Eskisehir Medical Journal
Eskişehir Tıp Dergisi

Eskisehir Med J. 2023; 4(1): 6-10
doi: 10.48176/esmj.2023.96

Original Article / Araştırma Makalesi

PERCUTANEOUS ENDOSCOPIC GASTROSTOMY RESULTS IN A SECONDARY STATE HOSPITAL

İKİNCİ BASAMAK DEVLET HASTANEMİZDE PERKÜTAN ENDOSKOPİK GASTROSTOMİ UYGULAMA SONUÇLARIMIZ

KEMAL YETİŞ GÜLSOY[1] **FERİT ÇELİK**[2] **SEMİHA ORHAN**[3]

[1]Burdur State Hospital Intensive Care Unit, Burdur, Turkey
[2]Burdur State Hospital, Department of Gastroenterology, Burdur
[3]Afyonkarahisar University of Health Sciences Intensive Care Unit Afyonkarahisar, Turkey

ABSTRACT

Introduction: The aim of this study was to determine the indications of Percutaneous endoscopic gastrostomy (PEG) patients treated in a secondary state Burdur hospital over a period of three years, the unit where the patient was hospitalized, survival time with PEG therapy, and the complications observed in these patients.

Methods: Patients who underwent PEG in the endoscopy unit of our hospital, between January 2019 and January 2022, were retrospectively evaluated. Age, gender, the unit of inpatient, indications for PEG therapy, complications after PEG, and survival status of the patients were recorded in the form of case reports. Patients with coagulation disorders, hemodynamic instability, peritonitis, sepsis, infection at the insertion area, peritonitis carcinomatosis, a history of total gastrectomy and gastric varices were excluded.

Results: The median age of the 120 patients included in the study was 79 (17–100) years, and 66 (55%) of the patients were male. Complications were observed in 14 (11.7%) patients, all of which were minor, including seven (5.8%) PEG site infections, three (2.5%) PEG site leakages, three (2.5%) PEG occlusions, and one (0.9%) PEG removal. It was determined that 73 (60.8%) patients survived at least 30 days; the patients were most frequently referred by the neurology unit, with a rate of 52.7%. The most common indications for PEG insertion were cerebrovascular disease (56.7%) and dementia (29.2%).

Conclusion: Maintenance of nutritional requirements via PEG allows for the preservation of mucosal integrity and barrier function, intestinal immune response, and normal flora. It is superior to other enteral feeding methods due to the lower risk of aspiration. In conclusion, our study, which presented the experiences of the PEG insertion and therapy in a secondary state hospital, stated that the complication rates, indications, and referring clinics were found to be consistent with available literature.

Keywords: Percutaneous endoscopic gastrostomy, cerebrovascular event, survival, indication, complication

ÖZET

Giriş: Bu çalışmanın amacı; 2. basamak Burdur Devlet Hastanemizde 3 yıllık sürede uygulanan Perkütan Endoskopik Gastrostomi (PEG) hastalarında, endikasyonları, hastanın yattığı birim, PEG ile yaşam sürelerinin belirlenmesi ve komplikasyonlarının tanımlanmasıdır.

Yöntemler: Bu çalışmada Ocak 2019- Ocak 2022 tarihleri arasında hastanemiz endoskopi ünitesinde PEG uygulanan hastalar retrospektif olarak değerlendirildi. PEG takılan hastaların yaş, cinsiyet, hastanın yattığı klinik, PEG takılma endikasyonu, PEG sonrası gelişen komplikasyon ve hastanın sağkalımı olgu rapor formuna yazıldı. Koagülasyon bozukluğu, hemodinamik instabilite, peritonit, sepsis, giriş alanında enfeksiyon varlığı, peritonitis karsinomatoza, total gastrektomi hikayesi ve gastrik varisleri bulunanlara PEG uygulanmamıştır.

