

Gastropleural fistula following pulmonary resection

Peter A O'Keefe, Peter Goldstraw

Abstract

A 77 year old man with an eight month history of polymyalgia rheumatica treated by steroids underwent left lower lobectomy for a non-small cell carcinoma. Following discharge he developed a pneumothorax, empyema, septicaemia, and acute renal failure. Reinvestigation and reoperation showed this to be caused by a non-malignant non-traumatic direct gastropleural fistula.

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Gastropleural fistula is uncommon, often occurring secondary to intra-abdominal or thoracic malignancy, and occasionally to trauma. We present a case which arose as a postoperative complication; extensive investigation initially failed to reveal the source of the pleural and systemic sepsis.

Case report

A 77 year old man was referred for surgical treatment of undifferentiated carcinoma of the left lower lobe. He was an ex-cigarette smoker and was taking prednisolone 5 mg daily for polymyalgia rheumatica.

Staging by computed tomography, radioisotope bone scanning, and abdominal ultrasonography showed no evidence of metastases. Enlarged precarinal lymph nodes examined by mediastinoscopy were histologically normal.

A left lower lobectomy was performed; because of unusual arterial anatomy a small branch to the lingula was sacrificed to allow resection. A lymph node removed from a site adjacent to the oesophagus showed no tumour invasion histologically. There were no adhesions between the lung and the diaphragm or the chest wall.

The patient was discharged home on the eighth postoperative day. Chest radiology was normal following pulmonary resection, with reduced lung volume on the left, no collapse, intrapleural air collection or effusion.

Two days later he was readmitted as an emergency complaining of dyspnoea and left sided pleuritic chest pain. Chest radiography revealed left hydropneumothorax which was treated with an intercostal chest drain. More than 1 litre of pus was drained which grew coliforms, yeast, and *Streptococcus faecalis* which were treated with antimicrobial therapy appropriate to their sensitivities. He contin-

ued to deteriorate, developing septicaemia and acute renal failure. A computed tomographic scan of the chest showed a loculated pneumothorax and pleural effusion; a Gastrografin swallow opacified the pleural fluid after the contrast medium had been aspirated into the left main bronchus. With a presumptive diagnosis of bronchopleural fistula he was returned to the operating theatre.

Bronchoscopy and oesophagoscopy showed nothing abnormal, and gastroscopy showed only fresh blood clot in the stomach. At rethoracotomy fresh blood clot was seen in the pleural space, and a small segment of the lingula was necrotic with an air leak. This was resected, and the patient was returned to the intensive care unit and ventilated for several days. Drainage of purulent, but sterile, fluid continued; otherwise recovery was satisfactory.

Upon discharge from the intensive care unit parenteral nutrition was replaced by oral food and fluid intake with nasogastric supplemental feeding. A fine bore feeding tube was passed and its position in the stomach was confirmed by air injection and plain radiography. Shortly after commencing feeding, the chest drain output increased and resembled the nasogastric feed. Feeding was discontinued and a chest radiograph revealed that the tip of the tube had migrated into the left pleural space. Contrast radiology showed the

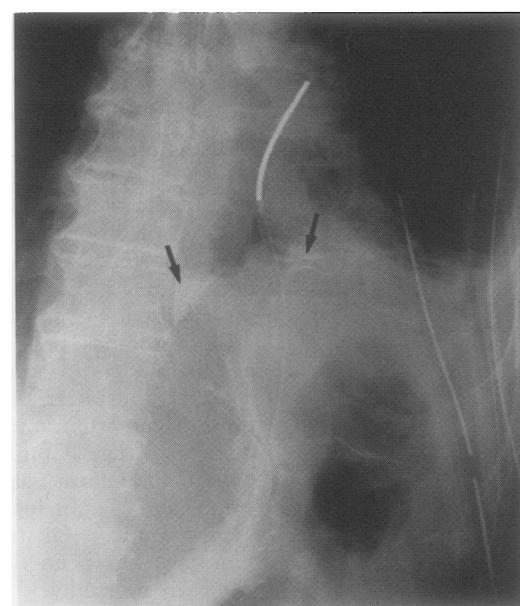


Figure 1 Tip of nasogastric tube in original position within the left pleural space, contrast medium having been injected down the tube opacifying the pleural fluid (arrows).

