

## Deconstructing the steps of pull-type PEG tube insertion

Ravishankar Asokkumar, MBBS, FRCP, FASGE,<sup>1,2,3</sup> Carlos Paolo D. Francisco, MD, FPCP, DPSG, DPSDE,<sup>4,5,6</sup> Lim Kim Wei, MBBS, MRCP,<sup>7</sup> Rajesh Ravi, MBBS, MRCP,<sup>7</sup> Mark Cheah, MBBS, MRCP,<sup>8,9</sup> Roy Soetikno, MD, MS, MASGE<sup>10,11</sup>



A PEG tube is the preferred feeding route for patients requiring long-term enteral nutrition.<sup>1-3</sup> There are 3 methods for PEG tube insertion: (1) pull technique, (2) push technique, and (3) introducer technique. Despite the benefits associated with PEG feeding, there is a disparity in its widespread adoption because of the risk of adverse events and lack of expertise to perform PEG.<sup>4-6</sup> This instructional video (Video 1), deconstructs the steps for performing pull-type PEG.

We perform PEG with the patient in a supine position and under sedation or monitored anesthesia for patients with a neuromuscular disorder or at high risk of aspiration. We perform a diagnostic EGD to assess suitability for PEG. We administer prophylactic antibiotics before the procedure. We distend the stomach adequately to bring the gastric and abdominal walls in direct contact. We direct the gastroscope toward the anterior gastric wall, look for the point of maximal transillumination, and confirm by finger indentation (Fig. 1). Typically, the location is 3 fingers (2-4 cm) below the left costal margin. We mark the site and sterilize the area and its surroundings thoroughly to prevent postprocedure infection.

We infiltrate the skin and deeper tissue with a local anesthetic. We make a 1-cm transverse abdominal incision at the marked site to facilitate the smooth passage of the PEG tube (Fig. 2). Following this, we advance the introducer needle with the sheath with an attached syringe

into the stomach (Fig. 3). During advancement, under negative pressure, we monitor for air, stool, or blood in the syringe before entry into the stomach. Observation of these should prompt removing the needle and selecting a different puncture site. Once the needle and the sheath are identified in the stomach, we withdraw the needle and leave the sheath in place.

We advance the looped wire through the sheath until it becomes visible in the stomach (Fig. 4). We remove the sheath, leaving the wire in place. The endoscopist captures the wire using a snare and withdraws it through the patient's mouth (Fig. 5). When the wire is out, we release it from the snare (Fig. 6). We connect the PEG tube and the looped wire by inserting the looped wire through the PEG tube loop, then insert the tube's bolster end inside the looped wire, forming a firm knot (Fig. 7). Once connected, we generously lubricate the tube from the wire attachment end to the internal bolster. We pull the wire from the abdominal cut end until we feel resistance. Then, we apply gentle, steady, upward traction and pull the tapered end of the tube through the abdominal cut surface (Fig. 8). The abdominal incision could be extended if there is significant resistance for the tapered end to exit. Once the tube exits, we continuously pull the tube until we feel the resistance of the internal bolster against the gastric wall. We confirm the bolster position using the endoscope. We detach the wire from the tube and slide the external bolster close to the skin. We leave at least a 1-cm distance between the outer bolster and the abdominal wall to prevent ulceration and buried bumper syndrome. Finally, we insert the tube clamp near the external bolster, attach the twist lock, and cut the excess tube at the "X" mark (Fig. 9). We connect the feeding port to the cut end and secure the PEG tube. In the immediate postprocedure period, we regularly monitor the patient's vital signs (15 minutes for the first 2 hours, 30 minutes for the next 2 hours, and hourly for the next 4-6 hours) and assess for new symptoms. We resume feeding by 4 hours if there are no adverse events.

