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Indocyanine green-guided video-assisted retroperitoneal drainage in pancreatic necrosis: a case report



Drenaje retroperitoneal videoasistido guiado con verde de indocianina en necrosis pancreática: reporte de un caso

Approximately 20% of patients with acute pancreatitis will have a serious or severe episode. Pancreatic necrosis is the complication with the highest mortality rate of up to 17%, and it reaches 19.8% in patients with infected necrosis and organ failure.¹

“Step-up” management is standardized for encapsulated pancreatic necrosis, in which the minimally invasive approach is ideal because of its efficacy and validation.²

The surgical approach depends on the site of the peripancreatic collections, and can be endoscopic transgastric drainage, percutaneous drainage, or video-assisted retroperitoneal debridement (VARD). The decision to start minimally invasive management allows more aggressive interventions to be delayed, enabling the necrotic collection to mature, and in some cases, be reversed, consequently reducing complications.³

VARD is a minimally invasive procedure, with direct visualization of the collection, but with a narrow surgical manipulation field. Its main complication is vascular injury and the development of pancreatic fistulas.⁴

Indocyanine green is a fluorescent dye that is visible with near-infrared light. It is detected by special cameras that transmit a signal to a monitor, where the structures taking up the dye are visualized. It is used in oncologic surgery with

fluorescent markers, in lymphatic drainage identification, bile duct visualization, or tissue dissection.⁵ In pancreatic necrosis, adjuvant use of indocyanine green during VARD is suggested, to guide the debridement.⁶

A 32-year-old man was admitted to the hospital due to painful abdominal symptoms. At admission, the laboratory work-up reported triglycerides of 5,020 mg/dl, cholesterol of 417 mg/dl, serum amylase of 930 U/l, and serum lipase of 3,357 U/l, and a tomography scan revealed acute edematous pancreatitis. The patient then presented with clinical deterioration, compartment syndrome, and multiple organ failure. Three laparotomies were performed. The first was carried out due to compartment syndrome and the second because of the patient’s clinical deterioration, during which necrosis of the tail of the pancreas was found intraoperatively, resulting in the performance of open necrosectomy. In the third laparotomy, partial omentectomy secondary to infarction was carried out. A postoperative grade C distal pancreatic fistula secondary to the necrosectomy was diagnosed and treated with a somatostatin analogue. A control tomography scan identified fluid collections along the left parietocolic gutter extending to the pelvic excavation, for which a three-week regimen of antibiotics was started. Afterwards, percutaneous drainage was performed, following the “step-up” management of pancreatic necrosis, placing two pigtail catheters in said collections.

Fifteen days later, the patient’s torpid progression persisted. A control tomography scan revealed an encapsulated collection at the level of the tail of the pancreas and the left parietocolic gutter (Fig. 1). The decision to carry out VARD was made. Forty-five minutes before the surgery, 2.5 ml of indocyanine green was administered, diluted in 5 cc of saline solution. A pigtail catheter was placed at the left mid-

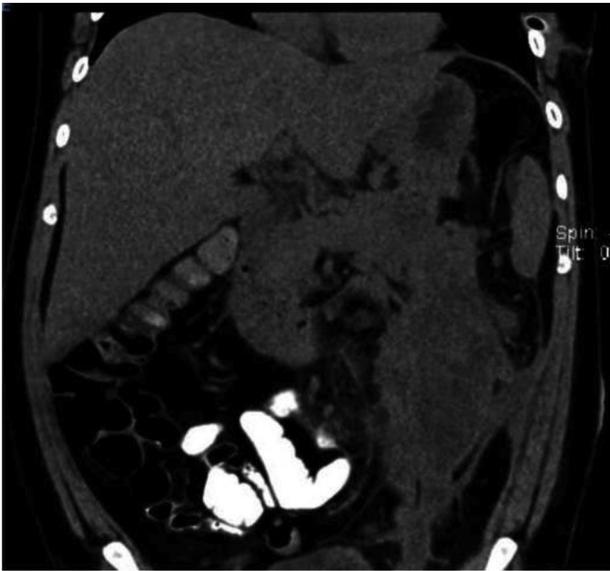


Figure 1 Computed tomography scan with contrast showing pancreatic necrosis and collections in the parietocolic gutter.

axillary line 5 cm above the anterior superior iliac spine to introduce a 12 mm trocar. CO₂ insufflation up to 12 mmHg was carried out, and a 5 mm trocar was placed under direct vision. The necrotic fluid was aspirated, obtaining 600 cc of purulent fluid. Aided by the indocyanine green, the devitalized tissue was debrided, avoiding injury to the vascular structures and the main pancreatic duct. The cavity was washed with physiologic serum and the pigtail catheter was removed, placing a 25 F closed Blake drain (Fig. 2).

Tomography scans performed three days after the procedure identified a decrease in the pancreatic collection, measuring 60 cc. The patient's clinical progression was satisfactory, and the catheters were removed, given the drainage reduction and pancreatic fistula resolution, after almost 4 months of hospitalization.

