

Destructive Tuberculous Coxitis Mimicking Femoral Head Osteonecrosis after Repeatedly Interrupted Antitubercular Therapy, Treated by Single-Stage Total Hip Arthroplasty: A Case Report

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Abstract

Case Report

Osteoarticular tuberculosis accounts for 1–3% of all tuberculosis cases, the hip being the second most frequently involved site after the spine. Because tuberculous coxitis produces a slowly progressive destructive arthropathy, it is readily mistaken for other causes of femoral head destruction, in particular osteonecrosis, especially when constitutional signs are absent and pulmonary bacteriology is negative. We report a 50-year-old man with pulmonary tuberculosis treated 20 years earlier and declared cured, who relapsed in 2022 and subsequently defaulted from a second course of therapy after four of six months. He had limped with left hip pain for three years, symptoms having started concurrently with his pulmonary relapse. He was referred with a working diagnosis of femoral head osteonecrosis. Radiographs and computed tomography showed collapse and marginal erosion of the femoral head with acetabular erosion, periarticular osteopenia, joint space narrowing and strikingly sparse osteophytosis a pattern more consistent with tuberculous arthropathy. Sputum bacteriology was negative at referral, yet four-drug therapy was reinstituted on clinical grounds. After seven weeks of chemotherapy, single-stage cementless total hip arthroplasty was performed through a posterior approach with radical synovectomy and multiple tissue sampling. Histopathology showed caseating granulomatous synovitis and GeneXpert MTB/RIF on articular tissue was positive with no rifampicin resistance. The patient completed a nine-month course of chemotherapy under directly observed therapy and was declared cured of his pulmonary disease. At eight months after surgery he was pain-free and walking unaided, with no clinical, biological or radiological evidence of local recurrence. This case illustrates that negative pulmonary bacteriology does not exclude active skeletal tuberculosis, that treatment default is a powerful driver of irreversible joint destruction, and that tissue diagnosis remains mandatory in any destructive coxopathy arising in a patient with a tuberculous history.

Keywords: Hip tuberculosis; tuberculous coxitis; osteonecrosis of the femoral head; total hip arthroplasty; treatment non-adherence; extrapulmonary tuberculosis.

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INTRODUCTION

Tuberculosis remains a major public health burden in endemic regions, including North Africa. Osteoarticular involvement represents approximately 1–3% of all tuberculosis cases and 10–15% of extrapulmonary disease. Within the skeleton the spine is the commonest site, followed by the hip, which accounts for roughly 15% of osteoarticular tuberculosis [1,2].

The course of tuberculous coxitis is insidious. Pain and limping progress over months to years, constitutional signs are frequently absent, and

inflammatory markers are often only modestly raised. The radiological signature periarticular osteopenia, peripheral osseous erosions and gradual joint space narrowing, classically the Phemister triad is not always complete, and in advanced disease a collapsed, deformed femoral head overlaps considerably in appearance with osteonecrosis, primary osteoarthritis and other septic or inflammatory arthropathies [1,3]. Tuli emphasised that whenever the presentation is atypical, tissue diagnosis is mandatory rather than optional [1].

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Interruption of antitubercular therapy compounds the problem. Incomplete regimens permit persistent bacillary activity at extrapulmonary sites even when pulmonary bacteriology converts to negative, and each relapse carries the risk of new haematogenous seeding.

We describe a patient in whom three years of hip symptoms, running in parallel with a pulmonary relapse and a defaulted treatment course, culminated in a destructive coxopathy initially labelled as femoral head osteonecrosis and ultimately managed by total hip arthroplasty. The case is reported in line with the SCARE 2023 criteria [14].

CASE PRESENTATION

History

A 50-year-old man of Central African origin, resident in Morocco, a non-smoker employed as a manual labourer, was referred to our department in November 2025 for a painful, disabling left hip.

His tuberculous history was extensive. Approximately 20 years earlier he had been diagnosed with pulmonary tuberculosis and completed 12 months of antitubercular therapy, after which he was declared cured. In 2022 he sustained a documented pulmonary relapse. In March 2024 bacteriological examination was again positive and a standard six-month regimen was started, but he discontinued treatment after only four months. In October 2025 he was reassessed by his pulmonologist: sputum smear and GeneXpert MTB/RIF were negative, yet a four-drug fixed-dose combination regimen (rifampicin, isoniazid, pyrazinamide, ethambutol) was reinstituted on clinical and radiological grounds.

Hip symptoms had begun approximately three years earlier temporally concordant with the 2022 pulmonary relapse as a painful limp of the left hip. Pain was initially mechanical and intermittent, becoming permanent with inflammatory features including night pain and prolonged morning stiffness. Walking distance had fallen progressively to about 200 metres and the patient had used a single cane for the preceding year.

