



Title: Foley Catheters for Gastrostomy or Jejunostomy Feeding Tubes: A Review of the Guidelines and Clinical Evidence

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Context and policy issues:

Gastrostomy and jejunostomy are surgical openings to the stomach.¹ A small, flexible, hollow, feeding tube with a balloon or special tip is inserted into the stomach through the skin and stomach wall. The stomach is stitched closed around the tube, and the cut is closed.² In a gastrostomy, a small incision is made on the left side of the stomach area while the patient is under general anesthesia.² The feeding tube is inserted through the abdominal wall and directly into the stomach.² Alternatively, the feeding tube may be inserted through the mouth using a minimally invasive procedure called an endoscopy.² In a jejunostomy, a tube is inserted through the skin, and then runs either directly into the jejunum, a part of the intestine, or into the stomach and then into the jejunum.³ Feeding tubes are recommended for adults who cannot swallow correctly, take enough food by mouth to stay healthy or often breathe in food when eating.²

A Foley catheter is a soft plastic or rubber tube that is inserted into the bladder to drain the urine,⁴ but is sometimes used in place of feeding tubes manufactured specifically for gastrostomy or jejunostomy enteral feeding as a result of a modified Ponsky technique (i.e. use of a Foley catheter instead of a mushroom catheter).⁵ The Foley catheter uses a simple technique. A hollow dilator is inserted percutaneously into the stomach through which the Foley catheter is inserted and the dilator is peeled apart, leaving the catheter in place.⁵ It avoids having to draw a long suture from the stomach out through the mouth, attaching it to a mushroom catheter and drawing the catheter through the mouth, esophagus and stomach and out through the abdominal wall.⁵ Two types of complications may be associated with using Foley catheters in a percutaneous endoscopic gastrostomy (PEG): 1) the rupture of the balloon allowing the catheter to slip out and 2) distal migration of the balloon that may cause intestinal obstruction.⁵

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The objectives of this review are to evaluate the evidence on the clinical effectiveness and risks and harms of using Foley catheters for gastrostomy and jejunostomy feeding tubes and to summarize the recommendations in North American guidelines for enteral feeding.

Research questions:

1. What is the clinical effectiveness of using foley catheters versus conventional gastrostomy or jejunostomy feeding tubes in adult inpatients requiring enteral feeding?
2. What are the potential risks/harms to the patient in using foley catheters versus conventional gastrostomy or jejunostomy feeding tubes?
3. What are the North American clinical practice guidelines for enteral feeding in the adult inpatient population?

Methods:

A limited literature search was conducted on key health technology assessment resources, including PubMed, The Cochrane Library (Issue 2, 2008), University of York Centre for Reviews and Dissemination (CRD) databases, ECRI, EuroScan, international HTA agencies, and a focused Internet search. Results include articles published between 1990 and July 2008, and are limited to English language publications only. No filters were applied to limit the retrieval by study type.

Summary of findings:

No relevant health technology assessments, systematic reviews, meta-analyses, or randomized controlled trials were identified examining clinical effectiveness or potential risk or harms of using foley catheters versus conventional gastrostomy or jejunostomy feeding tubes in adult inpatients requiring enteral feeding. Five case studies⁶⁻¹⁰ and three North American guidelines related to enteral nutrition were identified.¹¹⁻¹³

Observational studies

Authors Ibegbu *et al.* describe a case of an 89-year-old woman in a nursing home, who was hospitalized with abdominal pain, coffee ground emesis and change in mental status.⁶ Four months prior, the patient's PEG tube was dislodged unintentionally and was replaced with a 22fr Foley catheter, inflating the balloon with 10 cc of sterile water. An endoscopy revealed that a 22fr Foley catheter was tethering the loop of bowel to the body of the stomach.⁶ The complication was diagnosed as a retrograde intussusception (the invagination of a lower segment of the bowel into one just above).⁶ To improve the patient's clinical status, the Foley catheter was deflated and removed and a button replacement PEG was placed at the ostomy site. Moreover, the patient was hydrated intravenously, had a packed red blood cell transfusion and received broad-spectrum antibiotics.⁶ To avoid such a migration, the authors suggested to anchor any type of replacement tube with an external bolster.⁶

Two case studies reported a successful insertion and inflation of a 24fr Foley catheter into the patients' tracts after a PEG tube malfunctioned in a 84-year-old patient and a gastrostomy tube was displaced in a 68-year-old patient.⁷ Both procedures using the Foley catheters were successful in dilating tracts, and no patient adverse events were reported.⁷

In a third case report, a 61-year-old man with squamous cell carcinoma of the esophagus had a PEG inserted one year prior.⁸ The PEG was replaced with a Foley feeding catheter, which was accidentally removed two months prior to the article publication. When the Foley tube was replaced, it had been functioning well, but the patient noticed a decrease in its external length over a period of four to six weeks. The Foley catheter had been pulled inward to the hub of the catheter with pressure on the overlying skin.⁸ The patient experienced some adverse events, such as warm, red, hardening around the stoma site with serosanguinous discharge from the stoma around the Foley catheter.⁸ The migration of a surgically placed Foley catheter that resulted in small bowel obstruction may have been caused by the inflated balloon, intussusception, or obstructive jaundice.⁸ The authors suggested that migration may be prevented by suturing the catheter to the abdominal wall or by placing an external retention disk and a small plastic ring over the Foley catheter before replacing it into the stomach.⁸