Encapsulated pancreatic necrosis is defined as mature peripancreatic collections with well-defined limits, 4 weeks after their initial presentation. Postoperative pancreatic

fistula is a complication in the management of severe pancreatic necrosis, presenting with clinical deterioration and a high risk of death. Several medications have been suggested for its management, and somatostatin analogues have achieved a decrease in fistula output and closure time.⁷

We opted for VARD with the aid of indocyanine green, given the clinical deterioration of the patient and the location of the collections, thus reducing the possibility of vascular injury and damage to the nonnecrotized inflammatory tissue. Improvement was rapid after this procedure. These results are relevant, given the scant experience there is with the concomitant use of VARD and indocyanine green and the lack of articles on such cases in the literature.⁸

The combination of minimally invasive surgery and visualization techniques, such as indocyanine green, can be initially used in these types of cases to prevent future reinterventions, shorten the length of hospital stay, and reduce complications, compared with open necrosectomy.⁹ VARD and indocyanine green are proposed to be safe and easy-to-apply in pancreatic necrosectomy.¹⁰

CRediT authorship contribution statement

The authors declare that prior to the surgical procedure, a written statement of informed consent was requested of the patient, his family member, for this research. Because this is a case report, authorization by an ethics committee was not requested. The authors declare that this article contains no information that could identify the patient.

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Declaration of competing interest

The authors declare that there is no conflict of interest.

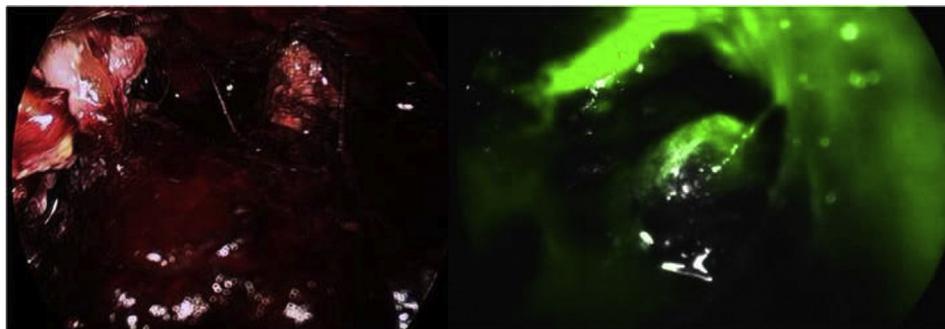


Figure 2 Video-assisted retroperitoneal drainage aided by indocyanine green, enabling the differentiation of correctly perfused pancreatic tissue.

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Stricturing Crohn's disease and intestinal endometriosis: An unusual coexistence



Enfermedad de Crohn estenosante y endometriosis intestinal: coexistencia inusual

Crohn's disease (CD) is an inflammatory bowel disease (IBD) characterized by transmural, segmental, and discontinuous inflammation that can affect any part of the gastrointestinal tract, from the mouth to the anal region. Its transmural involvement can result in complications of fistulas, abscesses and/or strictures.¹ Around 50% of patients with CD are estimated to develop a stricturing phenotype and approximately 75% will require surgery at some point during the course of the disease.²

Colonic stricture affects approximately 10% of the patients with CD,³ with the possible presentation of obstructive symptoms, as well as being asymptomatic. The risk of tumor development is important to consider as a possible cause of strictures in patients with IBD,⁴ given that said malignancies cannot always be ruled out during endoscopy. In such a context, surgery continues to be the gold standard for treatment and for making the definitive diagnosis.

We present herein the case of a patient with stricturing CD of the colon, who underwent surgical resection, and whose histopathologic study was consistent with endometriosis in the area of the stricture.

A 44-year-old woman had a past medical history of CD of the colon, diagnosed in 2013. She had multiple hospitalizations and was corticosteroid-dependent, with thiopurine refractoriness. In 2022, she was started on biologic therapy with infliximab due to perianal disease; later immune failure to that therapy resulted in switching her to adalimumab. Despite symptom improvement, biomarkers remained high (fecal calprotectin) and endoscopic examination revealed active CD in the rectosigmoid colon, with an uncrossable stricture in the sigmoid colon. (Fig. 1A and B). Magnetic resonance enterography (MRE) of the abdomen and pelvis identified inflammatory thickening of the walls of the distal third of the descending colon, the sigmoid colon, and the rectum, with small perirectal and presacral adenopathy (Fig. 1C). Surgical treatment confirmed the stricture and inflammatory activity of the neighboring mucosa (Fig. 1D). The histopathologic study revealed CD activity with a transmural inflammatory infiltrate (Fig. 2A and B), foci of endometriosis in the stricture (Fig. 2C and D) with positive PAX 8 immunohistochemical staining (Fig. 2E and F), and the presence of estrogen receptors (Fig. 2G). The patient progressed satisfactorily, restarting biologic therapy 4 weeks after surgery.

Endometriosis is a condition characterized by the presence of endometrial tissue and estrogen-dependent stroma located outside the uterine cavity,⁵ with a prevalence of 7-10% in women, mainly presenting as abdominal pain.⁵ In 5-12% of cases, it can present at the intestinal level, more frequently at the rectosigmoid level, in 75% of cases.⁶ From