CASE REPORT

# Percutaneous Instrumentation of Lumbopelvic Dissociation: A Case Report

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**ABSTRACT**

Lumbopelvic dissociations are rare cases of fractures, usually as a result of great impact trauma. Their treatment is difficult, and still, there is no consensus in the literature in regard to the best treatment, due to its low casuistic. In this paper, we present a case of a fracture of the sacrum with a "U" pattern treated with percutaneous instrumentation. This rare case is described to better understanding of the different surgical options that, in this case, were successful.

**Key words:** Lumbopelvic dissociation, percutaneous instrumentation, spinopelvic dissociation, U-shaped sacral fracture

## INTRODUCTION

At present, fractures of the sacrum with "U" pattern are very rare and the cases published in the literature are few. There is a loss connection between the lumbar spine and pelvis that results in a progressive kyphosis deformity at the fracture site.[1]

In a work published by Nork *et al*. noted only 13 cases of 442 patients with sacral fractures with lumbopelvic (LP) dissociation, with represented 2.9% of pelvic ring fractures.[1]

There is not a specific classification system for LP dissociations fractures. However, there is the classification of Tile [2] for pelvic ring fractures, Denis *et al*.[3] and Roy *et al*.[4] According to Denis *et al*. classification of sacral fractures, there are three different zones in the sacrum where the fracture can occur. The first zone corresponds to sacral wings, the second zone to sacral foramina, and the third zone to body and canal of sacrum. Usually, only the second and third zones fractures have neurologic symptoms. However, the majority of sacral stress fractures occur in the first zone, but they rarely produce neurologic symptoms. Roy *et al*. classification has four types, accordingly to displacement in the sagittal plane: I - angulation in kyphosis without displacement, II - angulation with anterior partial displacement, III - angulation with full displacement, and IV - segmental comminution of the S1 vertebral body. There is also the morphological classification used to describe the fracture pattern in the coronal plane, using the letters which resemble the lines of the fracture: "U," "T," and "Y."

The initial treatment of this high-energy trauma patients begins with damage control and acute trauma lifesaving protocols or similar.[5] Conservative treatment was used in the past because surgery could only offer a limited capacity for fracture reduction and stabilization.[6] However, nowadays, the standard is a surgical treatment of these fractures, with decompression of the neural elements (in case of neurological impairment), reduction, and fixation. With this procedure, it is possible to avoid prolonged bed rest, to decompress neurological elements, and to correct sagittal balance of the patient.[7]

Open surgery is associated with long hours of surgery, significant blood loss, higher wound problems, and higher infection rates. We performed a percutaneous LP reduction and fixation technique to address these issues.

## CASE REPORT

The authors report the case of a previously healthy 44-year-old male, who suffered a motor vehicle accident where there

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were mortal victims. At the emergency department, it was initiated the trauma protocol, in which he had normal 98% $SO_2$ and a Glasgow Coma Scale of 15. It was made a full body computed tomography scan, in which was diagnosed symphysis pubis diastasis of 3.5 cm, L4 and L5 anterior body stable fracture, and a complex fracture of the sacrum with a "U" pattern [Figures 1-3]. It was also diagnosed a Lisfranc fracture of the right foot.

The patient remained under mechanical ventilation due to pulmonary contusions, and we performed a damage control protocol with a pelvic binder and a below knee right splint.

On the 12th day after trauma, we manage to take the patient to the operating room, and we performed at first, with the patient on dorsal decubitus, a Stoppa approach and an open reduction of the pubic symphysis with osteosynthesis with two plates. Then, we turned the patient and managed to perform a closed reduction of the sacral fracture and performed a percutaneous instrumentation of L2-L3-L4-L5-iliac [Figures 4-6]. The patient remained under non-weight-bearing for 8 weeks.

After 1 year of the procedure, the patient has returned to normal life, including work. The computed tomography scan shows consolidation of the fractures [Figure 7-11].

## DISCUSSION

Sacral fractures with LP dissociation are highly unstable fractures. Open surgery has been associated with complications as higher loss of blood, higher rate of infection, and more wound complications.[8]

This case is our unique case of percutaneous management of spinopelvic dissociation fracture; however, we showed that it was effective at reducing with a good fixation. There were no hardware complications, and the wounds healed properly [Figure 11]. We cannot analyze the blood loss of the percutaneous instrumentation, because on the same stage of surgery, it was made and open reduction with fixation of the pubic symphysis. Although theoretically, after percutaneous