Royal Brompton
National Heart and
Lung Hospital, Sydney
Street, London
SW3 6NP
P A O'Keefe
P Goldstraw

Reprint requests to:
Mr P O'Keefe, Department
of Cardiothoracic Surgery,
Royal Postgraduate Medical
School, Hammersmith
Hospital, Du Cane Road,
London W12 0NN

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Figure 2 Swallowed contrast medium outlining the oesophagus, passing into the stomach, confirming the position of the nasogastric tube lying normally through the oesophagogastric junction. The tube was withdrawn as contrast medium was injected; intrapleural contrast medium can be seen.



tube to be lying within the oesophagus, passing through the oesophagogastric junction, and then directly through the fundus of the stomach to enter the chest (figs 1 and 2).

Upper gastrointestinal endoscopy revealed a 1 cm fundal gastric ulcer. At rethoracotomy bile-stained fibrinous debris was evacuated to reveal a rosette of gastric mucosa in the medial posterior quadrant of the central tendon of the diaphragm. The fistula was excised with a disc of surrounding diaphragm, the stomach repaired, omentum interposed between the stomach and diaphragm, and the diaphragm repaired.

After a short period of ventilation the patient left the intensive care unit and was discharged 16 days after fistula repair. Histological examination of the resected specimen showed gastric mucosa in continuity with granulation tissue lining the fistula, with widespread acute inflammation. There was no evidence of malignancy.

Discussion

This was a most unusual complication. The diagnosis was not immediately apparent, aspiration of contrast medium during initial radiology masking any other cause of pleural fluid opacification. The finding of blood clot in both the stomach and pleural space at first rethoracotomy in retrospect strongly suggested the eventual diagnosis, but the infarcted lung segment was also a potential cause of the clinical picture and was incorrectly assessed as the culprit.

The diagnosis was only suspected after migration of the nasogastric tube and matching of chest drainage to nasogastric infusion. Accurate demonstration of the fistula necessitated injection of contrast medium into the feeding tube whilst withdrawing it under screening.

The aetiology appears to be one of atypical gastric ulceration caused by a combination of oral steroids and intermittent non-steroidal anti-inflammatory drugs given for postoperative analgesia (ibuprofen 400 mg eight hourly). The combination of steroids and non-steroidal anti-inflammatory drugs featured in the only other reported case of pneumothorax and empyema complicating gastropleural fistula.¹ The formation of a fistula into the pleural space probably resulted in the initial clinical deterioration: the stability following the first reoperation, despite the persistence of the fistula, can be ascribed to efficient thoracic toilet and drainage, intravenous antibiotics and fluid replacement, and parenteral rather than enteral nutritional support.

The fistula was situated medially with the tip of the spleen immediately lateral to it, making it unlikely that trauma from chest drain insertion could have produced such a localised defect in that position. The diaphragm was not injured during any of the surgical procedures before diagnosis.

Hydropneumothorax is a radiological feature of ruptured oesophagus,² and pneumothorax has been associated with pneumoperitoneum after perforation of the stomach,³ duodenum,⁴ and colon⁵ when there were congenital diaphragmatic deficiencies, and following placement of nasogastric tubes.⁶ Direct communication between the perforated viscus and the pleural space is uncommon; pneumothorax and empyema complicating gastropleural fistula has only been described once in association with radiotherapy.

Pneumothorax has been reported as a result of pleural erosion in empyema⁷ and complicating subphrenic abscess when fluid may also be noted in the pleural space; a gastrobronchial fistula, in contrast, is much more likely to be caused by a subphrenic abscess.⁸ The presence of empyema and pneumothorax together should be considered an indicator of possible visceropleural leakage as well as bronchopleural fistula. Good quality contrast radiology and meticulous endoscopic examination are important for accurate diagnosis.

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