

Tuberculous bronchoesophageal fistula managed conservatively with a percutaneous gastrostomy for feeding and administration of medication

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ABSTRACT Bronchoesophageal fistulae are a rare complication of tuberculosis. Traditionally they are managed by either thoracotomy with resection and closure of the fistulous tract or by taking a more conservative approach of giving standard treatment for tuberculosis while ensuring nutritional support through a nasogastric tube. We report a young student with disseminated tuberculosis complicated by a bronchoesophageal fistula. He was managed conservatively with anti-tuberculous chemotherapy and nutrition administered through a percutaneous endoscopic gastrostomy tube. This approach was associated with a relatively good quality of life and he was able to pursue his studies uninterrupted at the local university.

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INTRODUCTION

Acquired bronchoesophageal fistula is an uncommon presentation defined as an abnormal communication between the oesophagus and a bronchus. Malignancy and trauma (especially related to endoscopic procedures) are the most common aetiologies, though infections such as tuberculosis have also been reported.¹ For patients with tuberculous bronchoesophageal fistulae, the usual management is by corrective surgery and there are very few cases where the conservative approach has been employed with a successful outcome. We report a case of tuberculous bronchoesophageal fistula which was successfully treated with medical management without any early complications or long term sequelae.

CASE REPORT

A 26-year-old male Bangladeshi student presented with a 6-week history of weight loss, fever, night sweats and dry cough. The cough was not initiated or aggravated by intake of food or fluids. He had been in the UK for less than ten months and there was no known history of tuberculosis contact. Clinical examination revealed a cachectic young man with few scattered bilateral chest crackles. There were no palpable lymph nodes and abdominal examination was normal. His chest radiograph revealed a bulky right hilum and diffuse miliary opacities in both lungs (Figure 1). His routine blood tests showed mild anaemia, borderline hyponatraemia and abnormal liver function tests (mildly elevated alanine aminotransferase and alkaline phosphatase levels).

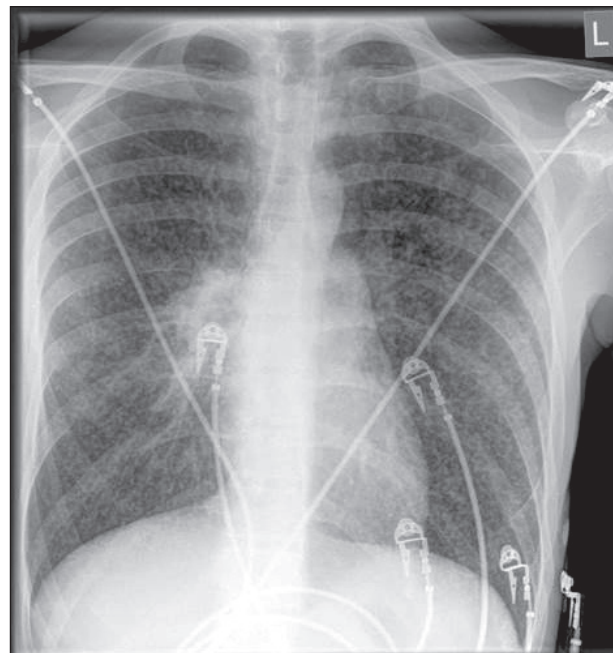


FIGURE 1 Anteroposterior chest radiograph showing diffuse miliary opacities throughout lungs and an enlarged right hilum, with overlying electrocardiograph leads

Computed tomography of his chest, abdomen and pelvis showed widespread miliary pulmonary nodules and partial right lower lobe collapse and consolidation. There was a 20 × 14 mm cavity in the right lower lobe with an air-fluid level suggesting an abscess, and tracking of gas to the subcarinal region (Figure 2). Below the diaphragm, there was a speckled high attenuation mass consisting primarily of mesentery. It extended from the tail of pancreas to the upper limit of the pelvis and

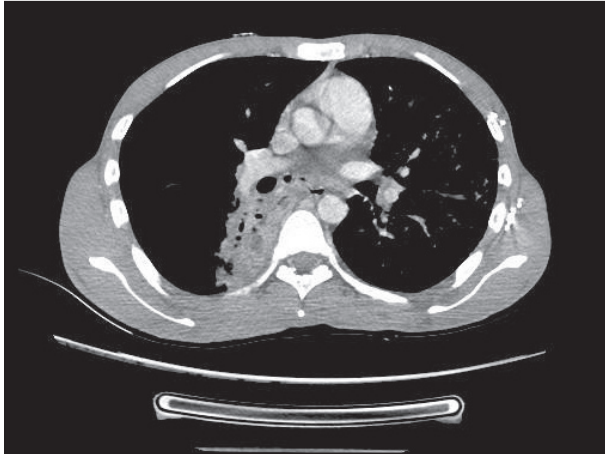


FIGURE 2 Chest computed tomography image showing the right lower lobe collapse and consolidation, and pockets of gas in the mediastinum

obscured small bowel anatomy. A small collection of pelvic fluid was also noted. The findings on abdominal imaging were consistent with disseminated tuberculosis, while the presence of gas in the mediastinum suggested mediastinitis (Figure 2). A barium swallow study identified a small bronchoesophageal fistula at the anterolateral margin of the mid oesophagus (Figure 3), tracking into the bronchus intermedius. Gastro-oesophagoscopy revealed an ulcerated area on the right oesophageal wall about 27 cm from the incisors. Bronchoscopic examination of his tracheobronchial tree was unremarkable.

