

# Major and Minor Complications of Percutaneous Endoscopic Gastrostomy

## PERKÜTAN ENDOSKOPİK GASTROSTOMİNİN MAJOR VE MİNOR KOMPLİKASYONLARI

Gülten KIYAK, MD,<sup>a</sup> Emre ERGÜL, MD,<sup>a</sup> Eyüp SELVİ, MD,<sup>b</sup>

Departments of <sup>a</sup>General Surgery, <sup>b</sup>Gastroenterology, Atatürk Education and Research Hospital, ANKARA

### Abstract

Percutaneous endoscopic gastrostomy (PEG) plays an important role in avoiding malnutrition in patients with swallowing disorders from various etiology. However PEG is an invasive procedure and many PEG-related complications have been described. The aim of this study is to determine the PEG-related complications in our centre.

We have analysed in this study the incidence of major complications and minor complications, in 18 patients who required PEG from January 1, 2004 to February 28, 2007. All indications for PEG were deemed appropriate by the nutrition team.

Minor complications have been occurred in 5 (27.77%) patients; wound infection in two (11.11%) patients, gastroparesis in two (11.11%) patients, dislodgement of tube in one (5.55%) patient. One patient (5.55%) showed peritonitis after dislodgement of the tube and one patient (5.55%) upper gastrointestinal bleeding as major complications.

We had 5 (27.77%) minor and 2 (11.11%) major complications in our patients. In this study, major complication rate is seen higher than in the literature. But one of them is peritonitis after patient's self dislodgement of the PEG-tube by the patient and increased complication rate. Minor complications rate is comparable to the literature. Also the small sample size in our study may affect the results. We suggest that PEG-tube placement is relatively free from serious complications and an acceptable and appropriate modality for the nutrition of selected patients.

**Key Words:** Gastrostomy; administration, cutaneous; endoscopy, digestive system

Turkish Medical Journal 2007, 1:86-89

### Özet

Çeşitli nedenlerden dolayı yutma problemi olan hastalarda malnutrisyondan korunmada perkutan endoskopik gastrostomi (PEG) önemli rol oynamaktadır. Ancak PEG invaziv bir girişimdir ve bir çok PEG uygulamasına bağlı komplikasyon tarif edilmiştir. Bu çalışmanın amacı merkezimizde PEG bağlantılı komplikasyonları belirlemektir.

Bu çalışmada 1.Ocak.2004 ile 28.Şubat.2007 tarihleri arasında PEG uygulanan 18 hastada major komplikasyonlar minor komplikasyonlar, incelendi. PEG için tüm endikasyonlar nütrisyon ekibi tarafından belirlendi.

Minor komplikasyonlar; yara yeri enfeksiyonu iki hastada (%11.11), gastroparezi iki hastada (%11.11), tüpün yerinden çıkması bir hastada (%5.55) olmak üzere toplam 5 (%27.77) hastada izlendi. Bir hastada (%5.55) tüpün yerinden çıkması sonrası gelişen peritonit ile bir hastada (%5.55) üst gastrointestinal kanama major komplikasyonlar idi.

Beş (%27.77) hastamızda minor ve 2 (%11.11) hastamızda major komplikasyonlar görülmüştür. Major komplikasyon oranımız literatüre göre yüksek olmakla birlikte, bir hastamızın tüpünü çekmesi sonucu görülen peritonit bu oranı artırmaktadır. Minor komplikasyon oranımız ise literatürle uyumludur. Hasta sayımızın az olması da sonucu etkilemektedir. Ancak buna rağmen PEG uygulamasının ciddi komplikasyonları olmadığı ve seçilmiş hastalarda kabul edilebilir en uygun modalite olduğu görüşüdeyiz.

**Anahtar Kelimeler:** Gastrostomi; perkutan; endoskopi

**P**ercutaneous endoscopic gastrostomy (PEG) is today a gold standard to place an alimentary gastrostomy to patients who require an enteral nutrition\*?.<sup>1</sup> Malnutrition is a

common problem affecting up to 40% of hospitalized patients and is a cause of morbidity and mortality in traumatised patients, surgical patients, and patients with cardiovascular and cerebrovascular disease.<sup>1,2</sup> The relationship between nutrition and disease is important and may affect recovery from illness.<sup>2</sup> The enteral route is the preferred method of administration, because the enteral route maintains the gastrointestinal mucosal integrity and immunity, important in this

**Yazışma Adresi/Correspondence:** Gülten KIYAK, MD  
Atatürk Education and Research Hospital,  
Department of General Surgery,  
06800, Bilkent, ANKARA  
gultenkiyak@yahoo.com

Copyright © 2007 by Türk Tıp Dergisi

population of patients who are at high risk for gastric ulcer, bacterial overgrowth and sepsis.<sup>2,3</sup> Medically appropriate tube feeding is required for patients unable to ingest adequate amounts of nutrition for short term feeding.<sup>2</sup> The PEG tube has rapidly become the method of choice for long term feeding.<sup>2</sup> It is safer and more cost effective than surgically placed gastrostomies, with a low procedure related mortality and complication rate.<sup>2</sup>

The aim of this study is to evaluate complications of PEG.

