



Case report

Breath-holding in a marijuana smoker

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ABSTRACT

It is vital to ask about illicit drug smoking in the respiratory history as marijuana smoking augments the detrimental effects of tobacco. We describe the case of a 28 year old marijuana smoker who developed a pneumothorax during a breath-holding competition. Pneumothorax is a common clinical entity that every physician should be aware of how to manage and lifetime risk is considerably increased by smoking and in exposure to barotrauma.

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1. Case

A 28 year old man with no past medical history presented to the emergency department with an acute history of dyspnoea and pleuritic chest pain 20 min after breath-holding for 2 min 28 s in a competition in his local public house.

He admitted to a 10 pack year of cigarette smoking and to regular cannabis use in the resin form, which he smoked either in rolled up cigarettes mixed up with tobacco or via water-pipes, otherwise known as “bongs”.

Clinically, his trachea was central but he had reduced air entry on the left side with a hyper-resonant percussion note. His oxygen saturations were 98% on air but he was tachypnoeic with a respiratory rate of 22 per minute. He was normotensive and had a pulse rate of 100 beats per minute.

His chest X-ray ([Image 1](#)) showed a left pneumothorax with a trace of fluid at the base and given the degree of breathless and size of pneumothorax, a 12 French Seldinger chest drain was inserted with no complications. Radiology post drain insertion showed good re-expansion of the affected lung. ([Image 2](#)) but the drain continued to bubble and swing. The lung did not fully expand despite suction and a small pleural effusion developed on subsequent chest radiographs. When suction was removed, the PTx was noticeably bigger ([Images 3–6](#)). Chest computerised tomography showed apical bullae and a well sited chest drain in the left apex ([Images 7 and 8](#)). However, overnight the drain became dislodged

and was removed. His clinical and radiological appearance remained stable ([Image 9](#)). He was discharged home with scheduled early follow up which unfortunately he has failed to attend.

2. Discussion

Cannabis is an illegal drug in the United Kingdom but has widespread recreational use among the younger generation and 44% of 16–29 year-olds have tried cannabis.¹ The damage and risk to the respiratory epithelium from 3 to 4 cannabis cigarettes is equivalent to approximately 20 tobacco cigarettes.² The former tend to be smoked in two forms. Resin, the residue of the cannabis plants, tends to be ground with tar to form a sticky paste that can be combined with tobacco and smoked usually with no filter-tips at the end of the “joint”. “Skunk”, the dried up leaves or flower of the marijuana plant, can be smoked directly. Water-pipes or “bongs” are also used as smoking instruments. With whatever method, the puff volume is increased by two-thirds and the depth of inhalation by one-third.³ There is an average fourfold longer breath-holding time with cannabis than with tobacco and hence tar deposition is four times as much as an unfiltered cigarette of the same weight.⁴

PTx is air in the pleural cavity and can be classified as primary and secondary. Combined United Kingdom hospital admission rates for primary and secondary PTx have been reported as 16.7/100,000 for men and 5.8/100,000 for women, with corresponding mortality rates of 1.26/million and 0.62/million per annum between 1991 and 1995.⁵ Smoking confers a lifetime 12% risk of PTx as compared to 0.1% in non-smokers.⁶ Sub-pleural blebs and bullae have been found on thoracoscopy and CT scanning in about 90% of patients with PTx and with negative pleural pressure increasing from the

Abbreviations: CT, Computerised tomography; PTx, Pneumothorax.

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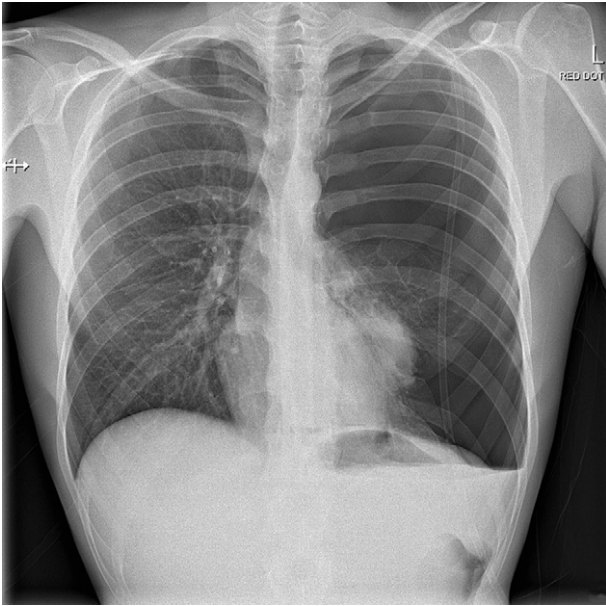


Fig. 1. Left sided pneumothorax at presentation with trace of fluid at the base.

