



Case report

Percutaneous endoscopic gastrostomy tube replacement after head and neck surgery: A case report

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ABSTRACT

Introduction: Percutaneous endoscopic gastrostomy (PEG) has been available since the 1980s. Routine replacement is conducted at bedside with relatively few complications. Two replacement methods have come into practice: the percutaneous method and the endoscopic method. The laparoscopic method has recently become favorable in the pediatric population.

Presentation of case: Herein, we describe a situation in which a gastrostomy tube was replaced at bedside on a patient with previous head and neck surgery for lingual cancer. The percutaneous traction method was used, and gastrostomy tube replacement into the gastric lumen could not be confirmed on subsequent imaging. The patient was ultimately taken to surgery for an open procedure where it was discovered that initial PEG placement had traversed the small bowel mesentery en route to the gastric lumen.

Discussion: The PEG tube is not a permanent device and routine exchange every 6–12 months is recommended. The percutaneous method and endoscopic method for gastrostomy tube replacement have both been used routinely, each with their set of complications. A third technique, laparoscopic placement, is the preferred modality in the pediatric population. Advantages are twofold: direct visualization of the stomach, thus eliminating inadvertent hollow viscus injury, and applicability in infants too small to undergo endoscopy necessary for PEG tube placement.

Conclusion: Consideration for laparoscopic placement or replacement in the head and neck cancer patient population, in which interval endoscopy is impossible, is thus advocated.

1. Introduction

Percutaneous endoscopic gastrostomy (PEG) is a relatively safe procedure that has been the widely preferred method of enteral feeding access since its introduction in the 1980s [1]. It is used primarily in patients with a functional gastrointestinal system who require long-term enteral nutrition and are unable to feed by mouth [2]. PEG tubes are not permanent, lasting on average around 6–12 months, and routine exchange is necessary to prevent malfunction [2,3]. While several methods have been described to place a PEG tube, there is a paucity of data on PEG tube replacement and associated morbidity.

Two replacement methods have predominated, namely, the percutaneous traction method and the endoscopic method. The percutaneous method involves using steady traction to pull the PEG tube out through the abdominal wall. The endoscopic method involves grasping the internal bumper with a snare or basket and extracting it retrograde

through the oral cavity.

Herein, we describe a patient in which the traction method was used to exchange a PEG tube at bedside. The replacement gastrostomy tube was found to be outside the stomach lumen and it was later discovered that the original PEG tube had traversed the small bowel mesentery en route to the stomach lumen. Our patient had a neck dissection in the interval since PEG tube placement precluding endoscopic PEG tube exchange. This case highlights the morbidity involved in bedside PEG tube replacement, especially for the initial exchange in patients with complex surgical histories precluding future endoscopy.

2. Case presentation

This work has been reported in line with the SCARE criteria [21]. A 59-year-old male with medical history of hypertension and squamous cell carcinoma of the oral cavity and surgical history of left subtotal

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glossectomy, left neck dissection, tracheostomy with interval decannulation, and percutaneous endoscopic gastrostomy tube placement presented to the hospital due to uncontrolled bleeding from his oropharynx. He had ongoing symptoms from acute blood-loss anemia and Interventional Radiology eventually performed coil embolization of his right lingual artery, which controlled the bleeding. During his hospital stay, it was found that his PEG tube (placed 16 months prior) was moldy and had significant wear, prompting a surgical consult for replacement. The percutaneous traction method was used to remove the PEG tube at bedside, which the patient tolerated well without complication. A 20F gastrostomy tube was then re-inserted into the well-formed tract and the balloon was inflated. Follow-up contrast study to confirm placement revealed failure of the stomach lumen to fill (Fig. 1). Instead, contrast outlined the stomach and numerous nearby small bowel loops with a large amount of free air. CT scan of the abdomen and pelvis was unable to confirm positioning of the PEG tube with its tip in the left upper quadrant and with adjacent decompressed stomach and small bowel (Fig. 2). There was accumulation of contrast in the pelvis from prior instillation. Of note, the patient was afebrile and hemodynamically stable and his only symptom was mild pain at the gastrostomy site. Thus, the decision was made to take the patient to the operating room for open PEG tube repositioning.

2.1. Treatment

Upon entering the peritoneum, it was noted that the small bowel was adherent to the abdominal wall where the gastrostomy tube had been tracking. The small bowel was carefully dissected away from the abdominal wall. A hole was found within the small bowel mesentery, through which the PEG tube had traversed en route to the stomach lumen (Fig. 3). The hole was oversewn with silk suture at this time. The gastrostomy site was found to be adherent to another portion of the small bowel and these structures were carefully dissected off one another. The gastrostomy site was then stapled. Using electrocautery, a new gastrostomy was created and purse string suture was used to tie down a new 16F gastrostomy tube. The tube was then inflated with saline and the stomach was tacked to the abdominal wall using silk sutures at the superior, inferior, medial, and lateral borders. A 19F Jackson-Pratt drain was then placed within the pelvis to drain prior contrast accumulation. The fascia was then closed using absorbable suture in interrupted fashion and the skin was closed with staples. The

patient tolerated the procedure well and was returned to the floor in stable condition.

