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**Up-to-Date Management of Severe End-Stage Femoral Head Osteonecrosis,
Subcapital and Femoral Neck Fracture in Extreme Elderly Patient with Low
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2026- Five Case Series Report.**



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Up-to-Date Management of Severe End-Stage Femoral Head Osteonecrosis, Subcapital and Femoral Neck Fracture in Extreme Elderly Patient with Low Income Treated at Kisarawe District Hospital, Tanzania from July 2025 - May 2026- Five Case Series Report.

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Abstract.

Purpose: Our current case series reports aim to report injury, explain the mechanism of injury, its clinical presentation, current goal-standard treatment, prognosis and the short-term functional outcome. In Tanzania and other developing countries, most fracture and pathology around hip joint in elderly population are not well-reported.

Methodology: Convenience sampling method was used whereby 5 patients who were 61 to 90 years of age was approached with 4 having displaced femoral neck fractures and 1 with severe femoral head osteonecrosis. All underwent partial hip replacement or hemiarthroplasty; all patients enrolled in the study were ambulant without assistance before injury. The study was conducted in the orthopaedic department clinic and emergency department at Kisarawe Hospital.

Findings: A complete and displaced nonunion femoral neck fracture was identified with avascular femoral head with no sign of bone-to-bone union. It was therefore concluded that the preferred management of severe end-stage femoral head osteonecrosis, femoral neck and subcapital femoral fractures in extremely aged patients was open surgical removal of head and neck followed by replacement with total hip or partial hip arthroplasty. However, children and young adults need hip preservation surgery.

Unique Contribution to Theory, Practice and Policy: It is therefore recommended to orthopedic and trauma surgeon to take care for any patient with hip trauma in history taking, examination and radiological investigation to immediately diagnose the type of hip fracture or pathology and whether it is subcapital or femoral neck. In cases of severe end-stage osteonecrosis, subcapital or femoral neck fracture in extreme elderly patients, an emergency surgical posterior [Kocher-Langenbeck] or anterior [Watson-Jones] approach, etc., must be adopted immediately without delay to remove the avascular head and replace it with an artificial hip component [partial or total hip arthroplasty] depending on availability, experience and patient cost-effectiveness.

Keywords: *Femoral Head Osteonecrosis, Subcapital Femoral Fracture, Transcervical Femoral Neck Fracture, Bipolar Hemiarthroplasty. (Partial Hip Replacement).*

Introduction

Partial Hip Arthroplasty (PHA) Likewise Total Hip Arthroplasty (THA) are both common recommended surgical intervention for severe or end-stage Femoral Head Osteonecrosis (FHON) or Hip Osteoarthritis (HOA), femoral neck fractures in extremely aged patients, and it referred as an orthopaedic surgical procedure that significantly improves the quality of life for patients suffering from debilitating hip joint disorders, particularly among elderly patients.(Yokoo et al., 2026),(Garofalo et al., 2025)

A systematic review and meta-analysis reported that radiographic evidence of joint osteoarthritis (OA) has the highest prevalence in Europe, at 12.59%. Some research studies in the United States report that OA affects approximately 32.5 million adults (Garofalo et al., 2025)(Ciminello et al., 2026).

(THA) or Partial Hip Arthroplasty (PHA) are widely recommended and acceptable surgical procedures to restore mobility and relieve pain in patients with hip joint injury or disorders. (Pobozy et al., 2025) .Femoral neck fracture (FNF), subcapital femoral neck fracture (SCFNF) and femoral head osteonecrosis (FHON) are commonly encountered pathological conditions in orthopaedic practice and are considered to have a high tendency for mortality and also reduced mobility if not intervened.(Wu et al., 2026) (Peng et al., 2022).

Several researchers pointed out that fractures around the femoral neck have globally increased in the recent decade, and it is expected that the incidence rates of FNF will be continuously increasing in the coming three decades. (Peng et al., 2022). (Garofalo et al., 2025).