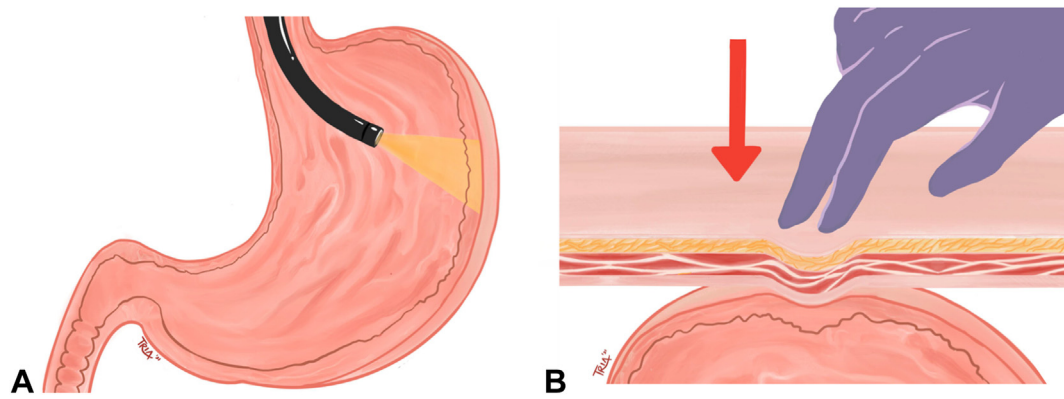
### CONCLUSION

PEG insertion can be performed safely in clinical practice. Our step-by-step video facilitates easy adoption and safe performance of PEG (Video 1, available online at [www.videogie.org](http://www.videogie.org)).

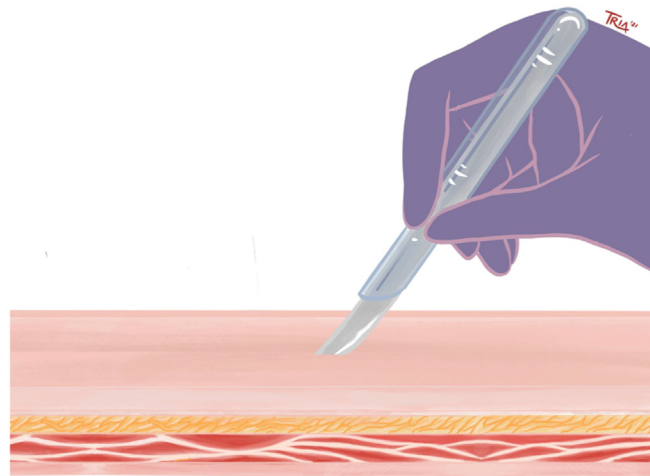
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<https://doi.org/10.1016/j.vgie.2024.02.010>

