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Iatrogenic Gastric Dilatation: A Rare and Transient Cause of Hepatic-portal Venous Gas

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Gas in the portal veins is rare and in most cases is associated with serious diseases and poor clinical outcome. A case of gas in the hepatic-portal veins with gastric dilatation, as shown by CT-scanning for abdominal trauma, is reported. The condition was clinically benign and resolved spontaneously. An abdominal CT scan documented the findings.

Key Words: Portal venous air, gas, trauma, CT, portal vein

INTRODUCTION

Gas in the portal veins is rare and usually associated with serious diseases and poor clinical outcome.[1-3] Reported causes include mesenteric infarction, intestinal obstruction, necrotizing enterocolitis, Crohn's disease, ulcerative colitis, suppurative cholangitis, intra-abdominal abscess, ileus, caustic ingestion, endoscopic retrograde cholangiopancreatography and endoscopic sphincterotomy, gastric dilatation, and seizure.[1-12] Herein we present a case of portal venous gas secondary to gastric dilatation. The condition was clinically benign and resolved spontaneously.

CASE REPORT

A 12-year-old female patient was involved in a road-traffic accident. She arrived at the Surgical Casualty Department conscious and anxious , able to move all her limbs, and bleeding from a cut wound on the scalp. Her heart rate and blood pressure were 140/minute and 120/65 mmHg, respectively. The patient could move her neck in all directions. Chest auscultation showed no abnormality. The abdomen was soft, with no tenderness; the bowel sounds were normal; and there was no signs of internal bleeding. The patient was started on Ringer Lactate solution. Complete blood count and kidney function tests were normal. X-rays of the skull, cervical spine, pelvis, long bones, and chest were taken, and only a linear fracture of the right tempero-parietal bone was found. A brain CT scan revealed a right moderate tempero-parietal extra-dural hematoma, which was removed surgically. Six hours later, the patient developed abdominal distension with minimal tenderness in the upper abdomen. A plain X-ray showed a hugely distended stomach (Fig. 1), and an abdominal CT scan showed air in the hepatic-portal veins (Fig. 2), while other abdominal organs appeared normal. When a naso-gastric tube was inserted, the abdomen became soft. The patient was kept nil by mouth and observed. She was started on oral fluid on the third day and was discharged home on the fifth day in good condition. A plain X-ray of her abdomen was taken before discharge and showed no abnormality.

DISCUSSION

Historically, portal venous gas has been associated with serious underlying disease and a high

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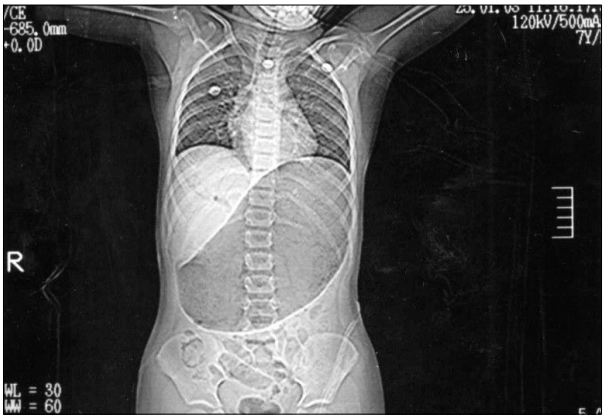

Fig. 1. Plain X-ray of the abdomen showing extensive gastric dilatation. Portal vein gas is also seen.

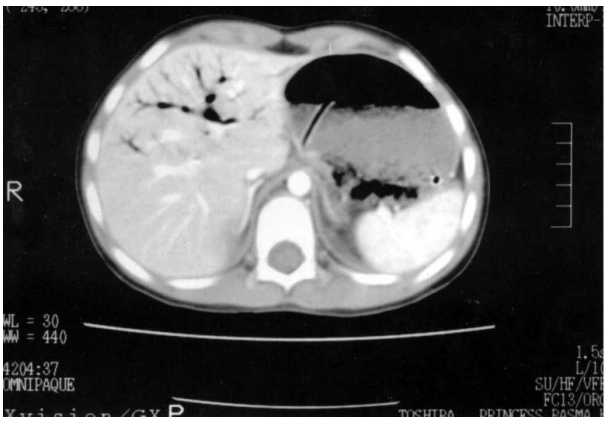

Fig. 2. Cross-section abdominal CT scan. Note the hepatic-portal veins gas, which appears as a branching radiolucency extending to within 2 cm of the liver capsule.

mortality rate.[4] It is often associated with intestinal pneumatosis and bowel necrosis.[2] Yarze et al. summarized the literature and found that portal venous air has been reported in 3 different clinical settings: (a) related to intra-abdominal sepsis due to various pathological processes (b) in association with inflammatory bowel disease, intestinal obstruction, ulcer disease, and gastro-enteritis (c) secondary to "benign" conditions such as after barium enema, colonoscopy, endoscopic biliary sphincterotomy, and seizures.[12] These authors suggested that there is no single patho-physiological process that leads to portal venous air in such diverse clinical settings.[12]

Portal venous gas due to blunt abdominal trauma was initially reported to signal vascular injury and bowel necrosis.[13] However, cases of benign portal venous gas seen on CT scans in patients with blunt abdominal trauma have been reported.[14,15] The most likely explanation is that a sudden increase in intra-abdominal pressure caused by the impact might force the intra luminal gas into the bowel wall, where it is absorbed into the portal circulation. Once in the portal system, the gas may pass into the hepatic veins via the sinusoids.[2,13]

Our case seems to indicate an iatrogenic complication of gastric dilatation, and these findings might not occur if the patient's gastrointestinal tract had been properly decompressed (two reasons for decompression are blunt trauma and neurosurgical procedure). We attributed the portal vein gas to gastric dilatation in this patient who was injured in a road-traffic accident and incurred significant head trauma. However, given the complex background, we are not absolutely sure that it is reasonable to draw this conclusion, particularly since there may have been blunt abdominal trauma associated with the original accident. As we mentioned before, portal vein gas can be associated with blunt abdominal trauma. Portal vein gas secondary to gastric dilatation has been reported in previous studies.[7,16-19] We speculate that the main cause of gas in the portal vein in our case was gastric dilatation. Portal venous gas might be related to an increase in intraluminal pressure, which forces intraluminal gas through a damaged or undamaged bowel wall, where it is absorbed into the portal circulation. This scenario has been reported in cases of ileus or gastric dilatation, or after blunt abdominal trauma, endoscopy, or barium enema examination.[20]

As shown in Fig. 2, hepatic-portal venous gas usually appears as a branching radiolucency extending to within 2 cm of the liver capsule.[2]

The significance of gas in the hepatic-portal veins depends on the underlying pathology; some cases have poor prognoses,[3] while others, like our case, have good prognoses.

In conclusion, gas in the portal vein in the liver may occur as a transient incidental finding with gastric dilatation in blunt abdominal trauma. It is difficult to draw a conclusion from a single case report, but we believe that nasogastric drainage for gastric decompression in patients with blunt

abdominal trauma might prevent this complication.

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