

## CASE REPORT

# Traumatic Posterior Hip Dislocation with Posterior wall Acetabular Fracture Associated with Ipsilateral Femoral Neck Fracture – An Unclassified Rare Case Report

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### ABSTRACT

**Introduction:** Posterior hip dislocation is not an uncommon injury in high-impact road traffic accidents. A combination of posterior wall fracture–dislocation with ipsilateral neck fracture without involving the head is a rare pattern of injury reported in the literature. **Case Report:** We describe a case of such complex fracture (unclassified injury), which was managed by emergent open reduction and internal fixation using a posterior approach without doing trochanteric flip osteotomy. Post-operative review after 2 years showed a healed fracture and a stable hip joint with some heterotopic ossifications. **Conclusion:** Osteosynthesis of complex hip injuries remains a big challenge due to its variable outcome. A better understanding of the fracture mechanism, the techniques, and the sequence of fracture reduction minimizes the risk of mal-reduction, avascular necrosis, and arthritis.

**Key words:** Acetabular wall, fracture–dislocation, osteosynthesis, pelvic injuries


### INTRODUCTION

The femoral head with its acetabular articulation constitutes the ball and socket type of synovial joint. Complex hip fractures with or without pelvic injuries pose a significant challenge to orthopedic surgeons, usually associated with high-velocity road traffic accidents. The high impact or the collision injuries can dislocate a stable hip, and the screening for associated fractures should be considered in these injuries. The association of acetabular fracture and/or head fracture with hip dislocation is not uncommon.<sup>[1]</sup> However, the combination of posterior hip dislocation with acetabulum and neck fracture has been rarely reported in the literature.<sup>[2]</sup> The incidence of avascular necrosis is directly

related to the duration of dislocation, fracture pattern, and associated injuries. In this case, we describe a rare combination of posterior hip dislocation with posterior acetabular wall fracture and ipsilateral neck fracture following a road traffic accident. Further, it describes the surgical approach and technique for fracture reduction without doing trochanteric flip osteotomy.

### CASE REPORT

A 51-year-old man who was riding a motor bicycle collided with a car and was thrown from his vehicle. He presented with severe pain in his right hip and was unable to lift his

Access this article online	
Quick Response Code: 	Website: <a href="http://www.jbmh.in">www.jbmh.in</a>
	Received on: 01-05-2023 Accepted on: 21-05-2023

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left lower limb. He was conscious, oriented, and with no history of head injury or any other limb injuries. On local examination, the right lower limb was abducted, externally rotated, and shortened with no evidence of any distal neurovascular deficit.

