Case Report

Caverno-Chest Wall Sinus: A Rare Manifestation of Chest Tuberculosis

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Abstract

Caverno-chest wall sinus without pleural spillage, a subentity of lung hernia, is a rare presentation of pulmonary tuberculosis resulting from spontaneous communication of the lung parenchymal cavity with the extraparenchymal compartment. This presentation in a completely healthy, young, asymptomatic individual for the first time is unusual. This rare presentation of tuberculosis is being highlighted in this case report.

Keywords: Caverno-chest wall sinus, lung hernia, pulmonary tuberculosis

Introduction

Protrusion of the lung tissue beyond the normal confines of the thoracic cavity across an anomalous opening in the thoracic wall, diaphragm, or mediastinum along the parietal and visceral pleurae is called as lung hernia.1 Caverno-chest wall sinus without pleural spillage is a subentity of lung hernia and is an uncommon occurrence resulting from spontaneous communication of lung parenchymal cavity with the extraparenchymal compartment.

The most common sites where lung hernias are found are the thoracic, cervical, or diaphragmatic regions. On the basis of etiological factors, the classification of lung hernias is categorized as either congenital or acquired. A greater number of lung hernias (82%) are acquired in nature, and of these, only 1% are attributable to tubercular infection, inflammation, or malignancies.2 Literature review shows a paucity of cases, wherein pulmonary lesions of tubercular etiology that included either a cavitary lesion or a granulomatous mass were seen to herniate across the thoracic wall without involving the pleural cavity.3-8

Here, we report this rare presentation in a previously healthy individual with no pulmonary symptoms presenting with a caverno-chest wall sinus after trivial chest trauma.

Case Report

A 23-year-old previously healthy male complained of pain of a few days’ duration in the left mammary region following trauma while wrestling approximately 15 days back. He had no fever, weight loss, cough, or difficulty in breathing. There was no history of contact with any known patient of tuberculosis.

Local examination of the chest elicited a possible bony contour abnormality along the left third rib in the midclavicular line. The chest did not reveal any signs of inflammation over the site of pain on the left side of the chest. General and systemic examination revealed no other abnormality.

Radiograph of the chest revealed a cavitary lesion with thick and nonuniform walls in the left middle zone with air extending into the soft tissues in the left anterolateral chest wall [Figure 1a and b]. The left third rib showed irregularity of contour anteriorly. A diagnosis of pulmonary tuberculosis was suspected, and a computed tomography (CT) scan of the thorax was advised. CT scan revealed an irregular-shaped...
cavitary lesion with surrounding consolidation in the anterior segment of the left upper lobe [Figure 2a and b]. The lesion was reaching up to the thoracic wall along the third rib. One of the peripheral branches of the anterior segmental bronchus of the left upper lobe [dashed arrow in Figure 2c] was seen communicating with the cavity.

The third rib adjacent to the cavity showed moth-eaten destruction with discontinuity of cortical contour [arrows in Figure 3a and b]. The cavitary lesion was seen to extend through this defect into a collection deep to the left pectoralis muscles [arrow in Figure 3c].

A CT-guided biopsy was done from the periphery of the cavity and the surrounding lung.

The biopsy of the lesion revealed a granulomatous reaction and a positive culture for *Mycobacterium tuberculosis*. A diagnosis of sputum smear-negative pulmonary tuberculosis was arrived at, and antitubercular therapy 2EHRZ (Ethambutol+Isoniazid+Rifampicin+Pyrazinamide)+4HR (Isoniazid+Rifampicin) was commenced. His follow-up CT scan after 6 months of antitubercular treatment [Figure 4a-c] revealed a significant reduction in the size of the pulmonary cavity with complete resolution of the fistulous tract to the chest wall and also of the communication of cavity with the bronchus.
Discussion
Clinically, lung hernias are diagnosed by a palpable defect in the chest wall through which a soft, crepitant protrusion is felt to bulge out on coughing. A radiograph of the chest can exhibit this herniation of the pulmonary contents past the normal boundaries of the thoracic cage. On radiographs of the chest, the localization of a pulmonary lesion as either intrapulmonary or extrapulmonary can be arrived at with the help of the “extrapulmonary” sign. CT scan of the thorax is superior to plain radiography in a detailed demonstration of the herniation of the lung, the contents of the herniation besides other associated intrapulmonary and extrapulmonary abnormalities.

