

TUBERCULOUS SPONDYLITIS IN A 20 YEARS-OLD MAN WITH PULMONARY LESIONS: A CASE REPORT

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ABSTRACT

Introduction: Tuberculosis caused by *Mycobacterium tuberculosis* (Acid-Fast Bacilli/AFB) the disease infects the lungs (pulmonary tuberculosis), but it can also infect other organs (extrapulmonary tuberculosis). Tuberculous spondylitis or Pott's disease is an infection of *Mycobacterium tuberculosis* in the vertebrae (extrapulmonary tuberculosis). The early diagnosis of tuberculous spondylitis is difficult and often confused with spinal neoplasms or other pyogenic spondylitis.

Case presentation: Our patient admitted to Dr. Ramelan Navy Hospital Surabaya with the chief complaint of bump in the lower right back since 4 months before entering the hospital, the bump felt painful (and a Wong- Baker pain scale of 4) when coughing and when touched, lump palpable with a soft consistency and 12 cm in diameter. Patient can move their legs freely and there are no limitations on the patient's range of motion. Defecate and urinate within normal limits. This patient has demonstrated a stable deformity with severe kyphosis with a 27% sagittal angulation without any neurological deficits.

Conclusions: This report highlights to clinicians the value of a high index of suspicion and careful history taking in tuberculous spondylitis; and how a combination of nonspecific findings helped reach an early diagnosis. Because the clinical manifestations of TB spondylitis differ, various methods, including thoracolumbosacral X-ray and MRI with contrast, are required to confirm the disease. As a result, an interdisciplinary collaborative team is required to achieve optimal patient outcomes and to prevent long-term sequelae.

Keyword: Tuberculous Spondylitis, Extrapulmonary Tuberculosis, *Mycobacterium tuberculosis*, Pott's disease

INTRODUCTION

Tuberculosis is an infectious disease that is a major cause of ill health and one of the leading causes of death worldwide until the coronavirus (COVID-19) pandemic. Tuberculosis caused by *Mycobacterium tuberculosis* (Acid-Fast Bacilli/AFB) was the leading cause of death from a single infectious agent, ranking above HIV/AIDS. Indonesia has become the second major contributors to the global increase cases between 2020 and 2021.¹

In tuberculosis, more than 80% of the disease infects the lungs (pulmonary tuberculosis), but it can also infect other organs (extrapulmonary tuberculosis) which spreads to other organs in 5 ways: (1) inhalation of droplet nuclei in sputum with tuberculosis active, (2) hematogenous spread from other organs, (3) lymphatic spread by infected nodes, (4) direct spread from sites, and (5) ingesting dairy products infected with *Mycobacterium bovis* while drinking raw milk.²

Tuberculous spondylitis or Pott's disease is an infection of *Mycobacterium tuberculosis* in the vertebrae (extrapulmonary tuberculosis). Pott's disease is caused by the hematogenous or lymphatic spread of *Mycobacterium tuberculosis* from a primary focus outside the vertebrae. The prevalence of Pott's disease is 2% of all cases of tuberculosis.³ Pott's disease can be found together with pulmonary tuberculosis or a history of pulmonary tuberculosis around 33-50%.⁴ Clinical symptoms of Pott's disease are not specific so that there is often a delay in diagnosis and disease progression can occur in the form of kyphosis and neurological deficits which can reduce productivity and quality of life.⁵

The early diagnosis of tuberculous spondylitis is difficult and often confused with spinal neoplasms or other pyogenic spondylitis. Ironically, the diagnosis is usually only made at an advanced stage, when spinal deformities and neurological deficits are already present. Clinically the symptoms of bone and joint tuberculosis are non-specific and clinically often indolent, resulting in significant delays in diagnosis and outcome of bone and joint destruction.⁷ Medical therapy in the form of antituberculosis drugs is preferred, whereas surgical therapy is tailored to each patient's unique circumstances.⁶ In this case report we present a case of 20 years-old man with tuberculous spondylitis with pulmonary lesions.

