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Tuberculosis of the wrist

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ABSTRACT

Mycobacterium tuberculosis (TB) is an infectious agent that can affect several organ systems and can cause various symptoms. The most common presentation is pulmonary TB. The incidence of extrapulmonary TB has become much more common worldwide due to the more frequent use of long-term immunosuppressive treatment for various indications. Examples include but are not limited to human immunodeficiency virus infection, organ transplantation, and rheumatic, hematologic, gastrointestinal, and dermatologic inflammatory conditions. Osteoarticular involvement is the third most common presentation of TB after the lung and lymph nodes, accounting for approximately 10-20% of all cases of extrapulmonary disease. The joint involvement is generally monoarticular and progresses insidiously. Skeletal TB mostly involves weight-bearing joints such as the hip and knee. Wrist involvement is rarely encountered and accounts for only 1% of skeletal TB. Herein, we describe a rare involvement of musculoskeletal TB in a renal transplant recipient.

Introduction

Mycobacterium tuberculosis (TB) is an infectious agent that can affect several organ systems and cause various symptoms. The most common presentation is pulmonary TB. Extrapulmonary TB diagnoses have been increasing worldwide due to the more frequent use of long-term immunosuppressive treatment for many indications. Examples include but are not limited to human immunodeficiency virus infection, organ transplantation, and rheumatic, hematologic, gastrointestinal, and dermatologic inflammatory conditions.

Musculoskeletal involvement is the third most common presentation of TB after the lung and lymph nodes, accounting for approximately 10-20% of all cases of extrapulmonary disease. The joint involvement is generally monoarticular and progresses insidiously. Skeletal TB commonly involves weight-bearing joints such as the hip and knee (1-3). Wrist involvement is rarely encountered and accounts for only 1% of skeletal TB. Here we describe a rare involvement of musculoskeletal TB in a renal transplant recipient.

Case Presentation

The patient was a 57-year-old woman admitted for pain and swelling in her right wrist for seven months. There was no history of trauma, fever, infection, rheumatic disease, or psoriasis. She had significant night sweats in the last two months and 15 kg involuntary weight loss in two years. In addition to hypertension, type 2 diabetes mellitus, and chronic kidney disease, she was a renal transplant recipient for 7 years. She could not give information about the result of the purified protein derivative

(PPD) test before transplantation. She had a history of Bacillus Calmette-Guérin vaccination postpartum and no known TB cases among family members. Her treatment included mycophenolic acid, tacrolimus, prednisolone, amlodipine, furosemide, diltiazem chloride, subcutaneous insulin glargine, and glulisine.

Physical examination was remarkable for local swelling, tenderness, and pain by movements in the right wrist (Figure 1). Laboratory analyses showed a white blood cell count of 18,400/microliter, neutrophil count of 17,400/microliter, lymphocyte count of 300/microliter, creatinine 1.11 mg/dL, urea 28 mg/dL, CRP 180 mg/dL, erythrocyte sedimentation rate 44 mm/h, procalcitonin 1.55 ng/mL, negative antinuclear antibody and negative anti-cyclic citrullinated peptide, complement component 3, complement component 4, normal level of antistreptolysin O, and positive rheumatoid factor. Serological tests for hepatitis B, hepatitis C, *Brucella*, and parvovirus B19 Epstein-Barr virus were non-reactive. The chest X-ray showed increased density in the upper left and lower right paracardiac areas, in the upper zones of the lung parenchyma on both sides. The patient's current tomography findings were not suggestive of TB. Sputum culture was negative for TB bacilli.

The joint aspiration showed turbid and cloudy synovial fluid. Microscopic examination of the joint fluid showed 3-4 polymorphonuclear leukocytes in each field and Gram-positive bacilli. Mononuclear cell count and acid-fast bacilli test were not available. Joint fluid was positive for the mycobacterium TB polymerase chain reaction test and rifampicin resistance was not detected. The PPD test and the quantiferon TB gold test were not available.

