Late fracture of the femur following perforation during hip arthroplasty

A report of 2 cases

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Two women in their seventies sustained a perforation of the femoral shaft during a total hip replacement without trochanteric osteotomy. They both had late fractures from minor trauma 7 and 12 months postoperatively. Immediate revision followed by 3–6 months of external support should be considered in patients with peroperative femoral perforation with cement leakage.

Case 1

A 79-year-old woman had a Charnley arthroplasty for arthrosis by an anterolateral approach without trochanteric osteotomy. Postoperative radiographs demonstrated extramedullary cement on the posterolateral side at the apex of the stem (Figure 1). The postoperative period was uneventful. Twelve months later, she experienced sudden pain in the thigh and was unable to walk. Radiographs demonstrated a displaced fracture just below the stem of the prosthesis. Revision was made with exchange to a 5-cm longer stem extending past the fracture area. After cementation, autologous bone was transplanted from the iliac crest to the fracture area. There was no postoperative pain.

Radiographs 4 months later showed new bone in the fracture area. One year after revision the patient is mobile, but uses a walking support.

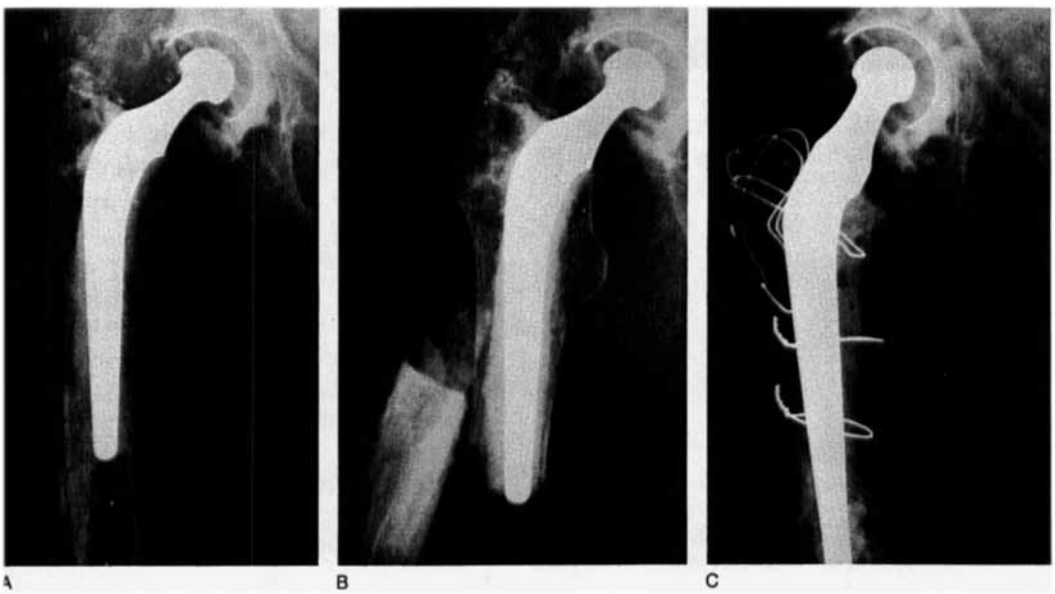

Figure 1. A 79-year-old woman had an arthroplasty for coxarthrosis.
A. Postoperatively, extraosseous cement is seen on the posterolateral side.
B. Transverse fracture at the tip of the stem 12 months postoperatively.
C. Four months after revision with autologous bone transplantation and a long-stem prosthesis extending past the fracture.

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Case 2

A 74-year-old woman had a Charnley arthroplasty for arthrosis by an anterolateral approach without trochanteric osteotomy. There were peroperative difficulties in exposing the operating field, which also influenced the preparation of the femoral shaft during the drilling and reaming. Postoperative radiographs demonstrated extraosseous cement, but no fracture (Figure 2). No postoperative walking pain was experienced. Seven months after surgery, the patient suddenly felt pain in the thigh while climbing stairs. Radiographs did not disclose any fracture, and the scintigraphy was normal. However, 3 weeks later an increased scintigraphy uptake was seen (Figure 2), and radiography showed an undisplaced fracture at the tip of the stem. Walking pain had increased; but at the clinical examination of the femur, no fracture pain could be induced. At surgery a complete, undisplaced fracture was seen extending from the perforation distally and laterally. The extraosseous cement was extracted, and trabecular bone was transplanted from the iliac crest.