CASE PRESENTATION

A male patient, 20 years old, ethnic Madurese, Muslim, a Surabaya resident was admitted to Dr. Ramelan Navy Hospital Surabaya with the chief complaint of bump in the lower right back since 4 months before entering the hospital, the bump felt painful (and a Wong-Baker pain scale of 4) when coughing and when touched, lump palpable with a soft consistency and 12 cm in diameter.

The patient also complained that his back felt increasingly hunched in the last few months. Patients experience back pain, particularly in the area of the bent/hunched back, and the pain was felt better at rest and worse during activities. In addition, the patient complained of a long cough since the last year, an active cough accompanied by greenish-yellow phlegm. Patient said he was ever coughing up with bloodstreak once a couple month ago. Patients also complain of frequent night sweats accompanied by weight loss. The patient has been tested for tuberculosis and the results are positive. Currently the patient is on anti-tuberculosis treatment. The patient has been taking anti-tuberculosis treatment 3 tablets a day since 2 months ago. The patient also has a history of asthma when he was a child. The patient had no history of hypertension, diabetes, or malignancy. The patient also had no prior surgical history. None of the patient's family members had similar complaints. There was no family history of cancer, hypertension, or diabetes mellitus.

There was no neurological disorder in the patient. Currently the patient can walk without assistance. Patient often consumes diclofenac sodium when the lump and back feels painful. Patient can move their legs freely and there are no limitations on the patient's range of motion. Defecate and urinate within normal limits.

On physical examination, the general condition was a little weak and comatose with GCS 4/5/6. The blood pressure 11/70 mmHg, pulse 84x/min, respiratory rate 20 x/min, SpO₂ 98% with free air, axillary temperature 36.7°C. Anemic conjunctiva, icteric sclera, cyanosis, dyspnea, increased jugular venous pressure, trachea deviation and enlarged neck lymph nodes were absent during the head and neck examination.

Thoracic examination revealed symmetrical movement with no subcostal, intercostal, or suprasternal retractions. On auscultation, heart sound regular single S1S2 with no murmurs, gallops, or pericardial rubs and the breath sounds from the left lung decreased. There were no enlarged lymph nodes in the axilla. In local status of the back, gibbus was found accompanied by a mass on the right side as high as 10 thoracic vertebrae. A fluctuating palpable mass accompanied by tenderness.



Figure 1. Gibbus (A) was found accompanied by a mass (B) on the right side as high as 10 thoracic vertebrates

The abdomen appeared flat on examination, with normal bowel sounds, a smooth touch, no tenderness, and tympanic percussion in all abdominal regions. The liver and spleen were not palpable. Warm, dry, and red acral was discovered during an examination of the extremities, with a capillary refill time of less than 2 seconds. There was no edema in both leg, no enlargement of lymph nodes in either inguinal and no pathological lesions on the patient’s skin. Motor strength was 5/5 (L2-L5, S1) on examination of both lower extremities, tendon reflexes in the form of knee pessus reflex (KPR) of +2 and Achilles pessus reflex (APR) of +2. The Babinski reflex and Chaddock reflex were absent during the head and neck examination. Hypoesthesia and anesthesia were not found.

Laboratory examination showed leukocytes 12.910/ μ L Hb 11.60 g/dL, neutrophils 78.90%, lymphocytes 11%, platelets 463.000/ μ L, bloodurea nitrogen (BUN) 12 mg/ dL, serum creatinine 0.90 mg/dL, SGOT 22 U/L, SGPT 17U/L, albumin 3.89 g/ dL, sodium 132 mmol/L, potassium 3.39 mmol/L, chloride 93.3 mmol/L, antigen SARS-Cov-2 and RT-PCR SARS-Cov-2 negative and HIV rapid test negative. An X-ray of the chest reveals a large and normal shape of the heart. On the lungs there is fibroconsolidation in the left supraparaphilar and there is an inhomogeneous consolidation in the left hemithorax from below to the top which covers the left costophrenic sinus and part of the left hemidiaphragm. Trachea in the middle. On the results of these examinations, the radiologist concluded that the lungs had the impression of pulmonary tuberculosis and left pleural effusion.