Bulgular: Çalışmaya dahil edilen toplam 120 hastanın yaş ortancası 79 (17-100) yıldı ve 66(%55)'sı erkekti. PEG takılan hastaların 14 (%11,7)'ünde komplikasyon görüldü. Görülen komplikasyonların tamamı minör komplikasyon olup 7(%5,8)'sinde PEG yeri enfeksiyonu, 3(%2,5)'ünde PEG yerinden sızıntı, 3(%2,5)'ünde PEG tıkanması, 1 (% 0,9)'inde PEG çıkması olarak saptandı. Hastaların 73(%60.8)'ünün en az 30 gün hayatta kaldığı tespit edildi. Hastaların en sık % 52,7 ile nöroloji tarafından yönlendirildiği saptandı. En sık PEG takma endikasyonları serebrovasküler hastalık (%56,7) ve demans (%29,2) idi.

Sonuç: PEG ile beslenmenin sürdürülmesi ile mukozal bütünlük korunmakta, mukozal bariyer fonksiyonu, intestinal immün yanıt ve normal flora yapısının devamı sağlanmaktadır. Aspirasyon riskinin daha az olması nedeniyle diğer enteral beslenme yollarına göre üstünlüğü kabul edilmiştir. Sonuç olarak ikinci basamak bir devlet hastanesinde PEG ile ilgili deneyimlerinin aktarıldığı bu çalışmada komplikasyon oranlarının, endikasyonların ve yönlendiren kliniklerin literatür verileriyle uyumlu olduğu gösterilmiştir.

Anahtar kelimeler: Perkütan endoskopik gastrostomi, serebrovasküler olay, sağkalım, endikasyon, komplikasyon

INTRODUCTION

Percutaneous endoscopic gastrostomy (PEG) is an enteral nutrition technique which is used in patients without gastrointestinal system dysfunction who can not be fed orally for any reason and require nutrition for more than 30 days (1). It was first described and applied by Gauderer and Ponsky in 1980 (2). The most common indications are neurological diseases, head and neck cancers, patients who are fed through a nasogastric tube due to insufficient oral intake, and patients who are at risk of aspiration pneumonia (3,4).

PEG feeding has several advantages over parenteral nutrition and surgical gastrostomy. The advantages are as follows: it is more economical; easier and more comfortable to use; protects the intestinal flora; prevents

Corresponding author: Semiha Orhan, Afyonkarahisar Health Sciences University, Department of Intensive Care Unit Afyonkarahisar. Turkey
Telephone: +905327281979
E-mail: smhorhan@gmail.com
ORCID: https://orcid.org/0000-0003-2617-6197
Received date: 15.08.2022 **Accepted date:** 24.02.2023

Cite as: Gülsoy KY, Çelik F, Orhan S. Percutaneous Endoscopic Gastrostomy Results in A Secondary State Hospital. Eskisehir Med J. 2023; 4(1): 6-10
doi: 10.48176/esmj.2023.96

mucosal atrophy; reduces bacterial translocation; and can be used at the bedside with minimal sedation and a short hospitalization time. PEG can be applied in various ways. The PEG pull method is the most widely preferred PEG technique (5,6).

Necrosis of the stomach wall, organ perforation, bleeding, and peritonitis are the most serious complications. Catheter occlusion, leakage from the site of insertion, and infection at the site of insertion are the most common minor complications (7).

The aim of this study was to determinethe indications for patients with PEG in our secondary state hospital over a 3-year period; the unit in which the patients were hospitalized; the life expectancy with PEG; and complications.

