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Bilateral irreducible asymmetrical fracture-dislocation of the hip: A case report and literature review

Kalaventhnan Pathinathan*, Nadun Marage, Nihal Fernando

Teaching Hospital-Kurunagala, Sri Lanka

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ABSTRACT

INTRODUCTION AND IMPORTANCE: Bilateral hip dislocation is a rare injury. Bilateral asymmetrical fracture-dislocation is an even rarer type of injury. Apart from its rarity, prompt diagnosis of this condition and emergent treatment is necessary to prevent complications.

CASE PRESENTATION: Here we present a 32 years old patient admitted with bilateral asymmetrical dislocation of hips following high energy motor traffic accident.

CLINICAL FINDINGS AND INVESTIGATIONS: Computed tomography revealed bilateral asymmetrical hip dislocations (Left hip anterior dislocation and the right hip posterior dislocation) with a small femoral head fracture on the right side and a large Pipkin I fracture on the left side.

INTERVENTION AND OUTCOME: Closed reduction of bilateral hips failed under general anaesthesia and rendered immediate open reduction of both hips through different approaches and fixation of the osteochondral fragment. Rehabilitation was challenging as the patient has been recovering from a head injury and bilateral lower limb involvement. The patient is under follow-up for any evidence of avascular necrosis of the femoral heads and myositis ossificans.

RELEVANCE AND IMPACT: Bilateral irreducible asymmetrical fracture-dislocations of the hip joint are rarest of its kind. Pre-operative emergent computed tomography is very helpful to identify fracture-dislocations and help in the planning of osteosynthesis. Preparation for open reduction while undergoing a close reduction is essential.

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1. Introduction

The incidence of bilateral asymmetrical dislocations of the hip is very low. In which, hips dislocate different directions to each other in a patient. It comprises 0.01–0.02% of all joint dislocations [1]. That denotes the rarity of this type of injury. Bilateral asymmetrical hip dislocations with bilateral femoral head fractures are even rarer injuries. Only one has been reported in the literature up-to date [2].

This case report has been prepared according to the SCARE guidelines [3].

2. Case report

A previously healthy 32-year-old man was brought to the Accident and Emergency unit, following a motor traffic crash. He was sleeping on the seat of a light weighted motor coach in a seated position during the accident. The motor vehicle has been met with

a head-on collision with a tree beside the road. He was haemodynamically stable, confused, and had subcutaneous emphysema of the left chest. His left leg was extended and external rotated, meanwhile his right leg was flexed and internally rotated. He was resuscitated, an intercostal tube inserted at the Accident & Emergency department. His CT- Brain showed a subarachnoid haemorrhage. Both lower limbs were neurovascularly normal.

The radiograph of the pelvis with both hips revealed bilateral hip dislocation with left side femoral head fracture (Fig. 1).

Non-contrast Computed tomography was taken. It showed posterior dislocation of the right hip with small intraarticular bony fragments and anterior dislocation of the left hip with the femoral head fracture (Fig. 2a & b).

Hence, the closed manipulation failed, the patient underwent open reduction. The right hip was approached via the Kocher-Langenbeck approach, revealed posterior dislocation of the femoral head with buttonholed through abductors which prevented the closed reduction. There was a fracture involving inferior to the ligamentum teres (Pipkin I) with fracture fragments were inside the joint (Fig. 3). Osteochondral fragments were removed and the femoral head relocated.

Subsequently, the Left hip relocated via a modified Hardinge approach and found to have anterior dislocation with a large

* Corresponding author. Permanent address: 78/3, Fatimagiri lane, Thandavanelly, Batticaloa, Sri Lanka.

E-mail addresses: kalaventhnansurgery@gmail.com (K. Pathinathan), nadun88@yahoo.co.uk (N. Marage), pnskfernando@gmail.com (N. Fernando).



Fig. 1. The radiograph of the pelvis anteroposterior view showing bilateral hip dislocation with the left femoral head fracture.

osteochondral fracture involving the anterosuperior region of the femoral head (Pipkin II). The hip was reduced following fixation of the osteochondral fragment with headless cannulated screws (Herbert) (Fig. 4).

Post reduction radiographs showed a congruent reduction of both hips (Fig. 5).

The patient was followed up at the Orthopaedic clinic of the same institution. In two weeks, wounds were inspected and clips were removed. Subsequently, in six weeks of post-surgery, he was allowed to weight bear as tolerated. Gait training, range of motion, stretching and strengthening exercises were arranged at the Department of Physiotherapy and Rehabilitation unit. The patient is on three monthly follow-ups at the Orthopaedic clinic to look for symptomatic and radiographic evidence of avascular necrosis of the femoral head, myositis ossificans and post-traumatic hip arthrosis.

3. Discussion

Posterior dislocation is the commonest direction, the hip gets dislocated. Bilateral asymmetrical fracture-dislocation of the hip is the rarest condition and it requires a complex, high energy mechanism to occur [2]. The mechanism to dislocate the hip posteriorly is a dashboard injury on a flexed adducted and internally rotated hip [1,2,4]. To dislocate the hip anteriorly, the force should be directed on an abducted and external rotated hip [4]. In this scenario, the patient is a middle seat passenger who was asleep when the acci-

