

Case Report

Peritonitis associated with peritoneal dialysis as a reason for delay in the diagnosis of gastric ulcer perforation: a case report

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ABSTRACT

This report presents a case of a perforated gastric ulcer in a patient on peritoneal dialysis (PD), illustrating the diagnostic challenges of abdominal pain in this population. PD patients are highly susceptible to dialysis-associated peritonitis, which is often the initial, presumed diagnosis for abdominal pain. This can lead to a critical delay in recognizing other serious intra-abdominal pathologies, such as peptic ulcer perforation, which these patients are predisposed to due to factors like uremia and medication use. A 74-year-old female on PD presented with abdominal pain. Initial studies supported a diagnosis of PD-associated peritonitis, and conservative management began. When symptoms persisted despite normalized fluid studies, a surgical consultation was requested. Imaging revealed a perforated gastric ulcer. She underwent ulcer resection, ulcerorrhaphy, and an omental patch. Her postoperative course was complicated by pneumonia, requiring transfer for further management. Patients on PD have an increased risk for gastric ulcers due to elevated gastrin levels, *H. pylori*, and gastric mucosa-damaging medications. While peritonitis is a common and primary concern, it can mask other acute abdominal conditions. Diagnosis relies on clinical assessment, peritoneal fluid analysis, and imaging (X-ray and CT scan). The choice between open or laparoscopic surgery depends on the patient's clinical condition and comorbidities. This case emphasizes the need for a broad differential diagnosis and high clinical suspicion to ensure timely intervention for life-threatening conditions beyond typical dialysis-related complications.

Keywords: Gastric ulcer, Acute abdomen, Peritoneal dialysis, Chronic kidney disease

INTRODUCTION

Acute abdominal pain is a common presentation in clinical practice, responsible for as many as 40% of outpatient visits and 5 to 25% of emergency department visits, and can represent conditions ranging from benign to life-threatening.¹ Patients with chronic kidney disease have an increased susceptibility for the occurrence of gastrointestinal lesions causing abdominal pain, among which the most prevalent are: adenomatous colorectal

polyps (39.6%), acute gastric mucosal lesions (22.6%), neoplastic lesions (15.1%), angiodysplasias (14.4%), esophagitis (8.4%), inflammatory bowel disease (4.8%), and ischemic colitis (3.1%).² Among the acute gastric mucosal lesions are gastric and duodenal ulcers, bulboduodenitis and acute gastritis.²

Individuals with a diagnosis of end-stage renal disease or KDIGO V, i.e., those with a glomerular filtration rate <15 mL/min/1.73 m², will require initiation of renal function

replacement therapy. These therapies may include renal transplantation or either of the two available dialysis modalities: hemodialysis and PD.³

PD consists of the exchange of solutes and water between blood in the peritoneal capillaries and the instillation of solution into the peritoneal cavity (dialysate) through a catheter, using the peritoneal membrane as the dialysis surface.³

The initiation of renal function replacement therapy carries different risks for the patient depending on the modality of choice. In the case of PD, the need for access to the peritoneal cavity increases the risk of acute abdominal pain due to various infectious, mechanical or inherent complications related to the insertion of the dialysis catheter.

Among the causes of acute abdominal pain in PD patients, the main ones are those of infectious origin, with peritonitis being one of the most serious complications, considered the main cause of abandonment of the technique and hospitalization in patients with end-stage renal disease, and responsible for >15% of deaths in patients on PD.⁴ Non-infectious intra-abdominal causes of abdominal pain include hemoperitoneum (6-17%), chyloperitoneum, pneumoperitoneum (4%), hernias (10-27%), catheter leaks (3-30%), hydrothorax (<2%).⁵

CASE REPORT

Female patient, 74 years old with a history of diabetes mellitus type 2 of 20 years of evolution in treatment with linagliptin 5 mg every 24 hrs; systemic arterial hypertension grade 1 since 8 years ago; cerebral vascular event of ischemic type 3 years ago without specifying treatment, RANKIN 2 with sequel of left hemiparesis; chronic renal disease KDIGO V diagnosed 2 years ago, currently in renal function replacement therapy for about 1 year, starting in hemodialysis modality with a duration of 2 months, receiving 3 sessions per week, then in July 2022, she changed to PD modality, being her only Tenckhoff catheter, denies previous episodes of peritonitis. Only surgical history, placement of dialysis catheter in July 2022.

Regular medications: ferrous sulfate one tablet daily, B complex one tablet daily, folic acid one tablet daily, laxatives (sodium picosulfate) two tablets every third day, denies regular use of analgesics.

