A 52-year-old woman presented for investigation of exertional chest pain. Her medical history included an atrial septal defect; this was extensively investigated with right and left heart catheterizations at 13 years. There were complications related to this investigation, and further details were unavailable. The atrial septal defect was surgically repaired at 15 years; she had a subarachnoid hemorrhage, resulting in clipping of a middle cerebral artery aneurysm in 1999. She had bilateral inguinal scarring with normal femoral pulsation and distal limb pulsation; physical examination was otherwise unremarkable.

She was a current smoker, and her total cholesterol level was 5.6 mmol/L (low-density lipoprotein, 3.8 mmol/L). Resting ECG showed a sinus rhythm with partial right bundle branch block and T-wave flattening in leads V2 through V6. Transthoracic echocardiogram was normal. Exercise stress testing with a standard Bruce protocol resulted in 2 mm of inferolateral ST-segment depression in Stage 2 (7 METS). In light of these results, she came forward for elective coronary angiography.

The procedure was undertaken by means of a right femoral artery approach. The vessel puncture was unremarkable, and the wire passed without resistance. However, there was marked hypotension and bradycardia. Hemodynamic stability was achieved after the intravenous administration of 0.5 mg atropine and 500 mL 0.9% normal saline bolus. The procedure was abandoned and apparent hemostasis was achieved by manual pressure with no evidence of local hematoma or active bleeding. One hour after procedure, the patient complained of right iliac fossa pain requiring 7.5 mg of intravenous diamorphine for analgesia. Her observations remained stable, and abdominal examination was normal. A full blood count revealed a drop in hemoglobin concentration from 12.6 to 8.3 g/dL. Abdominal computed tomography revealed a large retroperitoneal hematoma extending from the right peripelvic area with compression of the right femoral artery.

Following consultation with the vascular surgery team, a decision was made to aim for percutaneous treatment of the bleeding. An angiography was performed through the left femoral artery, and it demonstrated a well-collateralized chronic subtotal occlusion of the right common femoral artery (Figure 1). Selective catheterization of the right inter-

Figure 1. Digital subtraction angiogram of the right femoral artery. There is subtotal occlusion of the CFA that is well collateralized (Col). The collaterals run from the EIA to the FB below the inguinal ligament. The distal vessels are normal. CFA indicates common femoral artery; EIA, external iliac artery; FB, femoral bifurcation.
nal and external iliac branches revealed contrast extravasation around a prominent collateral (Col) running from the right distal external iliac artery (EIA) to the femoral bifurcation below the inguinal ligament (Figure 2). Hemostasis was achieved by embolization of the bleeding collateral (Figure 3). She was then transferred to the coronary care unit for monitoring and a transfusion of 2 units of packed cells. Her hemoglobin level rose to 10.1 g/dL and remained stable until discharge. She did not experience any complications from her embolization and did not develop any leg ischemia. Subsequent cardiac catheterization has shown normal coronary arteries and good left ventricular function.

Oclusion of the common femoral artery may occur after percutaneous procedures or the insertion of arterial lines for hemodynamic monitoring. This is more common in children and usually leads to the formation of significant collateral vessels. Large superficial collateral vessels may be detected as a normal femoral pulsation, and distal foot pulses are often present. Five years after diagnostic femoral arterial cannulation in children, 36% have arterial occlusion, of these 41% have abundant collateral formation and most have palpable leg pulses. There is usually an absence of ischemic symptoms in similar populations. In infants, clinically normal femoral pulsation may return within 24 hours of femoral artery occlusion via the development of collaterals in 50% of cases. The incidence of complete common femoral artery occlusion following cannulation in children is thought to be between 14% and 33%, the variation likely represents differences in the age at procedure in the studies. Cannulation of collaterals carries an increased risk of vascular damage due to their tortuous course and the absence of normal arterial wall musculature.

Many retroperitoneal hematomas can be treated conservatively; however, the traumatic nature of extravasation caused by arterial puncture may increase the need for intervention. Indications for surgical treatment or embolization include persistent hypotension, decreasing hematocrit values despite transfusion, or femoral neuropathy. Percutaneous angiographic embolization allows accurate diagnosis and minimally invasive treatment of the bleeding point causing the hematoma. Treatment of inadvertent laceration of pelvic collateral vessels has previously been described. We believe this is the first case report on the use of this technique to treat retroperitoneal hematoma caused by direct puncture of femoral collateral vessels.

Physical signs or personal medical history of previous femoral arterial cannulation, especially in childhood, should alert the operator to the possibility of abnormal femoral arterial anatomy and in such situations consideration should be given to alternative routes of access, or the use of noninvasive diagnostic techniques.

Disclosures

None.

References

Retroperitoneal Hematoma After Diagnostic Coronary Angiography Caused by Collateralization of a Chronic Common Femoral Artery Occlusion Secondary to Childhood Femoral Cannulation
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