*Int Surg* 2015;**100:**1225–1228
DOI: 10.9738/INTSURG-D-14-00191.1

Case Report

# Endoscopic Treatment of Esophago-Pleural Fistula Following Total Gastrectomy: A Case Report

Tzu-Chun Chen[1], Pei-Ming Huang[1], I-Rue Lai[1,2]

[1]*Department of Surgery, National Taiwan University Hospital, Taipei, Taiwan*

[2]*Department of Anatomy and Cell Biology, Medical College, National Taiwan University, Taipei, Taiwan*

**This paper is designed to report the endoscopic treatment for a rare esophagopleural fistula after total gastrectomy. Esophagopleural fistula is a rare complication following total gastrectomy. Nonoperative treatment using endoscopic injection of tissue glue is a less invasive and effective option. The history, treatment, and options for managing an esophagopleural fistula following gastrectomy are discussed. A 53-year-old female patient underwent total gastrectomy for advanced gastric cancer. An anastomotic leak with esophagopleural fistula formation developed at the esophagojejunostomy site. The fistula was successfully managed by endoscopic injection with n-butyl-2-cyanoacrylate into the fistula, chest tube drainage, systemic antibiotics, and total parenteral nutrition. This case report suggests that combing effective drainage and the use of n-butyl-2-cyanoacrylate of nonoperative treatment options for esophagopleural fistula.**

*Key words:* Gastrectomy – Esophagopleural fistula – Endoscopy – N-butyl-2-cyanoacrylate

A 53-year-old woman with past history of peptic ulcer in her thirties. She had intermittent epigastralgia for 1 year and visited our emergency department due to tarry stool. Panendoscope revealed a fungating mass with ulcerative surface was noted extending from angle to AW of upper body. Advanced gastric cancer, Bormann type 3, AW of upper body to angle was diagnosed. Pathology showed poor-differentiated adenocarcinoma. Abdominal and pelvic computed tomography revealed advanced gastric cancer with regional LAPs. Whole body bone scan showed no definite bony metastasis. She received total gastrectomy with Roux-en-Y esophagojejunostomy, lymph node dissection, splenectomy and distal pancreatectomy. The esophago-

Corresponding author: I-Rue Lai, MD, PhD, Department of Anatomy and Cell Biology, College of Medicine, National Taiwan University, No. 1, Section 1, Jen-Ai Road, Taipei, Taiwan.
Tel.: 886 2 23123456, ex 88172; Fax: 886 2 23915292; E-mail: iruelai@gmail.com



Downloaded from https://prime-pdf-watermark.prime-prod.pubfactory.com/ at 2025-07-07 via free access

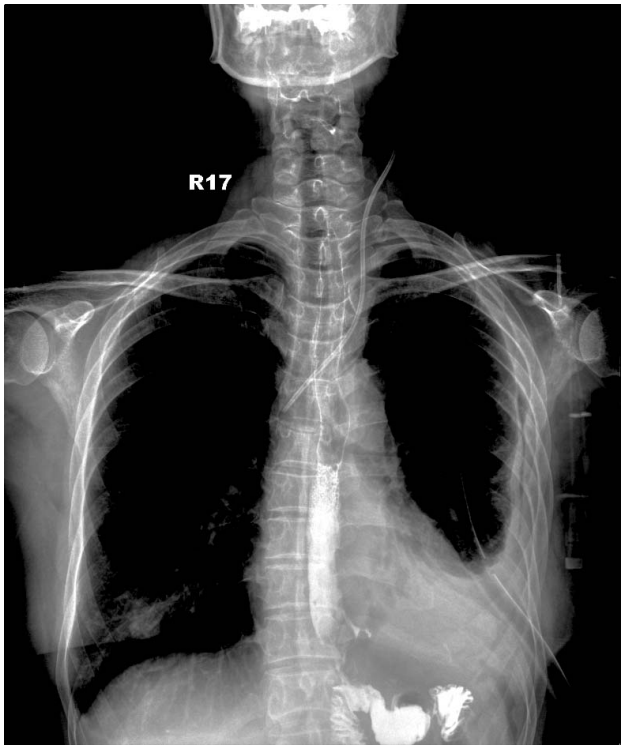


**Fig. 1** A trace of contrast media extravasated into the left thoracic cavity, just above the anastomosis.

jejunal anastomosis was performed by using a 25 Fr. end-to-end anastomotic stapler.

