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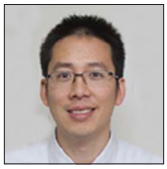
American Journal of Interventional Radiology

Case Report *GI/GU/Thoracic/Nonvascular Interventions*

Unusual intraperitoneal migration of nasogastric tube post-gastrojejunostomy tube insertion

Isabella J. Woo, Daniel T. Walker, Nawaf Abu-Omar, James K.H. Woo

Departments of Diagnostic Imaging, and Surgery, Scarborough Health Network, Scarborough, ON, Canada.



***Corresponding author:**
James K.H. Woo,
Department of Diagnostic Imaging, Scarborough Health Network, Scarborough, ON, Canada.

jwoo@shn.ca

Received: 13 May 2025
Accepted: 09 October 2025
Published: 04 November 2025

DOI
10.25259/AJIR_13_2025

Quick Response Code:

ABSTRACT

We report the case of a 78-year-old male with intraperitoneal migration of the nasogastric (NG) tube post-gastrojejunostomy (GJ) tube insertion. The malpositioned NG tube resulted in signs of infection and required laparoscopic operative intervention to remove purulent fluid in the peritoneal cavity and repair of gastrotomy. Interventional radiologists should recognize the possibility of this rare complication and consider the position of the NG tube during and after the GJ tube insertion.

Keywords: Gastrointestinal intubation, Gastrojejunostomy tube, Nasogastric tube

INTRODUCTION

A gastrojejunostomy (GJ) tube is a method of providing enteric access for patients with inadequate oral intake secondary to neurologic or gastrointestinal disorders.[1] The most common indications for GJ tube insertion include obstruction, dysphagia secondary to malignancy or neurologic disorders that increase the risk of aspiration and malnutrition.[2] Aspiration can largely be avoided by the preferential insertion of a GJ tube.[3] Insertion of percutaneous GJ tubes can be complicated by stoma irritation, skin infection, tube leakage, discomfort during feeding, occlusions, dislodgements, and tube fractures.[4,5] A malpositioned GJ tube may result in vomiting of tube feeds.[6] We report a case of a 78-year-old male with a malpositioned nasogastric (NG) tube in the peritoneal cavity post-GJ tube insertion.

CASE REPORT

A 78-year-old male with a right thalamic intra-axial hemorrhage and a NG tube *in situ* required GJ tube insertion for long-term feeding and to reduce the risk of aspiration. Informed consent was obtained. The patient was brought to the interventional radiology suite, and conscious sedation was administered. Skin was prepped, draped, and local anesthetic was injected into the skin and soft tissues. The stomach was insufflated with air through the existing 14 French NG tube, which had been inserted on the ward [Figure 1a]. Under fluoroscopic guidance, using a single-puncture technique, a 17-gauge T-fastener needle was advanced into the stomach. Water-soluble contrast injection confirmed position and opacified the gastric lumen, and a 0.035" Amplatz wire was inserted, deploying the T fastener (Cook Medical), and the wire was coiled within the stomach.[7] The T fastener suture was secured with a clamp. A 10 French dilator was inserted, and the wire was navigated into the jejunum [Figure 1b]. A 10 French peel-away sheath

was advanced over the wire, followed by a 5 French Kumpe catheter with contrast injection opacifying the jejunal lumen. The tract was dilated with a 12 French dilator [Figure 1c], and 14 French GJ multipurpose drainage catheter (Cook Medical) was advanced over the wire with the pigtail formed in the proximal jejunum [Figure 1d]. The wire was removed, T fastener suture was cut, and the tube was flushed with saline. The NG tube remained on gravity drainage post-GJ tube insertion while the GJ tube was capped.

At 24 h post-GJ tube insertion, the patient became febrile (38.9°C), tachycardic, hypertensive, and had an elevated white blood cell count. Computed tomography (CT) scout [Figure 2a] and CT maximum intensity projection [Figure 2b] of the abdomen and pelvis demonstrated the NG tube exiting the stomach through the anterior gastric body wall, immediately superior to the GJ tube, with tip in the anterior aspect of the peritoneal cavity. Moderate volume of intraperitoneal free air was noted.

