Percutaneous Endoscopic Gastrostomy for Gastrointestinal Decompression

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From September 1980 to April 1986, 185 percutaneous endoscopic gastrostomies were performed at University Hospitals of Cleveland. Of these, nine (5%) were done for chronic gastrointestinal decompression and form the basis of this report. Patients ranged in age from 21–73 years (mean: 51 years) and all had prolonged, complex hospitalizations extending 25–122 days (mean: 63 days). The only complication associated with the procedure was the identification of transhepatic placement of the catheter, which caused no adverse effects. Two of the nine patients died during hospitalization of causes unrelated to the gastrostomy construction. The goals of gastric decompression and elimination of nasogastric intubation were achieved in all patients. In one patient with gastric intestinal disconnection, the percutaneous gastrostomy was effective as the sole means for elimination of swallowed saliva and gastric output. Three patients continued to use the gastrostomies for chronic decompression after discharge for the remainder of their lives (2 months, 6 months, and 2 years, respectively). Percutaneous endoscopic gastrostomy may provide a safe, secure, and comfortable method of long-term gastric decompression in a select group of high-risk patients with complex intra-abdominal processes.

GASTROSTOMY IS MOST COMMONLY USED to provide secure, long-term access for enteral alimentation or temporary gastric and gastrointestinal decompression. The development of the percutaneous endoscopic gastrostomy (PEG) allows construction of a tube feeding stoma without the need for celiotomy or general anesthesia.[1,2] That PEG could be safely performed in patients with prior major abdominal surgery[3] suggested that this technique could also be helpful in patients who require both short- and long-term gastric decompression necessitated by unanticipated postoperative events or incorrectable, complex intra-abdominal processes. We report our experience with patients in whom PEG was performed solely for decompression.

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Methods

During the 66-month period from September 1980 to April 1986, 185 PEGs were performed by us at University Hospitals of Cleveland in patients from 1 month–98 years of age. Nine PEGs (5%) were done for gastrointestinal decompression (Table 1). These patients (3 males, 6 females) ranged in age from 21–73 years (mean: 51 years). Hospitalization was prolonged due to complex disease processes in most of these patients (Fig. 1), extending from 25–122 days (mean: 63 days). Each patient had one or more intra-abdominal procedures, and the techniques and precautions for PEG placement are those outlined in prior publications.[1-3] Two patients had PEG with general anesthesia as a secondary procedure at the time of celiotomy for correction of other conditions. In both of these patients the stomach at celiotomy was inadequately visualized secondary to adhesions in one patient and gastric resection with massive intra-abdominal infection in the other. Thus, PEG was used. In all other patients, PEG was done using local anesthesia and intravenous sedation. One PEG was performed in the surgical intensive care unit (Fig. 1), whereas all others were done in our operating room and surgical endoscopy suite.

Results

Morbidity and Mortality

Two patients (patients 1 and 2) died during hospitalization at 9 and 46 days, respectively, after PEG placement. The gastrostomy did not contribute to the deaths. Transhepatic placement of the gastrostomy was identified in three patients and produced no untoward sequellae (Fig. 2).

TABLE 1. *Clinical Presentation of Patients with PEG for Decompression*

Patient Number	Indications for PEG	Additional Medical Problems	Complications Related to PEG	Outcome
1	Enterocutaneous fistula; perforated sigmoid colon	Diabetes mellitus; coronary artery disease with bypass graft; poliomyelitis; aortofemoral bypass graft; right total hip replacement	Transhepatic placement	Died secondary to multiple organ failure
2	Enterocutaneous fistula; carcinoma of cervix; multiple enterectomy; multiple intra-abdominal abscesses; radiation enteritis	Obesity	None	Died, multiple organ failure
3	Pancreatitis and postoperative ileus	Resection of mesenteric fibromatosis	None	Discharged, PEG removed at first postoperative visit
4	Ovarian carcinomatosis	Obesity; malignant ascites	None	Discharged with PEG
5	Ovarian carcinomatosis	None	None	Discharged with PEG
6	Chronic small bowel obstruction; short gut syndrome	Remote resection hepatoblastoma; radiation enteritis; familial polyposis; multiple celiotomies (>15)	Transhepatic placement	Discharged with PEG
7	Gastric ileus secondary to pyloric sparing Whipple	Chronic pancreatitis	None	Discharged with PEG
8	Gastrointestinal disconnection; subtotal gastrectomy with intra-abdominal sepsis	None	Transhepatic placement	Gastrointestinal continuity restored and PEG removed
9	Metastatic abdominal carcinomatosis	Multiple previous celiotomies; gastrojejunostomy dysfunction	None	Discharged with PEG

