Portal Gas Embolism with Acute Liver Ischemia: Case Report

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Abstract: Portal gas embolism is a rare entity and considered a sign of poor prognosis in abdominal diseases, its mortality rate is about 75%. This case report is about a 61-year old patient with portal gas embolism and acute liver ischemia, evolving to death within 24 hours. Some cases reported in the literature demonstrate the severity of this dramatic condition. It is necessary to have a higher level of suspicion in the vascular structures of the abdomen in order to allow a timely treatment.

Key words: Portal gas embolism, liver ischemia, pneumatosis intestinalis, vena cava gas.

1. Introduction

Portal gas embolism is a rare entity and considered a sign of poor prognosis in abdominal diseases. The underlying pathologic condition is usually an intestinal ischemia, but it has been reported in association with a variety of conditions [1], which include intestinal ischemia and necrosis, causing intestinal pneumatosis (75% of the cases), ulcerative colitis, and intra-abdominal abscess [2]. Comorbidities such as systemic hypertension, cardiovascular disease and history of stroke also increased the risk. The mortality rate is about 75% [3]. The diagnosis may be suspected by abdominal tomography [4].

2. Objective

The aim of this study is to report a rare case of portal gas embolism with intestinal pneumatosis and acute liver ischemia as well as to describe signs, symptoms, diagnostic methods and finally to emphasize the seriousness of this disorder.

3. Case Report

A 61-year old woman related fever, pain on her right leg, tenderness, swelling and oliguria. She had systemic arterial hypertension and dyslipidemia. The vital signs were stable. She was hospitalised by the diagnosis of lower deep venous thrombosis and treated with enoxaparin. After a day, she referred severe abdominal pain, followed by dyspnea, arterial hypotension and cardiorespiratory arrest, being resurrected. The initial diagnostic suspicion had been pulmonary thromboembolism. The chest tomography was normal. The abdominal tomography showed a perfusion disorder in the left lobe of the liver (Figs. 1 and 2), hepatic portal venous gas (Fig.s 1 and 2), superior vena cava gas, associated with pneumatosis intestinalis and pneumoperitoneum (Fig. 3). Then, the patient presented irreversible respiratory cardiopulmonary arrest and dying, without the possibility of a surgical approach.

4. Discussion

Gas in the portal system is associated with various abdominal diseases and the early detection of this condition may define the prognosis of the patient. Some of the factors that worsen the prognosis is the presence of chronic long-term diseases, such as chronic renal failure, diabetes mellitus or systemic arterial
Fig. 1  Hepatic portal venous gas.

Fig. 2  Hepatic portal venous gas.

Fig. 3  Superior vena cava gas associated with pneumatosis intestinalis and pneumoperitoneum.
hypertension [4], just like this patient.

The pathophysiological mechanism is not well understood [5]. It may be caused by the presence of gas at a low pressure in the intestinal lumen or by alteration of the intestinal mucosa that allows gas to enter the portal system through the mesenteric vein [6]. The clinical picture is nonspecific: abdominal pain, nausea, vomiting, diarrhea and abdominal distension [1].

It should be emphasized that the atypical form that the disease manifested itself, with lower deep venous thrombosis, rapidly progressive dyspnea and hypotension, led us to suspect pulmonary thromboembolism.

The diagnosis can be made by a simple abdominal X-ray, ultrasonography, Doppler ultrasonography or CT (computed tomography) [4]. CT has high sensitivity and can detect the underlying cause [7]. On the CT, the gas has a peripheral distribution due to the hepatic blood flow, unlike pneumobilia, where the gas localisation is central due to the direction of the biliary flow [4]. In addition, CT can show gas in the intestinal wall (pneumatosis) and extrahepatic portal vein or its splanchic vasculature [8], as in this case, which still showed signs of hepatic ischemia.

IP (intestinal pneumatosis) is a rare radiographic finding with an incidence in the general population of approximately 0.03% [5]. The most common form of IP is secondary to acute gastrointestinal ischemia. Other secondary IP associations include malignancy, chemotherapy, trauma, mechanical intestinal disorders, and post-endoscopy [5]. It has been suggested that the combination of intestinal pneumatosis and portal venous gas is associated with the presence of intestinal ischemia in approximately 70% of all cases. This is infrequent and difficult to diagnose and may be confused with other clinical conditions [7].

Hani et al. analyzed 209 cases and concluded that patients who were older than 60 years with signs of peritonitis on physical examination and imaging tests showing pneumatosis intestinalis with gas in the portal system presented a higher risk of presenting intestinal ischemia or necrosis [7].

5. Conclusions

Deep vein thrombosis with mesenteric ischemia is an unusual association, but the most unusual find was the evidence of exuberant gas embolism in the portal system of the left hepatic lobe, causing the ischemia of these segments, leading to the patient death within approximately 24 hours of her admission. It is very important to emphasize the atypical form the disease manifested itself, with rapidly progressive dyspnea and hypotension that led us to suspect pulmonary thromboembolism. It is necessary to have a higher level of suspicion in the vascular structures of the abdomen in order to allow a timely treatment.

References

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