

## Spontaneous Rupture of the Esophagus Successfully Treated by T-Tube Drainage : Report of a Case

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### ABSTRACT

A case of spontaneous rupture of the esophagus was successfully treated by a T-tube drainage method with chest drainage, gastrostomy, feeding jejunostomy and intravenous high caloric feeding.

Our suggested treatments for spontaneous perforation of the esophagus are as follows: (1) Primary direct closure of the tear may be performed in an early case. It is important to place a drainage tube near the closure and to make a gastrostomy and a feeding jejunostomy. (2) Fundic patch method may be useful in a delayed case in which the time for primary direct closure of the tear is considered too late. (3) In a more delayed case such as ours, adequate drainage, including a T-tube, should be instituted.

*Key Words: T-tube; esophageal rupture*

Spontaneous rupture of the esophagus is a rare disease that usually occurs with a sudden onset of chest pain and epigastralgia secondary to violent retching and vomiting. It is usually fatal if untreated; therefore, early diagnosis and treatment are imperative. A diagnosis is usually not difficult if one thinks of it, because its clinical and physical features have some characteristic findings. Actually, because of its rarity, many cases of this disease are misdiagnosed and do not receive prompt surgical attention. The mortality rate still remains high, although it is improving with advance in surgical technique and other supportive measures such as intravenous high caloric feeding and closed chest drainage.

## CASE REPORT

Case: R.N., 52-year old man.

Chief Complaint: Severe chest pain and dyspnea.

Present Illness: The patient was in his usual good health until 10:00 PM on February 11, 1977, when he suddenly developed severe chest pain and dyspnea after heavy drinking. He denied vomiting but details were vague in the patient's mind. Because of increasing distress, after a house call, the patient was referred to the Nagato Central Hospital at 11:00 PM with a diagnosis of myocardial infarction.

Family History: Not remarkable.

Past History: Pulmonary tuberculosis at the age of 20.

Habits: Eating habits good, heavy drinker.

Physical Examination: The patient was in extreme chest pain. He had blood pressure of 110/70 Torr, pulse rate 120/min, respiratory rate 32/min and temperature 36.7°C. There was a slight respiratory lag of the left lower chest with decreased breath sounds. Electrocardiogram was within normal limits. The upper abdomen was slightly distended but no muscle rigidity was found. No subcutaneous emphysema was visible.

Clinical Course: He was given morphine intramuscularly with no noteworthy benefit. Respiration gradually became labored and cyanosis of the lips and nail beds appeared early next morning. The left chest was dull to percussion and no breath sounds were heard. The chest x-ray taken at 7:00 AM showed hydropneumothorax on the left and deviation of the mediastinum to the right (Fig. 1). Plain film of the abdomen disclosed marked gastric dilatation (Fig. 2). Shortly after the x-ray examination, he went into shock. Two large trocars were inserted into the pleural cavity and 2,500 ml of serosanguineous fluid including undigested food was aspirated. Thus, a diagnosis of spontaneous rupture of the esophagus was made 10 h after onset. The patient's general condition, when the diagnosis was made, was considered too ill to undergo thoracotomy. Continuous chest suction through aforementioned trocars was made. The patient's general condition gradually improved. On the 2nd hospital day, he was given a small amount of contrast medium, gastrografin, which was seen to extravasate from the esophagus into the left pleural cavity just above the diaphragm, confirming the diagnosis of spontaneous rupture of the esophagus (Fig. 3). Gastrostomy and a feeding jejunostomy were performed on the afternoon of the same day. X-ray film of the chest on the 3rd hospital day suggested the effective drainage of the left pleural cavity. The patient remained afebrile until the 6th hospital day, when his temperature rose to 39.0°C and leucocytosis appe-

