

Tuberculoma mimicking lung cancer: A diagnostic dilemma resolved by therapeutic trial

Zhong Xhen Khor, Mohd Isa Syamimi, Sze Yuen Lee

CASE REPORT

A man in his 30s presented to our casualty with a one month history of abdominal distension, weight loss, and shortness of breath. He otherwise denied any symptoms suggestive of tuberculosis, such as night sweats, fever, or chronic cough. He is a known intravenous drug abuser, as well as an active smoker of 18 pack/years. He was cachexic in appearance [weight 46 kg, height 165 cm, body mass index (BMI) 16.9 kg/m²] and mildly tachypneic (baseline respiratory rate: 24 breaths/min). Reduced breath sounds were appreciated over the right lung field and a positive shifting dullness on abdominal examination. Viral serology was done, revealing a positive hepatitis C core antigen. Subsequent paracentesis revealed a low serum ascites albumin gradient (SAAG) (serum albumin: 35, ascites albumin: 29; SAAG < 1.1) and ascitic samples sent for cytology, acid fast bacillus stain (eventually found to be negative) and mycobacterium cultures. No liver cirrhosis or mass was noted on abdominal ultrasound. As an irregular right upper zone opacity was seen on his initial chest radiograph, a contrast enhanced computed tomography (CT) thorax was performed for further evaluation, which showed an irregular heterogeneously enhancing mass with central hypodense component and internal calcifications in the posterior segment of right upper lobe, measuring 3.9 × 4.4 × 4.0 cm (Figures 1 and 2A). No pleural effusion was noted.

Concerned for lung malignancy as sputum acid fast bacilli was consistently negative, respiratory team was consulted for bronchoscopy. Unfortunately, no

biopsy samples were yielded as rigid bronchoscopy was technically challenging. Bronchoalveolar lavage also did not demonstrate the growth of any organisms, with negative Tuberculosis Gene Xpert. We subsequently attempted a CT-guided biopsy, which was also unsuccessful as the mass was central and access difficult. Frustrated due to a lack of progress, the patient accepted the diagnosis of a lung malignancy and its implications but refused further investigation or intervention. As such, we were unable to proceed with video-assisted thoracic surgery (VATS). One month into admission, our diagnostic dilemma was somewhat placated with a positive culture of *Mycobacterium tuberculosis* (sensitive to first line anti-tubercular therapy) from the paracentesis. As such, we initiated treatment for extrapulmonary (peritoneal) tuberculosis with standard weight-based regime of Oral Rifampicin 600 mg once daily, Oral Isoniazid 300 mg once daily, Oral Pyrazinamide 1200 mg once daily, Oral Ethambutol 800 mg once daily, and Oral Pyridoxine 10 mg once daily. Subsequent outpatient visits revealed improvement in his symptoms and effort tolerance, as well as weight (52 kg). Follow-up CT thorax after initiation of treatment (three months after the initial CT scan) showed reduction in the size of the right upper lobe mass with cavitation and air-fluid level within (Figure 2B). Upon completion of anti-tubercular therapy, a repeated CT thorax showed resolution of the right upper lobe mass with residual traction bronchiectasis and calcifications at this region (Figure 2C). In total, he completed nine months of anti-tubercular therapy and was gradually transitioned to direct acting antivirals (DAA) for his hepatitis C.

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Received: 13 January 2024

Accepted: 31 January 2024

Published: 15 February 2024

DISCUSSION

The relationship between tuberculosis and lung cancer was previously documented and can be symbiotic. On one hand, inflammation and fibrosis brought about by tuberculosis is thought to increase risk of lung cancer, while lung malignancy predisposes patients to tuberculosis, presumably due to local activation of old foci. Such patients are often relatively immunocompromised, be it via malnutrition, chemo, or radiotherapy. Adenocarcinoma is the most commonly associated lung

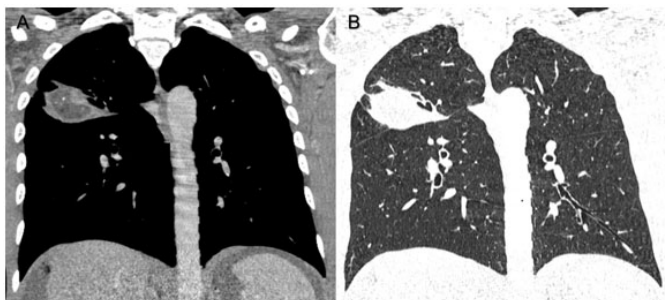


Figure 1: Enhanced CT thorax (coronal view) in (A) mediastinal and (B) lung window showing an irregular mass in the posterior segment of right upper lobe with central hypodense component and focal calcifications.

