A Case of Empyema Complicating Cannabis-Induced Bullous Lung Disease
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BACKGROUND
- Cannabis is the most frequently used illegal drug in the United Kingdom and globally.
- The health risks associated with cannabis smoking are frequently under- appreciated.

HISTORY
- 54 year-old British Jamaican male
- Presenting Complaint: 3-week history of:
  - Left-sided pleuritic chest pain
  - Shortness of breath
- History of Presenting Complaint:
  - Cough, fever & orthopnoea
  - Recent flight back from holiday in Jamaica
  - No associated calf swelling or peripheral oedema
- Had commenced oral steroids and antibiotics one week prior to presentation

Past Medical History:
- COPD/Bullous emphysema - complicated by two episodes of spontaneous right-sided pneumothorax, culminating in surgical bullectomy in 2010

Drug History:
- Oral steroids and antibiotics (completing one-week course)
- Tiotiapamide and Formoterol inhalers
- Lansoprazole

Social history:
- Factory machinery worker
- Has smoked cannabis extensively from teenage years to the present

EXAMINATION
- A – Patent airway
- B – Tachypnoeic (30 breaths per minute), using accessory muscles, O₂ sats on air 80%
- Chest examination:
  - Decreased air entry throughout the left lung field
  - Dullness to percussion and decreased vocal resonance over left mid-zone & left base.
- C – Warm and sweaty to touch
- Rate heart rate 110/min.
- Blood pressure 120/80 mmHg
- ECG showed sinus tachycardia
- D – GCS 15/15, alert and appropriate
- E – Temperature 38°C

ADMISSION INVESTIGATIONS
- Blood tests (Figure 1A) were consistent with an acute inflammatory process associated with type 1 respiratory failure
- The initial chest radiograph and subsequent CT were suggestive of bullous emphysema complicated by superadded infection +/- empyema (Figure 1B & 1C)

MANAGEMENT (1)
- High flow O₂ therapy, intravenous fluids, antibiotics and analgesia were commenced
- Fluid locules were identified on the left chest, both within the intra-pleural space, and within bullae on CT thorax (Figure 1C)
- Day 2: Ultrasound-guided drainage of the intra-pleural effusion was performed (Figure 2A)
- Analysis of the pleural fluid drained failed to confirm a empyema (Figure 2B)
- Day 3: With ongoing clinical sepsis, but negative blood and pleural fluid cultures, empirical antibiotic therapy was revised (from iv Benzylpenicillin & po Doxycycline to iv Tazocin, iv Gentamicin and po Chloramphenicol)
- Day 7: Despite pleural drainage and antibiotic revision, patient remained clinically septic

MANAGEMENT (2)
- Drainage of the intra-bullous fluid locules necessitated bullectomy
- Day 8: Rigid bronchoscopy and left-sided video-assisted thoracoscopic surgery was performed by the cardiothoracic surgical team; the procedure was converted to open thoracotomy for excision of multiple infected giant bullae, empyema drainage and decortication
- The post-surgical chest radiograph (Figure 3A) shows return of the mediastinum centrally
- Histopathological examination confirmed localised empyema within a bulla (Figure 3B)
- Pleural and blood cultures remained negative
- The patient’s subsequent clinical improvement on continued antibiotic therapy is reflected by an improvement in inflammatory markers: WCC (Figure 3C) and CRP (Figure 3D)
- Day 22: Patient was discharged home, with a regular outpatient follow-up plan
- Serum alpha-1-antitrypsin levels were shown to be in the normal range

DISCUSSION
- Empyema may be challenging to diagnose in the presence of bullous lung disease
- A higher incidence of respiratory complications is noted amongst cannabis users, including spontaneous pneumothorax, bullous emphysema lung disease and respiratory infection
- This observation is partly attributable to differences in smoking methods compared with cigarette smoking (larger inhalations, longer breath-holding, no filters), as well as a higher carcinogen content, and tetrahydrocannabinol-mediated immune suppression
- Whilst high profile media campaigns press for cannabis legalization, often trivializing its side-effects, this case highlights some of the complications associated with long-term cannabis use

Figure 1

Figure 2

Figure 3

Figure 4

References