

Case Report

Management of femoral neck fracture on prolonged steroid

Ryantino Irdan¹, Made Wirabhawa²

¹General Practitioner, Mayapada Hospital Bogor

²Orthopaedic and Traumatology Department, Mayapada Hospital Bogor

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Corresponding Author :

Ryantino Irdan, MD

E-mail: ryantinoirdan27@gmail.com

Abstract

Femoral neck fractures are among the most troublesome and problematic of all fractures. The patient, most commonly are elderly woman, has a trivial mishap such as losing her footing on a slippery surface or tripping over an object. As she tries to "catch herself," she may suddenly put a torsional force on one hip that fractures the neck of the femur and then she falls so fragile the femoral neck in the elderly. If the fracture is displaced, as 95% are, the patient is unable to get up because of pain and complete instability at the fracture site, Examination reveals that the entire lower limb lies in external rotation, although not usually so complete as that seen in patients with an intertrochanteric fracture. Steroids have major effects on how the body uses calcium and vitamin D to build bones. Steroids can lead to bone loss, osteoporosis, and broken bones. When steroid medications are used in high doses, bone loss can happen rapidly. Fracture risk increases as the daily doses of steroids increase. Various techniques including the use of radioopaque dyes and radioactive isotope scintigraphy have been developed to assess the circulation of the femoral head at the time of operation. The results of these techniques serve as a useful guide to treatment, because, if the femoral head of a middle-aged or elderly patient is completely avascular, it is better excised and replaced by a hemiarthroplasty using a bipolar endoprosthesis rather than reduced and nailed. The case study that will be discussed is a 53-year-old woman with a history of steroid consumption for 30 years (chalmethasone oral twice a day) on indications of rheumatoid arthritis falling in a sitting position and causing fractures in the neck of the left femur bone, decided to undergo immediate action prosthetic hemiarthroplasty bipolar. Results show that until now the patient has had no patient complaints related to instability in walking, Limitation in performing activities, and pain in his prosthetic bone.

Introduction

Femoral neck fractures are a specific type of intracapsular hip fracture. Hip fractures are a common source of morbidity and mortality worldwide. In 1996, the United States Department of Health and Human Services reported approximately 340,000 hip fractures in the United States alone, with most fractures occurring in women older than age 65 years. The number of people older than age 65 years is expected to increase from 37.1 million to 77.2 million by the year

2040 and the rate of hip fractures is expected to double concomitantly, with an estimated 6.3 million hip fractures predicted worldwide by 2050. The femoral neck connects the femoral shaft with the femoral head. The hip joint is the articulation of the femoral head with the acetabulum. The junctional location makes the femoral neck prone to fracture. The blood supply of the femoral head runs along the femoral neck and is an essential consideration in displaced fractures and patients in the younger population.¹ This activity reviews the etiology, presentation, evaluation, and

management of femoral neck fractures and reviews the role of the inter-professional team in evaluating, diagnosing, and managing the condition. Femoral neck fractures are associated with low-energy falls in the elderly. In younger patients sustaining a femoral neck fracture, the cause is usually secondary to high-energy trauma such as a substantial height or motor vehicle accidents. Risk factors for femoral neck fractures include female gender, decreased mobility, and low bone density.² The chief source of vascular supply to the femoral head is the medial femoral circumflex artery, which runs under the quadratus femoris. Displaced fractures of the femoral neck put the blood supply at risk, usually tearing the ascending cervical branches that stem off the arterial ring supply formed by the circumflex arteries. This may compromise the healing ability of the fracture, inevitably causing non-union or osteonecrosis. This is most important when considering the younger population that sustains this fracture, for which arthroplasty would be inappropriate. In patients treated via open reduction internal fixation, avascular necrosis is the most common complication.³

Medical assessment should include basic labs (complete blood count, basal metabolic panel, and prothrombin/international normalized ratio, if applicable) as well as a chest radiograph and electrocardiogram (ECG).

