International Journal of Advances in Medicine
Yong BJC et al. Int J Adv Med. 2022 Jun;9(6):741-745
http://www.ijmedicine.com
pISSN 2349-3925 | eISSN 2349-3933
DOI: https://dx.doi.org/10.18203/2349-3933.ijam20221362

Case Report

Tuberculous granuloma and cervical lymphadenopathy in an immunocompetent patient: a case report

Bernard Jonathan Christian Yong[1]*, I. Wayan Sunaka[2]

[1]Wangaya Regional General Hospital, Bali, Indonesia
[2]Department of Internal Medicine, Wangaya Regional General Hospital, Bali, Indonesia

Received: 11 April 2022
Accepted: 02 May 2022

***Correspondence:**
Dr. Bernard Jonathan Christian Yong,
E-mail: bernardyong10@gmail.com

ABSTRACT

Tuberculosis (TB) is one of the top 10 infectious diseases causing mortality worldwide. In 2019, approximately 10 million people were diagnosed with TB, with 5.6 million men, 3.2 million women, and 1.2 million children. One of the hallmarks of the course of TB is tuberculous granuloma. In this study, we reported a case of TB granuloma and further workup to exclude other etiologies. A 52-year-old man presented with a complaint of a lump on his left neck. There was a history of prolonged productive cough, weight loss, and shortness of breath. Chest radiograph and FNAB of the lump suggested pulmonary TB while the rapid molecular test was negative. The patient was also suspected of malignancy; but the trans-thoracal biopsy did not reveal any malignant cells. The patient was eventually diagnosed with granuloma due to primary TB with cervical lymphadenopathy. Tuberculous granuloma is one of the most common pulmonary granulomas and a hallmark of the course of TB. It is characterized by the immune system forming an environment to control the spread of the infection. In cases of tuberculous granuloma with negative rapid molecular test, further investigations should be conducted to find evidence of TB infection. Activated TB granuloma can spread to the surrounding tissues or organs. A negative rapid molecular test result does not necessarily exclude TB in endemic regions; thus, further investigations such as CT scans or histopathological examination are required to find features of TB infection.

Keywords: Tuberculous granuloma, Pulmonary TB, Cervical lymphadenopathy

INTRODUCTION

Tuberculosis (TB) is one of the top 10 infectious diseases causing mortality worldwide. In 2019, approximately 10 million people were diagnosed with TB, with 5.6 million men, 3.2 million women, and 1.2 million children. The number of deaths caused by TB is approximately 1.4 million lives. TB can be found in all countries and may affect any age group.[1]

The risk factors for TB are classified as exogenous and endogenous. The exogenous factors include airborne TB bacteria, while the endogenous factors are associated with progression of TB activation, immunity, nutrition, diabetes mellitus, alcohol consumption, and smoking habit.[2]

TB can manifest in intrapulmonary or extrapulmonary. Pulmonary TB is located in the lung parenchyma, while extrapulmonary TB can be found in other organs such as the pleura, lymph nodes, urinary tract, skin, joints, meninges, and bones. [3]

TB granuloma is one of the pathogenesis courses of TB. Tuberculous granuloma is also one of the differential diagnoses in pulmonary granulomas, which can be caused by bacterial, fungal, parasitic infections, non-infectious etiologies, or tumors. A histopathological investigation is required in granulomas to determine etiology.[4,5]

The incidence of tuberculous granuloma is more common compared to pulmonary granulomas of other etiologies. However, cases of TB granuloma are still limited, and

what is more often found is symptomatic or active pulmonary TB. Therefore, in this study, we reported a case of TB granuloma and further workup to exclude other etiologies.

CASE REPORT

A 52-year-old man presented to Wangaya general hospital with a complaint of a lump on his left neck. The lump was first recognized on February 12th 2022. Furthermore, the patient had a history of productive cough with white-yellowish sputum for the last eight months. The patient also reported a 15 kg weight loss for the last 6 months. Other symptoms such as diarrhea, excessive sweating, and chills were denied. He also complained of shortness of breath when lifting both of his hands. Previously, he never had pulmonary TB. He had a smoking habit from age 15-18 and had stopped for 1 year before admission.

