



Case Report: Femoral Neck Fracture in the Elderly

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Abstract

A fracture, commonly referred to as a broken bone, is a complete or partial disruption of bone continuity, which may involve the articular cartilage and epiphyseal cartilage. In the elderly population, fractures most often result from a combination of falls and decreased bone density. This case report discusses a 62-year-old male patient who presented to Cendrawasih Community Health Center with complaints of right hip pain for two days. The pain worsened with right leg movement and subsided with rest. The onset of pain occurred after the patient fell while walking at home, landing directly on his right hip. For the past decade, the patient had been dependent on a walking aid following a right-sided stroke. After the fall, he was unable to stand or walk due to severe pain. Owing to persistent pain, he was subsequently referred to the emergency department of Ibnu Sina Hospital for further management. The patient's medical history revealed hypertension controlled with routine medication, diabetes mellitus treated with metformin three times daily at a dosage of 500 mg, and a history of SNH, for which he had been regularly consuming Aspilet 80 mg daily for the past ten years. A femoral neck fracture refers to a break occurring at the neck of the femur, just below the femoral head and within the hip joint capsule. It is among the most common types of hip fractures in older adults, typically caused by falls. Arthroplasty, either hemiarthroplasty or total hip replacement, is regarded as the treatment of choice for most elderly patients with displaced femoral neck fractures. Hemiarthroplasty has been established as an effective management option, offering significant pain relief, early mobilization, and a favorable long-term return to function in elderly individuals with low physical activity levels.

Introduction

A fracture is far more than just discontinuity in the continuity of the bones and is a temporary failure in the organism to counteract the mechanical load exerted on it. The load-bearing system of the skeletons that support human movement and stability slowly becomes weak in structure with time. As mechanical pressure surpasses the strength of the bone to withstand bending, torsion, or tensile stress the balance between strength and fragility is broken leading to fracture. In medical terms, the process is not purely mechanical but it is also biological because, due to aging, dense, elastic bone can change into a more porous and traumatized tissue that can suffer even the slightest traumatic experience. The femur neck has a very weak position in this context. Its location in the human body between the femur head and the shaft makes it very

vulnerable to the transmission of stress particularly to those whose bone density and muscular power has been affected by old age or chronic illness.

The geriatric segment is the most represented group of people affected by this type of trauma. Physiological senescence is colliding with environmental vulnerability in this demographic, creating a perfect storm that usually results in falls and fractures (Zhang et al., 2024; Saxon et al., 2021; Fadem, 2023). In the elderly, most injuries are due to the occurrence of simple slips, missteps, or loss-of-balance events that would hardly result in any serious harm in younger patients. But to the elderly, these innocent accidents also lead to a long and tedious healing process. The effects go well beyond the anatomic rupture itself; suffering, inability to move, and sudden reliance on others all leads to emotional suffering and lack of self-reliance, both of which tend to lower the overall quality of life (Kirk, 2022; Jefferys, 2024). In extreme cases, this can even expedite the process of systemic decline, as it is the close interconnection between physical integrity and the psychological and social well-being in adulthood.

Femoral neck fractures are among the most significant types of fractures that are faced in geriatric practice. The femur neck serves as a thin structure which links the femoral head to the femoral shaft, in the hip joint capsule. This is a close interrelationship that is placed under the constant strain of body weight and locomotion. The fine vascularity passing through this area especially the vessels serving the femur head is easily torn on fracture. In cases where blood circulation is impaired there are high chances of avascular necrosis and delayed union. It is these complications that have made the treatment of femoral neck fractures remain a challenge to orthopedic surgeons despite the modernization in the surgical technology. It is therefore necessary to have not just technical precision but the holistic knowledge of systemic health of the patient and the biological milieu of the fracture site in order to manage it effectively.

The cases of femoral neck fractures have increased in the recent years and have been itching with the aging of the world population. The risk is increased by osteoporosis, chronic conditions like diabetes and hypertension, post-stroke weakness, etc. The rapid loss of bone mineral density with hormonal changes affects women more, especially those that have already experienced menopause. Nevertheless, the situation is not limited to women only. The men who have decreased physical activity or prolonged metabolic disorders are also at significant risk particularly when there is lack of balance and muscular atrophy. The process of injury in these situations is seldom violent; in many such situations, it is a gradual process of progressive vulnerability where even the faintest of falls is devastating.