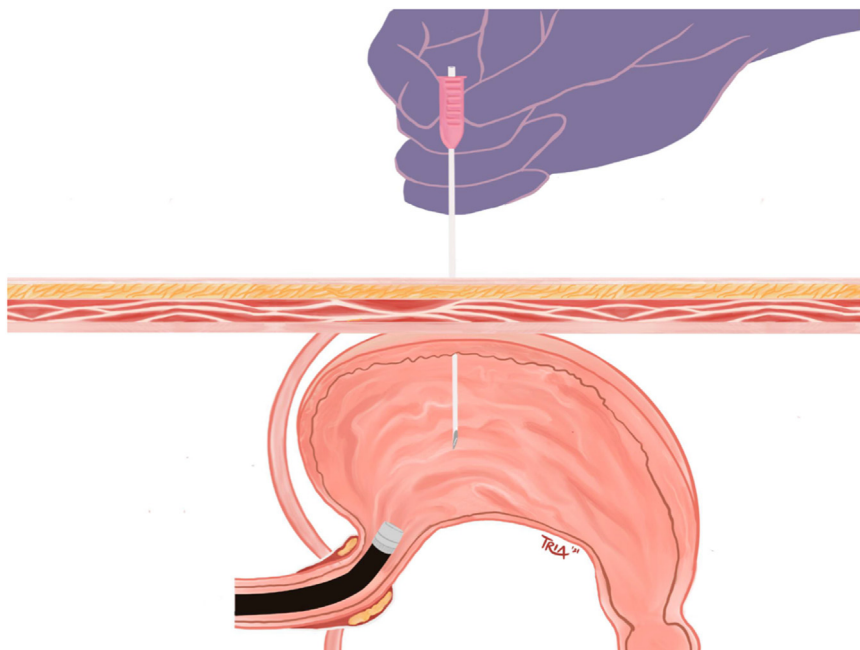
Department of Gastroenterology and Hepatology, Singapore General Hospital, Singapore (1), Duke-NUS Graduate Medical School, Singapore (2), Division of Gastroenterology and Hepatology, San Francisco VA Medical Center, San Francisco, California (3), Department of Gastroenterology and Hepatology, Singapore General Hospital, Singapore (4), Institute of Digestive and Liver Diseases, St. Luke's Medical Center, Global City, Manila, Philippines (5), Division of Gastroenterology and Hepatology, San Francisco VA Medical Center, San Francisco, California (6), Department of Gastroenterology and Hepatology, Singapore General Hospital, Singapore (7), Department of Gastroenterology and Hepatology, Singapore General Hospital, Singapore (8), Duke-NUS Graduate Medical School, Singapore (9), Division of Gastroenterology and Hepatology, San Francisco VA Medical Center, San Francisco, California (10), Academy of Endoscopy, Woodside, California, USA (11).



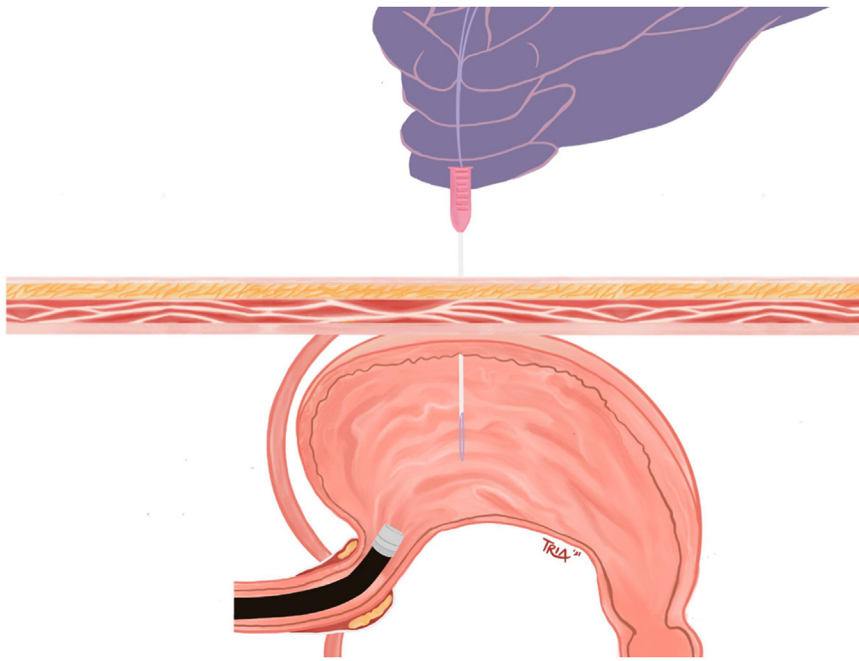
**Figure 1.** A, Transillumination of the stomach after insufflation. B, Finger indentation to identify the site of puncture.



