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Case Report

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A Rare Case Report of Extrapulmonary Rifampicin Resistant Mycobacterium Tuberculosis of the elbow Joint

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Abstract

Rifampicin resistant Mycobacterium Tuberculosis (TB) is common but extrapulmonary Rifampicin resistant Mycobacterium TB of the elbow joint is very rare. We present a 45 year old male patient who presented with a one week history of worsening pain, swelling and decreased range of motion of the left elbow joint. He underwent incision and drainage where GeneXpert revealed Rifampicin resistant mycobacterium TB complex and Rifampicin resistant anti-TB treatment was started. The patient had good outcomes; clinical symptoms had resolved, septic markers were within normal limits and radiologically had intra-articular joint involvement without gross destruction.

Level of evidence: Level 4

Keywords: *Rifampicin resistant; Tuberculosis; Elbow joint; Extrapulmonary Tuberculosis*

Abbreviations: CD4: Cluster Differentiation 4; HIV: Human immunodeficiency virus; SA: South Africa; TB: Tuberculosis; UA: uric acid; ESR: Erythrocyte Sedimentation Rate; CRP: C Reactive Protein; WCC: White blood Cell Count; MRI: Magnetic resonance imaging; PCR: Polymerase chain reaction

Introduction

Extrapulmonary Tuberculosis (TB) is an airborne disease caused by the bacterium mycobacterium TB within the body other than the lungs. This disease contributes about 15-20% of all cases in patients who are immunocompetent and 70% in patients who are human immunodeficiency virus (HIV) positive (1). The disease presents mostly in patients who are immunosuppressed and HIV positive with a CD4 cell counts < 250 cells/mm^3 (2). Musculoskeletal TB is rare and accounts for 1-3% of all TB cases. The spine has the commonest musculoskeletal involvement at 51% (3,4). TB arthritis of the elbow constitutes 2 – 5% of all musculoskeletal TB (4). South Africa (SA) has the highest burden of Rifampicin resistant TB and treats the third largest number of cases internationally after

India and Russia. Furthermore, SA continues to struggle with curing Rifampicin resistant TB due to the low socio-economic status in the local population, hence, resulting in poor second-line treatment outcomes (5). We are presenting a rare case of a 45 year old male who presented with Olecranon bursitis and synovitis of the left elbow at our orthopaedic casualty unit and this case was later confirmed as extrapulmonary Rifampicin resistant mycobacterium TB of the left elbow.

Case History

A 45 year old male patient who presented to our orthopaedic casualty ward with a one week history of worsening pain, swelling and decreased range of motion of the left elbow.

Background History

The patient denied any history of trauma to the elbow and was seen three months ago by a medical unit then later referred to orthopaedics unit. Initially, he had a painful elbow with no swelling, elbow x-rays were normal, bloods were done and was started on anti-inflammatory treatment as well as given a review date. On review, symptoms had not resolved and blood results were as follow: uric acid (UA) = 0.18 mmol/L, Erythrocyte Sedimentation Rate (ESR) = 57 mm/hr, C Reactive Protein (CRP) = 26 mg/L and White blood Cell Count (WCC) = 6.38 × 10^9/L. Magnetic resonance imaging (MRI) scans of the cervical spine were done to exclude any pathology which in turn should exclude the referred pain. In addition, the patient had a past medical history of HIV positive on fixed-dose combination (Efavirenz 600 mg + Emtricitabine 200 mg + Tenofovir 300 mg) since 2016 with a CD4 count of 250 cells/μL and viral load of < 50 copies/mL. He had a positive history of multidrug-resistant (MDR) TB contact at home, no previous TB, no constitutional symptoms and no other comorbidities.

Physical Examination

On clinical examination of the left elbow, the patient was swollen, with a 5 × 3 cm erythematous mass on the posterior elbow joint. The mass was fluctuant, warm and tender. He was neurovascular intact, and his range of motion was between 0 and 30 degrees with loss of forearm rotation. Moreover, systemic examination was unremarkable.

Investigations and Results

Plain radiograph of the left elbow on initial presentation showed narrowing of the ulno-humeral joint with peri-articular osteopenia. Chest x-ray was normal (see Figure 1) and his elbow ultrasound showed Olecranon bursitis and synovitis (see Figure 2). The patient was then diagnosed with infective Olecranon bursitis and synovitis. He underwent incision and drainage of the left elbow under general anesthesia and theatre specimen was sent for GeneXpert (Real time Polymerase chain reaction (PCR) for mycobacterium TB (Xpert MTB/Rif Ultra)). The specimen revealed a Rifampicin resistant mycobacterium TB complex and TB culture was done where a positive result was confirmed after 13 days.

