BJMS
Borneo Journal of Medical Sciences

CASE REPORT

# A Case of Disseminated Tuberculosis with Atypical Presentation in an Older Person

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Received: 2 May 2024

Accepted: 7 September 2024

Published: 2 January 2025

DOI: https://doi.org/10.51200/bjms.v19i1.5582

**Keywords:** *Disseminated tuberculosis, Atypical presentation, Older patient*



## ABSTRACT

Tuberculosis (TB) is an infectious disease caused by Mycobacterium tuberculosis. It is a significant health concern, with millions of new cases and deaths reported each year. Disseminated tuberculosis (dTB) is a serious condition which can affect various organs and tissues, leading to widespread symptoms and complications. The diagnosis of dTB can be challenging due to its atypical presentations. We present a case of dTB in a robust older person who presented with musculoskeletal pain, weight loss, and loss of appetite. Initially, he was treated for age-related spine disease, and pain management was provided. However, his subsequent visit raised suspicion of TB, prompting further work up. The diagnosis was revised to dTB, and anti-TB treatment was initiated. The near miss or delay in diagnosis and treatment may have played a role in dissemination of disease, increased frailty and reduction of function in this patient. Healthcare workers must maintain a high index of suspicion and remain vigilant for TB as starting early treatment will prevent dissemination in the patient, reduce risk to the public and improve outcomes.

## INTRODUCTION

Tuberculosis (TB) remains a major public health concern in Malaysia, with 25 391 new cases recorded in 2022.The notification rate stands at approximately 78 cases per 100,000

individuals (Health, 2022). Disseminated tuberculosis (dTB) is defined as having two or more non-contiguous sites resulting from lymphohematogenous dissemination of Mycobacterium tuberculosis (MTB) (Ayaslioglu et al., 2009). The incidence of TB is greater in the older person due to higher rates of TB reactivation as a result of impaired T-cell mediated immune responses (Rajagopalan, 2001). Diagnosis of dTB can be challenging due to its nonspecific clinical manifestations and potential mimicry of other disorders such as malignancies and age-related diseases. It may be life-threatening if the diagnosis and treatment is delayed. Herein, we describe a case of dTB in an older individual with no significant past medical history.

## CASE PRESENTATION

A formerly robust 75-year-old Chinese gentleman presented to the emergency department at Hospital Selayang, Selangor in May 2023 with a three month history of lower back pain, weight loss, and reduced appetite. Physical examination revealed a moderately built man with reduced power (3/5) over the lower limbs bilaterally with upgoing plantars. The rest of the examination was unremarkable. An X-ray of the spine demonstrated a compression fracture at vertebra T11 while blood investigations were normal. A diagnosis of cervical spondylosis myelopathy was made and he was admitted to the orthopaedic ward for further management. The pain improved but the weakness remained in the lower limbs. Nevertheless, he was discharged after three days with an appointment for magnetic resonance imaging (MRI) of the spine as an outpatient.

He attended the emergency department two-months later with worsening back pain and diarrhoea of 5 days duration. His mobility had been restricted since discharge resulting in functional impairment and deconditioning. He had become dependent and required assistance for his basic activities of daily living such as bathing, dressing and toileting. Clinical examination revealed weakness in the lower limbs as previously described. He was also noted to have episodes of hypotension and low capillary blood glucose in the ward.

Blood investigations (Table 1) revealed hyponatremia and hyperkalemia. Plasma glucose was within the normal range. In view of the biochemical abnormalities with episodes of hypotension, a morning cortisol level was sent. This subsequently came back as low confirming hypocortisolism. The chest X-ray (Figure 1) revealed cavitation over the right middle zone with opacification in the upper and lower zones of the right lung. There was also bilateral perihilar nodular calcification. MRI of the spine (Figure 2) was expedited and performed whilst an inpatient. This revealed compression fractures across multiple vertebrae with evidence of spinal stenosis. However, a bone biopsy was not performed due to patient's refusal of the procedure.