2.2. Outcome and follow-up

The gastrostomy tube was kept to gravity overnight and used only for medication administration. The following morning, Glucerna 1.5 tube feeds were resumed, which the patient tolerated without issue. The JP drain was removed. He was discharged home four days later. He was seen by his family physician in clinic two weeks after discharge, at which time his staples were removed. He had no abdominal complaints and the gastrostomy tube was functioning without problems. Unfortunately, the patient expired two months later for undisclosed reasons.

3. Discussion

Percutaneous endoscopic gastrostomy is not a permanent device and routine exchange is recommended after 6–12 months. Indications for replacement include deterioration of the PEG tube, persistent gastrostomy leakage, or malfunction of the internal bumper [4,5]. The PEG tube can be replaced either percutaneously or endoscopically. The decision on which route to use is dependent largely on hospital policy, medical history, and patient clinical status. For example, the percutaneous method of PEG tube replacement becomes necessary in certain circumstances such as in patients with prior head and neck surgery or esophageal cancer [6]. As in our patient, endoscopic PEG tube retrieval was not an option. Although PEG replacement is relatively safe, complications such as bleeding, fistula disruption, mucosal laceration, perforation, pneumoperitoneum, peritonitis, and injury to surrounding structures may occur [7–10]. Most of these complications are minor and can adequately be treated at the bedside, but few major complications may arise requiring surgical intervention [11].

The percutaneous method has long been favored from a cost-benefit perspective [10,12]. However, it is not without complication. This method has the potential to disrupt the gastrocutaneous tract or enlarge or injure the associated stoma. The most common complication with this method, however, is peristomal bleeding [12,13]. Numerous cases have been reported wherein the gastrostomy tube was replaced into a false tract or not within a tract at all, causing perforation and leading to serious complications including life-threatening infection [5,14,15].

The endoscopic method is preferred in patients who have had recent



Fig. 1. Abdominal x-ray with contrast outlining the stomach and small bowel loops. No intraluminal contrast is visualized.

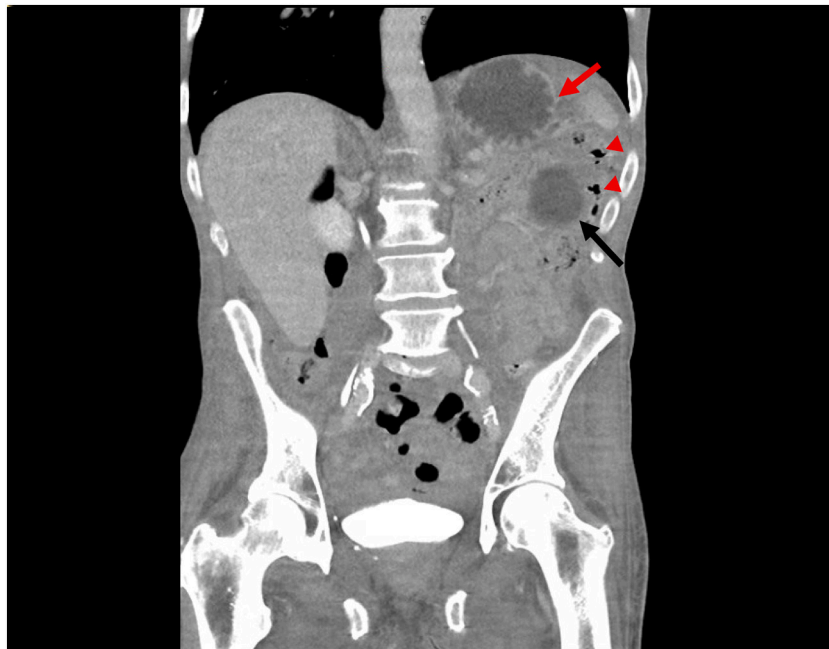


Fig. 2. CT scan of the abdomen and pelvis reveals extra-luminal contrast (black arrow) with adjacent decompressed stomach (red arrow) and associated pneumoperitoneum (arrowheads).

