

Case Report
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Neck of Femur Fracture in a Young Athlete

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Received: February 15, 2022; **Accepted:** February 22, 2022; **Published:** March 08, 2022

Keywords: Fracture Hip, Young adult, Athlete, Femoral Neck, Stress Fractures

Background

Neck of femur fractures in young individuals are rare but potentially serious injuries. They may result from an acute traumatic event or develop from repetitive stress in athletes. Young people with femoral neck fractures generally present differently to elderly patients with many having a longer duration of symptoms and being able to weight bear on the affected leg. Failure to diagnose and treat neck of femur fractures in young people can result in fracture displacement and compromise of the femoral head blood supply, leading to osteonecrosis. We present the case of a healthy 32-year-old male with an unusual neck of femur fracture pattern after a relatively low velocity injury (contact sports).

Case Presentation

A 32-year-old male presented to the emergency department with a four-day history of left hip pain after being tackled playing rugby. He had been tackled by another player from his right side, and landed directly on his left hip. He described hearing a 'pop' from his left hip when it made a contact with the ground. He was able to partially weight bear with crutches after the injury. He had no preceding hip pain to suggest the presence of a stress fracture prior to this injury. Demographics included work as a manual labourer, non-smoker, social alcohol (max 4units/week) with no medical comorbidities or regular medications reported. On examination he had an antalgic gait. Tenderness over the joint line was present. There were no sensory or motor deficits and distal pulses were present in his left leg. The skin was intact.

Investigations

The patient had a magnetic resonance imaging (MRI) scan which demonstrated an undisplaced fracture through the basicervical region of the femoral neck, extending inferiorly into the intertrochanteric region. The fracture was incomplete, involving the anterior two thirds of the femoral neck. Furthermore, there was an undisplaced fracture through the greater trochanter, gluteus minimus and gluteus medius tendonopathy with a low grade partial-thickness tear of the gluteus minimus tendon and an anterosuperior labral tear.



Figure 1: Unusually, the MRI scan did not demonstrate the high signal intensity on T2-weighted images in the proximal femur that would be expected with an acute fracture in this region

Differential Diagnosis

MRI confirmed a vertically oriented femoral neck fracture, however the chronicity of the fracture is uncertain. The patient had an acute injury precipitating his pain, however the absence of oedema surrounding the fractures on T2 weighted MRI sequences is suggestive of the presence of a chronic stress fracture of the proximal femur rather than an acute fracture in this patient.

Treatment

The patient was initially managed with analgesia and offloading of his left leg. He was admitted to hospital under the orthopaedics team and underwent surgical fixation of the left hip with a four-hole 130 degree dynamic hip screw. The procedure was uncomplicated. Post-operatively he was made to partial weight bear with crutches for six weeks and given prophylactic anticoagulation for deep vein thrombosis. He was discharged day 2 post-operation.

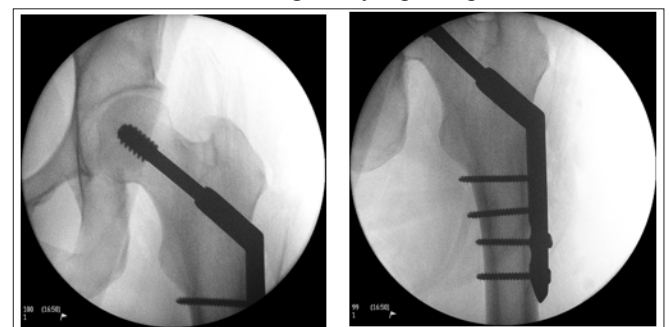


Figure 2: Intraoperative imaging

Outcome and Follow-Up

The patient was followed up at 6 weeks post-operatively. He had no ongoing symptoms in his left hip and was mobilising pain-free without a walking aid. On examination his wound had healed and he had a full pain-free active range of motion of his left hip. A CT scan at 9 weeks post-operatively demonstrated union of the fracture with no complications.

Currently, he is now back to his full duties as a mine site worker. However, he has not taken part in contact sports like rugby.



Figure 3: CT at 9 weeks post-operation demonstrating union of the fracture

Discussion

Stress fractures are overuse injuries that are understood to result from oft repeated submaximal stresses. Stress fractures of the femoral neck have a variety of presentations. Most commonly the patient has gradual onset hip or groin pain that is exacerbated with activity and relieved with rest [1].

The pain may progressively worsen over time with increasing exercise intensity or duration, and is sometimes followed by a ‘cracking’ sensation during activity or with trauma when an incomplete fracture is completed [2].

The incidence of stress fractures in athletes is higher in females than males, with an incidence of 9.7% in females and 6.5% in males [3].

Diagnosis of femoral neck stress fracture (FNSF) is often delayed. In a systematic review of 48 femoral neck stress fractures in runners, Neubauer, et al found a mean time to diagnosis of 57 days after the onset of symptoms [4]. Factors that contribute to the delay of diagnosis include nonspecific symptomatology, an insidious onset of pain and negative findings on early radiographs in 30-70% of cases [5,6]. MRI is the gold standard imaging modality for the detection of FNSF [7].

Management of femoral neck stress fractures is dependent on the pattern of the fracture. Compression type fractures that are incomplete (<50% femoral neck width) are more stable and can be managed conservatively, unless the patient is in uncontrollable pain or cannot straight-leg raise [8]. Complete compression fractures require surgical fixation with either cannulated hip screws or dynamic hip screw. Tension type fractures (either complete or incomplete) are unstable and require fixation with dynamic hip screw [2].

Learning Points/Take Home Messages

- Femoral neck stress fractures are a commonly missed diagnosis due to presentation with non-specific symptoms and often normal findings on radiographs.

- MRI may not demonstrate oedema on T2-weighted imaging in chronic stress fractures.
- Femoral neck stress fractures should be considered in both male and female athletes preventing with hip pain from minimal trauma.
- Early suspicion of femoral neck stress fractures is important to prevent missed diagnoses and future complications.

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