

PERCUTANEOUS ENDOSCOPIC GASTROSTOMY IN NEUROLOGY INTENSIVE CARE UNIT

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ABSTRACT Purpose: To evaluate the demographical characteristics of patients who underwent percutaneous endoscopic gastrostomy procedure in the neurology intensive care clinics. **Material and Methods:** Patients who underwent percutaneous endoscopic gastrostomy procedure in neurology intensive care clinics between 2015-2017 were included in this study. Demographical characteristics of the cases were retrospectively evaluated. **Findings:** In total, 50 patients (21 women, 29 men) were evaluated as the study group. Mean duration of follow-up was 40.12±30.19 days. All patients who underwent percutaneous endoscopic gastrostomy procedure had neurological disorders. Mean age of the patient group was 73±15.8 years. Mean Glasgow coma score (GCS) as evaluated on the day of PEG decision was 9.18±3.6. Five patients developed a skin infection on the site of PEG entry and one patient experienced peristomal bleeding. **Conclusion:** Enteral route must be the first option to be preferred for feeding patients who receive long-term inpatient treatment for neurological disorders in intensive care units. In patients who do not tolerate oral intake, percutaneous endoscopic gastrostomy applications provide a route to give pre-prepared nutritional solutions. Long-term nutritional support can be given through this route with minimal complications.

KEYWORDS: Percutaneous endoscopic gastrostomy, neurology intensive care, complication

Introduction

Percutaneous endoscopic gastrostomy (PEG) is a feeding technique preferred for patients who have standard gastrointestinal functions but cannot be fed orally due to any reason. This procedure has been safely performed since the 1980s. PEG feeding is preferred in patients who require feeding support for more than 30 days. Compared to parenteral feeding, enteral feeding offer advantages such as a lower cost, more comfortable and more convenient application, protection of intestinal flora, prevention

of mucosal atrophy and reduction of bacterial translocation in patients who require long-term feeding [1,2]. The present study aimed to evaluate the early-term, the 1st and the 3rd month, and the late-term outcomes of PEG procedure applied in the neurology clinics of our hospital for enteral feeding of patients who did not have an oral intake.

Materials and Methods

The present study aimed to perform a retrospective evaluation of age, gender, primary diseases, Glasgow coma scale, duration of intensive care stay, the day of PEG insertion after hospitalization, post-procedural major and minor complications, duration of follow-up after discharge (the 1st and the 3rd month), aspiration and feeding intolerance among 50 patients who were considered to be incapable of oral intake for a long-term and found eligible for PEG insertion in Neurology intensive care unit of Kahramanmaraş Sutcu Imam University Medical Faculty since May 2015. PEG procedure was performed after at least 12 hours of fasting. After the absence of leakage around PEG catheter and lack of complaints such as abdominal pain, abdominal distension, vomiting and diarrhoea were confirmed, ten cc per day increased

enteral feeding solution, and the required amount of calories was achieved within 8-10 days. Following discharge, patients' caregivers were trained by the nurses working for the manufacturers of the nutritional products of home-feeding. Early-term complications that occurred within the first month after insertion of the gastrostomy tube were recorded, and post-discharge data were obtained from polyclinic records and through direct interviews with the patients or their caregivers via telephone.

Statistical methods

For statistical tests, IBM SPSS for Windows, version 22.0 (IBM statistical software for Windows version 22, IBM Corporation, Armonk, New York, United States) was used. The data were expressed as the mean + standard deviation (O + SS). Categorical variables were expressed as percentiles.

Findings

Of the patients who were inserted PEG, 37 had a previous cerebrovascular disease, 4 had amyotrophic lateral sclerosis, and 3 had last-stage dementia. Table 1 shows Mean duration of hospital stays among patients who were inserted PEG, Mean Glasgow coma scale, demographical data, presents the causes of intensive care hospitalisations of the study patients.

Before PEG, all patients were fed through a nasogastric catheter. Mean duration of hospital stay among patients who were inserted PEG was 40.12±30.19 days, varying between 2 to 120 days. The patient with amyotrophic lateral sclerosis had the shortest duration of hospital stay. That patient had developed feeding problems due to dysphagia. Mean Glasgow coma scale (GCS) score, which was determined on the day of PEG insertion, was 9.18±3.6. On average, PEG was inserted 22±14 days after the patients were hospitalised in the intensive care unit (minimum: 2 days, maximum: 65 days). PEG was inserted later than expected in four patients. Causes that delayed PEG insertion included family consent, ineligibility of the patients' general status and delays in appointments. None of the patients experienced PEG-related mortality. In total, 14 patients died after PEG insertion due to the causes which were not associated with PEG procedure. Five patients developed a skin infection at PEG entry site, and one patient experienced peristomal bleeding, one patient experienced blockage in the tub. Table 2 shows early and late complications.

