

CASE FOR DIAGNOSIS

A man with upper respiratory tract infections, general weakness and fever

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Case report

A 56-yr-old man was referred by his general practitioner with complaints of recurrent upper respiratory tract infections, 17 days of fever, general weakness, and a stinging pain in his right axilla with radiation to his right shoulder and chest that was provoked by movement of his arm. The complaints had begun after an infection around his left eye. The patient had undergone a right-sided pneumonectomy with postsurgical radiotherapy for T₁N₂ squamous cell carcinoma 16 yrs earlier and had suffered a myocardial infarction 12 yrs earlier. He had been taking ranitidine 150 mg *b.i.d.* and digoxin 0.25 mg daily. He smoked 10 cigarettes a day and had recently been diagnosed as suffering from chronic obstructive pulmonary disease (COPD) for which he took inhaled salbutamol as required.

On examination, the abnormal findings were an elevated temperature of 38.6°C, a low blood pressure of 100/70 mmHg and a rapid pulse of 112 beats·min⁻¹. There was a dull percussion over his right chest with absent breath sounds, and resonant percussion over his left lung with expiratory wheezing. Initial investigations showed an erythrocyte sedimentation rate (ESR) of 110 mm·h⁻¹, white blood cell count 13.3×10^9 cells·L⁻¹ with a left shift on cytometry, haemoglobin (Hb) 8.8 mmol·L⁻¹, thrombocytes

591×10^9 cells·L⁻¹, sodium 136 mmol·L⁻¹, potassium 4.0 mmol·L⁻¹, urea 6.2 mmol·L⁻¹, creatinine 74 μmol·L⁻¹, aspartate aminotransferase (ASAT) 24 U·L⁻¹, alanine aminotransferase (ALAT) 47 U·L⁻¹, γ-glutamyl transpeptidase (γGt) 74 U·L⁻¹, and glucose 6.6 mmol·L⁻¹. The resting electrocardiogram showed signs of an old inferolateral myocardial infarction.

A chest radiograph was taken (fig. 1). The patient was diagnosed as having bacterial bronchitis and sent home with antibiotic treatment. Eleven days later he was still ill. On examination there were no additional abnormal findings so he was sent home again with altered antibiotic treatment. Fourteen days later he was still suffering from fever and complained of a painful swelling between his old pneumonectomy scar and his right nipple.

Because of the persistent complaints, with fever accompanied with a very high ESR, pain in the axilla and general weakness in a patient who had a history of bronchogenic carcinoma, he was admitted to hospital.

A computed tomography (CT) scan was performed to exclude the recurrence of bronchogenic carcinoma in the mediastinum and left lung, and showed a relatively large postpneumonectomy space. Additionally, a magnetic resonance imaging (MRI) scan (fig. 2) was made. A percutaneous biopsy of the swelling between the patient's old pneumonectomy scar and his right nipple was taken and sent to the pathology department to exclude bronchogenic carcinoma, and biopsy material was sent for culture.



Fig. 1. – Posteroanterior chest radiograph taken at initial presentation.

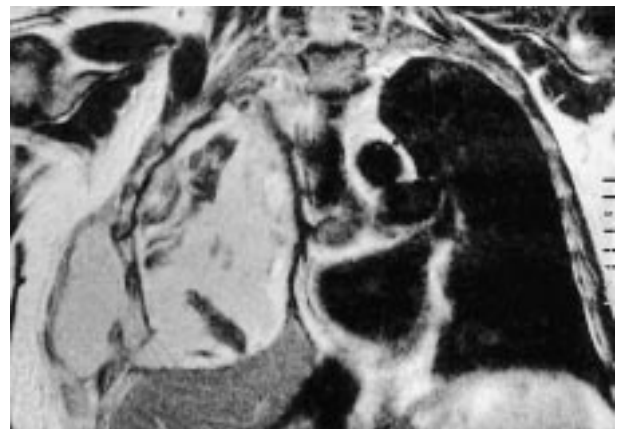


Fig. 2. – Coronal magnetic resonance image of the chest.

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BEFORE TURNING THE PAGE, INTERPRET FIGURES 1 AND 2, AND SUGGEST DIAGNOSIS AND TREATMENT.

Interpretation of the chest radiograph, MRI scan, pathology investigation and laboratory tests

The chest radiograph (fig. 1) was compatible with right pneumonectomy and showed no difference in comparison with 16 yrs earlier. On the MRI scan (fig. 2) a large extra-costal, axillar and sharply circumscribed oval accumulation of fluid can be seen that seems to be continuous with the fluid accumulation in the postpneumonectomy space.

The pathology investigation of the biopsy material showed no recurrence of bronchogenic carcinoma. A culture of the fluid yielded *Streptococcus pneumoniae*.

Diagnosis: "late-onset postpneumonectomy empyema necessitatis" caused by a *Streptococcus pneumoniae* 16 yrs after a right pneumonectomy.

Treatment and clinical course

A surgical intervention was performed. During the operation the right pleural space was debrided of necrotic tissue, three chest tubes were inserted and the cavity was irrigated with saline and antibiotics. During the postoperative period the patient recovered well.

Discussion

Most empyemas that occur after a pneumonectomy are of early onset (2–4% of pneumonectomies) [1, 2]. However, some empyemas occur several months or even several years after a pneumonectomy. The incidence of late onset (>3 months) postpneumonectomy empyemas seems to be quite low, and over the last 25 yrs, only about 20 reported cases of late-onset postpneumonectomy empyema were identified [1].

In general, diagnosing late-onset postpneumonectomy empyema is difficult because the symptoms such as anorexia, temperature elevation, weight loss, chest discomfort, and pain are nonspecific, and in a patient with a history of bronchogenic carcinoma these symptoms may be suggestive of a recurrence of the carcinoma. In the literature, as in the present case, a delay in diagnosis of several months seems to be the rule rather than the exception [3]. In most cases the diagnosis is established either because empyema necessitatis develops or because a bronchial or oesophageal fistula, revealing a new or altered air–fluid level on the chest radiograph, can be seen [3].

The cause of late-onset postpneumonectomy empyema in the majority of cases is probably the haematogenous spread of bacteria [1–5]. Following pneumonectomy, two-thirds of patients maintain a residual pocket of fluid with

thick fibrous margins [6]. This fluid is presumed to become the nidus for haematogenously seeded bacteria.

Late-onset postpneumonectomy empyema due to the haematogenous spread of bacteria from appendicitis [4], lower respiratory tract infection [3], dental procedures or complications of medial herniorrhaphy has been reported. In one case, an exposed silk suture allowed a bronchial infection into the pleural space [7]. In addition, there have been reports of late-onset postpneumonectomy empyema due to bronchial or oesophageal fistulae caused by progression of a tumour [3].

In the present patient, the diagnosis late-onset postpneumonectomy empyema was established 2 months after initial presentation, because an empyema necessitatis developed (fig. 2). The most probable cause was the haematogenous spread of *Streptococcus pneumoniae* either owing to bacterial bronchitis in the patient with COPD, or from the infection around his left eye.

Conclusion

Late-onset postpneumonectomy empyema is an infrequent cause of refractory illness in postpneumonectomy patients. The majority of the postpneumonectomy patients maintain an isolated pocket of fluid in the postpneumonectomy space. This fluid remains liable to infection, therefore a diagnostic aspiration of the residual fluid should be considered in postpneumonectomy patients with nonspecific complaints of anorexia, temperature elevation, weight loss, and chest discomfort or pain that do not respond to antibiotic treatment.

References

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