

# Midgut Volvulus after Percutaneous Endoscopic Gastrostomy

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## ABSTRACT

We report a 47-year-old man who underwent endoscopic gastrostomy placement due to feeding refusal and regurgitation. Procedure was unremarkable. Two days later, the patient presented signs of intestinal obstruction. Computed tomography imaging showed a well-positioned gastrostomy tube, small pneumoperitoneum, and small bowel volvulus (SBV) in the upper right abdomen with proximal small bowel dilated loops. Exploratory laparotomy revealed mesenteric torsion, leading to SBV, with no evidence of intestinal malrotation. Volvulus was successfully untwisted via surgery. This case highlights to the possible association between SBV and gastrostomy placement.

## INTRODUCTION

Since its introduction in 1980, percutaneous endoscopic gastrostomy (PEG) has gained worldwide acceptance as a safe technique for providing enteral feeding in patients with poor oral intake who have a functional gastrointestinal system.<sup>1</sup> Although safe, PEG tube insertion can result in minor or even major complications, but most patients do well with them. Serious complications requiring further intervention have been reported in 0.4–4.4% of procedures; these complications include peristomal leakage, necrotizing fasciitis, gastric bleeding, organ injury, tumor seeding, and death.<sup>2</sup> Pneumoperitoneum following PEG is a known minor complication occurring after 8–18% of procedures; it is usually benign and self-limited, although there are reports of a higher rate of associated complications.<sup>3–5</sup>

Small bowel volvulus (SBV) is a rare complication after PEG placement. SBV is an abnormal twist of a bowel loop around its own mesentery, leading to mechanical intestinal obstruction and bowel ischemia. There is a predilection for males (2:1), and peak incidence occurs in patients older than age 60 years.<sup>6</sup> SBV may be primary or secondary; primary volvulus is rare, mainly occurring in the neonatal period due to intestinal malrotation. There are a few reported cases of SBV after PEG placement where the PEG probe was found to have penetrated the mesentery root, thereby causing SBV.<sup>7,8</sup>

## CASE REPORT

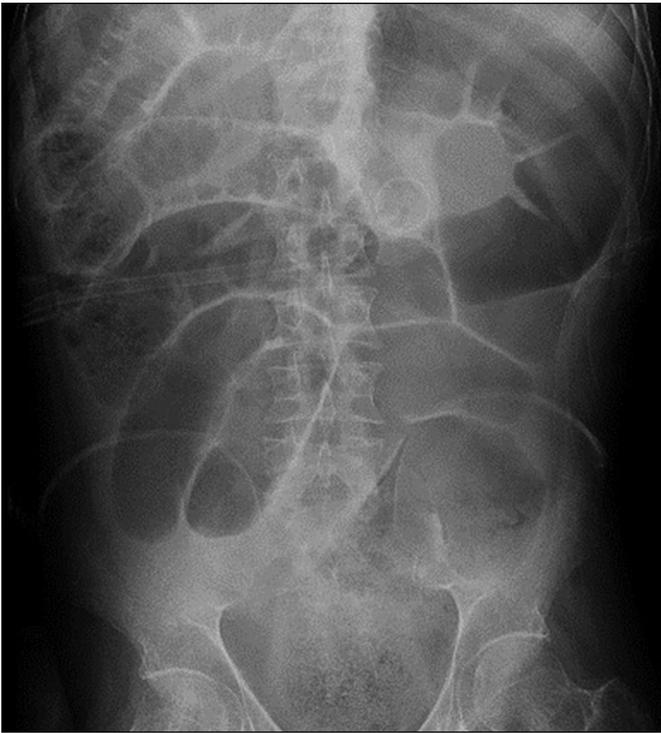
A 47-year-old man was referred to gastroenterology observation due to a progressive history of refusing to eat, regurgitation, and weight loss, which led to the placement of a nasogastric feeding tube. His medical history was notable for cerebral palsy and no previous abdominal surgeries; he was usually medicated with lansoprazol, baclofen, trazodone, and valproic acid. An elective admission for PEG placement was planned. Pre-anaesthetic study was unremarkable. The PEG placement was performed under antibiotic prophylaxis and anaesthesia, by pull method and safe tract technique, without immediate complications.

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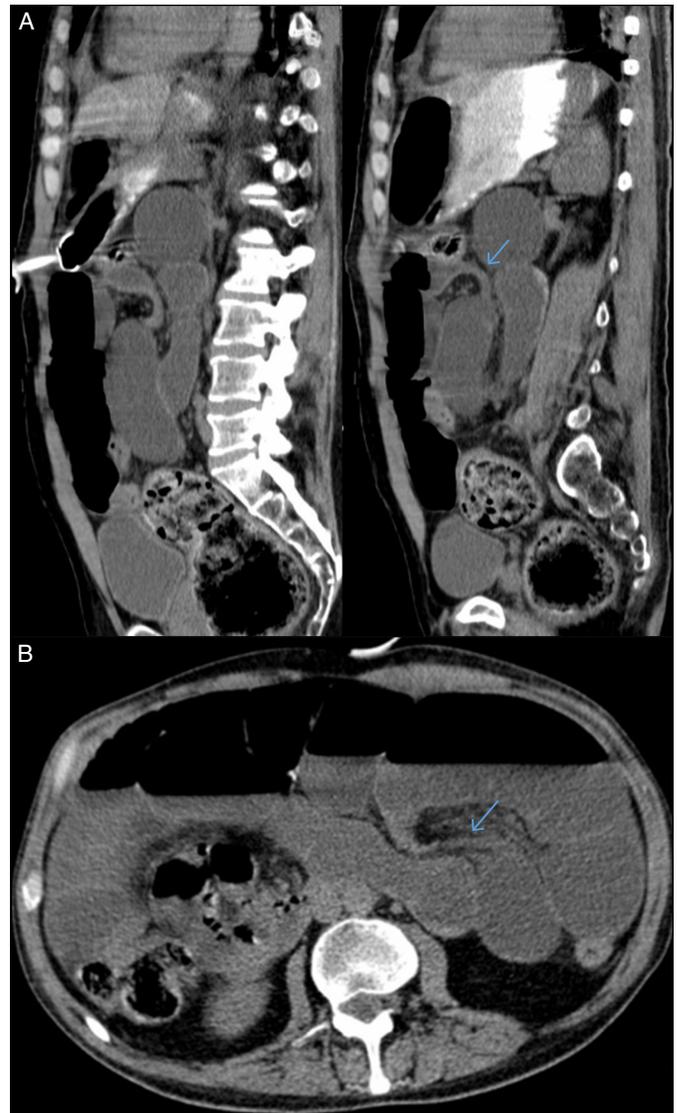


