



Percutaneous Endoscopic Gastrostomy (PEG) in Cancer Patients; Technique, Indications and Complications

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Abstract

Enteral feeding is the preferred method of nutritional support in malnourished patients with inadequate oral intake but with intact gastrointestinal tract. In cancer patients, adequate nutrition plays an important role in the success of the treatment and hence the overall prognosis. Percutaneous endoscopic gastrostomy proved to be an effective means for providing enteral nutrition with easy technique, less hospital stay and cost with less morbidity and mortality. Aim of work: It is a prospective study on 40 cancer patients with different indications for PEG which is done by pull technique under local anesthesia and sedation over a period of 12 months with a follow up period of 60 days. Results: The procedure was

successful in 38 patients (95%), 22 patients (55%) with esophageal cancer, 16 cases (40%) with head and neck cancer, and 2 cases (5%) for gastric decompression due to prepyloric gastric cancer. Mortality rate was 2.5% (1 case) due to leakage and peritonitis, and morbidity occurred in 6 cases (15%) due to port infection and minor leakage managed by dressing and systemic antibiotics.

Conclusion:

PEG is an easy procedure for providing enteral nutrition for cancer patients and associated with fewer rates of morbidity and mortality compared to gastrostomy procedures.

Key words:

Cancer, PEG, Nutrition

Introduction:

Providing enteral nutrition in patients who cannot ingest food for one reason or another, but who have an otherwise functioning gut is the most common indication to perform Gastrostomy. It is the preferred method of nutritional support in malnourished patients with inadequate oral intake. Traditionally, feeding has been provided with surgical Gastrostomy or a long-term nasogastric tube. However, the high morbidity and mortality reported in surgical series⁽¹⁻⁴⁾ provided impetus for the development of alternative techniques. In 1980, an endoscopic method was described by Gauderer et al⁽⁵⁾ as an alternative to surgical Gastrostomy for long term feeding for patients with swallowing disorders. Percutaneous endoscopic gastrostomy (PEG) is now a well recognized technique and has undergone various

stages of development and modifications to improve its safety and effectiveness. PEG may not be appropriate in some patients with rapidly progressing and incurable diseases or when oral feeding is expected to be resumed within 30 days because short-term nasogastric feeding may provide similar results⁽⁶⁾. In cancer patients adequate nutrition plays an important role in many aspects of cancer treatment and development. About 20-40% may die from poor nutritional status rather than the disease⁽⁷⁾. Cancer patients have increased basal metabolic rates due to released cytokines by the tumour cells, also the anorexia, inadequate intake, loss of lean muscle mass and fat stores. So it is important for the patient to be in a good nutritional status before starting anticancer treatment. On the other hand, anticancer treatment itself (surgery, chemotherapy or radiotherapy) may interfere with ingestion and/or digestion and utilization of food. Maintaining adequate nutritional support will make the patient able to tolerate the

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morbidity and in turn add to the success of the therapy ⁽⁸⁾⁽⁹⁾.

General Indications of PEG:

1. Failure to thrive.
2. Poor oral intake.
3. Dysphagia: mechanical or neurogenic:
 - Neurological: stroke with dysphagia, multiple sclerosis, motorneurone disease, cerebral palsy and myotonic dystrophy.
 - Mechanical: oesophageal carcinoma and head & neck malignancy.
 - Advanced dementia with poor oral intake.

Contraindications:

1. Severe co morbidity or sepsis.
2. Expected survival less than 6 weeks.
3. Abdominal wall infection.
4. Coagulopathy.
5. Multiple abdominal surgeries.
6. Intestinal obstruction.
7. Partial Gastrectomy

Complications of PEG:

1. Perforation of esophagus, stomach or transverse colon.
2. Hemorrhage.
3. Sepsis: usually detected in 2-3 days.
4. Clogging of the tube.
5. Gastrocutaneous fistula.
6. Gastric ulcer.
7. Leakage around the tube.
8. Peritonitis.
9. Buried bumper syndrome: when the bumper gets buried in the stomach wall.
10. Distal migration of the tube.
11. An agitated patient may pull the tube out ⁽¹⁰⁾.

