Buried bumper syndrome
Geraldine Huynh, BMSc, Milton Chan, MD, Hien Q. Huynh, MBBS, FRACP, FRCPC

A 2-year-old boy with cerebral palsy, failure to thrive, and a significant risk of pulmonary aspiration was examined. He had required insertion of a percutaneous endoscopic gastrostomy (PEG) tube and gastrostomy feedings to help him obtain his nutritional requirements, and the PEG tube had remained in place for 2 months. Five days earlier, his PEG tube was forcibly pulled. Over the next few days, his parents noted increased leakage around the PEG tube. He also had been experiencing abdominal pain with his feedings. Examination showed swelling and erythema of the skin surrounding the external bumper, and the tube could not be advanced. The internal bumper was also palpable.

A gastrostomy tube (G-tube), inserted through the abdomen to deliver nutrition directly to the stomach, is one way children with difficulty eating can obtain the fluid and calories they need. The G-tube consists of the tube itself, an external bumper that sits on top of the skin, and an internal bumper that lies in the stomach over the gastric mucosa. G-tubes can be placed in many ways: endoscopically, radiologically, or surgically. This report focuses on G-tubes placed endoscopically by use of the pull method, called PEG tube placement.1

ADVERSE EVENTS

Adverse events can arise with G-tube placement and position. For PEG tube placement, adverse events can arise 16% to 70% of the time.2–6 G-tubes can result in minor adverse events, for example, wound infection or minor bleeding.7 They can also lead to major adverse events, for example, necrotizing fasciitis or colocutaneous fistula.7

MECHANISM OF BURIED BUMPER SYNDROME

Buried bumper syndrome is an uncommon serious adverse event that occurs after the gastrostomy tract has matured. A total of 1.5% of patients who underwent PEG experience this syndrome.7,8 Buried bumper syndrome develops as a consequence of the tight positioning of the external bumper of the PEG tube against the abdominal wall. Slowly, the internal bumper of the G-tube erodes and is enveloped by the gastrostomy tract as a result of tension created on the tract (Fig. 1). This can also occur when the PEG tube is strongly pulled away from the person, moving the internal bumper into the gastrostomy tract. This causes swelling and erythema of the surrounding cutaneous tissues and lodging of the internal bumper into the gastric wall of the gastrostomy tract.

DIAGNOSIS

Buried bumper syndrome is suspected if there is increased leakage around the PEG tube. Other signs include resistance to infusion and/or abdominal pain with infusion of feeding. Induration of the tissue surrounding the tract can be seen. There may be a history of the PEG tube being forcibly pulled. On physical examination, the internal bumper may be palpable.

Once the internal bumper is trapped in the gastrostomy tract, the cardinal feature of buried bumper syndrome is the impossibility of advancing the tube and the internal bumper farther into the stomach with the external bumper/bolster moved back. Initially there will be difficulty in rotating the PEG tube. With continued feeding, the tract may expand, and rotation of the tube will be become possible, as in our case.

The ideal way to diagnose buried bumper syndrome is with endoscopy, in which the internal bumper is seen buried within the gastric wall. With imaging, a CT scan may show a migrated internal bumper. Fluoroscopy through the PEG tube will still show contrast material entering the stomach because the gastrostomy tract is still open, and the diagnosis may be missed.

TREATMENT OF BURIED BUMPER SYNDROME FROM PEG TUBE

Endoscopic PEG tube extraction can be performed with the patient under general anesthesia. Simple external traction is shown at the end of Video 1 (available online at www.VideoGIE.org), with an example of what buried bumper syndrome looks like and how to remove the buried bumper. The PEG tube can be replaced with either another PEG tube or a low-profile Mic-Key G-tube (Halyard, Alpharetta, Ga, USA).

If there is an abscess at the placement site, with or without severe skin infection, this worsens the patient’s clinical condition, and the abscess must first be drained surgically. The patient’s status is corrected by nutritional
support and by fluid and electrolyte adjustments. Finally, to control the infection at the tube site, broad-spectrum antibiotics and local wound care must be used. In these cases, a replacement PEG tube is best inserted at a different site.

**PREVENTION**

Good care and patient instruction can help prevent buried bumper syndrome. The external bolster of the gastrostomy tube should be left approximately 0.5 to 1 cm from the abdominal wall to prevent excessive traction. Gauze pads should not be placed under the external bolster. Finally, the gastrostomy tube itself should be pushed in and out 1 to 2 cm and rotated 360° during daily care. The length of the protruding external portion of the PEG should be measured periodically to recognize early migration, which may signify a progression to buried bumper syndrome.

**PROCEDURE**

Video 1 (available online at www.VideoGIE.org) shows a patient with a normal PEG tube, which can be easily advanced in and out of the stomach. The next patient shown has buried bumper syndrome, which we manage by simple external traction. Often in this syndrome, the bumper is caught in the gastrostomy track and cannot be rotated. In our case, we were able to rotate the tube because the gastrostomy track was expanded by inadvertent feeding in the track. The classic sign of buried bumper syndrome is the inability to advance the PEG tube farther, into the lumen of the stomach as with the patient reported in this case. The first step with simple external traction is to insert the Savary-Gilliard guidewire (Cook Medical, Bloomington, IN, USA) and to visualize the blunt flexible tip in the lumen of the stomach during endoscopy in the top left corner. Next, the buried bumper is removed by applying force to pull out the tube. Then, the track length of the tube is measured with a stoma measuring device, and the new Mic-Key G-tube is inserted, and a syringe with normal saline solution is attached to inflate the internal retention balloon inside the stomach. The guidewire is removed, and the procedure is finished. Palpation of the area around the stoma shows the marked degree of induration from the buried bumper, which in this case was about the size of a golf ball.

**CONCLUSIONS/KEY POINTS**

Buried bumper syndrome is a rare (1.5%) but severe adverse event of G-tubes. Tension on the tube can cause the internal bumper to erode into the tract. Buried bumper syndrome presents as pain, swelling, resistance to infusion, induration around the stoma, and the inability to rotate and/or push the tube into the stomach. Management is to refer the patient for urgent endoscopic removal.

**DISCLOSURE**

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Abbreviations: PEG, percutaneous endoscopic gastrostomy; G-tube, gastrostomy tube.

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**Figure 1.** Mechanism of Buried Bumper Syndrome.
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University of Alberta, Edmonton, Alberta, Canada.

If you would like to chat with an author of this article, you may contact Ms Geraldine Huynh at ghhhuynh@ualberta.ca.

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