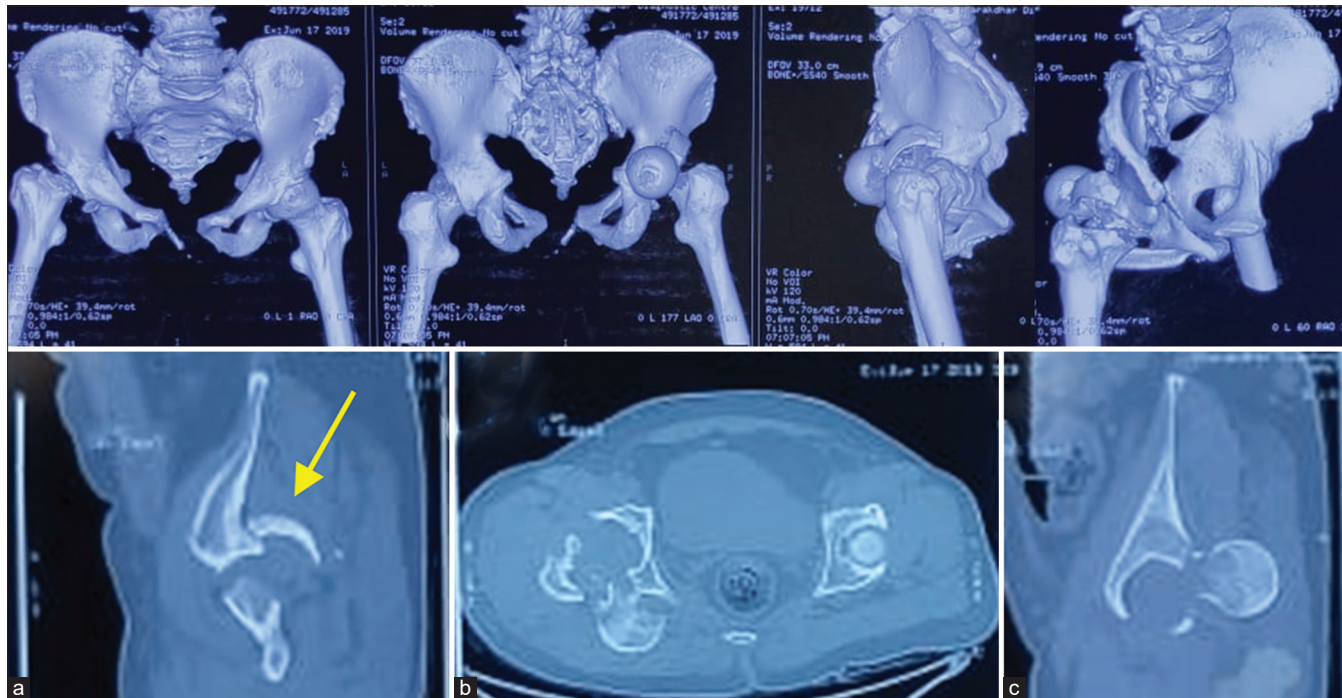
Initially, investigated with the X-rays of pelvis anterior-posterior (AP), right hip Judet views [Figure 1], and then confirmed using computed tomography imaging [Figure 2a-c], it shows the combination of posterior hip dislocation with posterior acetabular wall fracture (Thompson and Epstein type II) and ipsilateral neck fracture (transcervical). It is associated with pubic diastasis of 3 mm with anterior sacroiliac disruption of 2 mm (Young and Burgess APC type2). A pelvic binder was applied, and the patient was

hemodynamically stabilized using standard advanced trauma life support protocol.

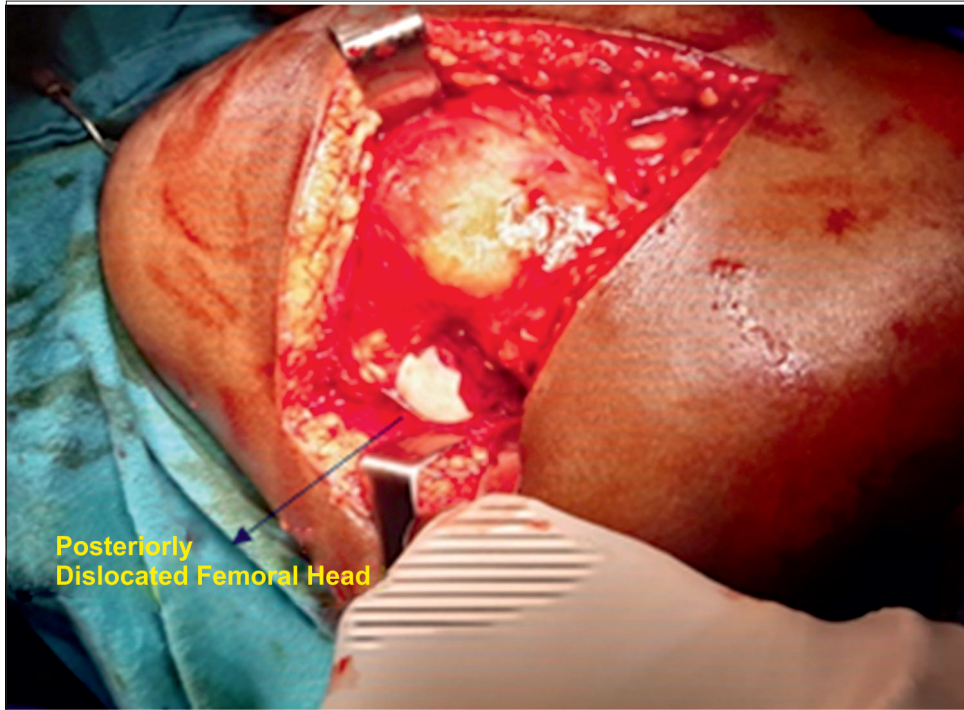
The patient was taken up for surgery in the left lateral position, Kocher–Langenback approach was used. In deep dissection, upon exposing the short external rotators, the piriformis tendon was found to be partially torn and lie between the dislocated femoral head and acetabulum. It was ligated and cut at 1 cm proximal to its insertion. In addition, we found that the triceps coxae were contused, the posterior capsule was torn, and there was popping out of the femoral head in the damaged capsule, as shown in Figure 3. The obturator externus and quadratus femoris were found to be intact, which protects the vessel that supplies the head. The femoral head was dislocated and moved much more posteriorly. Due to that, the sciatic nerve was



