

# Post-oesophagectomy anastomotic-bronchial fistula

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Anastomotic leakage after oesophagectomy is a dreaded complication. It has a wide range of presentations ranging from the patient being totally asymptomatic to septic with multi-organ failure. From the literature, in general, cervical anastomoses have a higher leakage rate than those that are intra-thoracic, but leaks from the latter confer greater morbidity. Cervical anastomotic leaks that are truly confined to the neck can be managed conservatively, but can extend into the mediastinum and result in more serious complications. Herein, we report on a patient with an oesophago-gastric anastomosis constructed in the neck but with extension into the mediastinum. Subsequently, the patient developed a fistulous erosion into the tracheobronchial tree, which was successfully managed endoscopically.

## Introduction

Controversy still exists regarding the optimal location of oesophageal anastomoses after oesophagectomy for cancer. Determining factors include the location of the primary oesophageal tumour and the length of the proximal resection margin that can be achieved, the preferred approach to resection, and whether a transthoracic or transhiatal resection is used.<sup>1-3</sup> According to the literature, in general, cervical anastomoses are associated with higher leakage rates, but their consequences are less severe than those of intrathoracic anastomoses.<sup>4,5</sup> Cervical leaks can often be managed by simple bedside exploration with drainage from the neck wound, while intrathoracic leaks result in mediastinitis and the subsequent sepsis is more difficult to control. In our own experience however, leakage rates in the neck and the thorax are the same, and the chances of death are also similar.<sup>1</sup> This may be because after construction, cervical anastomoses may retract into the upper mediastinum and thus are not truly confined to the neck; mediastinal extension of the leak could therefore result in more serious consequences. Herein, we present a patient with a cervical oesophago-gastric anastomosis after oesophagectomy, whose anastomotic leak resulted in fistulation into the tracheobronchial tree. The management of this complication is discussed.

## Case report

A 67-year-old man presented with a 2-month history of hoarseness of voice. Endoscopically, he was diagnosed to have a squamous cell carcinoma of the upper and middle third of the thoracic oesophagus. Staging investigations including endoscopic ultrasound, bronchoscopy, and positron emission tomography/computer tomographic scans (PET/CT) showed an uT3N1 tumour with peri-oesophageal nodal spread. Bronchoscopy also documented left vocal cord paralysis.

Concurrent chemoradiation was given. Chemotherapy consisted of two courses of cisplatin and 5-fluorouracil (5-FU). Cisplatin (100 mg/m<sup>2</sup>) was given as an intravenous infusion over 4 hours on day 1, followed by 5-FU (500 mg/m<sup>2</sup>/day) infusions on days 1 to 5. Chemotherapy was repeated on days 22 to 26. External radiation therapy was applied, using 40 Gy in total with 2 Gy per fraction given from week 1 to 4. Re-staging of the tumour was then performed and surgery was carried out 6 weeks after completion of the neoadjuvant therapy.

Post-chemoradiation therapy reassessment showed that there was significant response with reduction in the size of the primary tumour. There was a complete endoscopic response and biopsy was negative for malignancy. The left vocal cord remained immobile. There was no tracheobronchial tree involvement. Endoscopic ultrasound and PET/CT could no longer demonstrate any involved lymph node.

A transthoracic three-phase oesophagectomy was performed. Intra-operatively, there was no obvious residual tumour except some post-irradiation changes in the upper

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## 食道切除再造術後的吻合口支氣管瘻管

食道切除再造術後出現吻合滲漏是一種可怕的併發症，病人可以有不同程度的症狀，從毫無病徵至因膿毒症而出現多器官衰竭都可能發生。文獻記載中，大致上頸部接口的滲漏率比胸腔內接口為高，可是如果胸腔內接口出現滲漏，發病率便會較高。只限於頸部接口的滲漏可以用保守療法治理，但如果延伸至縱隔的話便會引致更嚴重的併發症。本文報告一名病人在頸部進行胃食道吻合術並延伸至縱隔。後來病人出現瘻管損傷並延伸至氣管或支氣管，最後用胃鏡術成功醫治。

oesophagus. The operation was uneventful and there was no difficulty in dissecting the oesophagus off the tracheo-bronchial tree. On the second day after the operation, the patient developed atrial fibrillation. Fine-bore endoscopy was performed and showed that the anastomosis was located 22 cm from the tip of the nostril. There was some slough covering the proximal part of the stomach from 22 cm to 27 cm. Ischaemia of the gastric conduit was suspected. The neck wound was explored in the operating room under general anaesthesia. Convincing evidence of ischaemia was not found and thus the anastomosis was not disturbed, and the wound was simply irrigated with saline and a drain was inserted.

Gastrografin contrast swallow on postoperative day 7 showed no anastomotic leak. The patient had recovered well and was commenced on an oral diet. Two weeks after surgery, the patient had evidence of aspiration and developed pneumonia. Antibiotics were prescribed. Endoscopic assessment showed that approximately one-third of the anastomotic circumference was dehisced and faced the right side which led into a cavity with the right lung which therefore formed part of its wall. The patient did not appear septic, and non-operative treatment strategies were adopted. The patient was kept nil by mouth and for nutritional support a nasoenteral tube was inserted by endoscopy. Another small tube was placed endoscopically into the leakage cavity for drainage. Endoscopic examination was performed 10 weeks after the operation. The anastomotic defect was much reduced in size (Fig 1). Contrast (Omnipaque; General Electric Healthcare Company, UK) was injected into the cavity endoscopically with the intent of demonstrating the size of the residual cavity. On injecting the contrast, a fistula into the tracheobronchial tree was immediately shown up (Fig 2).

