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Case Report

A 47-Year-Old Man with Hypertension, Old Stroke and Polymyositis Having Left Elbow Joint Swelling and Pleural Effusion: Common Things are Common!

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Case Summary

Tuberculosis (TB) is a pulmonary disease with potential extrapulmonary manifestations that is caused by the bacteria *Mycobacterium tuberculosis*. Despite advancements in treatment, TB remains a worldwide public health concern. While TB predominantly affects the lung parenchyma in more than 80% of people, extrapulmonary TB is also commonly encountered. According to World Health Organization (WHO) Global report on tuberculosis 2025, globally, 10.8 million people were diagnosed and reported to have a new episode of TB; and, most TB cases in 2024 were in the WHO regions of South-East Asia (34%). Of these cases, nearly 20% of them had extrapulmonary TB. Globally in 2024, there were an estimated 1.08 million deaths among HIV-negative people with TB [1].

And, musculoskeletal tuberculosis is the third most common site of extrapulmonary TB after pleural and lymphatic disease; TB osteomyelitis accounts for approximately 3-5% of them. It was reported that diagnosis of musculoskeletal tuberculosis was challenging especially it was confounded with other illness, especially polymyositis. Vertebral involvement (tuberculous spondylitis, or Pott's disease) is the most common type of skeletal TB, accounting for about half of all cases of musculoskeletal TB. It was followed by hip joint, knee joint, and elbow joint [2]. The

presentation of musculoskeletal TB may be insidious over a long period; and it leads to late diagnosis [3]. In patients with MCTD/polymyositis/rheumatoid arthritis, musculoskeletal TB may have similar presentation. It leads to delay in diagnosis. Concomitant pulmonary involvement may not be present, thus confusing the diagnosis even further [4].

Musculoskeletal TB is one of tumor mimics even in TB endemic countries [5]. Early diagnosis of bone and joint disease is important to minimize the risk of deformity and enhance outcome [6]. MRI is the imaging procedure of choice; however, multi-model approach is necessary [7]. And directed biopsies of affected area of the musculoskeletal system confirm the definitive diagnosis by histopathologic, microbiological, or molecular assays.

Case Presentation

A 47-year-old man had symmetrical polyarthritis, myalgia, malaise, cough, appetite loss and weight loss for 2 months. He had hypertension and stroke 3 years ago; lacunar infarct. He had painful swelling of elbow joints with pain at proximal inter-phalangeal joints and knee joints for two months. Both elbow joints were swollen more on left side; flexion deformity was noted. Range of movement of knee joints was limited due to pain; joint swelling was not obvious. He had left sided pleural effusion; pleural fluid was straw color; it was transudate; pleural fluid ADA was negative; and PCR for tuberculosis was negative. He had anemia; normal total WBC count with lymphopenia; normal renal profile; LDH was normal; HbA1C was normal; and hypoalbuminemia. HIV serology was negative. Serum iron study & ferritin were normal. Initial Chest radiograph revealed left pleural effusion; however, left chest was normal in humerus Xray. It is shown in (Figure 1). Ultrasound abdomen was normal. As he had chronic polyarthritis, serology for connective tissue screening was done. Blood for RA was negative; ANA was negative. And in ANA profile, blood RNP was strongly positive.

He Was Treated as MCTD/Polymyositis with Steroids and NSAID

Swelling at left elbow joint was increasing; skeletal survey was done to exclude osteolytic lesion. Skull X-ray revealed normal; lytic lesion was not seen in skull and facial bones. Left humerus (AP) view illustrated diaphyseal cortical bone lesion of left humerus. In left elbow (AP/Lateral) view, no obvious sclerotic or lytic lesion was detected; joint space was preserved. Lumbar Spine X-ray revealed features of lumbar spondylosis without disc space narrowing. It is illustrated in (Figure 1)

Figure 1: Figure (1a) Xray of Left elbow joint AP view showed diaphyseal cortical bone lesion at lower end of left humerus and elbow joint space was preserved. Figure (1b) Xay of Left humerus AP view illustrated same as photo (1a) and part of chest revealed neither obvious lung lesion nor pleural effusion. Figure (1c) and (1d) Xay of Lumbar Spine X-ray demonstrated features of lumbar spondylosis without disc space narrowing.