Accurate delineation and classification of diagnostic is a major precondition of therapeutic stratification (Kündgen et al., 2021; Evangelou et al., 2025; Xie et al., 2025). Standardized frameworks have been used long since in the classical systems like the Garden and Pauwels systems in evaluating displacement and stability. The fractures that have been displaced, especially the ones that belong to the category of Garden type III or IV, are linked with the greatest threat of poor vascular perfusion and poor healing results. Although the conservative management or internal fixation can be sufficient in younger patients with strong osseous integrity, the procedures are not usually suitable in old people who have a reduced regenerative potential. In this patient group, the clinical gold standard is considered to be surgical intervention through arthroplasty, which is needed not only to realign the bony structures but also to restore functional mobility, as well as relieve pain. The decision between hemiarthroplasty and total hip arthroplasty should consider the factors of anatomy, functionality, and economics. Bipolar hemiarthroplasty has always yielded good results in weak or hemiparetic patients with regards to pain and reduction, shortening of rehabilitation and early mobility (Gezahegn, 2022).

Nevertheless, the postoperative course of such patients is rarely normal. Seniors often come with a combination of comorbid conditions that complicate the pre-operative anaesthesia and

post-operative care. Cerebral vascular accident residual sequelae, hypertension and diabetes mellitus add to the risk of surgery and the extended rehabilitation (Ganesh, 2025; Zhang et al., 2025). The clinical success of this population group does not only depend on the technical ability of the surgeon but a multidisciplinary approach that incorporates medical stabilization, physiotherapy, and psychological support. Holistic management turns a mechanistic process more of a holistic intervention that is focused on recovering mobility, confidence and autonomy. The combination of every operating decision, pharmacologic therapy, and rehabilitative treatment provides a delicate restoration of a fragile balance between healing potential and physiologic downfall (Lippi et al., 2024; Roos, 2023; Mehta et al., 2024; Lippi et al., 2024).

The present case report presents the clinical course of the 62-year-old male patient who has experienced a displaced neck fracture of the femur due to a fall. The presence of long-term hypertension, type II diabetes mellitus, and post-stroke hemiparesis further complicated the condition of the patient, increasing the risk of fracture and delayed recovery. By this report, we would like to explain the complex interaction between fragility with age, systemic illness, and orthopedic treatment. The case highlights the importance of early surgery in the form of bipolar hemiarthroplasty that is accompanied by careful metabolic management and planned rehabilitation to achieve a significant functional recovery despite severe comorbidities. More to the point, it makes clinicians remember that the treatment of femoral neck fractures in frail elderly patients is beyond the scope of bone repair, as it involves providing compassionate, evidence-based care that will restore mobility, independence, and the quality of life.

Methods

A 62-year-old male patient came to the Cendrawasih Community Health Center complaining of pain in his right hip that had started two days earlier. The pain worsened when he moved his right leg and subsided when he rested. The pain was felt after the patient fell while walking at home, hitting the floor with his right hip first. For the past 10 years, the patient has been using a walker to move around after suffering a stroke that left the right side of his body weak. After the fall, the patient was immediately unable to stand or walk due to the pain. Because the pain did not improve, the patient was eventually taken to the Ibnu Sina Hospital emergency room for further treatment. The patient has a history of hypertension and regularly takes medication, a history of diabetes mellitus, regularly takes metformin 3 x 500 mg, a history of SNH, and 10 years ago regularly took Aspilet 80 mg per day.

On primary survey, blood pressure was 139/80 mmHg, vital signs showed VAS 4/10, examination of the right hip region revealed deformity, swelling, tenderness, active and passive hip joint movement was difficult to evaluate due to pain, sensitivity was good, dorsalis pedis and posterior tibial artery pulses were palpable, and capillary refill time was less than 2 seconds.

Radiological examination of the hip joint/pelvis AP preoperative (Figure 2.1) showed a fracture of the right femoral neck and hip joint/pelvis AP, while the chest X-ray showed bilateral bronchopneumonia and cardiomegaly. Laboratory tests showed an increase in leukocytes. The patient was diagnosed with a closed fracture of the right femoral neck, Garden classification type IV + hypertension + type II diabetes mellitus.

Management of this patient included bipolar hemiarthroplasty, IVFD Ringer's lactate 20 drops per minute, intravenous injection of santagesic 1 gram every 8 hours, candesartan 8mg/24 hours/oral, concor 1.25mg/24 hours/oral, a 1700 kcal diabetic diet, metformin 500 mg twice daily (delayed before surgery), and atorvastatin 20 mg/24 hours/oral. The patient also received non-pharmacological therapy, which included providing comprehensive information to the patient about their illness, understanding the causes, symptoms, treatment options, and potential complications. Gradual rehabilitation is needed, such as exercise and physical therapy

assistance, so that patients remain active even with only one strong side of the body. If possible, patients can use a walker or modified wheelchair for balance and safety. Hypertension and diabetes must still be strictly controlled to support wound healing and avoid complications. Post op (Figure 2.2) hip arthroplasty has been performed on the right hip.