### Materials and Methods

Ankara Atatürk Teaching and Research Hospital ethic committee approved the study. We have analysed in this study the incidence of minor and major complications in 18 patients who required PEG from January 1, 2004 to February 28, 2007. All indications for PEG were deemed appropriate by the nutrition team. Patients were considered for PEG if they did not have a terminal illness and were expected if the patient was dependent on enteral feeding (Nasogastric tube feeding) for more than one month and survive well beyond six months.

#### PEG-tube replacement technique

We used silicon made PEG-tube that was made up of an inert substance. Conscious sedation (midazolam) was routinely used. The upper gastrointestinal endoscopy involved endoscopic visualization of upper gastrointestinal tract up to second part of the duodenum and to exclude any other pathology. The site for placement of PEG-tube was located via trans-illumination on the abdominal wall, followed by an incision and placement of a cannula (provided in the PEG-tube kit). A guide wire was threaded in the stomach cavity through that cannula and grasped by a snare forceps. The guide wire was pulled out from the mouth, through which PEG-tube was tied and then PEG-tube was passed into the stomach cavity by pulling of the guide wire through an incisional hole created at the anterior abdominal wall. PEG-tube was placed on the left upper quadrant of the

anterior abdominal wall and secured. Positioning of PEG-tube was confirmed with re-endoscopy of the stomach.

During the procedure all patients were monitored through an oxymeter and we used mild sedative.

Post-PEG placement, patients were not fed by PEG for at least 24 hours and monitored for any complication. Patients were routinely assessed by the nutrition team the following morning and thereafter, periodically until discharge for complications related to the procedure.

In this study we determined the rate of successful PEG placement and the PEG-related complications. Major complications included peritonitis, intraabdominal abscess, hemorrhage, misplaced tube, gastrocolonic fistula, perforation, aspiration pneumonia, sepsis, PEG site abscess. Minor complications included ileus, tube dislodgement, gastroparezi, leakage requiring intervention, hematoma, mild tube skin necrosis, PEG-tube side infection and cellulitis.

### Results

Eighteen patients underwent PEG-tube placement, of those 9 (50.0%) were females and 9 (50.0%) were males. Over all mean age was 49.2 (range 23 – 86 years). The underlying diagnosis was cerebrovascular disease in 8 patients (44.44%), post-traumatic encephalopathy in 9 patients (50.0%) and postanoxic encephalopathy in one patient (5.55%) (Table 1).

Successful placement was achieved in 18 (100%) patients. But one patient (5.55%) pulled the tube out accidentally at the first day and underwent surgical gastrostomy because of peritonitis .

Upper gastrointestinal tract bleeding after PEG-tube placement occurred in a 73-years- old female patient and required 4 units of blood transfusion.

In two patients (11.11%) (67 and 70 years males) occurred \*? complications directly related to the gastrointestinal tract. In this patients the problem was vomiting. In one patient, it developed

**Table 1.** Underlying clinical pathology of patients referred for PEG.

| <b>Etiology of dysphagia</b>  | <b>Number of patients (%)</b> |
|-------------------------------|-------------------------------|
| Cerebrovascular disease       | 8 (44.44%)                    |
| Post-traumatic encephalopathy | 9 (50.0%)                     |
| Postanoxic ancephalopathy     | 1 (5.55%)                     |
| <b>Total</b>                  | <b>18</b>                     |

after 75 days. The other patient suffered from intermittent vomiting and gastrointestinal intolerances after one year of PEG. This problem was treated by using promotility drugs.

One patient (5.55%) resumed oral nutrition after three weeks of PEG placement and PEG tube pulled out by us. Two patients (11.11%) have suffered from wound infection, which treated medically. PEG-tube dislodgement occurred in one patient (5.55%) after 60 days of placement. There were no deaths related to PEG placement or its complications.