He reported no corticosteroid exposure, no alcohol abuse, no haemoglobinopathy, no dysbaric exposure and no hip trauma. He was not diabetic. He had lost approximately 6 kg over the preceding year and described intermittent night sweats without documented fever.

Clinical examination

The patient weighed 62 kg for 174 cm (BMI 20.5 kg/m²). He walked with an antalgic gait and a positive Trendelenburg sign on the left. The left lower limb was held in slight flexion and external rotation, without true limb-length discrepancy, the femoral head remaining seated within the acetabulum. Hip range of

motion was globally restricted and painful throughout: flexion 60°, fixed flexion deformity 10°, abduction 15°, adduction 10°, internal rotation 5°, external rotation 25°. The groin was tender on palpation. There was no palpable mass, no cutaneous fistula or discharging sinus, and no inguinal lymphadenopathy. Distal neurovascular examination was normal, and the contralateral hip and both knees were unremarkable. The Harris Hip Score on admission was 38/100.

Investigations

Laboratory results showed an erythrocyte sedimentation rate of 58 mm in the first hour, C-reactive protein 42 mg/L, white cell count $8.4 \times 10^9/L$, haemoglobin 11.2 g/dL, and serum albumin 32 g/L. HIV serology was negative, fasting glucose and liver function tests were normal, and haemoglobin electrophoresis was normal. Tuberculin skin testing produced 18 mm of induration.

Chest radiography showed bilateral apical fibro-retractile sequelae with upper lobe volume loss and calcified nodules, together with right apical pleural thickening; no cavitation or active parenchymal infiltrate was identified.

Plain radiography of the left hip (Fig. 1, Fig. 2) demonstrated marked loss of sphericity of the femoral head with superolateral flattening and collapse, irregular and ill-defined subchondral bone, marginal erosions at the head-neck junction with a moth-eaten appearance, severe superolateral joint space narrowing, erosion and irregularity of the acetabular roof, and periarticular osteopenia. Osteophyte formation was disproportionately sparse for the degree of joint destruction. The contralateral hip was radiologically normal.



Figure 1: Anteroposterior radiograph of the left hip (7 October 2025) showing loss of sphericity and superolateral collapse of the femoral head, marginal erosions at the head-neck junction, superolateral joint space narrowing, irregularity of the acetabular roof and periarticular osteopenia



Figure 2: Coned anteroposterior view of the left hip demonstrating in greater detail the moth-eaten destruction of the femoral head with irregular sclerotic margins and near-complete loss of the superior joint space, with comparatively little osteophyte formation

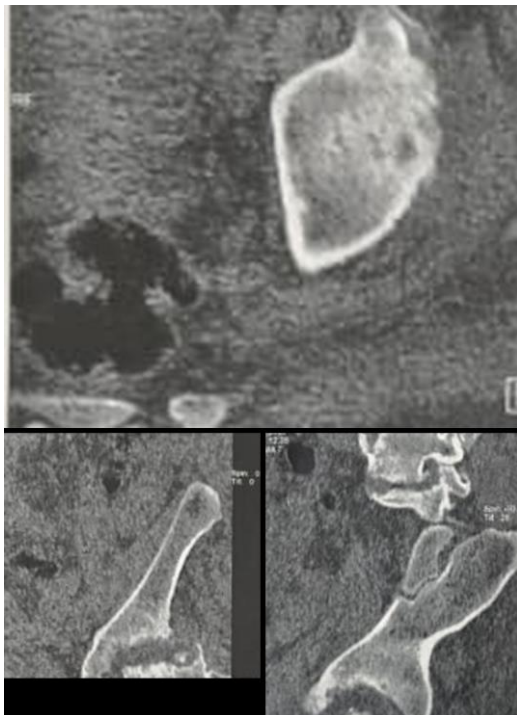


Figure 3: Computed tomography of the pelvis, bone window, axial (a), coronal (b) and sagittal (c) multiplanar reconstructions, confirming extensive subchondral and cortical destruction of the femoral head with geodes and fragmentation, and corresponding erosion of the acetabular roof, with preserved acetabular rim and columns

Computed tomography of the pelvis (Fig. 3) confirmed extensive cortical and subchondral destruction of the femoral head with multiple geodes, marginal erosions and fragmentation of the superior head, together with corresponding erosion of the acetabular roof. The acetabular rim and both columns were preserved. No sequestrum, cold abscess or periarticular soft-tissue collection was identified. Magnetic resonance imaging was not obtained, for reasons of access.

The combination of a unilateral, erosive process involving both the femoral head and the acetabulum, with periarticular osteopenia and minimal osteophytosis, in a patient with active and inadequately treated tuberculosis and no recognised risk factor for osteonecrosis, was considered more suggestive of tuberculous coxitis than of primary osteonecrosis of the femoral head.