A general surgery consultation was obtained. Physical examination was limited due to the patient's post-stroke neurological status; however, there was tenderness on deep palpation, and the GJ tube insertion site appeared clean and intact. No manual attempts to reposition the NG tube were made. The patient was taken to the operating room for diagnostic laparoscopy, which revealed a moderate amount of purulent fluid in the right and left upper abdominal quadrants. Fibrinous material was observed at the GJ tube insertion site at the anteroinferior aspect of the stomach, near the greater curvature, along with omental draping. The tip of the NG tube was identified traversing the omentum and was traced back to the GJ tube insertion site [Figure 3]. No significant or abnormal enlargement of the GJ insertion site

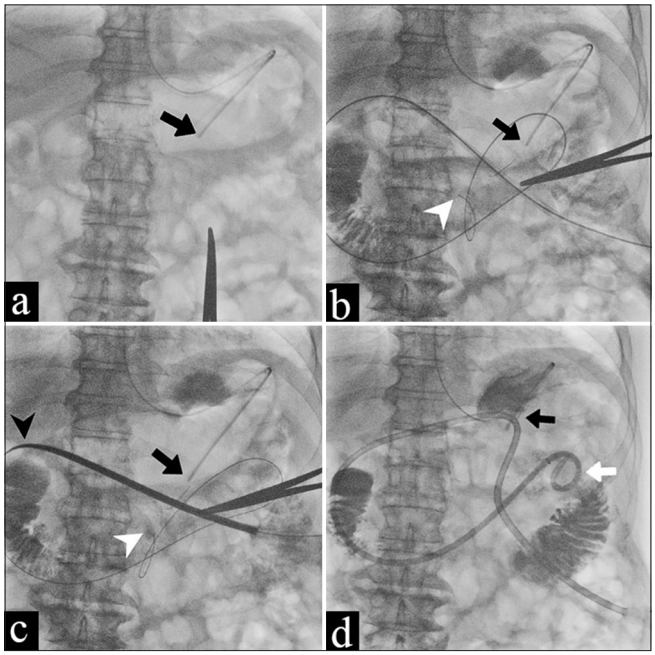


Figure 1: A 78-year-old male presented for gastrojejunostomy (GJ) tube insertion for long-term feeding. Fluoroscopic anteroposterior images (a-d) show (a) 14 French nasogastric (NG) tube tip (black short arrow) in the gas-filled stomach prior to needle puncture, (b) Amplatz wire tip (white arrowhead) in the proximal jejunum and NG tube tip in the stomach (black short arrow), (c) 12 French dilator (black arrowhead) inserted over the Amplatz wire (white arrowhead), with the NG tube tip essentially unchanged in position in the stomach (black short arrow) and (d) decompressed stomach with 14 French GJ tube pigtail (white short arrow) in the proximal jejunum as well as the NG tube tip in close proximity to the GJ tube entry site at the anteroinferior aspect of the stomach, near the greater curvature (black short arrow).

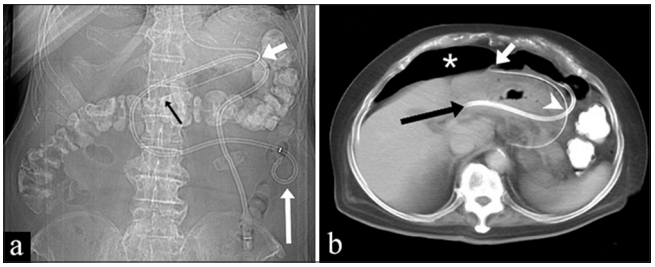


Figure 2: A 78-year-old male 24 h post-gastrojejunostomy (GJ) tube insertion became febrile, tachycardic, hypertensive and had elevated white blood cell count. (a) Computed tomography (CT) scout of the abdomen and pelvis shows nasogastric (NG) tube tip (black arrow) projecting over the epigastrium and GJ tube in the proximal jejunum (long white arrow). Note the crossing of the NG tube and the GJ tube (short white arrow). (b) Contrast-enhanced CT maximum intensity projection image of the abdomen and pelvis shows the NG tube (short white arrow) exiting the stomach (white arrowhead) with tip in an extraluminal location in the peritoneal cavity, GJ tube in stomach (black long arrow) and free air (white asterisk).

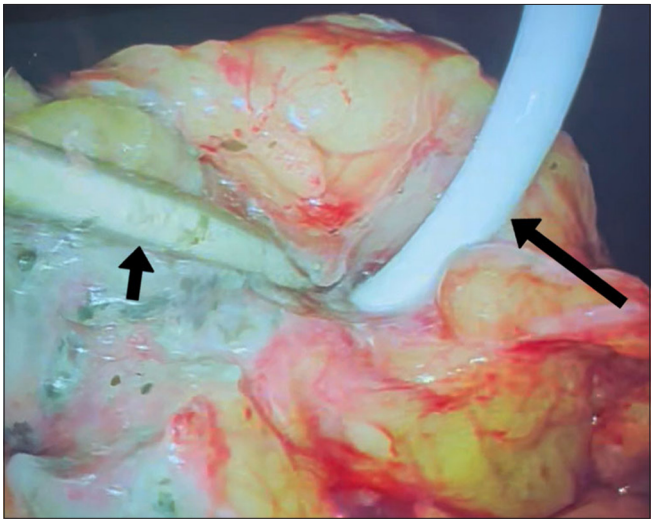


Figure 3: A 78-year-old male 24 h post-gastrojejunostomy (GJ) tube insertion was taken to the operating room for laparoscopy. Laparoscopic video image shows the nasogastric tube (black short arrow) exiting the stomach at the entry site of the gastrojejunostomy (GJ) tube (black long arrow) surrounded by omental fat.

