A Case of Transgastrostomal Endoscopy to Diagnose and Treat Gastric Ulcer Bleeding

Jong-Min Kim, Jae-Kwon Jung, Hyun-Soo Kim, Sang-Myung Yeo, Ji-Hun Jang, Dong-Wook Lee
Division of Gastroenterology, Department of Internal Medicine, Daegu Fatima Hospital, Division of Gastroenterology, Department of Internal Medicine, Daegu Catholic University Medical Center, Daegu, Korea

Gastrostomy tube feeding is a common method to provide nutritional support for patients with inadequate oral intake. Gastrostomy tube feeding carries the risk for various complications, with percutaneous hemorrhage being a major complication. Gastric ulcer bleeding is a rare complication in these patients and few researchers have reported such events. There has been no case report of gastric ulcer bleeding diagnosed and treated by endoscopy through a mature gastrostomy tract in Korea. We describe here a case in which gastric ulcer bleeding was diagnosed and treated by a transgastrostomal endoscopy.

Key Words: Gastrostomy; Gastric ulcer hemorrhage; Transgastrostomal endoscopy

INTRODUCTION

Gastrostomy tube feeding is a commonly used to provide nutritional support for patients with inadequate oral intake. Several methods for placement of the gastrostomy tube have been described, including percutaneous radiologic gastrostomy (PRG), percutaneous endoscopic gastrostomy (PEG), and surgical gastrostomy.

PRG is a procedure using interventional radiologic techniques. It is a non-endoscopic procedure, which provides a viable alternative to PEG for patients in whom endoscopic access is unavailable.1

Although both PRG and PEG are usually considered safe procedures, gastric ulcers can occur in patients who have protruding tip for an extended period of time.

Adverse events associated with a gastrostomy tube are usually diagnosed and treated using a per-oral endoscopic approach. However, it is difficult to detect or treat properly for adverse events occurred in patients with per-oral endoscopic approach is not available. Therefore, some experts have reported the use of transgastrostomal endoscopy (TGE) for management through a mature gastrostomy tract in special situation.

Here, we report a case that gastric ulcer bleeding was diagnosed and treated by TGE via a mature percutaneous gastrostomy tract in a patient with an esophageal stricture.

CASE REPORT

The patient is a 46-year-old man who was referred to emergency room for further evaluation of hematemesis. The patient was quadriplegic, having sustained a cervical spine injury in a traffic accident 7 years ago. The upper esophageal stricture had progressed after cervical spine disectomy and interbody fusion (Fig. 1). The patient had undergone PRG at a private medical clinic 5 years ago. The patient had past medical history of melena at emergency room 3 years ago. The bleeding status was improved after prescribing a proton pump inhibitor without endoscopic approach as an endoscope could not be passed through the luminal stricture of the upper esophagus. Replacement of gastrostomy tube was performed using a 24-French balloon replacement tube (Wilson-Cook Medical, Winston-Salem, NC, USA) as the patient needed over the past 5 years when the tube was inadvertently pulled out (Fig. 2). The patient had medication history of choline alfoscerate for optic atrophy at
department of ophthalmology.

At the time of admission, the patient’s vital signs were as follows: blood pressure, 70/40 mmHg; pulse, 124 beats per minute; respiration rate, 22 breaths per minute; and body temperature 37.8°C. Physical examination revealed a pale conjunctiva. The initial laboratory tests were as follows: hemoglobin, 10.5 g/dL; BUN, 29.5 mg/dL; creatinine, 0.2 mg/dL; and positive occult blood in stool. The hemoglobin level further decreased to 8.5 g/dL within the first 8 hours post-admission.

Owing to the upper esophageal stricture, endoscopic examination was not possible through a transesophageal route. Thus TGE was performed through the transabdominal route after the gastrostomy tube was removed. 5.0-mm ultrathin endoscope (GIF-XP 260N; Olympus Optical, Tokyo, Japan) was used as the gastrostomy tract was not sufficiently large to accommodate the use of a conventional endoscope. The initial TGE revealed large amount of dark red blood clots within the body of the stomach. However, there was no evidence of active bleeding and he showed stable vital signs including respiration rate, blood pressure and heart beat. Thus, we made a decision to perform second TGE on the next day rather than proceeding with a radiologic intervention or emergent surgery. The second TGE revealed about 14×7 mm area of active ulceration on the posterior wall of stomach body with an exposed vessel and red pigments. A diluted epinephrine solution was injected submucosally around the area of ulceration to promote local hemostasis (Fig. 3). After the procedure, the tube was inserted and neither bleeding nor any other complications developed. Family members refused a follow-up TGE examination, opting for prescription of medication for treatment of gastric ulcer.

