

Tuberculosis of the Elbow: A Rare Orthopaedic Entity Presenting Diagnostic Difficulties and Management

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Abstract

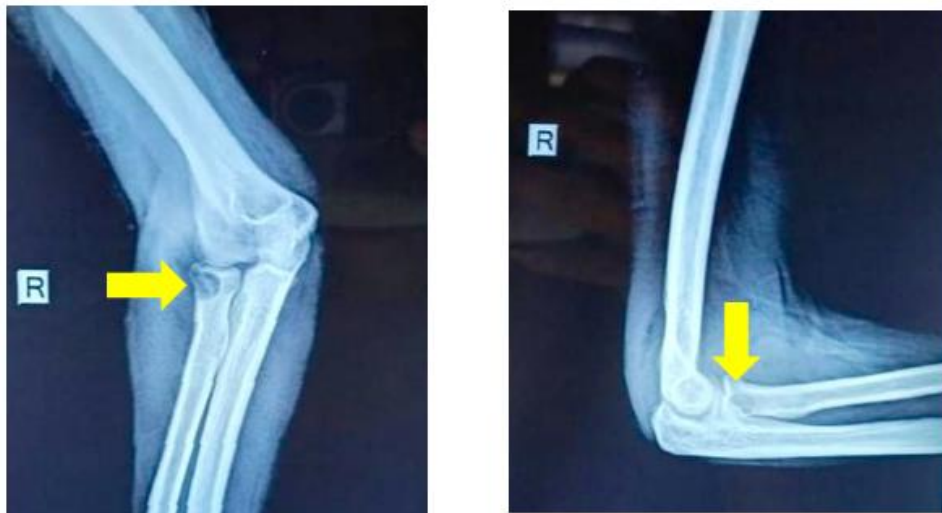
Elbow is an uncommon joint to be affected by Mycobacterium tuberculosis infection. It is involved in approximately 1-5% of all cases with musculoskeletal tuberculosis (TB). Early diagnosis of TB of the elbow joint can be easily missed due to an indolent natural history, delay in presentation, and varied clinical features. Delay in diagnosis can lead to irreversible osteoarticular destruction and loss of joint function. Careful clinical assessment, adequate imaging, microbiological, and/or histopathological confirmation of Mycobacterium tuberculosis infection is essential for early diagnosis of TB of the elbow joint. Judicious and early administration of anti-tubercular therapy can lead to preservation of the joint and a satisfactory functional outcome. Surgical intervention may be needed in later stages of the disease to achieve control of the infection, correction of deformity, instability, and restoration of function

Introduction

Tuberculosis remains a significant global issue, with about one-fourth of the world's population affected by Mycobacterium tuberculosis [1]. It stands as one of the most lethal infectious diseases, causing around 1.3 million deaths in 2022 alone [2]. Recent statistics from the World Health Organization for 2021 reveal that in India, the incidence and prevalence of tuberculosis are 188 and 312 per one lakh (0.1 million) population, respectively [3]. These figures underscore the ongoing challenge of tuberculosis control and the urgent need for effective interventions. Osteoarticular tuberculosis often goes undiagnosed until significant bone damage has occurred, as its presentation varies. Around 20% of mycobacterial infections in children manifest as extrapulmonary tuberculosis, with bone or joint tuberculosis accounting for 5% of these cases [4]. The initial symptoms of extrapulmonary tuberculosis resemble other diseases, earning tuberculosis the moniker "a great imitator" [5]. About 30%-40% of extrapulmonary tuberculosis cases, and 1%-3% of all tuberculosis cases are attributed to musculoskeletal tuberculosis. The hip, knee, and other joints are the most frequently afflicted, followed by the spine [6]. Elbow joint tuberculosis is an uncommon condition, with an estimated 1%-5% of all musculoskeletal tuberculosis cases affecting the elbow joint [7]. Herein, a rare report of tuberculosis of the right elbow joint in an Indian boy is presented. The situation was challenging due to vague symptoms and the clinical course