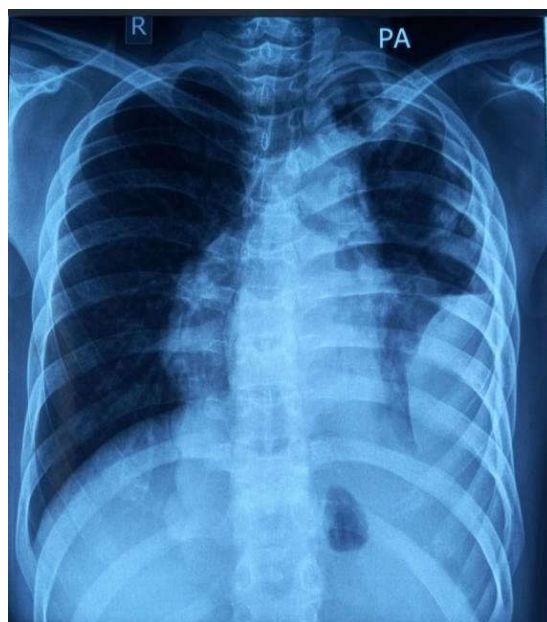


Figure 2. X-ray of the chest reveals impression of pulmonary tuberculosis and left pleural effusion.

AP/lateral thoracolumbosacral X-ray demonstrating compression of 10 thoracic vertebrate in the form of wedging with narrowing of 10-11 thoracic vertebrate discs and paravertebral masses as high as thoracic paravertebrates 9-11 right and left suspicious due to inflammatory process (Spondylitis).

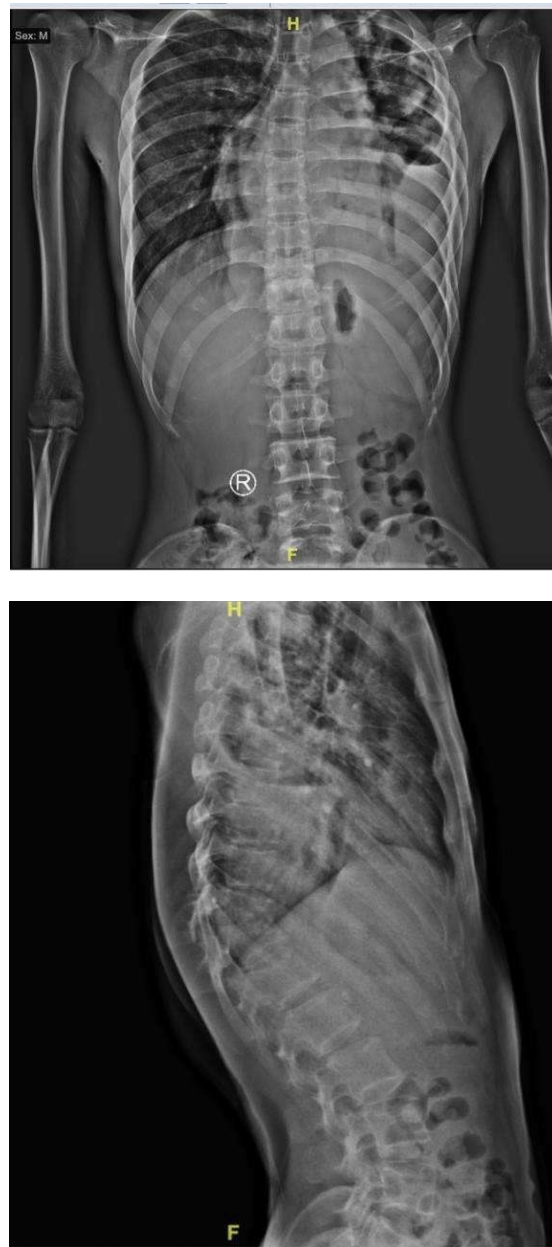


Figure 3. Thoracolumbosacral X-ray, Anteroposterior (A), Lateral (B).

