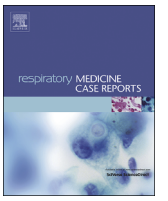
Respiratory Medicine Case Reports 50 (2024) 102030

Contents lists available at ScienceDirect

Respiratory Medicine Case Reports

journal homepage: www.elsevier.com/locate/rmcr



Case Report

Rare concurrent extrapulmonary tuberculous pericarditis and pleuritis accompanied with lung silicosis

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ARTICLE INFO

Handling Editor: DR AC Amit Chopra

Keywords:
Tuberculous pericarditis
Tuberculous pleuritis
Silicosis

ABSTRACT

Extrapulmonary tuberculosis could affect many organs beside lung airway and parenchyma. The mycobacterium tuberculosis can invade area such as the pleural and pericardium by lymphogenic, hematogenic, or direct infection. Patient with history exposure with silica (SiO2) have a high-risk factor developing tuberculosis or extrapulmonary tuberculosis. Therefore, this study presents a rare case of pulmonary silicosis in a 38 years-old-man with tuberculosis pericarditis and pleuritis. The amount of silica particle found in bronchoalveolar lavage (BAL) was 39,95 ppm SiO2, while the ADA test from the pericardium and pleural fluids was 35.4 U/L and 40.2 U/L, respectively. The patient underwent pericardiocentesis and thoracocentesis, received first-line anti-tuberculosis drugs, and resigned from work. After one month follow-up, the pericardial as well as pleural fluid totally disappeared. This disease can mimic any other disease. Early detection of risk factor for extrapulmonary tuberculosis and perform the right diagnostic and treatment will give a better outcome for the patient.

1. Introduction

Extrapulmonary tuberculosis (EPTB) is an active infection of *mycobacterium tuberculosis* in organs other than the lungs [1]. The prevalence of EPTB is 15–25 % from infection tuberculosis worldwide, with the most common sites is lymphatic, pleural, and musculoskeletal site. Different location of infection tuberculosis can present variety sign and symptoms such as swelling of lymph node in lymphadenitis TB or gibbus formation in spondylitis TB [2].

Patient with immunocompromised have a high risk for EPTB. One of immunocompromised condition is silicosis. Silicosis is an occupational lung disease that can cause inflammation and fibrosis in the lungs. It is caused by the inhalation and deposition of large amounts of crystalline silica. Patient with silicosis will have higher risk to develop both pulmonary and extrapulmonary tuberculosis cause by cumulative dust exposure. The mechanism of silicosis in tuberculosis involves the impairment of the immune hemostasis by silica deposits, thereby inducing severe immune reactions that occur in the pulmonary and the extrapulmonary site [3].

Tuberculous pleurisy is the second most common extrapulmonary tuberculosis after lymph node tuberculosis. The prevalence of tuberculous pleurisy in high burden tuberculosis country about 30 % while the prevalence of tuberculous pericarditis is 1 %–2 % of all tuberculosis cases [4,5]. extrapulmonary infections especially EPTB are some of the most difficult to diagnose and treat Therefore, this study presents an uncommon case of concurrent tuberculous pericarditis and pleuritis which resolve with anti-tuberculosis drug.

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https://doi.org/10.1016/j.rmcr.2024.102030
Received 21 September 2022; Received in revised form 31 August 2023; Accepted 26 April 2024
Available online 30 April 2024

2. Case report

A 38 years old male presented to the emergency department of Dr. Soetomo Hospital with shortness of breath in the last one week and the condition worsened for three days. Other complaints include cough for one month, chest pain in the last two weeks, loss of appetite, and loss of 5 kg body weight for two months. Furthermore, there was no history of diabetes mellitus, hypertension, or tuberculosis. The patient had no contact with other tuberculosis patient, but worked at a sandpaper factory for five years and did not used a mask while working. Patient also had smoking habit of one pack/day for the past 13 years. The patient was then referred from Bunda Hospital on December 4, 2019 to Dr. Soetomo hospital, and there had been an evacuation of pleural effusion 750 cc in the previous facility, as shown in Fig. 1A and B.