**Figure 1:** Posterior hip dislocation with posterior acetabular wall fracture, ipsilateral transcervical neck fracture with pubic diastasis, and sacroiliac disruption



**Figure 2:** (a-c) A large single fragment of the posterior wall with posterior dislocation with completely displaced femoral neck fracture without involving the head and pubic diastasis of 3 mm with anterior sacroiliac disruption of 2 mm



**Figure 3:** Intraoperative image showing torn posterior hip capsule with propping out of the femoral head in the damaged capsule

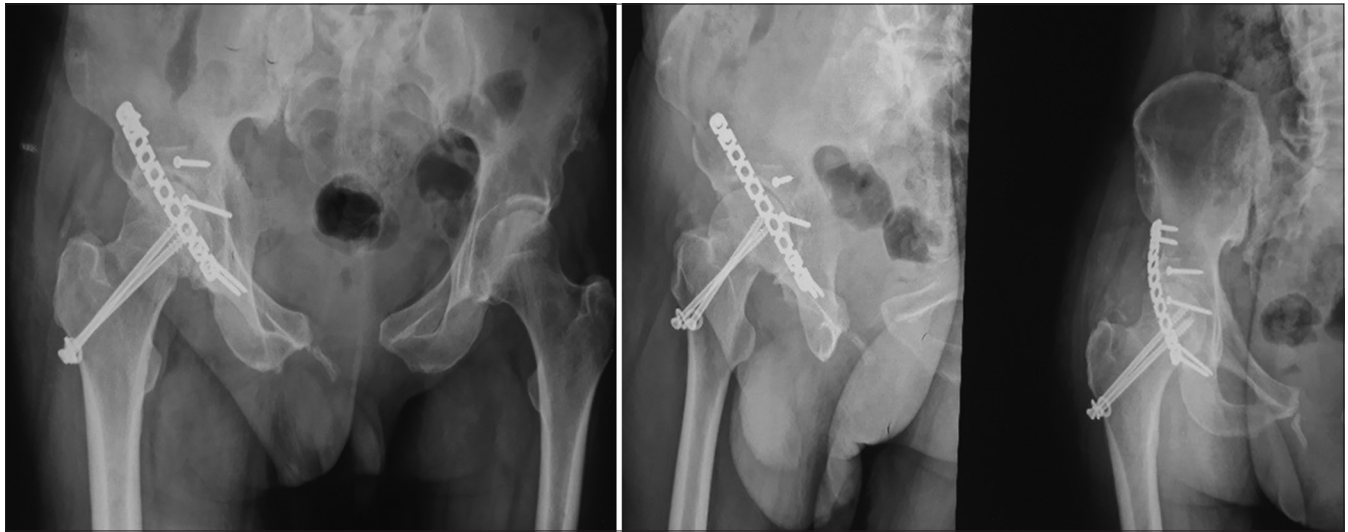


**Figure 4:** Immediate post-operative X-ray of the pelvis with bilateral hips showing an adequate fixation of posterior wall fragment with ten-holed recon plate and two lag screws

