International Surgery Journal
Momin ER et al. Int Surg J. 2016 Aug;3(3):1072-1076
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20162257

Research Article

A novel cost effective technique of percutaneous endoscopic gastrostomy with Foley's catheter: an initial report

Erbaz R. Momin*, Manmohan M. Kamat, Sunil Kumar, Amarnath Upadhye

Department of Surgery, Dr RN Cooper Municipal General Hospital, Vile Parle, Mumbai, Maharashtra, India

Received: 11 July 2016
Accepted: 16 July 2016

***Correspondence:**
Dr. Erbaz R. Momin,
E-mail: erbazmomin@gmail.com

ABSTRACT

Background: Percutaneous endoscopic gastrostomy has become an excellent safe alternative for nasogastric and surgically placed feeding tubes. Presently in our country the cost of the tube is one of the factors preventing its wider acceptance.
Methods: We have indigenised the technique of PEG using a Foley's catheter in order to make it more cost effective and acceptable.
Results: The mean procedure time was 29 minutes. No major complications or deaths were observed due to the procedure itself. Outcomes are similar to standard PEG placement where complications up to 7% and mortality up to 2% has been reported.
Conclusions: The initial results of this new technique are encouraging and it may be safely recommended.

Keywords: PEG, New technique, Cost effective, Novel

INTRODUCTION

Percutaneous endoscopic gastrostomy (PEG-tube) was first introduced in 1980 as an alternative to nasogastric tubes and surgically placed gastrostomy tubes.[1] It has now become an excellent alternative for the long-term management of patients having an intact gastrointestinal tract but, unable to feed themselves.[2]

PEG-tube has been found to be a safe and effective procedure and where feasible it is replacing open gastrostomy for long-term enteral nutrition.[3,4] However, the PEG tube itself is costly and cannot be afforded by common people. Also, tube changes, reinsertion or removal cannot be performed in the consulting room or outpatient department and requires endoscopy which involves additional recurrent costs.

Presently in our country, cost of the tube is one of the factors preventing its wider acceptance. In order to make it more affordable and accessible we have modified the procedure so that a Foley's catheter can be used as a feeding tube

METHODS

The study includes those patients who are unable to feed themselves but have an intact alimentary tract e.g. severe head injury, progressive neurologic disease, head and neck malignancies. Those having total oesophageal obstruction, previous gastric/colonic surgery, severe obesity, sepsis, deranged coagulation profile or ascites were excluded from this study.

Currently the original "pull" and the closely related "push" methods with comparable results are the two mostly commonly used techniques to perform PEG.[2,3,5] These methods are excellent and safe.[3] A novel technique was designed in which PEG tube is replaced by a Foley's catheter.

Novel PEG-tube placement technique

Patient preparation and identification of tube placement site

Feedings are with-held 8 hours prior to the procedure. The patient was placed supine on the operating table. Intravenous access was taken and antibiotic prophylaxis given. Oral cavity swabbed with 10% povidone iodine solution, abdomen scrubbed and draped with sterile sheets.

Two operators are needed one to perform endoscopy and one to introduce the feeding tube. Upper gastrointestinal endoscopy up to the second part of the duodenum was performed with a forward viewing endoscope to exclude any concomitant pathology or an intraluminal obstruction.

Gastric cavity was insufflated with air and the best site for tube placement located by turning the endoscope anteriorly and identifying the brightest trans illumination of the anterior abdominal wall. On this point pressure is applied by the assistant's finger to create a clear and prominent indentation of the gastric wall visible to the endoscopist. Multiple sites are evaluated and the best site is chosen. This site is further confirmed by the "safe tract technique" described by Foutch et al.[6] Local anaesthesia is given by infiltrating 2% lignocaine at the chosen sites.

Hitching of gastric wall to abdominal wall

At the above identified site, a 16 gauge hypodermic spinal needle is passed into the gastric cavity, and then a No. 1 nylon suture is passed through the lumen of the needle into the gastric lumen. This suture is then retrieved using a laparoscopic suture retriever which is introduced percutaneously slightly away from the needle again using the "safe tract technique".[6] The ends of this nylon suture are then tied together; hitching the stomach to anterior abdominal wall. Approximately 4-5 cm away from the previous nylon hitch the same procedure is repeated using a separate nylon suture material. Now the anterior gastric wall is hitched to the anterior abdominal wall at two points approximately 4-5 cm away (Figure 1, 2, 3).

Introduction of the feeding tube

Between the two hitching sutures the site for feeding tube is reconfirmed with the safe tract technique. At this site, a skin incision of 1 cm is taken and an autoclaved 16 F suprapubic catheterisation trocar and cannula is introduced into the gastric lumen under endoscopic visualisation.

