

# Surgical stabilization of acetabular injuries: approaches and methods

Jaikirty Rawal

Homa Arshad

Peter Bates

## Abstract

Surgical approaches to the acetabulum are key to providing adequate exposure and reduction of fracture fragments thereby restoring articular congruity. Here, we discuss both the anterior and the posterior approaches in common practice but also the techniques available to help achieve reduction.

**Keywords** acetabulum fracture; fixation; Gibson; ilioinguinal; Kocher-Langenbeck; lateral window; pelvic; reduction; Stoppa

## Introduction

Internal fixation of acetabular fractures is usually carried out to restore articular congruity of the weight-bearing zone of the hip joint as accurately as possible, thereby attempting to minimize the likelihood of developing subsequent osteoarthritis. Alternatively, in elderly patients, internal fixation can be inserted to provide sufficient stability to the acetabulum to support insertion of a hip replacement.

Indications for surgery are covered in previous sections. As with all intra-articular fractures, the goal of acetabular fracture surgery is to reduce each weight-bearing fragment anatomically and achieve stable fixation. As discussed in other sections, the acetabulum has two distinct aspects to it, anterior and posterior, and the surgical tactic follows this anatomy. Fractures affecting the front of the joint are treated with an anterior approach; those affecting the back of the joint are treated with a posterior approach.

When both columns are involved, unless one of them is undisplaced or can be dealt with percutaneously, the anterior and posterior fractures have to be approached separately; effectively in two sequential operations. An alternative to this is to use an

extensile approach, whereby both anterior and posterior fractures are exposed through one major exposure. Examples include the extended iliofemoral, the Big-T and the tri-radiate approaches. Unfortunately, these extensile approaches carry high complication rates, such as infection, heterotopic ossification and post-traumatic osteoarthritis and are therefore used increasingly rarely.<sup>1</sup>

## Anterior approaches

The three most commonly used anterior approaches are described below:

- Modified Stoppa
- Ilioinguinal
- Smith-Peterson.

The *para-rectus approach* is another, much less commonly used, anterior approach to the pelvis, which is not described in detail here.

The Stoppa and ilioinguinal are the anterior 'workhorses' of acetabular fracture surgery. They both expose the anterior column and the quadrilateral plate and the pros and cons of each are discussed below.

The Smith-Peterson is more distally based and is therefore used to expose the femoral head and neck and the supra-acetabular region (anterior inferior iliac spine (AIIS) and anterior acetabular wall).

## Modified Stoppa approach (Figure 1)

This provides access to both the anterior column, the quadrilateral plate and the posterior column.<sup>2</sup>

The indications for use (all fractures with anterior displacement) are:

- Anterior column
- Transverse (with anterior displacement)
- T-type
- Anterior column, posterior hemi-transverse (ACPH)
- Associated both column (ABC)
- Pelvic ring injuries with high pubic ramus ('root of ramus') fractures, requiring plating to extend above the hip joint.

The Stoppa approach is particularly useful for buttressing back a medialized femoral head and quadrilateral plate, via a plate that is anchored in the hard bone above the sciatic notch; the *sciatic buttress*.

As stated above, it can be used in conjunction with a Kocher-Langenbeck (posterior) approach, when injuries involve both columns, for example an ABC fracture with displaced posterior wall (PW). It can be combined also with a lateral window, to extend access up to the ilium.

**Positioning:** the patient is placed supine, on a radiolucent table with both arms abducted, to allow monitoring access and imaging. A urinary catheter is inserted to allow optimal surgical access, to remove bladder contrast that might obscure imaging and to minimise the chance of bladder injury.