There was no abnormal finding on his lung area based on the physical examination. There were multiple lumps on the left neck and slightly on the supraclavicular area; the lumps were solid, immobile, not warm, and with slight tenderness on palpation (Figure 1).

Figure 1 (A and B): Side view of multiple lumps on the left neck area and front view of multiple lumps on the left neck area.

Complete blood work consisting of complete blood count, renal function, liver function, electrolyte levels, blood glucose, chest x-ray, rapid molecular test, and fine-needle aspiration biopsy (FNAB) was performed. The results showed elevated leukocytes (13.80) dominated by neutrophils (74.1%) and normocytic normochromic anemia suspected due to chronic disease (Hb: 10.7, MCV: 81.5, MCH: 26.4), and anti-HIV was negative. Chest x-ray showed infiltrate on both perihilar regions of the lung with hilar enlargement, which was suspected to be duplex pulmonary TB (Figure 2); rapid molecular test for TB was negative, but the FNAB result showed chronic inflammation with features of xanthogranulomatous suppurative, suspicious of the tuberculous lymphadenopathy.

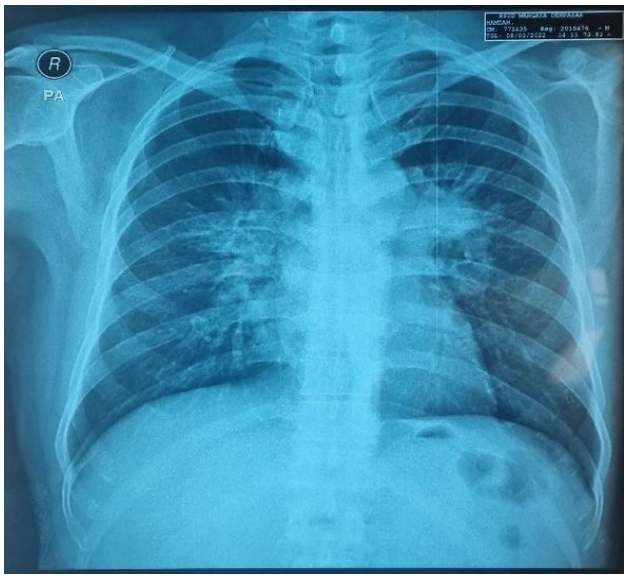

Figure 2: Chest X-ray showed infiltrate on both perihilar regions with hilar enlargement, suspicious for duplex pulmonary TB.

Since the patient complained of shortness of breath when he lifted both his hands, he was planned for a bronchoscopy. The result showed no intraluminal masses, but there was stenoting infiltrative on the right intermediate trunk and left superior lobe, suspected of malignancy. Biopsy was performed during bronchoscopy, which showed no malignant cells or specific processes. Thorax computerized tomography scan (CT-scan) with contrast was subsequently performed, which showed masses with a density of tissue on the left superior lobe of the lung. The patient was suspected of pulmonary cancer, but since it could not be diagnosed properly, trans-thoracal biopsy and repeated FNAB were planned on the lymphadenopathy area. The results showed chronic granulomatous in trans-thoracal biopsy (TTB) and xanthogranulomatous in FNAB. Therefore, the patient was eventually diagnosed with granuloma due to primary TB with left cervical lymphadenopathy.

