



## Pseudoaneurysm of the superior gluteal artery during iliosacral screw fixation

Ignacio MALED, Roberto VELEZ, Ricardo LOPEZ, Lledó BATALLA, Victor L. CAJA

*From Hospital Vall d'Hebron, Barcelona, Spain*

We present a case of a pseudoaneurysm of the superior gluteal artery following placement of an iliosacral screw in a patient with an unstable pelvic ring fracture. Percutaneous fixation of posterior pelvic ring injuries is becoming a popular method for pelvic stabilization. Several techniques are available to achieve stability and allow early mobilization in patients with displaced pelvic fractures. Percutaneous screw fixation of sacral fractures or sacroiliac joint disruptions should reduce operative and anaesthesia times as well as blood loss, while lowering the risk of surgical wound problems are decreased. The risks with this technique are generally iatrogenic, related with surgeon's lack of experience or imaging difficulties at the time of screw placement. The present case report describes an injury to the superior gluteal arterial system during percutaneous iliosacral screw insertion.

**Keywords** : iliosacral disruption ; screw fixation ; superior gluteal artery ; pseudoaneurysm.

### INTRODUCTION

Management of displaced pelvic fractures presents a challenge and, among treatment options, percutaneous screw fixation of posterior pelvic ring injuries is becoming a popular method for pelvic stabilization. This fixation technique of sacral fractures or sacroiliac joint disruptions reduces surgical complications and anaesthesia times. Blood loss and the risk of surgical wound problems are

decreased ; however it has its own risks, mostly iatrogenic, related with surgeon's lack of experience or imaging difficulties during screw placement. CT scan may be useful to locate a secure point of entry and reduce complications in screw insertion. An injury to the superior gluteal arterial system during percutaneous iliosacral screw insertion and treatment of this severe injury are reported.

### CASE REPORT

A 23-year-old woman with no relevant medical history was admitted after a motor vehicle accident. In the emergency room, physical examination revealed an unstable pelvis, confirmed by radiographs and computed tomography which showed a

- 
- Ignacio Maled, MD, Consultant.
  - Roberto Vélez, MD, Resident.
  - Ricardo López, MD, Consultant.
  - Lledó Batalla, MD, Resident.
  - Victor L. Caja, PhD, Consultant.

*Department of Orthopaedic Surgery and Traumatology, Hospital Vall d'Hebron, Barcelona, Spain.*

Correspondence : Ignacio Maled, Servicio de Cirugía Ortopédica y Traumatología, 2a planta, Hospital Universitario de Traumatología y Rehabilitación Vall d'Hebron, Paseo Vall d'Hebron 119-129 Barcelona 08035 Spain.

E-mail : 30124img@comb.es.

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**Fig. 1A.** — Pelvic AP radiograph



**Fig. 1B.** — Pelvic CT scan showing left displaced transforaminal sacral fracture.

left displaced transforaminal sacral fracture and a fracture of the left superior and inferior pubic rami (fig 1A, 1B) (10). No evidence of contrast extravasation was observed in CT and the patient maintained stable vital signs with adequate volume replacement. Forty-eight hours after admission, surgical stabilization of the pelvis using the percutaneous screw fixation technique with the patient in a semi-lateral decubitus position, was performed (7). Under computed tomography guidance, two 7.3-mm partially-threaded cancellous screws were inserted to stabilize the left sacroiliac joint (6) (fig 2). Within ten hours post-surgery, the patient complained of abdominal pain and her red blood cell count began to fall progressively. An abdomi-



**Fig. 2.** — CT guided percutaneous iliosacral screw placement

no-pelvic CT-scan showed arterial bleeding and a large pelvic haematoma from the superior gluteal artery (SGA) (2) (fig 3A-B). The patient was immediately transported to the angiography unit, where a superior gluteal artery branch pseudoaneurysm was diagnosed and embolisation with coils was performed (1) (fig 4A-B). A subsequent CT-scan revealed no pulsatile flow through the pseudoaneurysm. The patient was permitted to start mobilization without weight-bearing on her left leg. Three months after surgery, she was weight-bearing as tolerated with the aid of a cane.

