

Hip Reconstruction in an Adult with Suspected Neglected Coxitis Tuberculosis: A Rare Case Report and Surgical Management

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ABSTRACT

Neglected tuberculous coxitis is a rare, late form of osteoarticular tuberculosis causing progressive hip destruction, limb shortening, and disability, especially in endemic regions. It poses major reconstructive challenges requiring surgery and prolonged anti-tubercular therapy. A 30-year-old female presented with progressive left lower limb shortening over 2 years, pain, and hip instability since age 4. Examination showed an 8 cm limb length discrepancy. Imaging revealed severe acetabular deformity and proximal femoral destruction with absent femoral head, consistent with chronic tuberculosis. No prior TB workup had been done. Diagnosis was based on clinical, radiological, and intraoperative findings of granulomatous destruction. She underwent single-stage reconstruction with bone grafting and total hip arthroplasty (THA). Postoperatively, pain decreased and range of motion improved, but a 3.85 cm discrepancy remained. Revision to dual-mobility THA was needed due to instability. This advanced stage of hip tuberculosis requires extensive debridement, bone defect reconstruction, and THA combined with prolonged anti-tubercular therapy, with

implant selection tailored to compromised bone stock. Neglected tuberculous coxitis demands aggressive surgical reconstruction, meticulous planning, radical debridement, consideration of dual-mobility implants, and prolonged anti-tubercular therapy to optimize outcomes.

Keywords: Tuberculous Coxitis, Hip Tuberculosis, Neglected Tuberculosis, Hip Reconstruction, Total Hip Arthroplasty, Osteoarticular Tuberculosis

INTRODUCTION

Tuberculous coxitis, or tuberculosis of the hip joint, is a form of osteoarticular tuberculosis that accounts for approximately 15-20% of skeletal tuberculosis cases in endemic regions.¹ While early-stage hip tuberculosis can be managed with anti-tubercular therapy (ATT) and conservative measures, neglected cases present with progressive granulomatous destruction of the hip joint, leading to extensive femoral head osteolysis, acetabular deficiency, limb shortening, deformity, and severe functional disability.^{2,3}

Neglected tuberculous coxitis typically occurs in settings where access to healthcare is limited, diagnosis is delayed, or treatment

is inadequate or abandoned. The chronic granulomatous inflammatory process causes progressive articular cartilage destruction, subchondral bone erosion, and eventual collapse of the femoral head and acetabulum.⁴ Patients present with long-standing hip pain, progressive limb shortening, restricted range of motion, and gait abnormalities. In advanced cases, the hip joint architecture is severely compromised, with loss of normal anatomy, periarticular fibrosis, muscle atrophy, and secondary biomechanical changes including pelvic obliquity and compensatory lumbar scoliosis.^{5,6}

The pathophysiology of tuberculous coxitis involves hematogenous spread of *Mycobacterium tuberculosis* to the synovium or metaphyseal bone, followed by granulomatous synovitis with caseation necrosis. The inflammatory process leads to synovial hypertrophy, joint effusion, and progressive erosion of articular cartilage and subchondral bone. In neglected cases, extensive osteolysis results in femoral head destruction, acetabular bone loss, and sometimes pathological dislocation or subluxation.^{7,8}

Surgical management of neglected tuberculous coxitis is technically demanding and requires thorough debridement of granulomatous and necrotic tissue, reconstruction of bone defects, and total hip arthroplasty (THA) to restore hip function and correct limb length discrepancy.⁹ Perioperative anti-tubercular therapy is essential to prevent disease reactivation and optimize healing.^{1,4} Implant selection must account for compromised bone stock, altered anatomy, and the risk of postoperative instability due to abductor insufficiency and soft tissue compromise.^{9,10} Adult cases of neglected tuberculous coxitis requiring hip reconstruction are exceedingly rare in the literature. This report describes the surgical management of a 30-year-old female with suspected neglected tuberculous coxitis presenting with severe hip destruction, limb shortening, and instability. The case illustrates the reconstructive

challenges, intraoperative findings consistent with chronic granulomatous destruction, and the need for revision surgery to address postoperative instability. By presenting this unusual case, we aim to contribute to the limited body of literature on surgical management of neglected tuberculous coxitis and emphasize the importance of individualized treatment strategies in this rare and challenging condition

CASE PRESENTATION

A 30-year-old female presented with progressive left lower limb shortening over 2 years, a limp, pelvic discomfort, and a history of unstable left hip since age 4. No prior tuberculosis workup had been performed.