**Figure 1.** Abdominal radiography showing important dilation of small bowel loops.

The patient started gastrostomy feeding 6 hours after the procedure without complaints. Two days after the PEG procedure, he experienced fever, cough, and constipation. An abdominal exam revealed signs of peritoneal irritation, and a PEG probe revealed dark drainage. Diagnostic blood tests showed elevated C-reactive protein (17 mg/dL), thoracic radiography showed a right lung consolidation, and abdominal radiography showed marked dilation of the small bowel loops, suggestive of an abdominal obstruction (Figure 1). Abdominal computed tomography (CT) revealed a well-positioned gastrostomy tube, with a contrasted product administered via the gastrostomy passing into the duodenum with no leakage to other loops or peritoneum, as well as slight pneumoperitoneum and marked distension of proximal small bowel loops with clear caliber loop transition at the level of the upper right abdomen, compatible with SBV (Figure 2). An exploratory laparotomy revealed a mesenteric torsion, leading to SBV, without evidence of intestinal malrotation. The volvulus was manually untwisted, and no intestinal vascular compromise was noted. The patient started antibiotherapy and kinesiotherapy, and he was discharged clinically well and tolerating diet via the gastrostomy.

## DISCUSSION

Despite the well-known major complications of the PEG procedure, there are no reported cases of midgut volvulus after PEG placement without mesenteric root insertion.



**Figure 2.** (A) Coronal and (B) transverse abdominal CT scans showing a well-positioned gastrostomy tube and marked distension of proximal small bowel loops with a caliber loop transition at the level of the right upper abdomen (arrows).

SBV volvulus is a rare condition (0.5–2.5% of intestinal obstruction in adults), but it is potentially fatal.<sup>6</sup> Clinical presentations include abdominal pain, nausea, vomiting, and constipation. Laboratory tests may show inflammatory reaction, transaminase, amylase, and lactate levels elevation, according to the grade of ischemia. Currently, a contrast abdominal CT scan is the gold-standard method for diagnosing SBV as it offers a sensitivity of 94–100% and a specificity of 90–95%, and can reveal “whirl” or “peacock tail” signs (consisting of twisting of mesenteric pedicle), which are diagnostic of SBV.<sup>8</sup> SBV treatment involves surgery, despite the lack of guidelines. The main aim is to reduce the volvulus and re-establish blood flow to avoid further complications.

There is an increasing number of reported cases of SBV after laparoscopic procedures without previous malrotation or surgeries, pointing to predisposing factors such as pneumoperitoneum, bowel mobilization, inclination of the operating table, stasis, bowel bloating, and use of anaesthetics, all factors common to laparoscopy and PEG placement procedures.<sup>9-11</sup> Although a PEG-associated pneumoperitoneum presents with less pressure than a laparoscopy-associated pneumoperitoneum, it may be large, persistent, and associated with bowel injury.<sup>5</sup> In a reported case of gastric volvulus in an infant with a PEG placement, excessive gas inflation during gastroscopy and abnormal site of PEG entrance were indicated as predisposing factors for volvulus.<sup>12</sup> Gas insufflation was also considered a possible trigger in one case of gastric volvulus after an upper endoscopy in a dyspeptic woman.<sup>13</sup>

There are only two reported cases of SBV after PEG placement. In these cases, patients did not present known risk factors for intestinal volvulus.<sup>7,8</sup> Surgery revealed PEG tube insertion in two points of the jejunal mesentery, thereby acting as the axis around which the mesentery and small bowel were twisted. Clinical presentation was very similar, with both patients showing symptoms of intestinal occlusion or subocclusion. Despite the reported cases, no definitive cause-and-effect relationship could be drawn, but bowel inflation, pneumoperitoneum, anesthetics, and bowel mobilization could be involved in the genesis of the volvulus, probably in predisposed patients, such as patients with less fixed viscera.<sup>7-13</sup> The possibility of midgut volvulus after PEG placement as a cause of small bowel obstruction must be considered despite the rarity of the diagnosis, to properly refer patients to surgery and avoid serious complications.

## DISCLOSURES

Author contributions: D. Martins searched the literature and wrote the manuscript. All other authors reviewed and edited the manuscript. A. Castanheira is the article guarantor.

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Informed consent was obtained for this case report.

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