The patient underwent surgery with a prediagnosis of septic arthritis (Figure 2), and *Mycobacterium tuberculosis* was

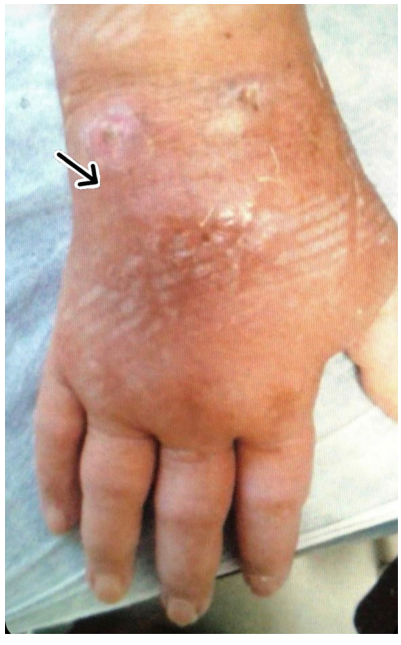

Figure 1. Local swelling of the wrist

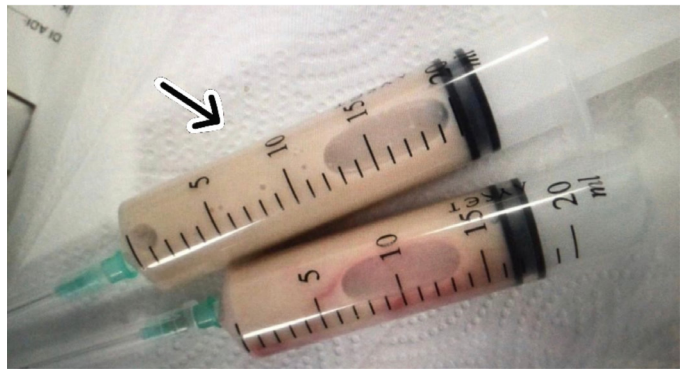

Figure 2. Joint aspirate of the patient

isolated from the joint aspirate culture. The patient was started treatment with a 2-month isoniazid 300 mg, rifampicin 600 mg, ethambutol 15-25 mg/kg, and pyrazinamide 25 mg/kg protocol, followed by a 7-month isoniazid and rifampicin treatment. Her symptoms improved remarkably, with no recurrence of arthritis.

Discussion

The incidence of TB is increasing rapidly, including in developed countries (4). Immunosuppression from any cause except old age, nutritional status, alcohol or drug abuse, and a history of or exposure to TB predispose to clinically overt disease (4,5).

The spread of *Mycobacterium tuberculosis* to joints can occur through different mechanisms. The most common route is hematological dissemination from the primary source or a reactivated infected focus. Direct extension from osteomyelitis and direct inoculation from the infected paraarticular tissue is among the other mechanisms. Night sweats, asthenia, and loss of appetite are the most common symptoms in TB cases (5). Although our patient did not report a marked loss of appetite, other symptoms were present. On the other hand, most conditions with inflammatory arthritis can cause such symptoms. Combined with the symptoms, we proactively ordered TB tests in joint aspirate and made the diagnosis in the current case. However, in the absence of positive chest X-ray findings, diagnosis could be difficult in a reasonable time.

The most common form of musculoskeletal involvement is TB spondylitis, accounting for approximately 50-70% of all cases (6,7). Musculoskeletal TB presents in the peripheral joints in 30% of all cases (7). TB arthritis typically involves weight-bearing joints such as the hip and knee, but any joints, including the shoulder, elbow, ankle, wrist, sternoclavicular, and those of the hand and foot, can be affected (1-3). Multiple joint involvements can be observed (8). Interestingly, wrist joint involvement, like in our patient, is rare, accounting for around 1% of all skeletal TB diagnoses (9). TB arthritis may most often be confused with rheumatoid arthritis and pyogenic arthritis. Classical manifestations of TB arthritis include pain, swelling, and functional limitation, similar to any form of joint inflammation.

The abscess formation occurs in 20-25% of cases. Although rheumatoid arthritis can manifest with the typical symmetrical polyarticular disease, initial monoarticular involvement is rare and can persist for a long time. In the differential diagnosis, large bone erosion and paraarticular abscesses support the diagnosis of TB arthritis rather than rheumatoid arthritis. The diagnosis of TB is generally made using radiological, microbiological, and histopathological findings. The classical long-term treatment entails a 9-month course of isoniazid, rifampicin, pyrazinamide, and ethambutol (10). Accordingly, the recommended protocol improved the symptoms in our patient.

This rare wrist TB patient shows that TB can affect every joint. Furthermore, careful examination of symptoms, lung findings, and joint aspirate is critical in making the diagnosis, and systemic TB treatment improves joint findings.

Ethics

Informed Consent: A consent form was filled out by all participants.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Concept: B.H., E.T., İ.T., Design: B.H., E.T., İ.T., Data Collection or Processing: B.H., E.T., İ.T., Analysis or Interpretation: B.H., E.T., İ. K; Literature Search: B.H., E.T., İ.T., Writing: B.H., E.T., İ.T.

Conflict of Interest: No conflict of interest was declared by the authors.

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