Aim of the work:

To evaluate the technique, outcome and complications in patients who underwent PEG a and had a follow up period of 60 days.

Patients and methods:

This is a prospective study done on 40 cancer patients in the period from August 2007 to July 2008 for whom PEG was indicated with a minimal follow up of 60 days

Preoperative investigations/preparation for the procedure:

- Consent/written, advanced and directive.
- Cardio-respiratory status assessment.
- Baseline laboratory parameters: (coagulation profile, complete blood count, liver and kidney function tests).
- A single dose of IV antibiotic administered.
- The patient general condition was reevaluated 24 hours prior to and a few hours prior to PEG insertion; acuity of illness could have changed the expected survival.
- The abdomen was examined for scars; a sign of ascites or cellulitis and the skin over the abdomen was cleaned using povidone iodine.

The procedure:

Ponsky Pull technique is used in this study. Pentax gastrovideoscope ES-384D was used. In cases of esophageal carcinoma the esophagus is first dilated to 38 Fr. using sailastic dilators to allow the passage of the gastroscop

1. The esophagogastroduodenoscope is passed into the stomach. The stomach is examined to rule out local contraindications, such as tumour, severe erosive gastritis, varices, large ulcers and outlet obstruction.
2. The patient is rotated then to supine position and the stomach is inflated with air, so that its anterior wall abuts the anterior abdominal, pushing away any bowel loops from in between.
3. Transillumination is attained through the anterior abdominal wall after darkening the room. The assistant makes a finger impression over the point of transillumination. Failure to transilluminate implies presence of intervening bowel loops, making procedure unsafe.
4. This indentation must be clearly visible through the endoscope, which is already positioned facing the anterior abdominal wall.
5. After marking this point on the skin, the assistant injects a local anesthetic into the

skin and makes a shallow 5mm cut using a scalpel.

6. An 18G hollow needle is passed through this incision, piercing the gastric wall, thus entering the endoscopic field.
7. The assistant passes a guidewire through the needle which is grasped by a snare that is passed through the endoscope. Both are pulled out through the mouth as one unit as the assistant feeds more wire as needed into the stomach.
8. The tapering end of the lubricated PEG tube is threaded over the wire and pushed through the mouth into the esophagus and the stomach, while the assistant pulls the wire back through the incision. As more wire is pulled out, the tapered tip of the PEG tube becomes visible and the process is continued until only about 3-4cm of the PEG tube remains deep to the skin. The marking on the tube help determine the length.
9. The tube is trimmed in length and a feeding port is attached to the tip after anchoring the tube to the anterior abdominal wall using a plastic stopper. The stopper now approximates the anterior gastric wall to the abdominal wall.
10. Feeding can be started on the same day if there are no complications.
11. Daily check for an adequate approximation of the gastric wall to the abdominal wall to prevent dislocation and peritonitis ⁽¹¹⁾.
12. The patient is then discharged with average hospital stay of one week.

Results

This study included 40 patients in the period from August 2007 till July 2008 at the National Cancer Institute, 27 males (67.5%) and 13 females (32.5%) with age ranging from 37 to 80 years old with a mean age of 58.5 years old (Table 1).

Gender	No	%
Males	27	67.5
Females	13	32.5

Table 1 : Patient Characteristics

The indications for PEG in this study were divided into 3 groups:

Group 1:

Dysphagia group included 22 cases (55%) of advanced esophageal carcinoma that are not fit for surgery, 7 cases (17.5%) with hypopharyngeal carcinoma for whom palliative treatment was scheduled, 4 cases (10%) of postglossectomy and radiotherapy and 2 cases (5%) of retromolar carcinoma.

Group 2:

3 cases (7.5%) with major mucocutaneous fistula following total laryngectomy and put under conservative treatment.

Group 3:

2 cases (5%) with advanced prepyloric gastric carcinoma with gastric dilatation and repeated vomiting and aspiration and scheduled for gastric decompression.

The procedure was successful in 38 cases (95%) and failure occurred in 2 cases of advanced esophageal carcinoma for which dilatation of the esophagus was impossible and referred for surgical Gastrostomy.