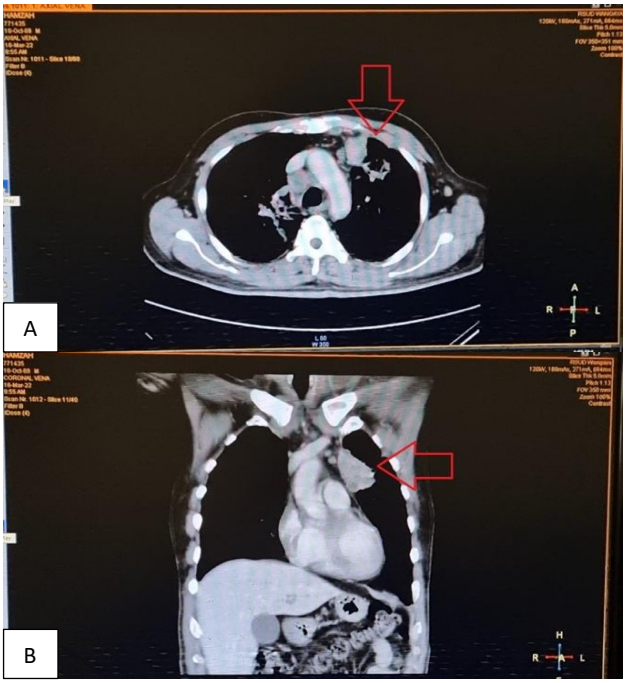

Figure 3 (A and B): Thorax CT-scan with contrast, axial plane and thorax CT-scan, coronal plane.

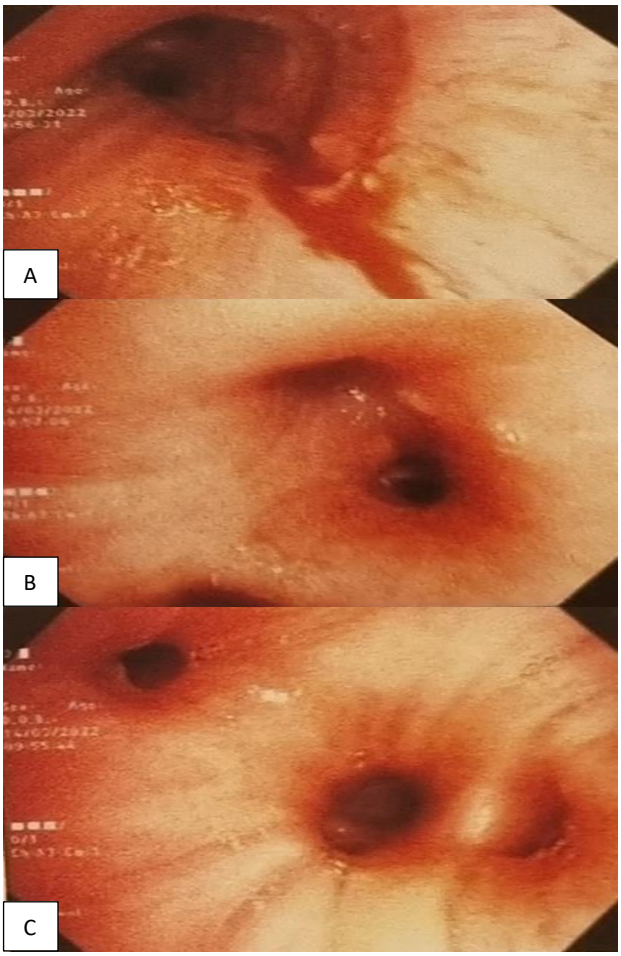

Figure 4 (A-C): Left main bronchus, left superior lobe and truncus intermedia with stenoting infiltrative.

DISCUSSION

TB is known as a disease with high mortality and morbidity rates. Almost one-third of the population is infected with TB, and only 10% of the infected population can progress. In other infected individuals, approximately two billion worldwide, the disease remains latent or asymptomatic. These individuals are the reservoir for the TB bacteria, and if they become immunosuppressed, then reactivation and symptoms of TB will occur.[1]

TB spreads via droplets that enter the respiratory tract. Some individuals can develop tuberculous granuloma. Tuberculous granuloma is one of the most common pulmonary granulomas.[6] It is a hallmark of the course of TB, characterized by the immune system forming an environment to control the spread of the infection, but may also provide a place for the mycobacterium TB to survive and modulate the immune response for its survival without being damaged in the long-term.[7,8] In our case, the patient had a good immune system, hence the granuloma formation. Until the making of this report, the patient had also been tested for HIV and showed a negative result, indicating that the patient was immunocompetent.