In a separate case, an 87-year-old woman living in a nursing home was sent to an emergency room for evaluation of a gastrostomy tube that was retracted into the stomach caused by a Foley catheter that has been used for gastrostomy feedings. The catheter was placed for gastrostomy feedings and, in a few months, had advanced into the stomach and could not be pulled back.⁹ The slipping of the catheter into the mid-small bowel causing bowel obstruction was likely due to the large size of the balloon at the tip of the Foley catheter (30mL).⁹ A percutaneous needle aspiration of the fluid within the balloon was performed and was followed by movement of the Foley catheter antegrade. The Foley tube became wedged into the sigmoid colon, and it was removed endoscopically since the long-term complications of leaving such a tube in place are unknown.⁹

During a complication of Foley jejunostomy, a 37-year-old man who experienced an anastomotic leak after a gastrectomy had a feeding jejunostomy constructed using a 16fr Foley catheter with the Stamm technique.¹⁰ Thirty days after the operation, the patient experienced an intestinal colic. The Foley catheter migrated into the abdomen during the attack, but there was no evidence of intestinal obstruction or peritonitis.¹⁰ Test results showed that the Foley catheter ended up in the intestine with the balloon inflated. The Foley catheter was passed six days later after the patient followed a fluid diet and took fecal softeners orally.¹⁰ The authors recommended to avoid the Foley catheter to construct a feeding jejunostomy since it offers no advantage over plain catheters and may result in an increased risk of a balloon-induced complication.¹⁰

Guidelines

The American Society for Parenteral and Enteral Nutrition (ASPEN) published guidelines in 2002 on the use of parenteral and enteral nutrition in adult and pediatric patients.¹¹ The ASPEN is an organization comprised of medicine, nursing, pharmacy, dietetics, and nutrition science and with a mission to serve as a “preeminent, interdisciplinary, research-based, patient-centered clinical nutrition society throughout the world”.¹¹ The guidelines were developed in agreement with the Institute of Medicine recommendations for use by health care professionals who provide support services to their patients, and offer clinical advice for managing adult and pediatric patients in inpatient and outpatient settings.¹¹ The practice guidelines for enteral access stated that the effectiveness of gastric emptying, gastrointestinal anatomy and aspiration risk should be considered. They also recommended the nasoenteric tube placement as an initial attempt using a spontaneous or another bedside placement technique and to apply the fluoroscopic or endoscopic guidance if the nasoenteric tube placement is unsuccessful. The guidelines also provided advice on the feeding tube tip position and cleaning and gastric residuals. Finally, the guidelines recommended to utilize the standardized protocols for enteral

nutrition ordering, administration and monitoring.¹¹ The guidelines did not discuss Foley catheters as feeding tubes.

The American Society for Gastrointestinal Endoscopy published guidelines outlining practical strategies for the use of PEG and jejunostomy for patients who require long-term enteral feeding and an intact gastrointestinal tract but are unable to maintain sufficient oral intake to meet metabolic demands.¹² The guidelines recommended not using PEG for nutritional support in the case of gastrointestinal tract obstruction.¹² Contraindications to PEG include neoplastic, inflammatory and infiltrative diseases of the gastric and abdominal walls.¹² The guidelines did not mention Foley catheters for enteral feeding.

In 1995, the American Gastroenterological Association (AGA) published guidelines on the use of enteral nutrition. For short-term feeding (<30 days), nasogastric or nasoenteric tubes were recommended, while gastrostomy tubes were suggested for long-term feeding (>30 days).¹³ Also, PEG tubes are normally preferable to operative gastrostomy for gastric access using conscious sedation.¹³ In addition, the guidelines listed some recommendations to reduce the risk of complications of tube feeding that relate to the patient's position and overall treatment, location of tube in the patient's body and fluid and electrolyte management.¹³

Other references

The Wound, Ostomy and Continence Nurses (WOCN) Society published a document on the management of gastrostomy tube complications for the pediatric and adult population.¹⁴ When a PEG tube is removed, it is usually replaced with a balloon tip tube. The paper clearly states that Foley catheters are not intended for gastrostomy feedings and have a higher rate of complications compared with commercial gastrostomy tubes.¹⁴

Conclusions and implications for decision or policy making:

The evidence on Foley catheters for gastrostomy or jejunostomy feeding tubes is limited. We identified only five case studies that reported using a Foley catheter for enteral feeding.⁶⁻¹⁰ In four case reports, the patient experienced complications, such as retrograde intussusception, by using Foley catheters for enteral feeding.^{6,8-10} However, two patients with an inserted 24fr Foley into their tracts experienced no adverse events and were transferred to a nursing home shortly afterwards. It is important to note that the long-term effects were not reported for either patient.⁷

Two North American guidelines recommended nasogastric or nasoenteric tubes for enteral nutrition,^{11,13} and gastrostomy tubes are recommended for long-term feeding.^{12,13} None of the guidelines explicitly discuss the use of Foley catheters for enteral feeding, but the WOCN Society discourages the practice because of an increased rate in complications.¹⁴ Although the evidence is inconclusive, the complications reported in the case studies and recommendations in the North American guidelines and by the WOCN Society should be considered prior to a decision to using Foley catheters for enteral feeding tubes.

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