

## Long-term results of percutaneous endoscopic gastrostomies

### *Perkütan endoskopik gastrostomi uyguladığımız hastalarda uzun dönem sonuçlarımız*

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#### ABSTRACT

**Objectives:** In order to provide enteral nutrition for patients in intensive-care units who cannot be fed orally, we aimed to present our percutaneous endoscopic gastrostomy (PEG) experience, which is a minimally invasive method.

**Materials and methods:** In this study, 700 patients who applied to our clinic between January 2000 and June 2011 and who had a PEG because they could not be fed orally were retrospectively assessed in terms of indications, complications, and results.

**Results:** Among these patients, 400 (57%) were male and 300 (43%) were female. Most of the patients with feeding problems had also neurologically caused pathologies. After the PEG, 50 (7.1%) patients had under-skin infections, 18 (2.5%) patients had leakage from the edge of the PEG, and 16 (2.0%) patients had bleeding from the edge of the PEG.

**Conclusion:** PEG is a secure and effective nutrition method as it can be performed with a minimally invasive procedure and it has low mortality and morbidity.

**Key words:** Gastrostomy, enteral nutrition, endoscopy

#### ÖZET

**Amaç:** Oral gıda alamayan, özellikle yoğun bakım ünitelerinde yatmakta olan hastalara enteral beslenme desteği sağlamak amacıyla minimal invaziv bir metod olan perkütan endoskopik gastrostomi (PEG) deneyimimizi sunmayı amaçladık.

**Gereç ve yöntem:** Bu çalışmada kliniğimizde Ocak 2000 - Haziran 2010 tarihleri arasında en az 4 hafta süreyle oral beslenemeyeceği öngörülerek PEG yerleştirilen 700 olgu retrospektif olarak incelendi. Hasta kayıtları endikasyonlar, komplikasyonlar ve sonuçları açısından değerlendirildi.

**Bulgular:** Hastaların 400' (% 57) ü erkek, 300' ü (%43) bayandı. Olguların büyük çoğunluğu nörolojik nedenli patolojilerdi. Tüm hastalarda beslenme problemi vardı. PEG sonrası 50 (%7.1) hastada cilt altı enfeksiyonu, 18 (%2.5) hastada PEG kenarından kaçak, 16 (%2.0) hastada PEG kenarından kanama görüldü.

**Sonuç:** PEG, minimal invaziv bir girişim ile yapılabilmesi, mortalite ve morbiditesinin çok az olması nedeniyle yoğun bakım hastaları için basit, emniyetli ve etkili bir beslenme yöntemidir.

**Anahtar kelimeler:** Endoskopik gastrostomi, enteral beslenme, endoskopi

#### INTRODUCTION

A percutaneous endoscopic gastrostomy (PEG) is used as an alternative feeding method in patients treated in intensive care, neurology, and reanimation clinics who cannot be adequately fed orally. An enteral feeding method is ideal for patients who cannot be fed orally but who have normal gastrointestinal functions. In enterally fed patients, there is

a continuation of the barrier functions of the gastrointestinal mucosa, intestinal immune response, and normal flora structure. Enteral feeding can be achieved with a nasogastric nasojejunal, gastrostomy, or jejunostomy tube. Each of these feeding techniques has advantages and disadvantages.<sup>1,2</sup> For long-term feeding, gastrostomy and jejunostomy tubes are generally preferred. Today, one of the most common methods is a percutaneous gastro-

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tomy tube. There are different surgical, radiological, and endoscopic ways to insert this tube. Surgical gastrostomy is not performed as often as it used to be as it requires general anesthesia for patients with many other problems and it is an invasive interruption. Although endoscopy is commonly used in the diagnosis and treatment of gastrointestinal diseases, for patients with feeding problems a gastrostomy can be done in a minimally invasive way. The PEG was first performed in 1980 by Gauderer et al. and it was recognized as a speedy and secure procedure for long-term enteral feeding.<sup>3</sup> Today, the PEG can be used as a more secure method than surgical and radiological interventions for patients of all ages with feeding problems.<sup>4</sup>

## MATERIALS AND METHODS

The records of the 700 patients who had in-patient treatment and an applied PEG in the intensive-care unit at the Meram Medical Faculty at Selçuk University between January 2000 and June 2011 were retrospectively examined in terms of indications, complications during intervention, and late-period complications. For patients who could be transferred, the PEG was performed in the endoscopy unit. For patients who could not be transferred, the PEG was performed on their beds. Patients who were not intubated in the intensive-care unit received 10 mg. of Dormicum and local anesthesia. The process was performed with minimally invasive techniques, and no patient received any general anesthesia during the process. In the PEG tube insertion, three types of techniques can be used: “pull,” “push,” and “introducer” techniques. We most frequently prefer the “pull” technique as defined by Gauderer et al. in the 1980s.<sup>3</sup> A classical esophagogastroduodenoscopy confirmed that all patients’ passages were open and that there were no pathological lesions. The patients began to be fed through the gastrostomy tube. Before the operation, all patients received first-generation cephalosporin in a pre-operative, single-dose antibiotic prophylaxis.

