

Acetabular fracture causing hip joint tamponade

A case report

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An 81-year-old woman had severe hip pain after a fall. Radiography was normal, but computed tomography and sonography showed a minor, displaced acetabular fracture and hemarthrosis. Aspiration of 15 ml of blood reduced the intracapsular pressure in the neutral position from 30 kPa to atmospheric pressure with relief of pain and increased joint motion. This case confirms that acetabular fracture may escape radiographic diagnosis and cause hip joint tamponade. Aspiration should be considered as a palliative and possibly therapeutic measure.

Hip joint tamponade with subsequent increase in intracapsular pressure may harm the blood supply of the femoral head in cervical fracture, hemophilia, and various forms of aseptic and septic synovitis (Minikel et al. 1983, Wingstrand et al. 1985, Wingstrand 1986a+b, Wingstrand et al. 1987a). This mechanism may also explain rare forms of idiopathic osteonecrosis, e.g., in alcoholics with undiagnosed hip joint trauma with tamponade as suggested by Bauer (1985) commenting on a patient originally presenting with an acetabular fracture that escaped radiographic diagnosis. We present another case of this type.

Case report

An 81-year-old woman fell in her home and sustained trauma to her right hip. She was incapable of weight bearing and had intense pain on passive motion. Conventional radiographs were normal, whereas computerized tomography and

sonography demonstrated an acetabular fracture, as well as an intracapsular hematoma distending the joint capsule (Figure 1). Arthrocentesis was performed with a 0.8-mm cannula connected to a piezoelectric pressure transducer by a saline-filled nonelastic plastic tube. On penetrating the hip joint capsule anterolaterally with the patient supine and the hip joint in extension and neutral position with regard to rotation, a pressure of 30 kPa was recorded. In inward rotation the pressure rose to 43 kPa, in outward rotation the pressure was 27 kPa, and in 45° flexion the pressure fell to 8 kPa. Fifteen milliliters of blood with a few fat droplets were aspirated followed by immediate relief of pain and an increase in active and passive motion in the hip. The pressure was reduced to the atmospheric level in the neutral position.

⁹⁹Tc^m-MDP scintimetry was performed 24 hours later confirming the diagnosis with an increased uptake in the central acetabular region. Due to the proximity to the fracture, it was not possible to assess femoral head uptake.

Following aspiration the patient was placed supine with the hip in 45° of flexion to minimize intracapsular pressure. She was mobilized, began weight bearing on the third day, and was discharged after 10 days capable of full weight bearing. Two months later, the woman fell again and sustained a pertrochanteric fracture of the same hip.

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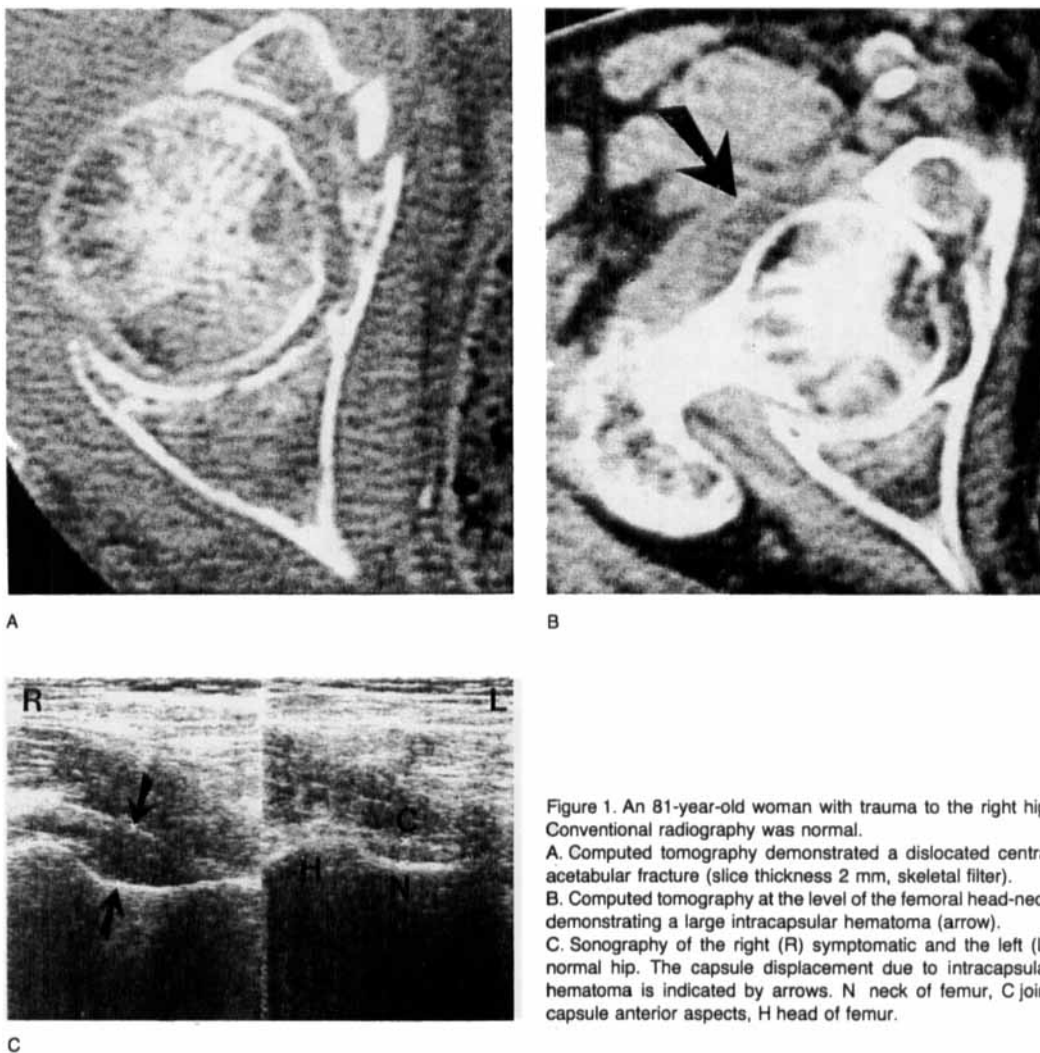