Table 2 summarizes the major and minor complications in our patients.

### Discussion

PEG was first introduced in 1980 as an alternative to nasogastric tubes and surgically placed gastrostomy tubes.<sup>4,6,7</sup> Several studies have reported the advantage of PEG in surgical,

**Table 2.** Complications that occurred after PEG placement in 18 patients.

| <b>Minor</b>                   | <b>Number of patients (%)</b> |
|--------------------------------|-------------------------------|
| Wound infection                | 2 (11.11%)                    |
| Gastroparesis                  | 2 (11.11%)                    |
| Dislodgement of tube           | 1 (5.55%)                     |
| <b>Major</b>                   |                               |
| Peritonitis after dislodgement | 1 (5.55%)                     |
| Upper GIS bleeding             | 1 (5.55%)                     |
| <b>Total</b>                   | <b>7</b>                      |

traumatised, cerebrovascular and oncological patients. It has now become an excellent alternative for the long-term management of patients with dysphagic stroke or for those who are unable to feed themselves for more than 4-6 weeks with intact gastrointestinal tract.<sup>4,6</sup> During the last decade, PEG placement has increased ten-fold as PEG-tube offers greater patient comfort and less frequent complications.<sup>4,8</sup>

Obesity, gastric surgery, or other anatomical abnormalities making transillumination of the abdominal wall difficult may lead to failure of PEG procedure.<sup>5</sup> In our centre, successful placement was achieved in all of our patients.

PEG is an effective and safe procedure to long-term enteral nutrition.<sup>6</sup> In the literature, procedure-related mortality rate is between 1% and 3%.<sup>6</sup> Complications related procedure is important, as they can effect the outcome. The major complications rate is 6% and the minor complications rate varies between 12% and 55%.<sup>6</sup> In our study there was no procedure-related mortality. Major complications rate was 11.11%, while minor complications rate was 27.77%. In this study, major complication rate is seen higher than in the literature. We had two major complications, but one of them is peritonitis after dislodgement of the PEG-tube by the patient. That increased our complication rate. Minor complications rate is comparable to the literature, however most minor complications in our study were due to wound infections that were easily treatable. Also the small sample size in our study may affect the results. The correct management of PEG, correct selection of candidates to procedure and dietician can reduce the rate of complication.

We suggest that PEG-tube placement is relatively free from serious complications and an acceptable, appropriate and safe modality. Also physicians should be aware of major and minor complications of PEG placement. Failure to recognise minor complications may result in serious complications.

**REFERENCES**

1. Del Rio P, Dell'Abate P, Soliani P, Arcuri MF, Ghirarduzzi A, Sianesi M. Complications of percutaneous endoscopic gastrostomy: a surgical experience. *G Chir* 2006; 27:388-91.
2. Pearce C B, Duncan H D. Enteral feeding. Nasogastric, nasojejunal, percutaneous endoscopic gastrostomy, or jejunostomy: its indications and limitations. *Postgrad Med J* 2002; 78:198-204.
3. Foster J M, Filocamo P, Nava H, Schiff M, Hicks W, Rigual N, Smith J, Loree T, Gibbs JF. The introducer technique is the optimal method for placing percutaneous endoscopic gastrostomy tubes in head and neck cancer patients. *Surg Endosc* 2007; 21:897-901.
4. Anis M K, Abid S, Jafri W, Abbas Z, Shah AH, Hamid S, Wasaya H. Acceptability and outcomes of the Percutaneous Endoscopic Gastrostomy (PEG) tube placement patients and care givers perspectives. *BMC Gastroenterol* 2006; 6:37.
5. Dinkel H P, Beer K T, Zbären P, Triller J. Establishing radiological percutaneous gastrostomy with balloon-retained tubes as an alternative to endoscopic and surgical gastrostomy in patients with tumours of the head and neck or oesophagus. *B J Radiol* 2002;75:371-7.
6. Varnier A, Iona L, Dominutti E, Deotto E, Bianchi A, Iengo A, Zacchini S, Benedetto D P. Percutaneous endoscopic gastrostomy: complications in the short and long-term follow-up and efficacy on nutritional status. *Eur Med Phys* 2006;42:23-6.
7. Chong V H, Vu C. Percutaneous endoscopic gastrostomy outcomes: can patient profiles predict mortality and weaning? *Singapore Med J* 2006;47:383-7.
8. Simon JE, Price CSG, Khan S. Percutaneous endoscopic gastrostomy: 30-day mortality trends and risk factors. *J Postgrad Med* 2005;51:23-29