In unstable conditions such as decreased immune system or HIV, granulomas may enlarge and undergo morphological changes, increasing the potential for the bacilli to disseminate from the main infectious location of the lung to other tissues and organs.[9] The closest spread to the lymph nodes near the hilar and parahilar may form Gohn complexes.[10] Activated granulomas may present with symptoms of local or systemic TB.[9] The symptoms found in TB infection include productive cough for 2 weeks or more, hemoptysis, decreased appetite, weight loss, night sweats, fever for over one month, and malaise.[3] We found similar findings in our case, in which he had granuloma in the left superior lobe of the lung and left cervical lymphadenopathy, which might be signs of activated or disseminated granuloma. Classic TB symptoms were also found, including productive cough for 8 months and 15 kg weight loss for the last 6 months.

Besides being influenced by the reduced immune system or immunosuppression, the activated granuloma is also influenced by microenvironment factors surrounding the granuloma. The mechanism of these microenvironment changes is not entirely known, but some argue that it is due to the changes in the metabolism of immune cells and oxygen levels around the granuloma.[9] Therefore, although the patient was considered immunocompetent in this case based on the negative anti-HIV result, there are still possibilities of microenvironment changes in the granuloma, leading to the activation of granuloma and symptoms of TB.

Since the contrast CT and MRI scans of the thorax showed a mass with a density of tissues in the left superior lobe of the lung, the patient was initially suspected of pulmonary carcinoma. A study by Shogoma et al stated that features

of pulmonary granuloma might be caused by bacterial, fungal, parasitic infections, non-infectious etiologies, or tumors. The study also showed a case with granuloma finding in pulmonary squamous cell carcinoma. Since there are many causes of granuloma, morphological examinations are needed to determine further etiologies of the pulmonary granuloma.[4] In this case, TTB was performed to further investigate the mass in the left superior lobe of the lung, which showed chronic granulomatous leading to TB infection.

Pulmonary TB can be diagnosed with bacteriological examinations such as direct microscopy tests, culture, and rapid molecular tests. However, if the result is negative, the diagnosis can also be made from clinical findings of TB with a chest radiograph that supports TB infection. Extrapulmonary TB can be diagnosed from bacteriological or histopathological examinations.[3] The guideline by WHO in 2020 stated the importance of a high-accuracy rapid molecular test, which could increase favorable outcomes in diagnosing TB in patients who are resistant to rifampicin, replacing the role of sputum examination.[11] Therefore, in this case, the patient was initially suspected of TB and had a rapid molecular test and chest radiograph for TB screening. Furthermore, TTB can also be performed for masses in the left superior lobe and FNAB in the cervical lymphadenopathy (extrapulmonary TB) for histological examination. The result showed negative on the rapid molecular test, but the chest radiograph supported TB findings; therefore, the patient was suspected of TB. The TTB and FNAB results also supported features of TB.

A study by Li et al stated that although a rapid molecular test has been used to diagnose TB, it is less sensitive in BTA-negative TB, culture-negative TB, and in all patients with high TB prevalence.[12] One of the reasons for the negative rapid molecular test in our patient might be due to Indonesia being one of the countries with high TB prevalence.[13]

A study by Han et al. stated that a thorax CT scan plays a major role in early diagnosis and treatment in patients with a negative rapid molecular test, which are in cases of TB infection findings in CT-scan (consolidations and cavities).[14] Therefore, besides a rapid molecular test, a CT scan was also performed in our case for further investigations. The result then showed a mass with a density of tissues in the left superior lobe.

After several investigations, the patient was eventually diagnosed with granuloma due to primary TB with left tuberculous cervical lymphadenopathy. The diagnosis was made after several additional investigations to differentiate between granuloma and malignancy. CT scan and histopathological examination were performed to confirm the result of the negative rapid molecular test. The diagnosis of TB granuloma requires multiple investigations.