METHODS

In this study, patients who underwent PEG in the endoscopy unit of our hospital between January 2019 and January 2022 were evaluated retrospectively. The study was conducted following the Declaration of Helsinki, and patients gave their written consent. Approval for the study was granted by the Clinical Research Ethics Committee of Afyonkarahisar University of Health Sciences (decision no:351, date:2022). The age, sex, clinic in which the patient was hospitalized, indication for PEG placement, complications after PEG, and survival status of the patients were recorded in the case report form. As a standard, all patients who underwent PEG and/or patient relatives were informed about the procedure and their approval was obtained. Patients were given 10% lidocaine spray (Xylocain 10% spray; Astra Zeneca, Sweden), which is a pharyngeal topical anesthetic. Intravenous midazolam (Dormicum; Roche, Switzerland) and/or propofol (Propofol 1% fresenius; FreseniusKabi, Austria) were administered for sedation. Endoscopic examinations were performed using the EG 530WR Fujinon device (Tokyo, Japan) by a gastroenterologist and endoscopy nurses. The pull-method PEG was performed which was described by Gauderer and Ponsky; after at least 8 hours of fasting (after cessation of enteral feeding); and after obtaining sufficient transillumination with gastroduodenoscopy. As a standard, an 18 Fr PEG set was used. PEG was not applied to patients with coagulation disorders, hemodynamic instability, peritonitis, sepsis, infection at the site of insertion, peritonitis carcinomatosis, history of total gastrectomy, and gastric varices. Following the procedure, 50 cc of water was administered through the tube 12 hours later, and enteral feeding was started 12 hours later if there was no leakage around the tube.

Statistical Analysis

The conformity of the age variable to the normal distribution was examined via visual (histogram) and analytical methods (Kolmogorov–Smirnov test). From the data collected in the study, the age variable was expressed as median (the largest–smallest value), whereas categorical data were expressed using descriptive methods such as percentages. The Chi-square test was used for post-hoc analysis and comparison of categorical variables between groups. Post-hoc analyses were performed using the Chi-square test and Bonferroni correction was used. P values less than 0.05 were considered statistically significant. The SPSS Statistics Ver. 22.0 program was used for all statistical analysis and calculations.

RESULTS

The median age of 120 patients included in the study was 79 (17–100) years, and 66 (55%) of them were males. No complications were observed in 106 (88.3%) of patients who underwent PEG placement. All the complications were minor complications, and PEG site infection was observed in 7 (5.8%), PEG site leakage in 3 (2.5%), PEG occlusion in 3 (2.5%), and PEG tube dislodgement in 1 (0.9%) patient. It was determined that 47 (39.2%) of the patients who underwent PEG died within 30 days and 47 (39.2%) died within ≥30 days. None of the deaths were related to PEG (Table 1).

The majority of patients referred for PEG placement were from neurology (62 [51.7%] patients), internal medicine (27 [22.5%] patients), and chest diseases (12 [10%] patients) clinics. The most common indications for PEG placement were cerebrovascular disease (CVD) (56.7%) and dementia (29.2%) (Table 2).

Of the patients, 96 (80%) were aged ≥65 years and 24 (20%) were aged <65 years. No significant difference was found between life expectancy and complications in terms of age groups ($p = 0.108$ and 0.887, respectively). In terms of age groups, there was a significant difference between the indications and the clinics that patients sent ($p < 0.001$). In the subgroup analyses, the following group of patients were aged ≥65 years: 52 (83.9%) who referred from the neurology clinic, 8 (42.1%) who referred from the chest diseases clinic ($p = 0.001$); 26 (96.3%) who referred from the internal medicine clinic, and 8 (42.1%) who referred from other clinics ($p < 0.001$). In the subgroup analyses, 14 (20.6%) of patients with CVD were aged <65 years, 1 (6.7%) of patients with dementia were aged <65 years ($p = 0.016$); 54 (79.4%) of the patients with CVD were aged ≥65 years, 8 (47.1%) of the other patients were aged ≥65 years ($p = 0.013$), and 1 (2.9%) of the patients with dementia were aged <65 years. Of the other patients, 9 (52.9%) were in the group of patients who were aged <65 years ($p < 0.001$) (Table 3) .

Table 1. Demographic data and complications of patients

Age (years) Median(min–max)	79 (17–100)
Sex	
Female (n, %)	54 (45)
Male (n, %)	66 (55)
Complication	
No (n, %)	106 (88.3)
Yes (n, %)	14 (11.7)
Average life expectancy after PEG	
Exitus in 30 days (n, %)	47 (39.2)
Exitus later than 30 days (n, %)	47 (39.2)
Survived (n, %)	26 (21.7)

PEG:Percutaneous endoscopic gastrostomy

Table 2. Percutaneous endoscopic gastrostomy placement indications and medical departments where patients are hospitalized.