## DISCUSSION

There is general agreement that reduction and early rigid pelvic fixation improves postoperative care and rehabilitation in patients with displaced unstable pelvic fractures (5). The method of stabilization depends on the fracture pattern, surgeon's experience and technical preference. Open pelvic surgery may be associated with a significant risk of soft tissue complications (4). Percutaneous pelvic fixation techniques should minimize blood loss and operative times, which can be particularly beneficial for the polytrauma patient. Although its infection rate, blood loss and risk of non-union is low, the percutaneous technique can be associated with complications related to improper placement of the iliosacral screw (8). There is a 1 to 5% risk of nerve injury involving the L5 nerve root (an anterior



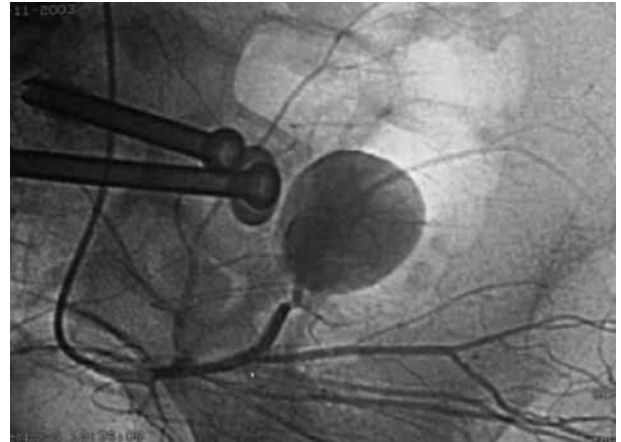
**Fig. 3A.** — Abdomino-pelvic CT scan showed bleeding and a large pelvic haematoma from the superior gluteal artery.



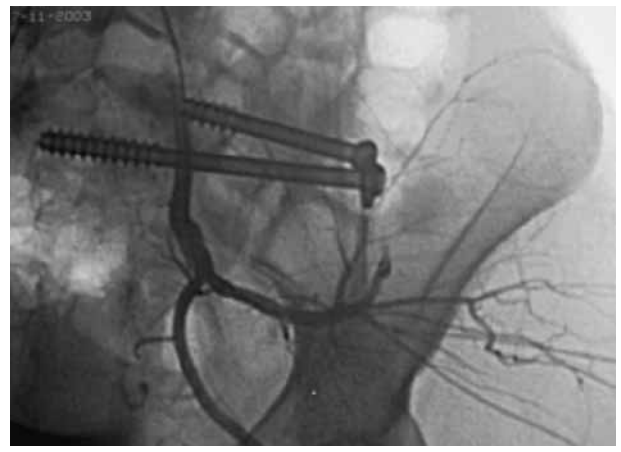
**Fig. 3B.** — CT scan 3-D reconstruction

exiting screw), the S1 nerve root (a sacral foramen screw), or cauda equina. The deep superior branch of the superior gluteal nerve and artery, which provide the major blood and nerve supply to the gluteus medius and gluteus minimus, is at significant risk during placement of percutaneous screws, compared with injuries to the iliac vessels located anteriorly to the sacral alar region (3).

In our patient, an injury to the SGA occurred during insertion of the percutaneous 7.3 mm iliosacral screw. Injury to the SGA was first reported by Altman *et al.* (2). In our case, the arterial injury may have been due to direct damage from the drill guide or screw insertion. Stephen reported



**Fig. 4A.** — Angiography : diagnosis of a superior gluteal artery pseudoaneurysm.



**Fig. 4B.** — Angiography post-embolisation with coils

a pseudoaneurysm of the SGA diagnosed fifteen days after treatment (9). He presumed the aetiology of the pseudoaneurysm was multifactorial, related with initial fracture displacement and/or direct trauma from the screw insertion. A contributing factor may have been the increased size of the guide wire for the 7.3-mm screws : 2.8-mm compared with 2 mm for the 6.5-mm screws.

We have reported here an acute injury to the SGA from percutaneous iliosacral screw insertion and the method of treatment that was used. Urgent angiographic diagnosis and embolisation was a successful treatment option in this patient (1). The immediate availability and technical expertise of



Fig. 5. — Iliosacral screw placement : the “safe zone”

the interventional radiologist enabled this potentially devastating vascular injury to be solved rapidly, with no adverse clinical effects. CT aids screw placement and may reduce the risk of neurovascular lesions since vascular structures can be located and a safe zone for their insertion determined (fig 5).

The diagnosis of gluteal artery pseudoaneurysm should be considered in the differential diagnosis of unexplained abdominal pain in a polytrauma patient undergoing iliosacral fixation.

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