

Thoracic Empyema and Lung Abscess Resulting from Gastropulmonary Fistula as a Complication of Esophagectomy

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A benign fistula between the gastric tube and the airway resulting from esophagectomy is a rare complication, but it is a potentially life-threatening status. We present a 59-year-old man with thoracic empyema and lung abscess resulting from a benign gastric tube-to-pulmonary fistula caused by a penetration of the peptic ulcer in the gastric tube four years after an esophagectomy for esophageal cancer. After a thorough conservative management of infection and nutrition, the fistula was successfully repaired surgically with direct closure. The postoperative course was uneventful. Two years and nine months later, the patient retains satisfactory oral feeding status and is in good general condition. (Ann Thorac Cardiovasc Surg 2008; 14: 172–174)

Key words: gastric tube-to-pulmonary fistula, thoracic empyema, lung abscess, esophagectomy

Introduction

A benign gastric tube-to-pulmonary fistula as a complication of esophagectomy is a very rare but potentially life-threatening status. We present a patient with thoracic empyema and lung abscess resulting from a benign gastric tube-to-pulmonary fistula four years after esophagectomy, possibly because of the penetration of a deep peptic ulcer in the gastric tube into the lower lobe of the right lung.

Case Report

A 59-year-old man with advanced esophageal cancer was referred to our hospital for dyspnea and fever approximately 4 years after a thoracic esophagectomy with right thoracotomy accompanied by a reconstruction of the

stomach through the posterior mediastinum. He received no adjuvant chemoradiotherapy before or after surgery. There was no evidence of recurrence over the follow-up period. He had periodically undergone upper gastrointestinal endoscopy, which revealed a small peptic ulcer in the gastric tube 2 years and 6 months after esophagectomy. A proton-pump inhibitor was given orally for 1 year and 6 months until this admission. As his primary symptom, he had presented with a productive cough after eating at least 1 month prior to this admission. On arrival at our hospital, he had a high-grade fever with a white blood cell count of 15,400 /mm³ and C-reactive protein of 26.6 mg/dL. A nutritional deficiency was observed with serum albumin of 2.1 g/dL. Chest radiography showed massive fluid in the right thorax. Chest computed tomography (CT) showed an intrapulmonary abscess adjacent to the gastric tube and massive fluid in the right thorax extending to the subscapular space (Fig. 1). Upper gastrointestinal endoscopy showed a small hole in the wall of the gastric tube, which was located at the same site as the known peptic ulcer, and the bronchial spur could be seen through the hole (Fig. 2). Based on these findings, thoracic empyema and lung abscess resulting from a gastric tube-to-pulmonary fistula caused by the penetration

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of a deep peptic ulcer in the gastric tube was suspected. A chest tube was inserted into the right thorax, and the massive yellowish septic effusion was drained without air leakage. Because the patient was in a very poor general condition with intrathoracic infection, we continued the conservative management for 4 weeks with full fasting and total parenteral nutrition with simultaneous thoracic drainage and broad-spectrum antibiotics. This conservative management improved the patient's general condition except for the intrathoracic infection, and surgical repair was performed through a right-sided thoracotomy 33 days after admission. Because of severe adhesion between the right lower lobe and the gastric tube, we had difficulty finding the fistula site, and an endoscopic intervention was performed in the operating room. Using endoscopy, we inserted a guide wire through the hole of the stomach tube to the fistula and easily found it. The fistula was dissected and severed. It was small and the surrounding tissues were relatively healthy without infection; therefore we decided to carry out direct closure of the gastric tube and visceral pleural defects because of the fistula without interposition of well-circulated tissues, such as a pedicled muscle flap. The gastric tube defect was closed directly with absorbable polyglatin 3-0 interrupted sutures in two layers. The visceral pleural defect of the right lower lobe was closed directly with absorbable polydioxanone 4-0 continuous sutures in one layer. The postoperative course was uneventful. The chest tube was removed on day 7, and the patient was discharged 41 days after the operation. Oral intake was reinitiated on day 6. Two years and 9 months later, the patient retains a satisfactory oral feeding status and is in good general condition.