The current condition began on April 4, 2023 with colicky abdominal pain of intensity 7/10 on the visual analog scale located in the left flank radiating to the hypogastrium, without extenuating or aggravating factors, accompanied by nausea without vomiting, with the last bowel movement on March 30. Subsequently, on April 6, he presented exacerbation of abdominal pain of intensity 10/10, with the same characteristics as previously mentioned, referring PD fluid output of cloudy

appearance, for which he went to the emergency room, on admission with the following vital signs: TA 108/50 mmHg, FC 93 bpm, FR 22, Temperature 36.2 °C. Physical examination showed a generalized distended abdomen, right paraumbilical Tenckhoff catheter surgical wound, with no secretions or erythema over the exit of the catheter. On auscultation, decreased peristalsis, painful on superficial and deep palpation, predominantly in the epigastrium and mesogastrium, with involuntary muscle resistance, positive rebound, dull on percussion in the left colonic frame, tympanic rest, no megaliths were assessed due to intense pain on manipulation. Due to a history of renal replacement therapy, he was admitted to the internal medicine ward with a diagnosis of peritonitis associated with PD.

Laboratory studies were requested showing glucose 214 mg/dl, creatinine 6.52 mg/dl, urea 176 mg/dl, potassium 5.06 meq/l, sodium 130 meq/l, leukocytes 7.330 mm³ neutrophils 6.630 mm³, hemoglobin 7.8 g/dl, hematocrit 23.6%, arterial blood gas with pH 7.48, pCO₂ 32 mmHg, HCO₃ 26.5 mmol/l. An abdominal X-ray was taken (Figure 1).



Figure 1: Simple abdominal radiography in decubitus supine position.

She started management with AB sinus and cytology and cytochemistry of peritoneal fluid which reported 1238 cells, 78% neutrophils, starting management with saline solution 0.9% 250 ml for 24 hrs, ceftazidime 375 mg single dose, continuing with 125 mg every 6 hrs intraperitoneal. She was evaluated by the nephrology service who commented that she did not have criteria for a change of dialysis modality and recommended to continue with the same management while waiting for cultures and antibiogram, the cavity was closed due to the presence of peritoneal irritation, a simple tomography of the abdomen was requested (Figure 2) and a consultation

with the general surgery service was made for clinical evaluation.



Figure 2: Simple abdomino-pelvic tomography in midline coronal section, with presence of free air in the anterior portion.

Imaging studies

Simple X-ray of the abdomen in anterior-posterior decubitus supine: evidence of abundant coprostasis predominantly in the descending colon with presence of gas in the rectal ampulla, Tenckhoff catheter is observed advocated in the pelvic cavity.

Simple tomography of abdomen and pelvis: presence of liquid in right and left subdiaphragmatic recess, anterior and posterior subhepatic, right and left parietocolic runners, right and left paravesical, as well as cul-de-sac and interasa, presence of gas in peritoneal cavity.

With the clinical data and complementary examinations, the general surgery service diagnoses: "sepsis of abdominal focus, acute surgical abdomen, generalized peritonitis, pneumoperitoneum due to probable perforation of the viscera". Therefore, she was scheduled for emergency surgery after preoperative anesthetic assessment (ASA III), in addition to signing the informed consent for exploratory laparotomy.

Abdominal approach is performed in upper hemiabdomen, supraumbilical incision in midline, access to abdominal cavity, abundant air outflow, free liquid in cavity about 1000 ml of gastro-alimentary content, abundant fibrinopurulent creams, exploration of gastric region, at the level of the anterior face of the stomach prepyloric region perforation of 3x4 cm in diameter

(Figure 3), regular fibrotic edges resection of the same to send biopsy, ulcerorrhaphy in 2 planes plus reinforcement with omentum patch, washing and drainage of the cavity; closure of the operative wound in planes. The postoperative diagnosis was: "septic shock of abdominal focus, acute surgical abdomen due to generalized peritonitis, perforated gastric ulcer Johnson type III". The patient was managed during the postoperative period with a double antibiotic regimen based on ceftazidime and vancomycin, a central venous catheter was placed with the start of norepinephrine to maintain mean arterial pressure higher than 65 mmHg, gastric decompression with a naso-duodenal tube and fasting for 5 days.



Figure 3: Perforated peptic ulcer in anterior prepyloric face.

The patient evolves in a torpid manner, developing in-hospital pneumonia, and after restarting the oral route through a naso-duodenal tube after days of fasting with no evidence of leakage, she is sent to the infectious disease hospital to continue with the management of the infectious condition.