There are many classifications for femoral neck fracture, including the most common clinical classifications by Garden and Pauwel, which include the following The Garden Classification Type I (Incomplete fracture valgus impacted nondisplaced), Type II (Complete fracture nondisplaced), Type III Complete fracture partial displaced), Type IV (Complete fracture fully displaced). The Garden classification is the most used system used to communicate the type of fracture. For treatment, it is often simplified into nondisplaced (Type 1 and Type 2) versus displaced (Type 3 and Type 4). The Pauwel classification also includes the inclination angle of the fracture line relative to the horizontal. Higher angles and more vertical fractures exhibit greater instability due to higher shear force. These fractures also have a higher risk of osteonecrosis postoperatively. Type I is less than 30 degrees, Type II is 30 to 50 degree Type III greater than 50 degrees.⁴

Nonoperative management for these fractures is rarely the treatment course. It is only potentially useful for non-ambulatory, comfort care, or extremely high-risk patients. Young patients with femoral neck fractures will require treatment with emergent open reduction internal fixation. Vertically oriented fractures such as Pauwel III type fractures are more common in younger and high-energy trauma patients. A sliding hip screw is biomechanically more stable for these fracture patterns. With displaced fractures in younger

patients, the goal is to achieve anatomic reduction through emergent open-reduction internal fixation.³

In the years before the development of internal fixation, a fractured femoral neck in an elderly person usually triggered a series of deleterious events that led to the unfortunate victim's painful demise. From a humanitarian point of view alone, internal fixation of displaced fractures of the femoral neck is indicated. The elderly merit relief of pain no less than the young.⁵

Closed reduction and internal fixation of the fracture should be performed as soon as possible. Aspiration of the hemarthrosis at this time may minimize the risk of avascular necrosis. The reduction can usually be obtained by flexing, adducting, and then internally rotating extending the injury hip. Internal fixation of the reduced fracture can be obtained either by a DHS (also known as a compression screw plate) or by three parallel cannulated screws After satisfactory nailing of the fracture, the patient may be out of bed in a chair within a few days and allowed to walk bearing partial weight on the injured limb with the help of crutches or a walker within a few weeks.⁵

Chronic steroid use may severely decrease bone strength, thus increasing the risk of such an injury. Steroid-induced osteonecrosis of the femoral head (SONFH) is a disease characterized by the collapse of the femoral head. SONFH occurs due to the overuse of glucocorticoids (GCs) in patients with immune-related diseases.³

Case Summary

On 01 June 2022, a 52-year-old woman came to our hospital with a history of falling in a sitting position to a height of approximately a half meter from a standing position. The patient can't stand because the pain is very severe in the left hip, and difficult to move and it gets worse when the patient tries to lift his left leg. The patient has a history of rheumatoid arthritis and has been undergoing oral corticosteroid treatment for 30 years (oral dexamethasone twice per day).

Normal lab results were found in routine blood, kidney function, liver, and electrolyte levels. pt and aptt are not elongated. Abnormal results were found in the patient's increased CRP and ESR levels, which is a marker of rheumatoid arthritis. Normal ECG and thorax photo were found in this patient. Pelvic AP X-ray shows left femoral neck fracture with mild displacement (Figure 1). Prosthetic Hemiarthroplasty Bipolar is performed immediately (Figure 2). considering the patient's history of active mobilization, pre elderly, long-term steroid consumption for 30 years, and a history of rheumatoid arthritis. Patients are treated and observed for 4 days in hospitalization, during hospitalization patients are treated together by an orthopedic doctor, internal medicine doctor, and medical rehabilitation doctor, patients get first-

generation cephalosporin class antibiotic 2 x 1 gr, antipyretics 3 x 1 gr, analgetics 3 x 1 vial, subcutaneous anticoagulants 1 x 0.2 ml and also attached drain vacuum, During postoperative treatment, patients are instructed not to perform hip flexion and internal rotation. Blood production is very minimal found in the vacuum drain from the first day postoperative. FWB mobilization with a walker and a lower extremity muscle rehabilitation program given by a medic rehabilitation doctor. On day 2 of postoperative, the patient was able to mobilize without a walker, the pain was minimally felt, and there was no disturbance in balance when the patient walked.