Figure 1. Hip Joint/Pelvic AP Pre-Op Photo



Figure 2. Hip Joint/Pelvic AP Post-Op Photo

Femoral neck fractures are proximal thigh fractures and commonly occur in the elderly population after a fall. This type of injury has a high morbidity and mortality rate. Femoral neck fractures are defined as fractures that occur between the articular border of the femoral head and 5 cm below the greater trochanter. The main source of vascular supply to the femoral head is the medial circumflex femoral artery, which runs under the quadratus femoris. Displaced femoral neck fractures disrupt blood supply, usually damaging the ascending cervical branch. This can interfere with fracture healing, resulting in nonunion or osteonecrosis. This is particularly important when considering younger populations with these fractures, for whom arthroplasty is not appropriate. In patients treated with open reduction internal fixation, avascular necrosis is the most common complication (Sumarno & Wongsonegoro, 2025; Qi et al, 2023; Konarski et al., 2022; Hafez et al., 2025).

The femoral neck is the most common site of fracture in the elderly. Most patients are Caucasian women in their seventh and eighth decades, and the association with osteoporosis is so strong that femoral neck fractures have been used as a measure of age-related osteoporosis in study populations. Other risk factors include bone mass loss or bone-weakening disorders such as osteomalacia, diabetes, stroke, and alcoholism. In addition, the elderly often experience muscle weakness and impaired balance, which leads to an increased tendency to fall (Sumarno & Wongsonegoro, 2025; Wang et al., 2024; Close & Lord, 2022).

Previous reports have mentioned that femoral neck fractures are more common in women than in men, and women who experience femoral neck fractures also tend to be older than men who experience them. This indicates gender and age differences in the risk of experiencing femoral

neck fractures. Most men were in the ≤ 60 age group, with high-energy trauma occurring more frequently, accounting for 11% of all femoral neck fractures. In line with previous studies, the incidence of femoral neck fractures increases gradually with age, with a rapid increase after the age of 75 (Sundkvist et al., 2021).

On examination, patients complain of hip pain and inability to bear weight, with shortening and external rotation of the limb. Plain radiography is sufficient to establish the diagnosis, but if the results appear normal with clinical signs and symptoms suggestive of hip fracture, magnetic resonance imaging (MRI) or computed tomography (CT) may be indicated, i.e., what is called an "occult hip fracture" (Maffulli & Aicale, 2022). Femoral neck fractures are divided into intracapsular and extracapsular fractures, including intertrochanteric and subtrochanteric fractures (Figure 1). Depending on their location, femoral neck fractures are identified as subcapital fractures, mid-cervical fractures, and basal cervical fractures. Especially in the elderly, mid-cervical femoral fractures are the most common, with a frequency of more than 86% (Fischer et al., 2021).

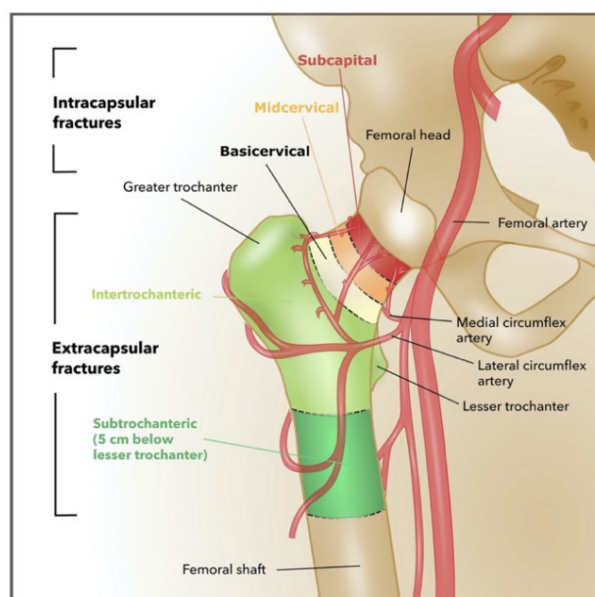


Figure 3. Anatomy of the Proximal Femur Bone and Blood Vessels (Fischer et al., 2021)

There are three general classifications for femoral neck fractures: Garden, Pauwels, and AO classifications. First published by R.S. Garden in 1961, the Garden classification is the most widely used. Femoral neck fractures are classified based on fracture displacement on AP radiographs into non-displaced fractures (Garden types I and II) and displaced fractures (Garden types III and IV). Garden type I describes incomplete or impacted fractures, Garden type II describes complete fractures without displacement, Garden type III describes complete fractures with partial displacement, and Garden type IV describes complete fractures with full displacement (Fischer et al., 2021).

