

Tension Band Wiring for a Greater Trochanteric Fracture Following a Low-Energy Fall: A Case Report

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Abstract

Background: Greater trochanteric fractures are relatively uncommon injuries that may be underestimated on initial radiographs because of possible occult extension into the intertrochanteric region. We report the case of a 42-year-old man who presented with pain and swelling over the left hip following a self-fall on March 11, 2024. Preoperative radiography demonstrated a fracture involving the greater trochanter of the left femur. The patient underwent open reduction and internal fixation on March 26, 2024, using tension-band wiring with two stainless-steel K-wires, stainless-steel wire, a cortical screw, and a washer. Intraoperative fluoroscopy was used to assess the reduction and fixation. Immediate postoperative radiography demonstrated satisfactory alignment and positioning of the fixation construct. At two-month follow-up, radiographs showed maintained alignment and stable fixation with evidence of interval healing. This case demonstrates the use of tension-band wiring as a surgical fixation technique for a greater trochanteric fracture and provides radiographic evidence of satisfactory early fixation and healing.

Keywords: Greater trochanteric fracture; Tension band wiring; Low-energy fall; Hip fracture; Orthopedic fixation; Case report.

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INTRODUCTION

Greater trochanteric fractures are relatively uncommon injuries that may occur following direct trauma or avulsion forces. Although many fractures involving the greater trochanter can be managed conservatively, their true extent may be underestimated on plain radiographs, particularly when occult extension into the intertrochanteric region is present. A systematic review has highlighted the diagnostic and management challenges associated with these injuries.^[1,2]

Earlier clinical reports have described isolated greater trochanteric fractures and their variable presentation and management.^[3] Importantly, magnetic resonance imaging (MRI) may demonstrate fracture extension that is not apparent on initial radiographs. Feldman and Staron demonstrated the value of MRI in evaluating seemingly isolated greater trochanteric fractures, while Lee et al. reported occult intertrochanteric extension in apparently isolated injuries.^[4,5] Subsequent studies have further demonstrated a high frequency of occult intertrochanteric extension in patients initially diagnosed with isolated greater trochanteric fractures on plain radiographs.^[6]

Management, therefore, depends on fracture morphology, displacement, associated extension, symptoms, and functional requirements. While conservative treatment is frequently reported, surgical fixation has also been described in selected symptomatic or displaced fractures.^[7-10] We present the case of a 42-year-old man with a left greater trochanteric fracture following a fall, managed with open reduction and internal fixation using a tension-band wiring construct, with radiographic follow-up

at two months.

CASE REPORT

A 42-year-old man, Shankar Naitam, presented with complaints of pain and swelling over the left hip following a history of a self-fall on March 11, 2024, at approximately 3:00 PM. There was no history of associated head or chest injury.

Preoperative radiographic evaluation demonstrated a fracture involving the greater trochanter of the left femur [Figure 1]. The patient was planned for operative fixation.

On March 26, 2024, approximately two weeks after the injury, the patient underwent operative fixation of the left greater trochanteric fracture. Under spinal anesthesia, the patient was positioned in the right lateral position. A lateral incision was made over the greater trochanter, and the fracture site was exposed. Open reduction of the fracture was performed, followed by fixation using two stainless-steel K-wires, a stainless-steel wire, and a cortical screw with a washer in a tension-band configuration. The reduction and fixation were assessed intraoperatively under fluoroscopic guidance.

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Representative intraoperative stages are shown in [Figure 2].



Figure 1: Preoperative radiograph demonstrating the greater trochanteric fracture

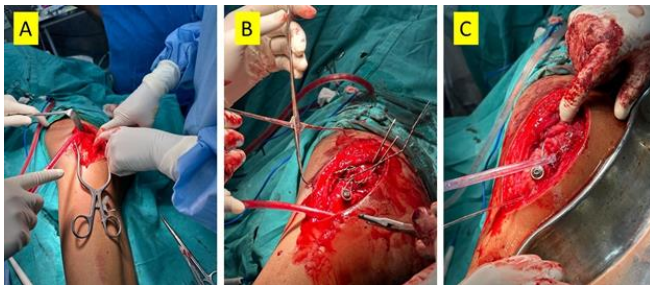


Figure 2: Representative intraoperative photographs demonstrating fixation of the left greater trochanteric fracture. (A) Exposure of the fracture site through the lateral approach. (B) Application and positioning of the tension-band wire with K-wires. (C) Completed tension-band wiring construct with the fixation components in position.

An immediate postoperative radiograph demonstrated satisfactory positioning of the fixation construct and maintenance of the reduction [Figure 3].



Figure 3: Immediate postoperative radiograph demonstrating fixation following tension-band wiring

At the two-month postoperative follow-up, radiographic evaluation demonstrated maintained alignment and stable positioning of the tension-band construct, with evidence of interval healing [Figure 4].



Figure 4: Radiograph at two months after surgery demonstrating maintained fixation and interval healing.

DISCUSSION

Greater trochanteric fractures may result from direct trauma or avulsion forces. In the present case, the injury resulted from a self-fall, with radiographic evidence of a fracture of the left femoral greater trochanter.

An important consideration in these injuries is the possibility of occult extension beyond the greater trochanter. Previous studies have demonstrated that fractures appearing isolated on plain radiographs may have intertrochanteric extension, emphasizing the role of additional imaging when the clinical or radiographic findings raise suspicion.^[4-6] In the present case, no preoperative MRI or CT documentation was available; therefore, an occult extension injury cannot be definitively excluded.

Although conservative management is commonly reported for apparently isolated greater trochanteric fractures, operative treatment may be considered in selected patients with displacement, persistent symptoms, functional demands, or fracture characteristics requiring stabilization.^[1,2] Published case reports have described different surgical approaches, including fixation of symptomatic greater trochanteric fractures, combined fixation techniques, percutaneous screw fixation, and fixation of greater trochanteric avulsion injuries in other clinical settings.^[7-10]

In the present case, open reduction and fixation were performed using two stainless-steel K-wires, a stainless-steel wire, a cortical screw, and a washer in a tension-band configuration. The immediate postoperative radiograph demonstrated maintained reduction and satisfactory positioning of the fixation construct. At two months, the radiograph demonstrated maintained alignment and stable fixation with evidence of interval healing.

This case highlights the practical application of tension-band wiring to fix a displaced greater trochanteric fracture. The

availability of sequential preoperative, intraoperative, immediate postoperative, and follow-up imaging provides radiographic documentation of the treatment and early outcome. However, the absence of documented preoperative MRI or CT and of long-term functional follow-up limits the assessment of occult fracture extension and the final clinical outcome.

Strengths and Limitations: The strength of this case is the availability of sequential preoperative, intraoperative, immediate postoperative, and two-month follow-up imaging documenting the treatment pathway. The principal limitation is the absence of longer-term functional follow-up and advanced preoperative imaging, such as MRI or CT, to definitively exclude occult intertrochanteric extension.

CONCLUSION

Greater trochanteric fractures are uncommon and require careful assessment to determine the extent of the fracture and appropriate treatment. Although many apparently isolated fractures can be managed conservatively, operative fixation may be considered in selected symptomatic or displaced injuries. This case demonstrates satisfactory early radiographic maintenance of reduction following tension-band wiring of a left greater trochanteric fracture after a fall. Sequential radiographic documentation provides useful evidence of the fixation and early healing response.

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Conflicts of interest

There are no conflicts of interest.

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