

Bullectomy for “bong lung” in an 18 year-old male presenting with spontaneous pneumothorax

Roger K.A. Allen

Wesley Medical Centre, Brisbane, QLD,
Australia

Key words:

- “bong lung”
- cannabis
- adolescence
- spontaneous pneumothorax
- apical bullae

Correspondence to:

Professor Roger K.A. Allen, MBBS (Hons 1st Qld), FRACP,
FCCP, PhD (Melb)
Suite 46, Wesley Medical Centre
40 Chasely St, Auchenflower,
Brisbane, QLD 4066
Australia
Tel.: +617 37195577
Fax: +617 37195177
E-mail: rogerallen@sarcoidosis.com.au

SUMMARY. An 18 year-old male who had smoked cannabis for four years presented with a spontaneous pneumothorax and was treated by apical bullectomy. The surgical and histopathological findings were characteristic of “bong lung”. This patient is the youngest reported in the literature and the case highlights the fact that the disease can occur even in adolescents after a few years of smoking cannabis. *Pneumon 2010, 23(3):301-303.*

HISTORY:

In August 2006, an 18 year-old male was referred for management of spontaneous left pneumothorax which had occurred the previous day, presenting with chest pain and dyspnoea. His general health had been good, apart from an episode of depression at age 14 years for which he had been hospitalized under the care of a psychiatrist and for which he was still taking venlafaxine hydrochloride 450 mg/day. There was no past history of lung disease. However, he had smoked marijuana heavily since the age of 14 years and was consuming, on average, one ounce of marijuana mixed with two ounces of tobacco weekly, or about four to five cones daily.

On examination, he looked well, he weighed 62 kg, his height was 185 cm and there were no physical findings apart from reduced breath sounds in the left apex. He was not Marfanoid.

RADIOLOGY:

Chest X-ray on 17 August 2006 showed a left pneumothorax. Chest computed tomography (CT) on 21 August 2006 (high resolution non-contrast 16 slice axial spiral scans, 1mm thick axial scans at 10mm intervals slices) showed thin-walled bullae in the left apex, the largest of which was 2.8 x 2.1 cm. Several smaller bullae were present in the right apex. There were

no other abnormalities (Fig. 1).

TREATMENT:

On 24 August 2006, he underwent video-assisted thoracoscopy, with apical bullectomy and stapling of the bullae in the left apex, and abrasion pleurodesis (Fig. 2).

SURGICAL FINDINGS:

The appearance of the lung differed very little on the outside from what is seen in the usual young pneumothorax patient who is a smoker. However the appearance of the cut edge of the lung parenchyma after the cutting and stapling device had been fired was quite different. The tissue was both thickened and "juicy", and very brown and tarry. The apical blebs or bullae were more prominent than the usual "bubble-wrap" appearance, but this is not pathognomic; it is the appearance of the cut edge which gives the clue to "bong lung".

PATHOLOGY:

The resected lung showed classical features of "bong lung". There were subpleural blebs/bullae and subpleural

emphysematous changes (Fig. 3), and immediately adjacent, numerous heavily pigmented smokers' macrophages, giving a desquamative interstitial pneumonia (DIP)-like effect (Fig. 4). These changes have been described in "bong lung".¹

DISCUSSION:

"Bong lung" was first described by Johnson et al in 2000 when they published four cases ranging in age from 27 to 46 years, with smoking of tobacco combined with marihuana common to all cases.¹ All had upper lobe bullae of varying severity, with essentially normal parenchyma

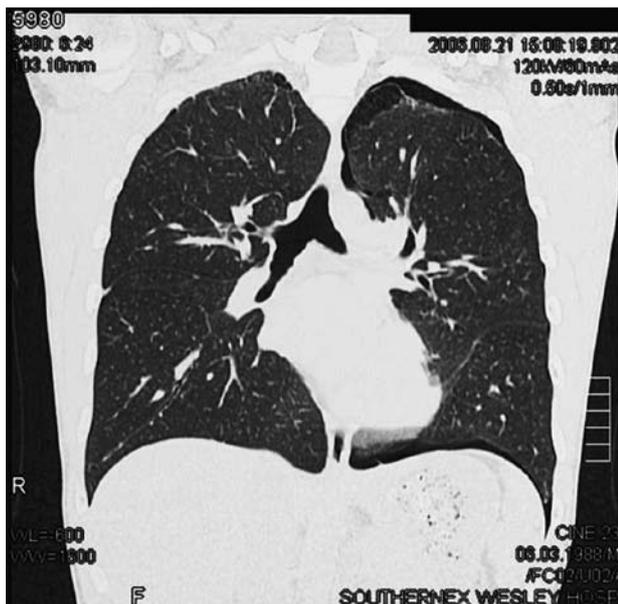


FIGURE 1. High resolution CT scan of the thorax, showing apical bullae in the left lung.

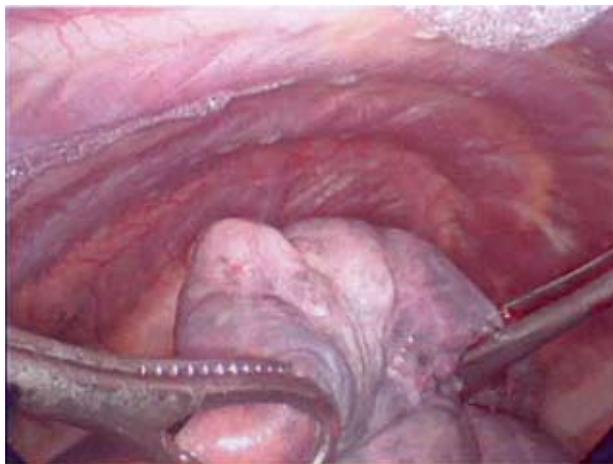


FIGURE 2. Video-thoracoscopy showing apical bullae in the left lung.

