

Case Report

Marijuana abuse and bullous emphysema

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ABSTRACT

Marijuana abuse has been on an increasing trend worldwide in the last decade. We hereby report a case of severe bullous emphysema resulting in pneumothorax in a patient with few years of marijuana abuse. We also review the major conditions in the differential diagnosis of bullous emphysema in adults.

KEY WORDS: Emphysema, marijuana, pneumothorax, VATS

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INTRODUCTION

Marijuana abuse has been on an increasing trend worldwide in the last decade. We hereby report a case of severe bullous emphysema resulting in pneumothorax in a patient with a few years of marijuana abuse.

CASE REPORT

We hereby report a case of a 25-year-old African American male who presented to the emergency room with sudden onset of shortness of breath and right-sided chest pain. His social history is significant for smoking two to four cigarettes and two to three joints of marijuana/day for the last 8 years. There is no history of significant occupational or animal exposure, intravenous drug use, or use of any medications. His past medical history is significant for sarcoidosis diagnosed 10 years back by bronchoscopy and biopsy. He was started on steroids for sarcoidosis, but was noncompliant to treatment.

On physical examination, the patient was afebrile with normal vital signs. The chest exam revealed decreased breath sounds as well as hyper-resonance on percussion over the right lung field. The cardiovascular

examination was normal. There was no cyanosis or clubbing. There was no hepatomegaly or signs of chronic liver disease.

A chest radiograph was performed, which showed a right-sided pneumothorax with no mediastinal lymphadenopathy [Figure 1]. Subsequently, a chest computerized tomography (CT) was performed, which showed severe emphysematous bulla in the bilateral lungs with upper lobe predominance [Figure 2].

The full-blood examination was normal, with no eosinophilia. The erythrocyte sedimentation rate

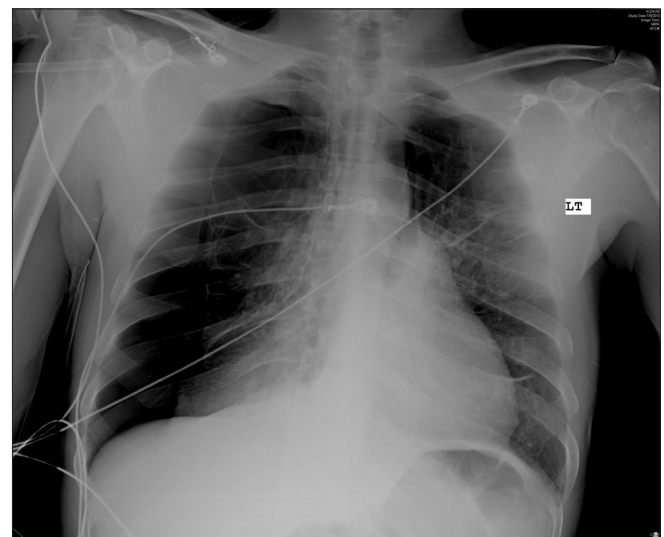


Figure 1: Chest radiograph showing right-sided pneumothorax on presentation

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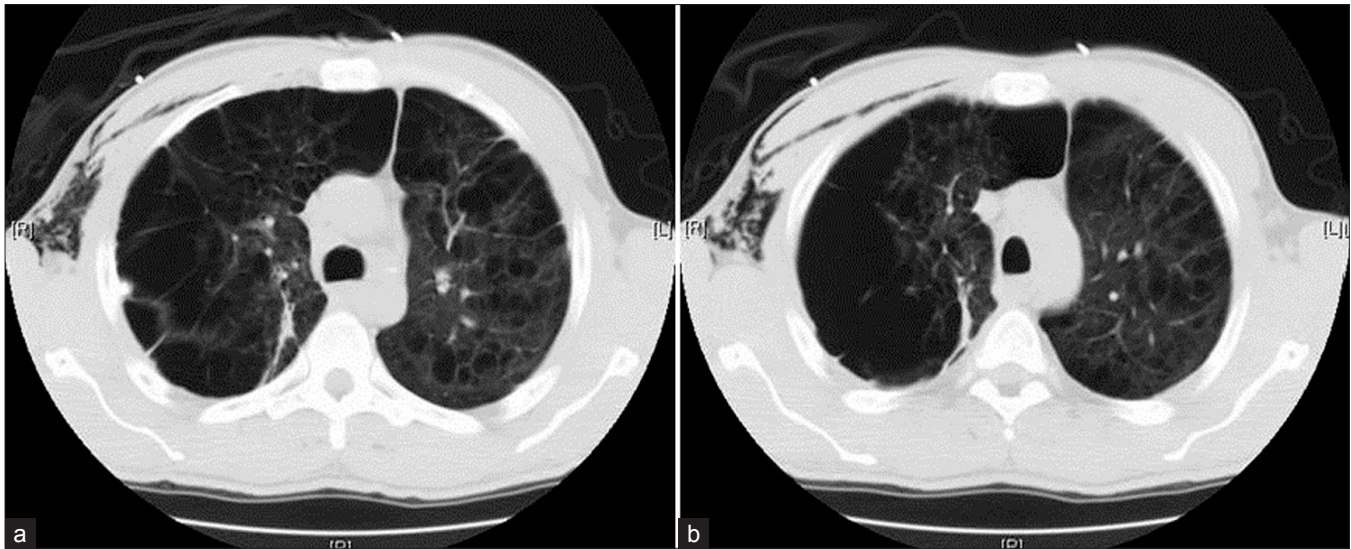


