

Necrosis of the duodenal wall with retroperitoneal perforation as a complication of perirenal abscess. Case report and management

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ABSTRACT:

Duodenal perforation is a rare and severe acute surgical condition which commonly follows the complications of endoscopic and laparoscopic procedures. Small degree of damage in this mechanism and an early diagnosis allow for an effective primary management. The most difficult surgical challenge is an effective management of retroperitoneal duodenal perforation together with coexisting pathological changes of its wall. In this work we present a case of duodenal necrosis with excessive necrosis of a fragment of its wall due to perinephric abscess, with an effective method of management of a defect in an isolated free small intestinal loop in association with gastroduodenal passage exclusion.

KEYWORDS:

duodenal necrosis, free enteral loop, perinephric abscess

INTRODUCTION

Duodenal perforation is rare and usually occurs as a complication of endoscopic and laparoscopic procedures. Generally, such injuries are small, and the duodenal wall structure is maintained, which allows for primary closure in most instances. In the literature, there are many publications on managing small duodenal perforations, however, there are no guidelines regarding extensive defects. In this articles, we present a case of duodenal perforation with extensive wall necrosis as a complication of the perirenal abscess, as well as a successful method of closure with an isolated free small intestinal loop.

CASE REPORT

A 66-year-old woman with sepsis was admitted to the Urology Department of the Military Medical Academy Memorial Teaching Hospital of the Medical University of Łódź presenting with abdominal and right lumbar pain and a fever of 38°C. Her symptoms developed 7 days before admission. Before that, she was treated with non-steroidal anti-inflammatory drugs for suspected sciatica. On physical examination, abdominal tenderness and guarding on the right side with right-sided vividly positive Goldflam's sign were noted. Peristalsis was normal. The laboratory results were as follows: RBC 3.23 mln/ul, PLT 486 k/ul, WBC 15.64 l/ul, CRP 138.2 mg/L, creatinine 58 umol/L, procalcitonine 0.49 ng/ml, and urinalysis revealed leukocyturia (covering the entire field), erythrocyturia and few bacteria.

IMAGING

The abdominal CT scan obtained on admission revealed a calcified stone about 1.5 cm in diameter at the right pelviureteric junction with subsequent right-sided hydronephrosis. In the right kidney, there was also a focal mass about 8 cm in diameter with

encapsulated fluid collections and gas bubbles, consistent with a renal abscess (Fig. 1.). The perirenal space was inflamed, together with the anterior wall of the retroperitoneal part of the duodenum and the lateral portion of the psoas muscle.

TREATMENT

After obtaining the results, the patient was qualified for an emergency urological intervention. From the right-sided lumbotomy approach, the right retroperitoneal space was accessed and the inflamed right kidney, right psoas muscle and peritoneum were identified. A large abscess was identified extending over the right renal hilum and the adjacent peritoneum and duodenum. Due to inflammation of the right ureter and renal pelvis, as well as difficulty identifying those structures among necrotic tissues, we decided to perform nephrectomy. After the kidney was removed, an extensive perforation of the descending duodenum covering a third of its circumference with necrotic margins was noted. An intraoperative surgical consultation was requested. Because the primary closure of the defect was impossible, we decided to perform duodenal bypass surgery and to use free jejunal loop to cover the defect. In the first stage of the procedure, the jejunum was cut at about 40 cm from the ligament of Treitz. A free intestinal segment with its mesentery approximately 25 cm long was then isolated (Fig. 2.) for use in later stages. The jejunum located distally from the prepared graft was used for an Roux-en-Y gastrointestinal anastomosis. Using a linear stapler (Covidien TA 60mm), we closed the gastric antrum (Fig. 3.). The intestinal graft was displaced through the ascending colonic mesentery to the retroperitoneal space, and then the intestinoduodenal anastomosis was performed end-to-side, thus closing the duodenal defect and preserving the intestinal passage. The distal part of the free loop was attached end-to-side to the jejunum approximately 40 cm distal to the previously performed gastrointestinal anastomosis (Roux-en-Y). Decompression duodenostomy was performed by inserting a 12F drain through the free loop into the duodenum. In addition,



Fig. 1. Lesion about 8 cm in diameter containing encapsulated fluid collections (arrow 1) with gas bubbles (arrow 2), probably corresponding to a renal abscess. Right-sided hydronephrosis can be appreciated (arrow 3).

