

Splenic Avulsion Following PEG Tube Placement: A Rare but Serious Complication

Brijesh B. Patel, MD^{1,2}, Christian Andrade, MD^{1,2}, Vignesh Doraiswamy, BS^{1,2}, and Donald Amodeo, MD^{1,2}

¹Division of Digestive Diseases and Nutrition, University of South Florida, Tampa, FL

²Department of Gastroenterology, James A. Haley Veteran's Administration, Tampa, FL

Abstract

Placement of a percutaneous endoscopic gastrostomy (PEG) tube is a common procedure to allow for enteral nutrition in patients with multiple indications. PEG tube placement is a safe procedure with minor complications such as site infection and irritation. One of the more severe complications is splenic laceration, which may result in intra-peritoneal bleeding and manifest as an acute abdomen. We present a rare case of intra-abdominal bleeding secondary to catastrophic splenic injury 12 hours after PEG tube placement resulting in hemodynamic compromise. The patient underwent splenectomy and had an uneventful recovery.

Introduction

Percutaneous endoscopic gastrostomy (PEG) placement is suitable for patients requiring a stable, long-term, and possibly permanent form of enteral nutrition due to chronic dysphagia, head and neck cancers, dementia, or accidents.¹ Techniques for PEG tube placement include the “pull,” “push,” and “introducer” methods, all of which are performed with a standard upper gastrointestinal endoscope, which aids in identification of the ideal location for placement and in approximating the anterior gastric wall relative to the abdominal wall.²⁻⁴ A skin incision is made 1.5 times wider than the diameter of the tube at a transilluminated site coinciding with the point of maximal gastric indentation under external pressure. The Ponsky pull method is the most widely used and is completed by pulling a tapered tip PEG tube with bumper end trailing through the mouth and out of the abdominal incision via a flexible wire. The Sacks-Vine push method is similar to the pull method, but requires pushing a long, stiff PEG tube over a taut wire through the mouth and out of the incision. In the Russell introducer technique, an abdominal wall gastropexy is first secured with T-fasteners under direct endoscopic guidance. After passage of a guidewire, the puncture site is serially dilated to allow for passage of the gastrostomy tube over a peel-away sheath (Figure 1).²⁻⁴ The overall mortality rate from the 3 techniques is 1–3%.⁵⁻⁷

Case Report

A 60-year-old man with T2N0M0 squamous cell cancer of the oral cavity was admitted by the otorhinolaryngology service for partial glossectomy and mandibulectomy with possible reconstruction. He had no prior abdominal surgeries. His social history was significant for alcohol abuse with up to 4 beers per day for 40 years and tobacco use totaling 40 packs per year. The patient had oropharyngeal dysphagia secondary to his malignancy. His clotting parameters were within normal limits, hemoglobin was 10.4 g/dL, platelet count was 256 x 10⁹/L, and he had no coagulopathy. Because of concern for possible metastatic seeding of the gastrostomy tract, he was scheduled for Russell PEG placement. No technical difficulties or immediate post-procedural complications were encountered following the 30-minute procedure.

ACG Case Rep J 2014;2(1):21–23. doi:10.14309/crj.2014.72. Published online: October 10, 2014.

Correspondence: Brijesh Patel, Division of Digestive Diseases and Nutrition, University of South Florida, Morsani College of Medicine, 12901 Bruce B. Downs Blvd., MDC 82, Tampa, FL 33612 (BPatel10@health.usf.edu).



Copyright: © 2014 Patel et al. This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 3.0 Unported License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-nd/3.0>.