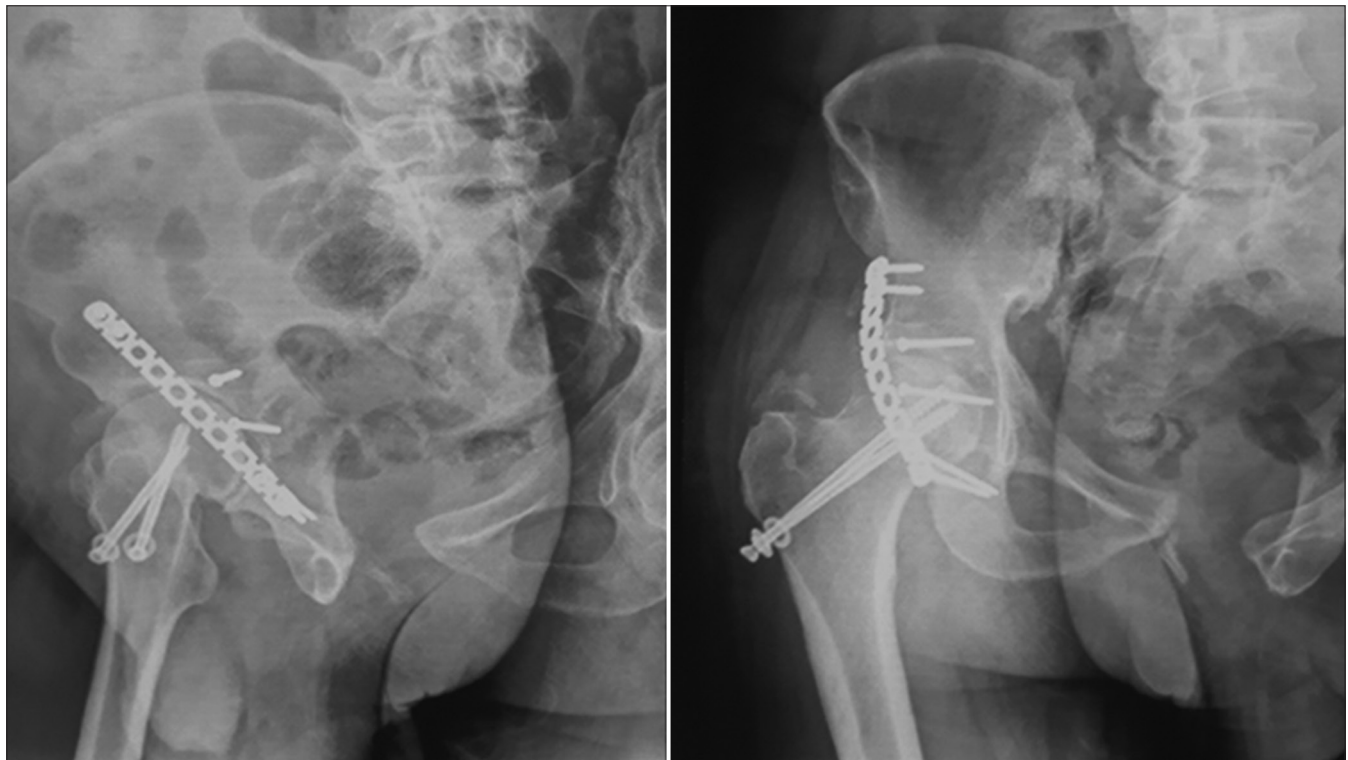
found to be very much stretched but luckily found to be intact. A single large posterior acetabular wall was fractured and found displaced posterosuperiorly. We knew that head could not be

reduced with simple traction–reduction maneuver, because it was associated with the fracture neck femur. On placing, a Hohmann levered over the anterior column and which was





**Figure 5:** Follow-up radiograph at 6 months post-operative period



**Figure 6:** Follow-up radiograph at 6 months post-operative period

passed through the neck fracture, which freed the acetabular socket adequately. With that in hand, the assistant pushed the head into the acetabulum, and it was reduced. After that, we tried to reduce the neck, and it failed, because the head was unstable and dislocating again through the fractured posterior wall. Hence, we went to reduce the displaced posterior wall fragment, and it was fixed with 2 lag screws and a recon plate. Later under image guidance, we realigned the neck with the relocated head by traction and internal rotation, it was

temporarily secured with transcervical and transacetabular 2 mm k-wires. The neck fracture was reduced indirectly without opening the fracture site and without doing trochanteric osteotomy. At last, the fracture neck femur was fixed with 2 CCS using the same approach. Since the fracture–dislocation necessitate early surgical intervention, the concomitant pelvic injury was managed conservatively, as shown in Figure 4. In the postoperative period, we mobilized the patient with partial weight-bearing using the walker only after 12 weeks due to

the disrupted pelvic ring, as shown in Figure 5. At 24-month follow-up, all the fractures were united, and radiologically, there were heterotopic ossifications at the trochanteric region and there were no signs of avascular necrosis on plain radiography, as shown in Figure 6.

