Case Report

Traumatic esophageal perforation by a self bougienage

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Abstract: The case report describes a 75-year-old female with esophageal perforation by a self bougienage. From a decade ago, she had performed an esophageal bougienage by herself with a 70 cm long self-made bougie whenever she suffered from food impaction. On the day of the accident, she went on an outing without carrying the bougie, she pushed a broken bough into her esophagus, eventually the bough perforated her thoracic esophagus. We found some food particles in a large mediastinal abscess cavity, and the perforated esophagus was repaired by interrupted sutures and reinforced with a pedicled intercostal musculopleural flap. We report an extremely rare case of esophageal perforation by a self bougienage.

Keywords: Esophageal perforation; esophageal bougie; mediastinitis

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Introduction

Traumatic esophageal perforation is a serious and life-threatening condition with a high mortality rate. Reported cases of non-iatrogenic esophageal perforation by trauma are commonly due to an external damage (a stab, a gunshot, or a swallowed glass injury, etc.), a fall-down and a traffic accident. The cases of esophageal perforation by oneself were extremely unusual except an esophageal injury during sword swallowing among the professional sword swallowers. We present a case of esophageal perforation by a self bougienage at a rare presentation that has not been reported yet.

Case presentation

A 75-year-old female visited our emergency medical center with a chest pain, a high fever and a respiratory difficulty that suddenly developed 2 days ago. On her past history, she had suffered from a pulmonary tuberculosis several decades ago, and multiple rib fractures with compression fractures of thoracic vertebrae due to fall-down, a year ago. She has been received a regular medication for a hyperthyroidism. For ten years, she had usually suffered a difficulty in swallowing, and performed a self bougienage with a 70 cm long self-made esophageal bougie without doctor's instructions (*Figure 1*). On the day of the accident, she did not take her own bougie, something blocked her esophagus during a meal, and she pushed it into her esophagus with a broken bough instead of the bougie. Eventually the bough perforated her mid-thoracic part of the esophagus.

At the emergency medical center, the arterial blood pressure was 160/100 mm Hg, the pulse rate was 136 per minute, the respiration rate was 28 per minute and the body temperature was 39.8 ℃. She had a palpitation, a decreased breathing sound on the right chest, and showed the severe subcutaneous emphysema on the neck, chest and abdomen. The chest radiograph and computed tomography showed an acute empyema with severe mediastinal emphysema and an abscess cavity on her right chest. On her blood examination, the WBC was 18,900/mm^3, the hemoglobin was 12.1 gm/dL. The esophagogram showed the dye (Gastrografin) leakage through the perforated esophageal hole about 1.0 cm upper from the carina (*Figure 2A*).

Posterolateral thoracotomy of the right side was performed through fifth intercostal space. We dissected

meticulously in order to avoid the injury to the edematous esophageal wall. On the lower part of the perforation, a large mediastinal abscess cavity about 10 cm long was found. As we opened the abscess cavity, a massive volume of whitish yellow pus gushed out with indigested food particles (sliced cuttlefish) (*Figure 2B*). After the traction of perforated esophagus with a rubber band and the sufficient debridement on the longitudinally perforated esophagus, we closed it vertically with interrupted 4-0 absorbable polyglactin sutures (mucosa), and interrupted 4-0 non-absorbable polypropylene sutures (muscle coat) in order to avoid the postoperative stenosis, and then wrapped it with a pedicled intercostal musculopleural flap for the prevention of suture dehiscence. We irrigated the mediastinum with warm 5,000 mL saline solution, then inserted two chest tubes: one was to the lung apex tracing the lateral part of the chest cavity and the other was near the perforated site for drainage (*Figure 3A*).

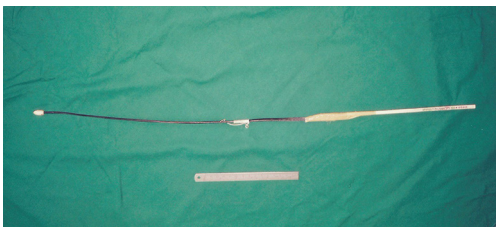

Figure 1 The self-made esophageal bougie. She made an own esophageal bougie by elongating the manufactured bougie with a long wooden stick.

During the postoperative days, she was treated with the total parenteral alimentation about 3,000 kcal per day and broad spectrum antibiotics through the central venous catheter. A week after the surgery, we performed the esophagogram with Gastrografin aqueous contrast. We checked the absence of leakage, and subsequently repeated the esophagogram with barium again (*Figure 3B*). After the esophagogram, we removed one of the chest tubes. She could sip only water for two days afterwards. We made sure of the normal vital signs, and then removed the mediastinal chest tube for her discharge on the following day.