ared. Left posterolateral thoracotomy was performed on the 7th hospital day under the diagnosis of pyothorax. The left pleural space contained a large amount of brownish-yellow turbid fluid. The pleura was markedly thickened and covered by fibrinous membrane, pus and undigested food. Partial mobilization of the esophagus revealed a 2 cm longitudinal perforation of the posterolateral wall of the esophagus 3 cm above the diaphragm. The wall adjacent to the tear was hyperemic and necrotic. After thorough irrigation of the intrapleural cavity with warm saline, a biliary T-tube was placed through the esophageal perforation and the T-limb was anchored to the top of the diaphragm by catgut sutures. Another two large drainage tubes were inserted; one placed posteriorly in the pleural cavity and the other near the perforation (Fig. 4). The T-tube, two thoracotomy tubes and gastrostomy tube were suctioned continuously. Large doses of antibiotics were administered. Intravenous high caloric feedings were started on the same day. Tube feeding through the jejunostomy was attempted in several occasions but met with intractable diarrhea and discontinued. High fever appeared occasionally and severe herpes zoster on the right chest wall was a complication from the 10th postoperative day. The white blood cell count, however, gradually decreased. The posteriorly placed thoracotomy tube was removed on the 11th postoperative day. On the 20th postoperative day, a contrast medium was injected into the T-tube and the thoracotomy drainage tube to examine the extent of pyothorax. The contrast medium flowed from the perforated portion upward in the pleural cavity, which was well encapsulated (Fig. 5). Because the oral stem of the T-tube had dislocated from the esophageal lumen, it was removed along with the thoracotomy tube. A Nelaton catheter was inserted through the esophago-pleuro-cutaneous fistula. Although this Nelaton catheter was connected to suction, no noteworthy drainage was obtained. Oral feeding was started on the 27th postoperative day with no evidence of leakage through the Nelaton catheter. The gastrostomy and the feeding jejunostomy were closed and the Nelaton catheter was removed on the 33rd postoperative day. Esophagogram on the 55th postoperative day revealed closure of the esophago-pleuro-cutaneous fistula with a remaining esophageal diverticulum-like protrusion (Fig. 6). The patient was discharged on the 75th postoperative day (Fig. 7). The esophagogram 6 mo after surgery showed a smaller protrusion compared to that during hospitalization (Fig. 8, A). After one yr, however, a stricture proximal to the perforation appeared (Fig. 8, B). Similar appearance of the esophagus was also demonstrated in the two-yr follow-up esophagogram (Fig. 8, C). The patient however, has been doing well without any evidence of passage disturbance of the

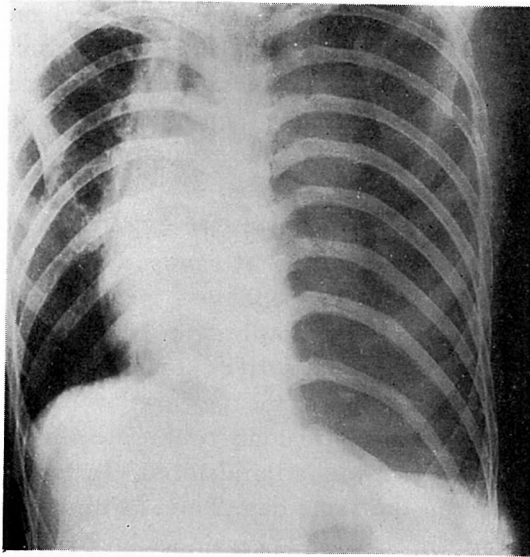


Fig. 1. Chest x-ray 10 h after onset, showing left hydropneumothorax and deviation of the mediastinum to the right.