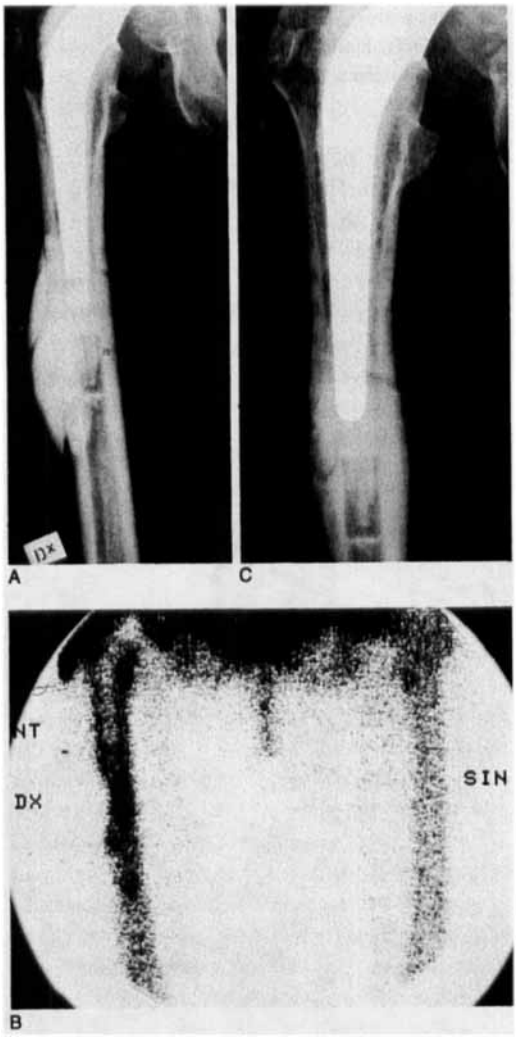

Figure 2. A 74-year-old woman had an arthroplasty for coxarthrosis.
A. Postoperatively, extraosseous cement is seen on the posterolateral side.
B. Scintigram 7 months postoperatively and 3 weeks after sudden pain when walking. Increased uptake anteriorly at the tip of the stem and a cortical deficiency lateral to the tip.
C. Eighteen months postoperatively and 12 months after revision with excision of cement and autologous bone transplantation. A nondisplaced fracture is still visible on the lateral side at the plastic plug.

Initially, the patient was mobilized with a whole-leg orthosis for 3 weeks, and then used only a femoral orthosis for another 4 months. Her walking pain decreased gradually. One year after revision the fracture line was still visible on radiographs, but respectively callus and a cortical thickening were present on the lateral and medial sides of the femur. One year postoperatively, the patient is using only one cane occasionally and has no pain while walking.

Discussion

The risk of peroperative perforation during femoral reaming is occasionally mentioned in operation manuals, but I have not found any previous reports of late spontaneous fracture. When the anterolateral approach is used, the curvature of the femur may cause considerable difficulty for the surgeon while reaming the medullary canal with straight reamers. This is especially obvious if the operating field cannot be entirely exposed, as may be the case if the gluteus medius is bulging or is tense. The straight reamers have now been modified, but they should still be used with caution, especially in the elderly, osteoporotic patient.

If a peroperative femoral penetration occurs with a leakage of cement, an immediate revision with extirpation of the cement and transplantation of trabecular bone to the perforation should be considered. Due to a later risk of an unstable fracture, external support with a walking aid and femoral brace should be employed during a 3–6-month period.

Reference

Hardinge K. The direct lateral approach to the hip. J Bone Joint Surg (Br) 1982;64(1):17–9