Case Series

The master impersonator: Pulmonary tuberculosis mimicking diffuse cystic lung disease – A mini case series of a rare presentation

Vinay V, Yasir Abdullah, Abhimanyu Garg, Paras Verma, Gaurav Kumar Singh, Amit Sharma

Department of TB and Respiratory Diseases, National Institute of Tuberculosis and Respiratory Diseases (NITRD), New Delhi, India

Abstract

Pulmonary tuberculosis has diverse clinical presentations. Cysts in the lung can arise due to large number of causes out of which tuberculosis is very rare. We report two immunocompetent cases of pulmonary tuberculosis who presented with multiple cysts in the lung parenchyma. The diagnosis was confirmed by the transbronchial lung cryobiopsy in first case and by analysis of bronchoalveolar lavage fluid in the second. Both had spontaneous pneumothorax which was treated with chest drain and pleurodesis. Both showed an excellent response to anti-tubercular therapy and steroids. Tuberculosis presenting as cystic lung disease is atypical and rare.

Keywords: Cystic lung disease, pneumothorax, pulmonary tuberculosis, transbronchial lung cryobiopsy

Introduction

Diffuse cystic lung diseases (DCLDs) are a heterogeneous group of lung diseases in which the pulmonary parenchyma contains multiple air-filled, thin-walled spaces. Mechanisms of cyst formation are not completely understood however lung remodeling associated with inflammatory destruction of alveolar septa, distal airways, and small vessels within the secondary pulmonary lobules are postulated. The etiologies for DCLDs are diverse which include interstitial lung diseases, infections, malignancies, lymphoproliferative disorders, smoking-related, congenital or developmental lung defects and miscellaneous.[1] Multiple lung cysts as initial presentation in pulmonary tuberculosis (TB) is atypical and rare. Here, we report two cases of pulmonary TB that presented as a cystic lung disease with varied presentation in young adults.

Address for correspondence: Dr. Amit Sharma, Room No 208, 2nd Floor, National Institute of Tuberculosis and Respiratory Diseases (NITRD), Sri Aurobindo Marg (Near Qutab Minar), New Delhi - 110 030, India.
E-mail: dramitsharma55@yahoo.co.in

Received: 08-02-2022 **Revised:** 23-04-2022
Accepted: 10-05-2022 **Published:** 31-10-2022

Access this article online

Quick Response Code:

Website: www.jfmpc.com

DOI: 10.4103/jfmpc.jfmpc_331_22

Case 1

A 19 yearold, previously, healthy male presented with complaints of fever and cough for 1 month followed by shortness of breath for 5 days. On presentation, the patient was in distress, his pulse rate was 130/min, blood pressure was 100/66 mmHg, and respiratory rate was 34/min. On auscultation, breath sounds were absent over left hemithorax; Chest X-ray revealed bilateral diffuse reticular shadows with left-sided pneumothorax, chest tube was placed immediately. Routine blood investigations were within normal limits except for mild anemia (Hb-11.1 g/dl). High resolution chest tomography (HRCT) thorax revealed left sided pneumothorax with multiple bilateral extensive cysts of varying sizes, diffuse bilateral ground glass opacity (GGO) and centrilobular nodules in both the lungs [Figure 1-a & 1-b]. Human

How to cite this article: Vinay V, Abdullah Y, Garg A, Verma P, Singh GK, Sharma A. The master impersonator: Pulmonary tuberculosis mimicking diffuse cystic lung disease- A mini case series of a rare presentation. J Family Med Prim Care 2022;11:6590-2.

immunodeficiency virus (HIV) testing by ELISA was negative. Bronchoalveolar lavage fluid was unremarkable, stains for PCP and AFB were negative, and Mycobacterium tuberculosis (MTB) was not detected on GeneXpert. Since no diagnosis was made at this point, a transbronchial lung cryobiopsy (TBLC) was taken from left lung and biopsy revealed multiple caseating granulomas in the interstitium consistent with tuberculosis. Anti-tubercular therapy (ATT) [Rifampicin, Isoniazid, Pyrazinamide, and Ethambutol] was started as per the protocol, in conjunction with short course of steroids (prednisone 0.5 mg/kg). Chest tube was removed post-pleurodesis with 10% povidine iodine after confirmation of lung expansion and patient was discharged in a stable condition. ATT was given for 6 months and steroids for 2 months with tapering doses. Follow-up HRCT Thorax [Figure 1-c & 1-d] showed reduction in the size and number of cysts at the end of treatment.

