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CLINICAL STUDY OF FOLEY'S CATHETER AS AN ALTERNATIVE TO PEG CATHETER

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A B S T R A C T

The primary indication for enteral or parenteral feeding is to meet the metabolic requirements for patients with inadequate oral intake. Enteral feeding is preferred over parenteral feeding in a patient with functional Gastrointestinal (GI) system due to inability of the parenteral nutrition to provide enteral stimulation and subsequent compromise of the gut defense barrier. Percutaneous endoscopic gastrostomy (PEG) is the preferred route of feeding and nutritional support in patients with a functional gastrointestinal system who require long-term enteral nutrition. PEG is less expensive than surgical methods, less invasive and there is no need for general anesthesia in majority of the cases. PEG, traditionally performed using the PEG tube, uses the standard 'pull technique' for insertion. This pull technique follows problems like peri-catheter infection due to contamination of the tube with oral flora, need for repeated endoscopy, potential oesophageal injury from the catheter. The push technique for PEG, where we use foley's catheter as an alternative to the PEG tube, is safe, simple, quick and it obviates the risks associated with the pull technique. Majority of the patient load at a government tertiary care setting belongs to the lower socioeconomic class. The PEG tube is expensive and cannot be afforded by these patients. Also, tube changes, reinsertion or removal cannot be performed in the consulting room or outpatient department and requires endoscopy which involves additional recurrent costs. The article focusses on using foley's catheter as an alternative to much expensive PEG tube and the surgical technique for the procedure of PEG

K E Y W O R D S

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ABSTRACT

The primary indication for enteral or parenteral feeding is to meet the metabolic requirements for patients with inadequate oral intake. Enteral feeding is preferred over parenteral feeding in a patient with functional Gastrointestinal (GI) system due to inability of the parenteral nutrition to provide enteral stimulation and subsequent compromise of the gut defense barrier. Percutaneous endoscopic gastrostomy (PEG) is the preferred route of feeding and nutritional support in patients with a functional gastrointestinal system who require long-term enteral nutrition. PEG is less expensive than surgical methods, less invasive and there is no

need for general anesthesia in majority of the cases. PEG, traditionally performed using the PEG tube, uses the standard ‘pull technique’ for insertion. This pull technique follows problems like peri-catheter infection due to contamination of the tube with oral flora, need for repeated endoscopy, potential oesophageal injury from the catheter. The push technique for PEG, where we use foley’s catheter as an alternative to the PEG tube, is safe, simple, quick and it obviates the risks associated with the pull technique. Majority of the patient load at a government tertiary care setting belongs to the lower socioeconomic class. The PEG tube is expensive and cannot be afforded by these patients. Also, tube changes, reinsertion or removal cannot be performed in the consulting room or outpatient department and requires endoscopy which involves additional recurrent costs. The article focusses on using foley’s catheter as an alternative to much expensive PEG tube and the surgical technique for the procedure of PEG and study it’s rationale, accessibility and affordability in a government tertiary care hospital.

KEYWORDS

Percuteneous endoscopic gastrostomy, PEG, Gastrostomy, Enteral nutrition,

Pull technique, Push technique

INTRODUCTION

For chronic debilitated patients who cannot consume sufficient calories to meet their metabolic demands, maintenance of their nutrition is the mainstay of treatment. Nutrition can be provided by either enteral or parenteral route but enteral route if more physiological, economic and associated with fewer complications and hence preferred.

Enteral nutrition should be considered for patients who have an intact, functional Gastrointestinal tract but are unable to consume sufficient calories to meet their metabolic demands. Naso-enteric feeding is the preferred approach to feed patients who are expected to resume peroral nutrition within 30 days. When long tern nutrition is required, either feeding gastrostomy or jejunostomy is indicated as it is more physiological and long term use of naso-enteric tube is associated with complications like oesophageal reflux, nasopharyngeal ulcerations, etc.

Percutaneous

endoscopic gastrostomy (PEG) is the preferred way for gaining enteral access as it avoids laparotomy in debilitated patient. It is an endoscopic procedure for placing a tube into stomach through the abdominal wall. The procedure is performed in order to place a gastric feeding tube as a long term means of providing nutrition to patients who cannot productively take food orally.

PEG administration of enteral feeds is most commonly used method of nutritional support for patients in the community. But the cost of PEG catheter ranges from 5000 rupees to somewhere around 8000 for commonly available PEG kits in the market and most of the patients in government hospitals cannot afford it so we have studied use of foley's catheter, which is readily accessible and affordable (available almost free of cost in most government hospitals), as an alternative to PEG tube, for the lower socioeconomic patients visiting government hospitals.