Case Presentation

A eighteen year-old Indian boy was brought to the outpatient department by his parents with complaints of pain, reduced range of movement, and swelling over his right elbow for two months after a fall about four months ago. The swelling was insidious in onset and tender to the touch. His parents consulted local clinicians following a fall, did massaging for 3 weeks and took pain relieving medications but except for some temporary relief with drugs, there was no substantial improvement. There was no history of constitutional features of tuberculosis or a history of disease in the family. He was a student belonging to a middle-income family. There was no history of staying at crowded places like night shelters, juvenile homes, or refugee camps. A general examination was suggestive of a hemodynamically stable boy. Local examination of the right elbow joint was suggestive of a swollen right elbow joint, tender to the touch with a range of motion for the elbow of with fixed flexion deformity of 30 degrees with further painful flexion upto 60 degrees, painful within that range, and severely painful thereafter. The arc of supination to pronation are restricted. Joint crepitus was not accompanied the movements. The distal neurovascular state remained unaltered. However, there were no discharging sinuses or raised local temperatures. The left elbow joint and the rest of his skeletal examination were unremarkable. There was no clubbing, cyanosis, koilonychia, epitrochlear, supratrochlear, or even axillary lymphadenopathy. A plain radiograph of the right elbow joint demonstrated lytic lesion of the radial head with mild soft tissue swelling on radial aspect



Anteroposterior and lateral radiographs of the right elbow joint radiographs showing lytic lesion of the radial head, with swelling of the soft tissues around the right elbow joint



MRI shows T1,T2 heterointense collection around elbow with extension upto shaft of radius and ulna with internal necrotic area

Following radiological evaluation, the patient underwent a CT-guided biopsy, which revealed a granulomatous lesion. Based on the clinical and pathological findings, anti-tubercular therapy was initiated as per the thoracic medicine/physician's recommendation after evaluating renal and liver parameters. The patient was subsequently monitored with serial imaging, as well as clinical and functional assessments, all of which demonstrated progressive improvement.

Throughout the follow-up period, the patient was evaluated with serial radiographs and clinical imaging, in addition to routine monitoring of hepatic and renal function parameters. Periodic ophthalmologic examinations were also conducted as part of the surveillance protocol. During the course of treatment, the patient reported bilateral pedal numbness, which was attributed to peripheral neuropathy and was managed successfully with vitamin B complex supplementation.

The patient exhibited marked improvement in elbow range of motion, with initial fixed flexion deformity of 30 degrees improving to a functional arc of 10°–100° at six weeks. By six months, full range of motion with flexion was achieved with a range of motion from 0° to 130°, accompanied by complete radiological resolution of the lesion. The patient continues to receive anti-tubercular therapy as per standard treatment guidelines and followed up further

Discussion

Elbow tuberculosis, though rare, should be considered in the differential diagnosis of chronic monoarticular arthritis, even in non-endemic regions. This case underscores the diagnostic complexity when the patient presents with a history of trauma and native treatment, without the typical risk factors such as pulmonary tuberculosis or known contact history. The absence of systemic or respiratory symptoms further delayed the diagnosis, highlighting the need for heightened awareness among clinicians in recognizing atypical presentations of musculoskeletal tuberculosis.

While tuberculosis is traditionally associated with endemic areas, its occurrence in non-endemic regions should not be dismissed, particularly in cases involving chronic joint symptoms and unexplained functional limitations. Early imaging, along with tissue biopsy for histopathological confirmation, is crucial for accurate diagnosis. Prompt initiation of anti-tubercular therapy, guided by clinical and pathological findings, can lead to significant clinical and radiological improvements. This case emphasizes the importance of maintaining a high index of suspicion for extrapulmonary tuberculosis, even in the

absence of typical epidemiological factors, to prevent delays in treatment and ensure favorable functional outcomes.

Conclusions

A rare case of tuberculosis involving the elbow joint in a young boy is presented here. A high index of suspicion for skeletal tuberculosis, together with a thorough history taking and clinical and radiographic evaluation, can lead to an early diagnosis and effective therapy. This will maintain the joint's maximum function and assist in preventing osteoarticular degeneration.



Pre OP With 40-degree flexion deformities



At 3 weeks follow up



At 20 weeks follow up



12 weeks follow up



26 weeks follow up

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