Management

Four-drug antitubercular therapy, reinstituted in early October 2025, was continued for seven weeks before surgery, with nutritional optimisation, analgesia and protected weight-bearing. Pre-operative joint aspiration was not performed, as the degree of destruction made arthroplasty the indicated procedure irrespective of the aspirate result, and sampling was therefore deferred to the operative setting.

On 28 November 2025 the patient underwent single-stage total hip arthroplasty of the left hip through a posterior (Moore) approach in the lateral decubitus position. Operative findings comprised approximately 40 mL of turbid serous effusion, exuberant hypertrophic villous synovitis, yellowish caseous-appearing material within the acetabular fossa, complete loss of articular cartilage on both surfaces, an irregular and partly fragmented femoral head with subchondral erosions, and erosion of the acetabular roof with preserved rim and columns. No sequestrum and no soft-tissue abscess were encountered.

A radical synovectomy with excision of all granulation and necrotic tissue was performed, followed by femoral neck osteotomy, acetabular reaming to bleeding subchondral bone and copious lavage with six litres of normal saline. Multiple synovial and osseous samples were sent for histopathology, GeneXpert MTB/RIF, mycobacterial culture on Löwenstein-Jensen medium and routine pyogenic culture.

A cementless construct was implanted: a 52 mm cementless dual-mobility acetabular component supplemented by two superior screws, a cementless straight femoral stem (size 11) and a 28 mm chrome-cobalt inner head. A dual-mobility bearing was selected in view of the posterior approach, the pre-operative stiffness and the periarticular soft-tissue compromise, all of which increase the risk of instability. The contained

superolateral acetabular defect did not require bone grafting. Estimated blood loss was 450 mL and no transfusion was required.

Histopathological examination of the synovium and subchondral bone showed epithelioid and giant-cell granulomas with central caseous necrosis. GeneXpert MTB/RIF performed on articular tissue was positive for *Mycobacterium tuberculosis* complex with no rifampicin resistance detected, and culture on Löwenstein–Jensen medium was positive at five weeks, with susceptibility to all first-line agents. Routine bacterial cultures remained sterile.

Outcome and follow-up

Antitubercular therapy was continued postoperatively as part of a nine-month course counted from its reinstitution in October 2025 (two months of rifampicin, isoniazid, pyrazinamide and ethambutol,

followed by seven months of rifampicin and isoniazid), corresponding to approximately seven and a half months of treatment after surgery. In view of the previous treatment default, the regimen was delivered under directly observed therapy with structured therapeutic education and monthly clinical, biological and hepatic monitoring. Adherence was complete on this occasion. Treatment was completed in July 2026, and the patient was declared cured of his pulmonary tuberculosis by his pulmonologist on the basis of negative bacteriology and a stable chest radiograph.

Rehabilitation followed standard posterior hip precautions, with protected weight-bearing using two crutches for six weeks and progression to full weight-bearing thereafter. The postoperative course was uneventful, with primary wound healing and no dislocation.



Figure 4: Anteroposterior radiograph of the pelvis (28 November 2025) after single-stage cementless left total hip arthroplasty, showing satisfactory component position with restored offset and equal limb lengths. Note the radiologically normal right hip

The immediate postoperative radiograph (Fig. 4) showed well-positioned components with restored offset and equal limb lengths. At eight months the patient was pain-free, walking unaided without a limp, with hip flexion of 95°, abduction of 35° and a Harris Hip Score of 89/100. Erythrocyte sedimentation rate had fallen to 18 mm/h and C-reactive protein to 4 mg/L. Control radiographs showed satisfactory osseointegration without radiolucent lines or periprosthetic osteolysis. At the time of writing there was no clinical, biological or radiological evidence of local recurrence, and surveillance is ongoing.

DISCUSSION

Three features of this case merit discussion: the diagnostic trap, the role of treatment default, and the place of arthroplasty in a tuberculous hip.

Osteonecrosis or tuberculosis?

The patient was referred with a working diagnosis of femoral head osteonecrosis, and the imaging in isolation supports that possibility: a collapsed, deformed head with subchondral irregularity. Several elements argued against it. Primary osteonecrosis characteristically preserves the joint space and spares the acetabulum until late, produces subchondral sclerosis

rather than marginal erosion, and, when secondary to systemic risk factors such as corticosteroids, alcohol or haemoglobinopathy, is frequently bilateral. Our patient had none of these risk factors, a radiologically normal contralateral hip, and erosive change on both sides of the joint with periarticular osteopenia and disproportionately little osteophytosis a constellation closer to the Pheemister triad of tuberculous arthritis [1,3]. The temporal concordance between symptom onset and documented pulmonary relapse further supported haematogenous seeding.