Attainment of Goals

The primary goal of PEG in this setting was elimination of the need for nasogastric intubation. This was accomplished in all patients. Vomiting was not seen as long as the gastrostomy remained patent (Fig. 3). Gastrostomy tubes were left to gravity drainage. Daily gastric output recorded by nasogastric suction before PEG placement was consistently greater than the gastrostomy output, but the latter was not associated with any patient discomfort or obvious clinical adversity. In one patient (patient 8), serial gastrostomy and nasogastric outputs were particularly instructive (Fig. 3) since these represented total gastric output because gastric and intestinal disconnection had been performed. The PEG reliably decompressed the totally obstructed stomach, and the patient, with only one exception, had no discomfort or vomiting during prolonged recuperation with the PEG in place.

Follow-up after Placement of the PEG

Two patients died in the hospital, and in both patients the PEG functioned until death. Patient 8 had gastrointestinal continuity re-established and, at that time, the PEG was removed. The two patients with advanced ovarian carcinomatosis returned home and lived 2 and 6 months, respectively, with right atrial catheters for total parenteral nutrition and PEG for gastric decompression. The patient with metastatic abdominal carcinomatosis (patient 9) has been discharged with the PEG, although it is currently not required for continual decompression. Two patients had PEGs removed after discharge since their underlying disease process resolved. Finally, one patient (patient 6) lived 2 years after PEG placement, using the PEG when needed to manage chronic small bowel obstruction. Thus, three of nine patients continued to use the PEG for decompression on a long-term basis after discharge.

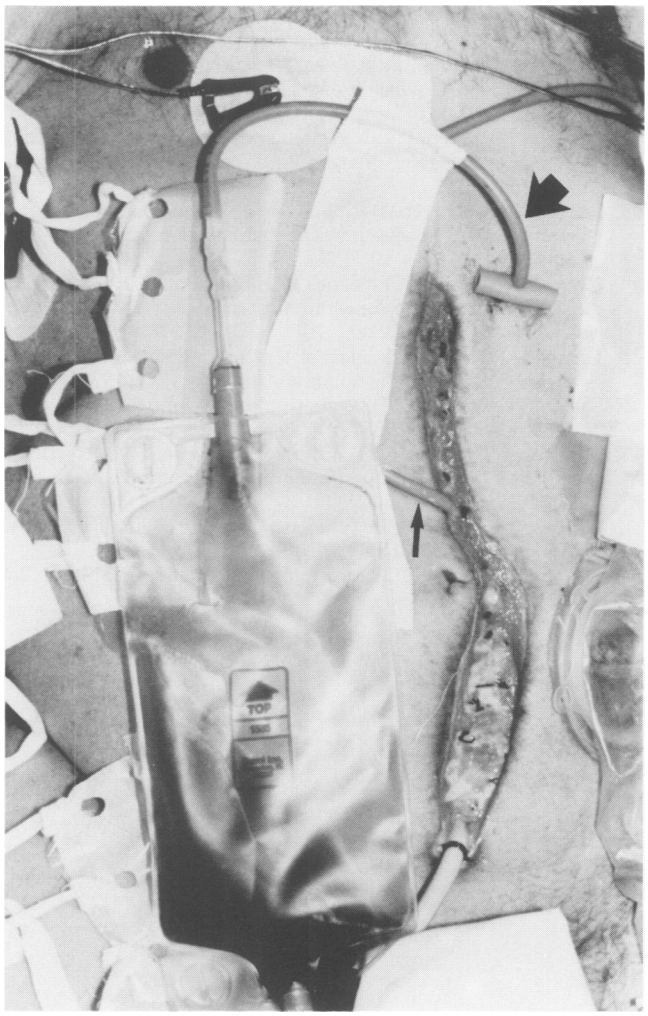

FIG. 1. 73-year-old male (patient 1, Table 1) with sump catheter (small arrow) draining enterocutaneous fistula through open abdominal wound. Colostomy is visible in left lower abdomen. Percutaneous endoscopic gastrostomy (large arrow) placed under local anesthesia without moving the patient from the surgical intensive care unit. Access for open surgical gastrostomy would have been difficult.