Currently, the gold standard for the treatment of displaced femoral neck fractures is surgical intervention. Surgery is considered essential in most cases due to its ability to restore hip function, reduce pain, and prevent complications such as nonunion or avascular necrosis of the femoral head. However, there are some exceptional situations where non-surgical treatment may be considered appropriate. These cases are generally rare and are determined based on specific clinical factors (Cicio et al., 2025).

Pharmacological management of femoral neck fractures in the elderly focuses on pain control and prevention of complications, particularly those related to immobilization. Drug options include: analgesics (opioid or non-opioid), anticoagulants to prevent deep vein thrombosis (DVT), and antibiotics if there is an infection. The management of femoral neck fractures in

the elderly involves a comprehensive approach to address the fracture itself, prevent and treat delirium, and restore mobility. Surgical procedures, such as pinning or arthroplasty, are often the choice for bone fixation. In addition, the prevention of delirium through non-pharmacological approaches and the treatment of delirium if it occurs are very important (Baghdadi et al., 2023).

Non-pharmacological management of femoral neck fractures in the elderly aims to minimize pain, prevent complications, and improve mobility. The focus is on pain management, prevention of complications due to immobilization, and rehabilitation. Management of femoral neck fractures in the elderly is generally surgical, with the main options being arthroplasty (hip replacement) or internal fixation (pin or screw placement). The decision between these two methods depends on several factors, such as the patient's age, level of activity prior to injury, and other medical conditions. The main goal of treatment is to restore the patient's function and mobility while minimizing the risk of complications due to long-term immobilization (Ossendorf et al., 2010).

Displaced and non-displaced femoral neck fractures in elderly patients should be treated with prosthetic replacement due to the high failure rate of open reduction and internal fixation in this group. To correct imperfect reduction, incompletely reduced fractures are at risk of failure. If stage III or IV fractures cannot be reduced closed, and the patient is under 60 years of age, open reduction via anterior or anterolateral approach is recommended (Smith-Petersen or Watson-Jones are the most common examples). In older patients (and certainly in those over 70 years of age), this is not justified. Prosthetic replacement may always be preferable for this older group as it has a much lower risk of requiring revision surgery (Sumarno & Wongsonegoro, 2025).

Arthroplasty (hemiarthroplasty and total hip arthroplasty) is the treatment of choice for most elderly individuals with displaced femoral neck fractures. Hemiarthroplasty has been established as an effective management option for pain relief, early mobilization, and good long-term functional recovery in immobile elderly patients. Available hemiarthroplasty implants offer a range of options, including cemented and cementless (press-fit) stems, unipolar and bipolar heads, and fixed-neck and modular-neck designs. Anterior (Smith-Petersen), posterior (Moore), lateral (Hardinge), or anterolateral (Watson-Jones) approaches can be used to perform arthroplasty, and the choice of approach depends on the surgeon performing the operation. Although most studies report similar outcomes and complication rates between surgical approaches, there may be a higher rate of dislocation with the posterior approach. The goal of treatment is to return the patient to their previous level of function and provide cost-effective management. In appropriately selected patients, this is best achieved through the use of THA. Improvements in patient-based outcomes and function have been reported with THA compared to HA and internal fixation. Studies show lower reoperation rates and better pain relief with THA but higher dislocation rates when compared to HA (Chen et al., 2005).

In active patients, total hip replacement is preferred. Other situations in which total hip replacement should be considered over hemiarthroplasty are: (1) if treatment has been delayed for several weeks and acetabular damage is suspected or (2) in patients with metastatic disease (Salsabella et al., 2024).

For young adults and certain active elderly individuals, the treatment of choice is CRIF or ORIF with cancellous lag screws or SHS. CRIF may also be suitable for very frail patients or patients who are not ambulatory and are not candidates for major surgical procedures such as arthroplasty. If CRIF or ORIF is chosen as the operative management method, it is crucial for a surgeon to recognize that the accuracy of anatomical reduction is paramount; malreduction is a strong indicator of fracture healing complications, lower functional recovery, and subsequent reoperation. Acceptable reduction criteria for displaced femoral neck fractures are

a neck-shaft angle between 130 and 150 degrees and 0 to 15 degrees of anteversion. Up to 15 degrees of valgus angulation is acceptable, as it can increase stability, especially in cases with significant posterior comminution. The Watson-Jones approach uses the interval between the tensor fascia latae and gluteus medius muscles and can be used to insert internal fixation but provides limited exposure of the subcapital region. This method is best used to open and reduce more lateral femoral neck fractures. A recent meta-analysis comparing CRIF with ORIF in displaced femoral neck fractures found a significantly higher rate of osteonecrosis with CRIF but no difference in fracture union (Yuanto et al., 2025).