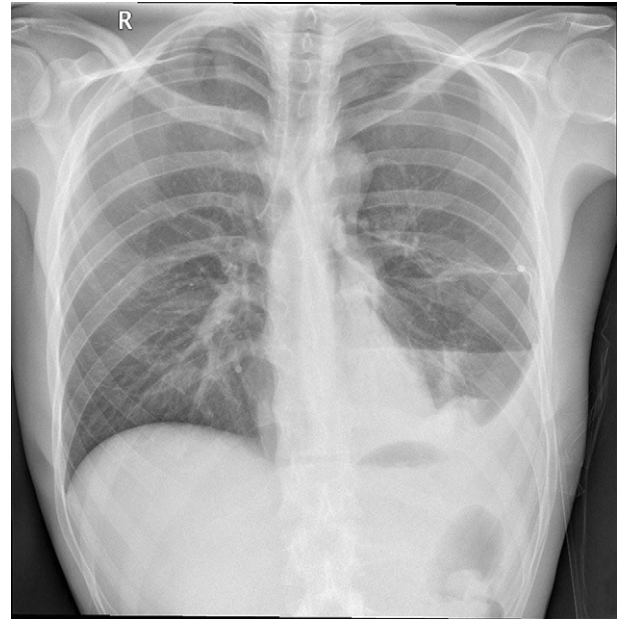


Fig. 3. Hydro-pneumothorax with intercostal drain in situ.

lung base to the apex, the alveoli in the apex are subjected to greater distending pressures.

An association between cannabis smoking and bullous lung disease has been described.^{7,8} Johnson et al⁸ coined the term “bong lung” when they described 4 patients ranging in age from 26 to 47 years who had extensive apical bullous disease and with one of them having previously suffered a spontaneous PTx. Their conclusion was that a history of marijuana smoking should be ascertained in any patient presenting with a spontaneous PTx. Pathological analysis shows supleural blebs and emphysematous changes with numerous heavily pigmented smokers’ macrophages which looks like a desquamative interstitial pneumonia.⁹ “Bong lung” however, does not have any interstitial changes on radiological imaging. It is

likely that both tobacco and cannabis are the culprits in this pathological entity rather than the latter alone.

PTx and pneumomediastinum have been reported in cannabis smokers with extreme breath-holding, Valsalva, and Muller’s manoeuvres. Miller et al¹⁰ described a case of a 23 year old smoker who performed repeated Valsalva manoeuvres for 5 h two days prior to an admission with a pneumomediastinum. It is thought that due to the increased intra-alveolar pressure, a disruptive

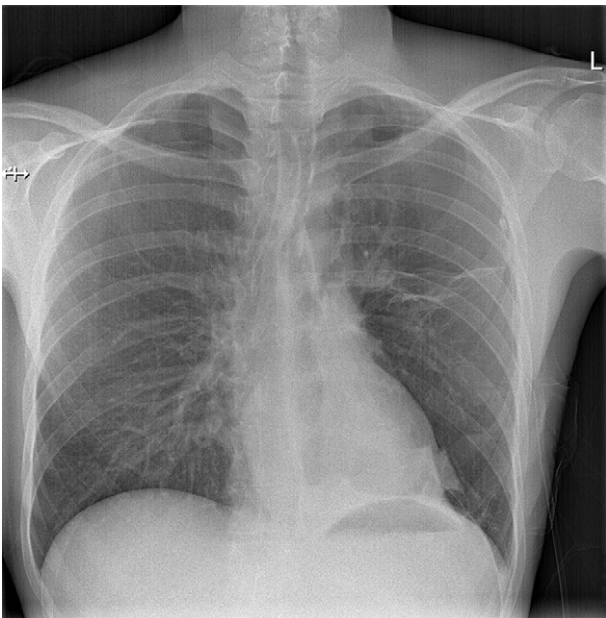


Fig. 2. Re-expansion of left lung with intercostal drain with trace of fluid at the base.

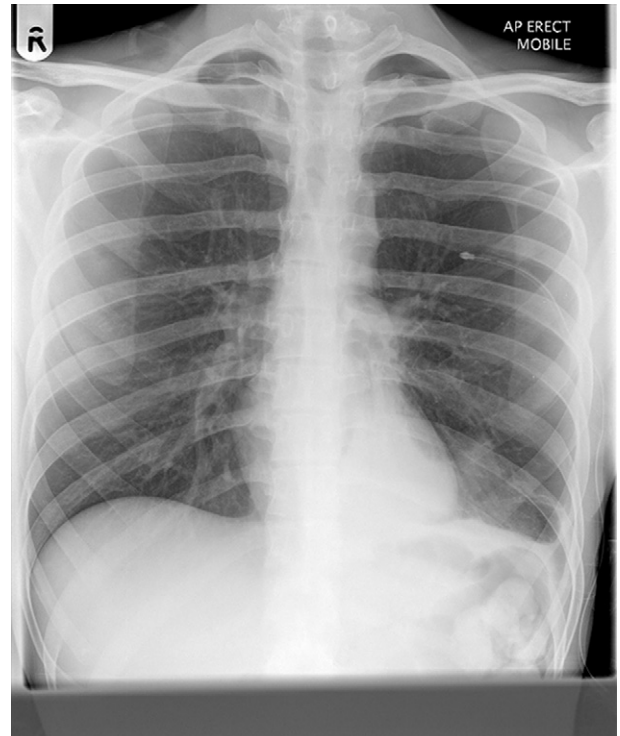


Fig. 4. Improvement of volume of pneumothorax on low pressure, high volume suction.

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