Discussion

Esophageal perforation can be considered a relatively life-threatening injury with considerable morbidity and mortality. Nowadays, the overall mortality rate of esophageal perforation is decreasing with new advances in

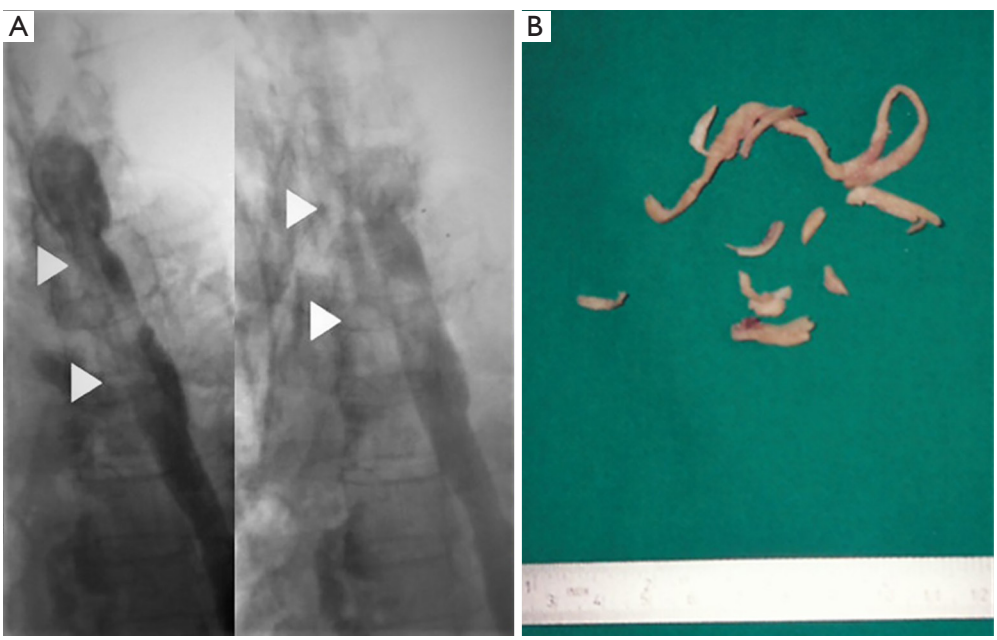

Figure 2 Preoperative and operative findings. (A) Preoperative esophagogram (with Gastrografin) showed the perforated site of esophagus (white arrows) about the upper 1.0 cm from the carina; (B) in the mediastinal abscess cavity, a massive volume of whitish yellow pus gushed out with indigested food particles (sliced cuttlefish).

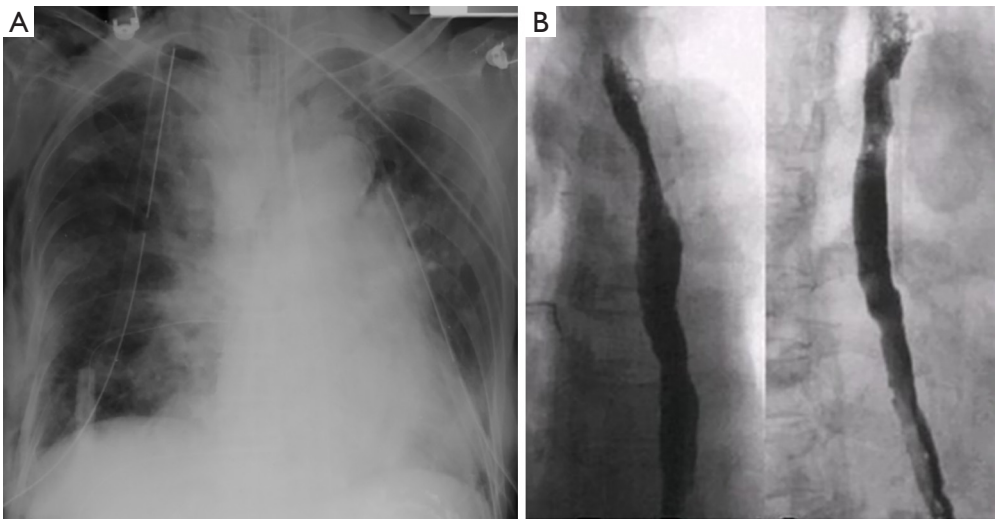

Figure 3 Postoperative findings. (A) Postoperative chest radiograph showed (I) two chest tubes in the right side: one was to the lung apex tracing the lateral part of the chest cavity and the other was near the perforated site for drainage, and (II) a chest tube in the left side: it was inserted in the Surgical Intensive Care Unit due to the pleural effusion; (B) postoperative esophagogram with barium showed no leakage of the perforated site of esophagus.

medical and surgical managements. However, there is no doubt about that early recognition and prompt surgical intervention have brought about a dramatic decrease in mortality. The location of the perforated site is an important factor in mortality. Particularly because the thoracic esophageal perforation is exposed to the mediastinum directly, the mortality rate is higher than that of the cervical esophageal perforation.

Iatrogenic injury is the most common cause of perforation (1,2). The incidence of this complication is 0.03–0.05% during a diagnostic endoscopy (2,3), but increases with the complexity of the procedure including a pneumatic dilation. Traumatic and spontaneous (barogenic) perforations are the next common cause of perforation. The cases of the esophageal perforation by trauma are usually in the form of an external trauma (a stab, a gunshot and a swallowed glass injury, etc.), a fall-down and a traffic accident. The unusual cases of the esophageal perforation due to sudden accidental hyperextension of the neck, compressed air to the oral cavity, working with a tank of compressed air, an esophageal hematoma in anti-coagulant therapy following blunt trauma and others (4,5) have been reported. Some curious reports by a self esophageal injury during sword swallowing (6,7) among the professional sword swallowers were found. But as far as we know, the esophageal perforation by self bougienage has never been reported yet.

Acknowledgements

None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Informed Consent: Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

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