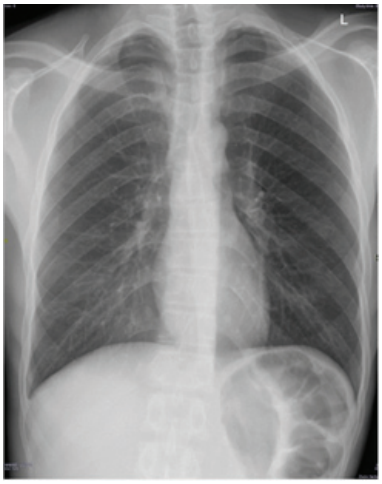

Figure 1: *Chest x-ray within normal limits.*

Management

The infectious disease team was consulted to review the patient and they started the patient on the following Rifampicin resistant anti-TB treatment: Levofloxacin 1000 mg daily, INH (Isoniazid) 900 mg daily, Ethionamide 750 mg daily, Clofazimine 100 mg daily, Ethambutol 1200 mg daily, Pyrazinamide 1500 mg daily, Pyridoxine 50 mg daily and Bedaquiline 400 mg. Bedaquiline was held to allow Efavirenz (EFV) washout for one week and EFV was substituted with Aluvia (Lopinavir/Ritonavir). The patient was then put on a longer regimen between 18 and 20 months.

Follow up review

On review at 12 months, the patient had gained weight of 4 kg (7.6%) and elbow pain had resolved. Clinically he had no sinuses on the elbow joint, the elbow was not tender and its range of motion had not changed. Plain radiographs of the left elbow showed decreased joint space, osteopenia and proximal ulnar osseous erosion as illustrated in Figure 3. His chest x-ray was within normal limits, ESR of 4 mm/hr, CRP of 0 mg/L and WCC of 3.36 × 10^9/L was responding well to the anti-TB treatment, currently on continuation phase and has started physical therapy.

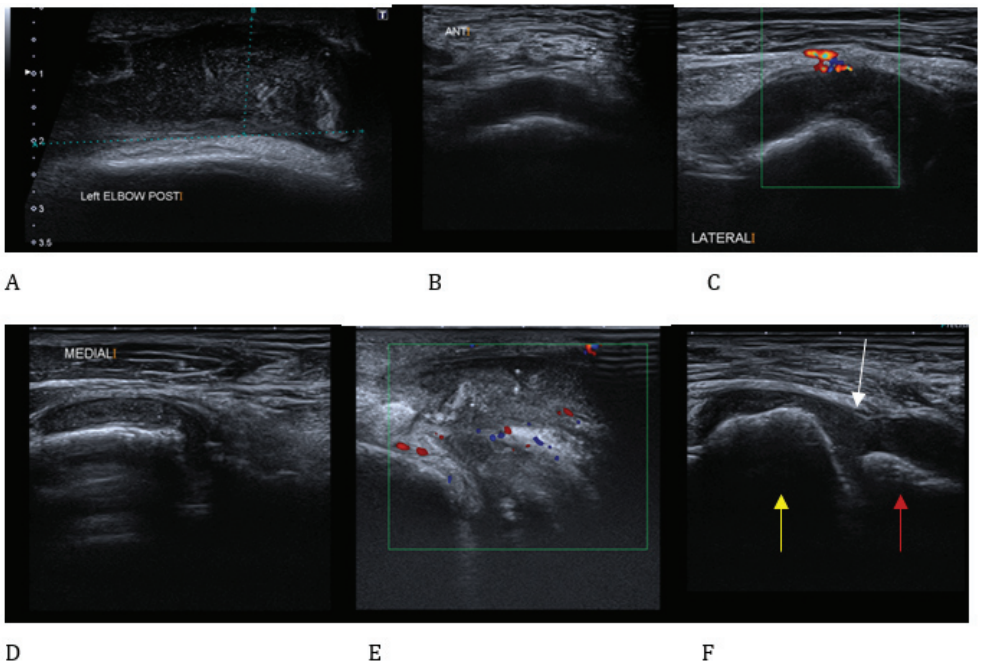

Figure 2: *A: Olecranon Bursitis; hypoechoic heterogenous complex fluid structure. B, C and D: Joint effusion. E: Synovitis and F: intraarticular effusion (yellow arrow: humerus, red arrow: radius and white arrow: joint effusion).*

