# T-Tube Drainage and Intercostals Muscle Flap Reinforcement for the Management of Intrathoracic Esophago-Gastric Anastomotic Leakage with Pyothorax : A Case Report

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## T-Tube Drainage and Intercostals Muscle Flap Reinforcement for the Management of Intrathoracic Esophago-Gastric Anastomotic Leakage with Pyothorax : A Case Report

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#### Abstract

We herein report a case of mediastinitis with left pyothorax due to anastomotic leakage after totally laparoscopic proximal gastrectomy (TLPG) successfully managed by T-tube placement and intercostal muscle flap reinforcement. A 51-year-old man, who had undergone a TLPG at a referring hospital, was referred for fever, elevated inflammation markers, and pleural effusion on postoperative day 3. A computed tomography (CT) scan revealed mediastinitis with left pyothorax caused by anastomotic leakage. An emergency operation was performed through a left thoracotomy. After an irrigation of the thoracic cavity and a decortication of the pleura, we found a perforation in the left side of the anastomosis. We decided to insert a T-tube through the perforation and performed intercostal muscle flap reinforcement. He got acute respiratory distress syndrome but recovered after treatment in Intensive Care Unit for 24 days. Oral intake was started on day 45 and he was discharged on day 71. A T-tube drainage and wrapping with the intercostal muscle flap is a useful choice of treatment for intrathoracic anastomotic leakage with severe inflammation.

Key words : T-tube · Intercostals muscle flap · LAPG · Anastomotic leakage · Pyothorax

#### Introduction

An esophago-gastric anastomotic leakage in the mediastinum may cause life-threatening complications, such as pyothorax and mediastinitis<sup>1)</sup>. We report herein a case of an anastomotic leakage with severe mediatinitis and left pyothorax after totally laparoscopic proximal gastrectomy (TLPG) successfully managed by a T-tube placement and intercostal muscle reinforcement.

#### **Case presentation**

A 51-year-old man, who had undergone TLPG for an early cancer of the gastric cardia with

esophageal invasion at a referring hospital three days before, was referred for high fever, pleural effusion and elevated inflammatory reaction. At the time of admission, the patient suffered from systemic inflammatory reaction syndrome (SIRS). He showed sinus tachycardia and tachypnea, and the laboratory data demonstrated an elevated white blood count (13.8 x  $10^9$ /L) and C-reactive protein (22.2 mg/dL). A computed tomography (CT) scan showed fluid collection in both the mediastinum and the left thoracic cavity. An upper gastrointestinal series revealed an anastomotic leakage at the esophago-gastric anastomosis.

An emergency operation was performed

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Fig. 1 (A) There were abundant dirty effusion in the thoracic cavity and the pleura was covered with purulent fibrous materials. (B) The arrow points a 24Fr T-tube inserted through the perforation. (C) The arrow points a 6th intercostal muscle flap. (D) The anastomosis was wrapped with a flap.



Fig. 2 Total six drainage tubes were inserted into the mediastinum and the bilateral thoracic cavity. #1 was T-tube inserted through the perforation. #2 and #3 were drainage tube inserted in front and back of the anastomosis through left thoracic cavity. #4 and #5 were also drainage tube inserted into mediastinum through neck and abdomen. #6 and #7 were chest tube inserted into the right and left thoracic cavity.

through a left anterolateral thoracotomy at the sixth intercostal space. There were abundant dirty effusion in the thoracic cavity and the pleura were covered with purulent fibrous materials (Fig. 1A). Then an irrigation of the thoracic cavity

and a decortication of the purulent pleura were performed. The anastomosis was located in the lower mediastinum and a perforation, which was approximately five millimeters in length, was found in the left side of the anastomosis. As the tissue around the perforation seemed to be too weak to suture primarily, a 24Fr T-tube was inserted through the perforation (Fig. 1B) and the anastomosis was wrapped with a 6<sup>th</sup> intercostal muscle flap (Fig. 1C, D). Then we opened and irrigated neck through upper mediastinum because the patient's neck skin appeared reddish. 16Fr double lumen tube was inserted from neck to anastomotic site through mediastinum. We also performed laparotomy and irrigated around esophageal hiatus. 8mm multi drainage tube was inserted from right upper abdomen to esophageal hiatus. Total six drainage tubes were inserted into the mediastinum and the bilateral thoracic cavity (Fig. 2).

He got a respiratory distress syndrome after the surgery and needed an intensive care for 24days. The T-tube was exchanged for a Nelaton catheter on day 38, and the Nelaton catheter was removed on day 55. Oral intake was started on day 45 and he was discharged on day 71.

#### Discussion

Perforation of the thoracic esophagus is a life-threatening condition that may rapidly progress to fatal mediastinitis, peritonitis, and septic shock. Thus, an early diagnosis and appropriate treatment are essential. Late (> 24hrs) recognition of an esophageal perforation is a very difficult clinical challenge, with a mortality as high as  $50\%^{2}$ . In this case, the duration from occurrence of the leakage to treatment was over 72 hours.

The choice of management depends on a number of factors, including etiology, location of the perforation, condition of the surrounding tissue, the patient's general condition, and the length of time from injury to diagnosis. There are a wide range of surgical repair options, including primary suture repair, reinforced primary repair with pleural, omental, or intercostal flaps, T-tube drainage, diversion and exclusion procedures, and esophageal resection with either immediate or delayed reconstruction<sup>2)</sup>. In this case, because of the late diagnosis, the tissue around the anastomosis was too weak to close primarily. Therefore, we decided to use T-tube drainage and intercostals muscle flap reinforcement. T-tube can decompress the pressure of intra gastroenterological tract and promote fistulization.

