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Case Report

Usefulness of percutaneous transesophageal gastrostomy for gastric outlet obstruction secondary to duodenal ulcer, a case report ☆☆☆★

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ABSTRACT

Severe duodenal ulcer stenosis requires continuous decompression, which makes oral ingestion difficult, yet poor nutritional status before surgery increases the risk postoperative complications. Double percutaneous transesophageal gastrostomy (dPTEG) is a new treatment that provides both decompression and enteral nutrition. We report a case of duodenal ulcer scar stenosis in which dPTEG was used for preoperative management. A man in his 40s visited our hospital with vomiting as a chief complaint. CT scan showed duodenal ulcer stenosis. As the existence of malignant disease could not be ruled out, surgery was planned. Before surgery, dPTEG was inserted to achieve decompression and nutritional management. The patient's gastric distension and nutritional status improved significantly, and laparoscopic distal gastrectomy was performed 22 days after the insertion. dPTEG may be an effective management method for patients with pyloric stenosis due to duodenal ulcer.

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Introduction

The incidence of peptic ulcer disease (PUD) has decreased significantly over the past several decades with the development of pharmacological agents such as H2 blockers and proton pump inhibitors (PPIs). Additionally, the discovery of *Helicobacter pylori* (*H. pylori*) as a leading cause of PUD and the development of treatments for it have reduced the need for surgical intervention [1]. Although endoscopic treatments such as balloon dilatation and stent placement have advanced [2], complications such as bleeding, perforation, and gastric outlet obstruction (GOO) require surgical intervention. One remaining problem is that cases with bowel obstruction require continuous gastric decompression, which makes oral nutrition difficult. Poor nutritional status before surgery increases the risk of anastomotic leakage [3].

Double percutaneous transesophageal gastrostomy (dPTEG) is a novel treatment that can achieve both gastric decompression and enteral nutrition. Previously, we reported that preoperative dPTEG was effective in gastric cancer patients with pyloric stenosis [4]. Here, we present the first reported case using dPTEG as preoperative management for gastric outlet obstruction secondary to duodenal ulcer.

Case report

A 40-year-old man with vomiting and abdominal distension was admitted to our hospital. Results of blood examination on admission demonstrated a low value of rapid turnover proteins (prealbumin 7.0 mg/dl, retinol 0.5 mg/dl, and transferrin 161 mg/dl, respectively), but no other abnormalities were found including tumor markers. CT scan showed, pyloric stenosis (Fig. 1). Upper gastrointestinal endoscopy was performed after decompression with a nasogastric tube, and an ulcer was found in the duodenal bulb. As no malignant findings were revealed through biopsy, scar stenosis due to repeated duodenal ulcer was suspected. Because the existence of malignant disease could not be completely ruled out,



Fig. 1 – Computed Tomography at admission. Significant gastric distension was seen. The arrow shows the constriction lesion.

surgery was planned. Before surgery, dPTEG was inserted to achieve both decompression and nutritional management.

Procedure

The procedure was performed under intravenous sedation and local anesthesia, using a PTEG catheter kit supplied by Sumitomo Bakelite Co. Ltd. (Tokyo, Japan). We confirmed that there were no blood vessels running under the puncture line by using cervical ultrasound imaging. A rupture-free balloon (RFB) catheter was inserted via the nasal cavity into the esophagus. Once in position, it was inflated with a dilute contrast material and punctured under ultrasound guidance (Fig. 2 A). A guidewire was inserted via the puncture needle and placed in the esophagus. The guidewire was released from the RFB catheter after deflation of the RFB. Thereafter, a 16-Fr dilator with a peeled-away sheath was inserted over the guidewire into the esophagus. The sheath and the guidewire were left in the esophagus and the dilator was removed. Through the sheath, a second guidewire (Pathfinder, Boston Scientific Japan, Tokyo, Japan) was inserted into the stomach, and the sheath was re-inserted over the first guidewire only. A 15-Fr, 90-cm PTEG tube was inserted over the first guidewire and through the sheath into the stomach. Using fluoroscopic guidance, a Radifocus Guidewire (0.035 inch [150 cm], 45° angle, Terumo Co., Ltd., Tokyo, Japan) attached to the PTEG tube was placed to the distal side over the stenosis, and the PTEG tube was then inserted to the third portion of the duodenum. Finally, a 12-Fr internal-external drainage catheter (Create Medic Co., Ltd., Kanagawa, Japan) was placed in the stomach over the second guidewire to serve as the gastric decompression tube (Fig. 2 B). Enteral nutrition was started at 480 kcal/day on the day after the procedure, and increased to 2000 kcal/day by day 5. An average of 333ml per day of drainage was observed from the decompression tube.