DISCUSSION

Peptic ulcer is the loss of continuity of a part of the wall of the gastrointestinal tract and reaches the mucosa, submucosa and muscularis mucosae of the gastrointestinal tract.⁶ The morbidity and mortality of this condition is mainly related to chronic abdominal pain and to its more serious complications such as upper gastrointestinal tract bleeding, intestinal perforation and obstruction.⁶

Perforation ranks second in frequency of peptic ulcer complications to bleeding (1:6) with a short-term mortality and morbidity of 30% and 50%, respectively; peptic ulcer perforation represents the most frequent indication for emergency surgery.⁷

Currently, the lifetime prevalence of peptic ulcer is estimated to be between 5% and 10% of the general population, and an incidence of 15-30 new cases per 1000 population per year.⁸ Different studies reveal a prevalence of *H. pylori* infection of between 11% and 69% in the general population and 8.9% to 72.8% in children, respectively in developing and developed countries.⁹

Risk factors for ulcer formation include smoking, medications such as non-steroidal anti-inflammatory drugs, oral iron supplements, uremia >50 mg/dl, diabetes mellitus, advanced stages of renal disease, hemoglobin <11 g/dl.² A greater association with *H. pylori* infection has now been evidenced, almost always present in a context of active chronic gastritis, being found in most patients with duodenal (80-95%) and gastric (60-90%) ulcer.¹⁰ While the remaining 30% of gastric ulcers are associated with the use of nonsteroidal anti-inflammatory drugs.²

Adverse effects of oral intake of ferrous sulfate tablets or pills include mucosal pigmentation, decreased intestinal motility, gastrointestinal irritation in the form of erosions, ulcers or diffuse gastritis.¹¹ Furthermore, in patients with end-stage renal disease, serum levels of gastrin in its amide form and total gastrin are found in elevated concentrations, producing an increase in the basal secretion of hydrochloric acid by the parietal cells of the gastric mucosa, further aggravating the damage to the gastric mucosa.^{2,12}

Peptic ulcer perforation is a serious complication of peptic ulcer disease that requires prompt surgical intervention. Surgical treatment of peptic ulcer perforation involves suturing the perforation or performing a more extensive procedure such as gastrectomy. Factors that may affect the treatment and outcome of peptic ulcer perforation include age, gender, comorbidities, location of the perforation, and time to diagnosis and treatment.¹³

In this case it is important to note that the patient was initially being evaluated for PD catheter-associated peritonitis, but a perforated gastric ulcer is discovered during the evaluation process, thus delaying surgical therapeutic management. Evidence demonstrates that increased surgical delay significantly impairs surgical outcome. In fact, a cohort study conducted in 2013 from the Danish clinical registry of emergency surgery showed that, during the first 24 h after admission, each hour of surgical delay beyond hospital admission was associated with a 2.4% adjusted decrease in the probability of survival compared with the previous hour, over the entire observation period.¹⁴

The decision of the surgical approach to perforated peptic ulcer is guided by the hemodynamic and general clinical stability of the patient, recommending a laparoscopic approach in stable patients and open surgery by laparotomy in unstable patients.¹⁵ The effects of

increased intra-abdominal pressure and hypercarbia due to CO₂ insufflation during laparoscopy are well known (increased systemic vascular resistance, mean arterial pressure, afterload, heart rate, chamber pressures, respiratory rate, maximal airway pressure, PaCO₂; reduction of stroke volume, venous return, cardiac output, thoracic distensibility, pH) and impede the laparoscopic approach to hemodynamically unstable patients or those with severe cardiovascular or pulmonary comorbidity.

The repair of perforated peptic ulcer larger than 2 cm usually poses a challenge depending on the anatomic location and should always include a histopathologic study of the edges, as was the case here. So far, there are no specific recommendations for surgical treatment, as the site of perforation and secondary effects on surrounding anatomical structures should guide the interventions needed.¹⁵ The two most frequently used techniques for the repair of gastric perforations are primary closure of the lesion, which consists of approximating the edges of the ulcer with interrupted absorbable sutures, the other technique is the use of an omental patch placed over the lesion to generate a plug which obstructs the lumen of the ulcer and is subsequently secured with interrupted, absorbable sutures.

Surgical treatment will depend on the conditions of the patient to be considered as the gastric resection of choice for reconstruction in large ulcers or variations of the procedure with primary closure or omental patch.