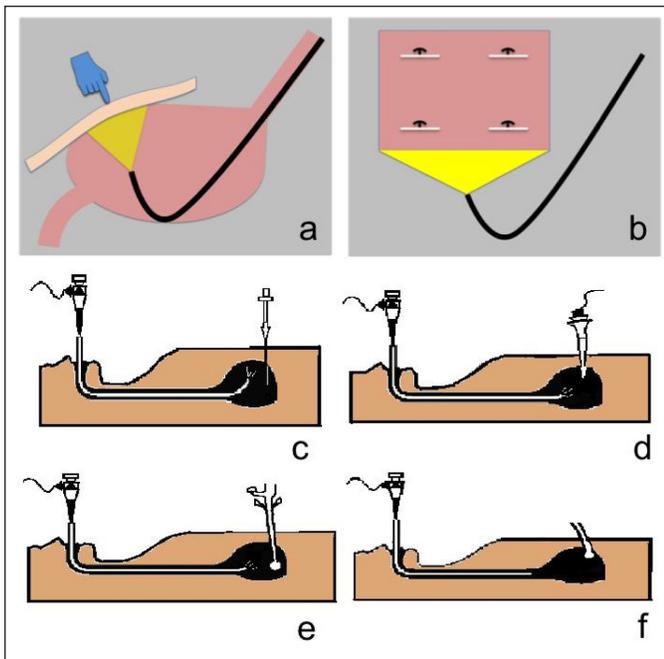


Figure 1. The Russell introducer technique. (A) Transillumination at the site of maximal digital displacement (“one to one”) after approximation of the gastric lumen to the abdominal wall via insufflation. (B) T-fasteners are deployed transcatheterly under endoscopic guidance to anchor the gastric wall to the abdominal wall. (C) A guidewire is inserted between the T-fasteners. (D) A serially dilating trochar is inserted over the wire to dilate the tract. (E) A balloon tipped feeding tube is inserted into the stomach via the trochar lumen and inflated. (F) The trochar is stripped away to the skin leaving the feeding tube in its place.

Approximately 12 hours after PEG placement, he was found to be unresponsive, hypoxic, and in respiratory distress. He was hemodynamically unstable, and a complete blood count demonstrated a 6-g/dL drop in hemoglobin. On physical examination, the patient had a rigid, diffusely tender, and distended abdomen. No blood return was noted on aspiration of an aggressive PEG tube lavage. A bedside ultrasound demonstrated free intra-peritoneal air and free fluid. He underwent emergent exploratory laparotomy and was found to have approximately 80% splenic avulsion with active hemorrhage from the splenic pedicle and short gastric vessels (Figure 2). He underwent complete splenectomy without any major complications. Since surgical exploration required disruption of the T-fastener gastropexy, a standard surgical Stamm gastrostomy was performed at the same site. Following transfusion and stabilization, the patient had an uneventful hospital course and was discharged without any sequelae.

Discussion

Complications of PEG tube placement include site infections, buried bumper syndrome, gastrocutaneous fistula, stomach ulceration, PEG site leak, skin irritation, dislodge-

ment, and gastric outlet obstruction.⁸ The Russell technique is favored in certain conditions because it requires only a single pass of the endoscope, avoids potential trauma to the oropharynx and esophagus, and although controversial, eliminates the risk of seeding of bacteria and malignant cells from esophageal and oropharyngeal sources at the PEG site.⁴ Pneumo-peritoneum is an expected, benign, and self-resolving complication of PEG tube placement that occurs secondary to leakage of air into the peritoneal cavity either from insufflated luminal air or ambient air during the process of introducer and final PEG tube insertion.^{5,7} Splenic injury has also been reported as a serious complication following PEG tube placement and other endoscopic procedures.⁹⁻¹¹ Immediate mortality after PEG placement is very rare, as low as <1%.¹²

We report the first case of a nearly complete splenic avulsion during PEG tube placement. We hypothesized that traction and torsional stress on the spleen along the gastro-splenic ligament and splenic vessels derived from maximal gastric insufflation likely caused the trauma. This potential mechanism of injury has been previously described in a series of 47 dogs undergoing introducer PEG insertion.¹³ In addition, the added stress from bowing of the endoscope during examination of the stomach and duodenum may have resulted in splenic injury. A previous case report of fatal retroperitoneal hemorrhage was believed to be secondary to splenic and superior mesenteric vessel rupture post EGD/PEG placement.¹¹

We highlight a presentation of a very rare complication of EGD that occurred during a Russell PEG procedure. Rapid diagnosis and surgical management was critical and may have prevented an untimely death. The patient’s hemodynamic instability, significant drop in hemoglobin, acute abdomen, and free fluid on bedside ultrasonography were consistent with the diagnosis. PEG tube placement is a very common procedure, but physicians should be mindful of this uncommon complication.