was noted. The NG tube was removed without difficulty, and the GJ tube was flushed and confirmed to be functioning appropriately. The GJ tube was then secured using purse-string sutures, and a gastropexy was performed to reinforce its position. The patient became afebrile and his leukocytosis improved, although his post-operative hospital course was prolonged and complicated by pre-existing comorbidities, including intracranial hemorrhage, urinary tract infection, aspiration pneumonia, and pressure ulcer.

DISCUSSION

The NG tube plays a critical role during percutaneous GJ tube placement, as it is used to insufflate the stomach and facilitate safe and accurate access. At our institution, patients are kept nothing by mouth (NPO) for 24 h following percutaneous feeding tube insertion. During this period, the existing NG tube is exclusively used for the administration of essential oral medications. If the patient remains clinically stable after 24 h, the NG tube is removed and enteral feeding through the GJ tube is initiated. To the best of our knowledge, this case represents the first reported instance of NG tube tip migration from the gastric lumen into the peritoneal cavity through the GJ tube insertion tract.

The precise intragastric position of the NG tube is typically inconsequential during percutaneous GJ tube insertion. However, this case highlights a rare but significant complication related to NG tube positioning, which should be recognized by interventional radiologists. On retrospective review of the final anteroposterior fluoroscopic image during GJ tube placement, the NG tube tip is seen in proximity to the GJ tube insertion site [Figure 1d], suggesting an increased risk for intraperitoneal migration. Notably, the gastrostomy tract is typically dilated 2–4 French sizes larger than the GJ tube itself, creating a transient peritubular space before tract maturation. Although the fluoroscopic images are 2-dimensional, based on the course of the NG tube, as shown in Figure 1, the tube follows the curvature of the fundus, and the tip of the tube is pointing anteriorly, abutting the anterior gastric wall. As the stomach spontaneously decompressed, due to the combination of the GJ access site and the location of the NG tube tip, the NG tube tip presumably was able to enter the peritubular space due to the semi-rigid properties of the tube and due to the location of the GJ entry site at the anteroinferior aspect of the stomach, near the greater curvature. Peristaltic forces and an increase in intragastric pressures from coughing or retching might have facilitated this NG tube migration. A less plausible mechanism would be pulling of the NG tube tip since the dilators used were smooth and did not have any defects that would cause the dilator to latch onto the NG tube tip. In this case, this mechanism of GJ tube malpositioning is unlikely given the unchanged appearance of the NG tube throughout the procedure, which can be seen in Figure 1. Inadvertent mechanical manipulation of the NG tube after the procedure was also unlikely, as the proximal end was taped to the patient's right nare.

Preventative strategies to reduce the risk of this complication may include ensuring the GJ entry site is more anterior and farther from the greater curvature of the stomach, ensuring that the NG tube tip is not in proximity to the GJ tube insertion site in the decompressed stomach, minimizing the dilation of the GJ tube tract, paying close attention to the NG tube tip during wire and tube manipulation and using a GJ tube that has an anchoring balloon. If the GJ tube had an anchoring balloon and was apposed to the gastric wall, it may have been more difficult for the NG tube to enter the gastrostomy site, reducing the risk of the complication.

In this case, the combination of NG tube length and positioning, along with the specific site of percutaneous access, likely facilitated migration of the NG tube tip through the immature gastrostomy tract into the peritoneal cavity.

CONCLUSION

The risk of intraperitoneal migration of the NG tube tip through the immature gastrostomy tract underscores the need for careful consideration of NG tube positioning during and after GJ tube placement. Withdrawing the NG tube to a safer intragastric length before decompression may reduce the risk of this rare but serious complication.

Ethical approval: The Institutional Review Board approval is not required.
Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent.
Financial support and sponsorship: Nil.
Conflict of interest: There are no conflicts of interest.
Use of artificial intelligence (AI)-assisted technology for manuscript preparation: The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript, and no images were manipulated using AI.

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How to cite this article: Woo IJ, Walker DT, Abu-Omar N, Woo JKH. Unusual intraperitoneal migration of nasogastric tube post-gastrojejunostomy tube insertion. Am J Interv Radiol. 2025;9:8. doi: 10.25259/AJIR_13_2025