Femoral neck and sub capital fractures occur in any age group but often occur in elderly patients as a result of low-energy injury. They also rarely occur in the young population, but are associated with high-energy injury, especially motor or motorcycle accidents and falls from height. (Journal et al., 2026; Peng et al., 2022). Currently, the aim of treatment of FNF is to achieve early patient mobilization, reduce the risk of complications, and improve patient outcomes.(Kostretzis et al., 2025).(Yang et al., 2025)

The surgical methods are various according to the stability and orientation of the fracture and patient factors, mainly including arthroplasty and internal fixation. In contrast, conservative treatment may be a better option for those with poor general conditions accompanied by excessive surgical risk (Lucenti et al., 2025).(Ciminello et al., 2026)

The femoral head and neck receive their most blood from the medial femoral circumflex artery (MFCA), which provides about 70% to 80% of blood supply to the adult femoral head of its total circulation. Specifically, the deep branch (lateral epiphyseal artery complex) of the MFCA delivers most of this critical flow to the weight-bearing dome of the femoral head. When blood supply is blocked by kinking of a blood vessel, hematoma, capsular tamponade, or direct injury

of a blood vessel by trauma, it may result into avascular necrosis of the femoral head (AVN) (Ciminello et al., 2026), (Lucenti et al., 2025)

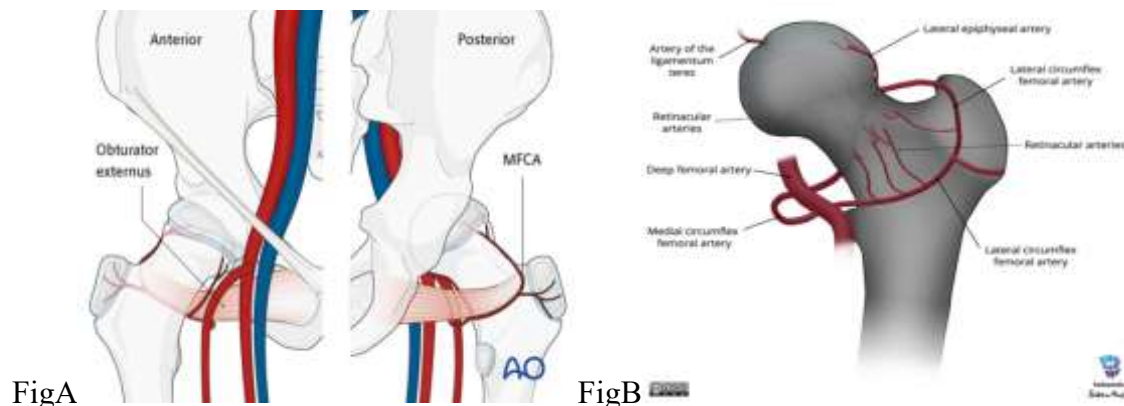


Fig A above: Vascular anatomy; <https://surgeryreference.aofoundation.org/orthopedic-trauma/pediatric-trauma/proximal-femur/further-reading/vascular-anatomy>.

Fig B above: Murphy A, Blood supply of the femoral head (illustration). Case study, Radiopaedia.org (Accessed on 06 Jun 2026) <https://doi.org/10.53347/rID-183513>

Pathological fractures in elderly patients are not uncommon, with reported injuries around the hip, which are normally sustained after a low-energy injury. This is a major global problem contributing to about (Kostretzis et al., 2025). Current study suggest new cases (incidence) of femoral head osteonecrosis in Tanzania but also similar study in the United States have been estimated to be (20000 to 30000) cases per year in the year 2022. (Lin et al., 2025).

The relationship between femoral head osteonecrosis in Tanzania and femoral neck fracture remains unclear due to the lack of published data. Several studies, including, suggest that femoral head osteonecrosis (FHON) is a pathological condition that causes irreversible death of cartilage and bone tissue due to insufficient or blocked blood supply to the femoral head, leading to subchondral collapse and eventually a femoral head fracture. (Kostretzis et al., 2025). (Mei et al., 2021)

Femoral head osteonecrosis mostly affects young and middle-aged individuals and the elderly; the condition is permanent and irreversible. Trans cervical or femoral neck fractures can occur in any age group in the population; nevertheless, they mostly occur in middle-aged and elderly people. (Peng et al., 2022).

