

# Gastrocolocutaneous fistula: An undetected complication of colon transfixation during percutaneous endoscopic gastrostomy

Gonçalo Nunes<sup>1</sup>, Gabriel Oliveira<sup>2</sup>, João Cortez-Pinto<sup>3</sup>, João Cruz<sup>4</sup>, Jorge Fonseca<sup>1,5</sup> 

<sup>1</sup>Department of Gastroenterology, GENE - Artificial Feeding Team, Hospital Garcia de Orta, Almada, Portugal

<sup>2</sup>Department of Surgery, Hospital Garcia de Orta, Almada, Portugal

<sup>3</sup>Department of Gastroenterology, Instituto Português de Oncologia de Lisboa Francisco Gentil (IPOLFG), Lisbon, Portugal

<sup>4</sup>Department of Radiology, Hospital Garcia de Orta, Almada, Portugal

<sup>5</sup>CiiEM, Centro de investigação interdisciplinar Egas Moniz, Monte da Caparica, Portugal

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Dear Editor,

Percutaneous endoscopic gastrostomy (PEG) is the gold standard for long-term enteral feeding in patients unable to swallow, but with an efficient digestive tract. Most common indications include neurologic disorders and head or neck cancer, both increasing in Western countries (1).

PEG-associated complications are often minor and are promptly managed by trained staff. Major adverse events are uncommon, and survival mostly depends on underlying disorders. However, massive bleeding, aspiration pneumonia, internal organ injury, necrotizing fasciitis, buried bumper syndrome, and stoma cancer seeding are life-threatening complications that deserve special attention due to their severity and negative impact on the clinical outcome (1).

A 31-year-old man previously diagnosed with hereditary spastic paraplegia was referred to the Artificial Nutrition Outpatient Clinic due to prolonged dysphagia and high nutritional risk. An endoscopic gastrostomy was scheduled for long-term enteral nutrition. During the procedure, abdominal transillumination was easily obtained, and the PEG tube could be placed without immediate complications. The patient was followed in ambulatory for several months. Some oral feeding could be maintained, being complemented by enteral nutrition to cover daily nutritional needs. Seven months later, despite being asymptomatic, PEG tube deterioration was evident, and replacement was planned. In upper gastrointestinal endos-

copy (UGE), the internal bumper was correctly positioned in the gastric body. It was looped using a polypectomy snare and removed by mouth, according to the standard protocol of our center for replacing the initial PEG tube. Under the endoscopic control, the replacement tube with a distal inflation balloon was easily inserted through the stoma without resistance; however it did not reach the gastric lumen. Gastric cannulation was impossible even after using a rigid guidewire, and therefore, the procedure was postponed, and the patient was admitted for investigation. An abdominal CT scan showed complete interposition of transverse colon between the stomach



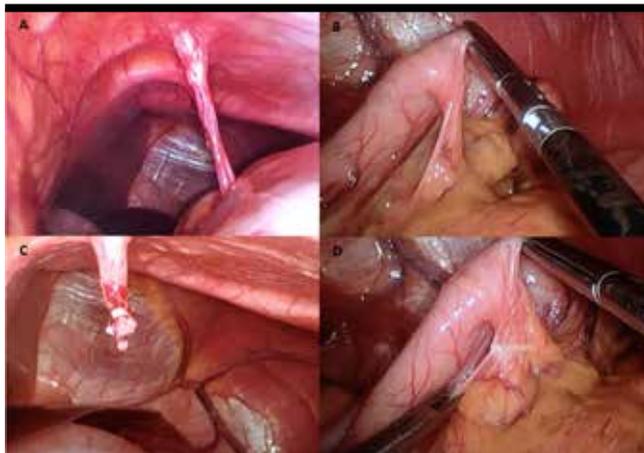
**Figure 1. a-c.** Abdominal computed tomography. Colocolocutaneous fistula is best viewed in the sagittal plane (red arrow). In the axial plane, it shows the presence of iodinated contrast in the colon (yellow arrow), after its administration through the stoma, diagnostic for colocolocutaneous fistula. The gastrocolic fistula can also be depicted on both the axial and coronal planes (blue arrows)

Corresponding Author: Gonçalo Nunes; [goncalo.n@hotmail.com](mailto:goncalo.n@hotmail.com)

