

Replacement of Percutaneous Endoscopic Gastrostomy Tube with Low Profile Button Percutaneous Endoscopic Gastrostomy: First Indian Experience

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ABSTRACT

Background: Percutaneous endoscopic gastrostomy (PEG) is a common procedure employed for patients with swallowing disorders with a functioning gastrointestinal tract. Replacement of PEG with a conventional PEG tube by 'pull technique' is considered to be the standard of care. Low profile or button PEG, an alternative that obviates the need for endoscopy, is less explored in the Indian setting.

Methods: Records of all the patients, who underwent PEG replacement with a low-profile PEG (MIC-KEY by Halyard, U.S.A.) for three years, were reviewed. Complications and other relevant details were recorded.

Result: Twenty four low profile PEG tubes were placed in 16 patients; [male 12 (75%); median age(range) 67 (25-85) years]. The indications of PEG placement were stroke in 10 patients, other neurologic illnesses in 5 patients and laryngeal malignancy in 1 patient. Perforation peritonitis and skin induration developed in one patient each. None of the patients had any procedure-related fatal complication.

Conclusion: Although PEG exchange with low profile PEG is considered safe, it has potential complications. Thus, utmost care is required to recognize and treat them early.

KEYWORDS: Gastrostomy, Post-operative Complications, Peritonitis, Enteral Nutrition.

Introduction

In the presence of a functionally intact bowel, enteral nutrition is always preferred over parenteral nutrition especially if needed for a longer duration. If normal swallowing is impaired, enteral nutrition could be provided through tube feeding which is passed through the nostrils (e.g. nasogastric tubes) or percutaneously.

Nutrition in a chronically debilitated patient, who needs long-term support, is preferably provided by endoscopically placed percutaneous endoscopic gastrostomy (PEG).

PEG tubes work for a finite period and need exchange with a new tube because of various reasons such as tube dislodgement, malfunctioning or clogging if traditional measures have failed.¹

Change of the PEG tube is considered a straight forward and relatively simple procedure and hence is poorly described in literature. Most of the complications of PEG tube placement, including infection, bleeding and perforation are related to the creation of gastro-cutaneous fistula, during the change of PEG tube this step is not required, and therefore most of these complications are avoided.

Low profile PEG tubes, also known as button PEG tubes have the advantage of being socially more acceptable, moreover, they can be replaced without the need for endoscopy, thereby improving patient acceptance and reducing the costs. Although PEG placement and its nutritional implications have been widely studied, PEG replacement has been infrequently described in literature.

We describe our experience in consecutive patients in whom low profile PEG tubes were used for replacement of conventional PEG tubes or replacement of low-profile PEG tubes placed earlier.

Methods

We retrospectively reviewed the records of the patients, treated between April 2014 and September 2017. All the patients were identified by reviewing endoscopy records. All those in whom low profile PEG (Mic-Key, Halyard, U.S.A.) was used for the replacement of either

conventional PEG or low profile PEG placed earlier, were included (**Figure 1, Figure 2**). Relevant clinical and procedural details of the eligible patients were recorded in a predesigned data collection form. For each of these patients, as a part of routine medical care, explained written and verbal consents had already been taken from either the patients himself/herself or their close kin.

The procedure was done after a minimum of 6 hours of fasting, sedation was not given. Antibiotic prophylaxis was not administered. Feeding was started immediately after PEG tube placement and patients were discharged soon if the feed were tolerated well. Hospitalization was extended if required.

We used 24 French low profile PEG (Mic-Key, Halyard, U.S.A.) for replacement in all patients. Conventional PEG placed by pull technique earlier was removed endoscopically with snare in all patients and a low profile PEG was placed through the gastrostomy and balloon inflated by 5 ml of sterile water. For those patients who needed a change of low profile PEG placed earlier the balloon was deflated and a new PEG was placed through gastrostomy and balloon inflated, in these patients, endoscopy was not required.

Results

In the study duration, 24 low profile PEG tubes were placed in 16 patients; [male 12 (75%); median age (range) 67 (25-85) years]. The indications of PEG placement



Figure 1: A healthy button PEG site.



