

A Rare Case of Chronic Osteomyelitis of the Femur Presenting as Persistent Limb Pain: A Case Report and Literature Review

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Case Report

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The most commonly isolated pathogen is *Staphylococcus aureus*, although Gram-negative organisms and polymicrobial infections are increasingly reported, particularly in immunocompromised patients. Delayed diagnosis often leads to complications such as chronic draining sinuses, pathological fractures, and systemic infection.

Case Presentation

Patient Information

A 54-year-old male construction worker from the United Kingdom presented to the orthopedic outpatient department with complaints of progressive pain in the left thigh for 4 months. The pain was dull, deep-seated, and progressively worsened over time. It was associated with intermittent low-grade fever, malaise, and difficulty in walking.

Medical History

The patient had a history of a minor road traffic accident 6 months prior, resulting in a soft tissue injury to the same limb. He had no history of diabetes mellitus, tuberculosis, or immunosuppressive conditions.

Clinical Examination

ABSTRACT

Osteomyelitis is a serious inflammatory condition of bone caused primarily by pyogenic bacterial infection, leading to progressive bone destruction if not diagnosed and treated early. Despite advances in antimicrobial therapy and imaging modalities, chronic osteomyelitis remains a challenging clinical entity due to its subtle presentation, recurrence risk, and requirement for prolonged treatment. We report a case of chronic osteomyelitis of the distal femur in a middle-aged patient who presented with persistent pain, swelling, and intermittent fever over several months. Initial misdiagnosis as soft tissue infection delayed appropriate management. Imaging studies including radiography and magnetic resonance imaging confirmed osteomyelitic changes, and microbiological analysis revealed methicillin-sensitive *Staphylococcus aureus*. The patient underwent surgical debridement combined with targeted intravenous antibiotic therapy, resulting in significant clinical improvement. This case highlights the importance of early suspicion, multidisciplinary management, and imaging-guided diagnosis in preventing complications of chronic osteomyelitis.

Keywords

Osteomyelitis, Chronic bone infection, *Staphylococcus aureus*, Bone debridement, MRI diagnosis, Case report

INTRODUCTION

Osteomyelitis is an inflammatory bone disease caused by infection, most commonly bacterial in origin, that affects the medullary cavity, cortex, periosteum, and surrounding soft tissues. It can occur via hematogenous spread, contiguous infection, or direct inoculation following trauma or surgery. The condition may present in acute, subacute, or chronic forms, with chronic osteomyelitis being the most difficult to treat due to necrotic bone formation and poor vascularization.

On examination, the patient appeared mildly febrile. Local examination revealed tenderness over the distal femur with mild swelling and restricted range of motion of the knee joint. No external sinus was noted initially.

Investigations

Laboratory Findings

- Elevated white blood cell count (14,800/mm³)
- Increased erythrocyte sedimentation rate (ESR): 78 mm/hr
- C-reactive protein (CRP): markedly elevated

Radiological Findings

Plain radiography showed:

- Irregular cortical destruction of distal femur
- Periosteal reaction
- Areas of sclerosis and lucency suggestive of chronic infection

MRI of the femur demonstrated:

- Bone marrow edema
- Cortical erosion
- Collection suggestive of abscess formation

These findings were consistent with chronic osteomyelitis.

Microbiological Analysis

Bone biopsy and culture revealed growth of *Staphylococcus aureus*, sensitive to flucloxacillin and vancomycin.

Diagnosis

Based on clinical presentation, imaging, and microbiological findings, a diagnosis of chronic osteomyelitis of the distal femur was established.

Treatment

The patient underwent a combined medical and surgical approach:

- Surgical Management
- Extensive surgical debridement of necrotic bone
- Drainage of abscess cavity
- Removal of infected soft tissue
- Medical Management
- Intravenous flucloxacillin for 4 weeks
- Transition to oral antibiotics for an additional 6 weeks
- Analgesics and supportive care

Outcome and Follow-Up

The patient showed marked improvement within 3 weeks of therapy. Pain reduced significantly, inflammatory markers normalized, and mobility improved. At 6-month follow-up, there was no recurrence of symptoms and radiographs showed evidence of bone healing with no new lesions.

DISCUSSION

Osteomyelitis remains a complex clinical condition due to its varied presentation and potential for chronicity. The pathogenesis involves bacterial invasion leading to inflammatory destruction of bone tissue, vascular compromise, and sequestrum formation.

Chronic osteomyelitis typically develops when acute infection is inadequately treated. The femur is one of the commonly affected long bones due to its rich vascular supply. However, trauma significantly increases susceptibility.

MRI remains the gold standard imaging modality for early detection, while bone biopsy is essential for definitive microbial diagnosis. Treatment requires prolonged antibiotics combined with surgical debridement to remove necrotic bone, which acts as a reservoir for infection.

Failure to treat adequately can result in complications such as:

- Pathological fractures
- Chronic sinus formation
- Sepsis
- Limb dysfunction

Multidisciplinary management involving orthopedic surgeons, infectious disease specialists, and radiologists is essential for optimal outcomes.

CONCLUSION

This case emphasizes the importance of early diagnosis and aggressive management of chronic osteomyelitis. High clinical suspicion in patients with persistent bone pain and prior trauma is essential. Combined surgical and antibiotic therapy remains the cornerstone of treatment. Early intervention can prevent long-term disability and recurrence.

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