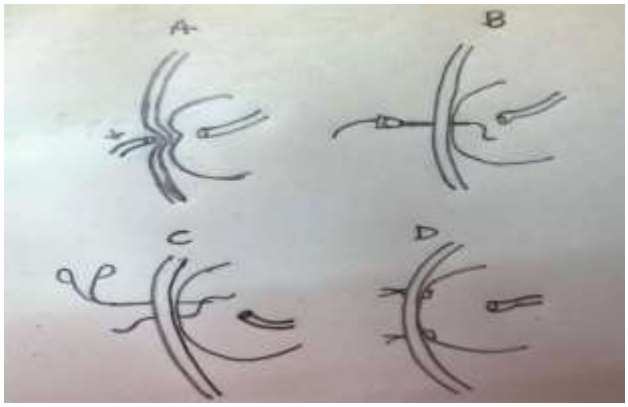

Figure 1: Endoscopic guided gastropexy by novel technique; a) identification of site by transillumination/indentation. b) introduction of nylon suture. c) retrieval of suture with suture passer. d) gastropexy completed.

Figure 2: Endoscopy guided introduction of nylon suture into gastric lumen through 16 G spinal needle.

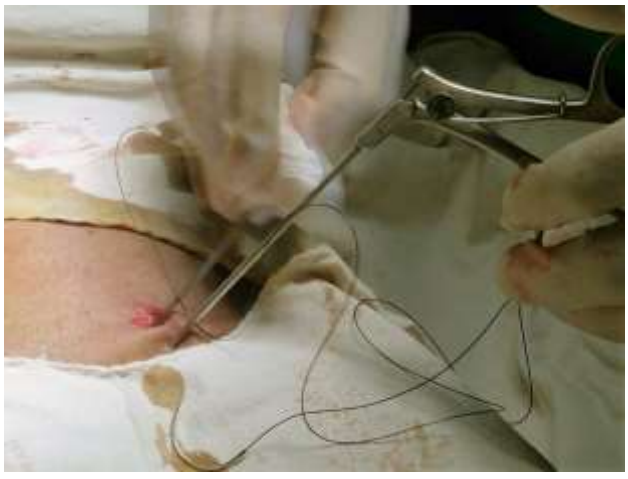

Figure 3: Endoscopy guided retrieval of nylon suture with suture passer.

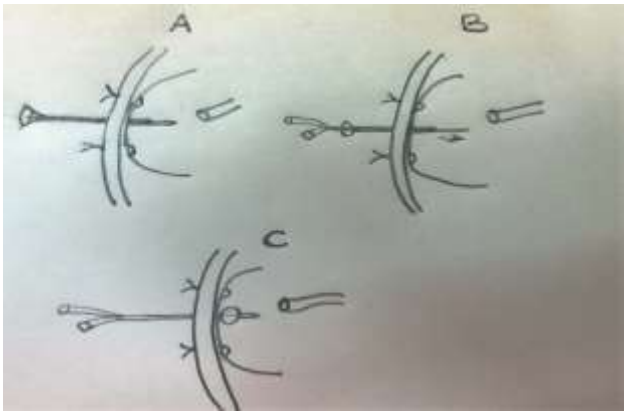

Figure 4: Endoscopic guided introduction of feeding tube. a) insertion of SPC trocar by "safe tract" technique. b) introduction of Foley's Catheter through cannula. c) Inflation of Foley's Bulb and hitching it to abdominal wall.

Figure 5: Endoscopy guided introduction of SPC trocar cannula into the gastric lumen.

Figure 6: Endoscopic view: SPC trocar cannula within the gastric lumen.

The trocar is withdrawn and a 16 F Foley's catheter introduced via the cannula into the stomach, the cannula is now withdrawn and the bulb of the catheter is inflated using 20 ml normal saline (Figure 4, 5, 6, 7 and 8).

Figure 7: Endoscopic view: Foley's catheter bulb inflated and hitched to anterior abdominal wall.

Figure 8: External view of the gastrostomy.

Fixation of the feeding tube and tube changes

The Foley's catheter was pulled out till the bulb was in close approximation to the gastric mucosa and the hemostasis checked. The catheter is then secured to abdominal skin and an occlusive dressing is applied. Test Feeds were started through the catheter 6 hours after the procedure. The hitching sutures are removed after 10-15 days once the tract is mature.

Tube changes are done on outpatient basis. No endoscopy is needed as the stomach is already secured to the abdomen, only the bulb is deflated and the catheter replaced.

Figure 9: Instruments used for performing PEG with the novel technique.

