

# Traumatic bilateral hip dislocation with bilateral sciatic nerve palsy

Ajay Pal Singh\*, Amarjit Singh Sidhu and Arun Pal Singh

**【Abstract】** Bilateral hip dislocation rarely occurs. In this paper, a case of bilateral hip dislocation associated with bilateral sciatic nerve palsy resulted from a road traffic accident is reported. Both hips were emergently reduced under general anaesthesia. Acetabular reconstruction was done bilaterally due to the unstable hips. The patient subsequently developed heterotopic ossification and avascular necrosis on the left hip and underwent total hip arthroplasty. The sciatic nerve on the right side achieved complete recovery

but that on the left side only partly recovered and was augmented by tendon transfer. Such injuries are serious and one should be aware of the complications because they can resurface and so patients should be followed up for a long time. To the best of our knowledge, this kind of injury has not been reported in the English language literature.

**Key words:** *Hip dislocation; Sciatic nerve; Paralysis; Accident, traffic*

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**T**raumatic hip dislocation is a severe injury with potential for significant complications and long term morbidity, accounting for 2%-5% of all dislocations.<sup>1</sup> As a complication of hip dislocation, sciatic nerve palsy is reported in 10%-15% of cases.<sup>2</sup> Bilateral traumatic hip dislocation rarely occurs and few cases associated with acetabular fractures have been reported.<sup>1</sup> Here we report a case of type IV bilateral hip fracture dislocation associated with bilateral sciatic nerve palsy caused in a road traffic accident, and discuss the immediate treatment of both hips and complications developed during the course of treatment. To our knowledge, this kind of injury has not been reported in the English language literature.

## CASE REPORT

A 54-year-old man who was bilateral hips injured in a road traffic accident and treated at a faraway hospital attended our out-patient department fourteen days after injury for the purpose of follow-up. His record re-

vealed that he suffered from bilateral Thompson and Epstein type IV hip fracture dislocation associated with bilateral sciatic nerve palsy (Figure 1A). The bilateral hips were reduced emergently within four hours after injury but both were found unstable after reduction. Then bilateral skeletal traction was performed. Computed tomography of the pelvis revealed fractures of the posterior wall and column, and comminuted fractures of the bilateral acetabular roof (Figure 1B). Under general anaesthesia, the patient underwent staged bilateral open reduction and internal fixation through the Kocher-Langenbeck approach. Flip osteotomy was carried on the left side for facilitating acetabular exposure. Internal fixation was performed using two cannulated screws on the left side and a reconstruction plate with several screws on the right side. The sciatic nerves on both sides were explored. Postoperatively, range of motion and strengthening exercises for the hip and the knee began. Bilateral ankle foot orthosis was applied and the patient was required not to bear weight for six weeks.

Fourteen days after surgery, clinical examination revealed well healed scars and stable hips bilaterally with almost complete range of motion. Neurological examination showed an absence of ankle dorsiflexion and toe extension and both lateral halves of the feet showed hypoaesthesia. The patient continued his postoperative rehabilitation. Six weeks postoperatively he was allowed to ambulate with the aid of dynamic foot drop splints and a walker. Electromyography done at this

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Department of Orthopaedics, Guru Teg Bahadur Hospital, University College of Medical Sciences, University of Delhi, Delhi 110095, India (Singh AP and Singh AP)

Department of Orthopaedics, Rajindra Hospital, Government Medical College, Punjab 147001, India (Sidhu AS)

\*Corresponding author: Tel: 91-9891394779, Email: docajaypal@gmail.com

time revealed an axonal involvement of the motor fibers of bilateral sciatic nerves. X-ray done two months post-operatively showed union of the acetabular fractures. A soft tissue calcification measuring 2 cmx3 cm was noted by radiograph of the left hip, suggesting a heterotopic ossification. The patient was administered 75 mg indomethacin per day for six weeks and took active range of motion exercises. The lesion progressed to Brooker grade II with no impact on the hip function. At three months the patient complained of pain that increased with weight bearing in the left hip. X-ray at this stage revealed a Ficat Arlet stage I avascular necrosis. A core decompression was done but the disease progressed to grade IV within the next four months (Figure 2A). Total hip arthroplasty was performed on the left hip ten months after the initial trauma. Indomethacin of 75 mg per day was continuously administered for one day before surgery and six weeks after surgery. Along the previous incision path, we performed a posterior approach. After the removal of screws, cemented total hip arthroplasty, with an acetabular cup (28 mm, Stryker, USA) and modular femoral stems (Exeter stems, Stryker, USA) was completed (Figure 2B). Range of motion exercise was started the following day and the patient was allowed to walk with a walker. At one year the sciatic nerve on the right side recovered completely but that on the left side only partially recovered with function of the right foot at Clawson grade 1 and left foot at grade 3. Due to persistent weak dorsiflexion, the tibialis posterior was transferred to function as dorsiflexor.