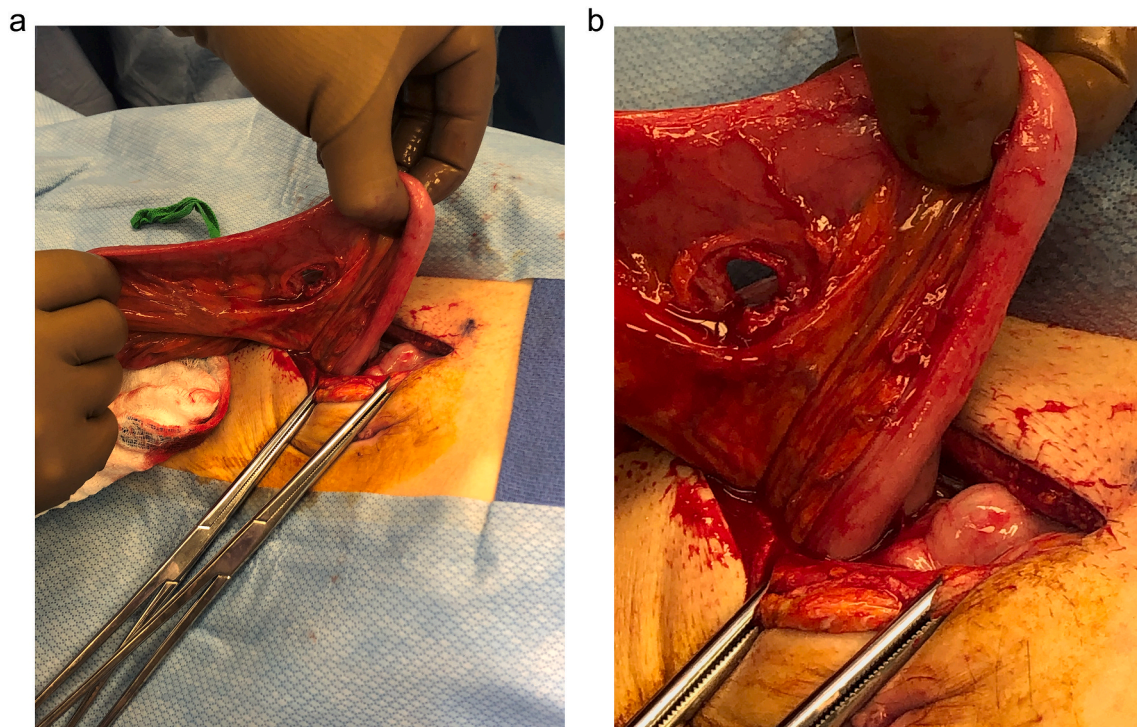


Fig. 3. a: Hole within the small bowel mesentery through which the PEG tube traversed en route to the stomach lumen.
b: Magnified view.

abdominal surgery or there is difficulty accessing the gastrostomy. Endoscopy is also not without complication, however, and several cases have been reported of upper airway obstruction and more commonly, esophageal mucosal injury such as laceration and microperforation [16–18]. The risk may be, in part, due to air insufflation necessary during endoscopy [12]. In the pediatric population, however, PEG tubes should always be removed by an endoscopic procedure due to the high risk of complications [19]. In addition, the traction method can be

extremely painful in a child, necessitating conscious sedation or general anesthesia.

Finally, laparoscopic gastrostomy insertion has been regarded as the gold standard in the pediatric population [20]. The advantage over percutaneous insertion lies in the direct visualization of the stomach, which eliminates inadvertent hollow viscus injury. Another advantage is the applicability of the technique to small infants (<2 kg) who may be too small to safely undergo upper endoscopy necessary for PEG

placement. By extension, this method may prove safer in patients with complex surgical histories precluding endoscopy, such as in the head and neck and esophageal cancer cohort. Typically, a patient undergoing radical neck dissection will undergo PEG tube placement prior to surgery since after surgery, the esophageal tract will be disrupted. Perhaps standard practice should be the laparoscopic insertion method in these cases to avoid PEG misplacement, such as was seen in our patient. In our patient, a PEG tube was placed prior to neck dissection for glossal cancer, a prophylactic measure since he would be unable to eat by mouth after surgery. In his case, percutaneous insertion with EGD guidance was utilized for initial PEG tube insertion, but he may have benefitted from laparoscopic insertion to avoid inadvertent small bowel injury. His injury was discovered on PEG tube replacement, which begs the question if laparoscopic placement or replacement on initial exchange should be favored in similar situations.

4. Conclusion

In conclusion, there is no clear consensus on gastrostomy tube replacement. Immediate complications between percutaneous and endoscopic replacement are comparable, but the nature of the serious complications may be graver in certain patient populations. Adults should be monitored for peristomal bleeding and gastrocutaneous tract disruption when using the traction method. The elderly may benefit from the percutaneous replacement method to avoid esophageal mucosal tears. Inadequate sedation in the outpatient setting may be limiting in the traction method in children. Laparoscopic gastrostomy should be considered in individuals in whom esophageal intubation will become impossible after head and neck or esophageal cancer surgery. These patients may benefit from the laparoscopic method for initial PEG tube placement or initial PEG tube exchange.

Consent

Written informed consent was obtained from the patient's next of kin (daughter) for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Ethical approval

IRB Exemption – deceased patient, see attached letter.

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CRedit authorship contribution statement

Aria Attia, MD, MS – involved in surgery, data collection, data analysis/interpretation, written paper
William Kurtis Childers, DO – involved in surgery, data collection, paper editing.

Declaration of competing interest

None.

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