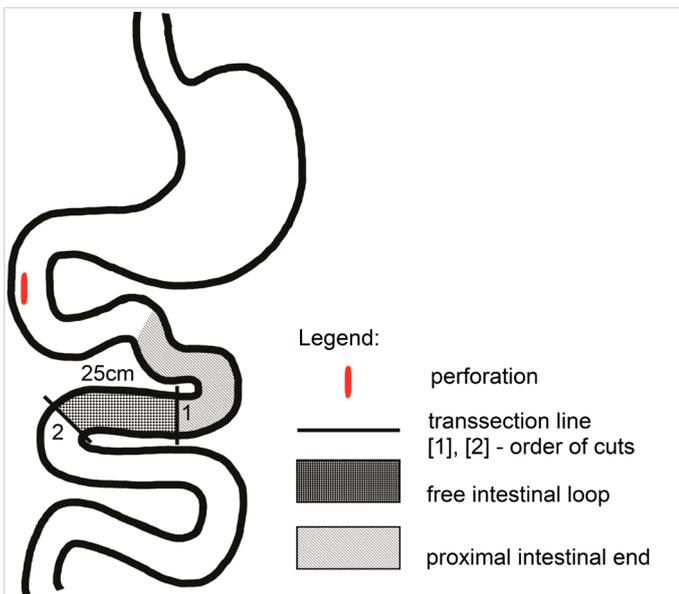


Fig. 2. Sites and order of transection of the small intestine, intestinal loop division into the proximal, distal and free portion.

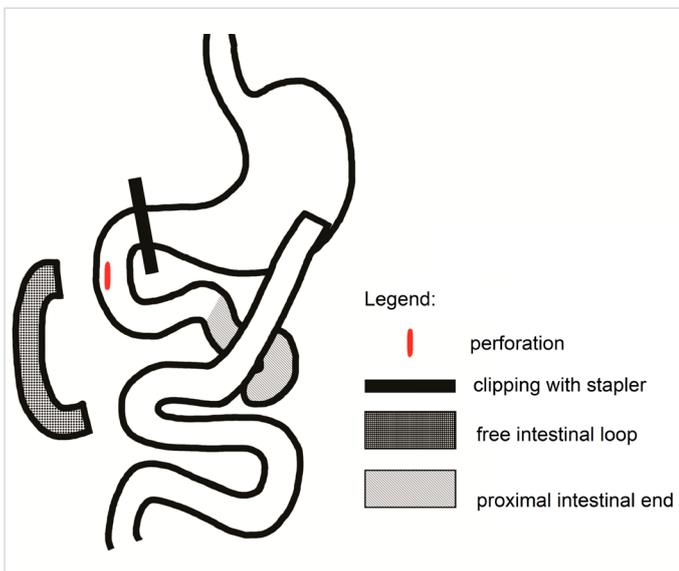


Fig. 3. Gastrointestinal Roux-en-Y anastomosis; site of antrum closure with a linear stapler.

cholecystostomy was performed using Petzer’s catheter (Fig. 4.). Immediately post-surgery, the patient received broad-spectrum antibiotics and later targeted therapy with ceftriaxone, metronidazole and meropenem. Parenteral nutrition was introduced and maintained for 7 days. Over the next days, her general condition improved. Inflammatory markers decreased (WBC 13.06 k/ul, CRP 7.3 mg/L). The patient was discharged home on postoperative day 17 in good general condition, with maintained duodenostomy and cholecystostomy. The drains were removed at the follow-up outpatient visit five weeks after the surgery. During the last visit two months after the operation, she appeared well.

DISCUSSION

Perforation of the retroperitoneal part of the duodenum may manifest itself with right-sided upper abdominal pain, nausea and vomiting, fever, abdominal guarding and other signs of peritonitis, sepsis and, in most severe cases, as a septic shock [1, 8]. The prognosis depends on the time of diagnosis. When diagnosed on the first day, the mortality is 6%, reaching up to 20% on the second day and gradually increasing as the diagnosis is delayed [1].