(Figure 2 & 3) are MRI (left humerus). MRI of Left humerus revealed cortically based lesion involving diaphysis of left humerus at deltoid muscle insertion with adjacent biceps muscle signal abnormality suggestive of focal cortical bone tumor with adjacent soft tissue involvement.

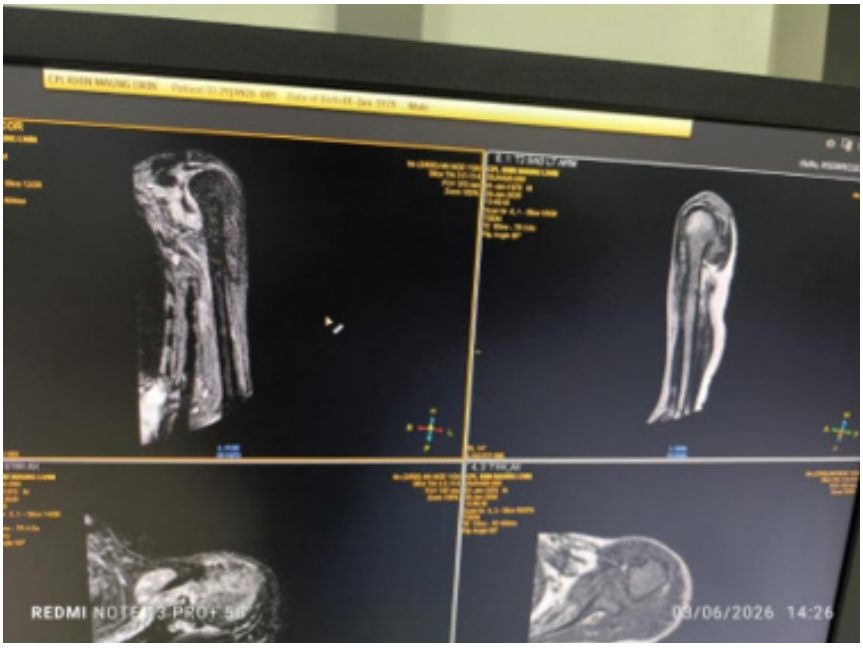

Figure 2: MRI of humerus revealed cortically based lesion involving diaphysis of left humerus at deltoid muscle insertion with adjacent biceps muscle signal abnormality suggestive of focal cortical bone tumor with adjacent soft tissue involvement.

Figure 3: MRI of Left humerus revealed cortically based lesion involving diaphysis of left humerus at deltoid muscle insertion with adjacent biceps muscle signal abnormality suggestive of focal cortical bone tumor with adjacent soft tissue involvement.

He Died Oof Cachexia While Arranging for Biopsy

In post-mortem examination, mass like lesion was noted at left elbow joint. On opening it, pus about 50 ml was noted. Pus was originated from distal shaft of left humerus and it was similar to osteosarcoma in gross anatomy. (Figure 4) reveals various sections on elbow joint and humerus.

Figure 4a: Autopsy left elbow joint showing mass like lesion at (Lt) elbow joint.

Figure 4b: Autopsy left elbow joint: pus 50 cc was drained on opening mass over elbow; it originated from distal shaft of (Lt) humerus; and it was grossly similar to osteosarcoma.

Figure 4c: Autopsy left elbow joint: pus 50 cc was drained on opening mass over elbow.