Discussion

A benign fistula between the gastric tube and the airway resulting from esophagectomy is a rare complication, but is potentially fatal. In our case, thoracic empyema and lung abscess were simultaneously complicated by the fistula 4 years after the esophagectomy. Our patient had had a small peptic ulcer in the gastric tube prior to this complication. A peptic ulcer in the gastric tube after esophagectomy is rare, but often causes hemorrhage, perforation, and penetration. The fistula in our case was probably caused by the penetration of a peptic ulcer exacerbation into the peripheral pulmonary parenchyma. In the 16 patients reported in recent English literature published after 2000,¹⁻¹⁰⁾ the causes of the fistula included a peptic

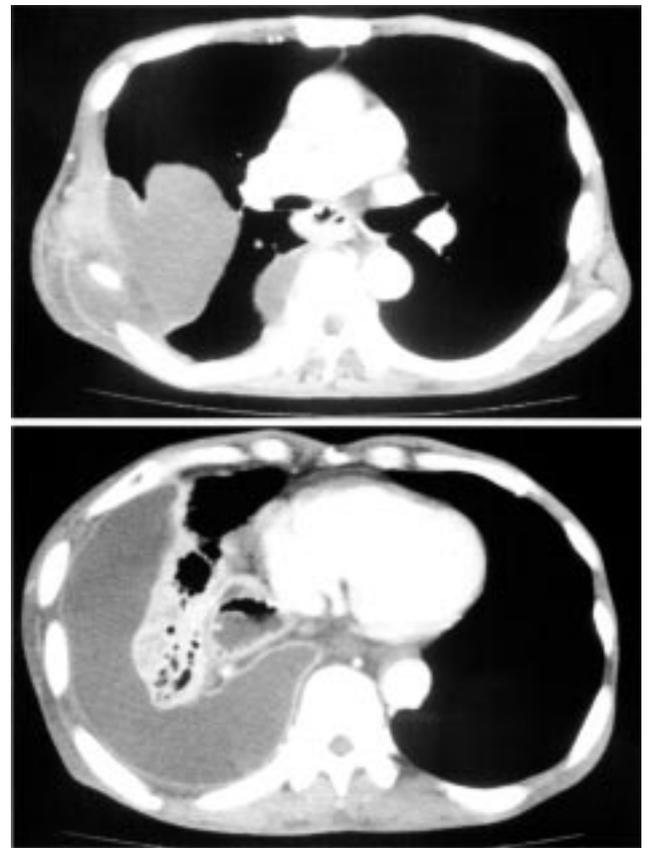


Fig. 1. Chest computed tomography (CT) showed an intrapulmonary abscess adjacent to the gastric tube and massive fluid in the right thoracic extending to the subscapular space.

ulcer,^{1,2)} anastomotic leakage,^{3,4)} endoscopic dilatation,^{4,5)} and stenting treatments^{6,7)} for anastomotic stricture, tracheal ischemia by tracheostomy tube,⁸⁾ and a staple from the gastric tube suture line eroding into the bronchus.^{9,10)} The fistula developed at the level of the trachea in 10 patients and at the level of the right bronchus in 6 patients.

Therapeutic strategies depend on the severity of a patient's condition. Various therapeutic methods for a fistula between the gastric tube and the airway have been described, such as conservation,⁴⁾ endoscopic intervention,^{2,10)} and surgery.¹⁻⁹⁾ In particular, many operative approaches using the interposition of vital tissues such as a pedicled pleural, pericardial,³⁾ or muscle flap^{1,4,6-8)} for the reinforcement and isolation of the suture line of pulmonary and gastric tube defects have been demonstrated. The muscle flaps included the latissimus dorsi, pectoralis major, and the intercostal muscle flaps. Making a good choice for appropriate surgical management might be difficult. Operative strategies depend on the size and loca-