MATERIALS AND METHOD

60 Patients who came to our Government hospital and those who

required enteral nutrition for more than one month were selected over the period of 2 years. 30 patients were randomly allotted in group one, where Foley’s catheter was used and in remaining patients PEG catheter was used for PEG procedure. Patients were followed up for three months. Patients requiring prolonged enteral nutritional support were included in the study whereas patients with Massive Ascites, Intraabdominal sepsis, Oesophageal or gastric varices, Severe gastro Oesophageal reflux, Intestinal obstruction, Portal Hypertension with gastric varices, coagulopathies were excluded from the study. Patients in whom intubating the oesophagus was difficult or in whom we were unable to transilluminate the stomach or in whom there was difficulty in eliciting the finger pressure sign, were also excluded. Materials that were required for the surgical technique were arranged which includes a Video endoscope to perform the oesophago-gastro-duodenoscopy, Scalpel with 11 No. Surgical blade, one SPC Trocar and canula (22Fr), Foley’s catheter (22Fr), Polypectomy snare (biopsy forceps can also be used) , PEG catheter set containing PEG tube, Polyurethane PEG feeding tube with

internal retention bumper with elastic foam, 14G. needle catheter, 18G. Seldinger needle (or an angiocath), 260 cms (102 inches) guide wire to guide the PEG tube through the oral cavity and upper git.

Both the groups were compared in terms of intra-operative and post operative complications and the effective cost required for the procedure and results were tabulated.

SURGICAL TECHNIQUE

PEG PROCEDURE WITH FOLEY'S CATHETER (PUSH TECHNIQUE) (Fig 1)

Abdominal painting and draping done. A dose of prophylactic antibiotic Inj. Monocef 1gm given. Patient is sedated and local anesthetist agent is kept ready. A full oesophago-Gastro-Duodenoscopy (OGDscopy) performed prior to the procedure. Stomach inflated and the site for placement of Foley's catheter is located by trans-illumination on the abdominal wall and finger indentation of stomach wall seen through the scope (Fig. 1a). A 22G. pilot needle inserted at the finger indentation site and it's entry in the stomach is noted. (Fig 1b and Fig. 1c). With the endoscope in stomach maintaining distension, a small incision is made under

local anesthesia (2% lignocaine solution) at the selected site over the abdominal wall. (Fig 1d). SPC trocar and canula (20Fr) inserted into the stomach through the abdominal incision made and visualized endoscopically (Fig 1e and Fig 1f). SPC trocar is removed following which Foley's catheter (22Fr) is passed through the canula and balloon inflated. (Fig 1g, Fig 1h, Fig 1i, Fig 1j). Catheter is fixed externally to abdominal wall. (Fig 1k). Hemostasis checked with repeat OGD scopy and feeding started 12hrs post procedure.

PEG PROCEDURE WITH PEG CATHETER (PULL TECHNIQUE) (Fig 2)

Abdominal painting and draping done. A dose of prophylactic antibiotic given. Patient is sedated. Local anesthesia kept ready. A full Oesophago-gastro-duodenoscopy (OGD scopy) done prior to the procedure. Stomach inflated and the site of incision is located by trans-illumination on the abdominal wall and finger indentation of stomach wall seen endoscopically. A small (14G.) needle is passed into the stomach An angiocath (18G) is used to puncture the abdominal wall through

a small incision. (Fig 2a). A soft guide wire is inserted through this angiocath and pulled out of the mouth. (Fig 2b). The feeding tube attached to the guide wire and pulled through the mouth, oesophagus, anterior wall of stomach and anterior abdominal wall. (Fig 2c). External bolster fixed. (Fig 2d) Hemostasis checked with repeat OGD scopy.

Feeding started 12 hrs after the procedure.

RESULTS

Tabulating the results and comparing both the groups it was observed that majority of the patients who require Gastrostomy fall into the age category of 40-50 years (20%) followed by 50-60 years (18%) and 60-70 years (18%). (GRAPH 1, TABLE 1)

68% were male and 32% were female. (GRAPH 2, TABLE 2)

Intraoperatively, 10% (3/30) patients in whom foley's was used and 16.6% (5/30) patients in whom PEG tube was used had pneumoperitoneum (P>0.001) which resolved spontaneously over next 24 hrs. None of the patients from both of the groups had stoma site bleeding or trauma to visceral organs. (GRAPH 3, TABLE 3)

Post operatively, 2/30

patients in foley’s group and 5/30 in PEG tube category had paralytic ileus(P>0.001). (GRAPH 4, TABLE 4). These patients responded to conservative management and feeding could be started in 24-48hrs.

2/30 in foley’s group and 5/30 in PEG tube group (P>0.001) had Gastric ulceration despite the PPI prophylaxis which were picked up on subsequent upper GI scopy. (GRAPH 4, TABLE 4). These ulcerations were concentrated mainly around internal bumper along anterior gastric wall. In case of foley’s catheter the ulcerations were located along the posterior gastric wall. Major complications of ulcer like perforation, bleeding did not occur.