DISCUSSION

Percutaneous endoscopic gastrostomy is a feeding technique preferred in patients who have normal gastrointestinal functions and cannot tolerate oral intake due to any reason but require enteral feeding for more than four weeks. It has been successfully used since it was first defined by Gauderer et al. in 1980 [3]. In neurology patients with insufficient oral intake or dysphagia, it is rather crucial to prevent malnutrition and decrease the rate of morbidity. Enteral feeding must be the first choice for patients with the intact gastrointestinal tract. Nasogastric tube insertion also presents a convenient way of enteral feeding, but its long-term use may be associated with some complications. The risk of aspiration during nasogastric feeding is notably increased in elderly patients with neurological disorders. Short-term feeding with PEG is crucial for stroke patients who have permanent neurological dysphagia. In a study performed by Hamidon et al., PEG feeding was reported to be more efficient compared to nasogastric tube insertion for the treatment of dysphagia in stroke

Table 1 Demographical data of the patients.

Groups		(Min.-Max.) or %
Age		73,20±18.16
Sex	Woman	21 (42)
	Male	29 (58)
MDH		40.12±30.19 (2 -120)
GCS		9.18±3.6
Diseases	Cerebrovascular event	37 (74)
	Amyotrophic lateral sclerosis	4 (8)
	Dementia	3 (6)
	Central nervous system malignancy	2 (4)
	Spinal muscular atrophy	2 (4)
	Progressive myoclonic epilepsy	1 (2)
	Central nervous system vasculitis	1 (2)
MDH: Mean duration of hospital stay among patients who were inserted PEG (days); GCS: Mean Glasgow coma scale		

Table 2 Early and late complications.

Complication	Early period	Late period	%
Peristomal infection	5		10
Peristomal bleeding	1		2
Tube clogging		1	2
Total	6	1	14

patients [4]. In the present study, patients who have initially inserted a nasogastric tube and then were switched to PEG feeding adapted well and did not experience any problems during follow-up. There is not a consensus in the literature as to when and how to initiate feeding after PEG insertion. Conventionally, it is initiated 24 hours after the procedure based on limited surgical gastrostomy data. In some studies, feeding was initiated after 1 hour, 24 hours or within the first 12 hours [5,6,7]. In our routine practice, the first feeding is initiated 24 hours after the procedure upon evaluation of the patient by the surgical team and inspection of the wound.

While PEG is a minimally invasive procedure, it may still result in untoward major and minor complications. The most critical major complications include gastric perforation, bleeding and internal organ injury, while the most important minor complications involve tube displacement, obstruction and breakage, peristomal leakage, pneumoperitoneum, peristomal skin infection and bleeding. In the literature, the reported rates of major and minor complications vary between 2.7-2.8% and 6-7.1%, respectively. The most common minor complication is a

peristomal infection [8,9,10]. While none of the patients in the present study developed a significant complication, 12% experienced a minor complication in the short-term. Five patients had a skin infection at PEG entry site, and one patient had peristomal bleeding. Bleeding spontaneously stopped almost 12 hours after the procedure in the patient with peristomal bleeding.

Mean duration of hospital stay was 40.12 ± 30.19 days in patients who were inserted a PEG. The patient with amyotrophic lateral sclerosis had the shortest duration of hospital stay. The guidelines on amyotrophic lateral sclerosis, issued by European Federation of Neurological Societies (EFNS) in 2011, recommend PEG to be inserted before patients start having respiratory failure. The patient in our study had developed dysphagia and feeding difficulties. PEG was performed on the 2nd day of hospitalisation. To safely provide sufficient nutrition with a lower risk of complications, it is recommended to insert PEG early during intensive care stay. The decision to insert PEG was given in 40 days on average, which appears to be quite long. However, some factors are contributing to this delay. Firstly, some patients in this study who had a stable neurological status progressed at a later time and only then required PEG. Secondly, some patients were receiving antiaggregant therapy and could undergo the procedure a few days after cessation of their medications. Last but not least, there were also delays in the time to obtain family's consent and schedule appointments for the procedure.

The rate of PEG-related mortality was reported to be lower than 1% [11]. Mortality rates after PEG procedure vary depending on the number of cases in each published series. In a study performed by Schneider et al., 119 patients were evaluated, and the 1-month mortality rate was reported as 10% [12]. In another study, Varnier et al. evaluated 68 patients and reported a 1-month mortality rate of 1.5% [13]. In a series of 97 cases reported by Taylor et al., the 1-month mortality rate was 22% and the leading causes of death within the first 30 days included pneumonia, cardiac disorders and cerebrovascular disease [14].

There was no procedure-related mortality in the present study. Of all patients who were inserted PEG, 12% (6 patients) died within the first 30 days, and 16% (8 patients) died within the subsequent 3-month period due to the primary disease. Follow-up of the patients who survived indicated that PEG site was closed and oral feeding was initiated in only one patient whose neurological status recovered in the 3rd month.

CONCLUSION

PEG provides a simple, safe and effective method of long-term enteral feeding, particularly in patients with permanent neurological dysphagia. In addition to feeding, it ensures convenient administration of oral preparations that are used for treatment. While the other previous studies addressed different patient populations, in the present study, we aimed to share our clinical experiences including PEG-related complications, long-term patient compliance and mortality, along with disease burden introduced by a neurological disorder, particularly in intensive care patients. Based on our experiences, we believe that PEG should be more commonly used in appropriate cases.

Authors' Statements

Competing Interests

There were no financial support or relationships between the authors and any organization or professional bodies that could pose any conflict of interests.

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