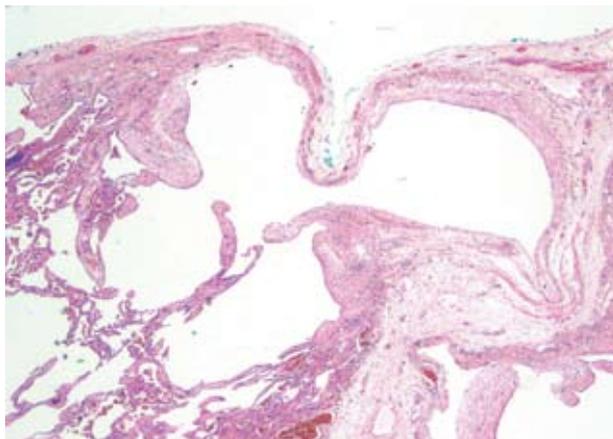


FIGURE 3. Histological section (x 20, H & E stain) showing subpleural bullae.

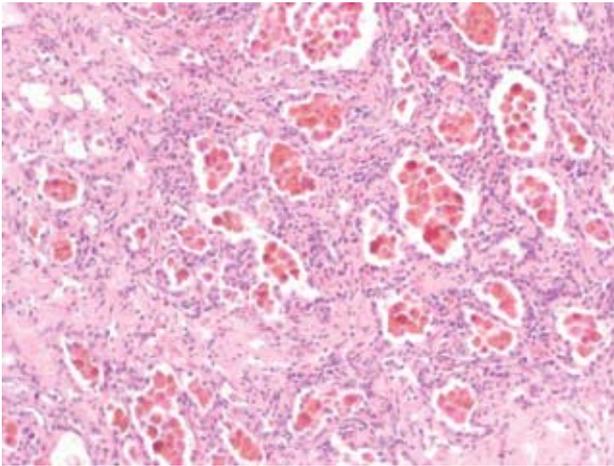


FIGURE 4. Histological section (x 100, H & E stain) showing desquamative interstitial pneumonia (DIP)-like reaction with massive intra-alveolar accumulation of heavily pigmented macrophages ("smoker's macrophages") and associated interstitial scarring.

below and were much more extensive than in the case reported here. The duration of marijuana smoking was considerably longer although not necessarily heavier than in the present case, and one had suffered a spontaneous pneumothorax. Of note was the finding that the amount of tobacco smoked was much less than would normally cause bullous lung disease. The authors concluded that "Bong lung should be considered as one of the many causes of spontaneous pneumothorax especially in young males. When a smoking history is taken, this should specifically include the smoking of marijuana".

The following histological features are strongly supportive of a diagnosis of use of cannabis (and other illicit drugs including "crack" cocaine): a DIP-like pattern in histological sections of apical lung specimens from resection for pneumothorax, characterized by massive accumulation of heavily pigmented macrophages (in excess of that seen with even heavy tobacco smokers), combined with the presence of pulmonary apical cystic disease.² What distinguishes DIP from "bong lung" is the combination of prominent interstitial scarring and bullous

disease in the latter. In addition, in patients with "bong lung", there is no radiological evidence of interstitial lung disease. The other disease to be considered in the histological differential diagnosis is respiratory bronchiolitis-interstitial lung disease (RB-ILD). In contrast to this disease, "bong lung" macrophages contain a coarse brown pigment and are not exclusively centred on the respiratory bronchioles.

Marijuana smoking is associated with deeper inhalation and longer holding of the breath than occurs with tobacco smoking and which may be sufficient to cause barotrauma.¹ This patient is the youngest reported in the literature and the case highlights, yet again, the fact that marijuana smoking is not an innocuous habit.^{3,4} The potential for cannabis to cause such severe lung damage in a relatively short time in young smokers should be emphasized in public health initiatives aimed at reducing the acceptance of cannabis smoking by the public, particularly the young.

ACKNOWLEDGEMENTS

I wish to thank Dr Debbie Norris, Histopathologist, Queensland Medical Laboratories for her advice on the histological features of this condition and for the photomicrographs, and Dr Peter M. Wragg, Thoracic and Vascular Surgeon, Wesley Medical Centre for his comments on the surgical findings and for the photographs taken at thoracoscopy.

REFERENCES

1. Johnson MK, Smith RP, Morrison D, Laszlo G, White RJ. Large bullae in marijuana smokers. *Thorax* 2000; 55: 340-342.
2. Gill A. Bong Lung: Regular smokers of cannabis show relatively distinctive histologic changes that predispose to pneumothorax. *Am J Surg Pathol* 2005; 29(7): 980-982.
3. Urban T. Manifestations Respiratoires liées à l' inhalation de fumée de cannabis. *Rev Mal Respir* 2008; 25:1338-40.
4. Taylor DR, Hall W. Respiratory health effects of cannabis: Position statement of The Thoracic Society of Australia and New Zealand. *Int Med J* 2003; 33: 310-313.