Figure 2: Low profile gastrostomy replacement tube after removal.

were stroke in 10 patients, other neurologic illness in 5 and laryngeal malignancy in 1 patient. In 16 patients the low profile PEG tubes were placed as a replacement for conventional PEG tubes and in eight, it was a replacement of low profile PEG placed earlier. Two patients developed complications in form of perforation peritonitis and skin induration respectively. None of the patients had any fatal complication.

Complications

Perforation peritonitis

After replacing a malfunctioning conventional PEG placed ten months previously with a low-profile PEG, on initiating feeds, the patient developed tachycardia and hypotension. His abdominal examination showed tenderness and guarding. Computed tomography confirmed perforation (**Figure 3a, 3b**). He was managed with surgical exploration, closure of perforation site and feeding jejunostomy. He improved and recovered from this complication.

Induration

Another patient with stroke developed skin induration after two months of placement of low-profile PEG (**Figure 4**); he was managed by reducing the inflation of the PEG balloon, thereby achieving decompression. On follow up, improvement of the induration was noted.

Discussion

Replacement of PEG through the previously formed gastro-cutaneous fistula obviates the need for further endoscopy, thereby it is potentially more cost-effective. Additionally, it avoids the complications associated with endoscopy, it can be done bedside and may be performed by less skilled healthcare providers and even by caregivers. It is proven to be more cost effective.² Khaliq reported that since it is the distal end of the PEG tube that gets degraded more often, to reduce replacement costs, it may be replaced with an urobag tube. The replacement of PEG with a Foley's catheter was suggested as a cost-effective method.³ Another study found Foley's catheter as a safe

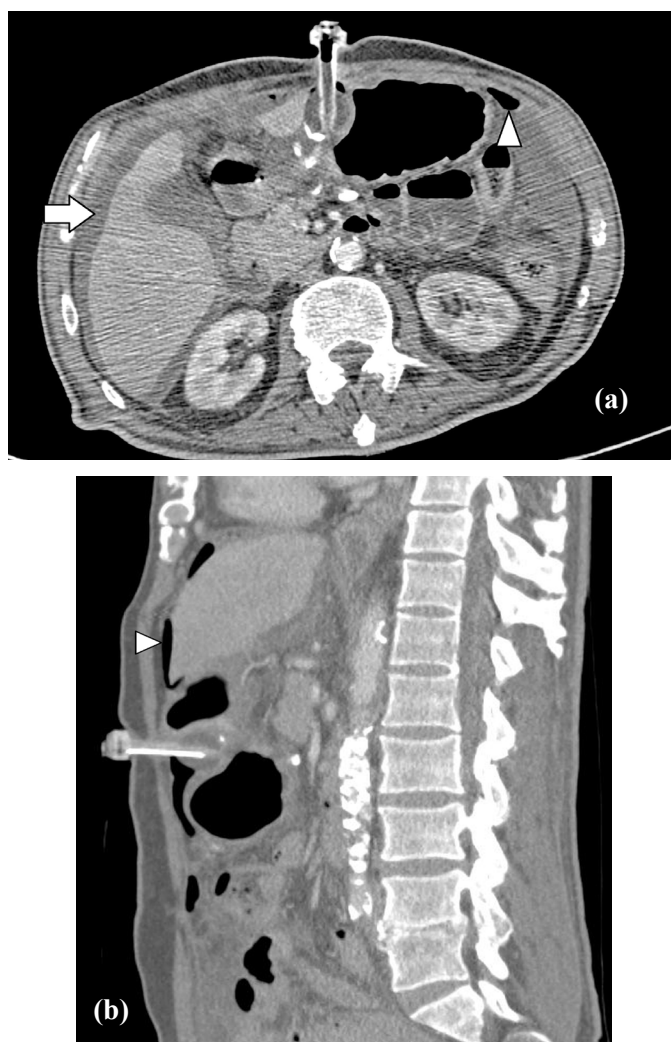


Figure 3: Computed tomography of the abdomen demonstrates extra-peritoneal air (arrow head), intraperitoneal fluid collection (arrow) and the gastrostomy replacement tube inside the peritoneal cavity. (a) axial, (b) sagittal.



