An unusual case of malignant oesophago-pulmonary fistula diagnosed by multidetector computed tomography

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MJAFI 2012;68:72–74

INTRODUCTION

Acquired oesophago-respiratory fistulae are a well-known complication of oesophageal carcinoma. Most of these are either oesophago-tracheal or oesophago-bronchial fistulae. However, oesophago-pulmonary fistulae have also been rarely reported. We present a case of oesophago-pulmonary fistula secondary to oesophageal carcinoma where the diagnosis was made by multidetector computed tomography (MDCT) with the assistance of three-dimensional (3D) imaging reconstruction.

CASE REPORT

A 56-year-old male presented with complaints of progressively increasing dysphagia with persistent cough following meals. A plain radiograph showed consolidation in the right middle and lower zones. Upper gastrointestinal endoscopic examination revealed a circumferential growth in the mid oesophagus. Biopsy confirmed the lesion to be carcinoma of the oesophagus. A provisional diagnosis of carcinoma oesophagus with aspiration pneumonitis was made.

The patient was referred for an upper gastrointestinal contrast study. An oesophagogram was carried out using dilute non-ionic iodinated contrast media (30 mL iohexol 300 mg I/mL diluted 1:5 with normal saline, to make 60 mg I/mL). Oral contrast was seen to opacify the upper and mid oesophagus beyond which contrast material was seen to overlie the right lower zone of the lung (Figure 1).

A computed tomography (CT) examination of the chest was then carried out using both oral and intravenous contrast material on a Siemens Sensation 16 MDCT scanner (Siemens AG, Germany) with 50 cm/0.75 mm/12 mm protocol (display

FOV/detector width/table movement per rotation; rotation time: 0.42 seconds) in a single breath-hold. The mid and lower oesophagus showed a circumferential enhancing growth with a maximum thickness of 12 mm and extending for a length of 8.8 cm. There was a single communication between the lower third of the oesophagus and the pulmonary parenchyma of the right lower lobe, which measured 8 mm in diameter and had an approximate length of 1.4 cm, with oral contrast passing into and pooling in a cavity in the right lower lobe. In addition the right upper and middle lobe also showed features of consolidation (Figure 2A). Three-dimensional imaging with multiplanar image reconstruction planes exquisitely demonstrated the fistulous communication between the oesophagus and the lung (Figure 2B).

DISCUSSION

Oesophago-respiratory fistulae are communications between the oesophagus and the respiratory tract, which may be congenital or acquired. Acquired oesophago-respiratory fistulae are rare and may be secondary to malignancy, prolonged intubation, corrosive ingestion, granulomatous mediastinal infections, prior surgery on the oesophagus or trachea-bronchial tree or

Figure 1 Oesophagogram showing oral contrast opacifying upper and mid oesophagus and distally overlying the right lower lobe, with consolidation of the right lower lobe.

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Received: 28.07.2010; Accepted: 06.09.2011

doi: 10.1016/S0377-1237(11)60108-1

Figure 2 (A) Computed tomography examination of the chest with oral contrast showing a circumferential enhancing growth lower and mid oesophagus demonstrating a communication between the lower third of the oesophagus and the right lower lobe, with contrast pooling in a right lower lobe cavity and, (B) coronal reformat of the same study demonstrating the fistulous communication.

trauma. Most oesophago-respiratory fistulae are due to an oesophago-tracheal fistula or an oesophago-bronchial fistula. Oesophago-pulmonary fistulae have been rarely reported. Although the most common malignancy implicated in acquired oesophageal respiratory fistulae is of the oesophagus, tumours at other sites, including the lungs, trachea, and metastatic lymph nodes, or a primary mediastinal malignant lymphoma may also cause the same. Radiotherapy has also been implicated in causation.¹⁻³

Oesophageal cancers may exhibit highly aggressive local growth and unpredictable natural history. An oesophageal respiratory fistula can develop in approximately 5–15% of patients of oesophageal carcinoma, with potentially fatal consequences. Patients are often unable to swallow food or even their own saliva without aspirating. If left untreated it may lead to multiple pulmonary fistulae and contaminate the respiratory tract, causing pneumonitis and lung abscesses that may eventually lead to sepsis, acute respiratory distress syndrome (ARDS), and death.^{3,4}

The investigation of these fistulae may require plain radiography, contrast radiography, oesophagoscopy, and bronchoscopy. Computed tomography has significantly improved the investigation of these cases, especially with the advent of MDCT. The MDCT employs volumetric acquisition with thinner sections with near-isotropic imaging, which enables the use of volume rendering techniques like 3D imaging, as also the use of multiplanar reformats and curved imaging planes, which allow better evaluation of lesions. Use of 3D image reconstruction may also assist in the assessment of fistula, abscess drainage, and can be useful in planning interventions.³

An oesophageal tumour may cause indentation or displacement of posterior wall of a bronchus. This may also be associated with thickening of the trachea-bronchial wall. Specific findings of tracheo-bronchial invasion include demonstration of the trachea-bronchial fistula or tumour extension within the airway lumen. It is necessary to demonstrate the fistulous tract, as contrast material within the bronchial

lumen or parenchymal cavity may be due to aspiration. The multiplanar capability of MDCT is most diagnostic to demonstrate the presence of contrast material in the fistulous tract.^{5,6}

There is no cure for malignant oesophago-respiratory fistulae and palliative procedures like oesophageal stenting/bypass/exclusion or surgical repair with fistula resection may prolong survival. Endoscopic oesophageal stenting using coated self-expandable metal stents is currently the most widely used palliative treatment modality. Radiotherapy/chemotherapy may also offer palliation. Without treatment, the mean survival time is only one to six weeks.¹

This case is unusual in that the fistula crossed anatomical boundaries in the posterior mediastinum with the fistula communicating directly with a cavity in the right lower lobe. Carcinoma of the oesophagus is an aggressive disease, which can show flagrant disregard for anatomical boundaries, sometimes leading to such oesophago-pulmonary fistulae. Although upper gastrointestinal contrast studies can suggest the diagnosis of these fistulae, an MDCT study using oral as well as intravenous contrast exquisitely delineates the number, course, and morphology of these lesions, which is useful for subsequent management.

CONFLICTS OF INTEREST

None identified.

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