Learning points for clinicians

Lung abscess and ipsilateral pleural empyema can rarely coexist in the same patient.

The causative organism, *Streptococcus intermedius*, produces unique virulence factors associated with deep-seated infections and crossing tissue planes in the lung suggesting the abscess as the primary event.

Prior laryngeal surgery and radiotherapy increased the patient’s susceptibility to retention and aspiration, initiating the vicious cycle.

A 57-year-old man was admitted with a 6-week history of anorexia, weight loss and night sweats, associated with cough productive of abundant purulent sputum, and more recently, left chest pain.

He had been a heavy smoker with COPD, locally advanced laryngeal cancer leaving him after surgical and radiation treatment with permanent tracheostomy but no evidence of recurrence, peripheral artery disease and diabetes.

He was cachectic, with poor dental hygiene, afebrile but hypoxemic and tachycardic with dullness to percussion over the left hemithorax, demonstrating 'white lung' on X-ray.

Haemoglobin was 10.3, white blood cell count was 11.3 x 10^9/L, erythrocyte sedimentation rate (ESR) was 116 mm/hr, C-reactive protein (CRP) was 353 mg/L (N<6), ferritin was >2000 ng/ml (N<274), sodium was 127 mEq/L, albumin was 2.8 and globulins was 4.7 g/dL. CT revealed an atelectatic left lung with lingular abscess and surrounding empyema (Figure 1A).

Blood and urine cultures were sterile. A chest tube was inserted, and 1800 ml of purulent fluid was removed (pH 7.09). All pleural fluid cultures grew *Streptococcus intermedius*. Intravenous (IV) ceftriaxone and clindamycin were administered, together with intrapleural t-PA-DNase. Drainage gradually ceased, and the tube was removed. IV antibiotics were continued for 6 weeks at home. Last seen 4 months after discharge, he gained his former weight, laboratory tests were normal (ESR, 12 mm/hr; CRP, 18 mg/L and albumin 4.5 g/dL) and contrast-enhanced chest CT was clear except for fibrotic tissue at the site of the former abscess in the lingual (Figure 1B).

Our patient presented with prolonged systemic symptoms, anaemia of chronic disease, hyperglobulinemia, acute-phase markers and syndrome of inappropriate antidiuretic hormone secondary to an extensive thoracic infection. The infection had two focuses: pleural empyema caused by *S. intermedius* and a 4-cm round lesion with hyperdense thick rim in the collapsed lung parenchyma containing air and consistent with lung abscess. This is an unusual occurrence.

Empyema of the pleura typically develops as a complication of pneumonia. However, it can also develop by extension of an adjacent abscess—subdiaphragmatic, paravertebral or located in the lung, as seen in our patient. His laryngeal surgery, and radiotherapy in particular, increased susceptibility to retention and aspiration. Of 387 patients who had pleural empyema or lung abscess, only 15 had both (3.8%), and viridans streptococci were a prominent pathogen (1:3), in particular *S. anginosus* (*S. milleri*) group (3). These facultative anaerobic cocci are indigenous to the oropharynx, and if aspirated, tend to cause varied dire thoracic suppurative infections, especially in immunocompromised patients. Interestingly, *S. intermedius* isolated in our patient, produces unique virulence factors such as intermedilysin and hyaluronidase, which have been associated with an ability of these infections to induce deep-seated infections and cross tissue planes in the lung.

Thus, identification of a suppurative thoracic infection extending radiographically across tissue planes as seen in our
patient (abscess and empyema) warrants early consideration of
S. anginosus infection and prompt action in both microbiological
diagnosis and appropriate treatment that often requires not
only antibiotics but also surgical drainage.

Conflict of interest: None declared.

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