

Percutaneous endoscopic gastrostomy; success and outcome of a novel modality for enteral nutrition

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Abstract

Objective: To determine the indications and complications of percutaneous endoscopic gastrostomy tube.

Methods: The retrospective audit study was conducted at the Department of Gastroenterology, Endoscopy Unit, Patel Hospital, Karachi, and comprised data of patients aged 4-95 years who underwent placement of percutaneous endoscopic gastrostomy under conscious sedation and for patients under 18 years of age having obtained anaesthesia fitness, under general anaesthesia, from August, 2008, to July, 2018. Pre-procedure treatment and follow-up was noted on a structured proforma. Data analysed using SPSS 21.

Results: Of the 367 patients, 237(64.6%) were males and the overall mean age of the sample was 63±15 years. Of the total, 257(70%) procedures were done in the day-care setting. The most common primary indication for tube placement was neurological dysphagia 259(70.6%). No procedure-related mortality was observed, but 35(9.5%) patients had PEG-site infection, and 3(8.5%) of them required removal of the tube.

Conclusion: Percutaneous endoscopic gastrostomy was found to be an effective and useful feeding alternative, leading to improved nutrition.

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Introductions

Percutaneous Endoscopic Gastrostomy (PEG) is an endoscopic technique connecting the gastrointestinal tract (GIT) with the external part of the body with a feeding tube through which it is possible to introduce nutritional blends into GIT.¹ This method was first introduced in 1980.²

This technique is very simple and commonly used in clinical practice all around the globe. The overall success rate of PEG insertion is reportedly 95-100%.³ One meta-analysis done in 2004 described PEG tube procedure-related morbidity of 9.4% and mortality of 0.53%.⁴

The key elements involved in the choice to do a PEG in clinically compromised conditions are psychological, religious, ethical and legislative reasons.⁵ Patients who have a difficult time swallowing or chewing may benefit from a feeding tube.⁶

Nowadays, PEG is considered the method of choice for long-term enteral feeding all over the world because of its effectiveness and easy execution.^{7,8}

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PEG is also appropriate for long-term enteral home use nutrition, as it decreases the risk of complications affected by nutrition nasogastric (NG) probes. PEG is also used in patients who cannot be offered enteral preparations through NG probe, like patients with maxilla-facial injuries.⁹ According to the guidelines of the European Society for Clinical Trials Nutrition and Metabolism (ESPEN),¹⁰ PEG is generally indicated when it is necessary to feed patient enterally for more than 2-3 weeks.

Assessment of indications and contraindications of PEG tube placement is crucial to deal with the problem of the growing disconnect between scientific evidence and clinical practice.¹ Despite the evidence showing an advantage in the outcome from PEG placement only in selected subgroups of patients, this technique is also used for questionable indications in clinical practice, such as advanced dementia, permanent vegetative state, and even in end-life patients. Such an overuse is indirectly confirmed by several studies reporting a high 30-day mortality rate after PEG placement in elderly patients.¹¹

Aftercare of PEG tube is simple; the caregivers or patients themselves can manage feeding and cleaning of the tube. Their education regarding this is the responsibility of the endoscopy team. Early identification of any complications, especially PEG site infection, is crucial, as holding of feeding for a few days and local measures can prevent its extension. The risk of aspiration still remains

and it needs to be emphasised on patients to know the measures to prevent it.

Currently, there is a growing trend for referrals to gastroenterology units for PEG tube placement. The procedure is performed in outpatient settings at most centres. So it seems necessary to periodically evaluate this technique, and its complication as well as indications. The role of patients' or caregivers' education is the key for safety of PEG feeding. The current study was planned to evaluate the success of PEG tube placement, and to identify the most common indications and various complications.

Methods

The retrospective audit study was conducted at the Department of Gastroenterology, Endoscopy Unit, Patel Hospital, Karachi, and comprised data of patients aged 4-95 years who underwent PEG tube placement under conscious sedation or under general anaesthesia in patients under 18 years of age after obtaining anaesthesia fitness, from August, 2008, to July, 2018. The patients provided informed consent before the procedure. For children under 18 years of age and where patients did not have the ability to understand, consent was obtained from the parents or immediate caretakers. Data included related to patients who had a life expectancy of more than a month, whose dysphagia lasted for at least one month and were referred for PEG tube placement and had no contraindication mentioned in the history. Confounding variables were strictly prevented by excluding data of patients with signs and symptoms of gastro-paresis, incurable gastric or pancreatic cancer, and previous gastric resection. Those who had platelet $<50 \times 10^9/L$, uncorrected coagulopathy and diagnosed patients with GIT or other malignancies were also excluded, and so were patients with recent history of melena or features suggestive of upper GI bleeding.

