

The most frequent clinical presentation in patients with PMP is progressive abdominal distension.¹ The slow increase in intra-abdominal pressure means that this disease can sometimes start as a hernia, most frequently inguinal, which occurs in 25% of men and 5% of women.¹

When this finding occurs during abdominal wall hernia repair surgery, the surgeon's approach should be as restrictive as possible, taking samples for histopathology analysis, performing simple closure of the hernia defect and referring the patient to a center specialized in peritoneal oncology surgery for definitive treatment by means of cytoreduction and administration of hyperthermic intraperitoneal chemotherapy (HIPEC).² The use of mesh, even in large defects, can be accompanied by problems related to the surgical wound, as well as an increase in the scar area facilitating the implantation and growth of tumor cells.² A recent publication by Sugarbaker found no hernia recurrence in the follow-up of patients undergoing cytoreduction and HIPEC due to PMP who had inguinal hernias. The peritonectomy of the hernia sac and fibrosis of the tract could explain this favorable evolution.³ As for the type of mesh to be used, there is no evidence or consensus in this regard.⁴

In conclusion, if the PMP is discovered at the time of hernia surgery, a sensible approach would be to take samples, close the aponeurotic defect with no added prosthetic material and refer the patient to a tertiary center experienced in peritoneal oncology for evaluation and specific treatment.

REFERENCES

1. Esquivel J, Sugarbaker PH. Clinical presentation of the pseudomyxoma peritonei syndrome. *Br J Surg*. 2000;87:1414-8.
2. Esquivel J, Sugarbaker PH. Pseudomyxoma peritonei in a hernia sac: analysis of 20 patients in whom mucoid fluid was found during a hernia repair. *Eur J Surg Oncol*. 2001;27:54-8.
3. Sugarbaker PH. Management of an inguinal hernia in patients with pseudomyxoma peritonei. *Eur J Surg Oncol*. 2017. pii: S0748-7983(17)30002-1.
4. Boutros C, Somasundar P, Espat NJ. Early results on the use of biomaterials as adjuvant to abdominal wall closure following cytoreduction and hyperthermic intraperitoneal chemotherapy. *World J Surg Oncol*. 2010;8:72.

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Gastric Neumatosis: When Not to Operate[☆]



Neumatosis gástrica: cuándo no operar

Gastric pneumatosis is defined as a collection of gas within the stomach wall and can encompass 2 processes with very different etiologies, symptoms and prognoses: gastric emphysema and emphysematous gastritis.¹ Frequently, gastric pneumatosis appears in association with intestinal pneumatosis related to ischemia/intestinal infarction, but when located exclusively in the gastric wall it is a rare entity.² Gastric emphysema is usually asymptomatic and generally derives from a mechanical cause that causes acute gastric dilatation and increased intraluminal pressure. Emphysematous gastritis is a rare form of gastritis secondary to infection of the gastric wall by gas-forming organisms; in this case, early diagnosis and treatment are essential to avoid the high mortality rate. The treatments of the two conditions are opposing. Patients with gastric emphysema do not require surgical treatment and progress well with conservative treatment, typically *nil per os* and an NG tube to reduce

gastric distension. However, patients with emphysematous gastritis require more aggressive early treatment with broad-spectrum antibiotics, fluid therapy and urgent surgery in certain cases, which is usually indicated when conservative treatment fails or there is perforation.³ Depending on the degree of involvement, surgical treatment may entail partial gastrectomy or even total gastrectomy, depending on the degree of involvement.

We present the case of a 77-year-old man with a history of DM, HTN, cholelithiasis, and recent hospitalization for severe acute pancreatitis with pancreatic pseudocysts, who was re-admitted due to abdominal pain. Abdominal-pelvic CT scan showed a reduction in pseudocysts, with no peripancreatic inflammatory changes. Incidental findings included important gastric distension with limited wall enhancement in the fundus, multiple gas bubbles and linear images in the gastric wall suggestive of gastric pneumatosis and free fluid, adjacent

