Case Report

Navigating diagnostic uncertainty: A case report of concurrent osteoarticular tuberculosis and miliary mottling in chest imaging.

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Abstract

Extra-pulmonary tuberculosis, including musculoskeletal tuberculosis presents diagnostic challenges due to diverse clinical manifestations. We present a case of a postpartum woman from Sri Lanka who initially presented with knee joint pain and subsequently developed respiratory symptoms. Her chest X-ray revealed miliary mottling, prompting further investigation. Despite sputum negative for acid-fast bacilli (AFB), the knee joint biopsy confirmed tuberculosis of joint. The diagnostic dilemma persisted regarding whether the presentation represented isolated osteoarticular tuberculosis or concurrent miliary tuberculosis.

This case highlights the complexity of diagnosing extra-pulmonary tuberculosis and the need for vigilance in evaluating diverse clinical presentations related to tuberculosis.

Keywords*: tuberculosis, osteoarticular, miliary mottling*

Introduction

Tuberculosis remains a significant public health concern in Sri Lanka with around 9000 cases per year, necessitating attentiveness in diagnosing both typical and atypical presentations of the disease.[1] This is caused by a slow growing, acid fast, non- motile, facultative intracellular, obligate-aerobic bacillus called *Mycobacterium tuberculosis*.[2] There are various types and nomenclature related to tuberculosis.[3]

The incidence of extra-pulmonary tuberculosis is increasing, while pulmonary tuberculosis cases are still the most common., Musculoskeletal tuberculosis accounts for a notable proportion (10%) of extra pulmonary tuberculosis.[4] Pott's spine and joint tuberculosis, particularly septic tuberculous arthritis, are frequently encountered sub types of musculoskeletal tuberculosis.[4] Additionally osteomyelitis, tenosynovitis, bursitis, and pyomyositis are other clinical presentations of musculoskeletal tuberculosis.[4]

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Miliary tuberculosis represents another significant entity, constituting 1-2% of all cases.[5] This is characterised by haematological dissemination and multi-organ involvement disproportionately affecting individuals under 40 years of age and those with compromised immune systems.[6] Diagnosis typically relies on the identification of miliary mottling on chest radiography.[7]

We present a rare case of tuberculosis of the knee joint, initially presenting with respiratory distress and exhibiting miliary mottling on chest radiography, underscoring the importance of recognising diverse clinical presentations in the diagnosis and management of tuberculosis.

Case report

A 38-year-old postpartum Sri Lankan woman (4 months after delivery), residing in the estate sector of Gampola, presented to a local hospital with a two-week history of right-sided knee joint pain and swelling. She attributed these symptoms to a mild slip and fall incident which happened two weeks prior to presentation. She underwent knee joint aspiration which showed only red blood cells and was initially managed for traumatic haemoarthrosis. However, due to persistent symptoms without improvement, she was readmitted to the same hospital and subsequently transferred to a tertiary care facility for further orthopaedic evaluation.

During her hospitalisation at the tertiary care facility, the patient developed sudden onset shortness of breath, tachycardia, tachypnoea, mild desaturation, and hypotension while awaiting the results of repeat knee joint aspiration. Detailed history-taking revealed that her right knee joint pain had commenced two weeks prior, characterised by constant mild pain with no alleviation upon rest or activity. The pain progressively worsened and was accompanied by swelling. There was no history of joint stiffness or involvement of other joints. The patient denied experiencing discolouration, warmth, fever, loss of appetite, or weight loss. She had no ocular symptoms, dysuria, vaginal discharge, high-risk sexual behavior, or known contact with tuberculosis.

The right knee joint examination revealed marked swelling without local tenderness and erythema. Mild joint effusion was noted. All range of active and passive movements were restricted due to pain. There was no discrepancy in leg length, no wasting of surrounding muscles and no palpable lymphadenopathy. The Bacillus Calmette-Guérin (BCG) scar was present. Her respiratory system examination revealed a SpO2 (oxygen saturation) of 88% in room air and a respiratory rate of 24 breaths per minute with scattered bilateral coarse crepitations. Cardiovascular examination revealed a shock state with a pulse rate of 102 beats per minute and blood pressure of 80/50mmHg without cardiac murmurs. Examination of the central nervous system and abdomen were unremarkable. Fundus examination was normal.