General condition was weak, BP 110/70 mmHg, HR 86x/min, RR 22x/min, temperature of 37.1°C, SpO2 92 % O2 nasal 3 Lpm, and Wong-Baker Pain scale 2. Physical examination of the chest showed asymmetric and left diminished. Ictus cordis was also observed on the left midclavicular fifth ICS. On palpation, there was decreased fremitus in the left hemithorax with percussion dull of the left hemithorax and no thrill. The right heart border was on the right parasternal line IV ICS, and the left heart border was on the left midclavicular ICS V. Auscultation revealed decreased vesicular breath sounds in the left hemithorax. There were no crackles and wheezing in both lung fields, no murmurs, but single S1 and S2 heart sounds as well as gallops were observed.

Laboratory examination on 6/12/20 showed transaminitis (SGOT 227 U/L, SGPT 250 U/L), increased LDH 414 U/L with BGA normal acid-base and mild hypoxemia. Pericardial fluid analysis revealed pH 8, MN 97.1 %, PMN 2.4 %, Cell count 6.521 u/L, Glucose 114 mg/dL, Protein 4,3 g/dL, LDH U/L (exudate). Meanwhile, the pleural fluid analysis showed pH 9, MN 96.9 %, PMN 3.1 %, Cell count 718 u/L, Glucose 119 mg/dL, Protein 3.9 g/dL, and LDH 157 U/L (exudate).

Echocardiography shows pericardial effusion massive anterior (2.7 cm), apical (4.1 cm), inferior (2.3 cm), left lateral (3.1 cm), right lateral (3.9 cm), posterior (3.0 cm), RA collapse (+), RV collapse (+), as shown in Fig. 1C. The hemodynamic parameters include PCWP of 9.34 mmHg and mPAP of 31.75 mmH. The patient underwent pericardiocentesis and a total of 600 cc pericardial fluid was drained, as shown in Fig. 1D.

Pericardial fluid evacuation of 200 cc and pleural fluid evacuation of 300 cc were carried out at second day of treatment. Based on histopathology examination with cytological smear and cell block from pericardial and pleural fluid, there was no malignant cell. Furthermore, the ADA test of pericardial and pleural fluids was increase with result 35.4 U/L and 40.2 U/L (normal range: 4–24 U/L). GeneXpert MTB/RIF assay sputum examination showed the absence of *Mycobacterium tuberculosis*. The staining sputum of ziehl-

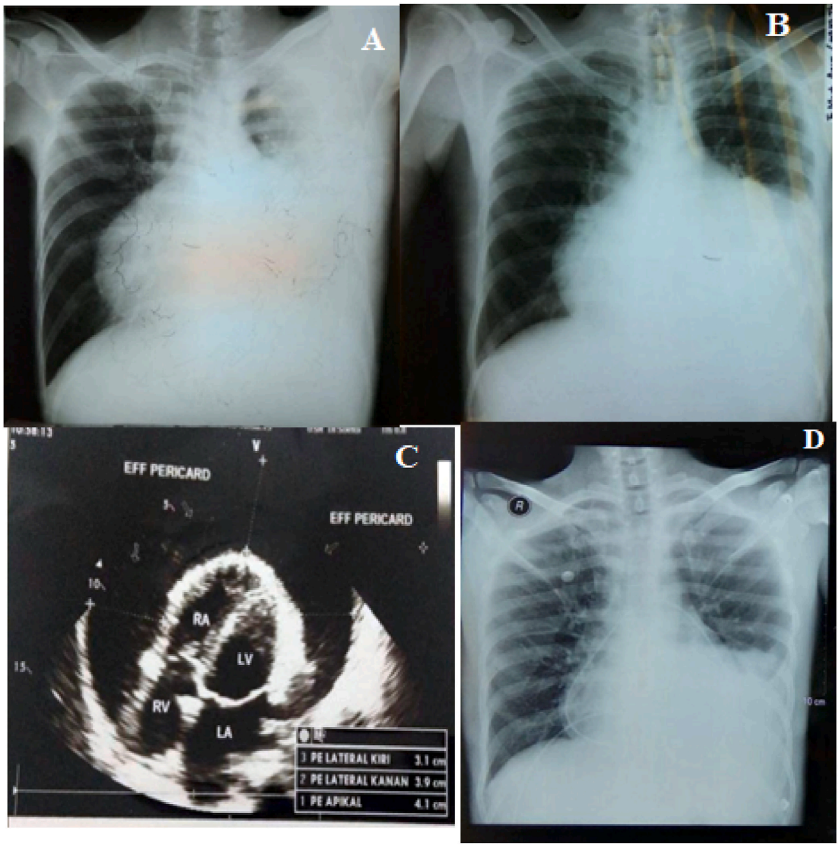

Fig. 1. (A) First-time patient in Bunda Hospital on December 4, 2019, (B) After 750 cc of pleural fluid drainage, (C) Echocardiography showed massive pericardial effusion, (D) After 600 cc of pericardial fluid drainage.