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**Figure 2. a-d.** Laparoscopy. Both the colocolocutaneous and the gastrocolic tracts were easily identified and ligated using *Hem-o-lok*

and abdominal wall. After diluted loperamide contrast (Ultravist 370, Bayer) administration through the stoma, colon opacification was observed without intraperitoneal extravasation (Figure 1). The diagnosis of gastrocolocutaneous fistula (GCCF) associated with colon transfixation during the PEG procedure several months before was confirmed. The patient was discharged under nasogastric feeding and referred for surgical gastrostomy that was scheduled for 1 month later. After analyzing the patient and CT scan images, the surgical team proposed a minimally invasive, laparoscopic approach. The colocolocutaneous and gastrocolic tracts were easily identified and ligated using *Hem-o-lok* (Figure 2). The colocolocutaneous tract was resected and the cutaneous end excised from the outside. To ensure that the new gastrostomy was well away from the gastric end of the gastrocolic fistula tract, a percutaneous combined assisted laparoscopic and endoscopic gastrostomy was performed, using the push method (Ballard introducer Kit Mic Key 20F) with gastropexy. The patient was further discharged after resuming enteral nutrition and maintained follow-up with our group without additional complications.

The GCCF is a rare complication of PEG, first reported in 1987. Some anecdotal reports have been described with an estimated prevalence of 0.5% in adult patients (2). Colon transfixation caused by interposition between the stomach and abdominal wall due to postoperative adhesions or gastric hyperinflation during the PEG placement was the most consistent risk factor (2). The GCCF may present as an acute complication after the PEG placement when peritonitis or a significant pneumoperitoneum develops, nevertheless the absence of clinical

manifestations is usual, as the fistula matures, and the internal bumper remains in the gastric lumen. In cases in which the PEG tube migrates through the fistula or is replaced by secondary balloon tubes, symptoms such as diarrhea after food administration, fecaloid vomiting, abdominal pain, and stool drainage through the tube may occur (3).

Data for the management of GCCF are scarce and insufficient to propose a standard management protocol. Most patients present a benign clinical evolution with fistula closing spontaneously after the PEG tube retrieval. A previous unpublished case of our experience was also detected at the moment of first tube replacement and exhibited this asymptomatic non-complicated evolution (2,3). Eventually, most cases of colon transfixation may present this benign course (3). However, some reports suggest the possibility of endoscopic treatment in cases where the fistula does not spontaneously close within several days. It may be a valid alternative if aiming to accelerate closure, especially when large orifices are present, or the patient is malnourished and exhibits deficient wound healing (4). Clipping the colonic and/or the gastric side of the fistula is a possible endoscopic approach with favorable results. Urgent surgery is only required when leakage is present causing peritonitis (3).

In our case, the patient remained asymptomatic after PEG tube removal, and any endoscopic treatment was considered. Given the need of long-term enteral nutrition, long life-expectancy, and the risk of a new colonic puncture if a second PEG had been tried, a laparoscopic approach was the preferred option for definitive nutritional access. Surgical gastrostomy is, nowadays, seldom used as we have recently reported. It is currently reserved for patients without the abdomen wall transillumination during UGE due to obesity, previously operated stomach or large hiatal hernias, and for the patients without endoscopic access (5). Our option not only provided a safe and effective gastrostomy procedure, but also allowed complete resection of the fistula, avoiding the possibility of persistence of the iatrogenic tract.

The present report highlights a rare complication of PEG that, nevertheless, has the potential to cause significant morbidity in patients that are usually fragile due to underlying disorders. When an established fistula is present, and endoscopic management is not possible or is unreliable, a minimally invasive, laparoscopic approach is a good alternative. As these cases are rare, a combined laparoscopic and endoscopic control is safer.

The authors recommend a three-step strategy to minimize the GCCF risk: (1) achieve an adequate abdominal transillumination during PEG; (2) perform the needle aspiration test routinely and confirm if air enters in the syringe at the same time the needle is seen endoscopically in the gastric lumen, excluding visceral interposition; (3) and achieve a perpendicular puncture of the abdominal wall. Confirmation of the PEG tube position after primary tube replacement using endoscopy or radiopaque contrast may be advised in high-risk patients (2).

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