Subcapital, transcervical, and intertrochanteric fractures are not uncommon pathological conditions reported in many studies. Several studies conducted in both developed and developing countries have shown that the prevalence of femoral neck fractures is estimated to be 53% among all proximal femur fractures. (Lu et al., 2026). (Pobozy et al., 2025),

The incidence of femoral neck and femoral shaft fractures ranges between 1-9%, but a few cases of occult femoral neck fractures, estimated at 30%, are undiagnosed. (Lin et al., 2025) Femoral neck fractures are common injuries to the proximal femur associated with increased risk of avascular necrosis (AVN) and high levels of patient morbidity and mortality. (Lin et al., 2025)

Current optional treatment modalities are generally operative with open reduction and internal fixation with cannulated hip screws in young and middle-aged patients, versus partial or total hip arthroplasty for the elderly patient above 60 years of age, and the patient's current activity demands and pre-injury mobility. (Kanis et al., 2012),(Peng et al., 2022).

Partial hip arthroplasty (PHA) or Total hip arthroplasty (THA) is a surgical procedure that involves surgical removal and replacing the damaged femoral neck and head with a prosthetic hip component. This includes a metal femoral stem inserted into the proximal femur and a prosthetic ball attached to the stem to the acetabulum cap, as explained by. (Choudhary et al., 2024)

Several studies suggest that the posterolateral approach has an increased risk of dislocations, but the anterolateral approach tends to increase hip abductor weakness. Both subcapital and trans cervical are extracapsular fractures; their management with total or partial hip replacement in elderly patients above 60 years does not differ. Partial hip arthroplasty (PHA), unlike total hip arthroplasty (THA), is cost-effective in low-income populations, especially in developing countries. (Choudhary et al., 2024)(Moretti & Post, 2017)

Currently, total hip replacement is an expensive procedure, more common in the United States of America and other developed countries, but is not performed in our hospital setting because of patient financial problems. The posterior approach has an increased risk of dislocation; the anterolateral approach has increased abductor weakness. A transcervical femoral neck fracture is an intracapsular fracture occurring through the middle portion of the femoral neck, often threatening the blood supply to the femoral head. (Pobozy et al., 2025)(Lucenti et al., 2025)

Typically resulting from falls in the elderly, it presents with groin pain, external rotation, and leg shortening. Urgent surgery is usually required to stabilise the hip(Pobozy et al., 2025). Most of the subcapital, trans cervical, and hip fractures are produced by direct force impact on the flexed hip in simple falls and automobile accidents. The fractures occur when the external force is great enough to cause the bone to break.(Zhang et al., 2025)

Case series report.

Between January 20Th, 2025, and May 10Th, 2026, we admitted five cases with severe pain around the hip joint. Four patients had fractures, and one had chronic hip pain.

Case 1. A 76-year-old male was brought to the emergency department (EMD) with a history of long-standing severe bilateral hip pain, which was not associated with trauma. Physical

examination revealed limping, no significant shortening and swelling of the right and left hips, tenderness, and restricted hip motion, with normal pedal pulses.

Case 2. A 73-year-old female was active, walking normally, and accidentally fell down in a squatting position, landed directly on her right hip with her knee flexed and abducted. Examination at (EMD) showed deformity and swelling around the right hip and proximal thigh contusion, positive axial tenderness, positive hip stress tests, severe hip pain and limited hip motion, but with normal neurovascular status.

Case 3. A 61-year-old female patient was brought in (EMD) with a history of being active, walking normally, sustained injury to her left hip joint after missed a step and a fall on her left hip side. Physical and radiological examination at (EMD) revealed left lower limb swelling, tenderness around the left hip joint and proximal thigh swelling. The axial load tenderness test was positive, and hip stress tests were positive. She presented with severe hip pain and limited hip motion, but her neurovascular status was normal.

Case 4. A 90-year-old female patient sustained injury to her right hip after fall. She was brought by ambulance from a nearby health center to our emergency department (EMD) with a history of isolated injury and acute onset of severe unilateral right hip pain, which was associated with trauma. Immediate physical and radiological examination revealed a closed transcervical fracture of the right femur, tenderness, restricted hip motion, and normal pedal pulses.