Fever, leukocytosis, and dyspnea developed 6 days after gastrectomy. Chest X-ray showed massive left pleural effusion, and pigtail catheter drained much turbid effusion. Chest CT on postoperative 10th day showed left pleural effusion and air entrapment near esophagus. She received video-assisted thoracoscopic decortications for the empyema on postoperative 11th day. Pleural effusion culture grew *Viridans streptococci*. However, food particles were found in the chest tube when she started liquid diet on the postoperative 18th day after gastrectomy. A Hypaque esophagogram confirmed a fistulous communication between the esophagus and the left thoracic cavity, just above the esophagojejunostomy (Fig. 1). Postoperative 20th day Esophagogastroduodenoscopy showed an abnormal opening with fibrin-coating in the esophagus, 1.5 cm above the anastomosis (Fig. 2). Injection of 2 mL of the n-butyl-2-cyanoacrylate (Histoacryl glue; B. Braun Aesculap, Tuttlingen, Germany) into the fistula was performed through an endoscopic catheter. One week later, only little clear effusion was demonstrated in the chest tube, and she

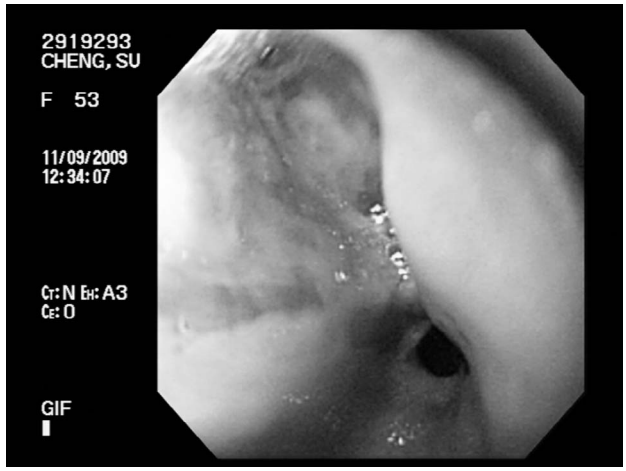


**Fig. 2** Esophagogastroscopy showed an abnormal opening, 0.3 cm in size, 1.5 cm above the anastomosis. Injection of 2 ml of the n-butyl-2-cyanoacrylate into the fistula was performed.

resumed diet uneventfully. At 2 weeks after the endoscopic treatment, she was free of symptoms and the follow-up chest X-ray showed intact n-butyl-2-cyanoacrylate in place and clear lung field (Fig. 3).

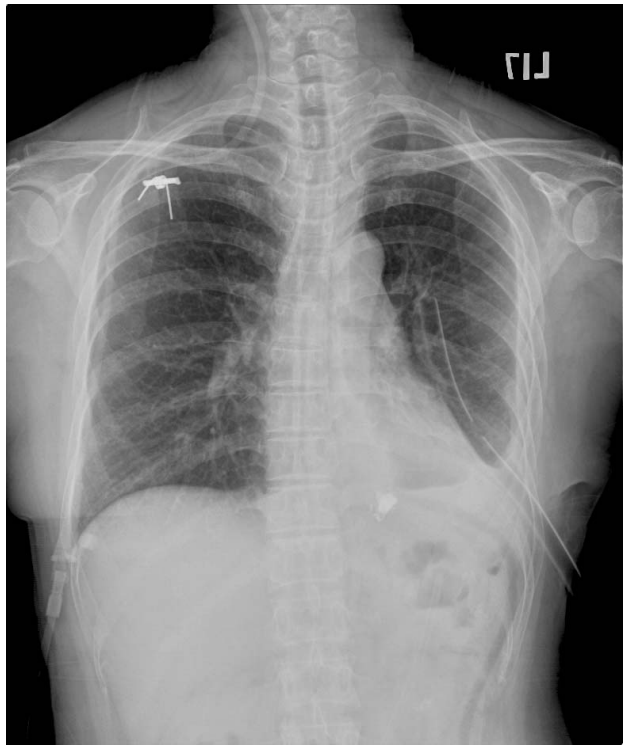

**Fig. 3** At 2 weeks after the endoscopic treatment, the follow-up chest X-ray showed intact n-butyl-2-cyanoacrylate in place and clear lung field.