After preparation of the abdomen, administration of prophylactic antibiotic full upper endoscopy was performed to ensure the patency of GI lumen. Routine antibiotic prophylaxis had been given to the patients as 500mg intravenous (IV) cefuroxime. IV injection of

midazolam and local anaesthesia with lidocaine hydrochloride spray were used for the planning of PEG tube placement. Standard kit for PEG tube had been used for all of patients. The 'pull' technique had been used for tube placement and all the procedures were performed by senior consultants with 8-15 years of working experience and senior registrars with 2-3 years of working experience. Procedures for the paediatric patients were performed by consultants having >26 years of experience in performing endoscopic procedures, including upper and lower GI endoscopy and PEG tube placement. After insertion, the standard practice is to commence feeding 4-6 hours post-insertion. Patients were reviewed by a dietician for education and to inform them about tube care and ways of administering feeds. Patient and family or their caregivers were given instructions for maintaining cleaning and assistance of the PEG tube for patients' proper feed at home. All patients had been referred to home PEG care services or were followed up in outpatient gastrostomy clinic. All demographics information, like age, gender and complications and indications, were noted on a structured proforma.

Data was analysed using SPSS 21. Numerical variables, like age, were expressed as means and standard deviations (SDs), while categorical variables, like gender, complications and indications, were expressed frequencies and percentages.

Results

Of the 367 patients, 237(64.6%) were males and the overall mean age of the sample was 63 ± 15 years. The median age was 63 years (interquartile range [IQR]: 74-52 years). Of the total, 257(70%) procedures were done in the

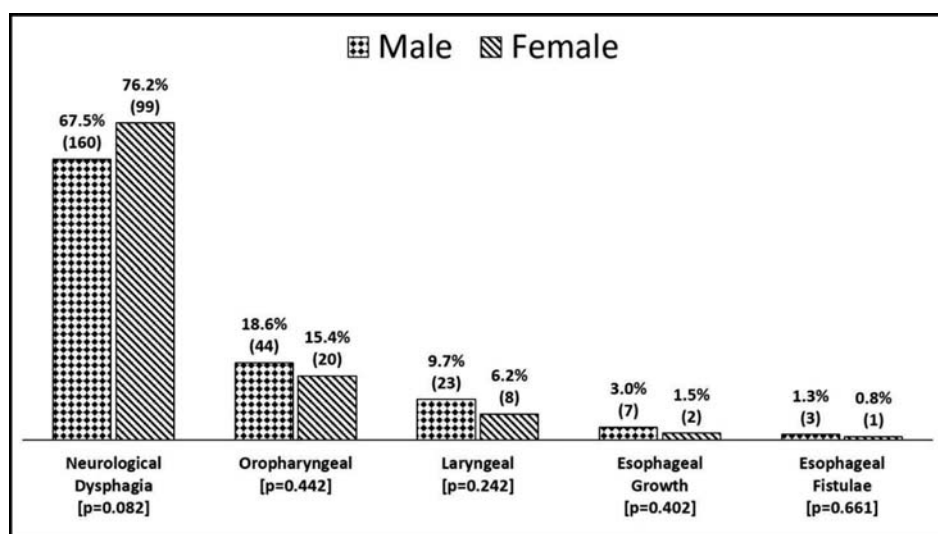


Figure-1: Indications for percutaneous endoscopic gastrostomy (PEG) tube by gender.

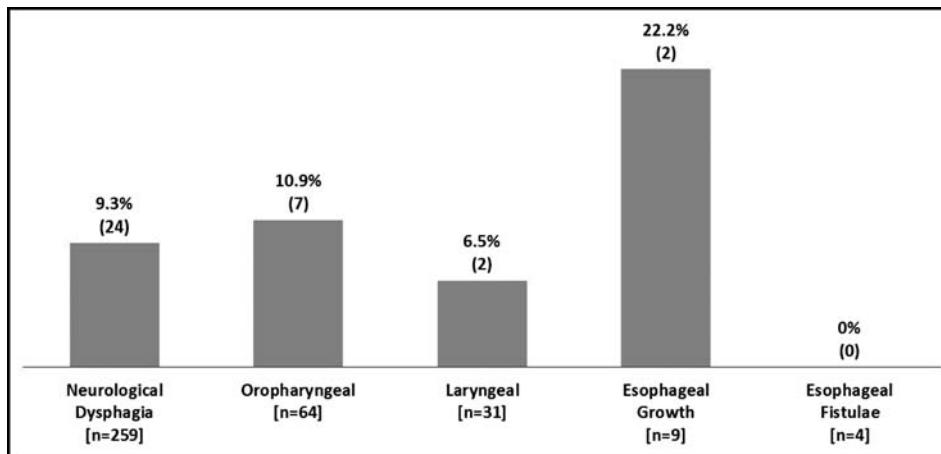


Figure-2: Complication rate by indications for percutaneous endoscopic gastrostomy (PEG) tube.

day-care setting. The most common primary indication for tube placement was neurological dysphagia 259(70.6%), and 212(81.9%) of them had stroke. Other indications included oropharyngeal growth 64(17.4%), laryngeal growth 31(8.4%), oesophageal growth 9(2.5%), and oesophageal fistulae 4(1.1%) (Figure-1).

