

## CLINICAL VIGNETTE

# Pulmonary Complications of Marijuana Smoking

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There have been only a few publications regarding the adverse pulmonary effects of marijuana smoking. As the use of cannabis increases with legalization and wider commercialization, clinicians should be aware of adverse pulmonary side effects of marijuana smoking.

### *History of Present Illness*

A 39-year-old male presented for wheezing and black sputum production in the context of long-standing marijuana smoking since the age of 18. At the time of presentation, the patient had been smoking 3.5 grams of cannabis every two days via glass water bong. Physical exam was notable for inspiratory squeaks. The initial FEV1 on office spirometry was 67% predicted with an FEV1/FVC ratio of 0.56, compatible with moderate obstructive airways disease. Chest X-ray showed mild hyperinflation (Figure 1).

Following his initial evaluation, the patient significantly reduced the amount of smoked marijuana. Subsequent pulmonary function testing demonstrated an improvement in FEV1 of 40

mL but had persistent obstructive ventilatory defect with hyperinflation (Figure 2).

High-resolution non-contrast computerized tomography scan was ordered and showed air trapping on exhalation and paraseptal emphysema (Figures 3A and 3B).

With the legalization of recreational marijuana in the United States, nearly 55 million adults are using it at least 1-2 times a year. Close to 35 million adults consider themselves “regular users,” at least 1-2 times a month. Therefore, it is prudent for the medical community to be aware of the adverse effects of marijuana smoking, as over half of these individuals are millennials.<sup>1</sup> Increasing popularity in a younger population, coupled with an overestimation of safety has caused greater consumption<sup>2</sup> and should prompt the medical community to become more familiar with the adverse effects of marijuana smoking.

Table 1 summarizes reported adverse effects of marijuana smoking.

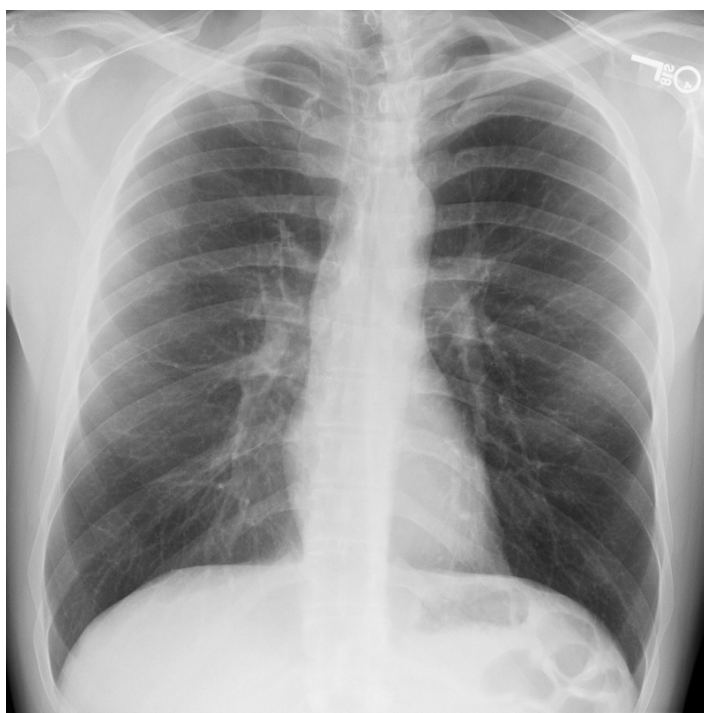
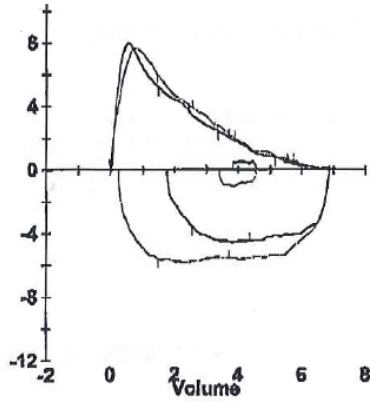
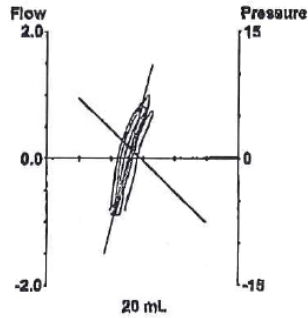