RESULTS

PEG-tube related outcomes

During the study period, 23 patients underwent PEG-tube placement. Over all mean age was 30 years. The underlying diagnosis was traumatic head injury leading to feeding difficulty in 19 patients, neurological condition precluding feeding in 4 patients. One patient had a mild bleeding from catheter insertion site during the procedure and was controlled by hitching the catheter. One patient developed hypergranulation tissue at insertion site 10 days post procedure and was managed by scooping. The mean procedure time was 29 minutes. No major complications or deaths were observed due to the procedure itself. The outcomes were similar to standard PEG insertion where complications up to 7% and mortality up to 2% has been reported.[1,3,7,8]

DISCUSSION

Various studies have demonstrated the advantages of PEG over open gastrostomy (OG). Unfortunately due to the cost of the PEG tube it was not possible to offer this procedure to our patients. This made us explore options to reduce the cost of the entire procedure and at the same time not to compromise on the safety and the time consumed to perform the procedure. At the same time it should not involve multiple passages of endoscope or repeat endoscopy for placement or tube changes. Also, the tube should be easily available and the introducer should be reusable to minimise the cost. Foley's catheter and the reusable, autoclavable trocar cannula for suprapubic cystostomy (SPC) were the possible candidates.

In 1984, Russell had introduced another technique of performing PEG by using Foleys catheter. To deploy the catheter into the gastric lumen a peel away sheath was used.[9] Miller demonstrated the safety and efficacy of this procedure.[10] The peel away sheath technique was successful and brought down the cost quite significantly, but we wanted to do away with the sheath and minimise the cost further using the SPC trocar cannula. Our concern was that while introduction of the trocar cannula the stomach might move away and might result in complications. This concern was overcome using nylon suture as a transcutaneous stay with the safe tract technique of Foutch.[6]

In the standard PEG tube technique, tube changes or removal needs repeat endoscopy and it cannot be performed in the consulting room or outpatient department (OPD). Also, it involves additional cost and it may result in complications as well. There is potential for infective complications as the catheter while being introduced is contaminated by orogastric flora.[10] Studies have demonstrated upto 7.4 % incidence of oesophageal mucosal laceration during tube changes.[11]

In this technique no hospitalisation or repeat endoscopy is needed. Existing catheters bulb is deflated and it is removed and replaced by a sterile new catheter. Tube replacement is easily performed using catheter one size larger or the same size.

In the study, it was found that this technique is easy to perform, less time consuming, provided the surgeon performing the procedure has the basic knowledge of laparoscopy, endoscopy and general urology. It is a very cost effective method since the cost of Foley's catheter is minimal and the SPC trocar is reusable. Tube changes do not require extraordinary skill can be safely done in the OPD even by nursing personnel and repeat endoscopy is not needed for the same.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

REFERENCES

1. Gauderer M, Ponsky JL, Izant RJ. Gastrostomy without laparotomy: a percutaneous endoscopic technique. J Pediatr Surg. 1980;15:872-5.
2. Ponsky JL, Gauderer M. Percutaneous endoscopic gastrostomy: a nonoperative technique for feeding gastrostomy. Gastrointest Endosc. 1981;27:9-11.
3. Ponsky JL. Percutaneous endoscopic gastrostomy. In: Fischer JE, Bland KI, eds. Mastery of Surgery. 5th ed. Philadelphia: LWW;2007:843-8.
4. Safadi BY, Marks JM, Ponsky JL. Percutaneous endoscopic gastrostomy. Gastrointest Endosc Clin N Am. 1998;8(3):551-68.
5. Hogan RB, Demarco DC, Hamilton JK, Walker CO, Polter DE. Percutaneous endoscopic gastrostomy to

push or pull. a prospective randomized trial. Gastrointest Endosc. 1986;32:253-8.
6. Foutch PG, Talbert GA, Waring JP. Percutaneous endoscopic gastrostomy in patients with prior abdominal surgery: virtues of the safe tract. Am J Gastroenterol. 1988;83:147-50.
7. Grant JP. Percutaneous endoscopic gastrostomy initial placement by single endoscopic technique and long-term follow-up. Ann Surg. 1993;217(2):168-74.
8. Blumenstein I, Shastri YM, Stein J. Gastroenteric tube feeding: techniques, problems and solutions. World J Gastroenterol. 2014;20(26):8505-24.
9. Russell TR, Brotman M, Norris F. Percutaneous gastrostomy: a new simplified and cost-effective technique. Am J Surg. 1984;184:132-137.
10. Miller RE, Kummer BA, Tiszenkel HI, Kotler DP. Percutaneous endoscopic gastrostomy procedure of choice. Ann Surg. 1986;204(5):543-5.
11. Lee CG, Kang HW, Lim YJ, Lee JK, Koh MS, Lee JH, et al. Comparison of complications between endoscopic and percutaneous replacement of percutaneous endoscopic gastrostomy tubes. J Korean Med Sci. 2013;28:1781-7.

Cite this article as: Momin ER, Kamat MM, Kumar S, Upadhye A. A novel cost effective technique of percutaneous endoscopic gastrostomy with Foley's catheter: an initial report. Int Surg J 2016;3:1072-6.