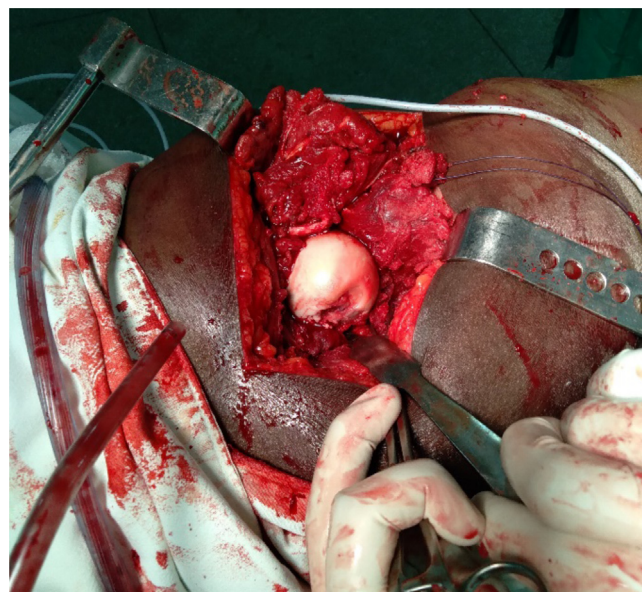


Fig. 3. shows a right femoral head with osteochondral fracture involving the inferior aspect of the ligamentum teres.

dent occurred. Though the mechanism was not known, a forceful abduction on an externally rotated and abducted left hip causing anterior dislocation and axial force on an internally rotated, adducted and flexed hip causing posterior dislocation.

Computed tomography is helpful not only to detect small fractures but, also to have an idea about the direction of the dislocation, anatomy of the fracture and intra articular osteochondral fragments. Closed reduction is the first-line treatment. If it is impossible, like in this patient, open reduction should be carried out immediately. In posterior dislocation of the hip, the acetabular wall can be fractured or it can impinge on the dislocating femoral head causing fractures [2]. In anterior dislocation, the impinging anterior acetabular wall causing fracture on the superior surface [2]. Posterior dislocation can be difficult to reduce when there is a large fragment of the femoral head or fractured acetabular wall causing impediment. In this patient, posteriorly dislocated femoral head buttonholed through external rotators preventing the reduction. In contrast, an irreducible anterior dislocation is usually caused by interposing capsule or iliopsoas [2].

Operative approaches can be selected according to the direction of the dislocation, anatomy of the acetabular fractures and pipkin fractures. Various approaches have been described in the litera-

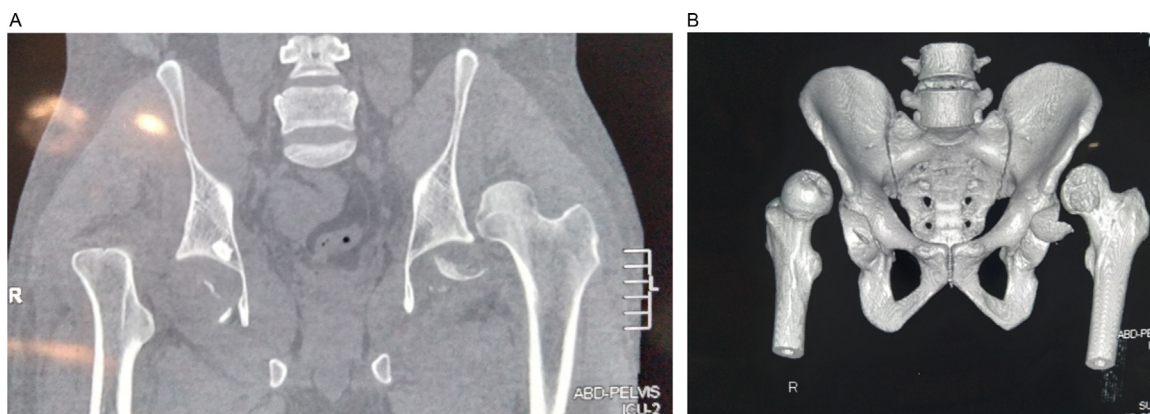


Fig. 2. (a) The Coronal image (CT) shows bilateral fracture-dislocation of the hip. (b) shows the 3D reconstruction image of the pelvis and both hips showing asymmetrical fracture-dislocation of hips.



Fig. 4. shows a large osteochondral fragment, which has been fixed with two headless screws.



Fig. 5. shows a post-reduction radiograph showing congruent reduction of bilateral hip joints.

ture. Those were Smith–Peterson, Watson Jones and Moore [4]. We approached the posteriorly dislocated left hip through the Kocher–Langenbech approach and the anteriorly dislocated left hip through the modified Hardinge approach. The main challenge was the risk of re-dislocation of the contralateral hip while operating on the other side.

As a substitute to the Herbert screws, cancellous screws can be used to fix femoral head fractures. In recent years, there are a variety of substitutes such as biodegradable screws and polylactide pins for the treatment of femoral head fractures [5].

To remove small osteochondral fragments arthroscopic debridement is an effective and evolving alternative in recent years [6].

Older patients with Pipkin fractures and patients with existing osteoarthritis of the hip can be treated with total hip arthroplasty [4].

Common complications of this entity are avascular necrosis of the femoral head, myositis ossificans and post-traumatic arthrosis [1–3]. Therefore, close follow up is mandatory to detect the complication early to prevent morbidity.

4. Conclusion

Bilateral hip dislocation is a rare entity. As it is an emergency, earliest identification and restoration into a congruent joint is an absolute necessity. A CT scan will be descriptive about the congruency of the joint, intraarticular fractures and presence of osteocartilaginous fragments. Surgical approaches have to be tailored according to the direction of the dislocation and the anatomy of the fracture. Early identification and emergent relocation will result in a good outcome.

Declaration of Competing Interest

All authors of this case report disclose any financial and personal relationships with other people or organizations that could inappropriately influence their work.

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Ethical approval

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Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Kalaventhnan, Marage and Nihal Fernando have contributed in concept, design, data collection and writing of this case report.

Registration of research studies

Not Applicable.

Guarantor

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