## RESULTS

Among the 700 cases, 400 (57%) were male and 300 (43%) were female, and the mean age was 49 (18-79). Most of the cases, 600 (85%), had neurological origins, and 100 (15%) had feeding problems

stemming from other causes (Table 1). The average operation period was determined to be 18 (8-5) minutes. The average PEG period was 130 days (10-425). After the PEG procedure, some complications developed, as 50 (7.1%) of the patients had subcutaneous infections, 18 (2.5%) patients had leakage from the edge of the PEG, 16 (2.0%) patients had bleeding from the edge of PEG, and 12 (1.0%) patients had early PEG ejection (Table 2).

**Table 1.** Primary pathologies of the patients who were applied PEG

Diagnosis	Number (n)	Percentage (%)
Cerebrovascular attack	260	37
Hypoxic brain Syndrome	150	21
Head trauma	130	19
Cerebral Infarct	60	9
Larynx cancer	54	7
Hypopharyngeal cancer	32	5
Guillian Barre syndrome	14	2

**Table 2.** Complications after percutaneous gastrostomy (PEG)

Complication	Number (n)	Percentage (%)
Subcutaneous Infection	50	7,1
Leakage from the edge PEG	18	2,5
Bleeding from the edge of PEG	16	2
Early ejection of PEG	12	1

The patients who developed subcutaneous infections were treated with medical dressings and antibiotherapy. For the 18 patients who had leakage from the edge of the PEG, the tube was inserted under the skin. The tube removed and after the infection was under control, a new tube was inserted. In 10 of the 16 patients who had bleeding from the edge of PEG, deep peripheral sutures were inserted and 6 of them were treated with medical follow ups. For the patients whose PEG tube was ejected early, a new tube was inserted with the same method. While there was not any mortality stemming from the operation, after the PEG interventions 52 patients were lost because of their primary diseases (12 patients died between days 1 and 20 for metabolic reasons, and 40 patients died of primary disease).

## DISCUSSION

Since the PEG was introduced in 1980, it has become one of the most important means of enteral feeding for patients with advanced cerebrovascular diseases, those with other neurological diseases, and those who cannot be fed orally because of cancers in the head-neck area.<sup>5</sup> In the treatment processes of critical cases, the provision of nutritional support is one of the most important intensive-care treatment protocols. Today, the PEG is a method that does not require general anesthesia, can be applied to the patient in his/her bed, and is more acceptable in terms of comfort and cosmetics.

The PEG is preferred instead of surgical gastrostomies that are performed with general anesthesia and have had higher morbidity in the past<sup>6</sup> In studies of esophagus perforation, serious complications after nutrition stemming from leakage such as peritonitis and gastrocolic fistula were reported, but only rarely.<sup>4</sup> More frequent complications such as wound infections and leakage and bleeding from the edge of the tube were seen; however, this rate ranged between 1.0%-7.1%, both in our study and in the literature.<sup>7</sup> The most frequent complication in our study was wound infection (50) patients. Other complications were leakage from the edge of the tube in 18 patients, bleeding at the edge of the tube in 16 patients, and the early ejection of the tube in 12 patients. No mortality occurred. The most common morbidity in our study and in the literature is an infection at the edge of the tube. It is emphasized in the literature that the use of pre- and post-operation prophylactic antibiotics significantly decreases the risk of infection and therefore it must be applied.<sup>8,9</sup> There is not a consensus about an ideal antibiotic choice and some studies include various antibiotherapy regimes.<sup>10,11</sup> In our patients, we preferred the first-generation cephalosporin group of antibiotic prophylaxis for a PEG.

For Nicholson et al., 73% of their 168 cases had neurological pathology and most of them were problematic patients with cerebrovascular attacks.<sup>12</sup> In our previously published study and in our ongoing study, most of the patients had difficulty with oral nutrition or could not be fed orally at all due to neurological pathology.<sup>13</sup> The timing of a PEG intervention, the right indications, and the patient's choice are important in preventing morbidity. Certain contraindications for a PEG include the inability

to bring the front stomach to the abdominal wall in the right position after it is pumped up with air. The PEG cannot be inserted in patients who are so obese that gastric resection, acid, hepatomegaly, and gastric translumination are prevented and feeding cannot be done in patients with gastrointestinal obstruction. And PEG is placed in the difficult tumors of the pharynx. But most of the patients can be placed in. These patients are making open surgery. In our study, our patients were checked to confirm that their gastrointestinal passage continuity was normal. Nutrition was started 48 hours after the PEG application. The average PEG duration in our patients was 124 days, which was compatible with the literature.<sup>14</sup>

In conclusion, the PEG with its low morbidity and mortality rates is a simple, safe, and efficient nutrition method for intensive-care unit patients as it can be done with a minimally invasive intervention.

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