Her basic investigations are shown in Table 1 with results on day 1, 4 and 8 after admission.

Table 1: Investigation summary with results on days 1,4 & 8 after admission

Investigation	Day 1	Day 4	Day 8	Normal Values
WBC	6.08 x10^3 uL	9.92 x10^3 uL	5.36 x10^3 uL	4 – 10x10^3 uL
Hb	10.1 g/dl	9.2 g/dl	8 g/dl	11-16 g/dl
Platelet	342 x10^3 uL	483 x10^3 uL	373 x10^3 uL	150-450 x10^3uL
ESR	40 mm/1st hr	62 mm/1st hr		20mm/1st hr
CRP	31 mg/L	116 mg/L	73.7 mg/L	<10 mg/L
S. Creatinine	276.7 mmol/L	292.6 mmol/L	235.6 mmol/L	65-120 mmol/L
UFR	Pus cells 1-2 No red cells Protein+		normal	
AST	24.5 U/L	14 U/L	13.1 U/L	<31U/L
ALT	23.1 U/L	10.6U/L	13.1 U/L	<34U/L
ALP	358 U/L	243.4 U/L	192.2 U/L	30-120U/L
GGT	226.7 U/L	161.2 U/L		9-39U/L
T. bilirubin	4.92 mmol/L	4.02 mmol/L		5-9mmo/L
D. bilirubin	2.5 mmol/L	1.89 mmol/L		1.7-6.8 mmol/L
Albumin	2.2 g/dl	2.2 g/dl		3.5-5.3 g/dl
Sodium	137 mmol/L	140 mmol/L		136-146 mmol/L
Potassium	3.7 mmol/L	3.3mmol/L		3.5-5.6 mmol/L

WBC: white blood cells; Hb: haemoglobin; CRP: C reactive protein
ESR: erythrocyte sedimentation rate; UFR: urine full report
AST: aspartate aminotransferase: ALT: alanine transaminase
ALP: alkaline phosphatase; GGT: gamma glutamyl transferase
T. bilirubin: total bilirubin; D. bilirubin:direct bilirubin.

Repeat joint aspiration yielded only 1cc of thick purulent fluid, which was negative on culture. Her right knee joint x-rays are shown in Figures 1a and b.

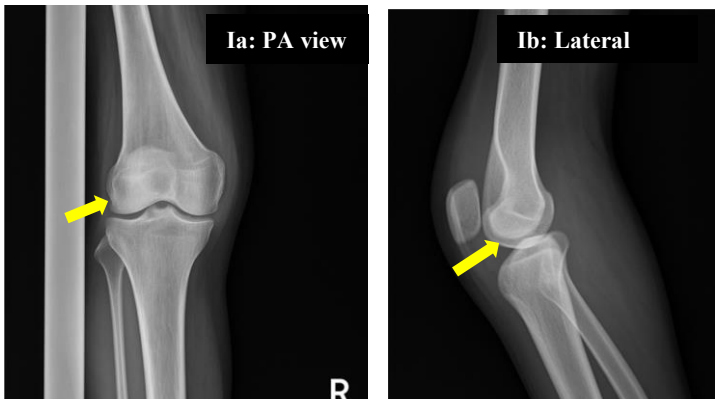


Figure 1: X-ray of right knee joint
Showing thickened synovium with irregularity of articular bones and destructed meniscus

Her chest x-rays taken 2days apart following shortness of breath (admission day 6 and day 8) showed miliary mottling of both lung fields (Figures 2a and b)