Referred by clinics	n (%)
Neurology	62 (51.7)
Internal medicine	27 (22.5)
Chest diseases	12 (10)
Other*	19 (15.8)
Indications	n (%)
Cerebrovascular disease	68 (56.7)
Dementia	35(29.2)
Trauma	10(8.3)
Other**	7(5.8)

*Neurosurgery (15), Otolaryngology (1), Thoracic surgery (1), General surgery (1), Infectious diseases (1)

**Previous surgery (1), Postintracranial surgery (1), General condition disorder (1), Subdural hemorrhage + brain edema (1), Larynx malignant neoplasm surgery + (1),Aspiration pneumonia (2)

Table 3. Comparison of demographic and clinical data by age groups

	Under 65 years old	65 years and older	p
Sex			<0,001*
Female (n,%)	3 (12,5 %)	51 (53,1 %)	
Male (n,%)	21 (87,5 %)	45 (46,9)	
Indications			<0,001*
Cerebrovascular disease(n,%)	14 (58,3 %)	54 (56,3 %)	
Dementia (n,%)	1 (4,2 %)	34 (35,4 %)	
Other (n,%)	9 (37,5 %)	8 (8,3 %)	
Referred by clinic			<0,001*
Neurology (n,%)	10 (41,7 %)	52 (54,2 %)	
Chest diseases (n,%)	2 (8,3 %)	10 (10,4 %)	
Internal medicine (n,%)	1 (4,2 %)	26 (27,1 %)	
Other	11 (45,3 %)	8 (8,3 %)	
Life time			0,108*
Under 30 days (n,%)	5 (20,8 %)	42 (43,6 %)	
30 days and above (n,%)	13 (54,2 %)	34 (35,4 %)	
Survived (n,%)	6 (25 %)	20 (20,8 %)	
Complications			0,887*
No (n,%)	21 (87,5 %)	85 (88,5 %)	
Yes(n,%)	3 (12,5 %)	11 (11,5 %)	

*The Chi-square test. P values less than 0.05 were considered statistically significant

DISCUSSION

PEG is a nutritional technique which is applied to the patients who can not be fed orally for any reason, or need enteral nutrition for more than 4 weeks but have normal gastrointestinal functions. By maintaining nutrition in this manner, mucosal integrity, mucosal barrier function, intestinal immune response, and normal flora structure are all preserved. This method is faster, safer, and less expensive than surgery. Because of the lower risk of aspiration, it has been accepted as superior to other enteral feeding methods (8-10).

It has been reported in the literature that the most common indications for PEG are neurologic dysphagia, head and neck cancers, and trauma (5,11,12). In studies conducted in our country, it has been reported that 63%–89.4% of the most common indications are neurological diseases (13-16). Similar to the literature, the most common cause in our study was neurological diseases (85.9%).

Minor complications of PEG are wound infection, tube occlusion, tube edge leakage, and tube dislodgement. Major complications are Burried Bumper Syndrome, bleeding, perforation, ileus, gastrocolic fistula, and aspiration pneumonia. In the literature, the rate of minor complications has been reported as 6%–33% and the rate of major complications reported as 0%–2.8% (13-

18). In our study, which is consistent with the literature, the rate of minor complications was 11.3%, with no major complications.

Wound infection is the most common minor complication following PEG placement. The incidence of wound infection has been reported as 5%–25% in some publications and up to 65% in others (19-20). In our study, the rate of wound infection after PEG was determined to be 5.8%. The balloon may become dislodged as a result of the internal balloon being deflated and the outer buffer or disk being removed. PEG tube dislodgement is a common complication that can affect up to 4% of patients. Rosenberg et al. reported in their PEG study of the 563 series that this complication increased up to 12.8% (21-22). In our study, PEG tube dislodgement was observed in 0.9% of the patients and this rate is quite low compared to the literature. The possible reason for this is the absence of a PEG replacement tube in our hospital and PEG changes of the patients performed by the pull method. One of the most important disadvantages of the PEG replacement tube is the deflating of the balloon in the stomach over time and the mechanism of the PEG tube coming out of the stomach. Blomberg et al. reported leakage from the PEG site in 10% of their cases in their prospective study (23). Leakage from the PEG site was detected in 2.5% of the cases in our study.

