Intraluminal bleeding and gastric mural perforation after diagnostic upper digestive endoscopy

Clinical History:

An elderly woman had history of chronic congestive heart failure, pulmonary hypertension, large gastric hiatal hernia, gallstones and previous recurrent episodes of acute cholecystitis treated medically.

Upon emergency department admission for crampy abdominal pain, the attending surgeon requested upper gastrointestinal endoscopy.

Imaging Findings:

Endoscopy was interrupted for suspected complications soon after the endoscope impacted the gastric fundus wall, and the patient was immediately rushed to the imaging suite to be investigated with CT (Fig.1). Image review at lung window settings showed pneumoperitoneum, and posterior pneumomediastinum surrounding a large hiatal hernia containing the rotated stomach along its main axis consistent with chronic organoaxial volvulus. In the herniated gastric fundus, unenhanced images showed hyperattenuating material suggesting fresh intraluminal blood, and linear contrast extravasation consistent with active bleeding was seen after intravenous contrast injection. Careful multiplanar image interpretation identified a probable focal discontinuity of the gastric wall consistent with iatrogenic perforation.

Considering the patient’s worsening clinical conditions and comorbidities, urgent laparotomic surgery was performed, including confirmation and suture of a focal full-thickness gastric wall laceration, and omentopexy. After an uneventful but prolonged postoperative course, follow-up CT one month after surgery (Fig.2) revealed normal postoperative appearances.

Discussion:

Extensively used for diagnosis and treatment of digestive tract disorders, upper gastrointestinal endoscopy (UGIE) is generally associated with very low morbidity (0.14-0.2%). The majority (almost 60%) of adverse events are cardiopulmonary (respiratory depression, arrhythmia, aspiration pneumonia, myocardial infarction, shock) related to sedation and analgesia. Conversely, rare complications include bacteraemia, bleeding, and perforation [1-3].

According to the European Society for Gastrointestinal Endoscopy practice guidelines, iatrogenic perforation after UGIE is exceptional with 0.03% estimated incidence and exceptional mortality. Perforation may occur at the pharynx or oesophagus during blind passage of the endoscope (particularly with predisposing factors such as cervical osteophytes, oesophageal strictures, Zenker’s diverticulum) or at sites of stricture or malignancy. However, UGIE complications may be encountered more often due to the increasing number and complexity of endoscopic procedures such as dilatation of strictures, anastomosis and lower oesophageal sphincter in achalasia, foreign
bowel retrieval, polypectomy, mucosal resection and submucosal dissection, cryotherapy and argon plasma coagulation, with a 5-10% chance of perforation in high-risk cases. After UGIE bleeding is very rare (<1%) and mostly related to coagulopathy or therapeutic manoeuvres [1, 3, 4]. Unfortunately, iatrogenic complications are often unrecognized during UGIE. Symptoms of oesophageal or gastric injury include chest or abdominal pain, haemodynamic instability, dyspnoea, hematemesis or melaena, followed by clinical and laboratory signs of systemic inflammation in a later stage. Since early diagnosis substantially impacts the outcome, prompt imaging investigation is warranted in patients with unusual complaints after UGIE [1, 4, 5]. Plain radiographs are currently considered suboptimal (50-70% sensitivity for pneumoperitoneum) compared to CT, which reliably detects minimal amounts of air or fluid in the mediastinum or peritoneal cavity, and identifies the site of perforation in 85-90% of cases. Furthermore, CT-angiography may show intraluminal hyperattenuating blood, and contrast extravasation indicating active gastrointestinal bleeding with 85.2% sensitivity and 92.1% specificity [2, 5-8]. Treatment of iatrogenic UGIE complications is tailored on patient's conditions and prognosis, site and entity of perforation and haemorrhage. Endoscopic closure of limited perforations and haemostasis with adrenaline, clips or thermal coagulation are recommended as first-line treatment within 12 hours from injury, with satisfactory results. Asymptomatic perforations may be treated conservatively with hospitalization, nasogastric suction, intravenous antibiotics and parenteral nutrition. Surgery is warranted in patients with large perforations, generalized peritonitis, sepsis or worsening clinical conditions, when CT reveals free fluid or enteral contrast extravasation consistent with contaminated mediastinum, pleural or peritoneal cavity, and when nonoperative management fails [1, 3-5].

**Differential Diagnosis List:** Intraluminal bleeding and gastric mural perforation after upper digestive endoscopy, Normal post procedural appearances, Acute pancreatitis, Hemoperitoneum, Pneumothorax / pleural effusion

**Final Diagnosis:** Intraluminal bleeding and gastric mural perforation after upper digestive endoscopy

**References:**


Description: Axial and coronal images viewed at lung window settings (a...c) showed pneumoperitoneum (arrowheads), large hiatal hernia containing rotated stomach consistent with chronic organoaxial volvulus, surrounded by posterior pneumomediastinum (+). **Origin:** Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
Description: Axial and coronal images viewed at lung window settings (a...c) showed pneumoperitoneum (arrowheads), large hiatal hernia containing rotated stomach consistent with chronic organoaxial volvulus, surrounded by posterior pneumomediastinum (+). Origin: Tonolini Massimo, Department of Radiology, "Luigi Sacco" University Hospital – Milan (Italy)
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Description: Unenhanced images showed hyperattenuating material (*) in the herniated gastric fundus suggesting fresh intraluminal blood. Note posterior pneumomediastinum (+). Origin: Tonolini Massimo, Department of Radiology, ‘Luigi Sacco’ University Hospital – Milan (Italy)
Description: Unenhanced images showed hyperattenuating material (*) in the herniated gastric fundus suggesting fresh intraluminal blood. Note posterior pneumomediastinum (+) and pneumoperitoneum (arrow). Origin: Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
Description: Axial and coronal contrast-enhanced images depicted linear contrast extravasation (arrows) consistent with active intraluminal bleeding. Note posterior pneumomediastinum (+), pneumoperitoneum (arrows). Origin: Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
Description: Axial and coronal contrast-enhanced images depicted linear contrast extravasation (arrows) consistent with active bleeding. Note hyperattenuating material (*) in the herniated gastric fundus indicating fresh intraluminal blood. Origin: Tonolini Massimo, Department of Radiology, "Luigi Sacco" University Hospital – Milan (Italy)
Description: Focused sagittal reformation showed hyperattenuating blood (*) in the herniated gastric fundus, contrast extravasation foci (arrows) consistent with active bleeding, suggested a focal discontinuity of the gastric wall (thin arrow). Note pneumoperitoneum (arrow). Origin: Tonolini Massimo, Department of Radiology, "Luigi Sacco" University Hospital – Milan (Italy)
Description: One month after surgery, unenhanced (a) and post contrast (b,c) CT images showed disappearance of extraluminal air and absent fluid collections, consistent with normal postoperative appearance. Note chronic gastric volvulus in large hiatal hernia. Origin: Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
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