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Case Report

Occult internal iliac arterial injury identified during open reduction internal fixation of an acetabular fracture: A report of two cases

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ABSTRACT

We present two cases of occult internal iliac arterial injury identified during operative reduction of a widely displaced posterior column posterior wall acetabular fracture. This complication was not recognised until reduction of the column fracture. There were no preoperative signs or symptoms indicative of a vascular injury. These cases emphasise the heightened awareness one must have when treating widely displaced posterior column fractures of the acetabulum, especially those fractures with extension into the greater sciatic notch, as previously formed clot can become dislodged and hemostasis lost. We also present management options when this complication occurs. We believe any surgeon treating acetabular fractures should be aware of this serious and potentially fatal complication.

Introduction

Vascular injuries are well described in pelvic ring disruptions, especially patterns that disrupt the posterior pelvic ring [3–5,7,11,14,19]. These injuries carry a significant morbidity and mortality [3–5,7,11,14,19]. In contrast, vascular injuries in acetabular fractures are much less common [15,18]. Most that have been documented in the literature exist as single case reports or small case series [2,6,8–10,12,13,16,17,20]. These injuries can be associated with significant morbidity and mortality, including reports of exsanguination and death from these vascular injuries [2,16]. One must have a heightened sense of awareness when treating these injuries and be prepared to treat them should they occur. In this article, we describe two illustrative cases of an occult internal iliac artery injury that became evident during open reduction internal fixation of a posterior column posterior wall acetabular fracture and propose subsequent management options.

Case report

Case 1

A 49-year-old healthy male was riding his motorcycle at speeds of 15–20 miles per hour when he sustained a collision with another vehicle. He was initially taken to and evaluated at a community hospital and then transferred to our level 1 trauma centre. Prior to transfer, a right-sided acetabular fracture dislocation was identified and closed reduction of the hip was performed.

Upon arrival to our trauma centre, a full trauma evaluation was undertaken. The patient had stable blood pressures with tachycardia to 130 beats/minue. His initial lactate level was 4 mmol/L (nl 0.5–2.2 mmol/L) and his haemoglobin (HGB) was 10.8 g/Dl (nl 13.5–17.5 g/Dl). On physical examination, he presented with a sciatic nerve palsy with absent ankle dorsiflexion and great toe extension and absent sensation of the superficial and deep peroneal nerve distributions. Peripheral pulses were easily palpable. Radiographic imaging with an anteroposterior (AP) pelvis x-ray confirmed a grossly displaced right posterior column posterior wall acetabular fracture (Fig. 1). In addition, a right-sided posterior tibial spine avulsion was noted. Computed tomography (CT) of the patient's abdomen and pelvis with intravenous contrast was obtained. These images revealed a pelvic haematoma, but did not show any active contrast extravasation (Fig. 2). No other orthopaedic or non-orthopaedic injuries were identified.

The patient was placed into distal femoral skeletal traction and admitted to the intensive care unit for resuscitation. During his resuscitation, he received a total of 4 L of crystalloid and two units of packed red blood cells. His tachycardia as well as his lactic acidosis resolved overnight (AM lactate 1 mmol/L). The following morning, with clinical and laboratory markers showing adequate resuscitation, he was taken to the operating room for open reduction and fixation of his acetabular fracture.

The patient was placed prone on a radiolucent table with the right limb in skeletal traction. A standard Kocher-Langenbeck

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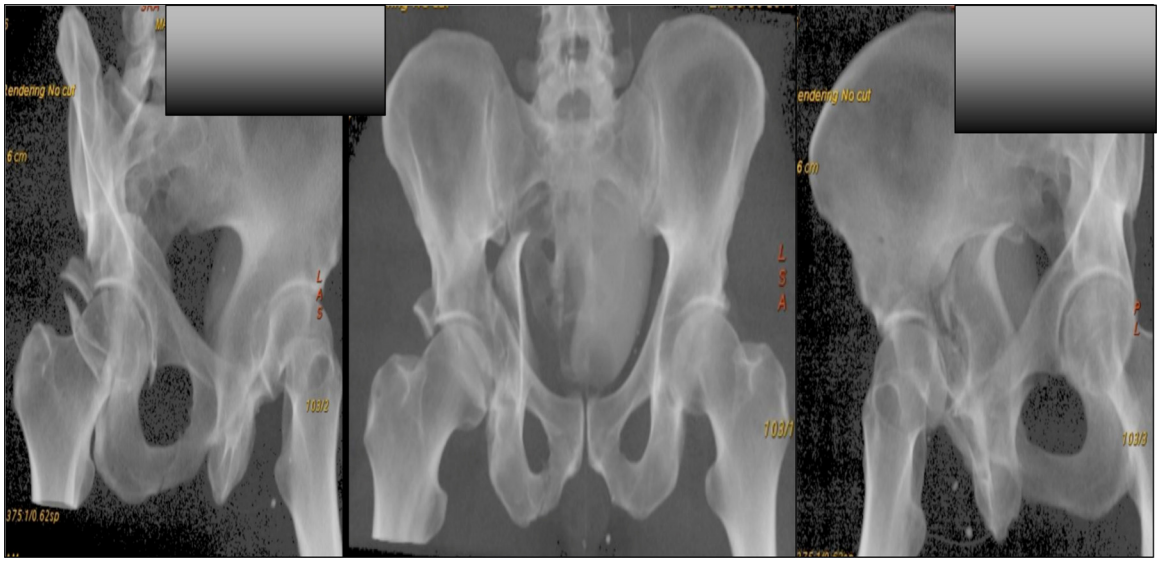