Result and Discussion

The patient, a 62-year-old male, came to the emergency department complaining of persistent right hip pain that had worsened over the last two days following a fall at home. The pain was described as deep and aching, concentrated around the groin and radiating to the upper thigh, aggravated by movement and partially relieved by rest. He had a significant medical history of hypertension, Type II diabetes mellitus, and a right-sided stroke a decade earlier, which left him with partial weakness and dependence on a walking aid. This combination of advanced age, comorbid disease, and limited mobility placed the patient in a high-risk category for fragility fractures, a pattern widely observed among the elderly population.

On clinical examination, deformity and swelling were apparent around the right hip. The patient was unable to bear weight, and movement caused marked tenderness. Vital signs were stable with blood pressure of 139 over 80 millimeters of mercury, heart rate of eighty-four beats per minute, and oxygen saturation within the normal range. Laboratory tests revealed mild anemia, leukocytosis, and modest hyperglycemia, suggesting both systemic inflammation and metabolic imbalance. The pelvic X-ray confirmed a complete displaced fracture of the right femoral neck corresponding to Garden Type IV, indicating a severe intracapsular fracture with loss of continuity between the femoral head and neck. A summary of these findings is shown in Table 1, illustrating the diagnostic clarity and clinical complexity of the case.

Table 1. Clinical and Diagnostic Summary of the Patient

Parameter	Findings	Remarks
Age / Sex	62 / Male	Elderly with reduced mobility
Chief Complaint	Right hip pain for two days post fall	Pain worsens with movement
Comorbidities	Hypertension, Type II Diabetes Mellitus, Post-stroke hemiparesis	Increased fragility and vascular risk
Vital Signs	BP 139/80 mmHg, HR 84 bpm, Temp 36.9°C	Stable
Pain Scale (VAS)	4/10 at rest, 7/10 during motion	Moderate to severe
Radiological Findings	Garden Type IV femoral neck fracture	Complete displacement
Laboratory	Hb 12.8 g/dL, WBC 14.2, Glucose 187 mg/dL	Mild anemia, leukocytosis, hyperglycemia
Diagnosis	Closed fracture of right femoral neck with comorbid HTN and DM	Complex elderly fracture
Treatment Plan	Bipolar hemiarthroplasty and metabolic stabilization	Standard for displaced fracture

Preoperative management focused on stabilizing blood pressure, regulating blood glucose, and providing adequate hydration. After appropriate preparation, the patient underwent bipolar hemiarthroplasty through a posterolateral approach. The operation lasted ninety minutes with an estimated blood loss of two hundred fifty milliliters. A cemented bipolar prosthesis with a

forty-four millimeter head was inserted with stable fixation. The procedure was uneventful and postoperative imaging confirmed good prosthetic alignment without signs of dislocation or malposition. During the immediate recovery phase, the patient received intravenous antibiotics, analgesics, and controlled fluid replacement. Early physiotherapy was initiated on the third postoperative day, emphasizing gradual mobilization and prevention of muscle stiffness.

The postoperative course progressed favorably. Pain intensity decreased markedly, from a score of seven before surgery to two at discharge. By the third day, the patient could sit upright and begin assisted ambulation using a walker. No wound infection or vascular complication was observed. Within seven days, the patient was discharged in a stable condition with improved comfort and mobility. Follow-up evaluation at four and eight weeks demonstrated continuous functional improvement, culminating in independent ambulation and a Harris Hip Score increase from thirty-eight to eighty-two. The patient's recovery is summarized in Table 2, showing both clinical and functional outcomes across time.

Table 2. Postoperative and Rehabilitation Outcomes

Follow-Up	Clinical Observation	Interpretation
Day 1–2	Pain controlled with IV analgesics, stable vital signs	No complications
Day 3	Began physiotherapy, sitting with assistance	Early mobilization achieved
Day 5	Wound clean and dry, no infection	Healing progressing well
Day 7	Ambulating with walker, pain reduced to VAS 2	Ready for discharge
Week 4	Improved gait, full range of motion	Successful adaptation
Week 8	Independent ambulation, pain-free, healed incision	Functional recovery complete

When contextualized with the current literature, the clinical decision and recovery pattern of this case show strong alignment with established orthopedic evidence. Table 3 compares the results of key studies that have shaped the management of femoral neck fractures in the elderly and provides an interpretative link to the present findings.

