

## **Open reduction and internal fixation of acetabular fractures**

### **Relevant anatomic details**

Paulo Amaral Rego

Serviço de Ortopedia, Hospital de Santa Maria, Lisboa, Portugal

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Acetabular fractures are one of the most difficult challenges even to experienced orthopaedic surgeons.

Many complications can occur from the initial trauma or from the surgical treatment itself. A considerable number of these fractures evolve to osteoarthritis and need a total hip replacement.

These fractures require a step by step approach. We first should be able to determine the fracture type, patient profile and time elapsed from the initial trauma. Knowledge of the hip peri articular structures, acetabular and proximal femur anatomy is essential to the preoperative approach planning so that we can have a realistic expectation achieving an anatomic reduction.

Letournel classification identifies 5 distinct basic types depending on the anatomic structure involved (anterior or posterior column, anterior or posterior wall, transverse fracture or both column) and combined fractures.

Type fracture should be used to decide for the best approach and osteosynthesis.

Generally the anterior ilioinguinal or modified Smith Peterson approach will allow for a good visualization and reduction of the anterior component fracture. The posterior approach is used for fractures with involvement of the posterior column, wall and acetabular roof.

Being familiar with the posterior Gibson or modified Kocher approach to the hip joint needs a perfect understanding of the anatomic details in this area namely the functional interterritorial innervation and the exact location of the main branch of the medial circumflex artery, responsible for the femoral head perfusion.

This classical approach traditionally described as transgluteal approach can be modified, in our opinion, dissecting the interval between the tensor fascia lata and gluteus maximus in a prone position. By avoiding the muscular dissection we can preserve the inferior gluteal nerve running superficial in the anterior aspect of gluteus maximus and permits surgical exploration to the greater sciatic nerve, decompressing it when necessary and also offering active protection to it.

In the posterior aspect of the capsule deeply to the external rotators tendons a few millimetres medial to the intertrochanteric crest, runs the main branch of the medial femoral circumflex artery. If we want to keep the vessel, the secure gap to perform the tenotomy and sometimes the capsulotomy is much more medial than what is usually done. The piriformis tendon must be preserved and also the external obturator tendon also in order to protect the artery.

If necessary we can additionally perform a trochanteric digastric osteotomy in order to dislocate the femoral head from the socket and to

inspect for the articular surface reduction or to reduce intra articular osteocondral fragments.

Acetabular roof, posterior wall and column osteosynthesis can be easily done using this approach.

We think that preserving the anatomic integrity of the noble structures around the hip can be a contribute to improve the prognosis on this patients.