Case 5. A 75-year-old female who sustained injury to the right hip after missing a step and felt on a smooth tile surface. The patient was received at our emergency department (EMD) with an isolated traumatic injury to her right hip. Immediately, clinical and physical examinations were done in the emergency examination room (ER). Emergency radiological investigation was done; initial pelvic and femur X-ray was taken, which revealed femoral neck fracture.

All four patients presented with apparent shortening of the affected limb and posterior displacement of the leg, except the patient with bilateral severe osteonecrosis. The patient with trauma stayed for the first three months, receiving traditional treatment but without improvement.

Surgical Approach and Technique.

For all five cases, the posterolateral approach was opted, and the surgical incision started approximately 5cm below the greater trochanter (GT) to the lateral center of the femoral diaphysis. The incision went upward and proximally along the posterior border of the greater trochanter then bent towards the posterior superior iliac spine (PSIS) for about 5- 7 cm.

Skin and subcutaneous fat were incised deep to the tensor fasciae lata and iliotibial band (ITB), then a longitudinal incision was performed to split the tensor fascia lata and iliotibial band (ITB) proximally through the gluteus Maximus fibers.

We commonly use a Chanley retractor to hold the split gluteus Maximus in position. Then, a deep dissection was done to expose and identify the tendon of the piriformis and its related powerful short external rotators (SERs). Tendons of the piriformis muscle and other short SERs were detached from its point of insertion.

The detached tendon of the piriformis and SERs was retracted and reflected laterally and posteriorly with stay sutures and secured to the Chanley retractor. Carefully the sciatic nerve was retracted back together with the piriformis muscles and protected well. Then, the posterior hip capsule was identified and well visualised, and a T-shaped capsulotomy was performed to expose the femoral head and neck.

The next step was to remove the femoral head, followed by dislocating the hip by manipulating internal rotation of the leg. Still, reduction was difficult for one patient with severe end-stage osteonecrosis, whereby it was difficult to reduce, and additional release of the external rotators was done. In case of difficult dislocation despite all necessary steps, partial release of the gluteus maximus insertion and incision of the inferior capsule, together with release of the rectus femoris, helped with the femoral dislocation.

Difficult reduction frequently occurs in a severely contracted hip after revision arthroplasty and long-term neglect due to either financial constraints or lack of proper health education. The next step after dislocation was the femoral neck osteotomy using an oscillating saw. The lesser trochanter was preoperatively used as a landmark to determine the exact height of femoral osteotomies. Femoral retractors and external rotation were used to maximise clear visualisation and good exposure of the proximal femur. Punch (hollow chisel) osteotomy, Austin Moore rasp, and head impactor were used. A tight-fit bipolar hip prosthesis stem was inserted first into the femoral shaft; then a reduction maneuver was applied as the assistant surgeon performed continuous traction, and at the same time performed external rotation, and the surgeon impacted the head into the acetabular cap.

After successful component placement, the capsule and SERs were repaired using Vicryl monofilament sutures placed through three created trans osseous tunnels. The fascia lata, ITB, and gluteus Maximus were also closed with interrupted Vicryl sutures, followed by routine closure of the subcutaneous tissues and skin.

Surgical wound management.

Wound management started with repair of capsules and short external rotators (SERs) by using Vicryl monofilament (absorbable, braided, sterile, surgical suture) to the proximal femur through three trans-osseous drill holes. Vicky (absorbable) monofilament suture was used for fascia and subcutaneous tissue. Nylon No 2/0 was used for the skin, and wound dressing using sterile gauze was done and left in place for 48 hours for wound inspection. The patient was instructed to use a pillow between thigh adduction. To prevent early dislocation, the patient was given appropriate

health education about proper hip flexion, abduction, extension, internal and external rotation, and other activities in the early postoperative period. To reduce bleeding, tranexamic acid (TXA) was used



Fig2. Showing bilateral femoral head osteonecrosis, Post hip replacement x-ray and Transcervical fracture



Fig 3. Showing hip joint control x-ray with Bipolar hip replacement component with concentric reduction.



Fig 4 showing pre op and post op x-ray after partial hip replacement.