Figure 4: Skin induration over replacement gastrostomy tube.

and cheaper alternative to replacement gastrostomy tubes, with similar rates of malfunction.⁴

During replacement, the internal bolster may be removed by external traction from the abdominal wall or by cutting the tube at skin level and endoscopic removal of the bolster, the former was found to have fewer complications, especially in older patients.⁵

Another issue concerning the replacement PEG tubes is the comparative longevity and tube dysfunction rates of commercially available variants. A Brazilian study compared four variants and found that although tube dysfunction was common with all models, the Wilson Cook model was found to last the longest.⁶

If a PEG tube placed more than a week ago gets accidentally displaced, the fistulous tract is generally mature, hence a PEG placement from the same site should be tried as soon as possible, preferably within a few hours of the event to avoid closure of the site. In case a PEG replacement is tried after 24 hours of the tube removal, the tract is likely to be closed and the procedure needs to be done as a fresh one.⁷

Most of the complications of PEG placement such as infection, bleeding and perforation are related to the creation of a gastro-cutaneous fistula.⁸ During the change of PEG tube this step is not required, therefore complications associated with replacement of PEG are rare, the most feared one being perforation due to intraperitoneal placement of the PEG. Tahri and coworkers described three cases of intraperitoneal placement of replacement PEG and reviewed the literature to find previously described five more such cases.⁹

Following methods have been described to confirm the proper placement of replacement PEG tube: (a) gastroscopy after placement (**Figure 5**) (b) radio-contrast study after placement (c) plain radiograph after air insufflation (d) aspiration of gastric juice and checking for air flushing sound.¹⁰ Although a gastroscopy may be the most satisfactory option for an endoscopist, it would defeat the purpose of percutaneous replacement and may not be cost-effective. In a study in which emergency department (ED) replacement of PEG tube was reviewed, it was found that trauma to the tract and tract immaturity are the major risk factors for significant complications after replacement in an ED setting and if either is suspected, a confirmatory X-ray with contrast injection in the newly

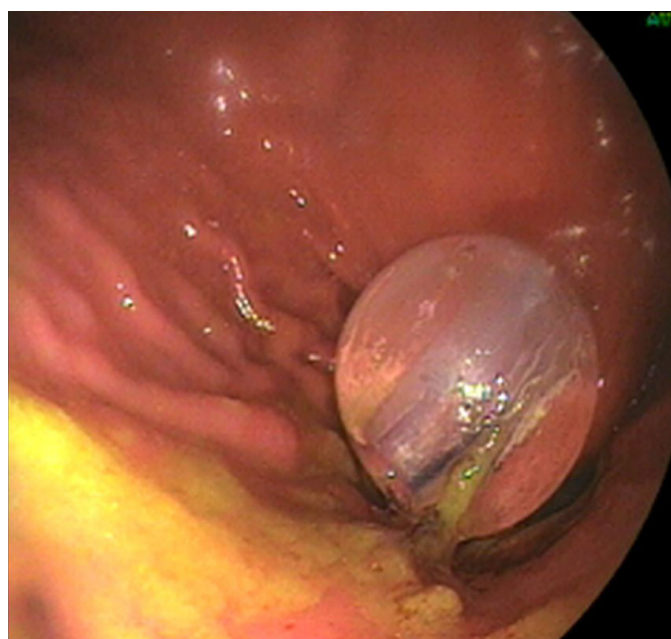


Figure 5: Gastroscopy verifying the intra-gastric position of the inflated balloon of gastrostomy replacement tube.

placed PEG tube was suggested.¹¹

Care must be taken not to overinflate the balloon, since local ischemia may cause complications such as induration noted in one of our patients.

The limitations of this study were the small sample size and retrospective study design.

To conclude, replacement of PEG tube with low profile button PEG is usually safe and potentially avoids the complications associated with endoscopy and thereby also reduces cost. However rarely it may be accompanied by significant complications which should be ruled out by investigating with a low threshold.

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