

Intestinal Pneumatosis Cystoides Associated with Small Bowel Volvulus: A Rare Cause of Pneumoperitoneum in a COPD Patient

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Abstract

We report the case of a 62-year-old male with a history of chronic obstructive pulmonary disease (COPD) and long-term tobacco use, admitted for persistent vomiting and cessation of bowel movements. Clinical examination revealed a stable, afebrile, and conscious patient with a soft, non-tender abdomen. Laboratory results demonstrate leukocytosis ($19,800/\text{mm}^3$), elevated C-reactive protein (52.1 mg/L), and hypokalemia (2.59 mmol/L). Abdominal computed tomography (CT) showed small bowel distension up to 45 mm, a mesenteric whirlpool sign in the right iliac fossa, adjacent lymph nodes, and a large pneumoperitoneum. Surgical exploration revealed intestinal pneumatosis cystoides associated with small bowel volvulus, confirming the cause of the pneumoperitoneum. This case highlights the diagnostic challenge of differentiating benign from life-threatening causes of pneumatosis intestinalis and underlines the importance of prompt surgical management.

Introduction

Intestinal pneumatosis cystoides (IPC) is a rare condition characterized by the presence of multiple gas-filled cysts within the intestinal wall. Its etiology can be primary (idiopathic) or secondary to other conditions such as chronic obstructive pulmonary disease (COPD), bowel ischemia, or mechanical obstruction. Small bowel volvulus is another uncommon but potentially life-threatening cause of intestinal obstruction and pneumoperitoneum. The coexistence of IPC and small bowel volvulus is exceptionally rare and can complicate the diagnostic approach.

Case Presentation

A 62-year-old male with a past medical history of chronic smoking and chronic obstructive pulmonary disease (COPD) under regular treatment was admitted to the emergency department for persistent vomiting and cessation of bowel movements that had begun the previous day.

On admission, the patient was conscious, hemodynamically stable, and afebrile. Physical examination revealed a soft, non-distended, and non-tender abdomen, with no guarding or rigidity. The remainder of the clinical examination was unremarkable. Laboratory investigations showed marked leukocytosis at $19,800/\text{mm}^3$, an elevated C-reactive protein of 52.1 mg/L , hemoglobin of 15.8 g/dL , and hypokalemia at 2.59 mmol/L .

An abdominal CT scan revealed distension of the small bowel loops, measuring up to 45 mm in diameter, associated with a mesenteric whirlpool sign in the right iliac fossa. Mild mesenteric fat infiltration and small adjacent lymph nodes were also noted. A large pneumoperitoneum was present, without any associated peritoneal effusion. The overall radiologic picture suggested small bowel obstruction due to a possible volvulus, with suspicion of a bowel perforation (fig 1).

The patient was taken to the operating room for surgical exploration. Intraoperatively, a volvulus of the small intestine was identified, associated with multiple gas-filled cystic lesions within the intestinal wall, consistent with intestinal pneumatosis cystoides. The bowel

was viable, with no evidence of ischemia or necrosis, and therefore no resection was performed. The volvulus was reduced, and the peritoneal cavity was cleaned (fig 2).

The postoperative course was uneventful, and the patient recovered well with normalization of laboratory values and resolution of symptoms.

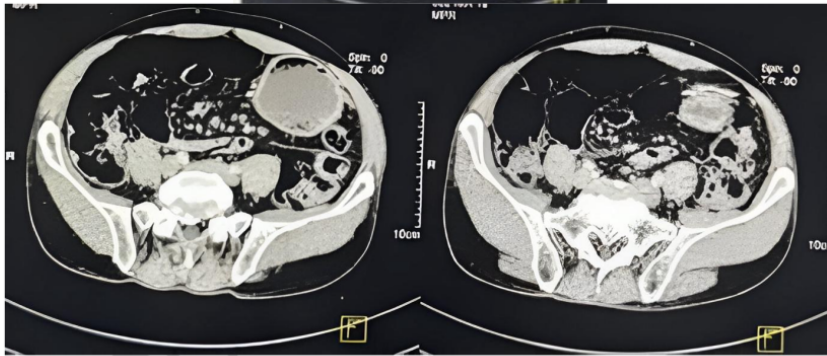
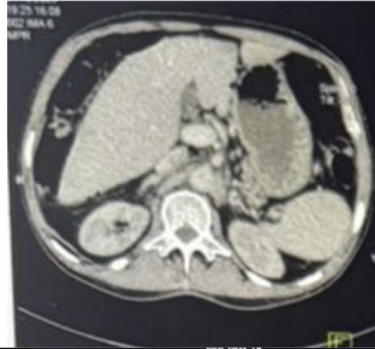