In this case the Cellan-Jones technique was used by open laparotomy. The Cellan-Jones patch is a type of patch used to repair peptic ulcer perforations. It is made of a thin layer of pedicled omentum and is designed to be sutured over the primary closure of the perforation to prevent leakage of gastric contents.¹⁶ The use of omental patch has been shown to be effective in the repair of peptic ulcer perforations, with low complication rates and good outcomes, without the need for gastrectomy and reconstruction.¹⁷

CONCLUSION

This case highlights how PD-associated peritonitis can act as a powerful diagnostic confounder, delaying recognition of life-threatening intra-abdominal pathology such as perforated gastric ulcer. The overlap in clinical presentation between dialysis-related infectious complications and acute surgical abdomen, combined with uremia-related alterations in immune response and gastrointestinal physiology, contributes to diagnostic anchoring and postponement of definitive surgical management. By illustrating the sequence of events that led to delayed diagnosis despite appropriate initial management, this report advances understanding of the need for a broader and more dynamic diagnostic approach to abdominal pain in PD patients. It reinforces the importance of maintaining a high index of suspicion,

early integration of imaging studies, and timely multidisciplinary collaboration when clinical evolution is atypical or refractory to standard therapy. Ultimately, this case contributes to the existing knowledge by emphasizing that not all abdominal pain with cloudy dialysate is attributable solely to peritonitis, and that early consideration of alternative surgical etiologies may improve outcomes and reduce morbidity and mortality in this high-risk population.

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REFERENCES

- Mota Ramirez G, Estrada-Salvador D, Romero-Lopez C, Santiago-Reyes S, Garcia-Ayon A, Santos-Matias M. Diagnostic scales and their utility in the clinical evaluation of abdominal pain syndrome in the first step of medical care. *Revista Sanidad Militar.* 2017;71(4):321-31.
- García-Agudo R, Aoufi-Rabih S, González-Carro P, Roldán FP, Vega BP, Arias AA, et al. Gastrointestinal lesions in patients with chronic kidney disease and anemia. *Revista Sociedad Española Nefrología.* 2019;39(1):50-57.
- Cruz-Andreoli MC, Totoli C. Peritoneal Dialysis. *Rev Assoc Med Bras.* 2020;66(1):S:37-44.
- Szeto CC, Li P. Peritoneal Dialysis-Associated Peritonitis. *CJASN.* 2019;14:1100-5.
- Clemente EP, Castellanos B. Non-Infectious Complications in Peritoneal Dialysis. Castellanos, "Noninfectious Complications in Peritoneal Dialysis. 2022. Available at: <https://www.nefrologiaaldia.org/464>. Accessed on 23 December 2025.
- Bashinskaya B, Nahed BV, Redjal N, Kahle KT, Walcott BP. Trends in Peptic Ulcer Disease and the Identification of *Helicobacter Pylori* as Causative Organism Population-based Estimates from the US Nationwide Inpatient Sample. *J Global Infect Dis.* 2011;3(4):366-70.
- Søreide K, Thorsen K, Harrison EM, Bingener J, Møller MH, Ohene-Yeboah M, Søreide JA. Perforated peptic ulcer. *Lancet.* 2015;386(1000):1288-98.
- Gisbert J. Peptic ulcer. Epidemiology, pathogenesis, diagnosis and general concepts on treatment. *Med.* 2004;9(2):64-74.
- Barbosa-Araújo M, Borini P, Cardoso-Guimaraes R. Etiopathogenesis Of Peptic Ulcer: back to the past? *Arq Gastroenterol.* 2014;51(2):10.
- Teitelbaum EN, Hungness ES, Mahvi DM. Sabiston's "Stomach," Sabiston's. *Treatise on Surgery. Biological foundations of modern surgical practice, Barcelona, Spain, Elsevier.* 2020;1188-236.
- Hashash JG, Proksell S, Kuan SF, Behari J. Iron Pill-Induced Gastritis. *ACG Case Rep J.* 2013;1(1):13-5.
- Ciccotosto GD, Dawborn JK, Kenneth JH, Shulkes A. Gastrin Processing and Secretion in Patients with End Stage Renal Failure. *J Clin Endocrinol Metabol.* 1996;81(9):3231-8.
- Søreide K, Thorsen K, Harrison EM. Perforated peptic ulcer. *Lancet.* 2015;368(10000):1288-98.
- Buck DL, Vester-Andersen M, Moller MH. Danish Clinical Register of Emergency Surgery, Surgical delay is a critical determinant of survival in perforated peptic ulcer. *Brit J Surg.* 2013;100(8):1045-9.
- Tarasconi A, Coccolini F, Biffl WL, Tomasoni M, Ansaloni L, Molfino S. Perforated and bleeding peptic ulcer: WSES guidelines. *World J Emergency Surg.* 2020;15(1):3.
- Cellan-Jones C. A rapid method of treatment in perforated duodenal ulcer. *Brit Med J.* 1929;1(3571):1076.
- Natarajan S, Chua D, Anbalakan K. Marginal ulcer perforation: A single center. *Eur J Trauma Emerg Surg.* 2016;43(5):717-22.

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