Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

General Surgery

Intestinal Ischemia with Extensive Aeroportia After Myocardial Infarction: A Case Report

P. Reis-Conceição[1*], M. Evans[1], M. Falcão[1], T. Adrêgo[1], I. Pereira[1], M. Siqueira[1], M. Damásio-Cotovio[1], R. Lima[1], M. Cinza[1], P. Ninitas[2], R. Félix[1], M. Carvalho[1]

[1]General Surgery Department, Unidade Local de Saúde Alentejo Central, Évora, Portugal
[2]Radiology Department, Unidade Local de Saúde Alentejo Central, Évora, Portugal

DOI: https://doi.org/10.36347/sjmcr.2025.v13i09.002 | **Received:** 02.07.2025 | **Accepted:** 27.08.2025 | **Published:** 02.09.2025

***Corresponding author:** P. Reis-Conceição
General Surgery Department, Unidade Local de Saúde Alentejo Central, Évora, Portugal

Abstract | **Case Report**

Hepatic portal venous gas (HPVG) and intestinal pneumatosis are rare radiologic findings strongly associated with acute mesenteric ischemia and high mortality. Non-occlusive mesenteric ischemia (NOMI) results from mesenteric hypoperfusion and/or vasoconstriction and is often underrecognized in critically ill patients. Early diagnosis and timely intervention are crucial for favorable outcomes. We report a 71-year-old male with chronic kidney disease and prior rectal adenocarcinoma who presented with acute myocardial infarction complicated by cardiac arrest during coronary angioplasty. On Intensive Care Unit (ICU) day two, he developed epigastric pain; CT revealed extensive HPVG and intestinal pneumatosis. Exploratory laparotomy and staged laparostomy confirmed jejunal, gastric, and duodenal ischemia without gangrene. Gradual recovery allowed intestinal recovery and abdominal wall closure. Follow-up imaging showed complete resolution, and he was discharged 12 days after admission with full functional recovery. Concurrent HPVG and intestinal pneumatosis typically indicate advanced mesenteric ischemia and carry a poor prognosis. Nevertheless, this case demonstrates that early recognition, prompt imaging, staged surgical management, and multidisciplinary supportive care can result in favorable outcomes, even in critically ill patients with multiple comorbidities. Awareness of NOMI in high-risk patients is essential to guide timely intervention and improve survival.

Keywords: Hepatic Portal Venous Gas; Pneumatosis Intestinalis; Mesenteric Ischemia, Non-Occlusive; Acute Myocardial Infarction; Critical Care; Laparotomy; Case Reports.

INTRODUCTION

The concepts of HPVG and intestinal pneumatosis refer to the presence of gas within the portomesenteric vessels and the intestinal wall, respectively. Their simultaneous occurrence is highly suggestive of intestinal ischemia, which accounts for approximately 70% of cases [1-3]. Intestinal ischemia can be classified in different ways. One common approach distinguishes between *occlusive* and *non-occlusive* intestinal ischemia. Non-occlusive intestinal ischemia results from hypoperfusion and/or vasoconstriction of the vessels supplying the affected organ [4].

From a pathophysiological standpoint, reduced mesenteric blood flow is followed by vasoconstriction, further compromising intestinal perfusion [5]. This condition may occur in patients with cardiac dysfunction and peripheral hypoperfusion, where treatment of the underlying disease may involve vasoconstrictive medications, further aggravating intestinal ischemia. Additionally, following cardiac catheterization or surgery, intestinal hypoperfusion can also result from microembolism, the release of vasoactive substances and coagulation abnormalities, which may lead to ischemia in other tissues, including the intestines [6-8].

Clinically, intestinal ischemia typically presents with abdominal pain, classically described as “pain out of proportion” to physical examination findings. Histopathological changes range from localized superficial lesions to transmural gangrene. Early diagnosis, ideally within the first 24 hours of symptom onset, is crucial for prognosis.

Clinical presentation, laboratory findings, and ultrasound lack diagnostic specificity, whereas mesenteric angiography remains the only reliable diagnostic tool and should be performed early in all patients in whom acute mesenteric ischemia is a real

possibility [9]. Contrast-enhanced abdominal CT can also establish the diagnosis, define the underlying etiology, and detect associated complications. Once the diagnosis is confirmed—particularly in patients showing signs of peritoneal irritation—emergency surgery, usually exploratory laparotomy, becomes mandatory. The concomitant presence of HPVG and intestinal pneumatosis is associated with a poor prognosis, with mortality rates approaching 85% [10,11].