Fig 1: Abdominal CT scan showing marked distension of small bowel loops (up to 45 mm in diameter) with a clear mesenteric "whirlpool sign" in the right iliac fossa, indicating small bowel volvulus. A large pneumoperitoneum is also visible, without evidence of peritoneal effusion.

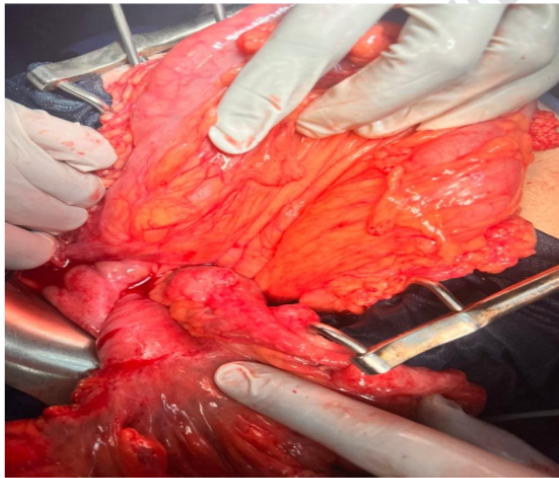
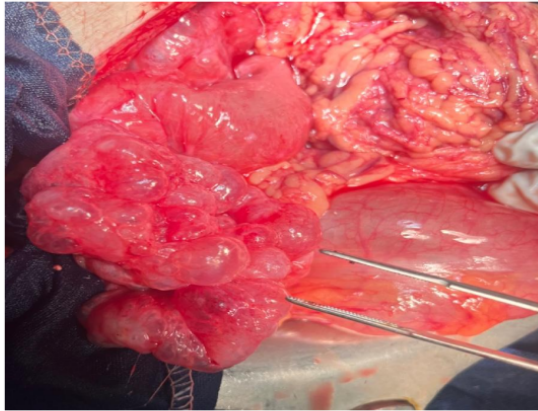


Fig 2 : Intraoperative findings showing small bowel volvulus associated with multiple gas-filled cystic lesions on the intestinal wall, consistent with intestinal pneumatosis cystoides. The bowel appeared viable with no evidence of ischemia or necrosis.

Discussion

Intestinal pneumatosis cystoides (IPC) is a rare entity that may closely resemble other acute abdominal emergencies. Its pathogenesis is multifactorial, involving mechanisms such as mucosal injury, increased intraluminal pressure, and, in patients with chronic obstructive pulmonary disease (COPD), the possible migration of gas from ruptured alveoli through mesenteric vessels (1,5,6,9). When IPC occurs in association with a small bowel volvulus, distinguishing between benign pneumatosis and true ischemic perforation becomes particularly challenging. In the present case, the CT findings of a pneumoperitoneum combined with a mesenteric whirlpool sign raised suspicion of ischemic volvulus and appropriately prompted emergency surgical exploration (1,3,8). While pneumoperitoneum typically suggests a bowel perforation requiring surgical management, in IPC it may result from rupture of subserosal cysts without full-thickness bowel injury. Nonetheless, the concomitant presence of volvulus in this patient justified prompt operative intervention to exclude ischemia and ensure a favorable outcome (2,4,7).

Conclusion

This case illustrates a rare association between intestinal pneumatosis cystoides and small bowel volvulus, presenting as pneumoperitoneum in a patient with COPD. Early imaging, careful interpretation of CT findings, and timely surgical exploration are essential for accurate diagnosis and favorable outcomes. Clinicians should remain aware that pneumatosis intestinalis can either mask or coexist with true surgical emergencies such as volvulus or perforation (5,10).

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