Hepatic Portal Venous Gas: Findings on Ultrasound and CT

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A 76-year-old female with a history of Parkinson’s, dementia, and hypertension presented to the emergency department with non-bilious, non-bloody vomiting and abdominal pain for 2 days. Her exam was significant for borderline hypotension without tachycardia, abdominal distension and a palpable ventral hernia. An emergency physician performed ultrasound showed free intraperitoneal air and gas in the liver (Video). A computed tomography showed pneumoperitoneum, pneumatosis intestinalis, and hepatic portal venous gas (HPVG) (Figure). At laparotomy, she was found to have a sigmoid colon perforation from adenocarcinoma, ischemic small bowel, and a colovesicular fistula. Post-operatively her clinical status worsened, and she was transitioned to comfort care and expired on hospital day 2.

HPVG was first reported in infants with necrotizing enterocolitis.¹ In adults, it is most commonly associated with mesenteric ischemia and pneumatosis intestinalis, accounting for 43% of HPGV cases² and an associated mortality of 75%.³⁻² It has been reported with other diseases such as diverticulitis, inflammatory bowel disease, obstructive pyelonephritis, pancreatitis, cholangitis, uterine gangrene, and severe shock.⁴ HPVG is attributed to either bacterial gas production in bowel entering mesenteric circulation⁵ or intraluminal air entering capillaries from impaired mucosal barrier or increased intraluminal pressure.⁶ HPVG spreads to the periphery of the liver whereas pneumobilia collects centrally, in the direction of bile flow. Treatment is always aimed at the underlying etiology of HPVG.

Video. Ultrasound videos in epigastrium and right upper quadrant showing pneumoperitoneum and hepatic portal venous gas.

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