Examination revealed 8 cm shortening of the left limb, severely restricted hip motion, muscle atrophy, positive Trendelenburg sign, pelvic obliquity, and compensatory lumbar scoliosis. Neurovascular status was intact.

Radiography showed a deficient, abnormally shaped acetabulum with loss of the acetabular roof; complete absence of the femoral head; extensive osteolysis of the proximal femur; and a shorter ipsilateral tibia. These findings strongly suggested neglected tuberculous coxitis. Single-stage reconstruction was planned: debridement, proximal femoral osteotomy and recanalization, acetabular reconstruction with bone grafting and fixation, and total hip arthroplasty (THA). The patient was counseled on suspected tuberculosis, prolonged anti-tubercular therapy (ATT), and surgical risks.

Through a posterior (Moore) approach, the joint was exposed. Acetabular destruction with large defect and severe flattening, especially anterosuperior, with extensive bone loss (Figure 1). The proximal femoral destruction with no recognizable femoral head; multiple bone fragments and caseous necrotic tissue also seen. Necrotic bone and granulomatous tissue were debrided and saved for autograft. Proximal femoral

osteotomy and recanalization were performed.

Autologous bone graft was placed into the anterosuperior defect, secured with two cancellous screws + ring washers, then a 4-hole T-plate with 4 screws to buttress the acetabular roof. Reaming to #46 (45° inclination, 15° anteversion). A cementless cup (size 48/2) was implanted with two screws (35 mm, 25 mm) (Figure 2).

The femoral canal was obliterated. After reaming to size 10, a trial component was placed. A cementless femoral stem (9 mm diameter, 200 mm length, head 28/+4) was chosen for distal fixation. Limb length discrepancy (LLD) was reduced from 8 cm to ~3 cm. The gluteus maximus was sutured to the stem to augment abductor function (Figure 3). A drain was placed, followed by layered closure.



Figure 1. Acetabular defect anterosuperior at native acetabulum

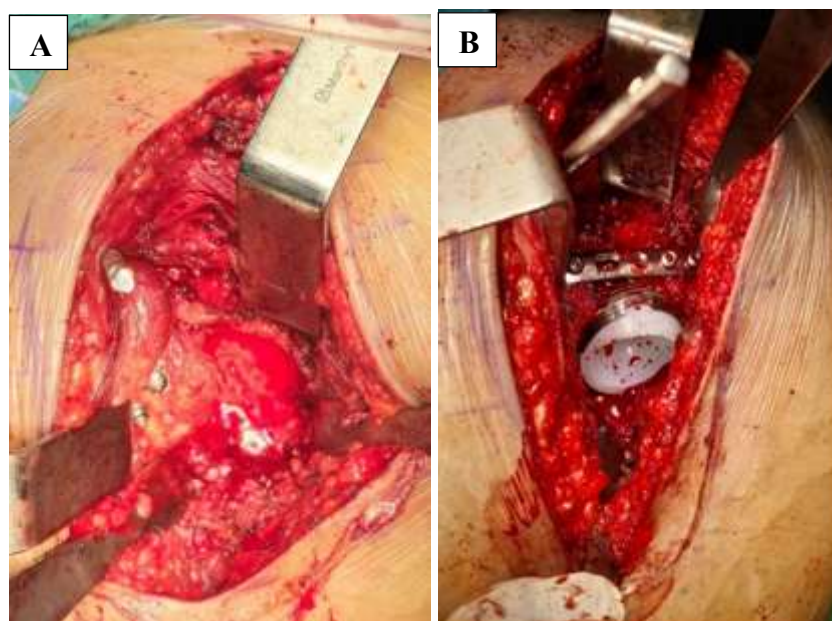


Figure 2. Acetabuloplasty with bone graft at anterosuperior acetabular defect before (A) and after (b) placement



Figure 3. Femoral canal widening with broacher reamer and gluteus maximus reattachment to proximal femoral stem for abductor mechanism preservation.

Postoperative radiographs showed satisfactory alignment and component positioning (Figure 4). The patient was mobilized partial weight-bearing with a

walker. ATT was initiated postoperatively. Pain decreased, range of motion improved, and residual LLD was 3.85 cm.