The patient had been followed up for three years and he achieved good functional recovery of both hips and can walk without aid finally.



**Figure 1. A:** Radiograph of the pelvis and bilateral hips showing a bilateral posterior type IV Thompson and Epstein hip dislocation. **B:** Post-reduction computed tomography showing fractures of the posterior wall and column.



**Figure 2. A:** Radiograph taken nine months after injury showing an avascular necrosis with arthritis and heterotopic ossification on the left hip, and well maintained joint space on the right side with united acetabular fractures bilaterally. **B:** Radiograph at three years showing total hip arthroplasty.

## DISCUSSION

Traumatic dislocation and fracture dislocation are steadily increasing in incidence. High energy trauma and not wearing seat belts are the main causes of these injuries.<sup>3</sup> Fracture dislocation of the hip typically occurs from a longitudinal force applied from the femur to a flexed hip in the neutral position or abduction.<sup>4</sup>

Bilateral hip dislocation is very rare and until 2007, only 55 cases have been reported.<sup>1</sup> Bilateral hip dislocation with bilateral sciatic nerve palsy has been reported only once in the English language literature and that dislocation was type I.<sup>5</sup> Our report is probably the first one describing bilateral sciatic nerve palsy in type IV bilateral fracture dislocations.

Sciatic nerve is the most commonly injured nerve in hip dislocation and has been largely reported in type IV dislocations followed by type II. Peroneal division of the sciatic nerve seems to be more commonly affected in our patient.<sup>6</sup> For fear of associated nerve injury, prompt closed reduction should be done to relieve distortion of the nerve from a dislocated femoral head or displaced acetabular fracture.<sup>2</sup>

The patient's document mentioned that reduction was performed immediately after dislocation and the bilateral hips were operated on due to instability and persistent displacement of fractures. Displaced fractures of the acetabulum were well treated with open reduction and internal fixation to obtain anatomic reconstruction of the articular surface.<sup>2</sup> During surgery, the bilateral sciatic nerves were found intact. During the follow-up, we observed complete recovery of the nerve on the right side and partial recovery on the left side. Throughout, the patient was given dorsiflexion

splints and active physiotherapy to prevent equinus. Electromyography taken at one month demonstrated a bilateral axonotmesis. Strength of at least grade 4 is required in the muscles of leg for functional use and normal gait pattern.<sup>7</sup> In our case, as the foot dorsiflexion did not recover to a functional level, we did posterior tibial tendon transfer through the interosseous membrane to the navicular bone on the dorsum of foot one year after the initial trauma and got good results. At that time, according to Clawson grading, the function of patient's right foot was at grade 1 and left foot grade 3.<sup>8</sup> Functional outcome of a nerve injury depends on motor recovery, age, occupation, motivation, objective physical abilities and expectations of patients.<sup>7</sup> Our patient had a desk-job and was satisfied with the outcome.

Avascular necrosis is a known complication of hip dislocation and type IV dislocation with significant incidence.<sup>3</sup> Time between injury and reduction has an impact on the outcome of dislocation, with an increased incidence of hip avascular necrosis among patients whose injury-reduction time was over six hours.<sup>9</sup> However, recent studies suggest that avascular necrosis results from the initial injury not from a prolonged dislocation<sup>10</sup> though prompt reduction is still vital.<sup>11</sup> In our case, both hips were reduced within four hours after injury. Three months after injury, the patient developed early stage of avascular necrosis. The exact role of conservative surgical treatment for posttraumatic osteonecrosis remains to be determined although it might be considered for early involvement.<sup>11</sup> Incidence of traumatic arthritis is high in dislocations associated with acetabular fractures. Osteoarthritis with avascular necrosis necessitates arthrodesis or hip replacement. Progressive avascular necrosis and resorption of the femoral head with arthritic changes in the acetabulum lead to total replacement of the right hip.

Heterotopic ossification is primarily associated with acetabular fractures but not simple dislocations.<sup>12</sup> It occurs after Kocher-Langenbeck approach in approximately 25% of patients who take no prophylaxis. Our patient developed heterotopic ossification in the left hip (Brooker grade II), which did not affect the hip function. The risk factors attributed in this case are male patient, Kocher-Langenbeck approach and trochanteric osteotomy. Heterotopic ossification often progresses with repeated surgical procedures, thus prophylaxis must be taken during reconstructive surgery on the hip.<sup>12</sup> We

used indomethacin as the prophylaxis before total hip arthroplasty and heterotopic ossification did not worsen in this case.

In conclusion, bilateral type IV hip dislocation with sciatic nerve palsy is rare and serious. Patients need to be followed up for a long time as complications can surface after some time. Its prognosis depends on the initial injury and subsequent treatments.

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