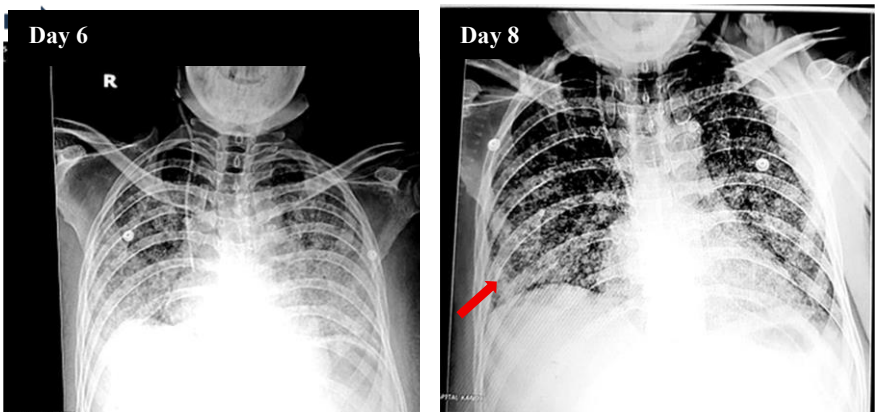


Figure 2: Chest x-rays taken 2 days apart showing miliary mottling

Her initial D dimer level was 1500ng/mL and a 2D echocardiogram was normal. However, due to the patient's haemodynamic instability, a computed tomography pulmonary angiography (CTPA) was deemed unfeasible at the time.

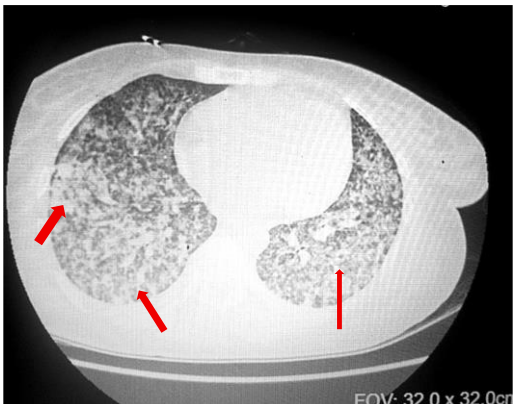


Figure 3: HRCT
shows innumerable small patchy areas of consolidation and ground glass appearance (red arrows)

Subsequently, on the 6th day after admission, a high-resolution computed tomography (HRCT) scan was conducted, revealing innumerable small patchy areas of consolidation with diffuse ground glass appearance and evenly distributed nodules in both lung fields (Figure 3). Differential diagnoses were given as miliary mottling due to sepsis, miliary tuberculosis and atypical pneumonia.

The patient's Mantoux test returned negative, and initial three sputum samples for acid-fast bacilli (AFB) were negative. Initially managed as septic arthritis in the orthopaedic ward, she received intravenous ceftriaxone. However, as her condition deteriorated with evident chest involvement, the antibiotic regimen was adjusted to intravenous meropenem, teicoplanin, and levofloxacin. Subsequently, she was transferred to the intensive care unit (ICU) for close monitoring and received high-flow nasal oxygen therapy.

