Percutaneous Transesophageal Gastrostomy Tube for Decompression of Malignant Obstruction: Report of the First Case and Our Series in the US

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BACKGROUND: Historically, surgical gastrostomies, gastrojejunostomy, and percutaneous endoscopic gastrostomy have been used palliatively. Recently, enteral stenting has also provided a means of reestablishing gastrointestinal flow in proximal and colonic obstructions.

STUDY DESIGN: Seven patients with known intraabdominal malignancy leading to gastrointestinal obstruction were evaluated for PTEG. Ultrasonography, fluoroscopy, and a rupture-free balloon were used in placement. An endoscope was not used. Consent was obtained from all patients. The procedure was performed by a single surgical endoscopist in an endoscopy suite. Patients had appropriate hemodynamic monitoring with pulse oximetry, and they were given preprocedure antibiotics and sedation.

RESULTS: PTEG was successfully placed and alleviated symptoms in all seven patients. One complication occurred; in the fourth patient subcutaneous emphysema developed on postoperative day 1, and was managed nonoperatively. All patients were discharged from the hospital.

CONCLUSIONS: PTEG is a safe and effective technique for decompression in malignant gastrointestinal obstruction.
(J Am Coll Surg 2005;201:695–700.)

Percutaneous endoscopic gastrostomy (PEG) was first described, for feeding purposes, by Ponsky and Gauderer[1-3] in 1980, and has become a general technique all over the world for placement of indwelling feeding and decompressive tubes. Relative contraindications to PEG placement exist and have led to development of the percutaneous transesophageal gastrostomy (PTEG) technique.[4,5]

PTEG was developed in Japan as an alternate route of access into the gastrointestinal tract. The device is placed in the cervical esophagus with use of transcutaneous ultrasonography and fluoroscopy. By avoiding placement into the abdominal cavity, certain contraindications of PEG can be overcome. This catheter has been shown to be safe and effective in enteral feeding, as documented in previous case series.[6-8] This article aims to support use of PTEG as a safe and effective alternative to PEG in patients with malignant obstruction.

Competing Interests Declared: None.

Received April 24, 2005; Accepted May 24, 2005.
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METHODS

On October 13, 2003 at the Cleveland Clinic Foundation, a 50-year-old woman with carcinomatosis and massive ascites from metastatic ovarian cancer underwent the first reported case of PTEG placement in the US. She had intractable nausea and vomiting resulting from malignant gastrointestinal obstruction. The other six patients, four women and two men, suffered from similar symptoms as a result of malignant obstruction. Patient characteristics, indications, and outcomes are summarized in Table 1.

Nasogastric tube decompression improved her symptoms. Once removed the obstructive symptoms recurred. All patients were managed with nasogastric decompression, except the fifth patient, who refused its placement and vomited ad libitum.

PTEG procedure is a minimally invasive technique using ultrasonography and fluoroscopy. PTEG catheter kit was supplied by Sumitomo Bakelite Co Ltd (Fig. 1). Procedures were performed in a well-equipped endos-

ISSN 1072-7515/05/$30.00
doi:10.1016/j.jamcollsurg.2005.05.036

Abbreviations and Acronyms

PEG = percutaneous endoscopic gastrostomy
PTEG = percutaneous transesophageal gastrostomy
RFB = rupture-free balloon

copy suite. All patients were sedated with intravenous medications in addition to a local anesthetic. All patients received preprocedural antibiotics. The patient is supine on a fluoroscopy table with the surgeon standing on the left side.

Abdominal ultrasonography was performed in all patients and confirmed ascites. A straight guidewire is inserted through the nose and into the esophagus and confirmed by fluoroscopy. The rupture-free balloon (RFB) is passed over the straight guidewire distal to the cricopharygeanus and inflated with dilute contrast media. The catheter is then positioned in the cervical esophagus above the level of the clavicle. Traction is then maintained on the balloon to keep it in the cervical esophagus. An ultrasonography transducer probe is used to identify the anterior neck structures on the left side, including internal jugular vein, carotid artery, and thyroid. The probe also locates the inflated RFB, which displaces the vessels laterally and the thyroid medially and superiorly. There is a risk of puncturing the internal jugular vein, as it will often be compressed with the ultrasonography probe, so the color Doppler mode of ultrasonography can be helpful to confirm location of the puncture site.

Local anesthetic is injected at the proposed catheter site over the RFB. Needle puncture into the RFB is performed under ultrasonographic guidance with a straight needle that has an outer sheath. Correct placement is confirmed by three criteria: resistance when the needle punctures the RFB, ultrasonographic visualization of the tip of the needle entering the balloon, and removal of the inner needle from the RFB yields contrast media (Fig. 2). Placement of the needle can also be confirmed by fluoroscopy. The inner needle is removed from the RFB while holding the tip of the sheath within the lumen of the RFB. Approximately 5 cm of a second guidewire is inserted through the sheath into the lumen of the RFB. The sheath is then removed and the wire secured at skin level. The RFB is deflated and both cervical guidewire and balloon are advanced under fluoroscopy approximately 20 cm distal. This allows the cervical guidewire to fall out of the lumen of the balloon yet remain in the esophagus. Next, both the RFB and the first guidewire are removed, leaving the second guidewire to stand alone in the lumen of the esophagus. Access to the cervical esophagus through the neck is now established.

A 1-cm incision is made at the puncture site with a

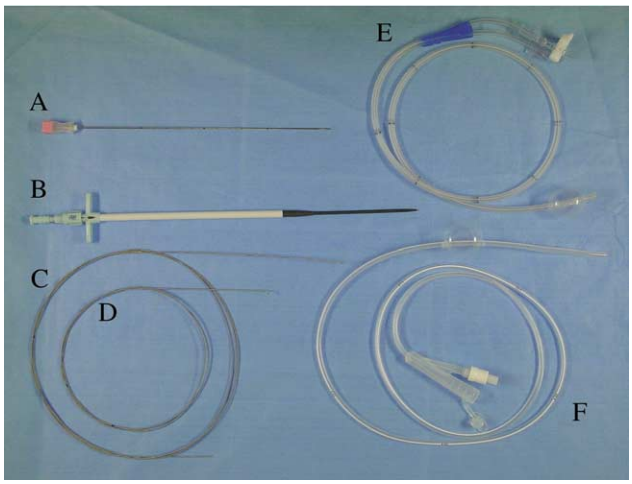

Figure 1. Percutaneous transesophageal gastrostomy (PTEG) device kit. (A) Needle with sheath. (B) Dilator with peel-away sheath. (C) Straight guidewire (first guidewire). (D) Angled guidewire (second guidewire). (E) Rupture-free balloon. (F) PTEG catheter.

Table 1. Patient Characteristics and Outcomes

Patient no.	Age (y)	Gender	Date	Disease	Indication	Contraindication for PEG	Complication
1	50	F	10/13/2003	Ovarian Ca	Obstruction/decompression	Massive ascites	None
2	83	F	12/23/2003	Ovarian Ca	Obstruction/decompression	Massive ascites	None
3	48	F	12/23/2003	Pancreatic Ca	Obstruction/decompression	Massive ascites	None
4	47	M	1/27/2004	Mesothelioma	Obstruction/decompression	Massive ascites	Subcutaneous emphysema
5	78	M	2/10/2004	Pancreatic Ca	Obstruction/decompression	Massive ascites	None
6	54	F	2/24/2004	Pancreatic Ca	Obstruction/decompression	Massive ascites	None
7	55	F	3/25/2004	Colon Ca	Obstruction/decompression	Massive ascites	None

Ca, cancer; F, female; M, male; PEG, percutaneous endoscopic gastrostomy.