

Is it a lung cancer or pulmonary TB? A histopathological diagnosis of pulmonary actinomycosis

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Introduction

- Actinomycosis is caused by bacteria belonging to the family *Actinomyceataceae*. They are Gram positive, fastidious bacteria which are mostly anaerobic
- Six species are thought to be pathogenic in humans, *A. israelii* being most commonly isolated
- Pulmonary actinomycosis is rare, accounting for 15% of actinomycosis cases
- Aspiration of oral *Actinomyces* is believed to be the route of infection
- Usually treated with 6-12 months of antibiotics eg penicillin
- Clinical and radiological features are similar to other chronic suppurative lung diseases such as TB and bronchial carcinoma; it is important to make the diagnosis in order to avoid unnecessary treatments including surgical procedures

Case History- Background

- 48 year old Bangladeshi gentleman
- Ex -smoker of 7 packs per year having stopped 7 years ago
- PMH: hypercholesterolaemia and gastro-oesophageal reflux for which he takes Atorvastatin and Ranitidine
- No known tuberculosis (TB) contacts or previous history of TB
- Moved to the UK in 2009, last travel to Bangladesh in 2017
- He lives with his wife and three children who are all well

Case History- Presentation

- Presented in November 2017 with 9 month history of persistent cough and haemoptysis, shortness of breath on minimal exertion and lethargy. There was no history of weight loss.
- Examination & bloodwork was unremarkable with normal inflammatory markers
- Blood borne virus screen was negative

Investigations and management

- Chest X-ray (CXR) showed a large hilar mass which was suspicious for pulmonary TB
- CT thorax found a large area of right upper lobe (RUL) consolidation with necrosis, and right hilar and mediastinal lymphadenopathy (subcarinal and right paratracheal). A calcified granuloma was seen in the right lower lobe.

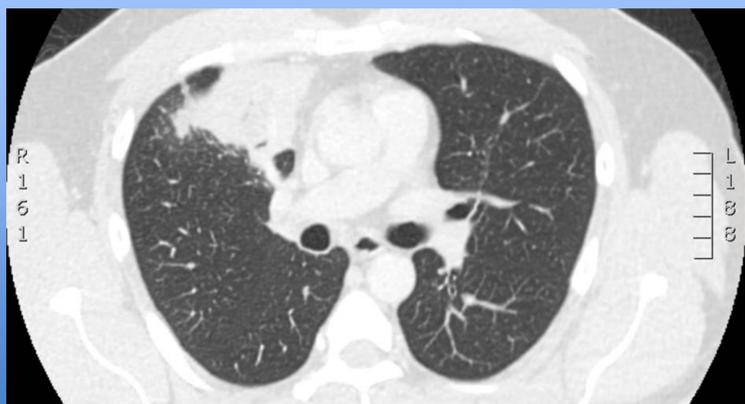


Image 1: CT thorax with contrast showing mixed density mass in the right upper lobe with mediastinal lymphadenopathy

- Sputum samples cultured respiratory flora only
- Three sputa were both Auramine smear negative and culture negative for mycobacteria
- Bronchoscopy: No malignant cells were seen in endobronchial washings, mycobacterial smear and culture negative, bacterial culture grew *Streptococcus anginosus*
- Repeat CT thorax after 10 weeks showed stable appearances

References

- G.F. Mabeza, J. Macfarlane *Pulmonary actinomycosis* European Respiratory Journal 2003 21: 545-551
D Farrokh, F Rezaitalab, B Bakshoudeh *Pulmonary Actinomycosis with Endobronchial Involvement: A Case Report and Literature Review* [Tanaffos](#). 2014; 13(1): 52-56.

- PET scan revealed the right upper lobe lesion to be hypermetabolic with a standardised uptake value (SUVmax) of 11.9 and subcarinal and paratracheal lymph nodes reaching an SUVmax of 4.5. This was reported to favour a primary lung malignancy and provisional staging was T2bN2M0.