Case 2

A 18-year-old female patient came to ER with the complaints of fever for 1 month, shortness of breath for 10 days, and pleuritic chest pain for 2 days. On examination, patient's pulse rate was 126 beats/min, blood pressure was 90/60 mmHg, and respiratory rate was 32/min. On auscultation chest revealed bilateral crackles over all the zones. Chest X-ray showed bilateral diffuse reticular shadows with pneumomediastinum. A contrast-enhanced computed tomography thorax [Figure 2a and b] showed bilateral multiple cysts with diffuse GGOs and pneumomediastinum. After stabilizing her, Bronchoscopy was done which revealed lymphocyte predominant bronchoalveolar lavage. Stain for AFB was negative in the lavage fluid while rifampicin-sensitive MTB was detected on GeneXpert. Later, she developed bilateral pneumothorax which was managed with bilateral chest drain. She was started on ATT and steroids. Post lung expansion and pleurodesis, chest drain was removed, patient was discharged in a stable condition to continue ATT for 6 months. Most of the cysts have resolved on follow-up CT scan [Figure 2c and d] and she is doing fine till now.

Discussion

The occurrence of multiple cystic lung diseases represents an ever-increasing set of rare diseases that can pose a diagnostic challenge to physicians because of the wide range of diseases associated with this presentation. A pulmonary cyst is a defined as low attenuation area or round parenchymal lucency with a wall thickness of <2 mm and having a well-defined interface with the normal lung. A multidisciplinary approach including clinical history, physical examination, and radiological findings are important to arrive at an appropriate diagnosis. The course of infectious diseases or inflammatory disorders is usually acute or subacute (days to weeks), while chronic illnesses (lasting over 1 month) are usually caused by non-infectious infiltrative processes.[2]

Multiple etiologies of diffuse cystic lung diseases exist, including infectious, inflammatory, and neoplastic etiologies. Most common causes are cystic bronchiectasis, emphysema, staphylococcal pneumonia, p*neumocystic carinii* pneumonia (PCP), recurrent respiratory papillomatosis, lymphocytic interstitial pneumonia, lymphangioleiomyomatosis (LAM), pulmonary langerhans cell histocytosis (LCH), metastases of sarcomas, desquamative interstitial pneumonia, pulmonary amyloidosis, light chain deposition disease (LCDD), and septic pulmonary emboli.[1,2]

Tuberculosis (TB) usually causes cavities in the lung that resolve with treatment however; they can persist as cystic lesions. These post-infectious sequelae can even replace the entire lung parenchyma.[3] TB with multiple lung cysts on presentation is less frequently reported. Cyst formation in the lung due to TB has not been clearly understood, but some mechanisms have been hypothesized: a) Interstitial air leakage due to tubercle

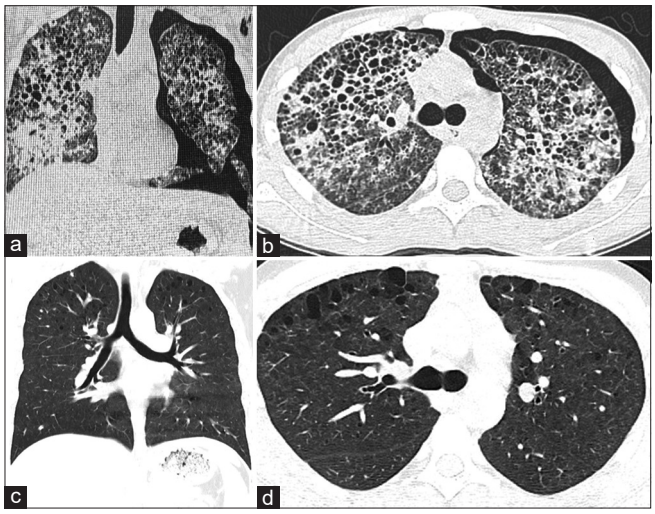

Figure 1: CT chest on admission (a-Coronal view & b-Axial view) showing multiple diffuse cysts with GGOs and few centrilobular nodules. Follow-up CT chest (c-Coronal view & d-Axial view) showing bilateral minimal cysts repeated after 6 months of treatment

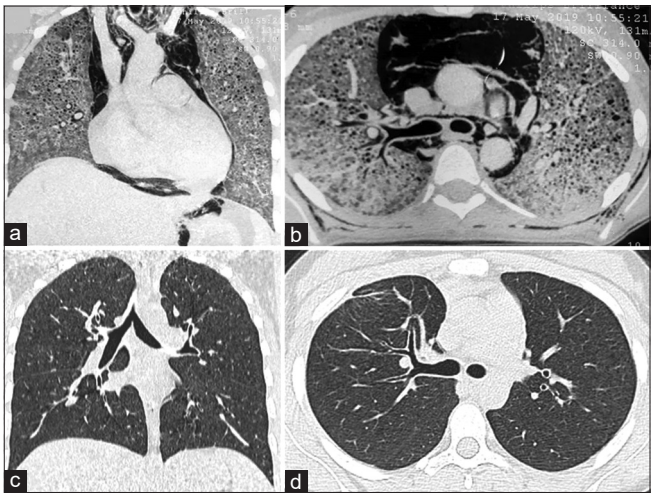

Figure 2: CT chest on admission (a-Coronal view & b-Axial view) showing multiple diffuse cysts with GGOs, centrilobular nodules, and pneumomediastinum. Follow-up CT chest (c-Coronal view & d-Axial view) showing very minimal cysts and fibrosis in bilateral upper lobe repeated after 6 months of treatment

