

Coil embolization of major bleeding after femoral fracture

A case report

Successful internal arterial embolization with steel coils in life-threatening bleeding after femoral fracture is described in an older patient.

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Major vascular injuries associated with fractures of the femur have been reported several times (Cameron et al. 1972, Wolfgang et al. 1974).

In our case an injury to a branch of the deep femoral artery was treated by embolization using steel coils.

Case report

A 76-year-old man was admitted to our orthopedic department in July 1983 after a fall in his home. In 1973, his right hip had been replaced with an endoprosthesis. Because of loosening, the femoral part of the prosthesis was changed in 1977. Since then he had enjoyed excellent hip function.

On admission, there were clinical signs of a right femoral fracture. The femoral, dorsal pedis, and posterior tibial pulses were normal. The fracture was located at the tip of the femoral stem of the prosthesis (Figure 1). The day after admission a massive swelling of the thigh was noticed. On opening of the fracture region, arterial bleeding was found, originating from posterior and medial to the femur. The exact site of the bleeding could not be visualized through the surgical approach used. Internal fixation using one AO-screw and two Richards fracture bands was performed. Postoperatively the patient was treated in balanced traction. Three weeks postoperatively a massive arterial bleeding was found originating from the same site as the bleeding noticed at the first operation. It could still not be controlled through the wound. Massive blood transfusions were given and the bleeding was temporarily stopped by compressing the thigh with elastic bandages.

Immediate arteriography showed fresh bleeding from a branch of the deep femoral artery into a false aneurysm (Figure 2). In association with arteriography several attempts were made to control the bleeding using internal arterial embolization with gel foam. However the gel foam pieces freely passed into the aneurysm. It was not until three steel coils, were inserted into the bleeding artery through a Seldinger catheter that complete and immediate control of the bleeding was obtained (Figure 3). Five months later the patient suffered a refracture below the tip of his prosthesis. He now received a new prosthesis with a 24-cm-long stem. The postoperative course has since been uneventful.

Discussion

Despite the high frequency of femoral fractures, associated vascular injuries demanding surgical intervention are quite uncommon (Fordyce, 1968). In our case the bleeding was probably caused by the sharp dislocated proximal fragment of the femur, lacerating a branch of the deep femoral artery, producing a false aneurysm.

Transcatheter intravascular occlusive therapy has come into use during the last decade for severe hemorrhages after trauma, bleeding neoplasms, arteriovenous malformations, and fistulae (Wallace et al. 1976, Gilland et al. 1982). The technique of intra-arterial embolization during arteriography is highly selective and permits branches of an artery to be embol-

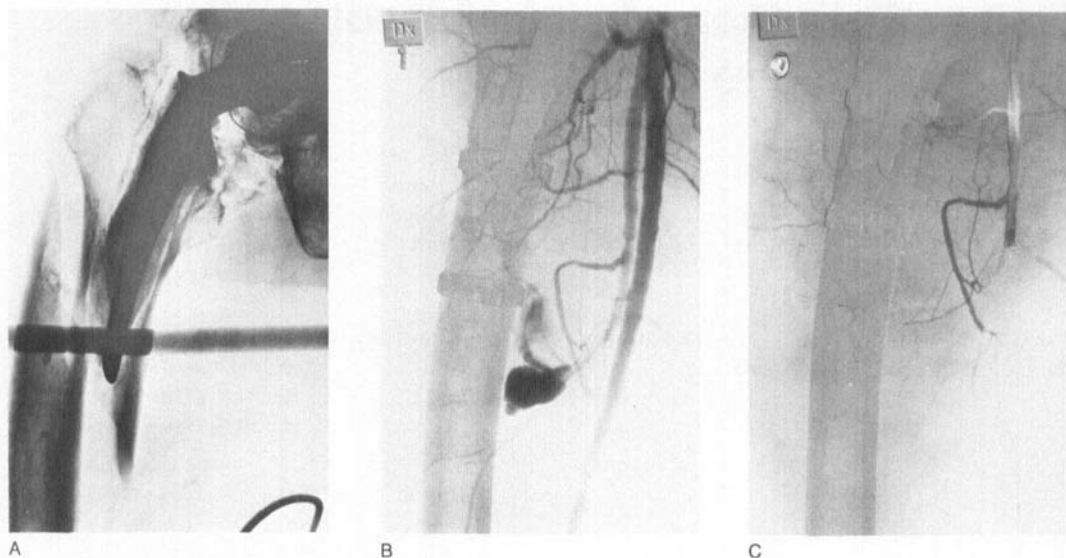


Figure 1. Fracture of the femoral shaft with arterial injury.

A. The fracture on admission.

B. Angiography 4 weeks after internal fixation. An arterial branch is freely bleeding into a false aneurysm that in turn freely leaks into the large hematoma in the thigh.

C. Angiography of the deep femoral artery. The bleeding has completely ended after insertion of three steel coils.

ized. The major stem of the artery does not have to be occluded and the method thus does minimize the danger of damaging the circulation of the limb. Embolization with gel foam failed in our case and complications have been reported, mainly peripheral unwanted embolization (Greenfield et al. 1978). Reconstructive surgery should be reserved for arterial lesions where an intact vessel is imperative for normal function. Internal arterial thrombosis may be the method of choice for treating major closed hemorrhages from arteries that can be occluded without endangering the vitality of the tissues involved.

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