Discussion

Gastrostomy for gastric decompression is well established although not universally accepted. Its advocates suggest it is more comfortable for the patient than nasogastric decompression and may decrease postoperative respiratory complications, especially in elderly patients who have abdominal surgery.[4–7] The use of gastrostomy tubes for chronic gastric decompression is less common. In our own study during a 5.5-year interval only nine patients, or 5% of our total PEGs, had this procedure for long-term chronic gastrointestinal decompression. Thus, this represents a very select subgroup of patients who have gastrostomy placement. In one third of these patients,

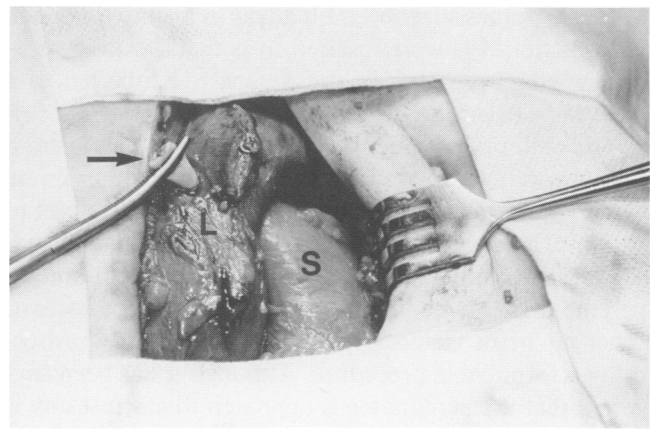

FIG. 2. 66-year-old male (patient 8, Table 1) with PEG catheter (arrow) traversing lateral segment of left lobe of liver (L) before entering stomach (S). This was identified at celiotomy for re-establishment of gastric and intestinal continuity. The transhepatic gastrostomy placement caused no adverse clinical abnormality.

PEG was permanent without any likelihood of discontinuation of the gastrostomy. In each of these patients, the gastrostomy functioned as anticipated and continued to provide adequate decompression documented by clinical evaluation for the remainder of each patient's life, 2 months, 6 months and 2 years, respectively. Although gastrostomy output invariably is less than nasogastric drainage, this does not indicate ineffectiveness of the gastrostomy. This phenomenon has been related to the irritating effects of the nasogastric tube that causes continual swallowing and thus increased gastric fluid. Verification

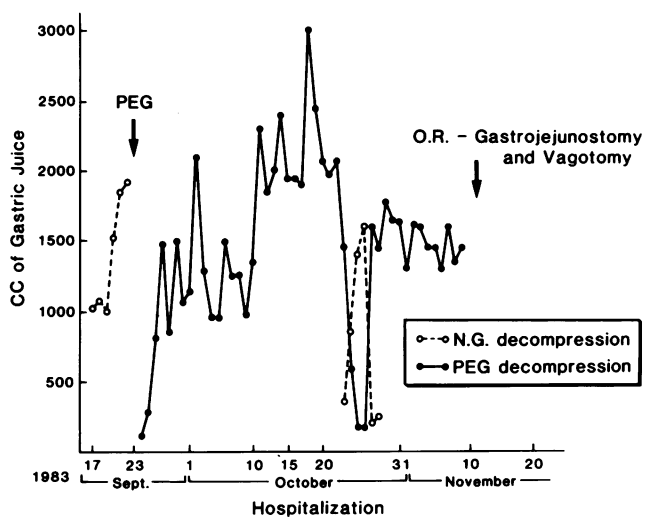

FIG. 3. Effectiveness of nasogastric (N.G.) and PEG decompression in a patient with gastric disconnection (patient 8, Table 1). During the end of October the PEG catheter became occluded and N.G. suction was instituted. During the remainder of his prolonged hospitalization, the percutaneous endoscopic gastrostomy effectively decompressed the totally obstructed stomach.

of this hypothesis has been obtained in a study in which nasogastric tubes were inserted in patients with gastrostomies.[8] The presence of the nasogastric tube led to a great increase in the gastrostomy output.

The majority of patients with gastrointestinal obstruction or dysfunction are easily managed with appropriate surgery or nasogastric suctioning. A very small subset of patients, however, require prolonged or permanent nasogastric suctioning. This particular subgroup in our experience has either complex intra-abdominal processes or other high-risk factors, which makes operative gastrostomy a formidable procedure. Although it has been suggested that the percutaneous approach to gastrostomy is not appropriate for gastrointestinal decompression,[9] our experience suggests otherwise. In these patients in whom we suspect long-term or permanent gastrointestinal obstruction, the endoscopic approach to gastrostomy may provide a safe, secure, and comfortable method of gastric decompression.

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