Although there is no report on the use of T-tube to treat the intrathoracic anastomotic leakage, there were 42 case reports on the insertion of T-tube to treat the esophageal perforation<sup>2)~14</sup>). The prognosis of patients treated with T-tube drainage has been reported to be favorable, but it depends on the time from the injury to the treatment. There was no mortality in patients who treated within 24 hours from the injury, while it is reported that 4 of 27 patients who treated after 24 hours died. These results indicate again that the early diagnosis and treatment is extremely important. However, the data also suggest that T-tube drainage is still useful to treat the cases with late diagnosis. We

performed intercostal muscle flap reinforcement because the patient's general condition was so poor that another leakage might make him fatal. The intercostal muscle flap is less invasive and can be performed in patients with poor general condition.

In summary, we report a case of anastomotic leakage with severe mediastinaitis and left pyothorax after TLPG successfully managed by T-tube placement and intercostal muscle flap reinforcement. Both an early diagnosis and treatment, and additional treatment corresponding to general condition are essential to save patients with leakage in mediastinum after TLPG.

#### References

- McMahon MA, O'Kelly F, Lim KT, Ravi N and Reynolds JV : Endoscopic T-tube placement in the management of lye-induced esophageal perforation : Case report of a safe treatment strategy. Patient Saf Surg. 14 ; 3 : 19, 2009.
- 2) Griffiths EA, Yap N, Poulter J, Hendrickse MT and Khurshid M : Thirty-four cases of esophageal perforation : the experience of a district general hospital in the UK. Dis Esophagus. 22 : 616-625, 2009.
- Larsson S, Pettersson G and Lepore V : Esophagocutaneous drainage to treat late and complicated esophageal perforation. Eur J Cardiothorac Surg. 5 : 579–582, 1991.
- 4) Linden PA, Bueno R, Mentzer SJ, Zellos L, Lebenthal A, Colson YL, Sugarbaker DJ and Jaklitsch MT : Modified T-tube repair of delayed esophageal perforation results in a low mortality rate similar to that seen with acute perforations. Ann Thorac Surg. 83 : 1129–1133, 2009.
- Lee TC, Dreyer ZE and Brandt ML : Conservative surgical treatment of a profoundly immunosuppressed pediatric patient with Boerhaave syndrome. J Pediatr Hematol Oncol. 27 : 616–617, 2009.
- Andrade-Alegre R : Surgical treatment of traumatic esophageal perforations : analysis of 10 cases. Clinics (Sao Paulo). 60 : 375–380, 2005.
- Port JL, Kent MS, Korst RJ, Bacchetta M and Altorki NK : Thoracic esophageal perforations : a decade of experience. Ann Thorac Surg. 75 : 1071–1074, 2003.
- 8) von Rahden BH, Feith M, Dittler HJ and Stein

HJ : Cervical esophageal perforation with severe mediastinitis due to an impacted dental prosthesis. Dis Esophagus. 15 : 340–344, 2002.

- 9) Seki H, Ueda T and Shibata Y : Spontaneous esophageal perforation related to a duodenal ulcer with pyloric stenosis : report of a case. Surg Today. 31 : 1082–1086, 2001.
- Bufkin BL, Miller JI Jr and Mansour KA : Esophageal perforation : emphasis on management. Ann Thorac Surg. 61 : 1447–1452, 1996.
- 11) Andrade-Alegre R : T-tube intubation in the management of late traumatic esophageal perforations : case report. J Trauma. 37 : 131-132, 1994.
- Lee YC, Lee ST and Chu SH : New technique of esophageal exclusion for chronic esophageal perforation. Ann Thorac Surg. 51 : 1020–1022, 1991.
- Gouge TH, Depan HJ and Spencer FC : Experience with the Grillo pleural wrap procedure in 18 patients with perforation of the thoracic esophagus. Ann Surg. 209 : 612–619, 1989.
- 14) Symbas PN, Hatcher CR Jr and Harlaftis N : Spontaneous rupture of the esophagus. Ann Surg. 187 : 634–640, 1978.

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(和文抄録)

## 噴門側胃切除後の縫合不全に対し T-tube 留置, 肋間筋弁被覆が有効であった一例

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【症例】51歳男性.前医にて胃噴門部早期胃癌に対し完全鏡視下噴門側胃切除施行.術後3日目発 熱,胸腔ドレーン排液の混濁化,炎症反応上昇あり,縫合不全による縦隔炎・左膿胸の診断で,再 手術目的で当科紹介.開胸すると胸腔内全体に混濁した胸水貯留,左肺全面が醸囊胸膜に覆われて おり,これを剥離し洗浄した.吻合部左側に5mmの穿孔部が2個連続しており entry hole の縫合 不全と考えられた.高度の炎症により周囲の組織は脆弱で縫合閉鎖は不可能であり,T-tube24Fr を縫合不全部から挿入し,吻合部に留置した.縫合不全部近傍の組織を可及的に縫合閉鎖した上で, その周囲を覆うように肋間筋弁にて被覆した.左胸腔ドレーンを計4本留置し手術を終えた.術 後は長期の集中管理と胸腔ドレーンからの洗浄,入れ替えを必要としたが,徐々に炎症は改善し, 当院術後71日目に退院した.

【まとめと考察】噴門側胃切除術後縫合不全に対し,T-tube 留置と肋間筋弁被覆が有効であった症例を経験した. 食道浸潤を伴う胃癌に対する噴門側胃切除後の縫合不全は縦隔炎・農協を来たし致死的になりうる.T-tube 留置と肋間筋弁被覆は脆弱化した吻合部を安全に瘻孔化でき,膿胸を合併した縫合不全の治療に有用と考えられた.