Downloaded from https://prime-pdf-watermark.prime-prod.pubfactory.com/ at 2025-07-07 via free access

## Discussion

Esophagopleural fistula after gastrectomy is a rare complication, and is difficult to repair by surgery. In this patient, chest tube drainage alone or decortication of empyema failed to heal the fistula. Therefore, endoscopic management for postoperative esophagopleural fistula was adopted as an alternative treatment. Endoscopic injection of Histoacryl glue (n-butyl-2-cyanoacrylate) into the fistula above the esophagojejunal anastomosis was performed, and the fistula healed 1 week later.

Esophagopleural fistulas were usually associated with esophageal diseases including esophageal carcinoma, corrosive injury, esophagectomy, foreign body perforation, and so on.[1–3] Esophagopleural fistula after gastrectomy is not common and is mainly related to the surgical trauma, especially the anastomotic leakage. The reported incidence of anastomotic leak after esophagogastric surgery is approximately 10% to 30%[4] and anastomotic trouble during construction of the esophagojejunostomy was one of the important risk factors for the occurrence of leakage.[1] For this patient, we proposed that pleura were severed during the dissection, and the esophagopleural fistula developed when the leakage of esophagojejunal anastomosis occurred. Though most of the leakage was drained via the abdominal drains, the negative intrathoracic pressure during inspiration might draw the leaked fluid into pleural space.

Conservative treatment including adequate drainage and nutritional support were usually the first option in treating minor postoperative fistula.[4] Endoscopic management was introduced as an alternative for postoperative fistula. The procedures used in endoscopic fistula treatment included stenting, clipping with detachable snare, endoluminal vacuum drainage. or tissue glue injection. Besides malignant obstruction, expandable stents were also used to cover the postoperative digestive tract fistula.[5,6] However, stent migration or tissue ingrowth were major concerns. Snaring or clipping, commonly used in endoscopic hemostasis, was also reported successful in immediate closure of gastric perforation,[7] though had limited use in scarred tissue. Dwelling vacuum-assisted drainage via endoscopy has been successful in treating iatrogenic esophageal perforations, with the price of patient discomfort and repeated sessions.[8] These endoscopic procedures, performed by experienced endoscopists, could offer nonoperative, effective treatment in selected patients with esophageal fistula.

Endoscopic instillation of tissue glue material into the fistula has been used successfully to treat postoperative fistula. The commonly used tissue glue are fibrin glue (Tissucol) and N-butyl-2-cyanoacrylate (Histoacryl). Fibrin glue (Tissucol, Baxter, Germany) consists mainly of clotting proteins (fibrinogen, Factor XIII, and fibronectin) and thrombin. The mixture of both components results in an adhesive coagulum of fibrin polymer shortly.[9] The combined use of fibrin glue and Vicryl plug was reported effective in 13 of 15 patients with postoperative upper gastrointestinal leakage or fistula.[10] N-butyl-2-cyanoacrylate (Histoacryl, B. Braun Dexon GmbH, Spangenberg, Germany) is a tissue glue monomer that instantly polymerizes and solidifies upon contact with body fluids. Besides sclerotherapy of esophageal varices,[11] N-butyl-2-cyanoacrylate has been used in treating digestive tract fistula including biliary,[12] and pancreatic.[13] Recently, some reported the novel use of N-butyl-2-cyanoacrylate in treating esophageal fistula[14,15] as well. As shown in our report, the combination of parenteral nutrition, chest tube drainage, and endoscopic injection of n-butyl-2-cyanoacrylate effectively healed the esophagopleural fistula.

Though endoscopic repair of digestive tract fistula are less invasive and effective, the indication of which depend on the extent of fistula, duration of disease, and patient's performance status. In cases with large defect or leakage in early postoperative phase, surgical treatment is indicated. The surgical options for esophagopleural fistula include diversion esophagostomy, creation of a controlled fistula by T tube,[16] or closure of esophageal defects with muscle flaps.[17]

## Conclusion

Esophagopleural fistula after gastrectomy is rare and difficult to repair by surgery. Total parenteral nutrition, adequate pleural drainage and endoscopic n-butyl-2-cyanoacrylate injection was another effective and safe option to heal the fistula.