**Figure 1:** CT coronal view

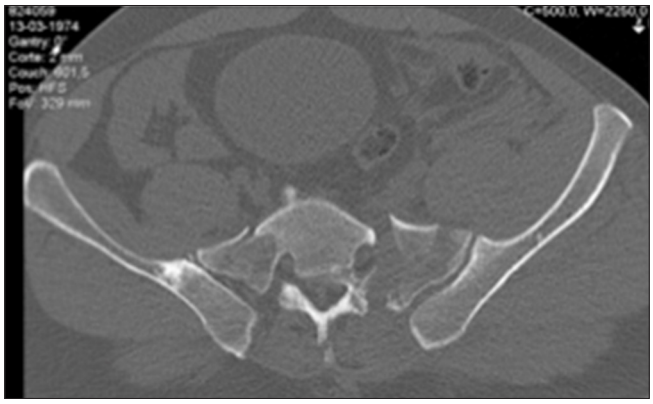

**Figure 3:** CT transversal view

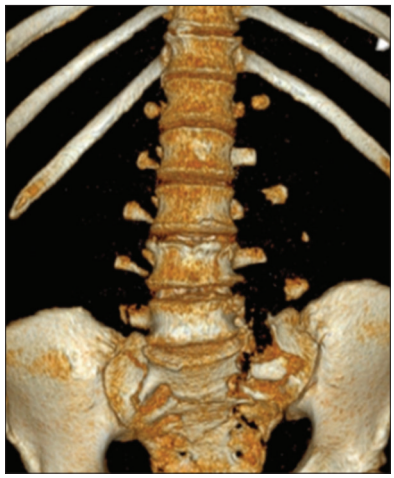

**Figure 2:** CT 3D reconstruction

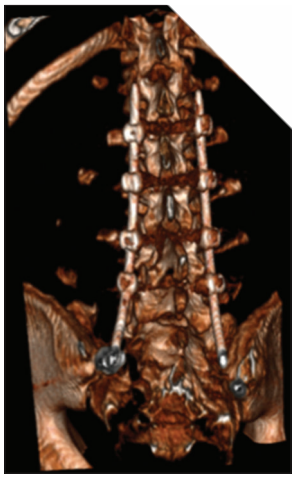

**Figure 4:** CT 3D reconstruction (postoperative)

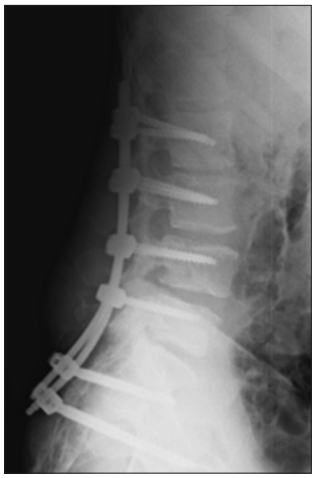

**Figure 5:** Lateral lumbar radiograph (postoperative)

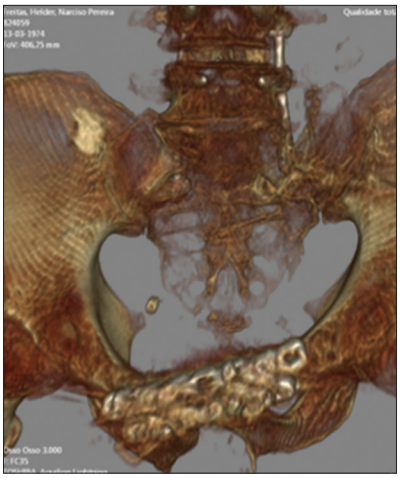

**Figure 8:** CT 3D reconstruction (1 year follow-up)

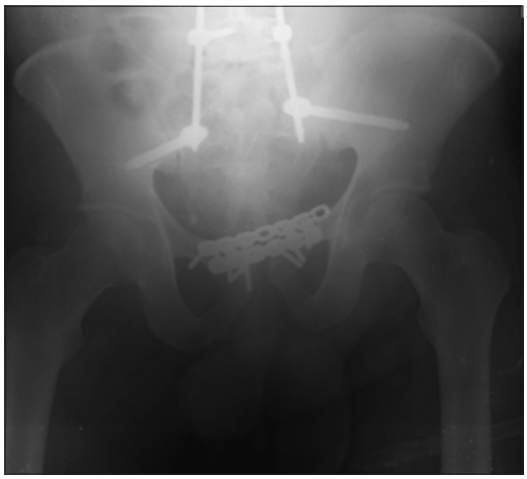

**Figure 6:** Pelvic inlet radiograph (postoperative)

**Figure 9:** Pelvic radiograph (1 year follow-up)

**Figure 7:** CT 3D reconstruction (1 year follow-up)

**Figure 10:** Lateral full spine standing radiograph (1 year follow-up)

instrumentation of spinopelvic dissociation, the patients can safely weight bear without restriction,[9] this was not the case, due to a Lisfranc fracture of the right foot and other medical problems.

One criticism of our case is that the sagittal balance was positive at 1 year [Figure 10], and although the patient is asymptomatic, we are planning to remove hardware. In this case, there was no neurologic deficit, although in the literature

**Figure 11:** Surgical scars (1 year follow-up)

for these type of fractures with neurologic deficits, is the necessity for a separate incision for sacral laminectomy.[10]

## CONCLUSION

Sacral fractures with spinopelvic dissociation are rare injuries with a low prognosis. In our experience, if the fracture pattern allows it, percutaneous instrumentation has a lot of advantages as less wound problems, less infection rate, and less blood loss.

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