Journal of Orthopaedics Study and Sports Medicine

Genesis-JOSSM-3(1)-29
Volume 3 | Issue 1
Open Access

Complex Cementless Hemiarthroplasty Following Removal of a First-Generation Cephalomedullary Nail in a Young Patient: A Case Report

Hatim Alshareef[1*], Ahmed Mosa Ahmed Alzahrany[2] and Ahmed Abdelfattah Essa Elbarbary[3]

[1]Consultant Orthopedic, Sports Medicine & Arthroscopic Surgery, Arthroplasty & Lower Limb Reconstruction Surgery, King fahd armed forces hospital

[2]Saudi Orthopedic Resident, Saudi German hospital- Jeddah

[3]Orthopedic Senior Registrar, King Fahad Army Force Hospital

***Corresponding author:** Hatim Alshareef, Reconstruction Surgery, King fahd armed forces hospital.

Citation: Alshareef H, Ahmed Alzahrany AM, Essa Elbarbary AA. Complex Cementless Hemiarthroplasty Following Removal of a First-Generation Cephalomedullary Nail in a Young Patient: A Case Report. J Orthop Study Sports Med. 3(1):1-04.

Received: February 09, 2026 | **Published:** February 20, 2026

Abstract

Displaced femoral neck fractures in young adults pose significant management challenges, particularly in the presence of retained femoral intramedullary hardware. While head-preserving fixation is generally preferred, arthroplasty may be required in selected cases due to fracture characteristics, implant-related constraints, or patient-specific factors. Conversion arthroplasty following long-standing intramedullary fixation is technically demanding and associated with increased operative complexity. We report a rare and complex case of cementless hemiarthroplasty performed in a 39-year-old male following removal of a first-generation cephalomedullary nail implanted 15 years earlier. The case highlights the technical challenges of nail extraction, altered femoral canal anatomy, and decision-making in young patients. With meticulous preoperative planning, availability of specialized extraction instruments, and careful surgical technique, satisfactory early clinical outcomes were achieved. This case underscores the importance of individualized treatment strategies in complex femoral neck fractures with retained intramedullary implants.

Keywords

Complex Cementless Hemiarthroplasty; Cephalomedullary nail; Conversion arthroplasty.

Introduction

Femoral neck fractures in young adults are uncommon and typically result from high-energy trauma. Preservation of the native femoral head through internal fixation is generally advocated in this population to avoid the long-term consequences of arthroplasty. However, the presence of retained femoral implants, fracture displacement, compromised bone quality, or patient preference may necessitate arthroplasty as a salvage option. Conversion arthroplasty following previous femoral intramedullary nailing is associated with higher rates of complications, prolonged operative time, and technical difficulty compared with primary arthroplasty. First-generation cephalomedullary nails, in particular, lack modern extraction features, making removal challenging. This case report describes a technically demanding cementless hemiarthroplasty following removal of a first-generation cephalomedullary nail in a young patient.

Case Presentation–History

A 39-year-old male was transferred from another hospital following a road traffic accident. Radiographic evaluation demonstrated a displaced fracture of the right femoral neck. The patient had a significant orthopedic history of a right femoral midshaft fracture sustained 15 years earlier, which had been treated with a first-generation cephalomedullary intramedullary nail that remained in situ. Prior to the current injury, the patient was fully ambulatory, pain-free, and functionally independent. After thorough discussion of treatment options, including internal fixation and arthroplasty, the patient elected to proceed with hemiarthroplasty.

Physical examination

On admission, the patient was hemodynamically stable. Examination of the right lower limb revealed shortening and external rotation. There was marked tenderness over the hip with severe pain on attempted range of motion. No open wounds or signs of infection were present. Distal neurovascular examination was normal.

Imaging findings

Anteroposterior radiographs of the pelvis and right femur confirmed a displaced femoral neck fracture with a retained first-generation cephalomedullary nail, including proximal and distal locking screws. Significant bony overgrowth was noted around the proximal nail entry point, consistent with long-standing osseointegration.