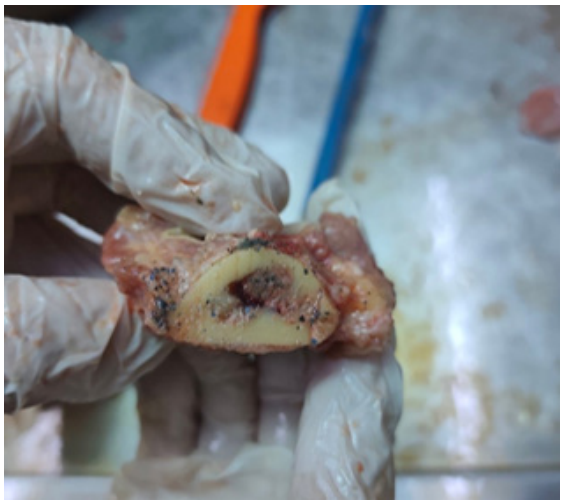

Figure 4d: Autopsy left elbow joint: pus containing mass was originated from distal shaft of (Lt) humerus and osteosarcoma like lesion was also noted.

Adhesions to pleura and consolidations are illustrated in (Figure 5). Cardiomegaly and thickened left ventricular wall are demonstrated in (Figure 6). Brain was normal except mild atherosclerosis (Figure 7). Pus culture was sterile.

Figure 5a: Autopsy lungs: carbon stains and adhesions more on left lung were on both lungs.

Figure 5b: Autopsy lungs: carbon stains and adhesions more on left lung were on both lungs.

Figure 5c: Autopsy lungs: Features of consolidation in both lungs.

Figure 6a: Autopsy heart: cardiomegaly; heart weight was 510 gm.

Figure 6b: Autopsy heart: increased left ventricular wall thickness; left ventricle diameter was 2 cm; and wall thickness was 3 cm.

Figure 7: Autopsy brain: cerebellum, midbrain, pons and medulla were grossly normal.; Circle of Willis showed mild degree of atherosclerosis.

Histology confirmed the diagnosis of tuberculous osteomyelitis with extension to nearby muscle and tuberculous pneumonia. (Figure 8-10) show features of tuberculous pneumonia. (Figure 9 &10) histology of lung parenchyma, well-formed granuloma with central caseous necrosis, rimmed by typical Langhans type multinucleated giant cells (Nuclei – horseshoe pattern distribution) are seen. They were suggestive of tuberculous pneumonia.

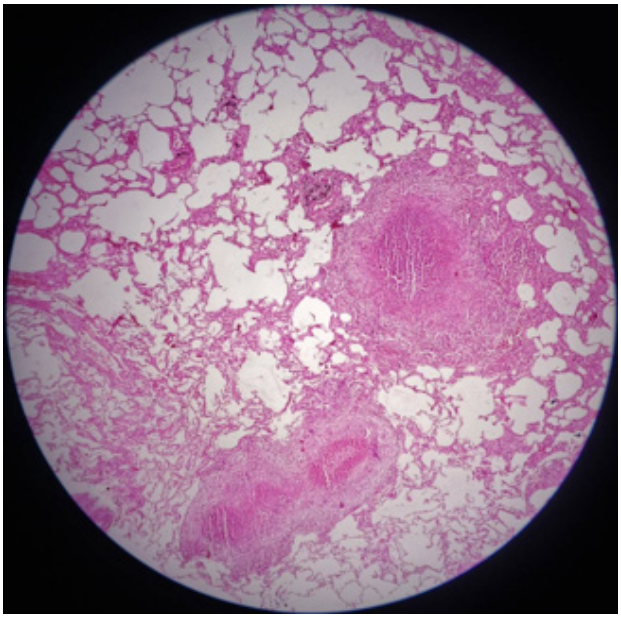

Figure 8: Histology of Lung parenchyma showing alveolar spaces, few carbon pigments and several caseating granulomas, surrounded by fibroblasts and giant cells.