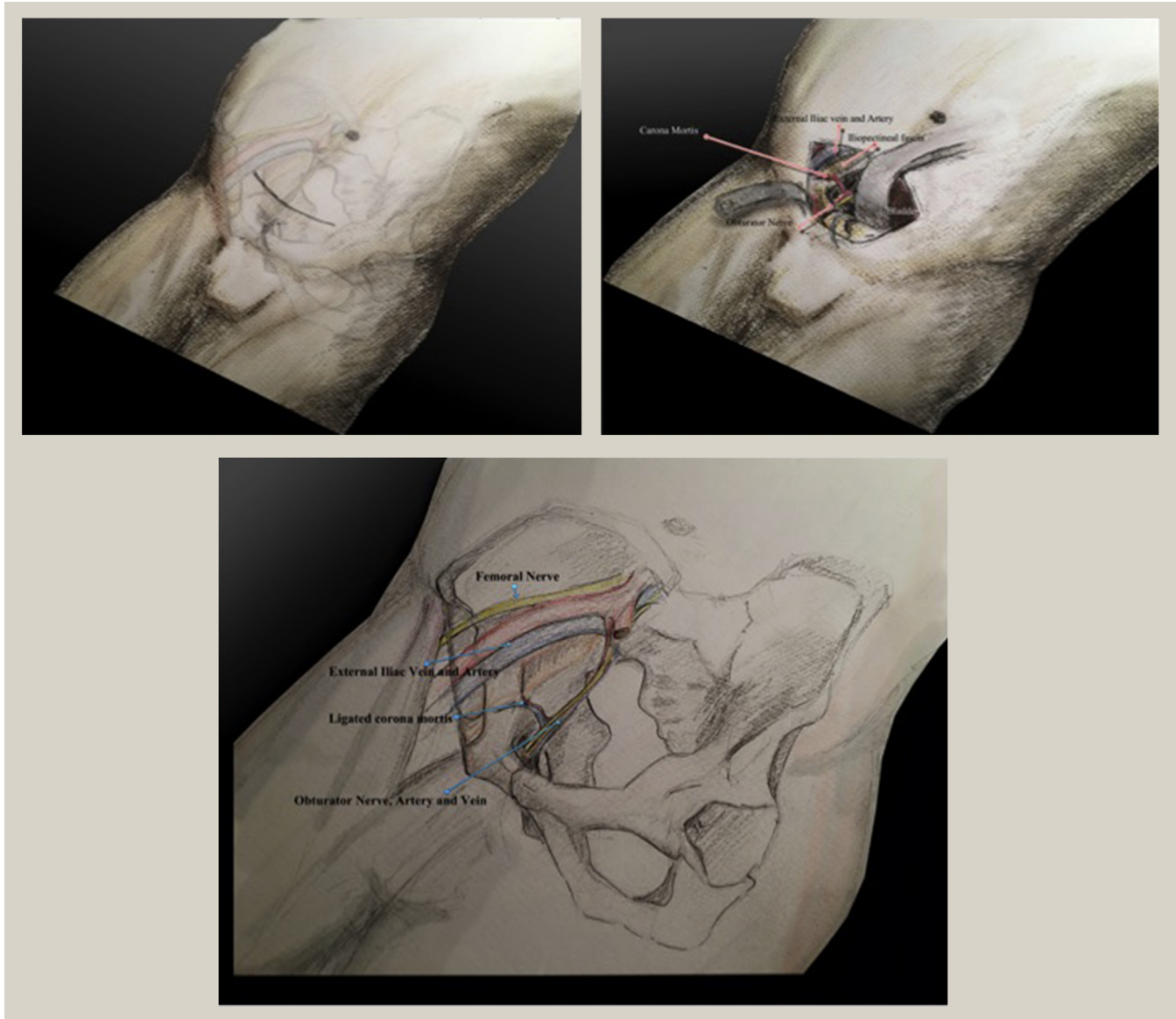
The ipsilateral hip and knee are flexed over a bump, to de-tension the overlying soft tissues. Muscle relaxant also helps with this.

Some surgeons like to place a bump under the contra-lateral hip, to improve visualization of the posterior column and greater sciatic notch to the operating surgeon. This needs to be

**Jaikirty Rawal FRCS (Tr&Orth)** Pelvis, Acetabular and Trauma Fellow, The Royal London Hospital, Barts and the London NHS Trust, UK. Conflicts of interest: none declared.

**Homa Arshad MA FRCS (Tr&Orth)**, Consultant Orthopaedic Trauma Surgeon, The Royal London Hospital, Barts and the London NHS Trust, UK. Conflicts of interest: none declared.

**Peter Bates MBBS FRCS (Tr&Orth)**, Consultant Orthopaedic Trauma Surgeon, Royal London Hospital, Barts and the Health NHS Trust, Senior Lecturer, Orthopaedic Trauma Sciences, Queen Mary University London, The Royal London Hospital, Barts and the London NHS Trust, UK. Conflicts of interest: implant design consultant for ITS. Educational contracts with Zimmer/Biomet, J+J, Smith and Nephew and Stryker.



**Figure 1** A Stoppa approach. Note the angle of approach is approximately 45° to the sagittal plane (coming from the medial aspect), which provides a view of the quadrilateral surface and the anterior column.

taken into account when taking intraoperative X-rays, since the patient is rolled slightly towards/onto the affected side. *The surgeon operates from the contralateral side.*

Prep and drape to leave the umbilicus exposed, to identify the midline, and the ipsilateral leg, to allow traction intra-operatively.

The main structures at risk (more so, in the context of previous abdominal or perineal surgery) are:

- Bladder: typically, a large swab is placed over the bladder to protect it
- Intra-peritoneal structures: similarly, the peritoneum is pushed away with a swab beneath a retractor
- External and internal iliac vessels: the veins are the most medial and at greatest risk of injury, although a recently embolized vessel can re-bleed, if disturbed.
- Corona mortis: the anastomotic connection between external iliac and obturator vessels (vein and artery).

These are almost always present in some form, although their anatomy is highly variable, and they need to be ligated safely.

- Obturator vessels and nerve
- L5 nerve root, as it passes just medial to the sacro-iliac joint.

**Surgical approach:** a transverse Pfannenstiel incision is made, 2 cm proximal to the symphysis. Alternatively, a midline incision can be used in the context of a recent laparotomy. Expose the rectus sheath fascia, observing the confluence of the left and right sided obliquely-oriented fibres, meeting in the middle, to identify the midline. The rectus sheath is divided longitudinally, two-thirds of the way up towards the umbilicus, and blunt finger dissection frees off the peritoneum superiorly and bladder from bone inferiorly. The bladder is pushed down and the peritoneum reflected up.

Download English Version:

<https://daneshyari.com/en/article/8801954>

Download Persian Version:

<https://daneshyari.com/article/8801954>

[Daneshyari.com](https://daneshyari.com)