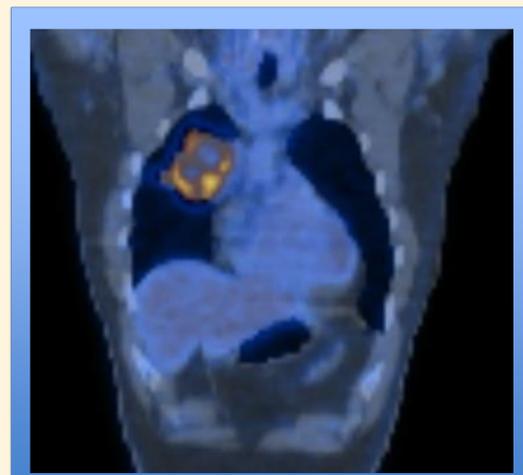


Image 2: PET thorax showing right upper lobe lesion with central necrosis with high FDG uptake

- Histological staining of tissue collected via Endobronchial Ultrasound (EBUS) showed only inflammatory nodules with no evidence of granuloma or malignancy and Auramine stain was negative.
- CT-guided lung biopsy tissue showed non-specific inflammation and fibrosis. Gram stain and Grocott staining by the histopathology department revealed Gram positive filamentous bacterial colonies. 16S PCR was negative on paraffin section.
- He was referred to the infectious disease (ID) clinic where a trial of PO amoxicillin 1gm TDS was commenced in March 2018.

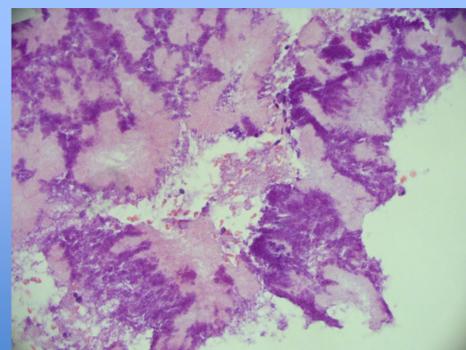


Image 3: H&E stain of tissue showing a clump of actinomyces colonies (x400 magnification).

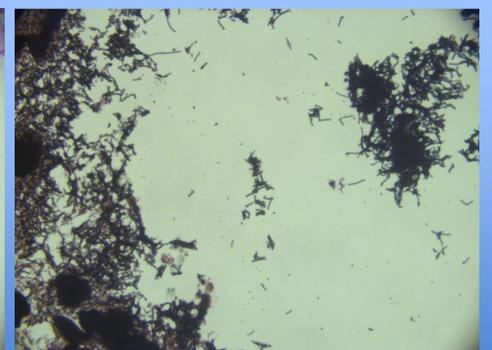


Image 4: Grocott stain of tissue highlighting the classical filamentous nature of the actinomyces organisms (x630 magnification).

Results

- The differential diagnosis in this case was between pulmonary Nocardiosis and pulmonary actinomycosis
- Administration of amoxicillin led to rapid resolution of the haemoptysis
- Good response to amoxicillin, both clinically and radiologically, supports a diagnosis of pulmonary Actinomycosis
- He remains under ID follow-up with planned treatment duration of 12 months. Serial CXR shows the RUL lesion to be slowly reducing in size to 5cm diameter.

Discussion

- This case highlights that this diagnosis is a clinical challenge as it is similar in radiological appearance to other benign and malignant intrapulmonary diseases. It is important to remember that not every pulmonary mass with mediastinal lymphadenopathy is malignancy or TB and to consider more unusual diagnoses.
- Microbiological diagnosis of pulmonary actinomycosis can be difficult - the diagnosis is often made on histological features, as is the case here. If the condition is suspected, bronchial samples should be procured anaerobically with a protected specimen brush. Specimens may be falsely negative if exposed to air for more than 20 minutes. Unfixed tissue samples can also be sent for 16-S PCR.