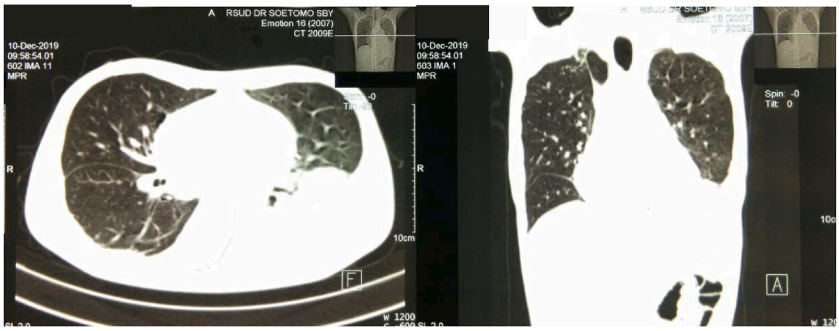

Fig. 2. The results of a CT scan thorax on December 10, 2019.

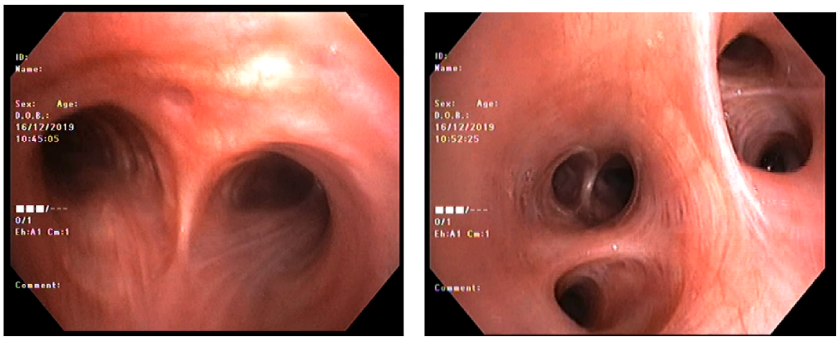

Fig. 3. Fiber Optic Bronchoscopy (FOB) shows no abnormalities in the bronchi and the branches.

neelsen did not find bacterial of acid-fast bacilli (AFB). The culture sputum with Lowenstein-Jensen medium did not find mycobacterium tuberculosis. A CT scan of the thorax (Fig. 2) was performed, which revealed fibrotic band in upper right lung, small rounded nodular in upper left and right lung, part solid ground glass nodules in lower left lung. There is bilateral pleural effusion with adjacent left inferior lobe atelectasis, pericardial effusion with a catheter inserted (see Fig. 3).

From echocardiography evaluation, there was no more pericardial fluid, and then the catheter removed. Furthermore, the volume of pericardial fluid produced from 6 to December 11, 2019 was approximately 2022 ml. A Fiber Optic Bronchoscopy (FOB) was carried out, and the results showed the absence of abnormalities in the bronchi. Broncho Alveolar Lavage (BAL) aspiration was performed for silica examination at the environmental quality management laboratory of Ten November Institute of Technology (ITS) Surabaya. The amount of silica from BAL was 39,95 ppm SiO2, and the result of Genexpert MTB/RIF assay from BAL was Mtb Not Detected. Based on the amount of SiO2 from the BAL and ADA test of pericardial and pleural fluids, the patient was diagnosed with tuberculous pericarditis and pleuritis accompanied with silicosis. Subsequently, the patient was administered with 1st line Anti-tuberculosis drug (ATD).

2.1. Polyclinic treatment

After one month of treatment with 1st line ATD, patient condition was improved. There were also no complaints of respiration symptoms, such as cough or shortness of breath. The patient have good appetite, and the body weight increased by 3 kg in the last months. A chest x-ray was performed on January 28, 2020 and there was an improvement compared to the first chest x-ray, as shown in Fig. 4. The pleural and pericardial effusions also disappeared, but the patient is still receiving the advanced phase of anti-tuberculosis treatment.