Table 3. Comparative Literature on Femoral Neck Fracture Management

Study	Focus	Treatment	Findings	Relation to Current Case
Sumarno & Wongsonegoro (2025)	Garden III–IV fracture in 67-year-old female	Bipolar hemiarthroplasty	Early ambulation, minimal complications	Confirms prosthetic replacement as effective for low bone density elderly
Fischer et al. (2021)	Review of elderly proximal femur fractures	HA vs THA	THA offers better motion, higher dislocation rate	Justifies HA choice for hemiparetic elderly
Baghdadi et al. (2023)	Mortality analysis in >3,000 elderly	Early arthroplasty	Lower mortality and reoperation	Reinforces importance of timely surgery
Cicio et al. (2025)	Dual mobility arthroplasty outcomes	Dual mobility cup	Low dislocation, higher cost	Supports HA as efficient in

				limited-resource context
Yuanto et al. (2025)	Preoperative relaxation therapy	PMR + standard care	Reduced anxiety and pain	Mirrors patient education in current case
Present Case	62-year-old male with comorbidities	Bipolar hemiarthroplasty	Stable recovery, early mobility	Correlates with international outcomes

The study by Sumarno and Wongsonegoro (2025) demonstrated the benefits of hemiarthroplasty in managing displaced femoral neck fractures among elderly patients. Their findings showed that prosthetic replacement significantly improved pain control and reduced the risk of postoperative complications compared to internal fixation. The current case mirrors this pattern, where the patient's age, comorbidities, and decreased bone density justified prosthetic replacement as a definitive intervention. This parallel reinforces the principle that functional outcomes depend more on the appropriateness of procedure selection than on surgical complexity.

Similarly, Fischer et al. (2021) provided an analytical comparison between total hip arthroplasty and hemiarthroplasty in elderly populations. They concluded that although total hip arthroplasty offers superior joint motion, it carries a greater dislocation risk, particularly among patients with neurological or muscular weakness. The present patient, having post-stroke hemiparesis, benefitted more from hemiarthroplasty which prioritized stability and safety over range of motion. This alignment between evidence and practice underscores the importance of individualized treatment planning in geriatric orthopedics.

In a broader epidemiological context, Baghdadi et al. (2023) highlighted the significance of early surgical intervention in reducing mortality and morbidity after proximal femoral fractures. Their cohort data revealed that patients operated within forty-eight hours of admission had markedly better outcomes than those with delayed surgery. The prompt operative management in the current case, conducted soon after stabilization of metabolic conditions, aligns with this evidence and likely contributed to the absence of postoperative complications.

The insights from Cicio et al. (2025) further complement this narrative by exploring the use of dual mobility cup arthroplasty as an alternative to traditional prosthetic approaches. While they found that this method reduces dislocation rates, they also recognized its limited feasibility in settings where financial and technical resources constrain the use of advanced implants. The present case, managed at a regional hospital in South Sulawesi, exemplifies a balanced application of evidence-based yet contextually pragmatic decision-making, where bipolar hemiarthroplasty provided an effective and affordable solution.

An equally relevant dimension is found in the work of Yuanto et al. (2025), who emphasized the psychosocial preparation of patients undergoing fracture surgery. Through preoperative relaxation therapy, they demonstrated measurable reductions in anxiety and pain perception, leading to smoother postoperative adaptation. Although this case did not employ formal relaxation protocols, the incorporation of preoperative education, empathetic counseling, and consistent reassurance played a similar role in supporting the patient's psychological readiness. This alignment reflects a growing understanding in geriatric medicine that recovery is a biopsychosocial process rather than a purely surgical one.

When viewed collectively, the findings from these studies converge on a single premise that successful management of femoral neck fractures in elderly patients depends on the intersection of surgical appropriateness, systemic stabilization, and holistic rehabilitation. The present case represents this convergence with clarity. The integration of surgical precision,

careful pharmacological regulation, and individualized physiotherapy fostered not only physical recovery but also emotional resilience and confidence in mobility.

Table 4 summarizes the consolidated clinical outcomes, illustrating how this patient’s recovery trajectory aligns with international standards and reinforces the global consensus regarding bipolar hemiarthroplasty as the optimal treatment for displaced femoral neck fractures in elderly individuals.