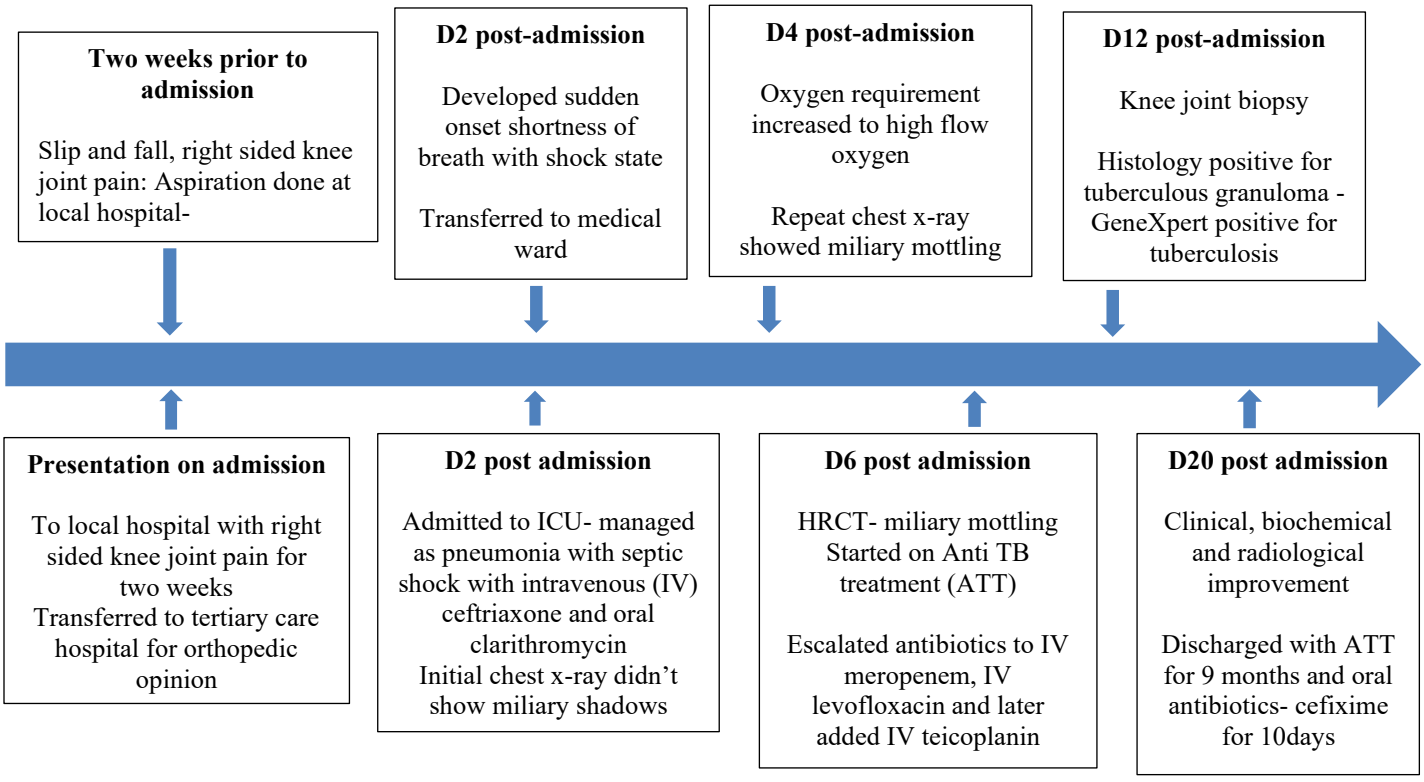
Given the clinical suspicion of tuberculosis based on the presence of miliary shadowing on chest radiography and supportive liver function tests, a collaborative decision was made with the respiratory team to initiate empiric anti-tuberculosis therapy. Following the commencement of anti-tuberculosis treatment, the patient exhibited clinical improvement with reduced oxygen requirement and resolution of chest radiography shadows. However, confirmation of the diagnosis necessitated tissue biopsy.

A right-sided knee joint synovial biopsy was performed with the assistance of the orthopaedic team. Histopathological examination revealed granulomatous infection, suggestive of

tuberculosis. This was confirmed by the GeneXpert test performed on the biopsy sample detecting the *M tuberculosis* complex.

Although the sputum samples were negative for acid-fast bacilli on two occasions, the second sample being obtained following saline stimulation, we proceeded with a diagnosis of extra-pulmonary tuberculosis. The patient positively responded to a nine-month course of anti-tuberculosis therapy, as evidenced by clinical, biochemical, and radiological improvements. Family screening was conducted for her two children and husband with chest x-ray and Mantoux test which were negative.

Figure 4: Timeline of the illness



Discussion

This case was chosen due to the diagnostic challenge posed by the coexistence of miliary tuberculosis and tuberculosis affecting the joints, which may be classified as disseminated tuberculosis or as an instance of extra-pulmonary tuberculosis only.[3] While pulmonary tuberculosis was clinically diagnosed based solely on chest X-ray (CXR) findings, joint tuberculosis was confirmed through histological examination and molecular testing.

Of particular interest is the patient's initial presentation with haemoarthrosis followed by the discovery of septic arthritis with draining pus. This raises the question of whether septic arthritis was secondary to another source of infection or was directly attributable to tuberculosis. Our

diagnostic inference is supported by pain restricted movements in the absence of severe tenderness as well as the negative cultures of the aspirated joint fluid, but it should be noted that the patient received oral antibiotics at a previous healthcare facility.

Conclusion

Clinicians should exercise vigilance for tuberculosis and other common chronic infections when confronted with atypical presentations that do not respond to conventional treatment. Early consideration of tuberculosis in such a scenario can facilitate timely diagnosis with the help of rapid molecular testing and appropriate management, thereby minimising morbidity and mortality and preventing further transmission.

Declaration

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Author contributions:
Subasinghe SMRK- writing original draft, reviewing and editing,
Senadheera J- Supervision,
Azher S- Supervision

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