

## Tracheoesophageal Fistula in the Treatment of Gastric Variceal Hemorrhage with Sengstaken-Blakemore Tube

The Sengstaken-Blakemore tube (SB tube) is used to control esophageal or gastric variceal bleeding in emergencies, and various complications have been reported following its use. Tracheoesophageal fistula (TEF) is an extremely rare complication after SB tube insertion. We herein present a case of an 80-year-old female patient who experienced TEF after repeated insertion of the SB tube to control recurrent gastric variceal hemorrhage. (**Korean J Helicobacter Up Gastrointest Res 2012;12:188-191**)

**Key Words:** Tracheoesophageal fistula; Sengstaken-Blakemore tube; Variceal hemorrhage

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### INTRODUCTION

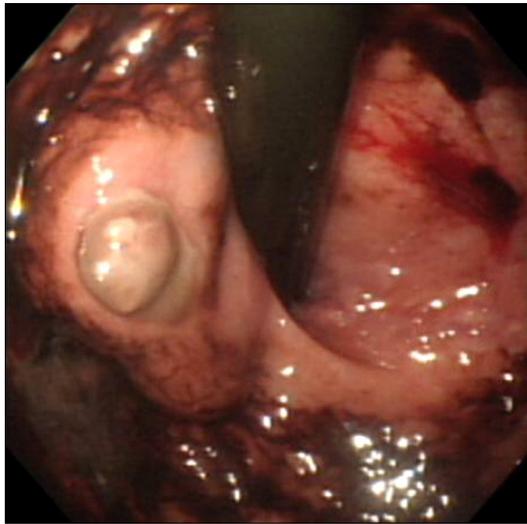
Tracheoesophageal fistula (TEF) is a state of abnormal communication between the esophagus and the trachea. It is caused by many reasons, including esophageal cancer, tuberculosis, trauma, and diverticula in adults.<sup>1</sup> It may also occur as a result of iatrogenic causes, but this is a quite rare complication. We herein report a case of an 80-year-old female patient who experienced TEF after undergoing repeated insertion of the Sengstaken-Blakemore tube (SB tube) to control recurrent gastric variceal bleeding.

### CASE REPORT

An 80-year-old woman was admitted to the hospital for mas-

sive hematemesis and hematochezia. The patient presented with intermittent hematemesis and hematochezia of 4 days. She was diagnosed with hepatitis B viral infection 30 years ago, but had never undergone any further evaluation or treatment. At the time of visit, vital signs were blood pressure 88/53 mmHg, pulse rate 129 beats/minute, respiratory rate 25 breaths/minute, the body temperature 36.6°C. On physical examination, pale conjunctivae, massive ascites, but no hepatosplenomegaly were observed. Laboratory findings were as follows: white blood cell count was 143,700/mm<sup>3</sup>, hemoglobin 7.3 g/dL, hematocrit 22.3%, platelet count 109,000/mm<sup>3</sup>, BUN 44.6 mg/dL, creatinine 1.16 mg/dL, total protein 5.38 g/dL, albumin 2.22 g/dL, AST 115 IU/L, ALT 77 IU/L, total bilirubin 1.42 mg/dL, direct bilirubin 0.43 mg/dL, ALP 158 IU/L, GGT was 79 IU/L, PT was 17.3 sec (control: 10~14 seconds), aPTT 35.4 sec (control: 23~35 seconds), AFP 113.1 ng/mL, and HBsAg positive.

Resuscitation was performed with normal saline, packed red cells, fresh frozen plasma, and somatostatin. We couldn't carry out the endoscopic examination of the patient because her vital sign was unstable and she didn't cooperate. The SB tube was inserted with 300 mL of air inflation in the gastric balloon and 38 mmHg of pressure applied to the esophageal balloon. On the second hospital day, the SB tube was deflated and removed to perform esophagogastroduodenoscopy, which revealed an approximately 0.8 cm sized gastric varix with ulcer at the cardia

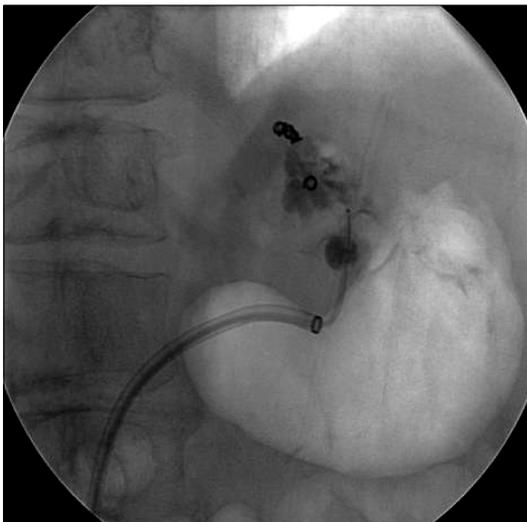


**Fig. 1.** Initial esophagogastroduodenoscopic finding showed approximately 0.8 cm sized gastric varix with ulcer at the cardia.

(Fig. 1). Diet was started with liquid food on the 6th hospital day as there was no evidence of active bleeding or oozing on the following endoscopy.

An abdominal computerized tomographic scan showed advanced liver cirrhosis with gastrosplenic shunt, and a 1.7 cm sized probable hepatocellular carcinoma in segment 4a. On the 20th hospital day, balloon-occluded retrograde transvenous obliteration (BRTO) was performed, but only partial embolization with microcoils was possible because there were too many afferent vessels to identify and the extravasation of contrast material blocked the field of view (Fig. 2). The patient was stable and no more signs of bleeding were observed after BRTO.