In studies conducted in our country, Gençosmanoğlu et al. (24) reported the 30-day mortality rate as 8% and the total mortality rate as 32%. Erdil et al. (25) reported the 30-day mortality as 26.8% and late mortality rate as 15.7%. Coşkun et al. (16) found 30-day and late mortality rates to be 8.6% and 46.6%, respectively. In our study, these rates were found to be 39.2% and 39.2%, respectively, which are higher than those reported in the literature, possibly due to the elderly population and the average age of the patients being older than in other studies.

The most important limitation in our study is the small number of patients. Another important limitation is that we were unable to make comparisons with alternative methods such as surgical gastrostomy.

In patients who require long-term nutrition, enteral nutrition should be used to avoid the complications of parenteral nutrition. In enteral nutrition, PEG should be preferred over surgical gastrostomy because it has low morbidity and mortality rates; can be applied at the bedside when necessary; does not require general anesthesia; and is cheaper and easily accessible.

CONCLUSION

As a result, in this study, which discussed the experiences of PEG in a secondary state hospital, it was shown that the complication rates were consistent with the literature data, and experienced professionals confirmed that this procedure is a safe method that can be performed at the bedside.

Presentation: This study was presented as an oral presentation at the 5th International Health Sciences and Life Congress 10-12 March 2022 Burdur, Turkey.

Ethics Committee Approval: Approval for the study was granted by the Clinical Research Ethics Committee of Afyonkarahisar University of Health Sciences (decision no:351, date:2022).

Informed Consent: Retrospective study.

Authorship Contributions:

Idea/Concept: FÇ, KYG, SO, Design: FÇ, KYG, Supervision: FÇ, KYG, Data Collection or Processing: FÇ, KYG, Analysis or Interpretation: FÇ, KYG, SO, Literature Search: FÇ, KYG, SO, Writing: FÇ, KYG, SO, Critical Review: FÇ, KYG, SO, References And Fundings: -, Materials: KYG, FÇ.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declare that they have no relevant financial.

REFERENCES

1. Pennington CR, Powell-Tuck J, Shaffer J. Review article: artificial nutritional support for improved patient care. Aliment Pharmacol Ther 1995;9: 471-81.
2. Gauderer MWL, Ponsky JL, Izant RJ. Gastrostomy without laparotomy: a percutaneous endoscopic technique. J Paediatr Surg 1980;15: 872–5.
3. Kumar S, Langmore S, Goddeau RP, et al. Predictors of percutaneous endoscopic gastrostomy tube placement in patients with severe dysphagia from an acute subacute hemispheric infarction. J.Stroke Cerebrovasc Dis 2010;19:1-7.
4. Ermis F, Ozel M, Oncu K, et al. Indications, complications andl ongterm follow-up of patients under going percutaneous endoscopic gastrostomy: A retrospective study. Wien Klin Wochenschr 2012;124:148- 53.
5. Beaver ME, Myers JN, Griffenberg L, Waugh K. Percutaneous fluoroscopic gastrostomy tubeplacement in patients with head and neck cancer. Arch Otolaryngol Head Neck Surg 1998;124:1141-4.
6. Jones M, Santanello SA, Falcone RE. Percutaneous endoscopic vs surgical gastrostomy. JPEN J Parenter Enteral Nutr. 1990;14: 533–4.
7. Grant JP. Percutaneous endoscopic gastrostomy initial placement by single endoscopic technique and long-termfollow-up. Ann Surg 1993; 217: 168-74.
8. Virnig DJ, Frech EJ, Delegge MH, Fang JC. Direct percutaneous endoscopic jejunostomy: a case series in pediatric patients. Gastrointest Endosc 2008;67:984-7.