Figure 1. An 81-year-old woman with trauma to the right hip. Conventional radiography was normal.
 A. Computed tomography demonstrated a dislocated central acetabular fracture (slice thickness 2 mm, skeletal filter).
 B. Computed tomography at the level of the femoral head-neck demonstrating a large intracapsular hematoma (arrow).
 C. Sonography of the right (R) symptomatic and the left (L) normal hip. The capsule displacement due to intracapsular hematoma is indicated by arrows. N neck of femur, C joint capsule anterior aspects, H head of femur.

Discussion

In childhood the proximal femoral epiphysis is supplied mainly via superficial intracapsular branches of the medial circumflex artery. The vulnerability of these vessels to hip joint tamponade has been demonstrated in dogs (Woodhouse 1964, Kemp 1981, Lucht et al. 1983); the tamponade causes ischemia of the epiphysis and may, depending on the severity and duration of increased intracapsular pressure, eventually produce irreversible damage. After closure of the growth plate, a collateral vascular supply develops via intraosseous cervical vessels, constituting an alter-

native vascular pathway in case of tamponade. In undisplaced cervical fracture, the intraosseous pathway is interrupted and the head of the femur is again dependent on the paracervical vessels, potentially vulnerable to an increase in intracapsular pressure with subsequent ischemia as demonstrated previously. In 8 consecutive such patients with scintimetric evidence of cervical fractures, only four fractures were visible on conventional radiographs (Wingstrand et al. 1986b). A case of femoral head necrosis diagnosed radiographically 1 year after a minimal acetabular fracture was published by Bauer (1985).

In our case, there were no obvious scintimetric

signs of ischemia of the femoral head, which, however, was difficult to assess due to the proximity of the high acetabular fracture uptake.

An acetabular fracture with comminution or major displacement probably drains the hip joint spontaneously, and we believe that a prerequisite for hip joint tamponade in association with an acetabular fracture is that the displacement is minimal; this parallels the cervical fracture where tamponade occurs mainly in minimally displaced fractures (Wingstrand et al. 1986b, Strömqvist et al. 1988).

Our case is the first demonstration that an isolated acetabular fracture may cause hip joint tamponade; it supports Bauer's (1985) suggestion that this fracture may cause femoral head necrosis by this mechanism. In cases with hip joint trauma without obvious radiographic findings, a fracture, hip joint hemarthrosis, and ischemia can be diagnosed by radionuclide scintimetry, CT and/or sonography (Egund et al. 1988, Wingstrand et al. 1987b). Decompression by aspiration and by placing the patient with the hip in 45° flexion may save the femoral head.

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