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## Case Report

# Disappearing portal venous gas in acute pancreatitis and small bowel ischemia

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## ABSTRACT

We report an unusual case of hepatic portal venous gas (HPVG) in the setting of acute pancreatitis and small bowel ischemia. Interestingly, the HPVG disappeared within 2 hours of the original computed tomography scan, despite the patient having small bowel ischemia. The patient had a complicated clinical course, dying 62 days postadmission. This case highlights that HPVG in setting of acute pancreatitis and small bowel ischemia has a very high morbidity and mortality, requiring early detection and aggressive surgical management.

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## Introduction

Acute pancreatitis affects an estimated 20,000 people annually in the UK [1], and it accounts for the most gastrointestinal-related hospital admissions in the United States [2]. A study conducted in Wales (1999–2010) observed that the incidence of acute pancreatitis is increasing annually by approximately 2.7% each year [3]. Rates are also increasing internationally. In the “Japan National Survey,” incidence increased from 12.1 to 15.4 per 100,000 between 1987 and 1998 [4]; meanwhile, in the Netherlands, the incidence has increased from 13.2 to 14.7 per 100,000 over the time period 2000–2005 [2]. Reported overall mortality rates vary from 4% to 10%, increasing substantially to 15% to 30% for severe cases [1].

The most common etiology for acute pancreatitis is largely due to biliary pathology (40%) and alcohol misuse (22%). Less common causes include trauma, secondary to iatrogenic procedures (post-ERCP), hypercholesterolemia, drug/medications (corticosteroids, azathioprine), or idiopathic causes [5].

Complications of acute pancreatitis can be either local or systemic events. The Revised Atlanta Classification aims to standardize the reporting of severity of acute pancreatitis to ensure consensus and standardized treatment protocols [6]. Alternatively, acute pancreatitis can also be subdivided into interstitial edematous pancreatitis and necrotizing pancreatitis [6]. Whereas the overwhelming majority of interstitial pancreatitis settles within a couple of weeks, necrotizing pancreatitis can have a more turbulent course. Approximately,

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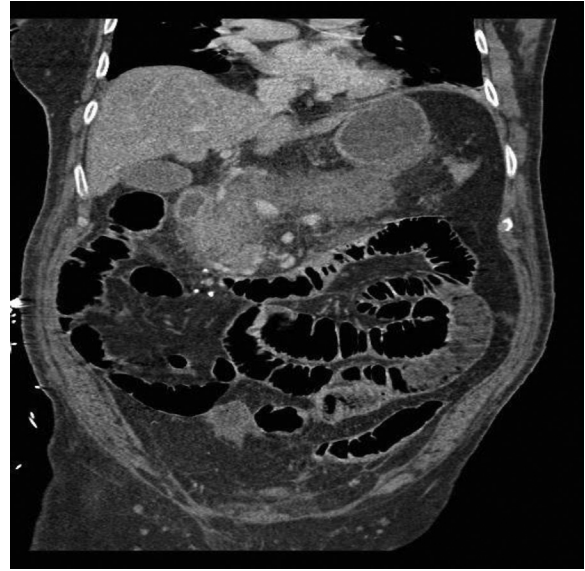
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5%–10% develop necrosis of pancreatic parenchyma [6]. The clinical course of necrotizing pancreatitis is very variable and is associated with the life-threatening complications. Portosplenic mesenteric venous thrombosis is reported as high as 50% in patients with necrotizing pancreatitis, but usually has a benign course [7]. Alternatively, hepatoportal venous gas (HPVG) is a rarer complication and more ominous finding [8]. It usually indicates concurrent mesenteric ischemia and is associated with substantial complications [8].

### Case report

A 64-year-old gentleman was referred to our hospital from another institution with a diagnosis of acute pancreatitis (Imrie/Glasgow Score = 6). Underlying biliary pathology was the suspected causative factor. Initial computed tomography (CT) scan of the abdomen demonstrated extensive edematous changes involving the entire pancreas with a significant volume of HPVG (Fig. 1). Concern regarding one segment of small bowel was raised. The patient proceeded to have a CT mesenteric angiogram within 2 hours of the original CT scan which showed a poorly enhancing segment of small bowel that was concerning for venous thrombosis (Fig. 2). Interestingly, there was a significant reduction in the volume of HPVG (Fig. 3). Despite this, the patient's clinical condition deteriorated and the decision to proceed for emergency laparotomy immediately was decided. At laparotomy, resection of a nonviable ischemic segment of small bowel (60 cm) was performed. Omental saponification was also evident (Fig. 4).

The patient had a prolonged intensive care admission (45 days) for the management of multiorgan dysfunction including acute kidney injury and adult respiratory distress syndrome before being discharged to the ward. The patient was readmitted to the intensive care unit 72 hours later due to overwhelming sepsis. Repeat imaging confirmed large peripancreatic necrotic collections (Fig. 5), and several interventional radiology drainages were performed. Despite escalation in both antimicrobials, antifungal and inotropic support the



**Fig. 2 – CT abdomen showing poorly enhancing segments of small bowel which is concerning for venous thrombosis. CT, computed tomography.**

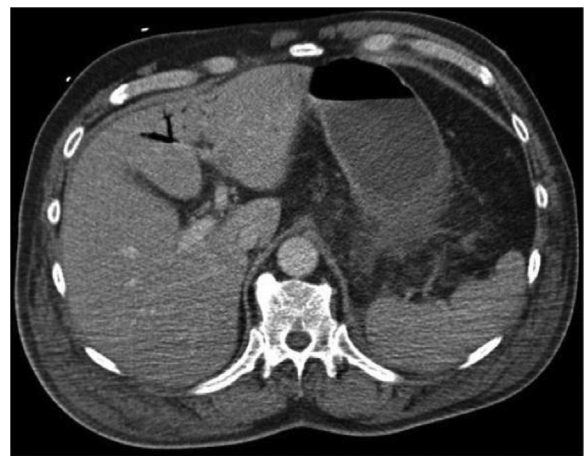
patient's clinical condition deteriorated and he died on the 62nd day of admission.

### Discussion

HPVG is a worrisome radiological finding [7]. It typically indicates an underlying life-threatening gastrointestinal pathology such as ischemia and/or inflammation, which frequently requires emergency surgical intervention [9]. Historically, the presence of HPVG has been associated with mortality rates >75% [10], but in contemporary times, mortality is 30%–40% [9]. Traditionally, the presence of HPVG mandated explorative laparotomy, but with improvements in radiological



**Fig. 1 – CT abdomen (cross-sectional) showing there is a branching linear gas pattern within the hepatic parenchyma extending to the periphery more pronounced in the right liver lobe consistent with extensive portal venous gas. CT, computed tomography.**



**Fig. 3 – CT Abdomen (cross-sectional) showing small residual focus of portal venous gas in hepatic segment IVb on CT acquired at 2-hour interval (significant reduction). CT, computed tomography.**

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