Indications in paediatric age group included cerebral palsy, space occupying lesions of brain and road traffic accident causing permanent neurological deficit. No procedure-related mortality was observed, but 35(9.5%) patients had PEG site-related infection. Among them, 24(68.5%) patients had mild infection that resolved spontaneously with enteral antibiotics and without holding the PEG feed, while 11(31.4%) had severe infection requiring parenteral antibiotics and holding of PEG feed for up to a maximum of 5 days. A total of 3(0.8%) patients required removal of PEG tube (Figure-2).

Discussion

Maintaining nutritional adequacy in clinically compromised conditions remains a great challenge to the clinicians for the optimum management of these patients.¹² Even after more than 35 years of its introduction,² PEG is the preferred and widely adopted approach of enteral nutrition and hydration.^{7,13,14} However, deciding on the placement of PEG tube is the joint responsibility of healthcare providers, families and patients, if possible.¹⁴⁻¹⁶

Data for PEG use in Pakistan is sparse, reflecting a low experience of or reliance on an invasive procedure. NG tube feeding is still regularly advised for prolonged periods, although there is established data to suggest superiority of PEG over NG feeding, especially in patients with stroke or oropharyngeal tumours.^{17,18} There is also a

fear among caregivers, generally family members in our community, regarding the procedure of PEG placement and its after-care. The post-PEG placement complications are site infection, bleeding, aspiration pneumonia and perforation. Early identification of these complications is of utmost importance as simple measures can avoid their extension. Similarly, care of PEG tube and feeding methodology prevents these happenings. A pre- and post-procedure form is made in our

unit for assessing the cause and initial stability of patients along with their medications history. Post-procedure immediate complications, if identified, are documented. Patients remain in recovery for a minimum of 2 hours. Post-PEG placement education is provided to the patient or care-giver, mainly regarding the cleaning, feeding technique with focus on measures to prevent aspiration like feeding at 30-45 degrees. Regular cleaning of PEG site, especially after feeding, to dry up the surrounding spillover is emphasised and taught to the families. They are educated to identify signs of early infection, like erythema, oozing or hot skin, and advised to immediately contact the health facility. Our team members, usually endoscopic technicians trained in after-care of PEG, remain in contact with families concerned. He or she visits patients to view PEG site and address any issues, if required.

In our study, primary indication for PEG tube placement were neurological dysphagia, oropharyngeal, laryngeal, oesophageal growth, and oesophageal fistulae respectively in descending order of occurrence. One local study¹⁴ found cerebrovascular accidents as the underlying diagnosis for the placement of PEG tube in 63% patients. Other indications observed in that study were dysphagia due to dementia, advanced parkinsonism, oropharyngeal tumours, and others. Another study⁷ reported cerebrovascular accident (96%) as the leading indicator for the placement of PEG tube in the local population. A range of indications have been reported in literature, including, oesophageal obstruction and non-obstructive dysphagia.¹³

It appears to be inappropriate to place PEG tube in patients with incurable and rapidly progressive illnesses.

To optimise the efficiency of PEG tube, it is important to understand the suitability of the target patient for the procedure. Some of the contraindications reported in literature that may impede PEG placement are history of gastric resection, hepatomegaly, ascities, and obesity.¹²

In our study, no PEG tube-related mortality was observed. The rate of site-related infections observed in our study was comparable with literature.^{7,14} One study⁷ reported dislodgement of PEG tube in 2.75% patients, while no such incidence was observed in our study. Another study¹⁴ reported dislodgement in 11.5% patients and tube blockage in 2.1% patients. The overall experience of the care-givers regarding PEG tube after-care management and feeding was satisfactory as acknowledged by them. They felt secured as they had easy access to our team members. A sympathetic, educated and available team was the key behind our success and so we are expanding this team work and introducing social workers and volunteers devoted to this cause. Despite lesser post-placement complications, a careful assessment of beneficence of PEG tube placement needs to be kept in mind by healthcare providers. The single-centre orientation and retrospective design are the key limitations of the current study.

Conclusion

PEG tube placement for enteral nutrition and hydration was found to be a safe procedure. The most common indication for the procedure was neurological dysphagia, and site-related infection was the most common post-placement complication.

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