9. Maple J, Petersen B, Baron TH, et al. Direct percutaneous endoscopic jejunostomy: outcomes in 307 consecutive attempts. Am J Gastroenterol 2005;100:2681-8.

10. Harbrecht BG, Moraca RJ, Saul M, Courcoulas AP. Percutaneus endoscopic gastrostomy reduces total hospital costs in head-injured patients. Am J Surg 1998;176:311-4.

11. Dwyer KM, Thurber JS, Benoit RS, Fakhry SM. Percutaneous endoscopic gastrostomy: the preferred method of elective feding tubeplacement in trauma patients. J Trauma 2002;52:26-32.

12. Goldberg LS, Altman KW. The role of gastrostomy tubeplacement in advanced dementia with dysphagia: a critical review. Clin Interv Aging 2014;9:1733-9.

13. Özgüç H, Gökçe E, Altınel Y, Kırdakalil T. Bir genel cerrahi kliniğinin perkütan endoskopik gastrostomi deneyimi. Turkish Journal of Surgery/Ulusal Cerrahi Dergisi 2011; 27(3): 145-8.

14. Temiz A, Aslan OB, Albayrak Y, Albayrak F, Kısaoğlu A, Er S. Perkütan endoskopik gastrostomi: endikasyon ve komplikasyonlar. Akademik Gastroenteroloji Dergisi 2015; 113-6.

15. Etik DÖ, Suna N, Öcal S, Selçuk H. Percutaneous endoscopic gastrostomy in older patient population. Endoskopi Gastrointestinal 2018; 26: 6-11.

16. Coşkun O, Arı D. Perkütan endoskopik gastrostomi uygulamasındaki sonuçlarımız: 58 olgunun değerlendirilmesi. Endoskopi Gastrointestinal 2019; 27(3): 93-6.

17. Lee SP, Lee KN, Lee OY, et al. Risk factors for complications of percutaneous endoscopic gastrostomy. Dig Dis Sci 2014;59:117-25.

18. Şenol Z, Karakaş DÖ, Yılmaz İ, et al. Perkütan endoskopik gastrostomi tecrübemiz: 64 olgunun değerlendirilmesi. Van Tıp Dergisi 2013;20:52- 6.

19. Vanis N, Saray A, Gornjakovic S, Mesihovic R. Percutaneous endoscopic gastrostomy (PEG): retrospective analysis of a 7-year clinical experience. Acta Inform Med 2012; 20: 235-7.

20. Preclik G, Grüne S, Leser HG, et al. Prospective, randomised, double blind trial of prophylaxis with single dose of coamoxiclav before percutaneous endoscopic gastrostomy. BMJ 1999; 319: 881-4.

21. Huc T, Spicak J. Complications of percutaneous endoscopic gastrostomy. Best Pract Res Clin Gastroenterol. 2016;30:769-81.

22. Rosenberger LH, Newhook T, Schirmer B, Sawyer RG. Late accidental dislodgement of a percutaneous endoscopic gastrostomy tube: an underestimated burden on patients and the health care system. Surg Endosc 2011; 25: 3307-11.

23. Blomberg J, Lagergren J, Martin L, Mattsson F, Lagergren P. Complication safter percutaneous endoscopic gastrostomy in a prospective study. Scandinavian Journal of Gastroenterology. 2012; 47: 737–42.

24. Gençosmanoğlu R, Şad O, Özdoğan O, et al. Perkütan Endoskopik Gastrostomi: 50 olguluk seri sonuçları. 17. Ulusal Gastroenteroloji Haftası, Antalya 2000; Poster bildiri. Turk J Gstroenterol 2000;11:36.

25. Erdil A, Tüzün A, Saka M, et al. Perkütan endoskopik gastrostomi uygulamalarımız ve sonuçları. Gülhane Tıp Dergisi 2001;43:379-83.