

Percutaneous endoscopic gastrostomy (PEG): 12 cases

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SUMMARY

Objective: To present our experience with percutaneous endoscopic gastrostomy (PEG).

Methods: Twelve patients were analysed in terms of PEG indications, duration of the procedure, complications and outcome retrospectively.

Results: There were six (50 %) male and six (50 %) female patients. Eight patients (67 %) had neurological problems due to head trauma. In nine patients (75 %) we used the pull-technique (Ponsky-Gauderer) and in the remaining three patients (25 %) the push technique (Sachs-Vine) was used. Median duration of the procedure was 23 minutes ranging from 13 to 35 minutes. Median duration of PEG feeding was 48 days (10-175 days). No procedure related death occurred and one patient (8 %) had a minor leakage from the stoma site.

Conclusion: We concluded that PEG is the procedure of choice in delivering enteral nutrition to patients with an intact gastrointestinal tractus and without significant gastroesophageal reflux.

Key words: Percutaneous, endoscopic, gastrostomy, nutrition, enteral

ÖZET

Perküton endoskopik gastrostomi (PEG): 12 olgu

Amaç: Perküton endoskopik gastrostomi uyguladığımız hastaların analizi.

Yöntem: PEG uyguladığımız 12 hasta, PEG endikasyonları, işlemin süresi, komplikasyonlar ve sonuçlar yönünden retrospektif olarak incelenmiştir.

Bulgular: Hastalarımızın altısı (%50) erkek, altısı (%50) kadındır. Sekiz hastamıza (%67) kafa travmasına bağlı nörolojik sorunlar nedeniyle PEG uygulanmıştır. Dokuz hastada (%75) "pull-teknik" (Ponsky-Gauderer), 3 hastada da (%25) "push-teknik" (Sachs-Vine) uygulanmıştır. Medyan işlem süresi 23 dakikadır (13-35 dakika). Medyan PEG beslenme süresi 48 gündür (10-175 gün). İşleme bağlı mortalite yoktur. Bir hastada (% 8) stoma çevresinden, pansumanlarla kontrol altına alınabilen sızıntı olmuştur.

Sonuç: PEG'in enteral beslenme uygulamasında, gastrointestinal sistemleri faal olan ve gastro-özofageal reflü sorunu olmayan hastalarda tercih edilmesi gereken yöntem olduğu kanaatine varılmıştır.

Anahtar kelimeler: Perküton, endoskopik, gastrostomi, beslenme, enteral

INTRODUCTION

Nutritional support of the critically ill patients is an important step in the treatment of these patients. Available clinical and experimental data suggested that the enteral route for nutritional support has major benefits over the parenteral route. Enteral feeding can be used even in small

amounts as an adjunct to total parenteral nutrition to maintain gut integrity and the intestinal barrier against bacteria and endotoxins (1-11).

Percutaneous endoscopic gastrostomy (PEG) is one of the means of establishing enteral access in critically ill patients which has gained widespread acceptance (12-19).

In this study, retrospective analysis of 12 patients in terms of indications, duration of the procedure, complications and outcome has been carried out.

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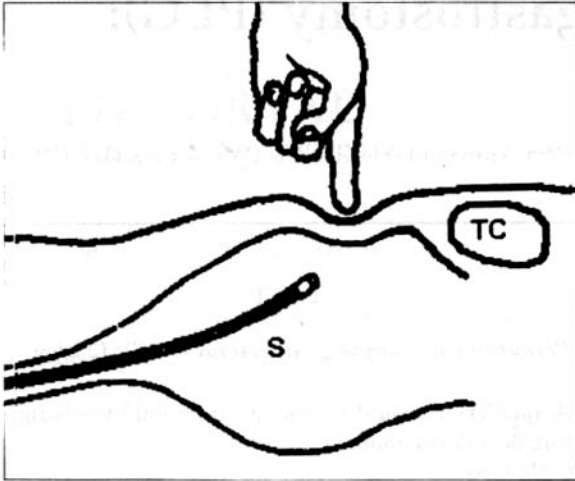


Figure 1. Impression of the assistant's finger pressing against the abdominal wall at the proposed stoma site (S:stomach, TC: transverse colon).

