Reminder of important clinical lesson

Thoraco-pulmonary and hepatic actinomycosis: an autopsy report

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Actinomycosis is now a rare disease and death unheard of. Diagnosis is made challenging by its varied presentations and ability to be a 'great pretender'. This report describes a rare autopsy case of thoraco-pulmonary and hepatic actinomycosis with the preceding clinical presentation.

BACKGROUND

With the advent of penicillin actinomycosis is now a rare disease with mortality confined to history. It is an often forgotten disease, whose diagnosis is difficult and frequently eludes clinicians. We report a fatal case of thoraco-pulmonary and hepatic actinomycosis leading to peritonitis in which the diagnosis was made after autopsy and histological evaluation. This case firstly aims to highlight the importance of early accurate diagnosis in what has been called 'the most misdiagnosed disease' to prevent the considerable morbidity associated with a delayed or missed diagnosis. The case also serves to highlight the importance of the autopsy in conjunction with clinical medicine as an important learning opportunity.

CASE PRESENTATION

A male in his 50s was admitted to hospital with a 5 week history of left sided chest wall and abdominal pain, breathlessness, a productive cough and weight loss. On clinical examination, a fluctuant mass on the left chest wall, enlarged liver and cachexia were noted. Blood tests showed a non-specific inflammatory picture with a severe anaemia. A chest x-ray showed a left sided mass and marked pleural thickening. The initial impression was of lung malignancy.

The condition of the patient rapidly deteriorated and within one day of admission he died before further investigation could be carried out. An autopsy was performed at the request of the Coroner due to a history of industrial exposure to asbestos. Grossly, the left lung was adherent to the left dome of the diaphragm and lateral chest wall and there was pleural thickening. The left lower lobe showed multiple abscesses with surrounding fibrosis involving the diaphragm and lateral chest wall. The left and right lungs, respectively weighed 834 and 955 g. The liver was enlarged (2747 g) with multiple coalescing abscesses in the left lobe which communicated with the left lower lobe of the lung through the diaphragm. The liver parenchyma showed brown/black discolouration. The right lobe of the liver appeared normal. Pus was present in the peritoneal cavity and in the lesser sac.

Consent was received to take postmortem histology, which showed the left lower lobe of the lung to be riddled with multiple abscesses centred around *Actinomyces* colonies with surrounding fibrosis. Some of the *Actinomyces* colonies were present within small bronchial branches and were associated with neutrophil polymorphs (figure 1A). The rest of the left lung and right lung showed congestion, pulmonary oedema and emphysematous changes. Histology of the left lobe of the liver showed similar multiple abscesses centred around *Actinomyces* colonies. The liver parenchyma was replaced by fibrosis and granulomatous inflammation.

DISCUSSION

Actinomycetaceae (which include the genera *Actinomyces*, *Rhodococcus* and *Nocardia*) and Mycobacteriaceae are both families of the order Actinomycetales. Entrenched nosological nomenclature such as actinomycosis often leads to the mistaken belief that it is a mycosis. *Actinomyces israelii*, an anaerobic gram positive bacterium, is by far the most common cause of actinomycosis in humans; others exist but are much rarer.¹ Microscopically, colonies are basophilic in H&E sections and composed of closely packed, radiating, filaments 0.5 to 1.0 µ wide. Special staining with the Gram stain or Grocott method helps to confirm the organism (figure 1B).

Actinomyces israelii is a common commensal organism of the oral cavity, colon and urogenital tract explaining the predominance of infection in these areas. Prevalence of cervicofacial infection is reported as 50–60%, abdominopelvic infection 20% and pulmonary 15%.² Pathological infection is postulated to follow mucosal breakdown, with immunosuppression a frequent cofactor. Pulmonary actinomycosis is most likely the result of aspiration of material laden with the organism.

The disease symptoms are quite non-specific and include; fever, cough, sputum, chest pain, abdominal pain and weight loss. The physical signs are equally non-specific. Cutaneous fistulas discharging 'sulphur granules' are seldom encountered today. Contrary to common belief, 'sulphur granules', which are yellow

Figure 1 (A) A colony of *Actinomyces* with radiating filaments surrounded by neutrophil polymorphs (stain, H&E); original magnification, x50). (B) Gram positive filamentous *Actinomyces* (stain, Gram; original magnification, x100).

colonial granules of the organism, are infrequently found in the sputum.

Blood tests show a non-specific inflammatory picture. From a lung imaging perspective, the main challenge remains in differentiating the disease from malignancy and other chronic suppurative lung infections. The common finding on abdominal ultrasound or CT imaging is of a mass, again often mistaken for neoplasia.³ Coexistence with malignancy further hampers diagnosis. Definitive diagnosis remains based on histology and microbiology, and as the organism is strictly anaerobic, microbiological advice should be sought before taking samples.

This case firstly aims to highlight the importance of early accurate diagnosis in what has been called ‘the most misdiagnosed disease’ to prevent the considerable morbidity associated with a delayed or missed diagnosis.⁴ Once diagnosed, the disease is highly treatable with antibiotic regimes which have traditionally included penicillin, although specific choice depends on local microbiological guidance.⁵ Secondly, the case serves to highlight the importance of the autopsy in conjunction with clinical medicine as a learning opportunity. If it was not for the history of industrial dust exposure, an autopsy would most likely never have been requested and the cause of death missed.

Learning points

- ▶ *Actinomyces israelii* is a common commensal organism of the oral cavity, colon and urogenital tract.
- ▶ Early accurate diagnosis of actinomycosis is important to prevent the considerable morbidity associated with a delayed or missed diagnosis.
- ▶ Diagnosis of actinomycosis is made challenging by its ability to be a 'great pretender', mimicking malignancy and other chronic infections.

Competing interests None.

Patient consent Not obtained.

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Please cite this article as follows (you will need to access the article online to obtain the date of publication).

Powell G, Mangalika M. Thoraco-pulmonary and hepatic actinomycosis: an autopsy report. *BMJ Case Reports* 2011;**10**:1136/bcr.09.2011.4831, date of publication

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