As the patient’s gastrostomy tube was dislodged 7 months after the procedure, we performed a follow-up TGE for surveillance, which revealed scarring stage S2 of benign gastric ulcer on the posterior wall of the body of the stomach. Cresyl violet stain was positive for Helicobacter pylori, and therefore, we planned to perform treatment for H. pylori eradication.

**DISCUSSION**

Stenosis of the upper esophagus is a rare complication of surgical treatment for cervical spinal fracture, likely...
arising from injury or perforation of the esophagus with hyperextension of the cervical spine. Such microperforations of the esophagus may not be detectable on plain radiographs early in their clinical course. One study reported that the incidence rate of esophageal stricture was high occurring in 54% of patients with cervical spine fracture. Therefore, the fluoroscopic approach is an alternative option to place the gastrostomy tube when endoscopic approach is unavailable. The gastrostomy, called as PRG, is a procedure that inserts a small tube through the skin directly into the stomach. The procedure is carried out by a radiologist who uses X-ray to guide the tube into the correct position.

Major complications such as peritonitis, bleeding, deep stomal infection, aspiration, sepsis, and displacement of the tube that require a repeated procedure are reported in 5.9% of cases of PRG. Minor complications such as superficial stomal infection, minor peritubal leakage, or tube dislodgement are 7.8% of cases in PRG.

Dislodgment of the feeding tube usually occurs because of deflation of the balloon at the end tip of the tube. Usually in these cases, the tube can be exchanged manually via the gastrostomy tract. With long-term use of the feeding tube, the tip of the balloon tube can compress the gastric mucosa on the posterior wall of the stomach, which can lead to a gastric ulcer and bleeding.

Nishiwaki et al. investigated newly developed lesions after PEG and the usefulness of TGE for management of patients who had undergone PEG. They reported incidence rate of 2.4%, with all lesions identified incidentally during TGE. However, there was no incidence of bleeding of gastric ulcers among their patient group.

In another retrospective study, gastric ulcers were reported in nine of 92 patients with gastrostomy tube, and in all nine, the ulcer was found on the posterior wall of the gastric body, where the tip of the PEG tube was attached. The occurrence of a gastric ulcer in their case series was associated with a PEG tube in patients with a protrusion of the tube ≥5 mm for the intragastric bumper, regardless of H2-blocker use and H. pylori infection.
Based on this evidence, Kanie et al. proposed that selection of an appropriate shape for the tube to ensure a short protruding tip may be crucial in preventing the development of a gastric ulcer after PEG placement. In our case, although the patient was infected by H. pylori, we suggest that the protruding tube of gastrostomy bumper caused gastric ulcer on the posterior wall of the stomach, just opposite the gastrostomy site.

Three years ago, we had opted to treat the patient conservatively for the melena as we were unable to pass either a conventional endoscope or ultrathin endoscope through the patient’s esophageal lumen because of upper esophageal stricture. For the current treatment of the hematemesis, the patient’s gastrostomy tract was sufficiently mature to use a transgastric approach. Once we had confirmed gastric ulcer bleeding, we injected an epinephrine solution to promote local hemostasis because the working channel of the ultrathin endoscope could not accommodate a hemoclip device or other coagulation device. We recognize that use of epinephrine therapy alone is not recommended, but rather should be combined with a second modality according to the practice guidelines of the American College of Gastroenterology. However, we gained the clear plan to treat the ulcer and the depth of the feeding tube insertion was closely monitored to prevent recurrence of a gastric ulcer on posterior wall of the body of the stomach. Recurrence of bleeding was not observed after treatment, and no other endoscopy-related complications including pneumoperitoneum, peritonitis, and peristomal infection, were observed.

Although the timeline of maturation of the stoma tract in humans has not been evaluated in a comprehensive way, the tract of PEG begins to mature 1–2 weeks after placement and it is well-formed by 4 weeks. Therefore, candidates for TGE are patients with a mature gastrocutaneous tract.

The use of TGE was first reported by Chaurasia and Chang who used a pediatric bronchoscope to insert a jejunal feeding tube through the PEG tract. Since then, transgastrostomal esophageal bougienage has successfully been performed in patients with severe esophageal stenosis without any complications. Two previously published reports have described successful introduction of an endoscope into the stomach through a mature percutaneous gastrostomy tract in special situations. In addition, the transgastrostomal approach has advantage of preventing asphyxia and esophageal mucosal tearing, unlike the peroral approach.

In conclusion, we propose that the transgastrostomal approach provides a safe alternative to per-oral endoscopy for diagnosis and further treatment of melena or hematemesis in patients with a mature gastrostomy tract when per-oral approach is unavailable.

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