On the 3rd day of hospitalization, a consultation was made with an orthopedic surgeon and was advised to perform Thoracolumbal MRI with contrast and planned debridement and stabilization of the posterior long segment and advised that antituberculosis treatment should be continued.

On the 4th day of hospitalization, a consultation was made with a thoracic and cardiovascular surgeon, the patient had a needle puncture in the pleura and found less than 1cc of purulent fluid. Pleura appeared thick. Then it is suggested to do an ultrasound with a marker on the patient.

On ultrasound examination with a marker showed that there was no left pleural effusion and indicated the possibility of compaction in the left hemithorax.

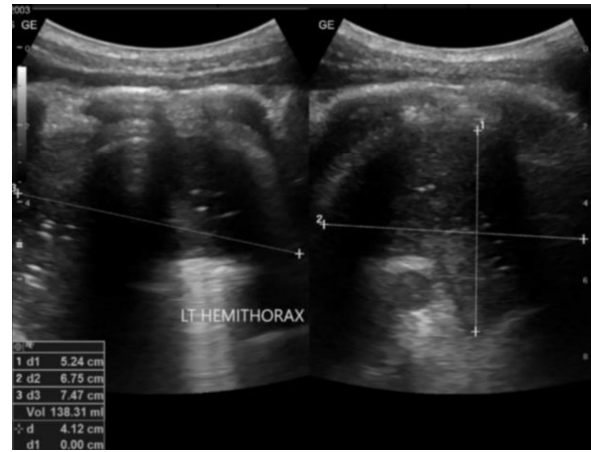


Figure 4. Ultrasound with a marker showed the possibility of compaction in the left hemithorax.

To facilitate clinicians in diagnosing and making different diagnoses for patients presenting with a pulmonary mass on chest radiograph, lateral views of chest X-rays should be obtained. These lateral views may facilitate localizing the pulmonary field. Chest ultrasound is also beneficial in differentiating effusions from masses.



Figure 5. CT Scan with contrast

Thoracolumbal MRI with contrast couldn't be done, therefore a CT Scan with contrast needed for a clearer diagnosis. CT scan result showed tuberculous spondylodiskitis accompanied by paravertebral soft tissue abscess, empyema and left pocketed effusion, and chronic inflammation of the left lung which currently does not appear active

The results of Cytological Examination on the back region (FNAB) showed chronic inflammation according to the tuberculosis process.

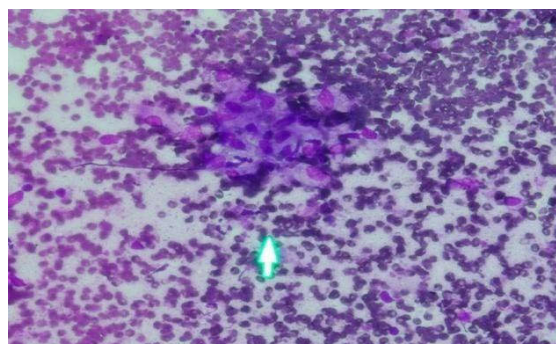


Figure 6. Cytological Examination (FNAB) on the back region.

MSCT guiding the thorax is performed on the mass of the left lung, and showed the results of granulomatous chronic inflammation according to the tuberculosis process.

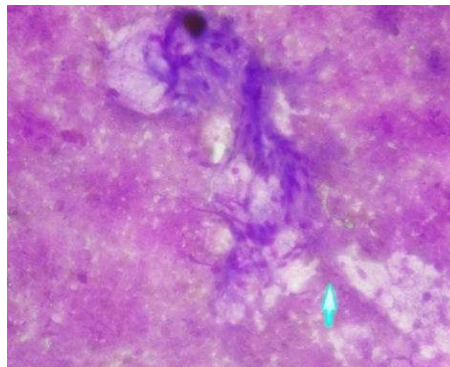


Figure 7. Cytological Examination (FNAB) on the mass of the left lung.