3. Discussion

The under diagnosed of EPTB still a challenge for TB control program especially in high burden TB country. in EPTB, patient not always presenting classical symptom of TB such as chronic cough, sputum production, loss of appetite, loss of weight, fever, and night sweats. This condition make difficult to diagnose EPTB only based on clinical symptoms [6].

In this patient we found that rare condition which EPTB showed as tuberculous pericarditis and pleuritis without involvement of lung tuberculosis. The mechanism might be that mycobacterium tuberculosis bacilli enter the pericardium and pleural space through retrograde lymphatic spread, hematogenous dissemination, or direct spread from infected structures to adjacent organs [7]. The condition usually happen in immunocompromised patient.

Immune status might also influence the incidence of tuberculous pleurisy and pericarditis in this patient. Immunocompromised hosts are less likely develop tuberculous pleurisy than the immunocompetent host [8]. Silicosis can decrease immunity by impaired immune system of the patient. The silica will inhibit CD8 T-lymphocytes and impairment of phagocytic activity and viability of

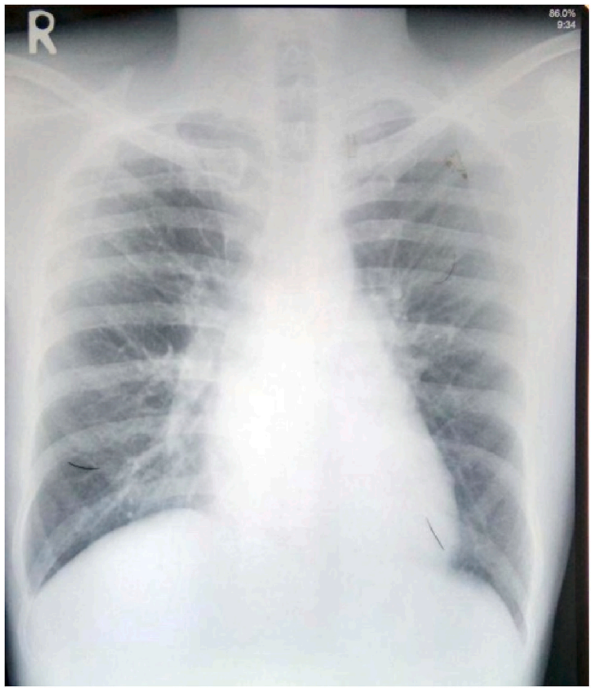

Fig. 4. Chest X-ray evaluation after one-month treatment with the anti-tuberculosis drug.

macrophages and neutrophils, with increased predisposition to mycobacterial infections [9]. Diagnosis of silicosis can be established by (1) history of occupation related with silica exposure, (2) radiological findings, and (3) other diseases are excluded [10]. The patient has been working in a sandpaper factory for five years, which is the possible have a high-risk factor for EPTB.

In tuberculosis pleurisy and pericardial, diagnostic with ADA test for pleural fluid and pericardial fluid showed 92 % of sensitivity and 90 % of specificity. Polymorphonuclear cells may predominate during the first 2 weeks following the onset of symptoms, but a shift towards lymphocytic predominance was observed at repeat thoracentesis [8]. In this patient, there is increasing of ADA test pericardial and pleural fluid 35.4 U/L and 40.2 U/L respectively.

Our patient has some unique features compared to recently described cases of EPTB. This patient presents with tuberculous pericarditis and pleurisy accompanied by silicosis. The Patient got anti-tuberculosis drug treatment and resigned from work after being diagnosed. After one month the pleural and pericardial effusions also disappeared.

4. Conclusion

We report an uncommon presentation of EPTB patient with tuberculous pericarditis and pleuritis accompanied with lung silicosis. Silicosis might be the risk factor of this rare condition of EPTB. Furthermore, workers at risk of exposure to silica must be regularly screened to prevent silicosis and its complications. Exudative pleural and pericardial effusion without lung TB involvement in high burden TB country also should screened for possibility of EPTB.

Funding acknowledgement

None.

Ethics statement

The authors declare that appropriate written informed consent was obtained to publish this case report and accompanying images.

Declaration of competing interest

The authors declare no conflict of interest

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