Figure 2. Gross specimen demonstrating splenic avulsion.

Disclosures

Author contributions: BB Patel and C. Andrade wrote and edited the manuscript. V. Doraiswamy and C. Andrade created the illustration depicting the PEG tube placement. D. Amodeo reviewed and edited the final manuscript prior to submission. BB Patel is the article guarantor.

Financial disclosure: None to report.

The patient is now deceased, but informed consent for this case report was obtained from the patient's next of kin.

Received: April 16, 2014; Accepted: September 18, 2014.

References

1. Ramage JI Jr, Baron TH. Percutaneous endoscopic cecostomy: A case series. *Gastrointest Endosc.* 2003;57(6):752–755.
2. Gauderer MW, Ponsky JL, Izant RJ. Gastrostomy without laparotomy: A percutaneous endoscopic technique. *J Pediatr Surg.* 1980;15(6):872–875.
3. Hogan RB, DeMarco DC, Hamilton JK, et al. Percutaneous endoscopic gastrostomy—to push or pull: A prospective randomized trial. *Gastrointest Endosc.* 1986;32(4):253–258.
4. Russell TR, Brotman M, Norris F. Percutaneous gastrostomy. A new simplified and cost effective technique. *Am J Surg.* 1984;148:132–137.
5. Hillman KM. Pneumoperitoneum: A review. *Crit Care Med.* 1982;10(7):476–481.
6. Gottfried EB, Plummser AB, Clair MR. Pneumoperitoneum following percutaneous endoscopic gastrostomy: A prospective study. *Gastrointest Endosc.* 1986;32(6):397–399.
7. Wojtowycz MM, Arata JA Jr, Micklos TJ, Miller FJ Jr. CT findings after uncomplicated percutaneous gastrostomy. *Am J Roentgenol.* 1988;151:307–309.
8. Calton WC, Martindale RG, Gooden SM. Complications of percutaneous endoscopic gastrostomy. *Mil Med.* 1992;157:358–630.
9. Petersen CR, Adamsen S, Gocht-Jensen P, et al. Splenic injury after colonoscopy. *Endoscopy.* 2008;40(1):76–79.
10. Lewis FW, Moloo N, Stiegmann GV, Goff JS. Splenic injury complicating therapeutic upper gastrointestinal endoscopy and ERCP. *Gastrointest Endosc.* 1991;37:632–633.
11. Lau G, Lai SH. Fatal retroperitoneal haemorrhage: An unusual complication of percutaneous endoscopic gastrostomy. *Forensic Sci Int.* 2001;116(1):69–75.
12. Botterill I, Miller G, Dexter S, Martin I. Deaths after delayed recognition of percutaneous endoscopic gastrostomy tube migration. *BMJ.* 1998;317(7157):524–525.
13. Clary EM, Hardie EM, Fischer WD, Kyles AE. Nonendoscopic ante-grade percutaneous gastrostomy: The effect of preplacement gastric insufflation on tube position and intra-abdominal anatomy. *J Vet Intern Med.* 1996;10:15–20.

Publish your work in ACG Case Reports Journal

ACG Case Reports Journal is a peer-reviewed, open-access publication that provides GI fellows, private practice clinicians, and other members of the health care team an opportunity to share interesting case reports with their peers and with leaders in the field. Visit <http://acgcasereports.gi.org> for submission guidelines. Submit your manuscript online at <http://mc.manuscriptcentral.com/acgcr>.