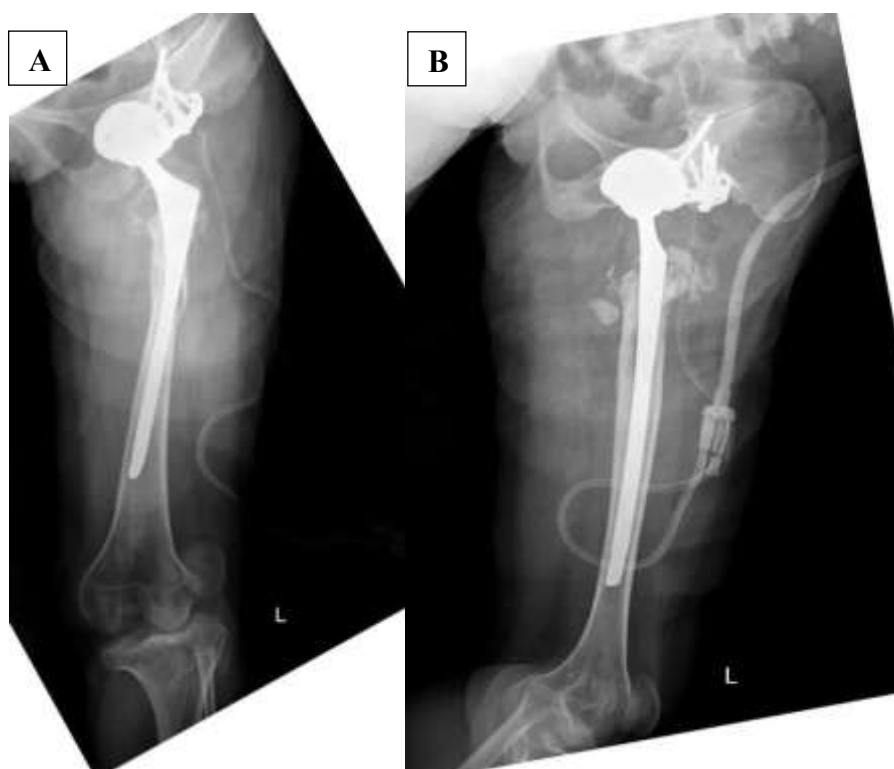


Figure 4. Postoperative anteroposterior (A) and lateral (B) radiographs of the left femur demonstrating cementless total hip arthroplasty following hip reconstruction for suspected neglected tuberculous coxitis.

The patient later fell and developed acute severe left hip pain. Examination revealed shortening, external rotation, instability, and inability to bear weight. Radiographs showed dissociation of the acetabular liner

and femoral head, with well-fixed acetabular shell and femoral stem. The diagnosis was acute postoperative instability after trauma, attributed to soft-tissue compromise and abductor insufficiency

from chronic tuberculous destruction. Through the previous approach, the cup was circumferentially exposed, fibrous tissue debrided, and the cup extracted with osteotomes while preserving remaining bone stock. After hip dislocation, the existing stem was mobilized using

osteotomes and curettes, then extracted. The canal was reamed for a revision stem. A dual-mobility cup was implanted with cement to fill cavitory defects. The polyethylene liner and femoral head were assembled onto the revised stem, providing increased stability (Figure 5).