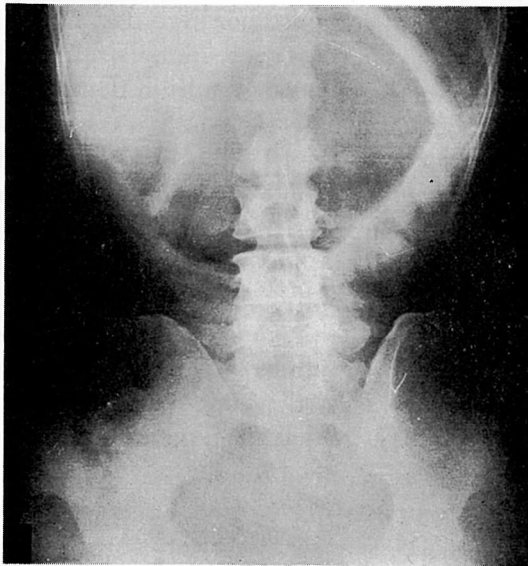


Fig. 2. Abdominal plain film 10 h after onset, demonstrating a marked gastric dilatation.



Fig. 3. Chest x-ray after a swallow of gastrografin, showing passage of contrast medium from the esophagus into the left pleural cavity.

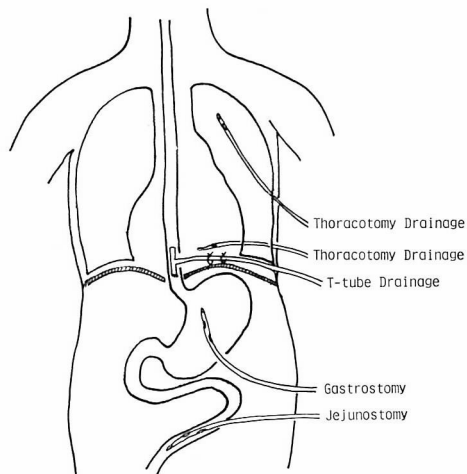


Fig. 4. Schematic illustration of the surgery. Gastrostomy and feeding jejunostomy on the 2nd hospital day. T-tube drainage with thoracotomy tube on the 7th hospital day.



Fig. 5. Chest x-ray on the 20th postoperative day. Contrast medium flowing from the perforated portion upward in the pleural cavity.

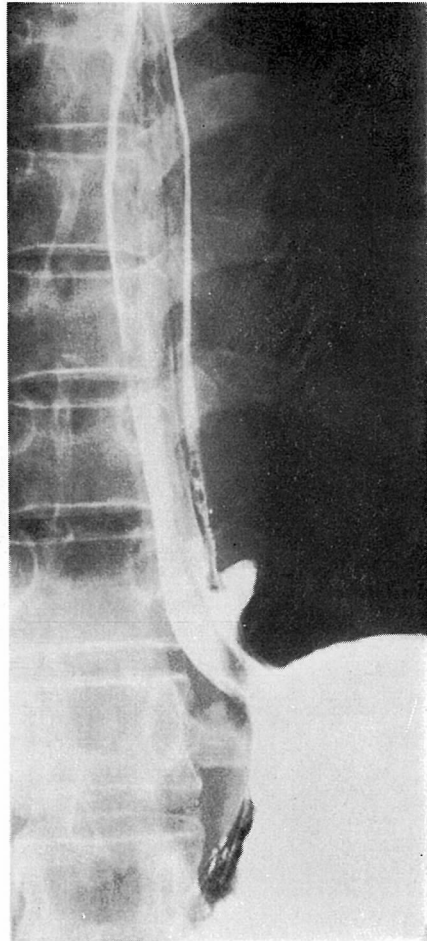


Fig.6. Esophagogram after the 50th postoperative day, showing closure of the esophago-pleuro-cutaneous fistula and a remaining esophageal diverticulum-like protrusion.