Case Report

A 71-year-old male with stage 5 chronic kidney disease secondary to lithiasis, rectal adenocarcinoma (pT3 pN1a) treated with neoadjuvant chemoradiotherapy followed by anterior rectal resection (oncologically stable at the time of presentation), hypertension, diabetes mellitus, and dyslipidemia, activated emergency medical services after experiencing left upper limb pain radiating to the ipsilateral jaw, associated with fatigue and dyspnea.

He was transferred to the emergency department with suspected acute myocardial infarction (AMI). Initial investigations revealed a sinus tachycardia, complete left bundle branch block, a pathological Q wave in lead DIII, and ST-segment depression in leads V4–V6 on electrocardiogram (ECG). Laboratory findings demonstrated elevated troponin, NT-ProBNP and hyperlactatemia on arterial blood gas analysis. Chest radiography showed a cardiothoracic index >50% with obliteration of the costophrenic angles and bilateral pulmonary congestion. Transthoracic echocardiography revealed moderate-to-severe left ventricular ejection fraction depression due to diffuse hypokinesia. Based on these findings, the differential diagnosis included non-hypertensive acute pulmonary edema in the context of dilated cardiomyopathy versus acute coronary syndrome.

The patient was admitted to the Coronary Intensive Care Unit (CICU) for optimization of care and subsequent coronary angiography. During CICU hospitalization, the patient experienced several episodes of diaphoresis, bronchospasm, nausea, and agitation, despite ongoing therapy, along with persistent hypotension requiring initiation of inotropic support. A multidisciplinary decision was made to proceed with coronary catheterization. During the procedure, the patient developed cardiac arrest, from which he recovered after one cycle of advanced life support. Shortly thereafter, he developed sustained ventricular tachycardia requiring three defibrillation shocks (120 J / 150 J / 200 J).

The patient was subsequently admitted to the ICU for organ support and recovery. On the second ICU day, he developed epigastric pain without radiation, associated with nausea, vomiting, and malaise. Another coronary angiography was performed, revealing no stent-related complications. Due to persistence of abdominal symptoms, contrast-enhanced abdominal CT was obtained, demonstrating the presence of hepatic portal venous gas and intestinal pneumatosis (Figure 1). Given the suspicion of intestinal ischemia, an exploratory laparotomy was indicated.

Intraoperatively, several jejunal segments with ischemic changes but without established gangrene were observed. The surgical team opted for temporary laparostomy to allow reassessment of the ischemic segments and to define further surgical strategy. The following day, the patient underwent an upper endoscopy, which revealed findings consistent with gastric and duodenal ischemia (Figure 2).

The clinical evolution was favorable, with progressive improvement. Forty-eight hours later, re-exploration of the laparostomy revealed partial intestinal recovery. During a second re-exploration, due to continued favorable evolution with viable bowel and absence of complications, abdominal wall closure was performed. Two days after closure, a follow-up abdominal CT showed “complete resolution of portal venous gas and preserved portal vein patency, no gas within the superior mesenteric vein, and no evidence of intestinal pneumatosis. Significant improvement of gastric and duodenal wall changes, currently without pneumatosis.”

One week after ICU admission, the patient was transferred to the cardiology department, where he continued to receive care with support from nephrology and general surgery teams. He was discharged home 12 days after the initial emergency department admission, with full recovery, maintaining his baseline functional and independence status.