DISCUSSION

Our patient admitted to Dr. Ramelan Navy Hospital Surabaya with the chief complaint of bump in the lower right back since 4 months before entering the hospital, the bump felt painful (and a Wong-Baker pain scale of 4) when coughing and when touched, lump palpable with a soft consistency and 12 cm in diameter. Patient can move their legs freely and there are no limitations on the patient's range of motion. Defecate and urinate within normal limits. This patient has demonstrated a stable deformity with severe kyphosis with a 27% sagittal angulation without any neurological deficits. This causes this patient to be included in the Gulhane Askeri Tip Academician Classification (GAHA) type II. Operative therapy is indicated in this certain cases of TB spondylitis.⁶

The presence of *M. tuberculosis* in cultured tissue specimens was initially considered the gold standard for the diagnosis of TB spondylitis, but the sensitivity was poor. BACTEC media culture requires 2-4 weeks of incubation. Histopathological studies (classical granuloma appearance) and acid-fast bacilli staining are standard references. GeneXpert MTB/RIF only takes 90 minutes with a relatively high sensitivity and specificity and can detect the rifampicin resistance.¹⁴

Spondylitis tuberculosa could be accompanied by abscesses in the vertebral bodies and in the paravertebral connective tissue ("Cold" Abscess). The combination of destruction and abscess results in a vertebral kyphosis known as gibbus. There is a more serious complication of Pott's disease, namely paraplegia due to compression of the spinal cord.^{8,9}

The clinical manifestations of spondylitis tuberculosa differ depending on the duration, severity, location of the lesion, and the presence of disease complications such as deformities and neurological deficits. Back pain in TB cases can be caused by active disease inflammation, bone destruction, or instability. Restless pain is a pathognomonic sign.^{10, 11}

To facilitate clinicians in diagnosing and making different diagnoses for patients presenting with a pulmonary mass on chest radiograph, lateral views of chest X-rays should be obtained. These lateral views may facilitate localizing the pulmonary field. Chest ultrasound is also beneficial in differentiating effusions from masses.¹²

Imaging could assist with the diagnosis of TB spondylitis. The chest X-ray only detects defects in late-stage kyphosis. Bone destruction, regional stability, posterior column involvement, and joints are all identified using computed tomography (CT). MRI can distinguish TB from other causes of spondylitis, detect soft tissue involvement, spread of abscesses, nerve compression, and assess response to therapy. MRI is the gold standard for imaging TB spondylitis, with a sensitivity up to 100% and 80% specificity.⁶

The patient was diagnosed with TB spondylitis. Antituberculosis drugs are the primary treatment option for TB spondylitis. Due to the difficulty of assessing therapeutic response, the WHO and American Thoracic Society (ATS) recommend rifampicin-sensitive TB spondylitis therapy in the form of two-month intensive phase drugs (isoniazid, rifampicin, ethambutol, pyrazinamide) and seven-month follow-up phase drugs (isoniazid, rifampicin).^{12, 13}

The prognosis for TB spondylitis is fairly positive, with antituberculosis therapy relieving pain and improving neurological deficits and kyphotic deformity in 82-95% of cases. Recovery time for TB spondylitis varies depending on

the prognostic stage. The sooner the diagnosis is made, the more deformity can be prevented, so the prognosis can be better 11, 12

CONCLUSIONS

This report highlights to clinicians the value of a high index of suspicion and careful history taking in tuberculous spondylitis; and how a combination of nonspecific findings helped reach an early diagnosis. Because the clinical manifestations of TB spondylitis differ, various methods, including thoracolumbosacral X-ray and MRI with contrast, are required to confirm the disease. As a result, an interdisciplinary collaborative team is required to achieve optimal patient outcomes and to prevent long-term sequelae.

CONSENT

Written informed consent was obtained from the patient.

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CONFLICT OF INTEREST

The authors declared there is no conflict of interest.

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