The two entities are not, however, mutually exclusive. Tuberculous infection of the hip can itself compromise femoral head vascularity and generate secondary osteonecrosis, and osteonecrosis of tubercular aetiology has been documented at other skeletal sites [4]. The distinction ultimately rests on tissue rather than on imaging, which is why intraoperative sampling was central to this case.

Negative bacteriology does not exclude active disease.

Sputum examination was negative in October 2025, yet antitubercular therapy was reinstituted on clinical grounds a decision the operative findings retrospectively vindicated. Osteoarticular tuberculosis is characteristically paucibacillary; smear and even molecular testing of respiratory specimens have limited sensitivity for extrapulmonary foci, and pulmonary conversion says nothing about bacillary persistence in bone. Tuli's principle that tissue diagnosis is mandatory in atypical presentations applies directly [1].

Treatment default as a determinant of joint destruction

Our patient abandoned a six-month regimen after four months in 2024, at a time when his hip symptoms were already established and progressing. Early diagnosis and complete chemotherapy allow 90–95% of patients with osteoarticular tuberculosis to heal with near-normal function [1]. The three-year interval between symptom onset and definitive orthopaedic management, spanning an incompletely treated relapse, plausibly accounts for the extent of destruction at presentation. This underlines the value of screening for skeletal symptoms in every patient with relapsing or defaulted pulmonary tuberculosis, and conversely of a low threshold for suspecting tuberculosis in any chronic hip monoarthropathy in endemic settings. It also justified the use of directly observed therapy postoperatively in this patient.

Arthroplasty in the tuberculous hip.

Historically, joint replacement was deferred until the disease had been quiescent for a decade [1], reflecting fear of reactivation around a foreign body. This position has been progressively revised. Kim *et al.*, reported favourable long-term results of arthroplasty for tuberculous coxarthrosis [5], and subsequent series by Neogi, Sidhu, Wang and Öztürkmen have shown that

single-stage total hip arthroplasty, performed under effective antitubercular cover with meticulous debridement, gives good functional results with low reactivation rates even in active disease [6,8,9,10]. A systematic review and pooled analysis supported this approach where adequate chemotherapy is given before and after surgery [7]. Reactivation nonetheless remains a documented risk, including decades after apparently quiescent disease [11], justifying prolonged postoperative therapy and sustained surveillance.

Practical points emerging from the literature and applied here include institution of antitubercular therapy for at least two to four weeks preoperatively where the clinical situation allows seven weeks in this case; radical synovectomy with excision of all necrotic tissue; routine multiple sampling for histology, molecular testing and culture; and a preference for cementless fixation in younger patients on the grounds of bone stock preservation and revision potential, although cemented and hybrid constructs have also performed satisfactorily [8,10,12].

One point of divergence deserves emphasis. Several authors advocate continuing chemotherapy for 12 to 18 months after arthroplasty for active hip tuberculosis [1,6], whereas our patient received approximately seven and a half months of postoperative treatment within a nine-month course, in accordance with the national programme and his pulmonologist's assessment. This is at the lower end of what is recommended in the arthroplasty setting, and although he was declared cured of his pulmonary disease with negative bacteriology, the shorter postoperative exposure reinforces rather than removes the need for prolonged orthopaedic surveillance around the implant.

Limitations

This is a single case with eight months of follow-up. Magnetic resonance imaging was not obtained, which would have better characterised marrow involvement and synovial disease preoperatively. Cure of the pulmonary disease has been declared, but local control around the implant cannot be asserted on this timescale: reactivation of tuberculous arthritis has been reported many years after apparently quiescent disease [11], and the postoperative chemotherapy in this case was shorter than that advocated by several arthroplasty series. Longer surveillance is therefore required before implant survival and durable eradication can be claimed.

CONCLUSION

A destructive coxopathy in a patient with a history of relapsing and incompletely treated pulmonary tuberculosis should raise suspicion of tuberculous coxitis, even when the radiological pattern suggests osteonecrosis and pulmonary bacteriology is negative. Tissue diagnosis is indispensable. Single-stage total hip arthroplasty combined with thorough debridement and prolonged antitubercular chemotherapy can restore a

painless, mobile hip in advanced disease. Above all, this case is a reminder that treatment default in tuberculosis is not merely a pulmonary problem it can cost a joint.

DECLARATIONS

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Consent: Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Guarantor: Lamrani MO.

Author contributions: RB conception, data collection, literature review, manuscript drafting. AA, MRF, JM data collection, imaging analysis, critical revision. MB, RAB surgical management, critical revision. MK, MOL supervision, critical revision, final approval. All authors read and approved the final manuscript.

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