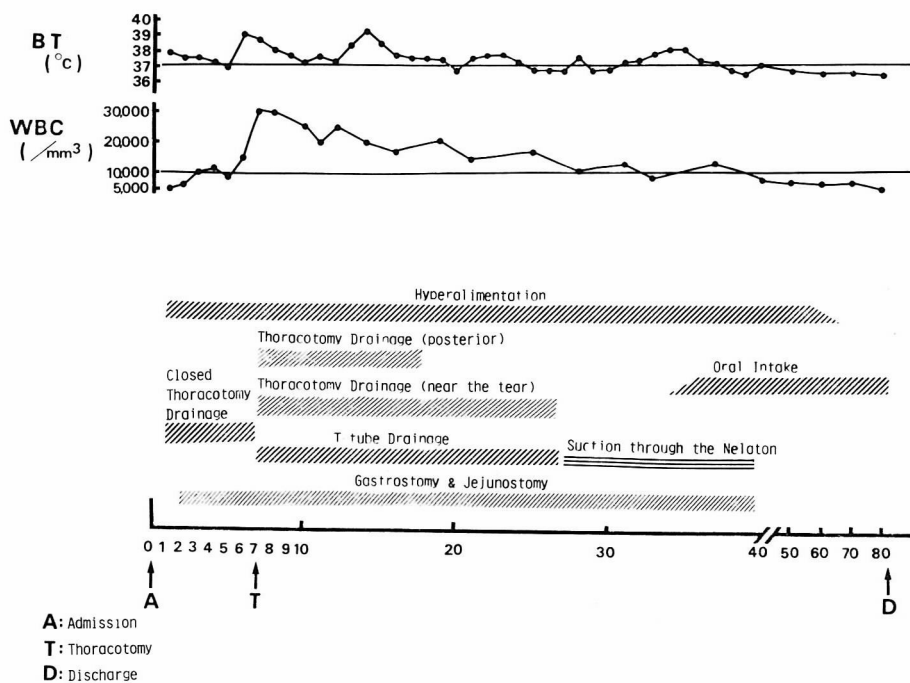


Fig. 7. Clinical course.

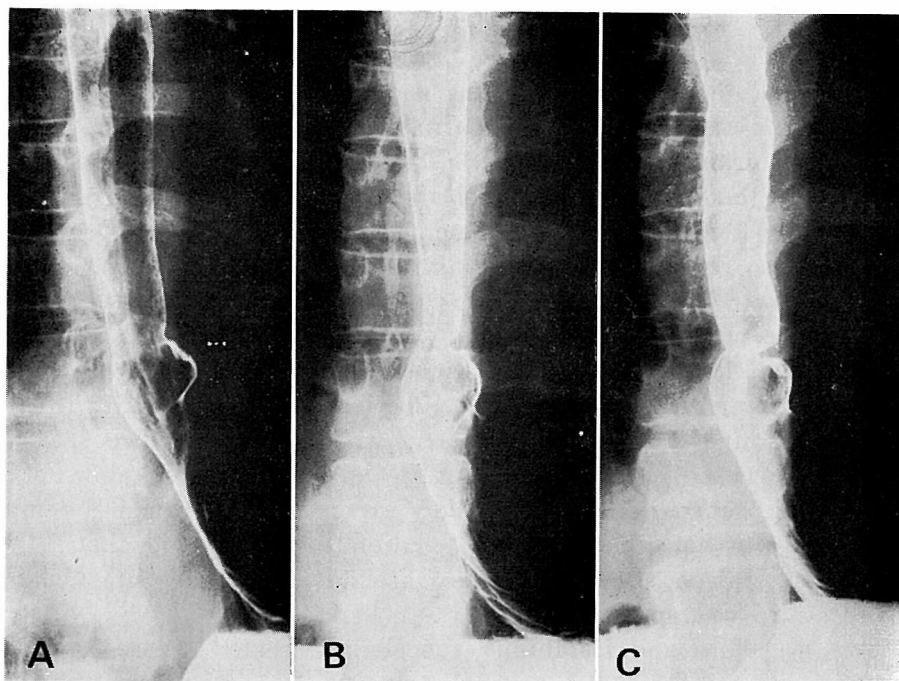


Fig. 8A Esophagogram 6 mo after surgery, showing a smaller protrusion.  
 Fig. 8B One yr after surgery. Stricture just above the perforation.  
 Fig. 8C Two yr after surgery. Almost the same as that of one yr,

esophagus.