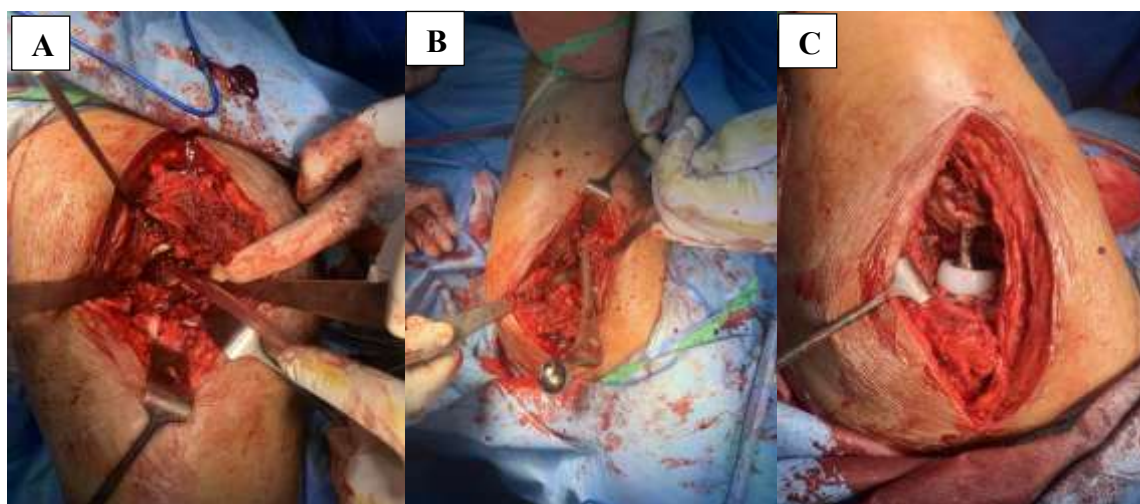


Figure 5. Acetabular Component Extraction (A), Femoral Component Extraction (B) and Femoral stem Revision, and Implant revision using dual-mobility total hip replacement with cemented augmentation (C).

Post-revision radiographs (Figure 6) confirmed a cemented dual-mobility acetabular cup and re-implanted femoral stem with trochanteric wire fixation. Trial

reduction showed satisfactory stability. Estimated blood loss was 800 mL, and early postoperative recovery was uneventful.

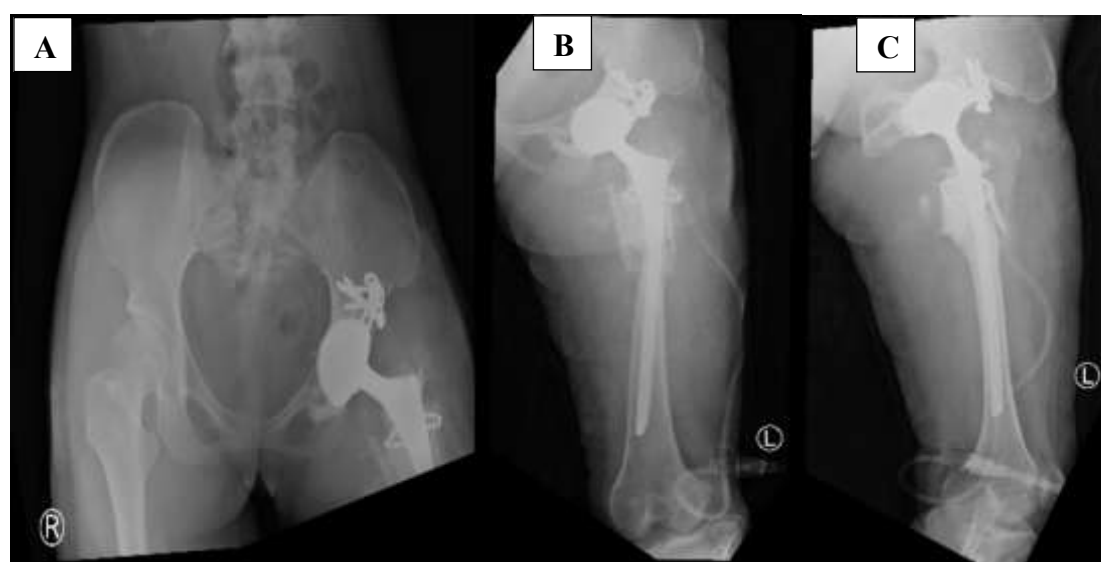


Figure 6. Pelvic X-Ray AP (A and B) Lateral (C) and View after revision

DISCUSSION

Neglected tuberculous coxitis is an advanced, destructive form of osteoarticular

tuberculosis, accounting for 15-20% of skeletal TB in endemic regions.^{1,5} It results from hematogenous seeding of

Mycobacterium tuberculosis to the synovium or metaphyseal bone, leading to granulomatous synovitis, caseation necrosis, and progressive osteolysis.^{7,8} When diagnosis is delayed or treatment inadequate, the chronic inflammatory process destroys the femoral head, acetabulum, and surrounding soft tissues, producing limb shortening, periarticular fibrosis, muscle atrophy, pelvic obliquity, and compensatory lumbar scoliosis.²⁻⁶ Our patient had a 30-year history of hip instability with no prior TB workup; diagnosis was based on clinical, radiological, and intraoperative findings of caseous necrosis and granulomatous destruction.