rupture (subpleural emphysema), b) Chronic granulomatous inflammation of bronchioles and caseating necrosis of the bronchiolar walls leading to dilated bronchioles by check-valve mechanism, c) Poor drainage of necrotic lung parenchyma along with bronchiolar obstruction.[4-6] The development of cysts attributing to isoniazid therapy was also reported.[7] Using immunohistochemical and electron microscopy investigations, it was determined that proteinases secreted by granulomas of the peribronchial lining are responsible for degradation of elastic fibers along the bronchial walls, alveolar ducts, and alveolar walls.[5]

The extent and outcome of cystic diseases are dicey. The cysts are reversible in few cases,[4] or may persist after completion of therapy.[8] When conventional methods fail to diagnose such cases with high suspicion of PTB, lung biopsy especially transbronchial lung cryobiopsy (TBLC) can be an alternative. The TBLC technique provides a greater volume of tissue specimens, with greater alveolated and architectural preservation, as well as less crush artifact; hence it improves the yield compared to flexible forceps biopsy.[9] In our case, though both patients had bilateral extensive cysts on presentation however they showed an excellent response to anti-tubercular therapy and steroids with minimal residual cysts on follow-up scan. Despite effective antitubercular therapy, steroids were given in the setting of persistent granulomatous inflammation. Delay in the diagnosis, aggressive course of the disease, dissemination, and poor compliance with treatment can be considered as poor predictors of outcome. This case highlights following learning points, a) Pulmonary tuberculosis can manifest as cystic lung disease, and this needs to be considered as a differential diagnosis in a TB endemic country like India, b) An integrated multidisciplinary approach is necessary for a timely diagnosis, c) Cysts may be reversible if diagnosed and treated on time, but their outcome is unpredictable.

Conclusion

TB is a heterogeneous disease with a myriad clinical presentation. In countries with high TB prevalence, cystic lung lesions as an initial presentation of pulmonary tuberculosis should be taken into account as a potential cause of acquired cystic lung disease. A multidisciplinary approach consisting of pulmonologist, radiologist, microbiologist, and pathologist play a pivotal role in making the diagnosis.

Declaration of patient consent

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Gupta N, Vassallo R, Wikenheiser-Brokamp KA, McCormack FX. Diffuse cystic lung disease. Part I. Am J Respir Crit Care Med 2015;191:1354-66.
2. Francisco FA, Souza AS, Zanetti G, Marchiori E. Multiple cystic lung disease. Eur Respir Rev 2015;24:552-64.
3. Puri MM, Jain AK, Kumar L, Sarin R. Total replacement of a lung by tuberculosis pneumatocele--an unusual post-tuberculosis sequel. Indian J Tuberc 2014;61:162-5.
4. Ko KS, Lee KS, Kim Y, Kim SJ, Kwon OJ, Kim JS. Reversible cystic disease associated with pulmonary tuberculosis: Radiologic findings. Radiology 1997;204:165-9.
5. Lee HJ, Goo JM, Im JG. Rapid and irreversible cystic change of pulmonary tuberculosis in an immunocompetent adult. J Thorac Imaging 2003;18:254-6.
6. Lim KE, Wu YK, Huang SF, Hsu YY, Chan CY, Tsai YH, *et al.* Cystic lung changes in a patient with pulmonary tuberculosis. Tzu Chi Med J 2010;22:111-4.
7. Fernandez A, Shah MD, Buhariwalla RJ. Multiple isoniazid cysts in a child with chronic pulmonary tuberculosis. (A case report). Indian Pediatr 1972;9:49-50.
8. Ramachandran R, Ralph J, Pulimi R, Rajamani L, Radhan P, Athiyappan K. Revisiting cystic lung disease--A review on diagnostic approach in high resolution computed tomography thorax. J Evol Med Dent Sci 2021;10:1435-44.
9. Herth FJ, Mayer M, Thiboutot J, Kapp CM, Sun J, Zhang X, *et al.* Safety and performance of transbronchial cryobiopsy for parenchymal lung lesions. Chest 2021;160:1512-9.