

Central Fracture-Dislocation of the Hip with Ipsilateral Femoral Neck Fracture in an Elderly Patient with Parkinsonism Managed with Dual Mobility Total Hip Arthroplasty: A Case Report and Review of Literature

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Learning Point of the Article:

Management of Central fracture dislocation of the hip with delayed one staged Total Hip Replacement has good functional outcome. Dual mobility cup is essential in patients with parkinsonism and other neurodegenerative disorders.

Abstract

Introduction: The combination of a central fracture-dislocation of the hip, acetabulum fracture, and neck of the femur fracture is a rare injury, with a few reports described in the literature. Guidelines regarding managing this type of injury in single or multiple stages, the requirement of acetabular augmentation with plates, metal rings or cages, and the implant selection in elderly patients are not adequately defined while planning a total hip arthroplasty (THA). The successful management of such a complex fracture pattern in an elderly patient with neurodegenerative disorder is described in our case report.

Case Report: An 81-year-old male presented to our outpatient department with a 2-month-old neglected post-traumatic central fracture-dislocation of the right hip with an ipsilateral femoral neck fracture. The patient had a known case of Parkinson's disease on treatment with oral medication. A single-stage hybrid THA with dual mobility (DM) prosthesis was done with femoral head autograft acetabular impaction bone grafting. The patient was mobilized full weight bearing with the support of a walker on the 2nd post-operative day. At the 1-year follow-up the functional Harris hip score was 87. Radiographs revealed a well-healed acetabular fracture with the incorporation of a bone graft. No signs of implant loosening were observed. We did not encounter any complications such as dislocation, infection, and heterotrophic ossificans.

Conclusion: Management of central fracture-dislocation of the hip with delayed one-staged THA has a good functional outcome. DM cup is essential in patients with parkinsonism and other neurodegenerative disorders.

Keywords: Central fracture-dislocation of the hip, neck of femur fracture, total hip arthroplasty, dual mobility, Parkinsonism.

Introduction

The combination of a central fracture-dislocation of the hip, acetabulum fracture, and a fractured neck of the femur is a rare injury, with a few reports described in the literature [1-7]. However, this type of injury pattern in an elderly patient with parkinsonism and its management with dual mobility (DM) total hip arthroplasty (THA) has not been described till now, and to our knowledge, this is the first case report described in the

literature. The successful management of such a complex fracture pattern is highlighted in our case report.

Case Report

An 81-year-old male presented to our outpatient department with a history of falls at home and was unable to walk for 2 months. On clinical examination, there was tenderness over the right hip and proximal femur. The right limb shortening of 5 cm

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Author's Photo Gallery



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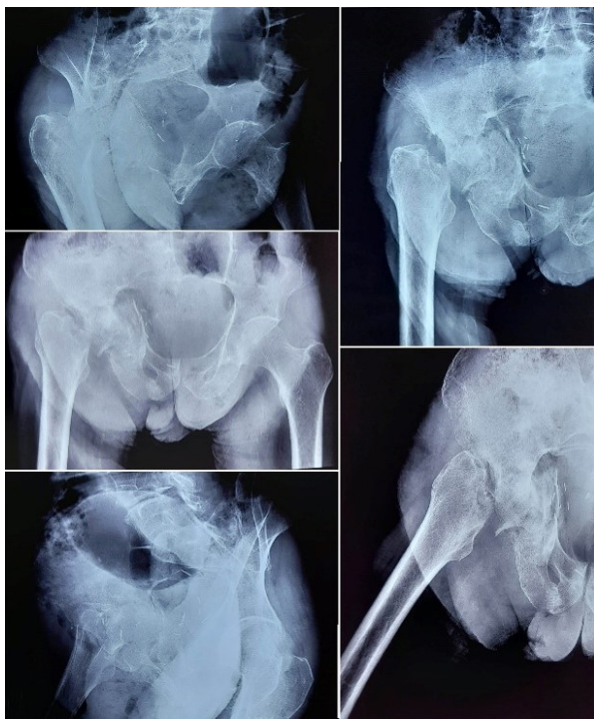


Figure 1: Radiographs showed a central fracture-dislocation of the hip associated with acetabular and femoral neck fracture.

