

# Gastric Perforation Following Nasogastric Intubation in an Elderly Male

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## ABSTRACT

In order to provide appropriate and timely treatment for an acute gastrointestinal bleed, it is vital to determine the site of hemorrhage. Historical clues and exam may be insufficient to differentiate upper from lower gastrointestinal bleeds and clinicians may utilize nasogastric lavage for diagnostic clarity. Nasogastric tube placement is a common procedure in the Emergency Department and is often viewed as benign. We present a patient presenting with hematochezia that developed pneumoperitoneum secondary to nasogastric tube perforation of the gastric wall and discuss the literature regarding gastric lavage in the setting of gastrointestinal bleed.

## INTRODUCTION

Gastric perforation is a surgical emergency that requires prompt diagnosis and treatment. Spontaneous gastric perforations most commonly occur secondary to peptic ulcer disease, non-steroidal anti-inflammatory drugs, and gastric cancer. Iatrogenic sources of perforation include esophagogastroduodenoscopy (EGD), but are an uncommon complication. Esophageal perforation secondary to nasogastric intubation has been described, but gastric perforation appears to be exceedingly rare.

## CASE REPORT

A 78-year-old male presented to the emergency department with history of several maroon-colored stools. He denied abdominal pain, nausea, and hematemesis, but did endorse symptoms consistent with orthostasis. After additional hematochezia, he became increasingly tachycardic and hypotensive requiring packed red blood cell transfusion. Gastroenterology and surgery were consulted.

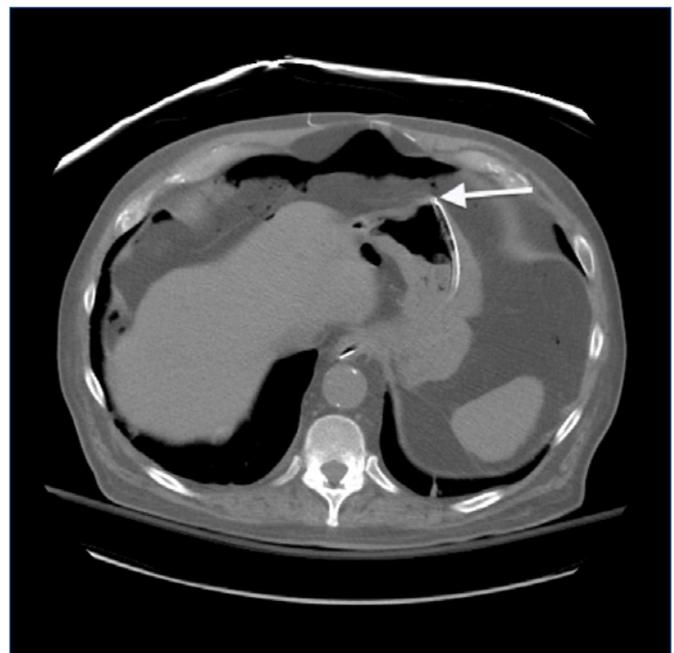
Given the patient's history of peptic ulcer disease, surgical consultants opted to perform a nasogastric intubation for gastric lavage to rule out a brisk upper gastrointestinal bleed, as this would have been an indication for emergent operative management. Five hundred milliliters of saline were injected into the nasogastric tube and clear effluent was aspirated from the stomach.

Subsequently, a computed tomography (CT) scan with contrast of the abdomen and pelvis was obtained and showed large amounts of free air within the peritoneum.

Reconstructions of the gastric portion of the CT were performed displaying the tip of the nasogastric tube piercing the gastric wall with air tracking through the muscular layer of the stomach (**Figure 1**). The patient was taken to the operating room for exploratory laparotomy and intraoperative esophagogastroduodenoscopy (EGD).

In the operating room, excision of two gastric ulcers located on the lesser and greater curvature of the stomach with primary closure was performed and EGD with gastric insufflation demonstrated no gas leak. The patient was admitted to the surgical intensive care unit and improved post-operatively, but was found to have increased pneumoperitoneum on postoperative day seven. He was brought back to the operating room and an air leak was discovered at the excision site of the anterior gastric ulcer. This site was repaired using a double layer technique. Despite clinical improvement post-operatively, the patient developed pneumonia resulting in increasing respiratory distress requiring intubation. A family meeting was held resulting in the decision to make the patient comfort measures only and the patient died 32 days after admission.

**Figure 1.** Axial CT image demonstrating perforation of the gastric wall by nasogastric tube (arrow) and associated pneumoperitoneum.



## DISCUSSION

The differentiation of an upper gastrointestinal bleed (UGIB) versus lower gastrointestinal bleed (LGIB) presents a difficult clinical scenario. Historical clues such as hematemesis can be helpful, but many UGIBs, especially those originating from a post-pyloric location, may not present with hematemesis. In addition, other historical clues, such as melena and hematochezia, can be difficult for patients to describe accurately.<sup>1</sup> To further complicate the issue, a brisk UGIB may present with massive hematochezia.<sup>1</sup>

One method that has been described to differentiate LGIB and UGIB is nasogastric lavage.<sup>2</sup> Aspiration of gastric contents after lavage and discerning acute blood or clots, indicating UGIB, from clear or bilious aspirate, suggesting a LGIB, is the most common technique. Despite its use, current literature does not support its reliability in distinguishing between UGIB and LGIB. In a recent study by Huang et al., nasogastric lavage was found to reduce time to upper endoscopy, but was not associated with decreased mortality, length of hospital stay, or units of blood transfused.<sup>3</sup> In response to this study, there has been a movement to discontinue the use of nasogastric lavage in UGIB.<sup>4</sup>

Although it is often viewed as a benign procedure, nasogastric tube placement is associated with multiple adverse complications.<sup>5</sup> Esophageal perforation is well documented.<sup>6,7,1,8,9,10,12</sup> Gastric perforation has been described in patients with prior gastric surgery and with baseline connective tissue disease; this patient had neither.<sup>13,14</sup> While this patient had two risk factors for spontaneous gastric perforation – peptic ulcer disease and chronic corticosteroid use – it is not known if these factors increase susceptibility to perforation from nasogastric tube placement.<sup>3,15</sup> Despite its theoretical clinical utility, the use of nasogastric lavage to differentiate UGIB from LGIB may not be appropriate as it puts patients at unnecessary risk for serious complication. In addition, when one performs nasogastric intubation for any indication, a review of risk factors for gastric perforation, along with risks and benefits, should be addressed before performing the procedure.

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