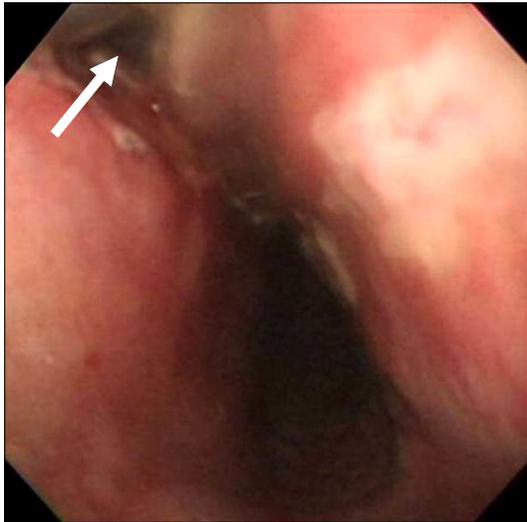
On the 26th hospital day, the patient experienced massive hematemesis and fell into hypovolemic shock. Immediately the SB tube (300 mL for the gastric balloon and 45 mmHg for the esophageal balloon) was inserted, and resuscitation was started with blood transfusion and other supportive care. Her vital signs were stable, but the SB tube could not be removed because the laboratory findings were getting worse and there were repetitive episodes of bleeding (hematochezia and melena). On three days after the second insertion, the SB tube was removed temporarily because the patient had complained of constant discomfort at the nose and throat. Two-and-a-half hours later, the SB tube was reinserted without any difficulty and inflated with 300 mL of air for the gastric balloon and 25 mmHg of pressure for the esophageal balloon. She was not agitated, and no respiratory distress was noted during the procedure. Chest radio-



**Fig. 2.** Fluoroscopic finding. Balloon-occluded retrograde transvenous obliteration was partially performed with two microcoils at the gastrosplenic shunt.



**Fig. 3.** Radiologic finding. Chest X-ray revealed the radiolucent gastric balloon at the left lung field.



**Fig. 4.** Follow-up esophagogastroduodenoscopic finding. It showed the tracheoesophageal fistula at 25 cm from incisor. Arrow indicated the location of the fistula.

graph which was performed soon after the SB tube insertion revealed a round radiolucent focus at the left lung field, and an esophageal injury was suspected (Fig. 3). Balloons were deflated immediately and the SB tube was withdrawn. On the following day, the esophagogastroduodenoscopy was performed, showing a TEF at about 25 cm from the incisor (Fig. 4). Endotracheal intubation was performed promptly to protect the airway, but her vital signs deteriorated gradually even with intensive and supportive care. She expired of sepsis-related multiple organ failure on the 31st hospital day.

## DISCUSSION

Gastric variceal bleeding is one of the most serious complications in liver cirrhosis. Gastric varices occur in 20~30% of portal hypertension patients, and the highest incidence is seen among patients with Child-Turcotte-Pugh class B or C.<sup>2</sup> The management of gastric variceal hemorrhage consists of volume resuscitation, pharmacologic therapies (vasoactive agents), endoscopic therapies (ligation or sclerotherapy), mechanical therapies (SB tube, Minnesota tube etc), transjugular intrahepatic portosystemic shunt, and shunt surgery.<sup>3</sup> The SB tube is used to control upper gastrointestinal bleeding, especially variceal bleeding when endoscopic and/or pharmacologic treatment fails to control, or effective emergency hemostasis is needed.<sup>4</sup>

It was impossible to carry out the endoscopic examination.

In addition, the patient wasn't cured enough by the pharmacological treatment, which we judged, was the cause of the continuous bleeding. So we inserted SB tube. The use of the SB tube has been associated with many complications. Common complications are aspiration, esophageal perforation, and pressure necrosis of the mucosa.<sup>5</sup> Among them, aspiration is the most common complication of the SB tube, occurring in approximately 10~20% of cases.<sup>6</sup>

TEF is an abnormal communication between the esophagus and the trachea, leading to serious and fatal pulmonary complications. It may occur as a result of both benign and malignant causes. Most benign cases are caused by complications of intubation and endotracheal cuff-related injury.<sup>7</sup> Blunt or penetrating trauma, radiation, operation, and caustic ingestion are also common causes. It may also occur as a result of cancer, tuberculosis, and diverticula.<sup>1</sup> The most common site of fistula is at the level of the trachea, but it can occur at the level of the bronchi and distal airways as well.<sup>8</sup> Diagnosis is made by endoscopy, bronchoscopy, and barium esophagram.<sup>7</sup> The treatment of TEFs is surgical repair in most cases, but endoscopic repair with glues also can be used in the case of a small fistulous tract.<sup>8</sup> The patient in this case had gastric variceal hemorrhage owing to the underlying hepatitis B related liver cirrhosis with Child-Turcotte-Pugh class C. The SB tube was inserted without any difficulties, and the position of gastric balloon was confirmed with auscultation, but the chest radiographic localization of the SB tube before full inflation of the gastric balloon was overlooked. The final diagnosis of TEF was confirmed by the esophagogastroduodenoscopy. We theorize that repeated and prolonged insertion (initially for about 24 hours, and then once again for about 72 hours) of the SB tube weakened the esophageal wall, and then the final insertion led to the development of the fistula.

This case demonstrates that repeated and prolonged insertion of the SB tube may weaken the esophageal wall, eventually resulting in a TEF. The SB tube should be kept for no longer than 48 hours, and routine chest radiograph should be taken soon after full inflation of the gastric balloon in order to confirm the position of the SB tube to prevent such complications.<sup>9</sup>

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