CT scan taken 5 days after the gastric tube insertion showed improvement in gastric distension (Fig. 3), and the patient's prealbumin, retinol, and transferrin levels were 7.0 mg/dl, 0.5 mg/dl, and 161 mg/dl, respectively. Laparoscopic distal gastrectomy was performed 22 days after this procedure. Reconstruction was performed according to the Billroth-II method. The feeding tube was removed during the operation, and the decompression tube was left in the remnant stomach. The operation time was 332 minutes, and operative blood loss was 5ml. The meal was started from 3 days after the operation, PTEG for decompression was removed after another 14 days. The residual gastrojejunostomy showed no anastomotic leakage, and the patient was discharged 20 days after the operation. Pathological findings revealed ulcer scar stenosis with no malignancy.

Discussion

PTEG was first developed in 1994 by Oishi to decompress the intestinal tract in cases of intestinal obstruction due to peritoneal carcinomatosis [5]. Since then, its indication has ex-

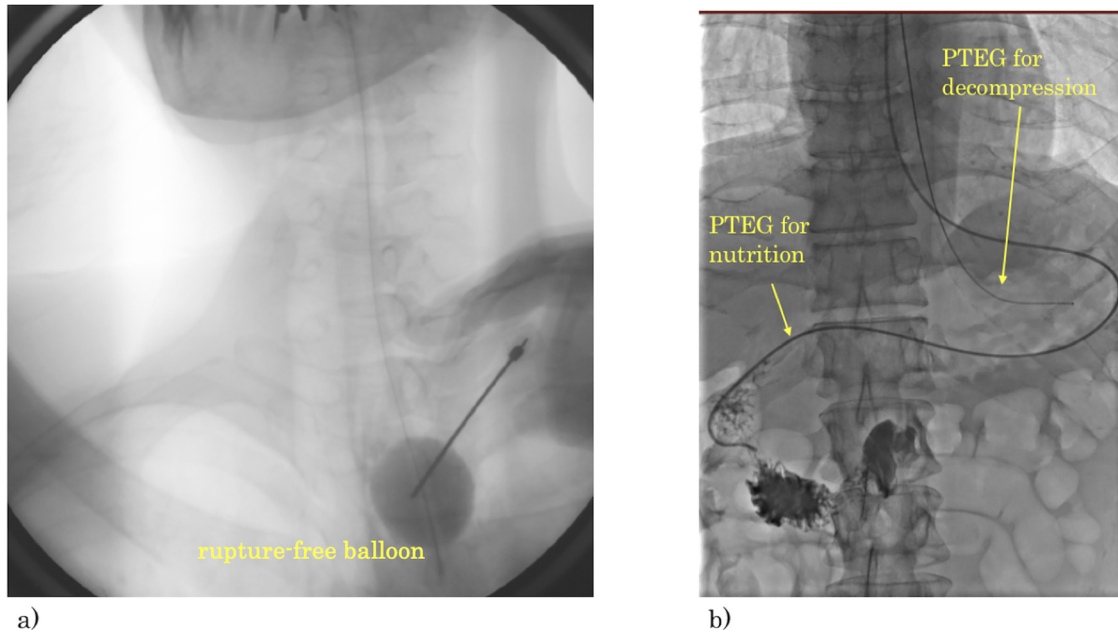


Fig. 2 – Procedure of dPTEG
RFB in the esophagus is punctured using ultrasound.
dPTEG was inserted to both oral and distal sides of the stenosis.



