

Answer

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The answer is B. Contrast-enhanced computed tomography (CT) was performed. It demonstrated a large right-sided retroperitoneal hematoma displacing the bladder to the left side of the pelvis. The hematoma extended from the level of the junction of the right external iliac artery to the ipsilateral common femoral artery. A catheter sheath was present in the left common femoral artery, which remained in situ following completion of the angioplasty. A selective femoral digital subtraction angiogram (DSA) was subsequently performed on the right side. The DSA demonstrated the presence of a small tear at the junction of the right external iliac artery and the ipsilateral common femoral artery (Fig. 1). The defect appeared small in calibre, measuring 1–2 mm in diameter. No other significant findings were evident in the aorta or common iliac vessels.

After discussion with the referring team, it was decided to place a covered stent over the area of the tear of the right common femoral artery. The stent was deployed using a 6-mm balloon. A follow-up DSA performed immediately after the placement of the stent demonstrated resolution of the retroperitoneal leak and restoration of hemodynamic stability (Fig. 2). A repeat CT performed 48 hours after the procedure demonstrated a significant decrease in the size of the retroperitoneal hematoma, with the stent in situ at the junction of the right external iliac and ipsilateral common femoral arteries. The patient made an uneventful recovery and remained well at follow-up.

Discussion

Arterial cannulation may cause vascular disruption. As the number of diagnostic and therapeutic cardiac and radiolog-

ical interventional procedures increases, the complications associated with arterial puncture occur with increasing frequency. Complications include bleeding, false aneurysm formation, infection, arterial occlusion from thrombosis or dissection and arteriovenous fistula formation. Characteristically, complications occur more often in therapeutic procedures than in diagnostic investigations. Documented risk factors for these complications include advanced age; female gender; obesity; atheroma at the puncture site; aortic regurgitation; hypertension and the use of aspirin, warfarin

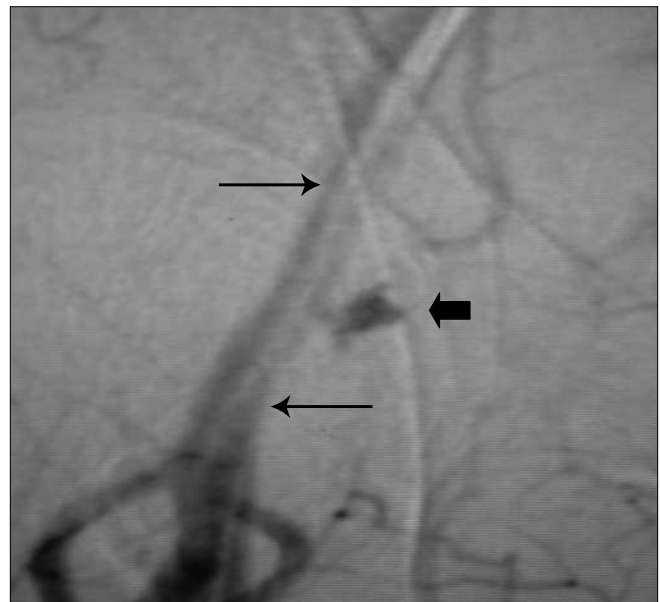


Fig. 1. Selective femoral digital subtraction angiogram demonstrating site of retroperitoneal hemorrhage originating from a tear (short black arrow) at the junction of the right external iliac artery (top arrow) and the ipsilateral common femoral artery (bottom arrow).

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or heparin; duration of the procedure; calibre of the sheath and catheters; and multiple arterial punctures.^{1,2} Overall, the risk of major vascular complications after cardiac catheterization is low.³ In a review of 7333 patients who underwent percutaneous femoral cardiac interventions, 1% of these patients underwent operative repair of catheterization-related complications.⁴

Retroperitoneal hemorrhage (RPH) is a rare (0.15 %) but life-threatening complication of arterial puncture.⁵ Hemorrhage tracking up from the femoral sheath may not be accompanied by local clinical signs.⁶ Emergency physicians should look for marked lower-abdominal or lower-back pain, hypovolemia, a falling hematocrit or extremity neurological complications due to femoral nerve compression. Early recognition and intervention are crucial in the management of RPH after cardiac or radiological interventional procedures. If a clinical suspicion of RPH exists, the best way to confirm the diagnosis is early recourse to contrast-enhanced CT for rapid evaluation. Results of CT characteristically demonstrate a high-density soft-tissue mass originating at the inguinal vessels extending into the ipsilateral retroperitoneal spaces.⁷ A number of therapeutic measures have been advocated: reduction or discontinuation of anticoagulants, supportive transfusion⁸ and balloon tamponade of the actively bleeding femoral artery.⁹ As described in our experience, consideration should be given to the placement of a covered stent to seal the site of RPH

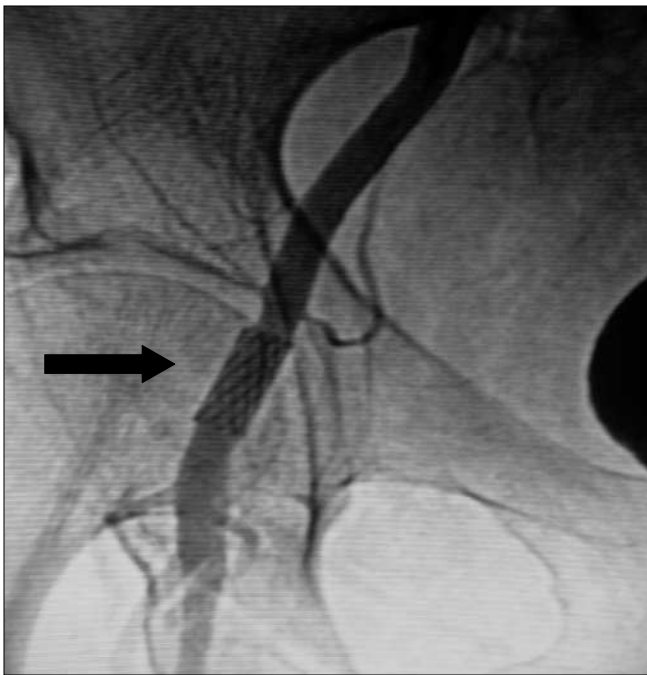


Fig. 2. Digital subtraction angiography demonstrating the position of a covered stent (arrow) placed over the area of the tear of the right common femoral artery.

identified at selective DSA.

For patients with neurological complications relating to femoral nerve compression, or in circumstances where endovascular measures are unsuccessful in the correction of hypovolemia, surgical exploration is mandatory.

Conclusion

Retroperitoneal hemorrhage is a rare yet life-threatening complication of arterial puncture during cardiac or radiological catheterization. We describe the successful placement of a covered endovascular stent to cover the site of arterial hemorrhage, which was identified through contrast-enhanced CT and selective DSA, thereby restoring hemodynamic stability and avoiding the necessity of surgical exploration.

Consideration should be given to the use of this technique in the management of this serious complication of arterial puncture following endovascular procedures.

Competing interests: None declared.

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