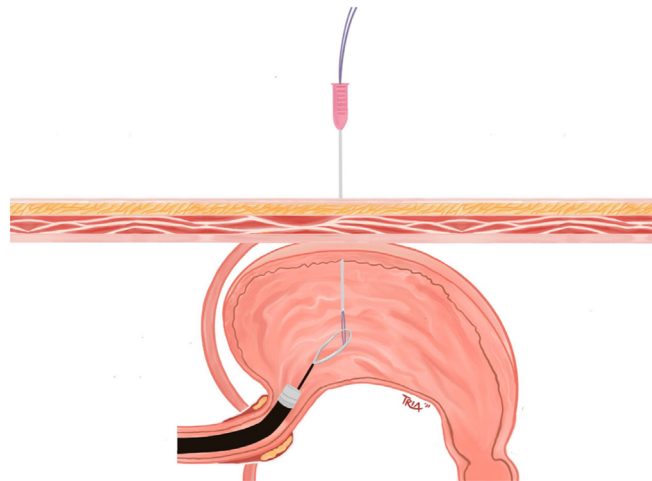
**Figure 2.** After sterilization of the area and local anesthetic application, a transverse abdominal incision is performed to allow smooth passage of PEG and accessories.



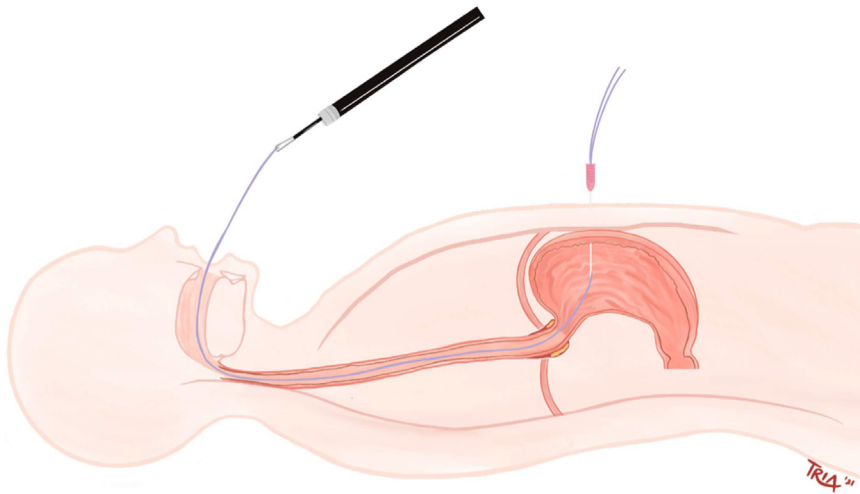
**Figure 3.** Advance a large-bore needle with a sheath through the abdominal incision until it appears in the stomach. Ensure there is no intervening hollow viscus or blood vessels before it enters the stomach.



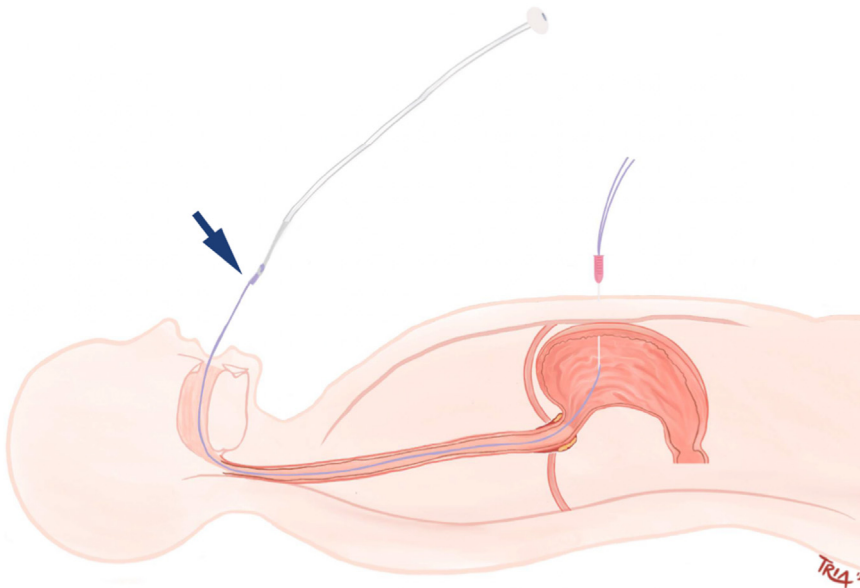
**Figure 4.** Advance the loop wire through the large-bore needle into the stomach.