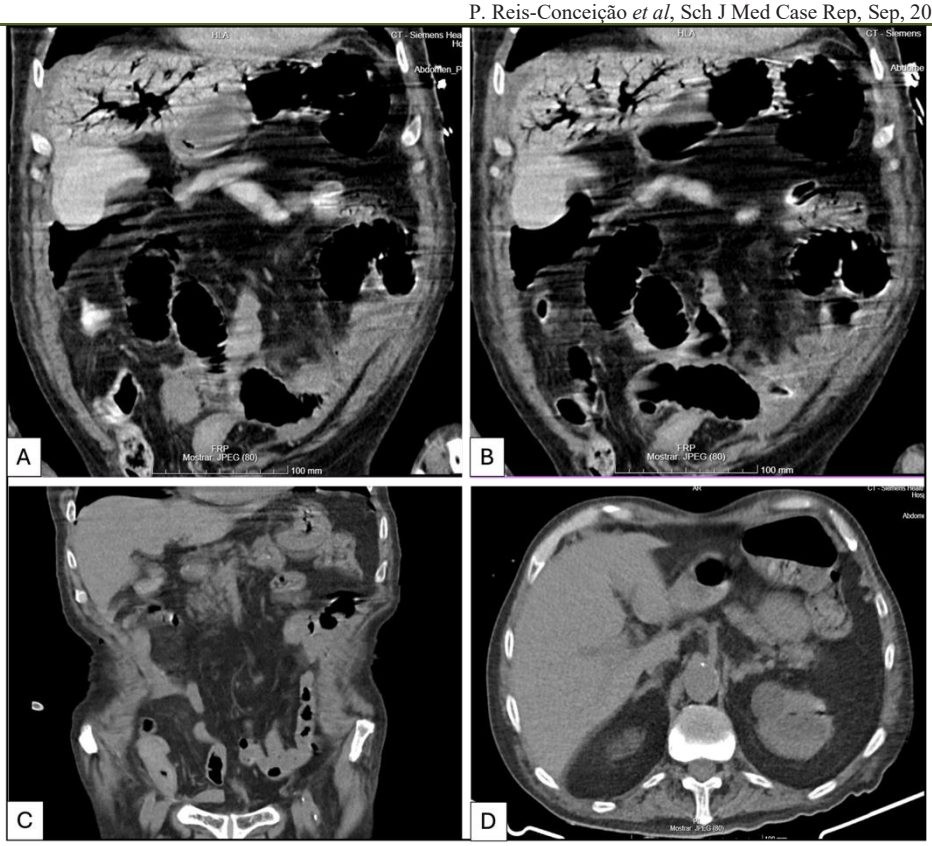

Figure 1 – Abdominal CT images of the patient. Upper panels (A, B) show hepatic portal venous gas and intestinal pneumatosis on initial imaging. Lower panels (C, D) demonstrate complete resolution on follow-up imaging during hospitalization

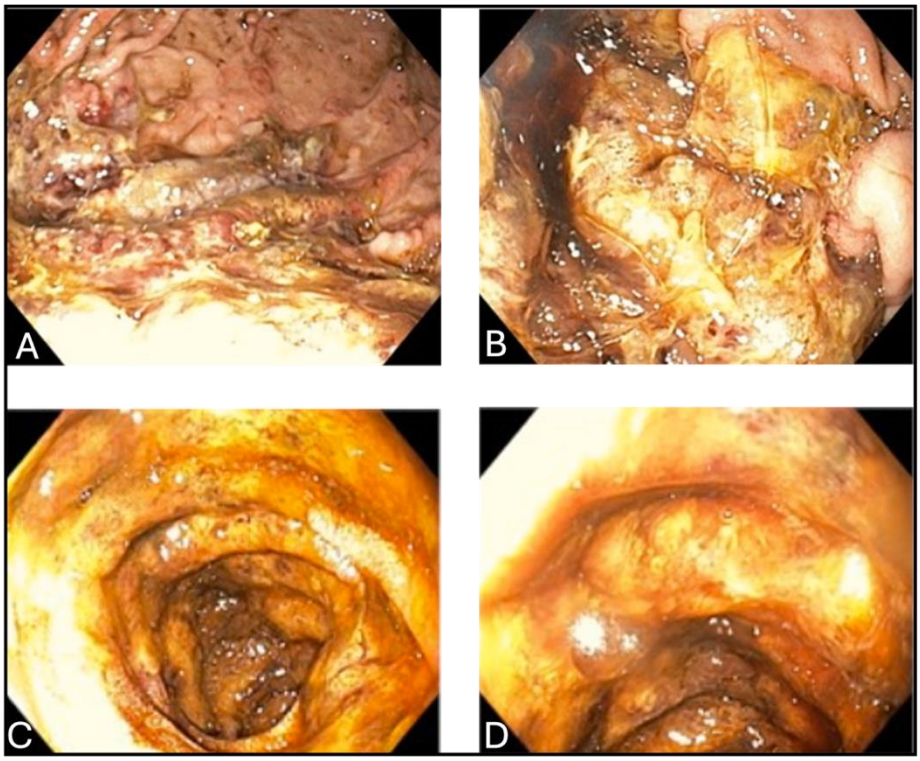

Figure 2 – Upper gastrointestinal endoscopy images. Upper panels (A, B) show the gastric fundus mucosa with ulcerated areas and signs of ischemia. Lower panels (C, D) demonstrate edematous duodenal mucosa (D2 and D3) with superficial circumferential ulceration consistent with ischemia.