Fig. 1. AP pelvis and Judet reformatted radiographs showing a displaced posterior column posterior wall acetabular fracture. Note the significant displacement of the posterior column in the greater sciatic notch. This was thought to be the cause of the vascular injury.

approach to the posterior acetabulum was performed. A significant amount of clot was identified during the surgical approach. The free articular fragment (denoted by an * in Fig. 2) was removed from the main fracture plane; clot and debris were cleaned from the fracture lines. While reducing and cleaning the large spike on the posterior column, active arterial bleeding from the greater sciatic notch was encountered. Despite several attempts, it was not possible to stop the bleeding thus, the area was tightly packed for temporizing haemorrhage control and the decision was made to proceed with emergent angioembolization. The posterior column was fixed in a reduced position by a single 3.5 mm lag screw. This screw was placed to prevent any further vascular injury by the column fragment and protect the endovascular intervention. The wound was provisionally closed and the patient was transported to the angiography suite for endovascular assessment.

Angiography demonstrated active contrast extravasation from the internal iliac artery (Fig. 3A). An intravascular coil was placed to completely obstruct flow just proximal to this portion of the artery (Fig. 3B). With the haemorrhage controlled, the patient was transferred back to the intensive care unit for further resuscitation. Two days later, he returned to the operating room for completion of the acetabular fracture fixation. Postoperatively, the patient's postoperative course was uneventful and he was discharged to a rehabilitation facility on postoperative day number five.

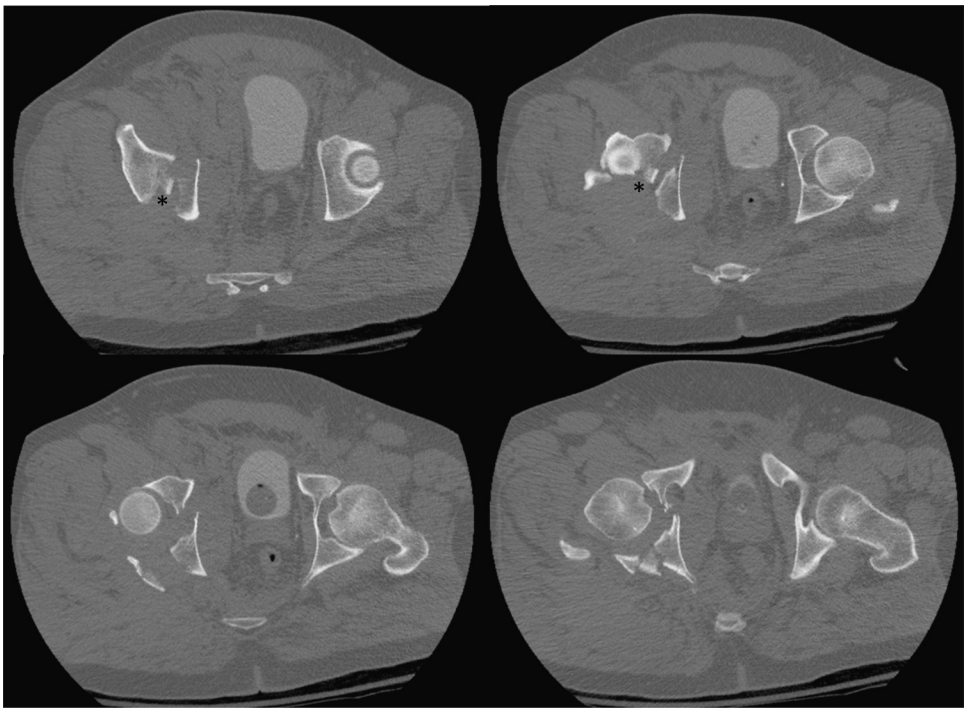

Fig. 2. Computed tomographic scans showing the acetabular fracture dislocation from the anterior inferior iliac spine through the articular surface. Note the * marking the intervening articular fragment preventing reduction of the posterior column through skeletal traction.