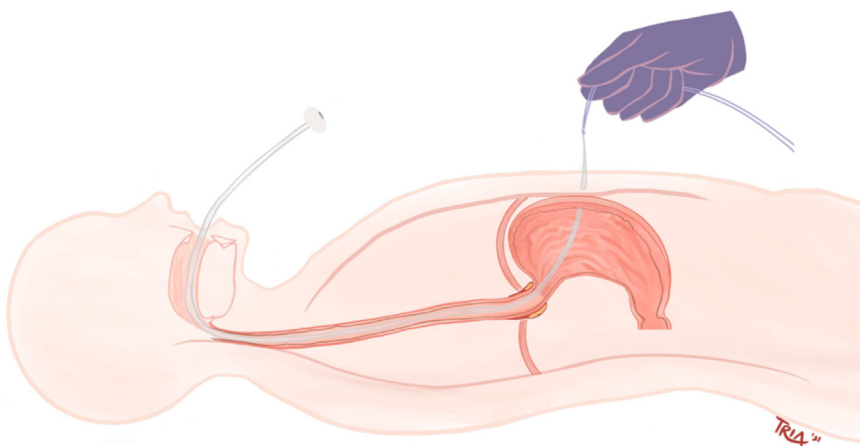
**Figure 5.** Capture the loop wire seen in the stomach using a snare.



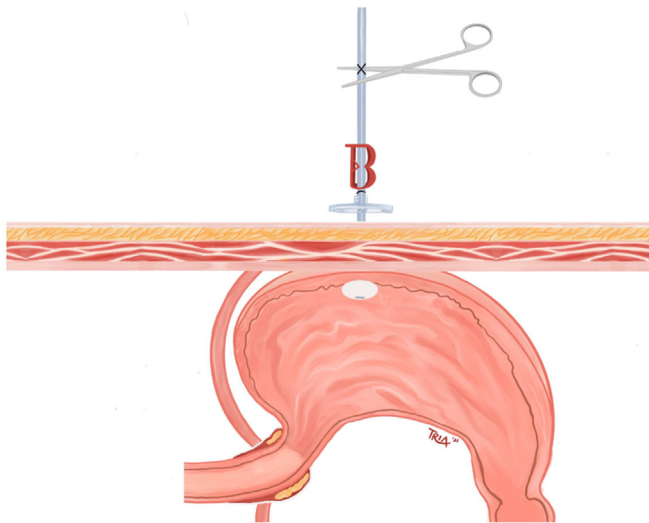
**Figure 6.** Slowly withdraw the wire and the endoscope through the patient's mouth.



**Figure 7.** The wire tip is first passed through the open loop at the tip of the feeding tube. The wire loop is then opened, and the internal bumper of the PEG tube is passed through to form a knot (*arrow*).



**Figure 8.** Lubricate the PEG tube adequately. Pull the wire from the abdominal site until the tapered end exits from the incision site.



**Figure 9.** Confirm the position of the internal bolster and ensure it is close to the gastric wall. Then slide the external bolster and position it 1 cm from the skin. Insert the clamp and cut the excess tube at the X mark.

## DISCLOSURE

Dr Asokkumar is a consultant for Apollo Endosurgery, USA. Dr Soetikno is a consultant for Olympus, USA, and Fujifilm, Japan. All other authors disclosed no financial relationships relevant to this publication.

## ACKNOWLEDGMENT

The authors acknowledge Meutia Gozali for the illustrations. The copyright for all the figures presented is owned by the Academy of Endoscopy, USA (AOE). Authors R.A., C.P.F., and R.S. are members of AOE, and no additional permissions were required.

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