



## Technical note

# Posterior sacroiliac osteotomy: an alternative to the ilioinguinal approach for pelvic reconstruction in misalignment lesions<sup>☆</sup>



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### ABSTRACT

Pelvic ring fractures occur in association with potentially fatal lesions, whose treatment is a priority in the polytrauma setting. As consequence, the definitive orthopedic approach may be postponed, leading patients to chronic and potentially disabling deformities. The treatment of these deformities is a challenge, requiring highly complex and staged surgical reconstructions. The ilioinguinal approach has been widely used in these surgeries, because it allows the release and mobilization of the hemipelvis and, in some cases, anterior fixation of the sacroiliac joint. However, in most cases, stable pelvic ring reconstruction requires this approach to be complemented by two other surgical approaches (posterior longitudinal and Pfannestiel). This requirement critically increases the surgical time and the risk of complications, such as neurovascular lesions and surgical wound infection. The current study presents a posterior osteotomy technique for posterior and anterior release of the sacroiliac joint, eliminating the need for ilioinguinal approach. The technique is performed by posterior longitudinal access; it allows adequate mobilization of the hemipelvis and reduction of vertical and rotational deformities, before the spinopelvic fixation and reduction of the pubic symphysis.

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### Osteotomia sacroilíaca posterior: uma opção ao acesso ilioinguinal na reconstrução pélvica em lesões inveteradas

#### RESUMO

As fraturas do anel pélvico ocorrem em associação com lesões potencialmente graves, cujo tratamento é prioritário no cenário de atendimento ao politraumatizado. Como consequência, a abordagem ortopédica definitiva pode ser postergada, fazendo com que os pacientes se apresentem com deformidades inveteradas e potencialmente incapacitantes. O tratamento dessas deformidades é um desafio, requer reconstruções cirúrgicas estagiadas e altamente

#### Palavras-chave:

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complexas. O acesso ilioinguinal tem sido amplamente usado nessas cirurgias, pois permite a liberação e mobilização da hemipelve e, em alguns casos, a fixação anterior da articulação sacroilíaca. Entretanto, na maioria das vezes, uma reconstrução estável requer que esse acesso seja usado em associação com outros dois acessos cirúrgicos (longitudinal posterior e Pfannestiel), o que aumenta sobremaneira o tempo cirúrgico e o risco de complicações, como lesões neurovasculares e infecção da ferida operatória. No presente estudo, apresentamos uma técnica de osteotomia posterior para liberação posterior e anterior da articulação sacroilíaca que elimina a necessidade de uso do acesso ilioinguinal. A técnica é feita pelo acesso longitudinal posterior e permite mobilização adequada da hemipelve e redução de deformidades verticais e rotacionais antes da fixação espinopélvica e redução da sínfise púbica.

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## Introduction

Pelvic ring injuries result from high energy trauma. Their association with cranioencephalic trauma, pulmonary contusions, and/or abdominal visceral lesions increases the length of stay in intensive care units (ICU) for clinical stabilization.<sup>1</sup> In some countries, the difficulty to access specialized orthopedic centers for the treatment of these lesions further delays the definitive approach; it also increases the length of hospital stay and the morbidity resulting from prolonged use of external fixators.<sup>1-3</sup>

It is not uncommon for these survivors to evolve with pain, functional limitation and, in some cases, neurological deficits associated with inveterate deformity,<sup>3</sup> whose treatment is still a challenge. Some of the difficulties to be overcome include vicious consolidation, exuberant formation of bony callus, proximity to abdominopelvic organs and neurovascular structures, and implant positioning in complex fracture patterns, with bone loss and/or infection resulting from prolonged use of external fixators.<sup>1-4</sup>

In most cases, inveterate pelvic ring lesions are treated with three surgical approaches: (1) ilioinguinal approach (first window), to release the anterior portion of the sacroiliac joint (SIJ); (2) longitudinal posterior approach to the sacrum, to release the posterior portion of the SIJ and posteriorly fixate the pelvic ring; and (3) the Pfannenstiel approach, to reduce and fixate the pubic symphysis (PS).<sup>1,2</sup> The present study presents a technique that eliminates the need for the first ilioinguinal window, reducing the risk of neurovascular injury and infection, as well as surgical time and operative blood loss.

## Description of the method

In the reported technique, the authors describe the case of a 40-year-old patient, victim of a 12-meter fall, who suffered direct trauma to the lower limbs. In addition to the pelvic injury, the patient was admitted to the emergency unit with head and abdominal trauma, pulmonary contusion and multiple rib fractures on the right, fracture-dislocation of the right foot, and neurological deficit of the right L5 nerve root. After initial stabilization of the pelvis (with external fixator) and of

the fracture-dislocation of the foot and exploratory laparotomy, the patient stayed in the ICU for eight weeks until clinical stabilization. The external fixator was then removed in the ICU, on the sixth week after the trauma.

Two years after the accident, the patient was re-assessed. She complained of low back pain, pain in the right inguinal region, and difficulty in walking and sitting for long periods. New imaging tests revealed deformity in lateral rotation and high right hemipelvis (Fig. 1A-D), which led to shortening of the ipsilateral lower limb. Surgical treatment was indicated for reconstruction of the pelvic ring.

## Surgical technique

### First stage

We performed a posterior longitudinal approach to the sacrum with the patient in ventral decubitus positioning, under general anesthesia, followed by dissection of the musculature to allow wide visualization of the right SIJ. The L5, S1, and iliac instrumentation were performed bilaterally, aiming to achieve spinopelvic fixation after osteotomy and correction of the deformity. The ossification observed on the SIJ, sacral wing, and transverse process of L5 was carefully removed, allowing the release of the L5 root, which was trapped between the sacral wing and the transverse process by the raised right hemipelvis. Careful osteotomies were made in the SIJ from its cephalic to caudal ends; thin osteotomes were used from the posterior sacral aspect toward the inside of the joint, creating a progressively wider groove in the joint space (Fig. 2A-C). At this stage, as a protective measure for the vessels and pelvic organs, we ensured that the osteotomes did not surpass the anterior portion of the joint. The thin bony layer remaining in the anterior portion of the joint was then removed with Kerrison punches (Fig. 2D). Before wound closure, a fragment of the iliac crest bone was resected for use in the next stage of surgery.

### Second stage

Still under general anesthesia, the patient was placed in the dorsal decubitus positioning. The PS was accessed through a Pfannenstiel approach. The PS was reduced with bone tweezers, and was fixated with a reconstruction plaque. The symphysis was revitalized and the iliac crest obtained in the

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