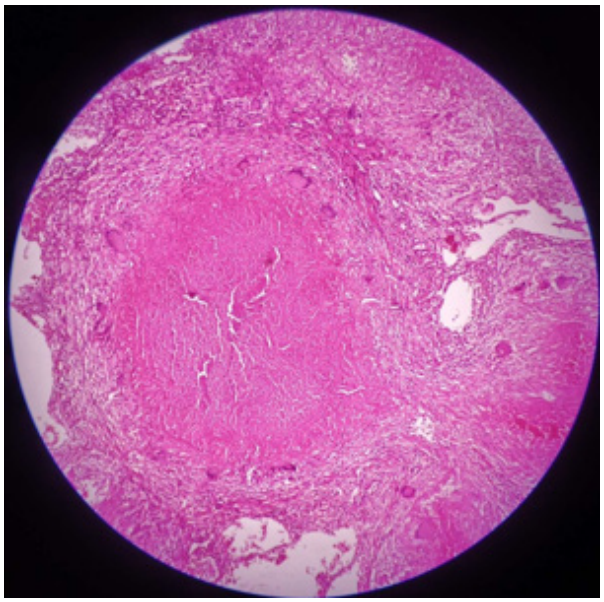

Figure 9: Histology of Lung parenchyma: Well-formed granuloma with central caseous necrosis, rimmed by typical Langhans' type multinucleated giant cells (Nuclei – horseshoe pattern distribution).

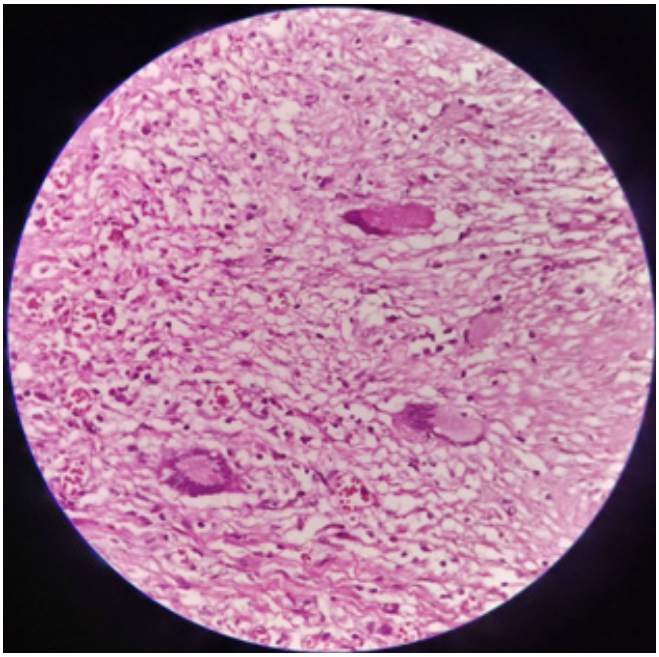

Figure 10: Histology of Lung parenchyma: Well-formed granuloma with central caseous necrosis, rimmed by typical Langhans' type multinucleated giant cells (Nuclei – horseshoe pattern distribution).

(Figure 11 & 12) reveal tuberculous osteomyelitis with extension to nearby muscle. Pus culture was sterile. In (Figure 11), histology of cut section of humerus, bone destruction of marrow cavity with anucleated osteocytes in body of lamellar bone (Sequestrum), thickened periosteum by granulomatous reaction with underlying compact bone are identified. The features were suggestive of tuberculous osteomyelitis.

In (Figure 12) histology of cut section of humerus, tuberculous granulomatous reactions, involving the bone and nearby soft tissues (the granulomas between the bony matrix, dilated blood vessels and adipocytes) are shown.

In (Figure 13), histology of cut section of humerus, numerous granulomas with Langhans giant cells, reaching the striated muscle fibers are illustrated. They were suggestive of tuberculous pyomyositis.

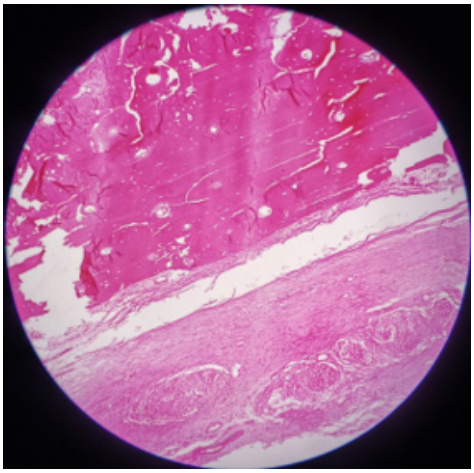

Figure 11: Histology of cut section of Humerus: Bony destruction of marrow cavity with anucleated osteocytes in body of lamellar bone (Sequestrum); thickening of periosteum, by granulomatous reaction, with underlying compact bone.