3/30 in the foley’s group and 4/30 in PEG tube group (P>0.001) had peristomal wound infection which were managed with topical antiseptic and antibiotic ointments. (GRAPH 4, TABLE 4). 3/30 in foley’s group and 2/30 in PEG tube group (P>0.001) had peristomal leak which were sealed off eventually as the tract got matured. (GRAPH 4, TABLE 4). 5/30 in foley’s group and 3/30 in PEG tube group (P>0.001) experienced clogging of the tube during follow-up survey. (GRAPH 4, TABLE 4). Tubes were declogged with warm

water. 1/30 in foley's group while none form the PEG tube group experienced expulsion of the tube and tube migration with bulb lying beyond the pylorus of stomach, P>0.001 suggests the difference is not significant, 1/30 in PEG tube group and none from the foley's group had buried bumper syndrome, the results being not significant (P>0.001). (GRAPH 4, TABLE 4). This complication was managed endoscopically where mucosa over the bumper coagulated with endoscopic hot biopsy forceps and bumper pulled in gastric lumen. Foley's catheter was used as a replacement tube. Patient tolerated the procedure well and had no significant complaints thereafter.

In a 3 month follow up, 3/30 patients in the foley's group required changing of catheter while 2/30 patients in PEG group required changing of the PEG tube (P>0.001).

None of the patients from either group experienced peritonitis, aspiration pneumonia or gastrocolocutaneous fistula.(GRAPH 4,TABLE 4).

Average operating time for the procedure was 16.2 minutes using foley's catheter and 19.8 minutes when using the PEG tube but the difference is not significant (P>0.001).

(GRAPH 5, TABLE 5)

Total cost of procedure (includes cost of insertion and removal) of PEG using foley's catheter is 110 rupees while that when using PEG tube is 8200 which is a significant difference (P<0.001). (GRAPH 6, TABLE 6)

DISCUSSION

Percutaneous endoscopic gastrostomy (PEG) initially developed for children with inability to swallow, had its first presentation at the annual meeting of the American Paediatric Surgical Association in Florida in 1980. Based on the novel concept of the sutureless approximation of a hollow viscous to the abdominal wall, (6) this minimally invasive procedure has become the standard for direct gastric access worldwide. The authors of the technique, Dr. Michael W.L. Gauderer and Dr. Jeffrey Ponsky, first published the technique in 1980. In 2001, the details of the development of the procedure were published, the first author being the originator of the technique itself. (1) The development of an endoscopic procedure for the placement of a gastrostomy feeding tube has revived interest in the use of this technique for nutritional support. The 'push' and 'pull'

techniques both have been used effectively to establish access to the stomach. (4) to establish

According to clinical practice guidelines for PEG, ideal time to start enteral feeding is between 4-24hours and majority (55.6%) patients require tube replacement within 6 months of placement.(2).

A study by Akkerdjisk et al showed that Antibiotic prophylaxis like amoxycillin clavalunic acid has been said to reduce the complication rate of the pull technique (5)

A study by Goncalo Nunes et al studied hypophosphatemia as a predictor of mortality in gastrostomy patients and observed that pre operative hypophosphatemia is an uncommon predictor of early mortality within the first week. (8)

Data in the results show that there is significant difference in the total procedure cost and insignificant differences in the overall complications and the procedure time. From this study, it can be concluded that use of foley’s catheter for PEG procedure is a rational, feasible and yet cost effective alternative for the more expensive PEG tube in a government tertiary care setting with majority of the patient load belonging to the lower

socioeconomic class.

Although following points should be noted:

Removal and reinsertion of foley’s catheter is more convenient than PEG tube.

Complications like peristomal wound infection, gastric ulcerations, and buried bumper syndrome occur more frequently with PEG tube due to physical properties of bolster. European society of gastrointestinal endoscopy (ESGE) recommends that daily tube mobilization (i.e. pushing inward) along with loose positioning of the external bumper of the PEG tube (1 - 2 cm from the abdominal wall) could reduce the risk of developing buried bumper syndrome. (3)

Complications like catheter migration and expulsion occur more commonly with foley’s catheter.

A study by Loser et al showed that long-term enteral feeding via PEG is accepted as a safe, simple, effective and an acceptable method with excellent long-term results and distinct improvement in the nutritional status of patients. (7)

Therefore, it can be said that foley’s catheter for Percutaneous endoscopic gastrostomy is a safe, easy, rational, feasible and yet cost effective alternative for the more expensive PEG

catheter in a government tertiary care setting with majority of the patient load belonging to the lower socioeconomic class.

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Conflict of Interest

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