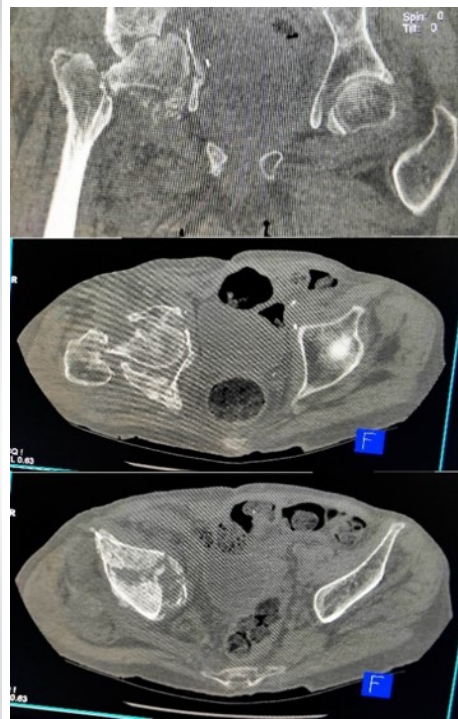


Figure 2: Computed tomography views of the fractures.

and external rotation deformity were present. Radiographs showed a central fracture-dislocation of the right hip associated with ipsilateral femoral neck fracture (Fig. 1). CT examination revealed a comminuted transverse acetabular fracture with a central migration of the femoral head fragment into the pelvic cavity (Fig. 2). There was no associated neurovascular injury.

The patient had a known case of parkinsonism and was on oral tablets levodopa, carbidopa, and pramipexole for the treatment.

As a definitive treatment, we planned to do femoral head autograft and THA with DM prosthesis.

The hip joint was exposed by a posterior approach. The femoral head was migrated medially and embedded in the acetabular fracture. It was engaged with a corkscrew and found to be mobile inside the acetabular cavity and was extracted out with the assistance of blunt Hohman retractors without damaging the acetabular wall. On palpating the inner wall, the acetabulum showed a contained defect without any obvious breach into the pelvic cavity.

We used the morselized cancellous bone from the femoral head to do impaction bone grafting over the acetabular defect. Additional reverse reaming was done over the impacted bone graft. A 54-mm cementless hydroxyapatite-coated cluster acetabular shell (Modular DM Trident PSL, Stryker, USA) was used to achieve a perfect fit. A high offset 37.5 mm size 1

cemented stem was used for the femur (Exeter, Stryker, USA) with a 28 mm metal head articulating with a highly cross-linked polyethylene DM liner of 46 mm. The wound was closed in layers without a drain.

The patient was mobilized full weight bearing with the support of a walker on the 2nd post-operative day. There was no limb length discrepancy. He was able to do active straight leg raising and abduction against gravity by the 3rd week. At the end of 3 months, the patient was walking unaided with a stable and pain-free hip. At the

1-year follow-up, the functional Harris hip score was 87. Radiographs revealed a well-healed acetabular fracture with the incorporation of a bone graft. No signs of loosening were observed (Fig. 3). We did not encounter any complications such as dislocation, infection, and heterotrophic ossification.

Discussion

Based on our literature search, this injury pattern was reported only in seven cases [1-7]. All these cases were in young patients without any neuromuscular abnormalities and were managed with fixation of fracture or a standard THA prosthesis (Table 1). In elderly patients with femur neck fractures, there is a high risk of non-union and avascular necrosis of the head, especially in cases of significant displacement, and the treatment of choice is THA [8].

While planning a THA, guidelines regarding managing this type of injury in single or multiple stages, the requirement of acetabular augmentation with plates, metal rings, or cages and the implant selection in elderly patients are not adequately defined.

Delayed THA after more than 3 months was successful in three studies [2, 3, 7].