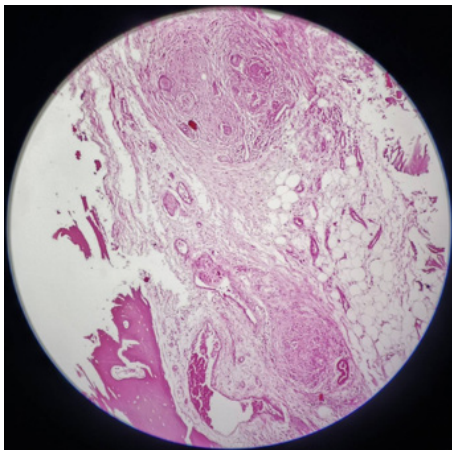

Figure 12: Histology of cut section of Humerus: Tuberculous granulomatous reactions, involving the bone and nearby soft tissues (Note the granulomas between the bony matrix, dilated blood vessels and adipocytes).

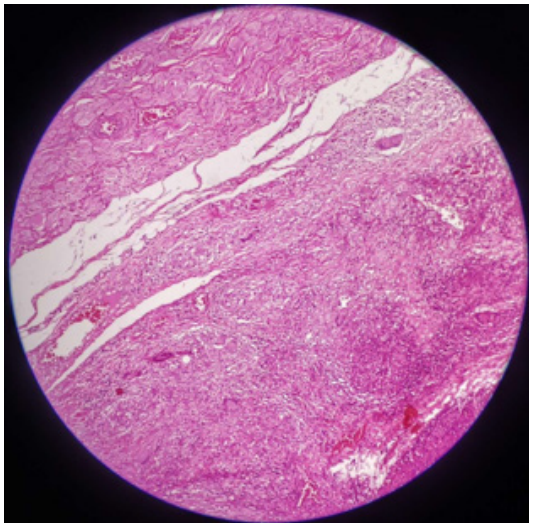

Figure 13: Histology of cut section of Humerus: numerous granulomas with Langhans' giant cells, reaching the striated muscle fibers.

Discussion

Mycobacterium tuberculosis is primarily known to affect the lungs; consolidation; cavities; bronchiectasis; pleural effusion; and enlarged hilar lymph nodes. However, the bacteria disseminates hematogenously to almost any organ; extrapulmonary spread. Approximately 20% of tuberculosis cases have evidence of extrapulmonary involvement and 10% of them have osteoarticular disease. Diagnosis of osteoarticular tuberculosis is usually challenging since it may be confounded with other illness, especially polymyositis. Nonetheless, it presented as an indolent bone mass without systemic manifestations according to case report by Knopp et al "humeral TB osteomyelitis in a 22-month-old female" [8]. Multifocal musculoskeletal tuberculosis was initially thought as either primary bone tumor or metastatic bone tumor due to its atypical presentation [9]. The diagnosis of extrapulmonary tuberculosis must be confirmed by the presence of Mycobacterium tuberculosis; histopathology; microbiology; and molecular assays.

In addition, musculoskeletal tuberculosis had chronic course, weight loss, and constitutional symptoms can further contribute to misdiagnosis. It resulted in inappropriate chemotherapy or radiotherapy as it was similar to tumor. This patient had polymyositis; the symptoms confined to musculoskeletal system typically to proximal muscle groups. However, the clue was localized swelling, weight loss and tiredness; they were refractory to steroids and analgesics. Moreover, the patient initially had pleural effusion which was transudate, pleural fluid ADA negative and Gene expert for tuberculosis was negative. Later, pleural fluid was resolved. It indicated that the etiology of pleural effusion was hypersensitivity to Mycobacterium tuberculosis. In pleural effusion due to *Mycobacterium tuberculosis*, the pathophysiological mechanisms were as follows: (1) hypersensitivity reaction to tuberculo-protein like erythema nodosa or phlyctenular conjunctivitis; (2) direct invasion of *Mycobacterium tuberculosis* to pleura with resultant either transudative or exudative pleural effusion; (3)shedding of *Mycobacterium tuberculosis* from tuberculous osteomyelitis of ribs into pleura giving rise to empyema; (4) rupture of tuberculous lung abscess into pleura.

