

Actinomycosis presenting as carcinoma

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Summary

Actinomycosis is rare compared to carcinoma, but the two conditions can present with very similar clinical pictures. Two cases of actinomycosis are reported, one thoracic and one pelvic-abdominal which presented as carcinoma and proceeded to surgery without a histological diagnosis having been established.

Keywords: actinomycosis, carcinoma

The bacterial genus *Actinomyces* is a Gram-positive branching organism found mainly in soil. The species *Actinomyces israelii* is a commensal of the human oropharynx and gastrointestinal tract and is potentially pathogenic, giving rise to the disease actinomycosis in which the organisms stimulate a chronic granulomatous reaction leading to abscess and sinus formation with pus containing diagnostic yellow 'sulphur granules' visible to the naked eye.¹

Thoracic actinomycosis often presents with features that mimic tuberculosis or carcinoma while abdominal infection frequently presents as a right iliac fossa mass (due to ileo-caecal involvement) often taken on clinical grounds to be malignant.^{2,3}

Case reports

Case 1

A 41-year-old woman was referred to the respiratory clinic with a four-week history of wheeze, moderate exertional dyspnoea and cough productive of pink frothy sputum. She was a nonsmoker and had no history of atopy.

The only abnormalities noted at presentation were scattered rhonchi and a chest X-ray which showed right hilar prominence and shadowing in the right cardiophrenic angle consistent with consolidation in the base of the right lower lobe. Laboratory investigations revealed an erythrocyte sedimentation rate (ESR) of 48 mm in the first hour and normal white cell and eosinophil counts. *Aspergillus precipitans* were not present and sputum was negative for alcohol- and acid-fast bacilli and malignant cells. Flexible bronchoscopy revealed oedematous mucosa in the right lower lobe, but no endobronchial lesion was identified. Biopsy showed evidence of both acute and chronic inflammation and bronchial washings demonstrated no malignant cells. Lung function tests were normal. A computed tomography (CT)-scan of the thorax demonstrated collapse/

consolidation of the posterior and medial basal segments of the right lower lobe with associated pleural reaction. At this point a fine-needle biopsy was considered but the patient declined this procedure. The patient was therefore referred for a surgical opinion. Rigid bronchoscopy was normal and therefore thoracotomy was performed. This showed a bulky tumour arising from the right lower lobe below the right hilum. There was extensive mediastinal node involvement with infiltration into the posterior chest wall and soft tissues overlying the spine, diaphragm and pericardium. A right pneumonectomy and node clearance was performed as palliation for presumed bronchial carcinoma. Histology of the resected lung showed end-stage fibrotic lung with actinomycosis colonisation but no evidence of malignancy. The patient made an uncomplicated recovery and has had no further problems. She was treated with intravenous antibiotics in the postoperative period (benzylpenicillin 1.2 g four times daily for two weeks).

Case 2

A 43-year-old woman was admitted as an emergency complaining of vaginal discharge, menorrhagia, passage of air per vaginum, pneumaturia, dysuria, abdominal distension and colicky abdominal pain. Her bowel habit had become irregular with alternating constipation and diarrhoea and there was a history of anorexia associated with weight loss of more than 12 kg. She was noted to have an intrauterine contraceptive device (IUD) which had been in place for over two years.

On admission she had a swinging pyrexia, and examination revealed left iliac fossa tenderness, generalised abdominal distension and a fixed pelvis with cervical excitation. Laboratory investigations demonstrated an ESR of 168 mm in the first hour, haemoglobin of 6.4 g/dl (normochromic/normocytic film)

Features of infection

- actinomycosis is usually caused by *Actinomyces israelii*
- actinomycosis is characterised by granuloma and abscess formation
- clinical features of thoracic actinomycosis include chest pain, sputum and pleural/bony abnormalities on chest X-ray
- actinomycosis generally responds well to penicillin

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and a white cell count of $12.9 \times 10^9/l$. Biochemistry was normal.

The IUD was removed and dilatation and curettage performed. However, the patient's clinical state deteriorated and further investigations were carried out. Abdominal and pelvic ultrasound showed a fluid collection in the left iliac fossa and a barium enema revealed irregularity of the distal sigmoid colon with evidence of leakage. The patient proceeded to laparotomy which revealed widespread tumour on all free peritoneal surfaces with several nodules in the liver giving the appearance of multiple metastatic deposits. In addition a complex mass involving the sigmoid colon, left ovary, uterus and bladder was noted. At this point the working diagnosis was that of widespread metastatic tumour of probable ovarian origin. Before performing a diverting loop transverse colostomy and closing the abdomen, a hepatic nodule was excised for frozen section and fixed histopathology to facilitate formal tissue diagnosis. These biopsy specimens showed the characteristic sulphur granules of actinomycosis with no evidence of malignancy. Cultures subsequently obtained from the IUD grew *Actinomyces israelii*. The patient was treated with intravenous benzylpenicillin (1.2 g four times daily for two weeks) followed by phenoxymethylpenicillin (0.5 g orally four times daily for four weeks) and made an uncomplicated recovery. The diverting colostomy was eventually closed and the patient has had no further complaints.

Discussion

The classical clinical picture of thoracic actinomycosis reported by Bates and Cruickshank⁴ is that of chest pain, cough, sputum, associated skin changes and underlying pleural and bony abnormalities on chest X-ray. However, later reports⁵ have suggested that these features are not as common as first thought.

Learning points

- presentation of actinomycosis and carcinoma may be similar
- pelvic actinomycosis is associated with IUD use
- thoracic actinomycosis is rare compared to bronchial carcinoma
- histological confirmation of carcinoma (by open biopsy if necessary) should always be carried out prior to surgical resection
- although very rare, actinomycosis should be included in the differential diagnosis of carcinoma

Our case of thoracic disease did not display any of these features apart from the less specific ones of cough and sputum production. The patient was, however, a young lifelong non-smoker, making the diagnosis of bronchial carcinoma less likely, and it could be argued that these facts alone should have led to consideration of rarities such as actinomycosis in the differential diagnosis.

In case 2, the presence of an IUD which had been in place for more than two years was a definite clue. Infection with actinomycosis is a recognised consequence of IUD use⁶ and disseminated disease is an established association.⁷ Although the aetiology of actinomycosis in IUD users is not clear, the most popular hypothesis is that inflammation and breakdown of the endometrium allows asymptomatic colonisation to progress to symptomatic infection⁶ so that IUDs present *in situ* for long periods will increase the likelihood of problems.

Although actinomycosis is rare compared to carcinoma (estimates vary between five and 10 thoracic cases in the UK per annum), awareness of the possibility is the initial key to successful management.

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