Surgical management must achieve three goals: radical debridement, bone defect reconstruction, and total hip arthroplasty (THA) to restore function and correct limb length discrepancy.⁹ Perioperative anti-tubercular therapy (ATT) is essential. While some centers use 2-6 weeks of preoperative ATT, single-stage reconstruction is safe in patients without draining sinuses or systemic illness.^{4,5,7} In our patient, ATT was initiated postoperatively, and no reactivation occurred. Total ATT should continue for 9-18 months, with reported reactivation rates as low as 3/226 in systematic reviews.^{1,4} Staged reconstruction is reserved for cases with sinus tracts, extensive sequestra, or secondary infection.^{7,5}

Implant selection depends on bone defect patterns. Cementless implants are preferred because they achieve biological fixation in healthy bone distal to the destroyed area.^{9,10} In our patient, the acetabular anterosuperior defect was managed with autologous bone graft (from evacuated femoral fragments) secured by screws, ring washers, and a T-plate, followed by a cementless cup with supplemental screw fixation. On the femoral side, the proximal canal was obliterated; after recanalization, a long diaphyseal-engaging cementless stem (9×200 mm) was chosen for distal fixation, bypassing the compromised proximal bone. This strategy

is well described for severe proximal femoral bone loss.⁹

One of the most challenging sequelae is abductor insufficiency. Chronic inflammation destroys the greater trochanter, atrophies the gluteal muscles, and alters the biomechanical lever arm. We attempted to improve abductor function by suturing the gluteus maximus to the proximal stem. Nevertheless, the patient remained at high risk for instability. A postoperative traumatic fall resulted in dissociation of the femoral head from the acetabular liner - a complication reflecting the inherent instability of conventional THA constructs in the setting of severe soft-tissue compromise and abnormal biomechanics.⁹

Revision surgery was performed using a dual-mobility total hip arthroplasty with cemented acetabular augmentation. Dual-mobility systems increase jump distance and significantly reduce dislocation rates in high-risk patients, making them particularly suitable for tuberculous coxitis with abductor insufficiency or bone loss.⁹ Cemented augmentation allowed us to fill cavitory defects and achieve stable fixation in the deficient acetabulum. This construct successfully restored hip stability. Given this experience, dual-mobility cups should be considered as a primary option in neglected tuberculous coxitis rather than reserved for revision.

Large series report marked functional improvement after THA for tuberculous coxitis, with mean Harris Hip Scores of 88-90 and overall complication rates around 10-12%.^{1,4,5} Our patient achieved a reduction in limb length discrepancy from 8 cm to 3.85 cm, good pain relief, and improved range of motion after primary surgery. However, the need for revision highlights the importance of long-term surveillance to detect recurrent instability, aseptic loosening, graft resorption, or late reactivation.^{11,12}

Successful management requires a multidisciplinary approach involving orthopedic surgeons, infectious disease specialists, radiologists, and rehabilitation

teams.^{11,12} Preoperative planning should include templating for both standard and revision implants, with a low threshold for dual-mobility constructs. Intraoperative tissue samples should be sent for acid-fast bacilli culture and PCR to confirm the diagnosis. This case adds to the limited literature on adult hip reconstruction for neglected tuberculous coxitis and underscores the need for adaptable surgical planning, prolonged ATT, and individualized treatment strategies to optimize outcomes in this rare and challenging condition.

CONCLUSION

Neglected tuberculous coxitis in adults is a rare condition with significant reconstructive challenges due to bone destruction, altered biomechanics, and soft-tissue compromise. Hip reconstruction with total hip arthroplasty can relieve pain and reduce limb length discrepancy, but postoperative instability remains high. Implant dissociation in this case highlights the limitations of conventional THA constructs; revision with a dual-mobility system and cemented augmentation effectively restored stability. Successful management requires meticulous debridement, consideration of dual-mobility implants, prolonged anti-tubercular therapy, long-term follow-up, and a multidisciplinary approach.

Clinical Significant

This case highlights the importance of individualized reconstruction in neglected tuberculous coxitis with severe bone loss and soft-tissue compromise. Radical debridement, acetabular bone defect reconstruction, appropriate implant selection, and prolonged anti-tubercular therapy are essential. The revision to a dual-mobility construct emphasizes that high-risk hips with abductor insufficiency may benefit from stability-enhancing implants during the primary reconstruction.

Declaration by Authors

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