Because of its multi-organ involvement (including bones, muscle and pleura), it mimicked mixed connective tissue disorder or systemic lupus erythematosus or polymyositis. It resulted in delayed diagnosis. Lesmana et al reported the slow progression and multiple differential diagnoses frequently result in a delayed diagnosis, which leads to complications [10]. In this case, having initial diagnosis of polymyositis mislead the tuberculosis. Several studies mentioned the problems in diagnosis of tuberculosis. Mkrtchyan highlighted the diagnostic challenge of spinal TB with large cold abscesses mimicking malignancy [11]. They pointed out the importance of biopsy for accurate diagnosis and the timely initiation of appropriate therapy. Awareness of multi-drug resistant tuberculosis required tailored therapy. In this patient, because of delay in doing biopsy we could not get the correct diagnosis. Subramony et al reported the etiology of tracheoesophageal fistula as tuberculous; uncommon manifestation of tuberculosis. It was an example of multifocal skeletal TB [12]. Another study agreed that disseminated Tuberculosis (TB) could mimic metastatic/malignant disease because of its multi-organ involvement (including bones) making the diagnosis much more complicated [13].

In this patient, the initial diagnosis was 'polymyositis with malignant bone tumor humerus'; it was based on MRI findings. And, the patient succumbed while waiting for biopsy/surgery. We made wrong diagnosis. Wagh et al analyzed both clinical and radiological features and tissue diagnoses in 25 patients referred to the department of orthopedic oncology with radiological suspicion of tumor. And, they pointed out that the diagnosis based primarily upon imaging was a wrong approach. They suggested a multimodal approach to differentiating tuberculous bone infections from sarcomas [14]. They emphasized the need for tissue diagnoses to confirm bone pathology. Therefore, mislead diagnosis in this case strongly supported their suggestion. Here, tuberculosis osteomyelitis was missed clinically because having strongly positivity serology for RNP, vague musculoskeletal pain and transudative pleural effusion resolved spontaneously with steroid were points unlikely to be tuberculosis. Autopsy revealed non-caseating granulomas with Langhan's giant cells in ostium of humerus with invasion into nearby muscle and in lung parenchyma. Pus culture from autopsy did not grow organism. This case signified that atypical presentations of *Mycobacterium tuberculosis* mimicked bone tumor. And it pointed out the need for tissue biopsy early.

V Chewoolkar, et al., found, primary tuberculous pyomyositis in a 14-year-old boy; his initial symptoms included localized muscle pain, swelling, and tenderness [15]. They pointed out that tuberculosis involving the soft tissue near adjacent bone or joint was well recognized as we found in this case. In histopathological examination, non-caseating granulomas with Langhan's giant cells in ostium of humerus with invasion into nearby muscle was illustrated. In this patient, the symptoms were more of generalized muscle pain; and minimal tenderness over the elbow joint was the focal sign. Having tuberculous osteomyelitis, tuberculous pyomyositis, tuberculous pneumonia, pleural effusion and lymphopenia in this patient was a rare manifestation.

Conclusion

Tuberculosis may present with multisystem involvement in endemic areas. Tuberculosis may mimic tumor; hence, bacteriological and histological confirmation is the key. Misdiagnosis of tuberculous abscess/osteomyelitis could lead to inappropriate treatments, prolonged morbidity and even death. Awareness on musculo-skeletal tuberculosis is important particularly if a patient with polymyositis has localized/focal lesion in a particular area of bone or joint. Combination of transudate nature of pleural effusion and lymphopenia may be either due to hypersensitivity reaction to *Mycobacterium tuberculosis* or connective tissue disorder.

Conflict of Interest

None.

Acknowledgement

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