Fig. 3 – Computed Tomography after the procedure. Gastric distension was improved.

panded to enteral nutrition. Percutaneous tubing with ultrasound and fluoroscopy, has been shown to be a safe and effective alternative to PEG [6]. In addition, since the puncture site is on the distal side of the pharyngoesophageal junction, patients have less discomfort and pain associated with this procedure than with a nasogastric tube.

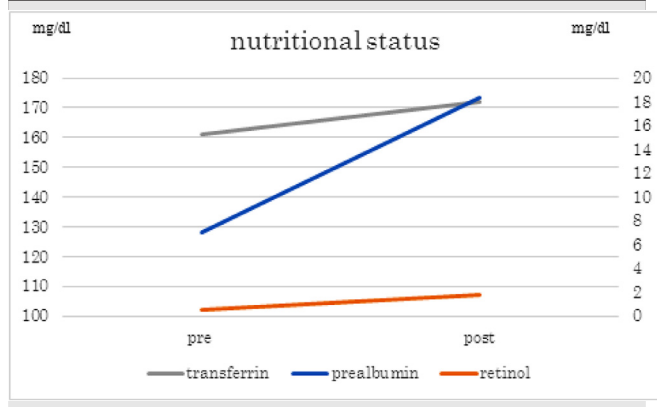
Benign gastric outlet obstruction (GOO) occurs in about 3% of PUD cases [1]. Recent research has shown that endoscopic balloon dilation combined with medical therapy yields favorable long-term outcomes; this is now considered the first-line treatment for benign GOO [7], although one-third of patients may ultimately require surgical intervention [8]. Patients are unable to take oral nutrition prior to healing, and their quality

of life (QOL) and nutritional status are poor due to frequent vomiting.

Conventionally, a nasogastric tube and intravenous nutrition or double elementary diet (W-ED) tube are used for the preoperative management for these patients. However, long-term placement of these tubes are difficult because of the poor tolerability, nasal bleeding, and risk of aspiration pneumonia. In fact, there is an RCT states that PTEG has a superior QOL over nasogastric tube [9]. In addition, intravenous nutrition alone is inferior to enteral nutrition and includes a risk of catheter infection [10].

Since surgery was planned in our present case, early decompression and enteral nutrition were thought to achieve better wound healing and to prevent postoperative complications. The European Society for Clinical Nutrition and Metabolism (ESPEN) guidelines state that malnutrition and undernutrition are risk factors for postoperative complications and that early enteral nutrition is especially relevant for any surgical patient at nutritional risk, especially those undergoing upper gastrointestinal surgery [3]. To avoid these problems, we selected dPTEG, which places a decompression tube to the oral side of the stenosis and a feeding tube to the distal side of the stenosis from the same wound in the neck. We used rapid turnover protein (RTP) as an index for nutritional status. Before the dPTEG procedure, the patient's nutritional status were poor. Twenty-one days after the procedure, it has improved considerably by using enteral nutrition from PTEG (Table. 1). We did not choose percutaneous endoscopic gastrojejunostomy (PEG-J) because we thought that adhesions would interfere with surgery.

This procedure has possibility of injury of thyroid gland and blood vessels. However, it is a relatively safe method when

Table 1 – How the nutrition status changed.

performed with ultrasound guidance by interventional radiologists. There is an original article of 115 cases, which reported that there were no major complications [6]. We believe that PTEG should be useful for almost all patients withstanding the nasogastric tube for a long time.

Conclusion

dPTEG is a safe and effective management technique for patients with gastric outlet obstruction due to duodenal ulcer.

Author contributions

Keigo Nakashima: data collection, formal analysis, interpretation, project administration, and writing the article. Hironori Ohdaira: conception, design, methodology, and critical revision of the article. All authors participated in revising the manuscript and all authors are in agreement with the content of the final manuscript. Yutaka Suzuki has given final approval of the version to be published.

Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethical statement

Not applicable

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