Figure 2: Computerized tomographic scan showing severe bilateral upper lobe bullous lung disease

Table 1: Main differential diagnoses of bullous lung disease in adults and features, from the current case, against these diagnoses

Stage 4 sarcoidosis	No evidence of fibrosis or traction bronchiectasis on CT scan; no clinical features
Alpha-1 antitrypsin deficiency	Negative blood test for alfa-1 antitrypsin level; upper lobe involvement in our patient in contrast to lower lobe predominance in alfa-1-antitrypsin deficiency
Pulmonary Langerhans histiocytosis	No clinical or pathological evidence
Adult-onset cystic fibrosis	Negative sweat chloride test
Lymphangioliomyomatosis	No clinical or pathological evidence

was not elevated. An angiotensin-converting enzyme level was performed, which was normal (44; reference range: 12–68). Alpha-1-antitrypsin was also within the normal range (151; reference range: 90–200). Sputum microscopy and culture for bacteria, acid-fast bacilli, and fungi were negative.

Pulmonary function testing revealed a severe obstructive ventilatory defect, with a possible associated restrictive ventilator defect, and no response to the bronchodilator. Gas transfer was significantly reduced.

After excluding all the potential causes of cystic lung disease [Table 1] and taking into consideration his new-onset marijuana smoking in the last 8 years, marijuana abuse was thought to be the cause of his bullous lung disease. The patient was treated with a chest tube and subsequently discharged with advice to quit marijuana smoking and further referral to general surgery for bullous resection.

DISCUSSION

The harmful effects of tobacco smoking, especially over a period of several years, leading to large emphysematous

lung bulla have been well documented.^[1] However, the chronic pulmonary effects of marijuana smoking are less well described and there are very few reports demonstrating the association of marijuana smoking with large lung bulla.^[2]

In 1972, Miller *et al.* reported a case of pneumomediastinum resulting from performing high-pressure valsalva maneuvers during marijuana smoking.^[3] In 2000, Johnson *et al.* described four cases of large lung bulla in young men with significant exposure to marijuana but low exposure to tobacco.^[4] According to the more recent data in 2008, Hii *et al.* conducted a prospective case series consisting of 10 patients who regularly used marijuana and who developed new respiratory symptoms. Nine of these patients showed severe asymmetrical and variably sized bulla on CT scan.^[5] Similarly, in 2008, Beshay *et al.* conducted a retrospective case series in which, among the 102 patients who presented with spontaneous pneumothorax at the emergency unit within a 2.5-year period, 17 patients who had relevant pulmonary emphysema and history of marijuana abuse were retrospectively evaluated systematically. The study concluded marijuana abuse as one of the important differentials in case of emphysema in young individuals.^[6]

Marijuana smoking frequently, known as “POT,” is of significant concern because of its frequent use among young adults. The exact mechanism for bulla formation in marijuana abuse is not well known. It may be a combination of direct pulmonary toxicity from components in marijuana in susceptible smokers and airway barotrauma related to the high inspiratory pressure and prolonged breath-hold generated during marijuana smoking.^[7] Studies have shown that marijuana smoking involves a two-thirds larger puff volume, a one-third greater depth of inhalation, and four-times longer breath-holding time than tobacco smoking.^[3] This inhalation pattern can result in an increased risk of spontaneous pneumothorax, as seen in marijuana smokers. Besides spontaneous pneumothorax, regular marijuana

users also experience more cough, sputum, and wheezes than nonsmokers. Three to four “joints” of marijuana per day have been reported to give as many symptoms as an average of 24 cigarettes.

CONCLUSION

We affirm that in all cases of bullous emphysema in young individuals, marijuana abuse should be included in the differential diagnosis. The period of marijuana smoking plays an important role in the development of lung emphysema. Most of the patients are asymptomatic and present with spontaneous pneumothoraces. Video-assisted thoracoscopic surgery (VATS) should be considered as one of the options for resection of bulla and prevention of recurrent pneumothoraces.

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Announcement

Participate In ICS Research Projects

Indian Chest Society has decided to undertake following research projects:

1. In order to assess proportionate burden of respiratory diseases a survey will be carried out on four days in a year among OPD/Indoor patients.
2. A registry of important but rare respiratory diseases will be prepared. In the initial phase registry of interstitial lung diseases (ILD) and allergic bronchopulmonary aspergillosis (ABPA) would be started. At least one center will be selected from one state.

If you wish to establish collaborating research center at your place for these projects, please volunteer to email on: drvirendrasingh93@gmail.com

These studies will not only help in developing understanding and formulation of national strategies for respiratory diseases but also help in upgrading care of your center.

Dr. Virendra Singh
Coordinator
Research Projects
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