After multidisciplinary discussions involving the gastroenterology, microbiology and nutrition teams, the patient had a percutaneous endoscopic gastrostomy (PEG) tube inserted and was commenced on PEG feeding. His sputum culture grew methicillin-resistant *Staphylococcus aureus*. Hence he was treated initially with intravenous linezolid. Later, bronchial washings grew isoniazid-resistant *Mycobacterium tuberculosis*. A prolonged course of modified anti-tuberculosis therapy was prescribed. He was given rifampicin, pyrazinamide and ethambutol for 4 months, followed by rifampicin and ethambutol for a further 8 months along with prednisolone. All his medications were administered through the PEG tube.

He underwent serial barium swallows as an outpatient to assess his progress. Oral feeding was gradually reintroduced by the fifth month of treatment after barium swallow confirmed closure of the fistula; the PEG tube was removed after 7 months. Prednisolone was gradually reduced after 11 months. He was discharged from follow-up after successful completion of his treatment, with no long term sequelae.

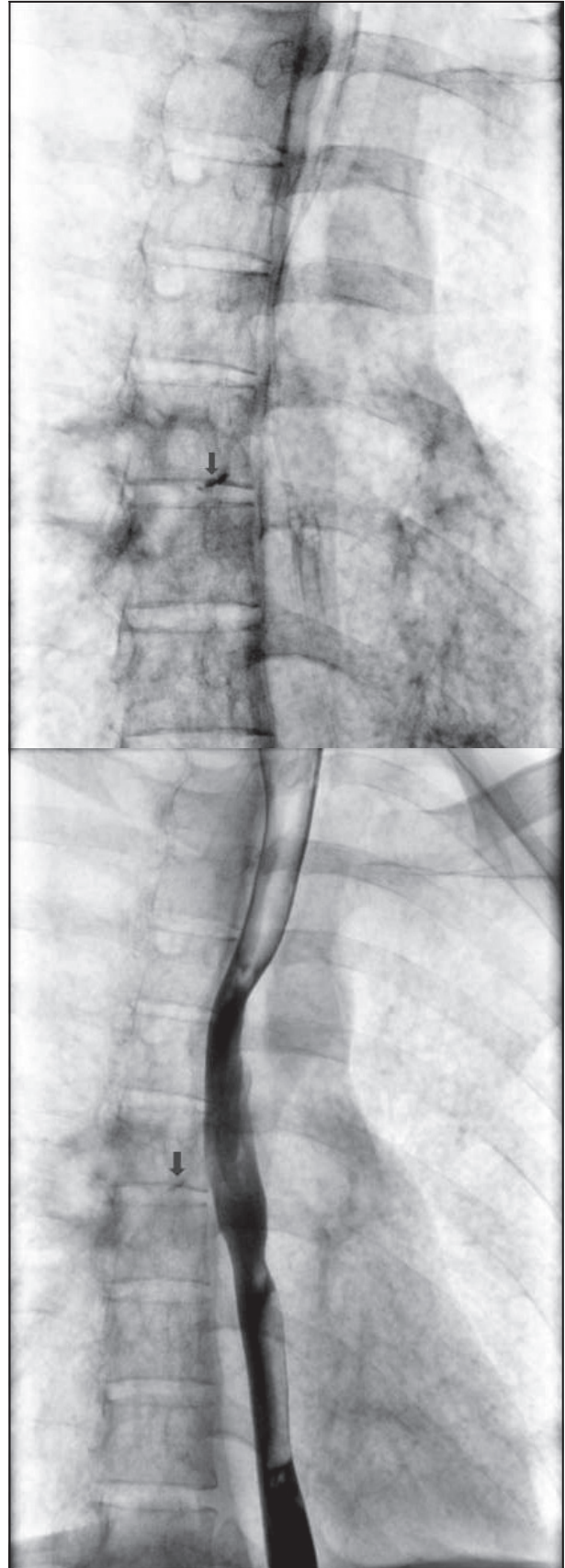


FIGURE 3 Barium swallow showing contrast enhancement of the fistulous tract (arrow) between the mid part of oesophagus and the bronchus intermedius