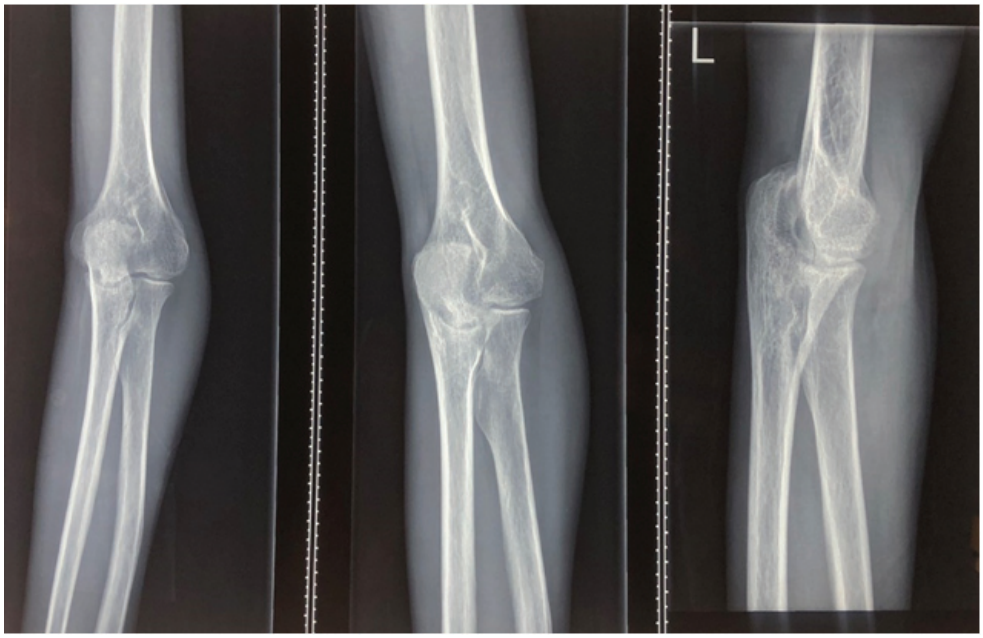

Figure 3: *Radiographs of the left elbow: showing decreased joint space, Osteopenic bones and the lateral view shows ulnar bone osseous erosion.*

Actual outcomes

Clinical symptoms had resolved, septic markers were within normal limits and radiologically had intra-articular joint involvement without gross destruction.

Discussions

Clinically, TB arthritis can be difficult and delayed to diagnose due to non-specific symptoms on presentation. It commonly presents with pain, swelling, decreased joint movement and deformity. This disease can also uncommonly present with constitutional symptoms, muscle wasting and a draining sinus (3,4,6,7). Our patient had progressive painful, swollen elbow and stiffness of the elbow joint. Plain radiograph changes generally present late post onset of the disease at 2 – 5 months (3). A Phemister triad is used to diagnose and monitor follow up of treatment of musculoskeletal TB. A triad consists of peri-articular osteoporosis, peripherally located osseous erosion and gradual diminution of the joint space (8). The modified Martini classification divides the radiological changes of musculoskeletal TB into four stages: stage 1-synovial, stage 2-extra-articular away from the joint, stage 3-extra-articular lesions threatening to affect the joint or intra-articular lesions without gross destruction, subtype 3A-extra-articular lesions threatening to affect the joint, subtype 3B-intra-articular lesions without gross destruction and stage 4 gross destruction (9).

Pulmonary TB is observed in only 50% of all cases presenting with TB arthritis on chest x-ray and systemic symptoms are not always observed in this group of patients (6). Computed Tomography (CT) scan and magnetic resonance imaging (MRI) are good in defining elbow bony lesions and soft tissue pathology (3). In our patient these modalities unfortunately, were not used. Ultrasound is frequently used to diagnose extrapulmonary TB of the abdomen when suspected (2) and in our case it was used to diagnose synovitis stage 1 of the TB arthritis (10). Rifampicin resistant-TB is principally diagnosed with the use of Xpert MTB/Rif Ultra cartridges (11). Xpert MTB/Rif has a sensitivity of more than 77% and specificity above 73% (2). Differential diagnosis of TB arthritis may include the following disease: septic arthritis, gout, rheumatoid arthritis, osteoarthritis, ankylosing spondylitis, synovial osteochondromatosis and haemophilic arthropathy (8). Rifampicin resistant TB is orally treated in two ways, shorter and longer regimens, where shorter is between 9 and 11 months while longer is between 18 and 20 months. The longer regimen of anti-TB intensive phase is between 6 and 12 months of continuation phase. Our patient was on longer regimen Rifampicin resistant anti-extrapulmonary TB treatment (11). The surgical option is normally reserved for cases with modified Martini classification stages 3 and 4. However, our patient was diagnosed with bursitis and synovitis, with increased inflammatory makers, WCC, CRP and ESR, therefore, allowing us to draw a conclusion of infective Olecranon bursitis and owe performed surgery as recommended (12).

Conclusion

TB arthritis must be considered in the diagnosis of single joint arthritis in HIV positive patients with low CD4 count and Rifampicin resistant TB should be suspected. Chronic painful elbow joint should raise suspicion of extrapulmonary TB arthritis and ultrasound examination may be considered in the early diagnosis of TB arthritis. Our patient was able to respond positively to the treatment we offered him, with clinical symptoms resolved, weight gained and low ESR.

Ethics Clearance Number: M200780

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