## References

1. Migita K, Takayama T, Matsumoto S, Wakatsuki K, Enomoto K, Tanaka T *et al*. Risk factors for esophagojejunal anastomotic leakage after elective gastrectomy for gastric cancer. *J Gastrointest Surg* 2012;**16**(9):1659–1665
2. Roufail WM, Brice BS Jr. Esophago-pleural fistulae secondary to perforated esophageal ulcer. *Gastrointest Endosc* 1972;**18**(4): 165–166

Downloaded from https://prime-pdf-watermark.prime-prod.pubfactory.com/ at 2025-07-07 via free access

3. Cherveniakov A, Tzekov C, Grigorov GE, Cherveniakov P. Acquired benign esophago-airway fistulas. *Eur J Cardiothorac Surg* 1996;**10**(9):713–716
4. Kim YJ, Shin SK, Lee HJ, Chung HS, Lee YC, Park JC *et al*. Endoscopic management of anastomotic leakage after gastrectomy for gastric cancer: how efficacious is it? *Scand J Gastroenterol* 2013;**48**(1):111–118
5. Repici A, Romagnoli R, Reggio D, Salizzoni M, Barletti C, Juliani E *et al*. Successful closure of a postsurgical benign esophagomediastinal fistula by temporary placement of a polyester, expandable stent: Case report and review. *Gastrointest Endosc* 2002;**56**(5):747–750
6. Al-Haddad M, Craig CA, Odell J, Pajaro O, Wallace MB. The use of self-expandable plastic stents for non-malignant esophago-pleural fistulas. *Dis Esophagus* 2007;**20**(6):538–541
7. Kim HH, Park SJ, Park MI, Moon W. Endoscopic hole and clipping technique: a novel technique for closing the wide orifice of a postoperative fistula. *Gastrointest Endosc* 2012;**75**(6): 1250–1252
8. Wedemeyer J, Schneider A, Manns MP, Jackobs S. Endoscopic vacuum-assisted closure of upper intestinal anastomotic leaks. *Gastrointestinal Endosc* 2008;**67**(4):708–711
9. Canonico S. The use of human fibrin glue in the surgical operations. *Acta Biomed* 2003;**74**(suppl 2):21–25
10. Böhm G, Mossdorf A, Klink C, Klinge U, Jansen M, Schumpelick V *et al*. Treatment algorithm for postoperative upper gastrointestinal fistulas and leaks using combined Vicryl plug and fibrin glue. *Endoscopy* 2010;**42**(7):599–602
11. Huang YH, Yeh HZ, Chen GH, Chang CS, Wu CY, Poon SK *et al*. Endoscopic treatment of bleeding gastric varices by N-butyl-2-cyanoacrylate (Histoacryl) injection: long-term efficacy and safety. *Gastrointestinal Endosc* 2000;**52**(2):160–167
12. Seewald S, Groth S, Sriram PVJ, Xikun H, Akaraviputh T, Mendoza G *et al*. Endoscopic treatment of biliary leakage with n-butyl-2 cyanoacrylate. *Gastrointestinal Endosc* 2002;**56**(6): 916–919
13. Seewald S, Brand B, Groth S, Omar S, Mendoza G, Seitz U, et al. Endoscopic sealing of pancreatic fistula by using N-butyl-2-cyanoacrylate. *Gastrointestinal Endosc* 2004;**59**(4):463–470
14. Pramateftakis MG, Vrakas G, Kanellos I, Mantzoros I, Angelopoulos S, Eleftheriades E *et al*. Endoscopic application of n-butyl-2-cyanoacrylate on esophagojejunal anastomotic leak: a case report. *J Med Case Report* 2011;**5**:96
15. Yurtçu M, Arbag H, Cağlayan O, Abasiyanik A, Oz M. The effect of cyanoacrylate in esophagocutaneous leakages occurring after esophageal anastomosis. *Int J Pediatr Otorhinolaryngol* 2009;**73**(7):1053–1055
16. Qadir I, Zafar H, Khan MZ, Sharif HM. T-tube management of late esophageal perforation. *J Pak Med Assoc* 2011;**61**(4):418–420
17. Richardson JD, Tobin GR. Closure of esophageal defects with muscle flaps. *Arch Surg* 1994;**129**(5):541–547

Downloaded from https://prime-pdf-watermark.prime-prod.pubfactory.com/ at 2025-07-07 via free access