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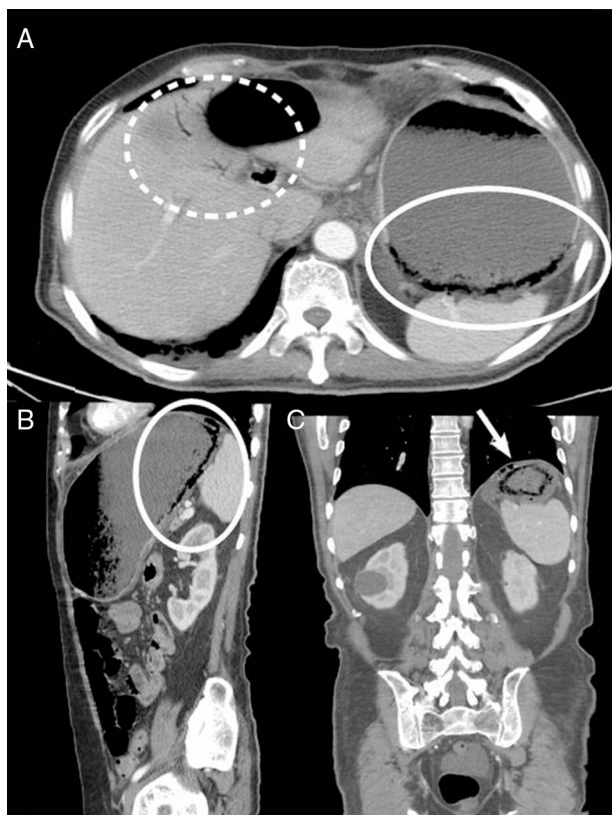


Fig. 1 – Abdominal-pelvic CT with intravenous contrast in axial (A), sagittal (B) and coronal (C) planes, showing important gastric distension with limited wall enhancement in the fundus, where multiple intramural gas bubbles are observed, suggestive of gastric pneumatosis (circle), free fluid and bubbles of ectopic gas (arrow), as well as venous gas in left main portal branch and distal portal branches of the left hepatic lobe (dashed circle).

ectopic gas bubbles (Fig. 1) as well as the presence of portal gas (Fig. 1). Given the CT findings, the patient, who was asymptomatic, was reassessed clinically with abdominal examination and laboratory tests, which were normal. In this case, the differential diagnosis included emphysematous gastritis secondary to a complication of acute pancreatitis or gastric emphysema caused solely by gastric distension. Given that the patient was asymptomatic and hemodynamically stable, we decided to proceed with conservative treatment with NG tube placement and *nil per os*. The patient progressed favorably, and a follow-up CT scan 7 days later demonstrated complete disappearance of the gastric pneumatosis, portal gas, free fluid and ectopic gas (Fig. 2), and the patient was discharged 3 days later.

In the case of gastric emphysema of generally mechanical etiology, cases have been described after gastroscopy, vigorous vomiting and aerophagia in situations of obstructed distal gastric emptying⁴ (duodenal ulcer, gastric volvulus, cancer of the antrum, small bowel obstruction), even in patients with spinal trauma, associated with pneumothorax



Fig. 2 – Axial abdominal-pelvic CT scan showing the disappearance of gastric pneumatosis, free fluid and bubbles of ectopic gas and portal venous gas.

or rupture of pleural bullae, associated with acute pancreatitis, prolonged and repeated inhalations and a history of general anesthesia.¹

The main differential diagnosis of gastric emphysema includes emphysematous gastritis, which is the infectious form of gastric pneumatosis and has a worse prognosis if not treated appropriately. In the case of emphysematous gastritis, there is usually a lesion in the gastric mucosa that enables passage of gas-producing germs. Predisposing factors include: ingestion of caustic substances, alcohol abuse, abdominal surgery, gastroenteritis and, less commonly, the ingestion of soft drinks, diabetes, gastric mucormycosis,⁵ ischemia or gastric infarction⁶ and parasites. Several germs are associated: *Clostridium welchii*, *Clostridium perfringens*, *Escherichia coli*, etc. In this case, contrary to what happens with gastric emphysema, symptoms appear suddenly and vary from epigastric pain, nausea, vomiting, fever, tachycardia, etc., to a state of shock, with high mortality.

