

Massive hepatic portal venous system gas embolism and bowel pneumatosis due to intestinal ischemia. A case report

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Case Report

General Surgery



Introduction: Gas in the hepatic portal venous system (HPVS) is a radiological sign that was first described by Wolfe and Evans in infants with necrotizing enterocolitis. This condition is life-threatening and is mostly associated with intestinal necrosis, ulcerative colitis, intraabdominal abscess, and intestinal obstruction. We present the case of a 65-year-old male with a history of chronic renal disease, systemic arterial hypertension, vascular accesses, and arteriovenous fistula (AVF). Chronic consumption of non-steroidal anti-inflammatory drugs (NSAID). Presented to ER department with abdominal pain associated with food ingestion, nausea, and vomiting, presenting hematemesis on 3 occasions. Blood test with severe metabolic acidosis. CT scan showed gas in the HPVS and an extended bowel pneumatosis. The patient presents rapid hemodynamic and neurological deterioration suffering cardiac arrest. The patient was declared dead after unsuccessful CPR was given.

Keywords: Portal vein gas embolism, intestinal ischemia.

Introduction

In 1955, the appearance of gas in the hepatic portal venous system was first described in infants. Later these images were described in adults suffering from small bowel infarction. Intestinal ischemia is a common and dangerous abdominal pathology that occurs especially in geriatric patients, with a mortality of approximately 75 to 90%. Intestinal ischemia results from insufficient arterial flow to or from the intestines. It can be acute or chronic. (1) The mechanism of the appearance of gas in the HPVS is not well understood. There are some factors related to this pathology that have been proposed: 1) escape of gas produced by gas-forming organisms in the bowel lumen or in an abscess which then circulate into the liver or (2) the presence of gas-forming organisms in the portal venous system with the passage of gas into the circulation. Liebman et al report that the presence of gas in the HPVS is mostly associated with intestinal necrosis (72%), ulcerative colitis (8%), intra-abdominal abscess (6%), and intestinal obstruction (3%). (2) In this study, we report a case of intestinal infarction and the development of gas in the HPVS and bowel pneumatosis.

Case report

A 65-year-old male with a history of chronic kidney disease, 10 years of evolution in renal in hemodialysis treatment. Systemic arterial hypertension of 10 years of evolution, surgical history: 3 vascular accesses (2 mahurkar and 1 left brachiocephalic arteriovenous fistula (AVF)). AVF with a history of dismantelation and reanastomosis due to thrombosis. Chronic consumption of NSAIDs. Came due to 2-month history of abdominal pain localized in the mesogastrium and right hypochondrium, associated with food intake. 24 hours prior to admission, he presented abdominal pain in the epigastrium of moderate intensity and later generalized, nausea and vomiting of gastric content, and in coffee grounds on 3 occasions, he reports that the pain becomes intense 10/10 in the Analog Visual Scale (AVS). On admission, physical examination with vital signs of arterial pressure of 80/40 heart rate of 100bpm, respiration rate 18bpm, He presented hematemesis again and was admitted to the ER where resuscitation with crystalloids was started. On physical examination, soft abdomen, absent peristalsis, depressible, with generalized pain on palpation, with

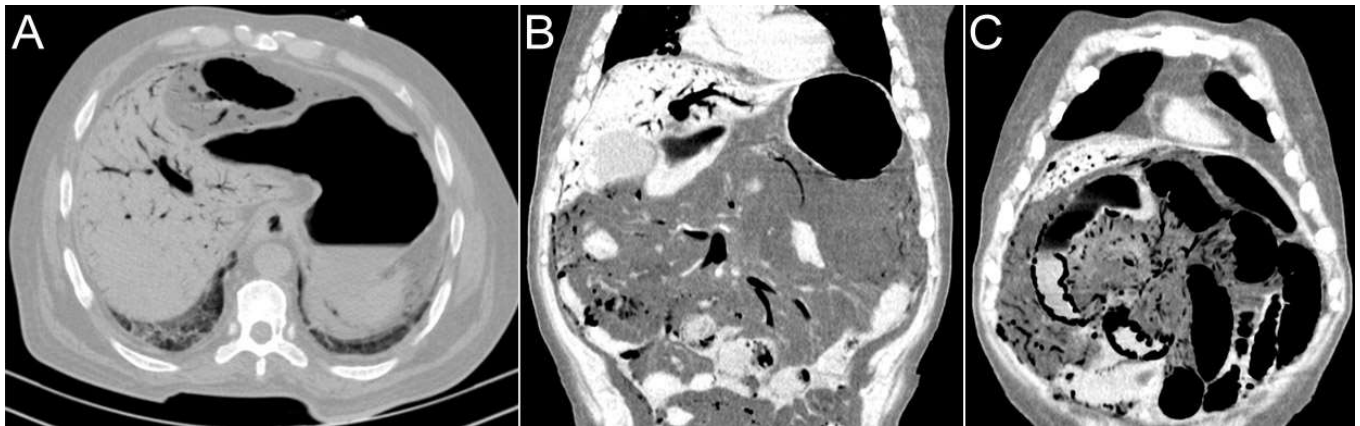


Figure 1. A,B. Gas in the HPVS in an axial and coronal CT scan. C. Intestinal pneumatosis in the coronal CT scan

data of peritoneal irritation. Disproportional pain related to the abdominal examination. Blood tests were performed without major alteration but with significant metabolic and lactic acidosis. A simple CT scan of the abdomen was performed documenting gas in the HPVS in addition to significant intestinal pneumatosis. Figure 1,2. The patient presents rapid hemodynamic and neurological deterioration presenting cardiorespiratory arrest. Advanced CPR maneuvers are performed according to the ACLS protocol for 15 minutes without being able to reestablish spontaneous circulation. The patient is declared dead after 6 hours of admission.

Discussion

Gas in the HPVS is a radiological sign most related to gastrointestinal pathology. (3) As stated before, This finding is most commonly associated with intestinal ischemia, ulcerative colitis, intra-abdominal abscess, and intestinal obstruction. (2) The presence of gas in the HPVS predicts high-risk mortality of up to 50% (4). The first diagnosis to consider when detecting this finding is intestinal necrosis which carries a 75% mortality. (5) CT scan is the gold standard for diagnosing gas in the HPVS and its etiology (3). The etiology of intestinal ischemia can be varied: thromboembolism, vasculitis, medial segmental arteriopathy, intestinal obstruction, abdominal trauma, neoplasia, abdominal inflammatory disease, chemotherapy, drugs, corrosive lesions, and radiation (1). Regardless of the etiology, intestinal ischemia can progress after 3 hours of presentation and even present ischemia at 6 hours. The treatment is surgical intervention. (6) When associated with pneumatosis intestinalis, it confers a poorer prognosis and it should be treated with intestinal resection. (1) In this case we presented a patient suffering from intestinal ischemia and the development of gas in the HPVS and massive intestinal pneumatosis that

couldn't be taken to the operating room because he died 6 hours after the admission.

Conclusion

Intestinal ischemia is the most common pathology when gas in the HPVS in the abdominal CT scan is seen. The mortality of this finding goes up to 75% and if it's related to intestinal pneumatosis, the patient should undergo to the operating room and practice a bowel resection. It's mostly seen in elderly patients and it has a poor prognosis. Many patients with these findings would not make it to the operating room.

Conflicts of interests

Authors declare that they have no conflict of interest.

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