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Gastrointestinal barotrauma: a rare cause of acute gastric ischemia

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Dear Editor,

We report the case of a 61-year-old male with no significant past medical history or cardiovascular risk factors, who presented to the emergency department following ascent to an altitude of 4,000 meters. The patient reported pain with abdominal dissension and coffee-ground emesis. Laboratory workup revealed elevated acute-phase reactants and lactate dehydrogenase levels. Abdominal radiography demonstrated gastric chamber dilatation, prompting nasogastric decompression and further evaluation with contrast-enhanced abdominal computed tomography (CT).

CT imaging revealed pronounced thickening of the gastric fundus and proximal body, attributed to submucosal edema and mucosal hyperenhancement. Associated findings included gastric venous pneumatosis (Figure 1A) and significant portal venous gas (Figure 1B), highly suggestive of acute gastric ischemia (AGI). Mild involvement of the proximal small intestine was also observed, with no evidence of major splanchnic vessel occlusion.



An urgent diagnostic laparoscopy revealed a collapsed but viable-appearing stomach, with normal color and texture. Real-time perfusion assessment using indocyanine green fluorescence angiography confirmed preserved mucosal vascularization.

Intraoperative esophagogastroduodenoscopy (EGD) demonstrated congested and erythematous mucosa on the posterior gastric wall, with loss of the normal vascular pattern and deep erosions consistent with moderate ischemic injury (Figures 1C-D).

The patient was managed conservatively with bowel rest, continued nasogastric decompression, proton pump inhibitors, and antibiotics. He showed progressive clinical improvement without recurrence of symptoms. Repeat CT and EGD performed six months later confirmed complete resolution of ischemic changes.

AGI is a rare clinical entity, largely due to the stomach's robust collateral blood supply, but it carries a high mortality rate of 30–40% (1,2). Common etiologies include systemic hypoperfusion, vasculitis, and thromboembolic events (1,2), while gastrointestinal barotrauma represents a underrecognized cause. Rapide pressure changes, such as those occurring during high-altitude ascents, may compromise gastric perfusion through the formation of microbubbles and hypo perfusion phenomena, in a mechanism similar to that described in the decompression of divers and in aeromedical literature (4).

Diagnosis relies on clinical suspicion, imaging findings, and EGD, with the most frequently affected areas being the greater curvature, posterior gastric wall, and fundus (3).

Despite significant radiologic findings, the absence of transmural necrosis or full-thickness ischemia on EGD and laparoscopy, and therefore being a moderate IGA (1), supported a conservative approach, which led to a favorable clinical outcome. This case underscores the importance of early diagnosis and a multidisciplinary evaluation, which may allow for non-operative management and avoidance of unnecessary surgical intervention in select patients with AGI.

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Figure 1: CT image with presence of thickening of the proximal gastric fundus-body, gastric pneumatosis, of the left gastric veins (Fig 1A) and at the portal level (Fig 1B). The EGD showed an erythematous, friable mucosa, with deep erosions on the posterior gastric wall consistent with ischemic injury ((Fig. C-D).