



## Pathology & Biology Section – 2005

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### **G33 Sudden Death Due to Bilateral Spontaneous Pneumothoraces in a Marijuana User**

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After attending this presentation, attendees will realize the rare, and potentially fatal, complications of chronic marijuana smoking.

To the author's knowledge, there have been no previous reports in the medical literature of sudden death due to bilateral spontaneous pneumothoraces in an individual known to use marijuana. This presentation will impact the forensic community and/or humanity by demonstrating the adverse pulmonary effects of marijuana smoking, and focusing on a rare complication that may result in sudden death.

Marijuana remains the most commonly smoked illicit substance in American society. There is a public perception that marijuana smoking has little adverse effect on physical health. However, habitual marijuana smoking may produce lesions in the conducting airways and lung parenchyma similar to those lesions caused by repeated inhalation of tobacco smoke. 9-tetrahydrocannabinol and combustion products of *Cannabis sativa* are respiratory irritants. Compared to tobacco smoke, marijuana smoke causes a fivefold greater increment of blood carboxyhemoglobin level, a threefold increase in the amount of tar inhaled, and retention of one-third more inhaled tar in the respiratory tract. The pulmonary effects of chronic marijuana smoking include epithelial remodelling of airways and barotrauma.

Inhalation of marijuana smoke involves deep, sustained inspiratory effort, often followed by frequent and prolonged Valsalva maneuvers. As a consequence of increased intraalveolar pressure, there may be rupture of alveoli with air leakage into the septal connective tissues. Peripheral dissection of air within the pulmonary interstitium may lead to the formation of visceral pleural blebs or bullae.

Rupture of the visceral pleural bullae may result in a pneumothorax, which is rarely fatal. The reported case documents the gross and microscopic autopsy findings of a 23-year-old male who was a known habitual user of marijuana, whose sudden death was due to bilateral spontaneous pneumothoraces with bilateral apical bullous lung disease. Although giant bullae and nonfatal pneumothoraces have been documented by chest x-ray and CT scan in smokers of marijuana, there have been no known previous reports in the medical literature of sudden death due to bilateral spontaneous pneumothoraces in an individual known to use marijuana.

**Marijuana, Pneumothorax, Bullous Lung Disease**