The radiological findings of both entities are similar and well defined: presence of bubbles or linear images of air that dissect the gastric wall. Thus, clinical parameters differentiate between these processes and guide the management approach.¹ Other associated radiological findings may be observed, such as the presence of portal venous gas,⁷ which is more frequent in cases of emphysematous gastritis and with a very poor prognosis⁸; however, it can also be associated with gastric emphysema, with survival rates close to 100%.⁸ Radiologically, a gastric emphysema can also be distinguished from an emphysematous gastritis by the presence of gastric wall thickening, which is more frequently present in emphysematous gastritis, as well as the finding of other signs that can lead to determining the origin of this gas in the wall gastric (for example, intestinal ischemia).⁸

In short, gastric pneumatosis is a rare radiological finding. When detected, it is essential to establish whether it is due to gastric emphysema or emphysematous gastritis, since the treatment and prognosis are different and the distinction provides for adequate patient management, while avoiding

unnecessary surgical interventions. The fundamental tools for making this distinction are imaging tests (mainly CT^a) and the assessment of the patient's clinical status.

REFERENCES

1. Reimunde E, Gutiérrez M, Balboa O, Espinel J, Rodríguez C. Neumatosis gástrica. *Gastroenterol Hepatol*. 2002;25:458-61.
2. Johnson PT, Horton KM, Edil BH, Fishman EK, Scott WW. Gastric pneumatosis: the role of CT in diagnosis and patient management. *Emerg Radiol*. 2011;18:65-73.
3. Guillen Morales C, Manuel Vazquez A, Carrascosa Mirón T, Bañuls Laguna L, Jimenez Miramón FJ, Jover Navalón JM. Rara causa de abdomen agudo y tratamiento conservador: gastritis enfisematosa, a propósito de un caso. *Cir Esp*. 2014;92(Espec Congr):523.
4. Gutierrez Andreu M, Otero Perpiñá B, Muñoz C, de la Cruz Vigo F. Neumatosis gástrica secundaria a estenosis pilórica de origen péptico. *Cir Esp*. 2011;89:188.
5. Alvarado Lezama J, Espinosa González O, García Cano E, Sánchez Córdova G. Gastritis enfisematosa secundaria a mucormicosis gástrica. *Cir Cir*. 2015;83:56-60.
6. Pueyo Pérez EM, Andrés Pérez S, García Tejero A, García Fernández C. Necrosis gástrica secundaria a incarceration inguinal. *Cir Esp*. 2016;94:180.
7. Sebastián C, Quiroga S, Espin E, Boyé R, Alvarez Castells A, Armengol M. Portomesenteric vein gas: pathologic mechanisms, CT findings and prognosis. *Radiographics*. 2000;20:1213-24.
8. Domínguez Jiménez JL, Puente Gutiérrez JJ, Marín Moreno MA, Bernal Blanco E, Gallardo Camacho JI, Uceda Vañó A. Neumatosis gástrica y gas en el sistema venoso portal secundario a úlcera peptica. *Gastroenterol Hepatol*. 2008;31:494-6.

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Endovascular Repair of an Arterial Pseudoaneurysm Due to Ureteral-Iliac Fistula[☆]



Reparación endovascular de pseudoaneurisma arterial secundario a fístula iliaco-ureteral

The presence of an ureteroiliac fistula (UIF) is an unusual cause of hematuria that should be suspected in patients with a history of pelvic surgery, arterial revascularization, pelvic inflammatory processes, radiotherapy or ureteral stent placement¹; occasionally, it is also associated with the presence of an arterial pseudoaneurysm. One of the greatest advantages of endovascular procedures is the rapid control of bleeding with minimally invasive techniques.

We present the case of a 53-year-old male with a history of dyslipidemia, peritonitis due to acute gangrenous appendicitis requiring laparoscopic appendectomy, and bladder cancer treated by transurethral resection and endocavitary chemotherapy. Three years later, he presented recurrence of said neoplasm with infiltration of the ureteral wall and meatus, lymph node involvement and bone metastases (invasive bladder cancer pT4 pN3 M1). The patient was treated surgically by the urology department, who performed radical cystec-

tomy associated with extended bilateral iliac lymphadenectomy and cutaneous ureterostomy. The patient also required palliative chemotherapy.

One month later, the patient came to the emergency department due to colicky pain in the left iliac fossa and bleeding through the ureterostomy. The interventional radiology unit injected iodinated contrast through the ureteral catheter, observing the presence of a left UIF, which they treated with the placement of 2 Fluency[®] (Bard) 8×60 mm coated stents. Six months later, the patient once again presented the same symptoms. Computed tomographic (CT) angiography demonstrated a proximal leak of contrast material from the stents. The patient was again treated by the interventional radiology unit with the placement of another 8×60 mm Fluency[®] stent.

Two months later, the patient came to the emergency department again due to intense pain in the left hemiabdomen

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