## DISCUSSION

The combination of posterior wall fracture–dislocation with femoral neck fracture without head fracture is a rarely described unclassified injury.<sup>[3]</sup> High-velocity road traffic accidents around the hip joint make a poor functional outcome due to associated fracture–dislocations. Posterior dislocations are the most common direction of dislocation of the hip joint, it accounts for the ratio of 9:1 with the anterior dislocation.<sup>[4]</sup> If the hip is flexed and adducted during the time of injury, the directed axial forces through the femur cause posterior hip dislocation. The loading force and the high-energy direct impact of the femoral head over the posterior wall lead to its fracture. It has been shown that the amount of femoral anteversion proportionately increases the risk of posterior wall fractures in cases with dislocations.<sup>[5]</sup> The continued force along with further adduction and external rotation of the dislocated femoral head fixed by the tight capsule about the pelvis can cause the femoral neck fracture without involving the head.<sup>[6]</sup> The same mechanism of injury has been observed in our case. A neck fracture can also occur iatrogenically due to multiple inadvertent attempts of closed reduction maneuvers.<sup>[7]</sup>

Our case was managed with open reduction internal fixation of the posterior wall and femoral neck emergently. The delayed presentation of such cases or when it is associated with femoral head fracture mandates primary replacement procedures with acetabular reconstruction. The risk for avascular necrosis and revision surgeries increases multifold in those cases.<sup>[8]</sup> Duygulu *et al.* attempted ORIF in a case of acetabular fracture, femoral neck, and shaft fracture using the posterolateral approach.<sup>[9]</sup> Saragaglia *et al.* did ORIF in two cases of posterior fracture–dislocation with neck fracture using the Kocher–Langenbeck approach.<sup>[10]</sup> In both the studies, they documented that there was no AVN at the longest follow-up.

Gupta *et al.* described the role of trochanteric flip osteotomy in the fixation of complex acetabular fractures using the Kocher–Langenbeck approach. They showed that it facilitates adequate exposure and minimizes the risk of avascular necrosis.<sup>[11]</sup> However, cases associated with an ipsilateral neck fracture, this procedure exposes the neck fracture site, also damages the hip capsule all around, and causes overall instability. Further, it increases the risk for non-union of the neck and when it is associated with non-union of the trochanteric flip region, it becomes very cumbersome for hip salvage osteotomies.<sup>[12]</sup>

Too many classifications are described in the literature for hip dislocations along with fractures around the hip, namely, Thompson and Epstein,<sup>[13]</sup> Stewart and Milford,<sup>[14]</sup> Brumback *et al.*,<sup>[15]</sup> etc., but none of the commonly used classification systems describe the very rare combination of posterior wall fracture–dislocation with femoral neck fracture without involving the head.

## CONCLUSION

Ipsilateral posterior wall acetabular fracture–dislocation with femoral neck fracture is very rare and makes a surgical challenge. Such a complex fracture should be addressed meticulously and it was not classified under any of the present classification systems used for fracture–dislocation around the hip joint. The study hypothesizes the mechanism of such injuries and it guides the surgeons about the sequence of fracture fixation. This kind of injury may necessitate early and appropriate surgical techniques to minimize long-term complications such as non-union and avascular necrosis.

## TAKE HOME MESSAGE

Meticulous pre-operative planning of such complex injuries with the implementation of ideal surgical techniques for fracture fixation makes osteosynthesis still a possible option in patients with sufficient skeletal brawniness to yield a good clinical outcome.

## ACKNOWLEDGMENT

Nil.

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**How to cite this article:** Nallakumarasamy A, Jeyaraman M. Traumatic Posterior Hip Dislocation with Posterior wall Acetabular Fracture Associated with Ipsilateral Femoral neck Fracture – An Unclassified Rare Case Report. *J Bones Muscles Health* 2023;1(1):37-42.

**Conflicts of Interest:** None. **Source of support:** None.

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