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# Spontaneous Pneumomediastinum in a Young Female with a History of Marijuana Use

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## Abstract

- We describe a case of spontaneous pneumomediastinum following inhalational marijuana use.

## Introduction

- The patient is a 21 year old female with a history of obesity, marijuana & tobacco use, presenting with right neck pain. Prior to falling asleep, she had smoked marijuana. She was awoken by right neck pain, which radiated to her right upper chest.
- Patient denied retching, dysphagia, odynophagia, or trauma. She was hemodynamically stable & saturating on room air. Crepitus was heard over the right anterior chest & neck. The only remarkable lab finding was an elevated D-dimer at 0.70 ug/mL (ref: <0.50 ug/mL).
- CT chest with pulmonary embolism protocol revealed pneumomediastinum with air tracking into the lower neck, epicardial fat & esophagus (Fig 1 & 2). There was no evidence of a pulmonary embolism. She was given supplemental oxygen & her pain was controlled with analgesics.
- Thoracic surgery was consulted; they recommended esophagram for evaluation of esophageal microperforation. It was unremarkable with no indication for surgical intervention. Over the course of 48 hours, the patient's pain & crepitus resolved. On further questioning, she stated that she would forcefully inhale & hold her breath while smoking marijuana on a regular basis. Patient was counseled to discontinue marijuana & tobacco & was discharged with close follow up.

## Discussion

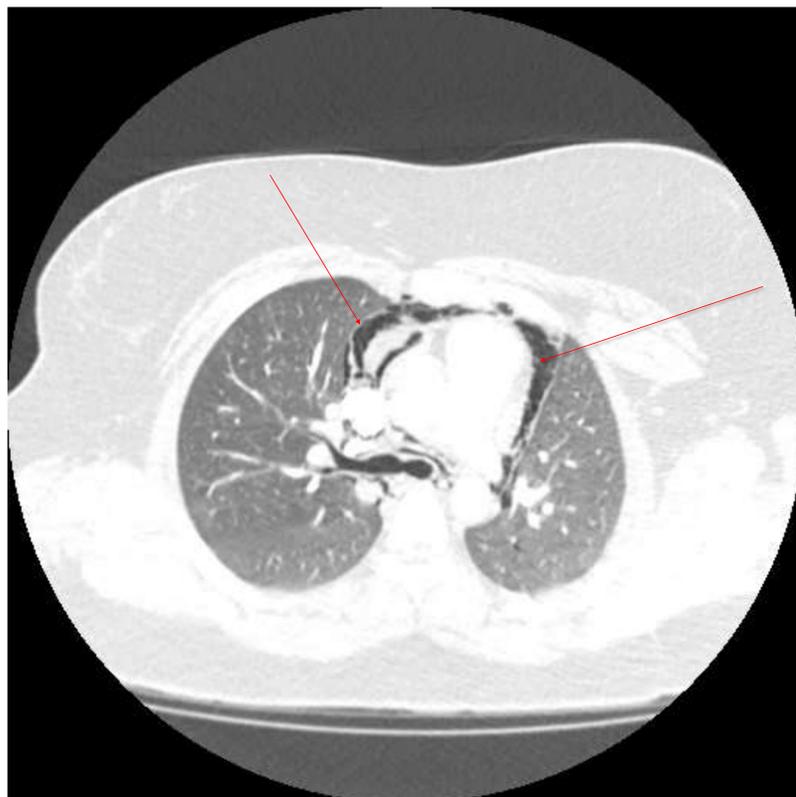
- Spontaneous pneumomediastinum (SPM) is a rare disease with a poorly described etiology. Literature characterizing the pathophysiology of SPM in connection to drug use is vague, given the overall low incidence [4] of 1/102,000. It is known to occur in younger males [3,4,7] following forceful emesis, intense coughing and asthma [1,3,4,7] & even vigorous sexual activity [6].
- SPM post inhalation drugs use [1,4] is not commonly found in the literature. Two proposed mechanisms of action illustrate SPM following inhalation drug abuse [3,4,8], including violent Valsalva maneuver [5,9,10] & cocaine induced alveolar damage with capillaritis [3,6]. SPM after vehement tobacco inhalation using electronic cigarette has also been described [8], along with the SPM after oral intake of MDMA [10].
- There are no reported studies on whether the type of smoking device increases the Valsalva maneuver & intrathoracic pressure. However, when compared to tobacco, marijuana users have an average fourfold longer breath holding time regardless of smoking device [2], which could increase the risk of SPM as compared to tobacco smokers.
- Given our patient's limited history, her SPM was likely secondary to forceful Valsalva during marijuana inhalation.

## Conclusion

- SPM is a rare but generally benign condition described in medical literature. As the use of marijuana and tobacco via electronic devices becomes more popular, spontaneous mediastinum should be considered in young patients presenting with chest pain and crepitus.
- Preventative counseling should also be considered in those at risk of marijuana and tobacco abuse.

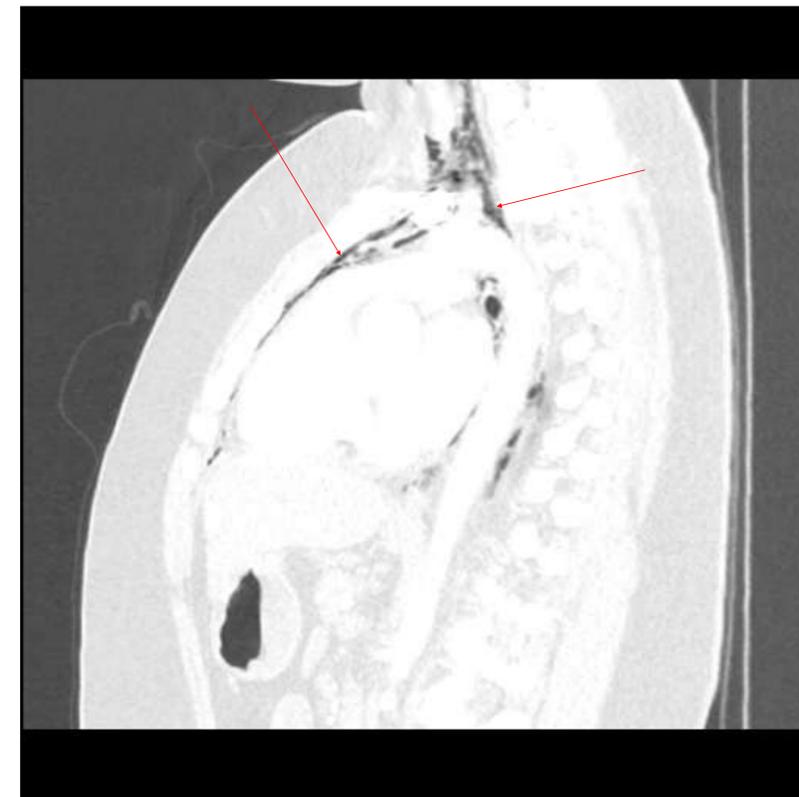
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**Figure 1:**  
Axial CT chest with iv contrast pulmonary embolism

Extensive pneumomediastinum with air dissecting into the lower neck and into the epicardial fat.



**Figure 2:**  
Sagittal CT chest with iv contrast pulmonary embolism

Extensive pneumomediastinum with air dissecting into the lower neck and into the epicardial fat.