MATERIAL and METHODS

During a period of 12 months PEG has been performed on twelve patients in Surgical Endoscopy Unit of the İstanbul Medical School. Detailed patient data was obtained from the computer database of the unit (Calaris File Maker Pro). In addition to the demographic data such as age and gender, information about the PEG indication, method of insertion, duration of the procedure, antibiotics used, early and late complications, eventual removal and outcome was obtained.

Technique of PEG

The procedure was performed either in endoscopy unit or at the bedside. After sedation with midazolam (dosage according to patients clinical status) and mild neuromuscular blockade in intubated patients, a formal upper gastrointestinal endoscopic examination was performed to exclude any pathologic condition which might contraindicate enteral nutrition.

The endoscope was then placed in the stomach and the stomach was insufflated fully so that the anterior stomach wall came in contact with the parietal peritoneum of the anterior abdominal wall.

The stoma site was selected using transillumination as a guide and view of the direct impres-

sion of a finger pressed on the proposed stoma site (Figure 1). The distended stomach was punctured with the introducer cannula and the guidewire was passed into the stomach lumen.

The guidewire was grasped with an endoscopic snare and brought out with the endoscope. As described elsewhere ^(1,20) the gastrostomy tube was inserted and fixed in place. The tube was connected to a bag for free drainage. After 48 hours the first dose of the enteral feeding was allowed. No prophylactic antibiotics were used.

Technique of removal

The tubes were removed if the patient has recovered and oral feedings could be tolerated. If the gastrostomy tube used was a "pull removal" type, the tube was simply pulled out. Older models of tubes required endoscopic removal.

RESULTS

There were 12 patients, six male (50 %) and six female (50 %). Median age was 42 ranging from 23 to 93 years. Eight of the patients (67 %) had neurological disorders due to head trauma, three of the patients (25 %) had neurological problems such as cerebrovascular accident (2 cases) and Guillain-Barré syndrome (1 case) and the remaining one (8 %) had respiratory distress due to pulmonary tuberculosis. In 9 patients (75 %) the "pull" technique and in the remaining three patients (25 %) the "push" technique was utilised. Median duration of the procedure was 23 minutes ⁽¹³⁻³⁵⁾.

In one patient there was an upper gastrointestinal bleeding 18 hours after the procedure. Endoscopic examination revealed acute erosive gastritis and this complication was not related to PEG. The only PEG-related complication was minor leakage from the stoma site which required local wound care only (8 %). Six patients died of their original diseases in a period of 1 day to 6 months. In four patients the tube was withdrawn after recovery in a period of 4-20 weeks. The fistulous tract closed in 2-4 days in all patients. Two patients are already living with their tubes in place. Median duration of PEG feeding was 48 days ⁽¹⁻⁷⁵⁾. There were no PEG related deaths.

DISCUSSION

The benefits of the enteral nutrition over parenteral nutrition are widely accepted today⁽¹²⁻¹⁹⁾. Parenteral nutrition is expensive, requires exact dosing, is prone to septic complications. Its primary advantage is availability in patients who have serious gastrointestinal problems.

On the other hand, enteral requirements of nutrients is more precisely established than for parenteral nutrition and intestinal integrity and barrier against bacteria and endotoxins is maintained. The mere requirement for enteral nutrition is an intact gastrointestinal tract at least until colon⁽¹⁾.