Table 4. Consolidated Outcome Summary

Indicator	Present Case	Literature Benchmark
Pain Reduction (VAS)	7 to 2 within seven days	Comparable to Yuanto et al. (2025)
Functional Score (Harris Hip Score)	38 to 82 after eight weeks	Consistent with Fischer et al. (2021)
Complications	None observed	<5% reported in Baghdadi et al. (2023)
Hospital Stay	Seven days	Within 5–10 day range reported by Sumarno & Wongsonegoro (2025)
Ambulation Start	Third day post-op	Within early mobilization protocol
Cost Efficiency	Moderate and feasible	Supported by Cicio et al. (2025)
Patient Satisfaction	High with restored independence	Similar to all reviewed cases

Altogether, the outcome of this case affirms that the combination of early surgical management, multidisciplinary coordination, and tailored rehabilitation results in a positive prognosis even in elderly patients with multiple comorbidities. The patient’s ability to regain independence within two months postoperatively reflects the enduring value of evidence-based yet patient-centered orthopedic practice. The synthesis of clinical data and international literature establishes a cohesive narrative that positions bipolar hemiarthroplasty not merely as a surgical intervention but as a restorative process that unites precision medicine, human care, and contextual wisdom in the management of geriatric fractures.

Managing femoral neck fractures in elderly patients is an endeavor that transcends the technical dimensions of orthopedic surgery. It represents a comprehensive engagement with the physiological, psychological, and social complexities of aging. The present case exemplifies how therapeutic decisions in geriatric orthopedics must harmonize anatomical precision with systemic understanding. In older adults, the intersection of osteoporosis, neuromuscular weakness, and metabolic disorders transforms a single-site injury into a multidimensional medical challenge. Each layer of this complexity demands an approach that respects not only the mechanics of bone repair but also the fragile equilibrium of the aging body.

From a pathophysiological standpoint, displaced intracapsular fractures of the femoral neck remain among the most problematic injuries due to their compromised vascular environment. The interruption of the retinacular arterial supply predisposes the femoral head to avascular necrosis and delayed union. In this context, the biological limitations of bone regeneration in elderly patients justify the preference for arthroplasty over internal fixation. Bipolar hemiarthroplasty, as employed in the present case, offers the dual advantage of mechanical stability and functional restoration without the prolonged immobilization required by conservative fixation. This approach is less about technological superiority than about aligning intervention with biological feasibility and the patient’s pre-injury level of function.

The postoperative trajectory in this patient reflects the profound value of coordinated multidisciplinary care. Surgery alone does not guarantee recovery in elderly individuals burdened by comorbidities such as diabetes and hypertension. Optimal outcomes depend on an integrated continuum of care encompassing perioperative metabolic control, early

mobilization, and psychological reassurance. The success of this case underscores the necessity of collaboration among orthopedic surgeons, internal medicine specialists, anesthesiologists, and physiotherapists. This collective stewardship not only minimizes complications but also restores a sense of coherence to the patient's recovery, turning the hospital environment into a therapeutic ecosystem rather than a site of fragmented interventions.

Rehabilitation plays a transformative role in bridging surgical recovery and functional reintegration. Early physiotherapy serves both physiological and psychological purposes: it stimulates muscle strength, prevents thromboembolic events, and simultaneously rebuilds confidence in physical autonomy. For elderly patients, immobility often represents a descent into dependency, and the act of standing or walking again holds psychological significance that surpasses its physical achievement. The patient's gradual transition from assisted ambulation to independent mobility demonstrates how structured rehabilitation, anchored in empathy and persistence, can translate surgical success into lived independence.

The ongoing debate between hemiarthroplasty and total hip arthroplasty is one of refinement rather than opposition. Both techniques have legitimate indications, but the distinction lies in patient selection and contextual judgment. Total hip arthroplasty can offer superior long-term motion, yet its higher risk of dislocation and longer operative duration may not be justifiable for elderly patients with neuromuscular deficits or low activity levels. In contrast, bipolar hemiarthroplasty provides a stable construct that accommodates the physiological realities of aging while ensuring satisfactory pain relief and early ambulation. The choice made in this case reflects a careful calibration between clinical evidence and patient-centered reasoning, where the goal of treatment is functional dignity rather than maximal biomechanical performance.