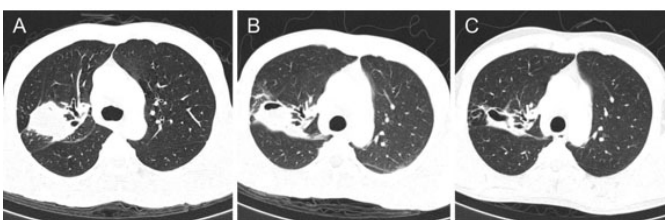


Figure 2: Series of CT thorax (axial view) in lung window at the same level showing (A) the right upper lobe mass on initial scan, (B) three months after the initial CT scan (mid therapy) showing reduction in the size of the mass with cavitation and air-fluid level within, and (C) after completion of anti-tubercular therapy showing resolution of the mass with residual traction bronchiectasis and calcifications.

cancer with regard to tuberculosis [1]. While uncommonly reported, tuberculosis can occasionally present as lung mass, a nodule, or in our case, a tuberculoma. We only made this diagnosis in retrospect, upon receipt of the unexpected positive mycobacterium culture from the peritoneal fluid. Additionally, it was not expected at outset of therapy that his lung mass would gradually recede and eventually resolve with anti-tubercular therapy. Positron emission tomography-computed tomography (PET-CT) is not available in our setting. However, even if utilized, it is unable to conclude a patient's diagnosis definitively [2]. In this regard, advances in Radiomics [the utilization of artificial intelligence (AI) in analysis of CT images] have higher discriminative imaging capabilities and hold significant promise [2]. Empirical anti-tubercular therapy, while liberally practiced in tuberculosis endemic countries, is not without its issues. Debilitating side effects, such as drug-induced liver injury, peripheral neuropathy, skin rash, and gouty attacks, are often drawbacks. Furthermore, success of long-term treatment hinges on strict medication compliance, which is often difficult to attain in smokers or patients with high-risk behaviors, such as ours. Overall treatment success, of course, assumes the diagnosis of smear negative tuberculosis is right in the first place [3]. The positive response in our patient allowed us to forgo further invasive or high-risk tissue biopsy, and has the indirect effect of improving our patient's satisfaction and compliance to therapy. In cases

with diagnostic limitations and within appropriate clinical context, a supervised therapeutic trial of anti-tubercular with monitored response is a worthy consideration. In some cases, it might be the only way [4].

CONCLUSION

Tuberculosis must always be considered as a differential in the workup for lung malignancy, particularly when patients have shared clinical risk factors or presentation.

Not all lung masses are lung cancer: tuberculosis can also present in this fashion as a solid lung mass (tuberculoma) and needs to be considered as a differential, particularly in endemic countries.

Supervised, therapeutic trial with tuberculosis is a worthwhile consideration in cases where histological and microbiological sampling is not feasible.

Keywords: Differential, Lung cancer, Lung nodule, Tuberculosis

How to cite this article

Khor ZX, Syamimi MI, Lee SY. Tuberculoma mimicking lung cancer: A diagnostic dilemma resolved by therapeutic trial. *Int J Case Rep Images* 2024;15(1):27–29.

Article ID: 101440Z01ZK2024

doi: 10.5348/101439Z01ZK2024CI

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Author Contributions

Zhong Xhen Khor – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Mohd Isa Syamimi – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Guarantor of Submission

The corresponding author is the guarantor of submission.

Source of Support

None.

Consent Statement

Written informed consent was obtained from the patient for publication of this article.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.

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