There are many possibilities for the administration route of enteral feeding for short term nutrition simply a nasogastric or nasojejunal tube can be used. If a nutritional regime longer than 30 days is anticipated, these tubes should not be used and a gastrostomy or jejunostomy should be performed instead^(1,12,13). Gastrostomy is the most preferable method if no gastroesophageal reflux (GER) and no gastric atony is present. Nutrients can be given in hyperosmolar forms and as bolus feeding. Jejunostomy feeding however must be isoosmolar and given as continuous infusions using special pumps to prevent gastrointestinal intolerance^(20,21,22).

The most common indication for PEG is neurological disorders, trauma and malignant disorders^(15,19,19). This is also true for our series. PEG can also be used for gastric decompression^(14,23).

A gastrostomy can be constructed using four main techniques:

- Classical open gastrostomy
- Laparoscopic gastrostomy
- Interventional radiologic gastrostomy and
- Percutaneous endoscopic gastrostomy (PEG).

PEG is a minimally invasive procedure and its only requirement is open passage to the stomach. In patients with obstructing lesions of the esophagus and cardia, PEG can be performed if sufficient dilatation can be achieved previously. Only a mild sedation and local infiltration anesthesia is required in most cases. In patients requiring respiratory support the procedure can

be done at the bedside^(14,24).

There are three main techniques of PEG: "Pull technique" (Ponsky-Gauderer)⁽²⁵⁾, "Push technique" (Sachs-Vine) and "Insertion technique" (Russel)⁽¹⁾. The first two techniques utilise Mallecot-like domed catheters and the last technique makes use of Foley-like balloon catheters. In our series we used only the first two methods and the choice of the technique based primarily on the availability of the type of the PEG-set.

Routine use of prophylactic antibiotics are not recommended⁽²⁶⁾. The most important early complications of PEG are bleeding, esophageal rupture, colonic perforation, wound infection and gastric wall erosion. The main late complications are GER, gastrocolic or gastro-colocutaneous fistula and migration of the tube into the duodenum or jejunum^(27,28).

Intolerance to enteral feeding can occur but it should not be classified as a procedure-related complication. Colonic perforation is a major complication which occurs due to inadvertent puncture of the transverse colon during the procedure. The most important step to prevent this complication is the proper transillumination of the gastric wall with the endoscope. Seeing the impression of the finger pressing on the proposed stoma site through the endoscope is not an indicator of the direct contact of the anterior stomach wall with the abdominal wall.

As a rule of thumb, if the transillumination fails, the procedure should be aborted unless there are facilities such as endoscopic ultrasonography available^(29,30).

In our series one patient had gastrointestinal bleeding due to acute erosive gastritis which was not classified as procedure-related. The only procedure related-complication was minor leakage around the PEG tube in one patient (8 %).

Dislodgement of the tube and thus the stomach from the anterior abdominal wall can be hazardous in the first 10-14 days after the procedure because this can lead to leakage of gastric juice into the free peritoneal cavity. If the tube is dislodge or withdrawn before the 14th day, a nasogastric tube should be inserted and radiologic studies using water-soluble contrast undertaken.

ken. If there is leakage to the peritoneal cavity surgical intervention is indicated. Later dislodgements can be treated by inserting another tube and verifying the position using a water soluble contrast study ⁽¹⁾. We have't experienced such a complication.

The most important long term complication of PEG is GER and aspiration pneumonia⁽¹⁹⁾. In patients with high risk of GER, jejunostomy instead of gastrostomy must be considered. In our series there were no GER-related pulmonary complications.

After the patient has recovered and oral feedings can be tolerated, the PEG-tube can be removed. Older types required endoscopic removal whereas new types are being removed simply by pulling out the device. This can lead to separation of the end-piece from the body and dislodgement of the end-piece in the gastrointestinal tract. In such cases the end-piece of the tube is usually passed per rectum but occasionally it can lead to bowel obstruction requiring urgent laparotomy ^(27,28). We haven't experienced such a complication.

In conclusion, PEG is the procedure of choice in patients needing enteral nutritional support who have a functioning gastrointestinal tract without significant GER.

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