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Concomitant Neck of Femur and Greater Trochanter Fracture in a Young Adult – A Case Report

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Learning Point of the Article:

Concomitant neck of femur and greater trochanter fracture can be effectively managed with multiple cannulated screws with a favorable outcome.

Abstract

Introduction: Concomitant injury to the femoral neck and trochanteric area is very rare in younger patients; these are usually the result of a high-energy trauma, such as a motor vehicle accident or a fall from height. It is recommended to reduce and fix the fractures as early as possible to avoid complications, including avascular necrosis (AVN) of the femoral head, impaired functioning of the hip abductor muscles, malunion, and non-union.

Case Report: We report an extremely rare case of a 23-year-old male patient who sustained concomitant neck and greater trochanter (GT) of femur fracture, which was operated with closed reduction and internal fixation with percutaneous partially threaded cannulated cancellous (CC) screws.

Conclusion: Concomitant neck of femur and GT fracture in young adults is a rare and difficult fracture pattern presenting challenges as to optimum modality of fixation. Although mostly dynamic hip screw (DHS) has been used to treat this fracture, it can also be managed by multiple CC screws, avoiding the risk of lateral wall instability inherent with DHS fixation in this fracture pattern.

Keywords: Concomitant neck of femur and greater trochanter, multiple cannulated cancellous screws, non-union, avascular necrosis of the femoral head.

Introduction

Fractures of the femoral neck are one of the most common orthopedic injuries, predominantly seen in elderly patients. In younger patients, these are usually the result of a high-energy trauma, such as a motor vehicle accident or fall from height, and there may be associated injuries, such as ipsilateral femoral shaft fractures, distal radius fractures, and proximal humerus fractures [1]. Concomitant injury to the femoral neck and trochanteric area is very rare and has mostly been reported in the elderly [2].

Unlike elderly patients, where arthroplasty is the treatment of choice, in younger patients, it is recommended to reduce and fix the fractures as early as possible. Concomitant neck of femur and greater trochanter (GT) carry a substantial risk of complications, including avascular necrosis (AVN) of the femoral head, impaired functioning of the hip abductor muscles, and malunion and non-union [3]. We, hereby, report an extremely rare case of a 23-year-old male patient who sustained concomitant neck and GT of femur fracture, which was operated with closed reduction and internal fixation with percutaneous partially threaded cannulated cancellous (CC) screws.

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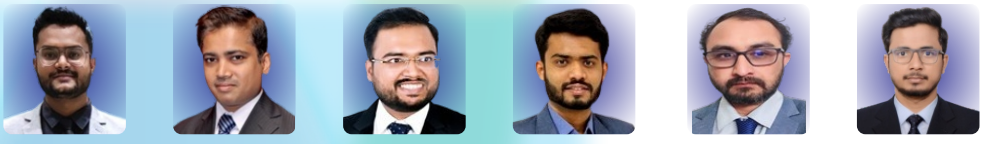

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Case Report

A 23-year-old male was admitted to our emergency department 2 h following a road traffic accident, sustaining injury to the right hip. On presentation, patient had pain in the right hip with inability to bear weight on the same side. Radiographs revealed the presence of neck of femur fracture accompanied with a fracture of the GT (Fig. 1).

(Pre- and post-operative computed tomography was not advised as the fracture pattern was adequately distinguished in X-rays and to avoid excessive radiation exposure).

The patient was posted for surgery within 48 h of trauma. With the patient on the fracture table, gentle traction was given and a satisfactory closed reduction could be achieved. After confirming reduction under C-arm, we proceeded for percutaneous partially threaded CC screw fixation (Fig. 2).

Initially, two parallel guide wires for 6.5 mm CC screws were passed to stabilize the femoral neck fracture. This was followed by one guide wire fixing the GT to the femoral head and another guide wire from the tip of GT directed toward the lesser trochanter. The femoral neck screws were passed first and compression was achieved across the fracture site. Then, the screws fixing the GT fragment were passed. Care was taken to ensure that all the screw threads crossed the fracture lines. Due to the complexity of the fracture pattern, we delayed post-operative mobilization. Non-weight-bearing walking with axillary crutches was started at 6 weeks, progressing to full weight-bearing once radiological union at the fracture site was confirmed at 12 weeks postoperatively (Fig. 3 and 4).

At 4 months post-operative, the patient had achieved an excellent, painless range of motion of the affected hip, allowing him to resume his job. At the latest follow-up at 18 months, there was no radiological evidence of AVN (Fig. 5).

Magnetic resonance imaging (MRI) was not done for this patient as the patient had painless and full hip range of motion and could carry out his daily activities without any issues. Hence, we opted against conducting an MRI, given the absence of both clinical and radiological evidence of involvement.

Discussion

Concomitant fracture of the neck of the femur and GT is extremely rare and has mostly been reported in the elderly, with only a few case reports in young patients [2, 4, 5, 6]. At present, there is no classification for combined fractures involving both the neck and trochanter of the femur and there is a dearth of literature regarding guidelines for treatment of such fractures. Concomitant neck and trochanter fracture is inherently unstable due to multiple fracture fragments, rotational instability of the neck fragment, and the possibility of concealed lateral wall fracture [7]. In the elderly, these have been treated by various methods, including fixation and replacement [7]. In young adults, the main goals are to preserve the femoral head, to reduce iatrogenic insult and pseudoarthrosis to avoid total hip replacement [7].

Such a complex fracture pattern presents several dilemmas concerning the choice between open reduction internal fixation