In view of these findings, screening was performed for the possibility of TB. Sputum for acid-fast bacilli (AFB) were negative. However, the sputum GeneXpert MTB/RIF test result returned as positive. Tumour markers sent for completeness were negative. He was referred to endocrinology for the adrenal insufficiency. We concluded that this is likely adrenal tuberculosis secondary to disease dissemination. A Computed tomography (CT) scan of thorax and abdomen appointment was given for further evaluation.

A diagnosis of dTB involving the lungs, adrenal glands, and spine was made based on these findings. Immediate anti-tuberculosis treatment was initiated, which included ethambutol 1200 mg daily, pyrazinamide 1500 mg daily, rifampicin 600 mg daily, and isoniazid 300 mg daily, with pyridoxine 20 mg daily for the intensive phase of 2 months, followed by rifampicin 600 mg daily and isoniazid 300 mg daily for a minimum of 7 months. Steroid supplementation was commenced for the adrenal insufficiency on

the fifth day of admission. The compression fractures were managed conservatively. He was isolated in a negative pressure room resulting in limited rehabilitation during his hospitalization. He was discharged after ten-days of hospitalization once the pain was controlled and electrolytes normalized. Mobility remained limited and he was given outpatient appointments for continuation of physiotherapy and occupational therapy.

He completed his dTB treatment in early May 2024. His functional condition has improved, and he is now able to mobilize with an assistive device. He has transferred his follow-up care for endocrinology and orthopedics from Hospital Selayang, Selangor, to Hospital Segamat, Johor, as he has returned to his hometown and is currently awaiting a CT scan of the thorax and abdomen for further evaluation post dTB treatment.

**Table 1:** Blood investigation results on presentation

| Investigations | Result | Unit Type | Reference range |
|---|---|---|---|
| Hemoglobin | 12.6 | g/dl | 13 - 17 |
| White blood cell | 5.7 | 103/uL | 4 - 10 |
| Platelet | 165 | 103/uL | 150 - 410 |
| Sodium | 121 | mmol/L | 136 - 146 |
| Potassium | 5.8 | mmol/L | 3.4 - 4.5 |
| Urea | 7.3 | mmol/L | 2.8 - 7.2 |
| Creatinine | 97 | umol/L | 64 - 104 |
| Cortisol | 98 | nmol/L | 138 - 635 |
| Alpha feto protein (AFP) | 1.4 | ng/mL | 0 - 9 |
| CA 19-9 | 8.1 | U/mL | 0 - 35 |
| CEA | 3.2 | ng/mL | 0 - 5 |
| PSA | 2.9 | ng/mL | 0 - 4 |

## DISCUSSION

TB is endemic in Malaysia. The World Health Organization (WHO) has ranked this country as an intermediate TB burden country. dTB presents a significant global public health challenge and is associated with marked morbidity and mortality. This condition has the potential to mimic various illnesses and with limited diagnostic tools, up to 50% of cases are undiagnosed prior to death in some case series.

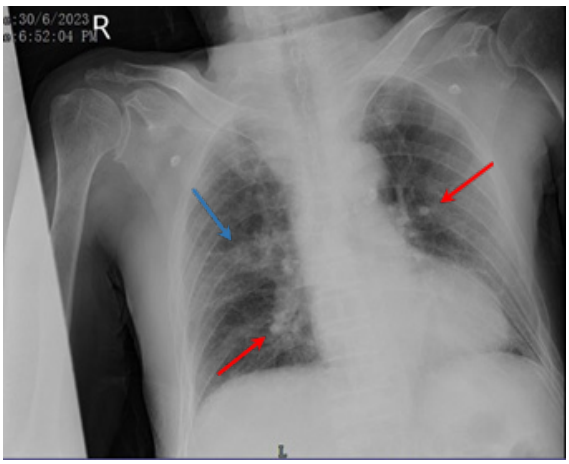


**Figure 1:** Chest x-ray showed opacities seen over right upper, middle and lower zones. Rounded opacities projected over bilateral perihilar and mediastinum region with some of it calcified (Red arrow). Cavitation over right middle zone (Blue arrow)

Diagnosis of dTB can be challenging due to the nonspecific clinical characteristics in older persons which may be confused with age-related illnesses. The typical TB symptoms of cough, haemoptysis, fever, drenching night sweats and weight loss may not be evident in older patients. Non specific symptoms, such as weakness, dyspnoea, anorexia and mental change, are more frequent in older patients with TB compared with younger patients (Byng-Maddick & Noursadeghi, 2016). There is limited data on dTB in older patients in the literature.