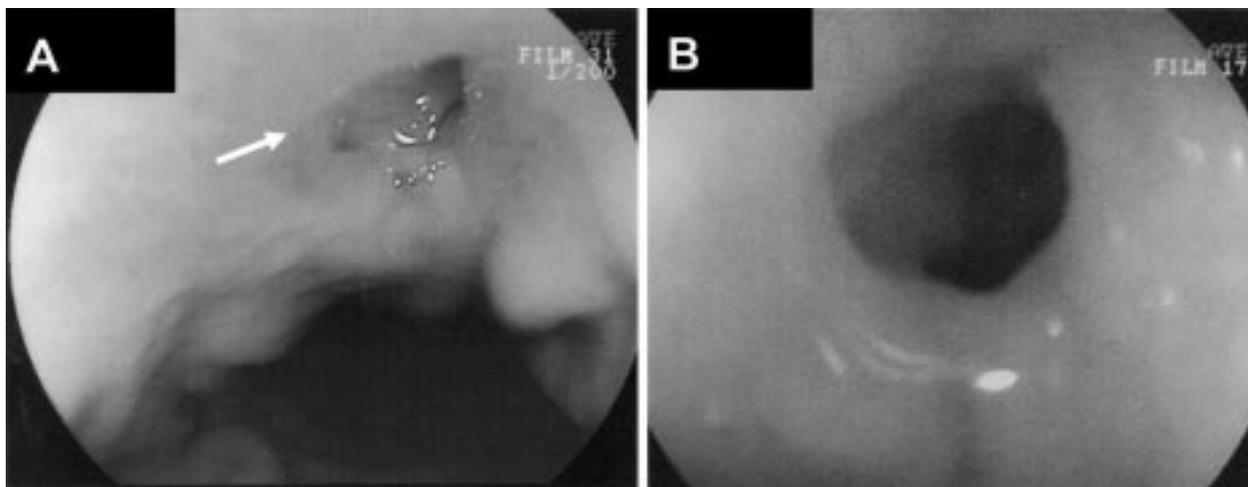


Fig. 2. Upper gastrointestinal endoscopy showed a small hole in the wall of the gastric tube (arrow). The bronchial spur could be seen through the hole.

tion of the fistula, and accompanying conditions such as the severity of intrathoracic and mediastinal infection. For an airway too large to be closed directly, indirect closure using muscle flap transposition may be a useful approach.¹⁾ Usually, repaired suture lines are at risk of dehiscence because of local infection and the poor general condition of the patient; however, if local infection is well controlled with a good general condition, direct closure without the interposition of vital tissues may be a choice as a surgical option. Our case was successfully treated with only the direct closure of pulmonary and gastric tube defects.

Once the diagnosis of a benign fistula between the gastric tube and airway has been made, early surgical repair should be considered; however, we believe that preoperative thorough conservative management of infection and nutrition made it possible for this difficult complication to be cured with surgery.

References

1. Okuyama M, Saito R, Motoyama S, Kitamura M, Ogawa J. Histological confirmation of healing of gastrobronchial fistula using a muscle flap. *Ann Thorac Surg* 2002; **73**: 1298–9.
2. Brega Massone PP, Lequaglie C, Ferro F, Gallino G, Magnani B, et al. A rare complication of surgical management for esophageal tumor: a non neoplastic belated fistula between stomach and main right bronchus. *J Cardiovasc Surg (Torino)* 2000; **41**: 787–90.
3. Song SW, Lee HS, Kim MS, Lee JM, Kim JH, et al. Repair of gastrotracheal fistula with a pedicled pericardial flap after Ivor Lewis esophagogastrctomy for esophageal cancer. *J Thorac Cardiovasc Surg* 2006; **132**: 716–7.
4. Buskens CJ, Hulscher JB, Fockens P, Obertop H, van Lanschot JJ. Benign tracheo-neo-esophageal fistulas after subtotal esophagectomy. *Ann Thorac Surg* 2001; **72**: 221–4.
5. Devbhandari MP, Jain R, Galloway S, Krysiak P. Benign gastro-bronchial fistula—an uncommon complication of esophagectomy: case report. *BMC Surg* 2005; **5**: 16.
6. Aguiló Espases R, Lozano R, Navarro AC, Regueiro F, Tejero E, et al. Gastrobronchial fistula and anastomotic esophagogastric stenosis after esophagectomy for esophageal carcinoma. *J Thorac Cardiovasc Surg* 2004; **127**: 296–7.
7. Shichinohe T, Okushiba S, Morikawa T, Kitashiro S, Manase H, et al. Salvage of a massive esophago-tracheal fistula resulting from a stenting treatment. *Dis Esophagus* 2006; **19**: 299–304.
8. Kalmar K, Molnar TF, Morgan A, Horvath OP. Non-malignant tracheo-gastric fistula following esophagectomy for cancer. *Eur J Cardiothorac Surg* 2000; **18**: 363–5.
9. Pramesh CS, Sharma S, Saklani AP, Sanghvi BV. Broncho-gastric fistula complicating transthoracic esophagectomy. *Dis Esophagus* 2001; **14**: 271–3.
10. Bennie MJ, Sabharwal T, Dussek J, Adam A. Bronchogastric fistula successfully treated with the insertion of a covered bronchial stent. *Eur Radiol* 2003; **13**: 2222–5.