In the case report by Dusak et al., delayed management after 3

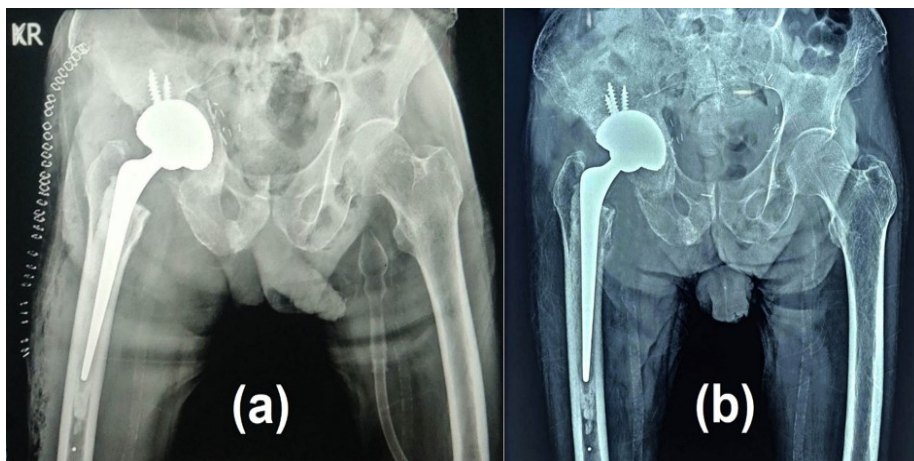


Figure 3: Post-operative X-ray showing hybrid total hip arthroplasty. (a) Immediate post-operative view. (b) Following a 1-year follow-up.

Mesdadah in his case report did not extract the head fragment out during delayed THA. The CT scan showed that the head fragment had healed well and fused to the acetabular roof and column without going into avascular necrosis, thus creating a consistent acetabular bed. The entire mass was progressively reamed and a metal ring was inserted and fixed with screws. A cemented THA was done over this construct [2].

The use of cemented stem prostheses provides initial stability and immediate weight-bearing ambulation in elderly patients with osteoporosis.

weeks by primary cemented THA with bone grafting of the acetabular defect and insertion of an acetabular cage fixed with multiple screws was done [6].

Femoral head extraction and impaction bone grafting to strengthen the acetabular bed are recommended in previous studies for contained acetabular defects [6,7].

Parkinson's disease (PD) is the most common movement disorder and represents the second most common degenerative disease of the central nervous system. It is characterized by worsening motor symptoms, including resting tremors, bradykinesia, rigidity, shuffling gait, and poor muscle coordination. The onset of the disease is usually at an age of 65–70 years. PD prevalence is increasing with age and PD affects 1% of the population above 60 years [9].

Patients with PD undergoing THA are at increased risk for medical complications and surgery complications, particularly superficial wound infection and deep vein thrombosis as compared to patients without PD. PD patients also exhibit increased length of stay and total hospital charges [10]. The instability in PD patients can potentially make them more likely to fall, resulting in post-operative prosthesis dislocation and periprosthetic fracture [11].

While there are no substitutes for proper positioning of the components and meticulous soft-tissue repair, DM implants can improve stability in patients with unmodifiable risk factors for dislocation. The use of DM THA is recommended in patients having a high risk of falls, neurodegenerative disorder, hip fractures, history of alcohol abuse, spine pathology, and other factors placing the patient at a high risk of dislocation [12]. DM systems allow the head-liner complex to function as a large femoral head, increasing the head-neck ratio and jump distance, thereby improving stability and terminal impingement (Fig. 4).