The heightened vulnerability in older persons is attributed to several factors, including immunosenescence, physiological changes associated with aging, malnutrition and comorbidities. Immunosenescene is

**Figure 2:** MRI whole spine showed Reduce T5, T11 and T12 vertebral body height suggestive of compression fracture (Red arrow). Spinal stenosis worst at T11 vertebral body. Bilateral T11 exiting nerve roots are not visualized likely to be compressed.

an age-related condition where there is hematopoietic stem cell dysfunction and thymus involution. Both events decrease T-cell generation resulting in decreased levels of naive T-lymphocytes accompanied by the impaired ability of T cells to achieve immunological memory. These changes favour infections such as TB in the older person (Muller et al., 2019). Although the primary cause of adrenal insufficiency is autoimmune, TB remains major cause in developing countries (Arlt & Allolio, 2003).

According to the Malaysian clinical practice guidelines, the initial diagnostic tool for MTB is smear microscopy with Ziehl-Neelsen staining (AFB staining). This has limited sensitivity. Mycobacterial culture remains the gold standard for confirmation of MTB but requires four to eight weeks to obtain an isolate and determine its susceptibility to antibiotics (Adler et al., 2005). Both methods have limitations for the early detection of MTB. A better tool which the WHO has endorsed is the Gene-Xpert MTB/RIF assay, which can detect MTB within two hours by using a nucleic acid amplification technique with a sensitivity and specificity of 97.83% and 92.59% respectively (Dye & Williams, 2008), (Shah, 2016). It has become an excellent clinical tool for early detection of smear negative TB as well as Rifampicin resistance.

Clinical diagnosis of dTB is confirmed if a patient has any of the following conditions: (1) Isolation of MTB from blood, bone marrow, liver biopsy specimen, or ≥2 non contiguous organs; (2) Isolation of MTB from 1 organ and histologic demonstration of caseating granulomatous inflammation from the bone marrow, liver biopsy specimen, or another non contiguous organ; (3) Isolation of MTB from 1 organ and radiographic finding of miliary lung lesions (Fahmi Yousef Khan, 2016). In this case, dTB was not considered during his initial presentation due to a combination of low clinical suspicion and a lack of typical symptoms. The subsequent admission raised the concern of dTB based on the persistent symptoms, confirmed hypocortisolism, radiological findings and the positive Gene-Xpert MTB/RIF assay. The delay in diagnosis and treatment may have played a role in dissemination of disease, increased frailty and reduction of function in this patient.

Disseminated tuberculosis is a life-threatening condition, with a reported mortality of up to 30%, (Khan, 2019). Early detection can significantly reduce morbidity and mortality. Further research is needed to identify the impact of dTB in the older patients for future clinical practice.

## CONCLUSION

Tuberculosis is a common disease which can present atypically. Healthcare workers must maintain a high index of suspicion and remain vigilant for TB as starting early treatment will prevent dissemination in the patient, reduce

risk to the public and improve outcomes.

## CONFLICT INTEREST

None

## CONSENTS

The participant provided written informed consent to participate in this study. Additionally, written informed consent was obtained from the individual for the publication of any potentially identifiable images or data included in this article.

## ACKNOWLEDGEMENTS

We gratefully acknowledge Dato Dr. Tunku Muzafar Shah Tunku Jaafar, Head of Unit, Department of Geriatric Medicine for advance review. We would also like to thank the Director General of Health Malaysia for his permission to publish this article.

## ETHICAL ISSUES

This case report has obtained approval from the National Medical Research Register (NMRR), Ministry of Health Malaysia: NMRR ID-23-02640-AZZ

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