Fibrin glue injection (TISSEEL; Baxter, US) method was used to treat the anastomotic-bronchial defect. An endoscopic brush was used to create raw surface on the tissue around the defect, immediately thereafter 1 to 2 mL of tissue glue was injected. The

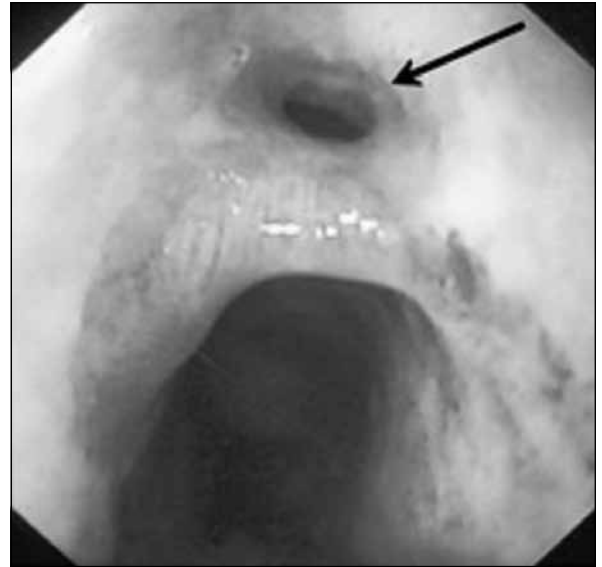


FIG 1. Arrow points to the defect at the anastomosis



FIG 2. Fluoroscopy photo with contrast injection through the anastomotic defect (arrow) showing the tracheobronchial tree

size of the residual defect was examined 1 week later, and the procedure repeated. The entire procedure was repeated once again, whereupon no residual defect was evident. Thus, progressive reduction in the size of the defect eventually gave rise to its total closure (after three sessions of tissue glue injection). The patient was discharged 14 weeks after the initial operation.

## Discussion

Many surgeons prefer cervical anastomosis after oesophagectomy, because when leaks occur, they are usually confined to the neck and consequently easier

to manage. Orringer et al<sup>6</sup> reported a series of 1085 patients who underwent transhiatal oesophagectomy, 146 of whom developed anastomotic leakage; the majority (137/146) were managed using only local wound care. However, we are also aware that cervical anastomotic leaks are not always confined to the neck. In one well-documented series, 240 patients underwent transthoracic oesophagectomy with a cervical anastomosis.<sup>7</sup> Anastomotic leaks occurred in 11% of patients, of whom 52% had intrathoracic manifestations from cervical leaks; empyema was the most common consequence. Patients with intrathoracic spread of sepsis had significantly longer in-hospital and anastomotic healing times, and received more drainage procedures than those with leaks confined to the neck. The authors concluded that intrathoracic manifestations of cervical anastomotic leaks were more common after transthoracic oesophagectomy than what had been reported for transhiatal oesophagectomy.<sup>7</sup> As illustrated in our patient, even fistulation into the lung could occur.

Transthoracic rather than transhiatal resection might well favour intrathoracic manifestation of cervical leaks. Possible reasons could be the more extensive superior mediastinal dissection with the former approach, and establishment of a communication between the cervical pre-vertebral region and the pleural space when mobilising the oesophagus within the mediastinum and the neck. In contrast, in transhiatal oesophagectomy, the pleural envelope of the superior mediastinum should remain intact. In our patients, prior radiation to the lungs and superior mediastinum could contribute

to the formation of fistula. A peripheral branch of the bronchial tree was eroded, causing 'aspiration' pneumonia.

In general, thoracic leaks are associated with higher morbidity and mortality, because the consequent mediastinitis and empyema are usually more extensive and 'collections' are more difficult to drain. In our patient, the manifestation was slightly atypical in that leakage was not evident until 2 weeks after surgery. This allowed adhesions to develop and that helped restrict the leakage to a small cavity in the superior mediastinum. But then the cavity eroded into the lung parenchyma and communicated with a peripheral branch of the bronchial tree. This resulted in aspiration, as swallowed liquid entered directly into major airways. This was well illustrated in the fistulogram. When sepsis is controlled and collections are well drained, most leaks should heal with time. Our patient was successfully managed with a strategy involving nil by mouth orders, nasoenteral feeding and naso-cavity drainage.

As an adjunct to conservative management, in our patient fibrin sealant was also used to hasten the healing. The fistula healed after three injection sessions.<sup>8,9</sup> In recent years, more endoscopic methods have become available for the treatment of leaks and fistulae, and include endoscopic clips (Endoscopic clip HX-600-135; Olympus, Japan) or removable stents (Polyflex Esophageal Stent; Boston Scientific Corp, US). However, each method has its advantages and disadvantages,<sup>10,11</sup> for which selective and/or combined use of endoscopic means, interventional radiology, and possible timely operative interventions are the keys to success.

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