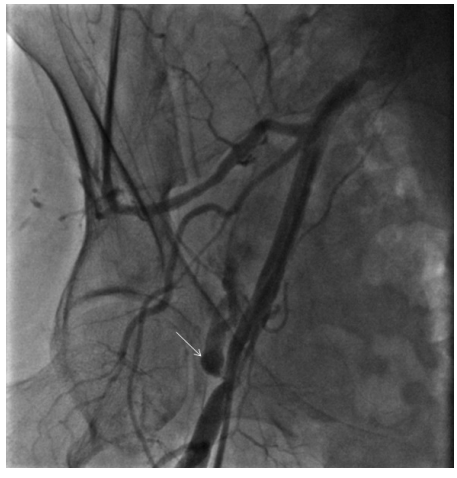
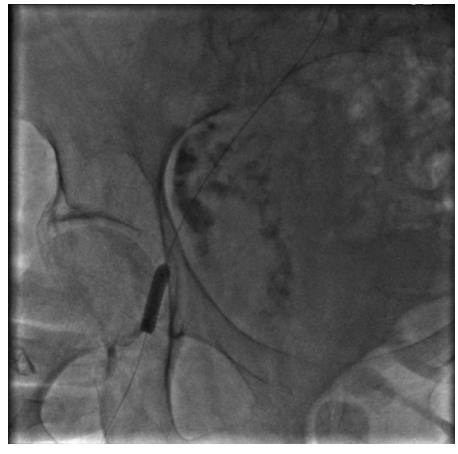


Figure 2. Inflation of a non-compliant balloon after insertion of the Graft-Master covered stent to achieve haemostasis. Residual contrast in the retroperitoneal space is visible.



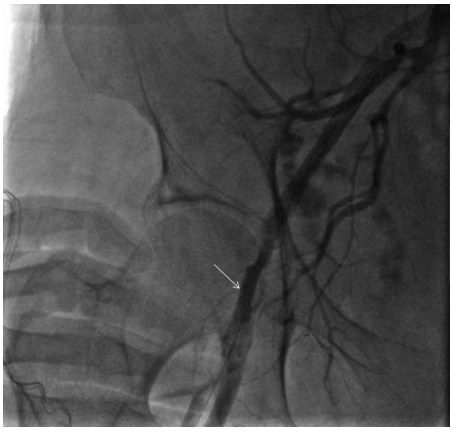
CASE REPORT

A 72-year-old woman with severe aortic regurgitation, stage 4 chronic kidney disease, hypertension and type 2 diabetes, underwent diagnostic coronary angiography during work-up for aortic valve replacement. Right femoral arterial access by Seldinger technique was achieved with a single puncture and a 6 French sheath was deployed for catheter introduction. Diagnostic coronary angiography was completed successfully using Judkins catheters. After the procedure a routine femoral angiogram was performed by contrast injection through the femoral sheath to confirm that an arterial closure device could be safely deployed. This revealed a high femoral puncture site with contrast leaking from the ilio-femoral artery and tracking into the pelvis. The appearance was of retroperitoneal haemorrhage (*Figure 1*) and the decision was taken to stem the haemorrhage by deployment of a covered stent.

Access to the ilio-femoral bleeding point required left femoral puncture for deployment of a 6 French sheath. A Judkins right coronary guide catheter was positioned at the aortic bifurcation and used to deliver a guidewire retrogradely down the right ilio-femoral artery beyond the right femoral puncture site. The right femoral sheath was removed and a 4.8x19 mm Graftmaster covered stent was positioned across the bleeding point. Despite being under-sized (only coronary stents were available) deployment using 24 atmosphere balloon inflation and post-dilatation with a 5.5 mm non-compliant balloon (*Figure 2*) effectively stemmed the haemorrhage, preventing further extravasation of contrast into the retroperitoneal space. Flow in the femoral artery was well preserved (*Figure 3*).

After the procedure, pedal pulses were present and the patient remained haemodynamically stable. She was reviewed by the vascular surgeons but no further intervention was considered necessary. She continued to make a good recovery but 1 week later had a catastrophic stroke and died.

Figure 3. Haemostasis achieved with successful deployment of the Graft-Master covered stent (arrowed). Femoral flow is well preserved.



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LEARNING POINTS

- Femoral angiography after cardiac catheterization is now routinely performed to confirm that an arterial closure device can be safely deployed.
- This allows early diagnosis of ilio-femoral haemorrhage into the retroperitoneal space.
- Covered stents can be promptly deployed to stem the haemorrhage and prevent haemodynamic collapse.

Spontaneous pulmonary embolism following a recently thrombosed, disused haemodialysis fistula

A 52-year-old man noticed that his disused fistula was no longer functioning and had become red, firm and tender. It had been unused for 6 years, following a successful renal transplant. Examination revealed a mildly tender, erythematous fistula, with no palpable thrill. Following discussion with the transplant team, he was discharged with antibiotics and imaging was felt to be unnecessary.

He re-presented with left-sided pleuritic chest pain 1 week later. Clinical examination was essentially normal. Chest X-ray showed multiple areas of plate atelectasis and patchy left basal consolidation (*Figure 1*). With no infective symptoms or signs, he went on to have a computed tomography pulmonary angiogram which showed a left lower lobe pulmonary embolism (*Figure 2*). He was anticoagulated and made an unremarkable recovery.

The link between de-clotting thrombosed fistulae and pulmonary embolism is well described (Toosy et al, 2008; Shah et al, 2012) but to the best of the authors' knowledge, this is the first case describing the phenomena of a pulmonary embolism occurring following thrombosis of a disused haemodialysis fistula. BJHM

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Figure 1. Chest X-ray showing multiple areas of plate atelectasis and patchy consolidation at the left base.

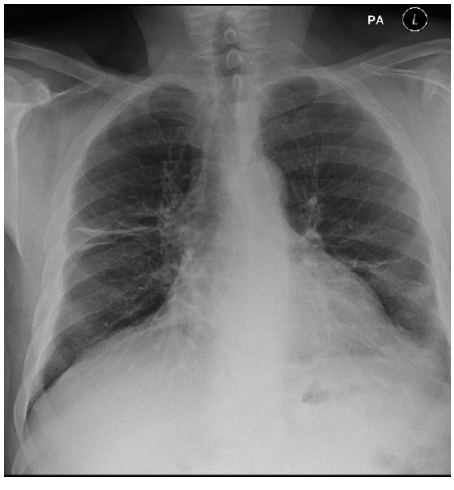

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Figure 2. Computed tomography pulmonary angiogram showing left lower lobe pulmonary embolism (arrow) within the segmental and sub-segmental pulmonary arteries, plus some consolidation within the left lower lobe.