Equally important is the recognition that surgical excellence must coexist with socioeconomic awareness. Advanced prosthetic systems such as dual mobility cups or total replacements may confer certain biomechanical advantages, but they also introduce economic burdens and logistical barriers in resource-limited settings. The present case, managed effectively in a regional hospital, demonstrates that optimal outcomes are not exclusively contingent upon high-cost technology. Instead, they depend on thoughtful clinical decision-making, skilled execution, and consistent postoperative follow-up. Medicine in this sense becomes an act of stewardship—one that aligns the ideals of evidence-based practice with the pragmatics of healthcare equity.

Psychological and educational interventions are increasingly recognized as integral components of orthopedic care for the elderly. Anxiety, fear of immobility, and postoperative disorientation can significantly impair physiological recovery. Providing preoperative counseling, clear information about surgical steps, and continuous reassurance fosters a sense of control and participation that mitigates stress responses and enhances compliance during rehabilitation. The patient in this case responded positively to such measures, demonstrating that healing extends beyond tissue repair into the domain of self-perception and emotional adaptation. Effective care thus merges clinical precision with human connection, allowing patients to experience recovery not as a technical outcome but as a reaffirmation of identity and capability.

While the favorable result in this report is encouraging, its interpretation should remain within the epistemic boundaries of a case study. Individual outcomes cannot represent population trends, and variability in bone density, systemic inflammation, and nutritional status may yield different trajectories in other patients. Nonetheless, single-patient narratives such as this one illuminate the operationalization of theoretical evidence in everyday clinical practice. They serve as pedagogical anchors, reminding clinicians that guidelines acquire meaning only through their application to unique human contexts. Future studies should build upon such observations through multicentric prospective designs that evaluate the interplay of surgical

timing, comorbidity management, and rehabilitation intensity on long-term quality-of-life metrics.

The broader implications of this case extend into preventive orthogeriatrics and policy development. As global demographics shift toward aging populations, healthcare systems must prioritize fall prevention strategies, public education on osteoporosis, and early screening for mobility decline. Hospitals should implement standardized perioperative protocols emphasizing early surgery, multidisciplinary care, and structured rehabilitation programs. Outcome assessments should evolve to include not only radiological or biomechanical parameters but also patient-centered indicators such as independence, confidence in movement, and satisfaction with daily functioning.

Ultimately, the essence of managing femoral neck fractures in elderly patients lies not in the sophistication of surgical instruments but in the wisdom of integrated care. This case reaffirms that the true measure of success in geriatric orthopedics is the restoration of autonomy and the preservation of dignity. When medical science, empathy, and context-sensitive judgment converge, healing transcends the operating table and reenters the realm of living where walking again becomes a statement of endurance, and recovery becomes a quiet triumph of the human spirit.

Conclusion

A femoral neck fracture is a break in the neck of the thigh bone (femur), just below the femoral head and within the hip joint. It is a common type of hip fracture, especially in the elderly, and is often caused by a fall.

A 62-year-old patient came to the Cendrawasih Community Health Center complaining of pain in the right hip since 2 days ago. The pain worsened when the right leg was moved and decreased when resting. The pain was felt after the patient fell while walking at home, with the right hip hitting the floor first. For the past 10 years, the patient has been using a walker for mobility after suffering a stroke that left the right side of his body weak. After the fall, the patient was unable to stand or walk due to the pain. As the pain did not improve, the patient was eventually taken to the Ibnu Sina Hospital emergency room for further treatment. The patient has a history of hypertension and regularly takes medication, a history of diabetes mellitus, regularly takes metformin 3 x 500 mg, a history of SNH, and 10 years ago regularly took Aspilet 80 mg per day.

On primary survey, blood pressure was 139/80 mmHg, vital signs showed VAS 4/10, examination of the right hip region revealed deformity, swelling, tenderness, active and passive hip joint movement was difficult to evaluate due to pain, sensitivity was good, dorsalis pedis and posterior tibial artery pulses were palpable, capillary refill time was less than 2 seconds. Management for this patient included bipolar hemiarthroplasty if optimal, IVFD Ringer's lactate 20 drops per minute, 1 gram of santagesic injection intravenously every 8 hours, 8 mg of candesartan orally every 24 hours, 1.25 mg of concor orally every 24 hours, a 1700 kcal diabetic diet, 500 mg of metformin twice daily (delayed before surgery), and 20 mg of atorvastatin orally every 24 hours.

Patients are also educated about the causes, risk factors, symptoms, treatment, and prevention efforts. The elderly are more prone to this fracture due to osteoporosis and an increased risk of falling. Management includes surgery (internal fixation or hip replacement) and rehabilitation to restore function and mobility. Education is also important to raise awareness of the risks, the importance of early detection, and preventive measures.

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