Surgical technique

Surgery was performed under general anesthesia using a standard lateral approach to the hip. Removal of the cephalomedullary nail was technically challenging due to extensive bony overgrowth and the absence of a modular extraction interface. Conventional extraction techniques failed. A specialized intramedullary nail extraction system was employed, allowing controlled disengagement and safe removal of the implant without iatrogenic femoral fracture. Following nail removal, the femoral canal was carefully prepared, taking into consideration altered anatomy and sclerosis. A cementless hemiarthroplasty stem was implanted, achieving secure press-fit fixation, appropriate leg length restoration, and stable hip biomechanics.

Postoperative course

The patient was mobilized early with weight bearing as tolerated under physiotherapy supervision. The postoperative course was uneventful, with no early complications such as periprosthetic fracture, infection, or dislocation. Wound healing was satisfactory, and the patient demonstrated good early functional recovery.

Discussion

Arthroplasty following previous femoral intramedullary fixation presents unique technical challenges. These include difficult implant extraction, distorted femoral canal anatomy, increased risk of intraoperative fracture, and higher blood loss. Studies have demonstrated inferior outcomes and higher complication rates for conversion arthroplasty compared with primary procedures. First-generation cephalomedullary nails further compound these challenges due to limited extraction options. In young patients, cementless hemiarthroplasty may be considered when acetabular cartilage is preserved and total hip arthroplasty is not immediately indicated. Careful patient selection, meticulous surgical technique, and availability of specialized instruments are essential to optimize outcomes.

Conclusion

Cementless hemiarthroplasty following removal of a long-standing first-generation cephalomedullary nail in a young patient is feasible but highly technically demanding. Surgeons should anticipate extraction difficulties and altered femoral anatomy. Individualized decision-making, thorough preoperative planning, and appropriate implant selection are critical to achieving favorable outcomes in such complex cases.

Figure 1: AT admission shows displace neck of femur fracture with 1 st generation cephalomedullay nail

Figure 2: post op day 1 x ray shows hemiarthroplasty with prophylaxis cerclage wires

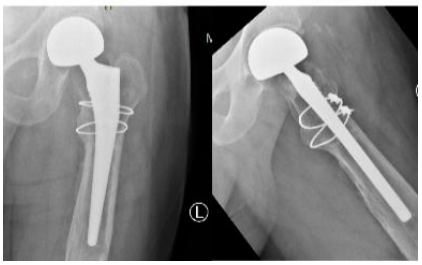

Figure 3: post op 1 year shows stable hemiarthroplasty

References

1. Slobogean GP, Sprague SA, Scott T, Bhandari M. (2015) Management of young femoral neck fractures: is there a consensus? Injury. 46(3):435-40.
2. Haidukewych GJ, Berry DJ. (2003) Hip arthroplasty for salvage of failed treatment of proximal femoral fractures. J Bone Joint Surg Am. 85(5):899–904.
3. Mortazavi SMJ, Greenky M, Bican O, Kane P, Parvizi J. (2012) Total hip arthroplasty after prior surgical treatment of hip fracture is associated with inferior outcomes. J Arthroplasty. 27(3):424-29.
4. Archibeck MJ, Carothers JT, Tripuraneni KR, White RE Jr. (2013) Total hip arthroplasty after failed internal fixation of proximal femoral fractures. J Arthroplasty. 28(1):168-71.
5. Zlowodzki M, Ayieni O, Petrisor BA, Bhandari M. (2008) Femoral neck shortening after internal fixation of femoral neck fractures. Injury. 239(7):817-26.
6. Enocson A, Lapidus LJ. (2012) The vertical hip fracture: a treatment challenge. Injury. 43(6):965-70.
7. Abdel MP, Cottino U, Mabry TM. (2016) Management of femoral neck fractures in young patients. J Am Acad Orthop Surg. 24(12):e201-e209.
8. Schwarzkopf R, Oni JK, Marwin SE. (2014) Total hip arthroplasty after prior femoral fracture surgery. Orthop Clin North Am. 45(2):243-54.