Fig 5, Above, showing intraoperative position and surgeon's pictures during procedure

Discussion

Our present case series report used one of the well-known surgical techniques, named partial hip replacement”, which was introduced. The technique used showed great promise as a safe, less invasive, cost-effective, and effective surgical option for severe end-stage femoral osteonecrosis and femoral neck fracture/short operative time, less trauma, a low rate of intra- and postoperative complications, and good functional recovery. (Zhang et al., 2025)

The key to treating subchondral necrosis is proper management of the collapsed area. In this study, we used partial hip replacement to precisely remove the femoral head and neck. Partial hip or total hip replacement surgery (partial /total hip arthroplasty) involves a surgical procedure to remove the femoral head and its neck remnant in the hip joint and replace them with an artificial proximal

femoral component (prosthesis) made of metal, ceramic, and plastic. (*Total Hip Replacement Surgery Guide*, n.d.), (Peng et al., 2022)

Our current case study on femoral head osteonecrosis, femoral neck fracture and subcapital fracture in the elderly population also had similar findings and management and should be taken as a serious orthopaedic injury which calls for emergency intervention by an expert and experienced orthopaedic and trauma surgeon. (Peng et al., 2022)

Our current report finds that all four cases were managed by using available partial hip arthroplasty (bipolar), which had similar outcomes as those treated with total hip arthroplasty. The number of elderly patients sustained injury around the hip joint as a result of a simple fall, which is a similar finding to other research done in the United States of America

In our study, we found mechanism of injury was injury from low energy after a simple fall which also had similar findings to studies done in the United States of America, China and the United Kingdom. The incidence of low-energy trauma cases is becoming increasingly common among the geriatric population.

Several studies and the literature review suggest that fractures in the elderly population are increasing as a result of low-energy traumatic injury such as a simple fall. (Ciminello et al., 2026), (Schade et al., 2020). A review of several published research articles suggests that there is an increasing number of elderly injuries as a result of low-energy traumatic injury.

Road traffic accidents are relatively common in elderly patients but also contribute a significant percentage of trauma. (Lucenti et al., 2025), (Pobozy et al., 2025). Many studies suggest low-energy injuries are becoming more common among elderly people after accidents. In patients with osteonecrosis, transcervical and subcapital femoral head fractures tend to experience severe pain from obvious injuries and osteoarthritis, leading to delayed diagnosis and treatment, which may result in serious complications. (Wu et al., 2026), (Kostretzis et al., 2025)

Even though the use of partial and total hip arthroplasty, as illustrated by (Clinic, 2013), (Maj et al., 2023), (Pobozy et al., 2025) has been widely accepted as the standard treatment modality for femoral head osteonecrosis and transcervical and subcapital fractures in elderly patients, which is similar to this study. (Ciminello et al., 2026) Several studies and literature reviews done in Italy by (Kostretzis et al., 2025) suggest the population stratum most affected by transcervicle femoral neck fractures (TFNF) was composed of women above 85 years of age, which is similar to our study (3:1) female (75%) to /male (25%) ratio with approximately 1400 cases per 100,000 in the year 2001 in study done in Italy (Ciminello et al., 2026), (George & Lane, 2022)

Other studies have reported cases of trans cervical fractures associated with femoral head fractures, as described by the Pipkin and Garden classification. reported a type IV transcervical fracture with displacement which is similar to some of our cases (Kostretzis et al., 2025). The current literature

suggests that traumatic hip fractures associated with low energy, especially in elderly patient is most common pathological condition. But in young individuals do get fracture around hip mechanism of injury is high energy, with males most affected (90.7%). The mean age was 34.4 years, with similar findings as those reported by. (Lu et al., 2026)

Conclusion. We designed a partial hip replacement procedure specifically for extreme elderly patients with subcapital fracture and femoral neck fractures, and one with severe end-stage osteonecrosis/severe femoral head osteonecrosis. Children and young elderly patients face great challenges regarding treatment, which emphasises hip preservation surgery.

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Declarations: Ethical approval and consent to participate in this study were obtained and authorised by the Kisarawe District Hospital ethical committee. Procedures were done well, and all principles of the Helsinki declaration and its guidelines were well observed.

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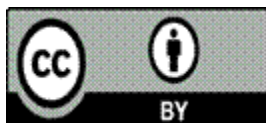
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