CONCLUSION

TB granuloma is a feature of the course of TB that can be activated as the immune system is suppressed or due to microenvironment changes. Activated TB granuloma can spread to the surrounding tissues or organs. The differential diagnosis for TB granuloma is tumor; therefore, histological examination is necessary for further investigation. A negative rapid molecular test result does not necessarily exclude TB in endemic regions; thus, further investigations such as CT scans or histopathological examination are required to find features of TB infection.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. WHO. Global Tuberculosis Report 2020. Available at: https://apps.who.int/iris/bitstream/handle/10665/336069/9789240013131-eng.pdf. Accessed on 15 Feb, 2021.
2. Narasimhan P, Wood J, MacIntyre C, Mathai D. Risk Factors for Tuberculosis. Pulmonary Med. 2013;1-11.
3. Kemenkes. Peraturan Menteri Kesehatan Republik Indonesia Nomor 67 Tahun 2016 tentang Penanggulan Tuberkulosis. Available at: http://hukor.kemkes.go.id/uploads/produk_hukum/PMK_No._67_ttg_Penanggulangan_Tuberkolosis_.pdf. Accessed on 15 Feb, 2021.
4. Tajima S, Koda K. Granulomatous inflammation of pulmonary squamous cell carcinoma: a rare phenomenon. Int J Clin Exp Pathol. 2015;8(6):7547-52.
5. Ohshimo S, Guzman J, Costabel U, Bonella F. Differential diagnosis of granulomatous lung disease: clues and pitfalls: Number 4 in the Series "Pathology for the clinician" Edited by Peter Dorfmüller and Alberto Cavazza. Eur Respir Rev. 2017;26(145):170012.
6. Rosen Y. Pathology of Granulomatous Pulmonary Diseases. Arch Pathol Lab Med. 2022;146(2):233-51.
7. Silva Miranda M, Breiman A, Allain S, Deknuydt F, Altare F. The tuberculous granuloma: an unsuccessful host defence mechanism providing a safety shelter for the bacteria? Clin Dev Immunol. 2012;2012:139127.
8. Rao M, Ippolito G, Mfinanga S. Latent TB Infection (LTBI) - Mycobacterium tuberculosis pathogenesis and the dynamics of the granuloma battleground. Int J Infect Dis. 2019;80S:S58-61.
9. Kiran D, Podell BK, Chambers M, Basaraba RJ. Host-directed therapy targeting the Mycobacterium tuberculosis granuloma: a review. Semin Immunopathol. 2016;38(2):167-83.
10. Heemskerk D, Caws M, Marais B. Tuberculosis in Adults and Children. London: Springer; 2015. Chapter 3, Clinical Manifestations. Available at:

https://www.ncbi.nlm.nih.gov/books/NBK344404/. Accessed on 15 Feb, 2021.
11. World Health Organization. Molecular assays intended as initial tests for the diagnosis of pulmonary and extrapulmonary TB and rifampicin resistance in adults and children: rapid communication. World Health Organization. 2020. Available at: https://apps.who.int/iris/handle/10665/330395. License: CC BY-NC-SA 3.0 IGO. Accessed on 15 Feb, 2021.
12. Li S, Liu B, Peng M, Chen M, Yin W, Tang H et al. Diagnostic accuracy of Xpert MTB/RIF for tuberculosis detection in different regions with different endemic burden: A systematic review and meta-analysis. PLOS ONE. 2017;12(7):e0180725.
13. Noviyani A, Nopsopon T, Pongpirul K. Variation of tuberculosis prevalence across diagnostic approaches and geographical areas of Indonesia. PLOS ONE. 2021;16(10):e0258809.
14. Lee H, Kim J, Kim Y. Clinical and CT characteristics of Xpert MTB/RIF-negative pulmonary tuberculosis. PLOS ONE. 2021;16(5):e0250616.

Cite this article as: Yong BJC, Sunaka IW. Tuberculous granuloma and cervical lymphadenopathy in an immunocompetent patient: a case report. Int J Adv Med 2022;9:741-5.