DISCUSSION

The coexistence of HPVG and intestinal pneumatosis is rare and highly specific for intestinal ischemia, with mortality rates reported up to 85% [1–3,10,11]. Most published cases describe poor outcomes, often due to late recognition or irreversible bowel necrosis [1–3,10]. In contrast, our case demonstrates that early diagnosis and staged surgical management can lead to full recovery, even in patients with multiple comorbidities.

This patient presented several risk factors for NOMI, including advanced chronic kidney disease, diabetes, recent myocardial infarction with cardiac arrest, and vasopressor use, which are well-documented mechanisms promoting mesenteric hypoperfusion and vasoconstriction [4,5]. Furthermore, microemboli and vasoactive substances released during coronary intervention may have exacerbated ischemia [6–8]. These findings are consistent with current theories of NOMI pathogenesis [4–8].

Imaging played a pivotal role in this case. While mesenteric angiography is considered the gold standard for early diagnosis [9], it was not feasible in this critically ill patient. Contrast-enhanced CT provided rapid confirmation, revealed the extent of intestinal involvement, and guided surgical decision-making, aligning with recent literature supporting CT as the first-line imaging tool in unstable patients [10,11].

The favorable outcome may be attributed to early suspicion, timely imaging, and a damage-control surgical approach with temporary laparostomy and planned re-exploration. This strategy avoided unnecessary extensive resections and allowed intestinal recovery, which contrasts with most reports where extensive bowel necrosis leads to poor survival [10,11].

This case emphasizes the importance of maintaining a high index of suspicion for mesenteric ischemia in critically ill patients and highlights the need for multidisciplinary management. Future research should focus on early biomarkers, imaging algorithms, and decision-making protocols for NOMI to improve prognosis in this high-risk population.

CONCLUSION

HPVG and intestinal pneumatosis are radiological signs strongly suggestive of advanced mesenteric ischemia and generally associated with poor prognosis. However, as illustrated in this case, early recognition, staged surgical management and intensive supportive care can lead to favorable outcomes, even in patients with multiple comorbidities and critical illness.

REFERENCES

1. Pereira, M., Miguel Afonso, L., Patrão, S., et al.,(2016). Clinical medical reviews and case reports: Aeroportia – A rare finding for a frequent disease. *Case Reports: Open Access*.
2. Oliveira, E., Manuel, P., Alexandre, J., et al., (2013). Abdominal pain, pneumatosis intestinalis and aeroportia in a hemodialyzed patient. *Revista Clínica Española, 213*, e33–e35.
3. Bodlet, A., & Tintillier, M. (2011). Aeroportia and pneumatosis intestinalis in a hemodialysis patient. *Hong Kong Journal of Nephrology, 13*, 39–40.
4. Wilcox, M. G., Howard, T. J., Plaskon, L. A., Unthank, J. L., & Madura, J. A. (1995). Current theories of pathogenesis and treatment of nonocclusive mesenteric ischemia. *Digestive Diseases and Sciences, 40*(4), 709–716. https://doi.org/10.1007/BF02064966
5. Lock, G., & Schölmerich, J. (1995). Non-occlusive mesenteric ischemia. *Hepatogastroenterology, 42*(3), 234–239.
6. Fitzgerald, T., Kim, D., Karakozis, S., Alam, H., Provido, H., & Kirkpatrick, J. (2000). Visceral ischemia after cardiopulmonary bypass. *American Surgeon, 66*(7), 623–626.
7. Allen, K. B., Salam, A. A., & Lumsden, A. B. (1992). Acute mesenteric ischemia after cardiopulmonary bypass. *Journal of Vascular Surgery, 16*(3), 391–395; discussion 395–396.
8. Downing, S. W., & Edmunds, L. H., Jr. (1992). Release of vasoactive substances during cardiopulmonary bypass. *Annals of Thoracic Surgery, 54*(6), 1236–1243. https://doi.org/10.1016/0003-4975(92)90113-i
9. Lock, G., & Schölmerich, J. (1995). Non-occlusive mesenteric ischemia. *Hepatogastroenterology, 42*(3), 234–239.
10. Ortega-Deballon, P., Radais, F., & Facy, O. (2008). Aeroportia and acute abdominal pain: ischemic bowel necrosis. *Clinical Journal of Gastroenterology, 1*, 157–159.
11. Abboud, B., El Hachem, J., Yazbeck, T., et al.,(2009). Hepatic portal venous gas: physiopathology, etiology, prognosis and treatment. *World Journal of Gastroenterology, 15*, 3585–3590.