## DISCUSSION

Excellent detailed reviews about spontaneous rupture of the esophagus have been published by Derbes and Mitchell<sup>1)</sup> in 1956, Anderson<sup>2)</sup> in 1957 and Abott et al.<sup>3)</sup> in 1970. In this paper, we would like to focus our discussion to problems in the treatment for this disease.

Derbes and Mitchell<sup>1)</sup> reported that only 35% of untreated patients survived for 24 h, only 11% of 48 h, and all were dead at the end of one week. On the other hand, 35 out of 55 surgically treated patients survived, a mortality rate of 36%. Anderson<sup>2)</sup> stated that early deaths were due to shock, tension pneumothorax or possibly hemorrhage, whereas later deaths were due to pleural or mediastinal infections. Although the prognosis is influenced by the size and position of the rupture, death is almost certain to occur unless the diagnosis is made and adequate treatment is carried out as early as possible. Recently a few cases, in which the rupture was minute, were successfully treated by conservative therapy, such as closed chest drainage and intravenous high caloric feeding<sup>4)</sup>.

Treatments suggested in the literature are as follows; (1) direct closure of the tear, (2) fundic patch method, (3) a T-tube drainage, (4) closed chest drainage by tube insertion or surgical thoracotomy and (5) esophagectomy.

Direct closure of the tear seems to offer the best result if an early diagnosis is made. Samson<sup>5)</sup>, comparing the outcome of direct closure with that of drainage, stated that direct closure was superior to drainage. He reported that 10 out of 15 cases treated by direct closure survived, whereas only 8 out of 15 cases treated by drainage survived. Derbes and Mitchell<sup>1)</sup> also reported that 70% survived after direct closure, whereas only 33%, with drainage. Samson<sup>5)</sup>, however, stated that the first 15 h after rupture was the critical period for applying direct closure. Abott et al.<sup>3)</sup> stated that 12 h was the critical period. On the other hand, Mori et al.<sup>4)</sup> analyzing 59 Japanese cases, reported that the mortality in cases treated by drainage was 36.5% (8/22), whereas that of direct closure was 61.1% (11/18). Mori et al.<sup>4)</sup> also reported that break-down of the sutured site occurred in all 7 survivors except one, for whom a detailed description was not obtained. They, therefore, emphasized that it was important to place suction catheters around the suture site, when a direct closure was applied.

In 1964, Thal and Hatafuku<sup>6)</sup> successfully treated a case in which



the esophageal perforation was patched with gastric fundus extruded through the widely incised esophageal hiatus. This method is based upon the principle of secondary wound closure. The inflamed esophageal wound is covered by the highly vascular gastric wall, providing an ideal framework for granulation and the ingrowth of esophageal mucosa. Thal<sup>7)</sup> reported that 4 out of 5 cases treated by this technique survived following the first successful case in 1964. This fundic patch method can be applied to a delayed case in which the time good for primary direct closure of the tear has been passed.

Abott et al.<sup>3)</sup> reported cases successfully treated by their unique technique, a T-tube method. The fundamentals of this procedure involve placement of a large, soft T-tube down through the esophagogastric junction, a drainage gastrostomy and a feeding jejunostomy. In their personal series of 47 cases, 13 were treated by direct closure with a mortality rate of 62%, whereas their T-tube drainage method was applied to 10 cases in whom 4 died.

Abott et al.<sup>3)</sup> also reported that of 10 cases managed only by closed chest drainage 6 survived. We also attempted to manage our patient by closed chest drainage with a gastrostomy and a feeding jejunostomy until the 7th hospital day, when pyothorax occurred and open thoracotomy became obligatory.

Esophagectomy seems to be too aggressive to apply when consider postoperative distress and recent advances in other supportive therapies.

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