Discussion

Prosthetic Bipolar Hemiarthroplasty is the best technique for treating cases of femoral neck fracture. The patient with a displaced femoral neck fracture is at significant risk for osteonecrosis and nonunion. Treatment options include closed reduction and internal fixation or ORIF with different constructs, hemiarthroplasty (unipolar and bipolar), and THA.⁶

Multiple studies have been done on the outcomes of internal fixation of femoral neck fractures versus arthroplasty (eg, hemiarthroplasty, THA). The risk of osteonecrosis, nonunion, and revision following internal fixation of displaced intracapsular fractures must be balanced against the potential complications following arthroplasty.⁷

The ideal treatment of displaced intracapsular fractures is not straightforward (Table 1). The current data indicate that internal fixation of femoral neck



Figure 1. Left femoral neck fracture with mild displacement

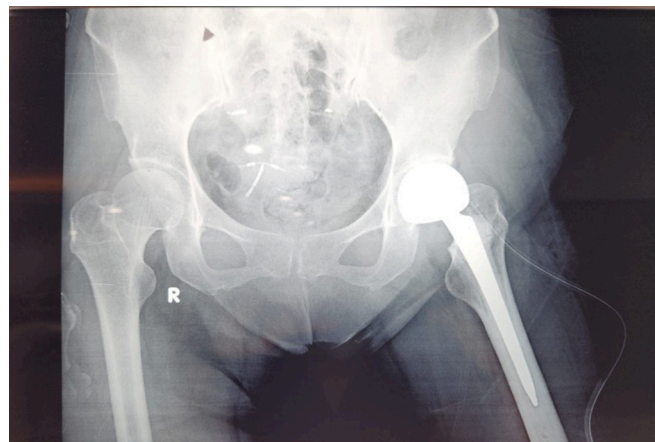


Figure 2. The femoral caput prosthetic bone is attached and settled to this good femur bone and good joints

Study	Level Of Evidence	Cohort	Similar Outcomes	Conclusions
Masson et al (Cochrane review)	I	ORIF Versus Hemiarthroplasty	Pain, Mobility, mortality	Decreased surgical time, blood loss, and infection rate with ORIF, but a higher revision rate
Rödén et al	I	ORIF Versus Hemiarthroplasty	mortality	Decreased surgical time and blood loss in the ORIF group, but a higher revision rate
Parker and Pryor	I	Von Bahr Screws Versus Hemiarthroplasty	Pain, Mobility, mortality	Decreased surgical time and blood loss in the ORIF group, but a higher revision rate and a greater rate of limb shortening
Parker and Pryor	I	ORIF Versus Hemiarthroplasty	Functional Outcome	Decreased surgical time and blood loss in the ORIF group and slightly decreased mortality, but a higher revision rate
Puolakka et al	I	ORIF Versus Hemiarthroplasty	-	Higher revision rate and mortality in the ORIF group, so the study was terminated early; hemiarthroplasty was superior to ORIF
Rogmark et al	I	ORIF Versus Hemiarthroplasty	-	Decreased length of surgery and hospital stay in the ORIF group but a higher complication rate; increased cost of ORIF over the first 2 years
Lu-Yao et al	I	ORIF Versus Hemiarthroplasty	Postoperative complications, mobility, mortality	Increased pain relief and decreased revision with hemiarthroplasty

ORIF = open reduction and internal fixation

Table 1. ORIF Versus Hemiarthroplasty For The Management Of Displaced Femoral Neck Fracture

fractures is associated with a greater number of significant problems (eg, osteonecrosis, nonunion, revision) than hemiarthroplasty. These risks outweigh the benefits of slightly shorter surgical times and marginally decreased blood loss. With similar mortality and pain scores, hemiarthroplasty appears to be the better option for displaced femoral neck fractures. However, other factors critical in the decision-making process, such as age, were not considered in most of these studies.⁷

The results in this patient indicate that bipolar hemiarthroplasty is the best option in cases of femoral neck fractures in the elderly who have a history of long-term oral steroid medication.

It has been one year since the patient underwent surgery, currently, the patient has no complaints in the form of limited movement, or pain at rest or during activity, and there are no balance problems when the patient walks.

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