Figure 1: Chest X-ray with hyperinflation from air trapping



**Spirometry**

		Ref	Pre Meas	Pre % Ref	Post Meas	Post % Ref	Post % Chg
FVC	Liters	5.74	6.91	121	6.89	120	-0
FEV1	Liters	4.30	3.77	88	3.97	92	5
FEV1/FVC	%	75	55	73	58	77	6
FEF25-75%	L/sec	4.24	1.73	41	1.98	47	15
PEF	L/sec	10.31	7.98	77	7.67	74	-4
FET100%	Sec		16.30		14.45		-11
FIVC	Liters	5.74	5.17	90	6.62	115	28
FIF50%	L/sec		4.44		5.51		24
FVL ECode			000000		_000		
MVV	L/min	180	130	72			



**Lung Volumes**

		7.93	10.23	129
TLC	Liters	7.93	10.23	129
VC	Liters	5.74	6.91	121
RV	Liters	2.29	3.32	145
FRC PL	Liters	4.34	5.78	133
ERV	Liters	1.91	2.46	129
IC	Liters	3.82	3.94	103
RV/TLC	%	30	32	108
Raw	cmH2O/L/sec	0.99	1.73	175
Vtg	Liters		5.04	
sGaw	L/s/cmH2O/L	0.233	0.114	49

**Diffusion**

		30.3	32.2	106
DLCO	mL/mmHg/min	30.3	32.2	106
DL Adj	mL/mmHg/min	30.3	32.2	106
VA	Liters	7.94	8.03	101
DLCO/VA	mL/mHg/min/L	4.33	4.01	93
DL/VA Adj	mL/mHg/min/L		4.01	
IVC	Liters		6.46	

Hb:

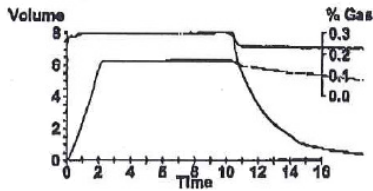


Figure 2

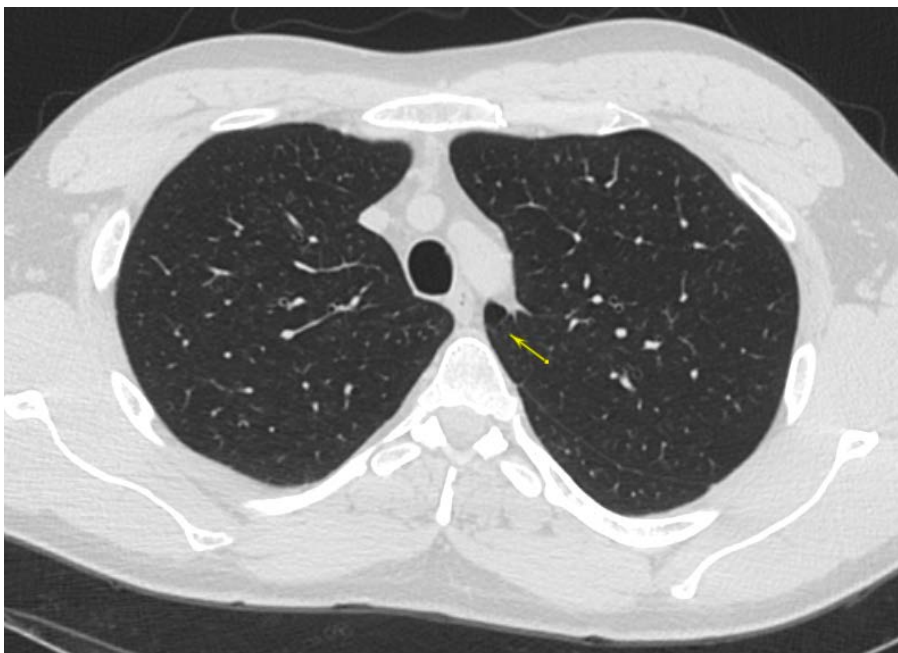


Figure 3A: Inhalatory imaging with arrow demarcating paraseptal emphysematous change