Complications:

Occurred in 7 cases and were divided into 2 categories:

Minor complications:

Occurred in 6 cases (15%) and included 4 cases with PEG site infection, developed in the first week and managed by local dressing and systemic antibiotics and infection resolved within few days. The other 2 cases developed

	Dysphagia group				Fistula group	Gastric Decompr
	Esophageal Ca	Retromolar Ca	Hypopharyngeal Ca	posglossectomy		
No.	22	2	7	4	3	2
%	55%	5%	17.5%	10%	7.5%	5%

Table 2 : Patient Groups

minor external leakage around the PEG tube and managed conservatively by frequent dressing and skin protecting cream from maceration and leakage stopped within ten days.

Major complication:

Occurred in one case that developed peritonitis 5 days following PEG insertion and beginning of tube feeding. Patient was explored and revealed generalized peritonitis and patient died 5 days later from septicemia and multisystem organ failure.

Discussion

Gastrostomy is the preferred method of administering enteral nutrition in patients with

	Morbidity		Mortality (Peritonitis)
	PEG site infection	Minor ext. leakage	
No.	4 cases	2 cases	1 case
%	10%	5%	2.5%

Table 3 : Complications

impaired ability to eat. Many authors firmly support the advantages of enteral feeding⁽¹²⁾ because disorders of intestinal motility are avoided, mucosal atrophy is prevented and structural gastrointestinal tract integrity is maintained. The percutaneous approach to gastrostomy tube placement is generally recognized to be lower in cost and reduces procedure time as well as the necessity for general anesthesia. Because it makes laparotomy unnecessary, this approach is almost considered safer than the surgical placement⁽¹³⁾. Compared to nasogastric tube, there is lack of nasal irritation, wider caliber, ability to administer bolus feed and avoiding reflux as nasogastric tube makes cardiac sphincter incompetent⁽¹⁴⁾. Surgical gastrostomy (SG) is associated with a higher morbidity and mortality rates in the literature. Comparing PEG with percutaneous radiologic gastrostomy PRG, the endoscopic technique benefits from direct inspection of the esophagus and stomach and of the needle puncture of the stomach. In addition, guide wire and catheter looping in the peritoneal cavity do not occur⁽¹⁵⁾.

In this study esophageal cancer patients constitutes the main group of patients 55% (22 patients), head and neck malignancies represent

40% of the cases (16 patients) while the remaining 2 cases (5%) are gastric outlet obstruction due to prepyloric cancer for gastric decompression.

When we come to the incidence of complications, wound infection represents the most common complication accounting for 10% of cases (4 cases) which occurred in the first four days following insertion; this is compared to 9% incidence in the literature. This low incidence of infection is due to the routine use of prophylactic antibiotic which is reported in the literature and reduces the rate of infection up to 80%^(16, 17).

Hemorrhage, gastric perforation and gastrocolic fistula were not reported in this study. This may be due to the small number of cases. In large series the rate of this complication accounts for 3-3.5% of cases⁽¹⁸⁾.

In this study, only one case (2.5%) developed generalized peritonitis and septicemia and was due to leakage from the gastrostomy opening in the stomach. This patient was explored and revealed generalized peritonitis. This patient soon died of sepsaemia and multisystem organ failure. This was the only mortality in this study accounting for 2.5% of cases. In large studies, the incidence of mortality is about 3.5% of cases⁽¹⁹⁾.

Endoscopic related morbidities such as; aspiration, apnea and perforation were not reported in this study. The risk factors for these morbidities include; supine position, sedation and advanced age and the accompanying comorbidities. As stated before, there is only one case of mortality (2.5%) during the first month of follow up compared to 3-3.5% in the reported literature⁽²⁰⁾.

We come to the conclusion that the percutaneous approach for placing a feeding tube is associated with less expenditure of cost, time, personnel, analgesics and hospital stay compared with operative gastrostomy and this technique is generally accepted and has been performed during the last 2 decades with satisfactory results. Although this study includes a small number of patients with a short follow up period compared to the large series with a longer follow up period, the results are encouraging and match with the larger series.

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