Conclusion

Our case report highlights the management of a complex hip fracture in an elderly with neuromuscular movement disorder with a good clinical outcome. Priority should be

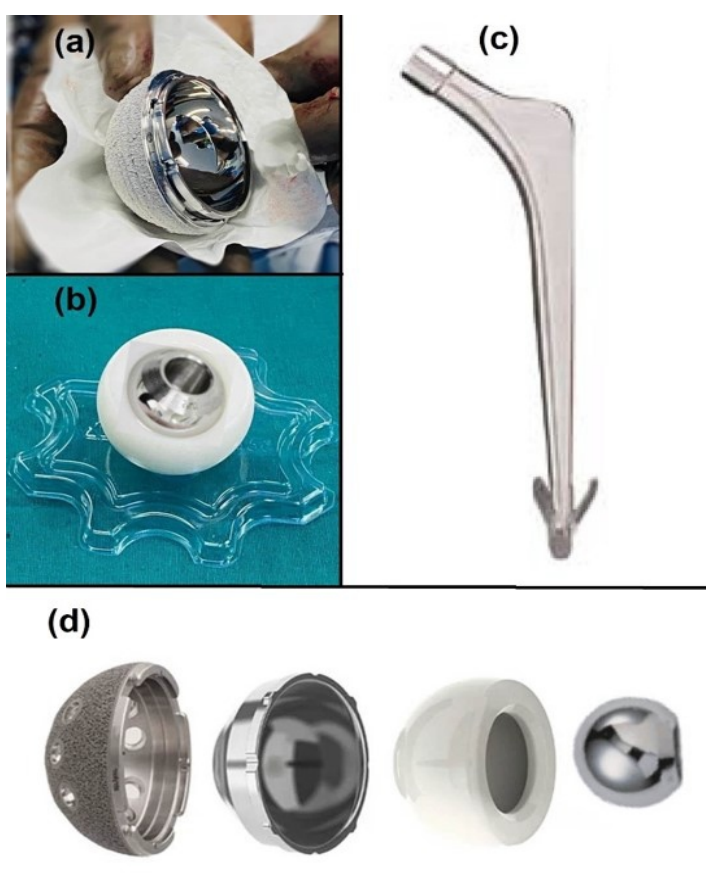


Figure 4: Dual mobility THR components. (a) Uncemented acetabular shell with modular dual mobility metal liner. (b) Headliner complex consisting of a metal head and a highly cross-linked polyethylene liner. (c) Cemented exeter stem. (d) Graphical representation of component assembly.

Table 1: Overview of the cases of central fracture-dislocation of the hip with ipsilateral femoral neck fracture

Study	No of patients	Age (In years)	Additional fractures and comorbidities	Management
Meinhard <i>et al.</i> (1987)	1	27	-	Fixation of neck with screws and conservative treatment for acetabular fracture.
Mestdagh <i>et al.</i> (1991)	1	52	Pelvic ring fracture	Traction for 3 months and delayed cemented THA using acetabular metal ring
Mesa <i>et al.</i> (1997)	1	27	Head injury with multiple rib fractures.	Delayed primary cementless THA after 6 months
Aparicio <i>et al.</i> (2001)	1	56	Pelvic ring and greater trochanter injury	Extraction of head, fixation of trochanter followed by traction. Patient rejected the second surgery.
Hidalgo-Pérez <i>et al.</i> (2006)	1	57	-	Primary cementless THA and autograft from the extracted head fragment
Dusak <i>et al.</i> (2021)	1	57	Abdominal trauma	Delayed hybrid THA with metal acetabular cage support after 3 weeks
Elsoud <i>et al.</i> (2022)	2	27,54	Pelvic ring injury	Acetabular fixation followed by delayed cementless THA after 8 months
This study (2023)	1	81	Parkinsonism	Delayed hybrid THA with dual mobility prosthesis.

given for the evaluation of other injuries and stabilization of the patient as such complex fracture patterns are often associated with polytrauma. Central fracture-dislocation of the hip with a comminuted acetabular fracture can be successfully managed with delayed THA without acetabular fixation or metal cages. The use of DM prosthesis is beneficial in such situations as it decreases the risk of dislocation in elderly high-risk patients.

Clinical Message

Management of central fracture-dislocation of the hip with delayed one-staged THA has a good functional outcome. A dual mobility cup is essential in patients with parkinsonism and other neurodegenerative disorders.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

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