DISCUSSION

Infections are an important cause of acquired bronchoesophageal fistula with tuberculosis being the most common, although HIV, syphilis and candidiasis have also been reported.¹⁻³ Other causes for bronchoesophageal fistulae reported in the literature include endoscopic instrumentation, ingestion of corrosives, foreign bodies in the oesophagus, and chest trauma.² Inflammatory conditions such as Crohn's disease can also occasionally result in bronchoesophageal fistula.^{2,3} Of all the known causes, malignancies remain the most frequent.^{1,2}

There have been very few documented cases of tuberculous bronchoesophageal fistula. Only 36 cases were reported between 1893 and 2001.³ With the onset of HIV, extrapulmonary complications of TB like BEF have been reported more frequently over the past three decades.³ This is probably due to early lymph node involvement in HIV whereby local inflammation and subsequent scarring pulls a diverticulum from the nearby oesophagus. The tip of this diverticulum eventually perforates to form a fistula.⁴ With effective modern treatment for tuberculosis, bronchoesophageal fistula is now rarely reported in patients with tuberculosis in the absence of concurrent HIV infection. Our patient however, had tested negative for HIV.

Acquired fistulae are usually diagnosed late especially if patients have an alternative cause for their symptoms, for example, cough attributable to pulmonary tuberculosis. The symptom of postprandial cough along with recurrent chest infections may point towards the diagnosis of bronchoesophageal fistula in the absence of neurological findings such as absent gag reflex to suggest aspiration pneumonia. Ono's sign can usually be elicited in patients having a large bronchoesophageal fistula where a cough follows fluid intake, and crepitations are audible in the sixth intercostal space posteriorly.⁵ As a complication of an abnormal communication arising from the oesophagus, particulate and liquid food can spill into airways causing pneumonia, lung abscess and atelectasis.⁶ In our patient, chest CT confirmed an abscess and bronchial aspirate grew methicillin-resistant *Staphylococcus aureus*.

The pathogenesis of bronchoesophageal fistula may be due to a complication of either pulmonary or oesophageal tuberculosis. Mediastinal lymph nodes can become inflamed due to direct tuberculous infection with eventual caseation, abscess formation and rupture into the airway and/or oesophagus. Alternatively, there may be erosion of a bronchial ulcer.⁷ Tuberculosis can also cause mediastinitis with progressive scarring of tissue in the vicinity of the bronchial tree and oesophagus, forming traction diverticula, which in turn lead to fistula formation. Oesophageal tuberculosis is rare. It has been

diagnosed in less than 0.3% cases of abdominal tuberculosis and can cause bronchoesophageal fistula as a local complication.⁸ In our patient, upper gastrointestinal endoscopy had revealed an area of inflamed mucosa in the mid oesophagus at the site of the bronchoesophageal fistula. Unfortunately no biopsy specimens were taken from this site and oesophageal tuberculosis could not be confirmed.

Being an uncommon diagnosis, bronchoesophageal fistula is usually diagnosed late. The best diagnostic tool is barium oesophagography. As in our patient (Figure 3), it can accurately delineate the extent of the abnormal tract, and show contrast leak into the bronchial tree confirming the fistulous communication.⁸ Computed tomography of the chest can reveal the primary lung pathology and involvement of the mediastinum, such as the presence of abnormal lymph nodes and mediastinal gas. Bronchoscopy has a diagnostic yield as high as 83% for bronchoesophageal fistula, although it failed to identify the fistula in our case.⁹

Different forms of treatment have been employed for tuberculous bronchoesophageal fistulae. Traditionally corrective surgery has been preferred over medical treatment due to higher success rates. Open thoracotomies have been performed with complete excision of the fistulous tract.¹⁰ Endoscopic treatment strategies have also been used but success rates are less encouraging. Both fibrin and acrylate glue have been instilled into the fistulous tract but success has depended on the size of fistula. Application of haemoclips and stenting have also been attempted.^{11,12} Due to advances in anti-tuberculous chemotherapy, medical treatment alone may suffice, and it has been documented to be effective especially for small tuberculous bronchoesophageal fistula.¹³ The usual route for continuation of feeding is via nasogastric tube, which ensures that daily nutritional requirements are met without further aspiration through the fistulous tract. Nasogastric feeding has been documented to be inferior to PEG feeding in terms of interventional success but both have similar rates of complications.¹⁴ We opted for PEG feeding with our patient because he could effectively continue his studies at the local university while having the PEG hidden under his clothing. For many patients, we believe PEG feeding for bronchoesophageal fistula provides a better quality of life than a nasogastric tube as it allows patients to have a relatively normal life. To our knowledge this is the first case of tuberculous bronchoesophageal fistula reported in the literature where PEG feeding was employed with a successful outcome, and suggests that such an approach may be worth considering for selected patients with relatively small fistulae.

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