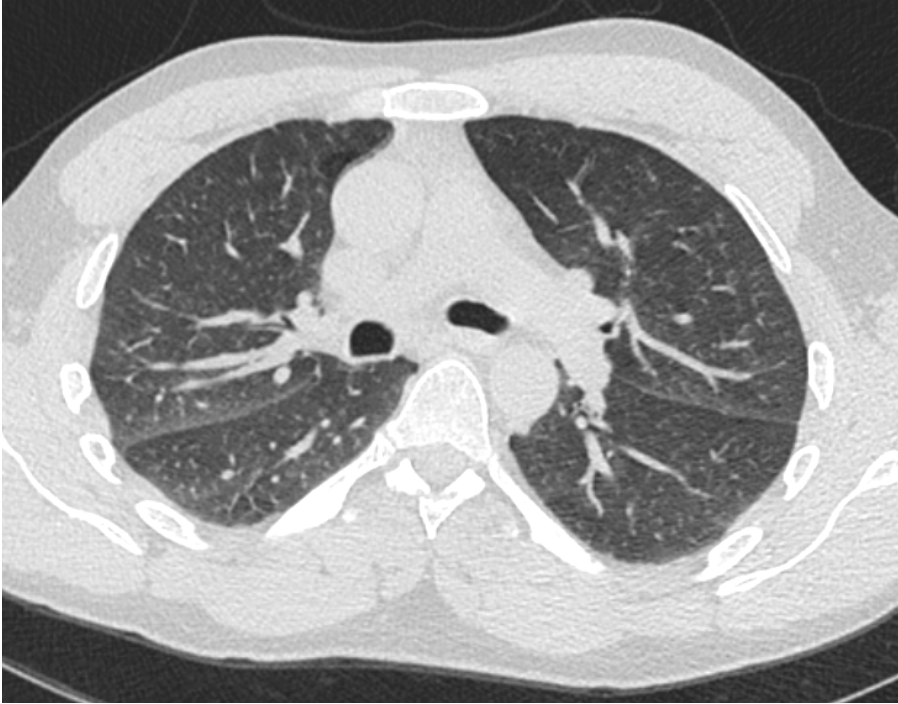


Figure 3B: Exhalation phase

Author	Complications
<b>Aldington, et al<sup>3</sup></b>	<ul style="list-style-type: none"> <li>• Dose-related impairment of large airways function resulting in airflow obstruction and hyperinflation.</li> <li>• Seldom associated with macroscopic emphysema.</li> </ul>
<b>Joshi, et al<sup>4</sup></b>	<ul style="list-style-type: none"> <li>• Habitual smokers report cough, wheeze, shortness of breath, sputum production, chest tightness, pharyngitis, hoarse voice, and worsening asthma symptoms.</li> <li>• Respiratory symptoms in marijuana smokers are likely due to the trans-bronchoscopic pathologic findings of injurious effects of marijuana smoke on the bronchial mucosa</li> <li>• Pneumothorax from barotrauma when smoking accompanied by Valsalva maneuver</li> </ul>
<b>Pletcher, et al<sup>5</sup></b>	<ul style="list-style-type: none"> <li>• A higher levels of marijuana exposure, more than 10 joint-years, was associated with a education in the FEV1 slope by -2.2 ml/joint year and -3.2ml a &gt; 20 episodes/month.</li> </ul>
<b>Mishra, et al<sup>6</sup></b>	<ul style="list-style-type: none"> <li>• Smoking marijuana is associated with a 66% larger puff volume and 33% increase in breathing depth and inhalation time compared with tobacco</li> <li>• Increased risk of apical emphysema and pneumothorax in marijuana smokers</li> </ul>
<b>Donald Tashkin<sup>7</sup></b>	<ul style="list-style-type: none"> <li>• Increased prevalence of chronic cough or sputum, wheezing, and shortness of breath</li> <li>• Increased incidence of acute bronchitic episodes or clinic visits for acute respiratory illness</li> <li>• Association with pulmonary barotrauma or bullous lung disease</li> </ul>

Table 1.

## REFERENCES

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