Two essential prerequisites for the development of a lung hernia are (a) fragility of the thoracic wall due to congenital weakness or disease and (b) increase in intrathoracic pressure.

In our case, the presence of a cavity in the left middle zone with adjacent parenchymal infiltrates, the absence of pleural effusion, and a well-delineated sinus tract connecting the cavity and air collection deep to the left pectoralis muscle indicated it to be an intrapulmonary lesion with the elimination of entities such as empyema necessitans and cold tubercular abscess.

The caverno-chest wall sinus in our patient appears to have developed from rupture of the cavitary lesion. The endobronchial component of the lesion, which was well delineated on the CT, acted like a one-way valve, thereby creating tension in the cavity and predisposing it to rupture. The rupture of the cavity, in this case, was not associated with pyopneumothorax as pleural adhesions must have taken place in view of a slow protracted course of the disease. The involvement of the third rib by the underlying inflammatory process was evident in the form of moth-eaten destruction of the rib overlying the cavity and appears to have contributed to the frailty of the thoracic wall. The history of thoracic wall trauma during wrestling could have further weakened the chest, thereby contributing to the formation of the caverno-chest wall sinus. The presence of granulomatous lesion on CT-guided tru-cut biopsy and response to anti-tubercular treatment are strong indicators of tubercular etiology of the cavity.

In general, conservative treatment is adequate. Surgical repair is resorted to, only when there is relentless pain, recurrent infections, respiratory discomfort or cosmetic distress. Surgery is also recommended when any substantial physical activity that can lead to an immoderate increase in thoracic pressure and consequent rupture of the lung is predicted. Peritoneal flaps pulled from the adjacent ribs are used for surgically treating these defects.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

References
1. Adkins PC. The chest wall. In: Blades B, editor. Surgical Diseases of Chest. St. Louis: CV Mosby Company; 1961. p. 87.
2. Donato AT, Hipona FA, Navani S. Spontaneous lung hernia. Chest 1973;64:254-6.
3. Singh SK, Narang RK, Kothari AK, Chandra R. Spontaneous cavernopleurocutaneous fistula in pulmonary tuberculosis. Indian J Chest Dis Allied Sci 1983;25:297-8.
4. Seetharaman ML, Bahadur P, Srivastava KK. Spontaneous tuberculous cavernopleurocutaneous fistula. Indian J Tuber 1989;36:52-3.
5. Raj B, Bilhari K, Arora K. Ectopic herniation of pulmonary cavity. Lung India 1991;9:156-8.
6. DIXIT R, Nawal CL. Intercostal lung herniation in cavitary pulmonary tuberculosis. J Assoc Physicians India 2002;50:1339.
7. Rai SP, Kaul SK, Naware SS, Kashyap M. Herniation of tuberculous cavity presenting as caverno-chest wall fistula. Lung India 2005;22:119-1.
8. Ahmed N, Watanakunakorn C, Sarac E. Pleuro-pulmonary tuberculosis presenting as a chest wall mass in a patient undergoing long-term hemodialysis. Infect Dis Clin Pract 2001;10:403-4.
9. Fraser RS, Colman N, Pare PD, editors. Radiological signs of chest disease. In: Synopsis of Diseases of the Chest. 3rd ed. Philadelphia: W.B. Saunders & Co.; 2005. p. 124-6.
10. Prasad R, Mukerji PK, Gupta H. Herniation of the lung. Indian J Chest Dis Allied Sci 1990;32:129-32.
11. Goodmann HL. Herniation of lung. J Thorax Cardiovasc Sing 1933;2:368.