The computed tomography is the most useful modality for duodenal lesions. As in retroperitoneal perforation, the scan reveals fluid collections with gas bubbles adjacent to the duodenum. On the other hand, perforation of the intraperitoneal portions of the duodenum is indicated by the presence of free gas under the diaphragm and free fluid in the peritoneal cavity. However, those signs are also characteristic for perforation of other parts of the gastrointestinal tract at its intraperitoneal course. When the diagnosis remains unclear, oral administration of Gastrografin may be useful to show leakage [1, 9].

The treatment of choice of early and minor duodenal lesions resulting from laparoscopic or endoscopic procedures is primary closure with stitches or clipping [1, 2, 9]. In the literature, there are reports on successful duodenum-sparing treatment of medium-sized duodenal perforation and diverticula by decompression of the alimentary tract and drainage of the duodenal and pancreatic space [4, 8]. George H. Sakorafas et al. in their article presented several ways of managing such defects as a complication of acute pancreatitis. In the first method, the Malecot 30F drain was inserted through the duodenal wall defect with subsequent suction drainage of the pancreatic and duodenal space. In another case, the Malecot 22F drain was used, and the treatment was supplemented by feeding jejunostomy introduced through the defect. Both methods attempted to establish cutaneoduodenal fistula to promote healing. The third method included a more invasive, multi-stage treatment, with duodenal diverticulation by pylorus displacement, biliary tree drainage with Kehr’s drain and suction drainage into the retroperitoneal space as in previous cases. In the next stage (after 48 hours), the continuity of the gastrointestinal tract was restored by gastrojejunostomy. Because of excessive discharge from the drains, additional duodenojejunostomy was performed 4 months after the last intervention by Roux-en-Y technique [4].

In our case, surgery was the treatment of choice, because of the size of the abscess and inflammation of the surrounding structures with extensive necrosis of the duodenal wall. It should be noted

that the primary closure of the duodenal wall defect was impossible due to its size.

There is no uniform expert position in the literature on managing necrosis with extensive perforation of the retroperitoneal part of the duodenum. Pancreatoduodenectomy was the only known available method of treatment, however, it would have posed too much risk for our patient who had undergone nephrectomy during an ongoing infection. The situation forced the operator to perform duodenal diverticulation, to cover the defect with the free small intestinal loop and to perform decompression cholecystostomy and duodenostomy.

To the best of our knowledge, this is the very first report on closure of a large defect of the duodenal wall in this way. The biggest advantage of our method is the fact that it enabled successful treatment of duodenal defect without damaging healthy organs (pancreas) or extensive biliary tree surgery. Compared to pancreatoduodenectomy, our method is less invasive and thus is less likely to have serious complications. An alternative treatment in our case would be covering the defect with an omega intestinal loop. Due to a long segment of the intestine, which would be required for an anastomosis, as well as difficulty of dislocating the intestinal loop into the retroperitoneal space through the transverse colonic mesentery, we considered it a less desired way of managing the defect. Based on the literature, pancreatoduodenectomy should only be limited to cases where less invasive methods are not applicable [3, 4].

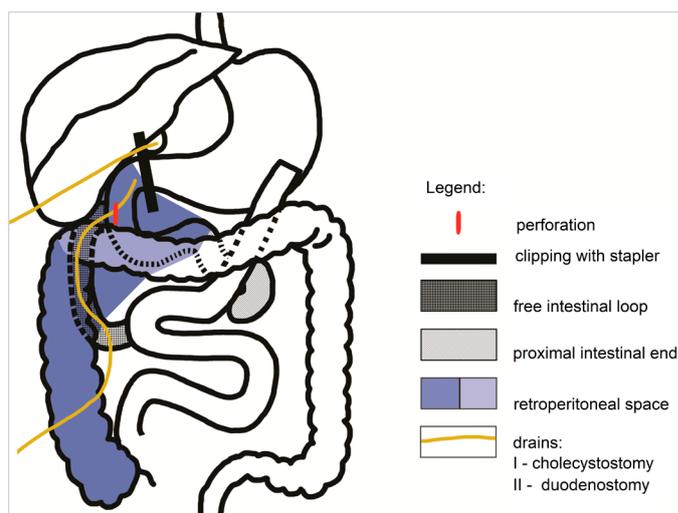


Fig. 4. The figure shows the technique of closing the duodenal wall defect with the free intestinal loop and attaching the free loop to the jejunum. The site where the free loop was inserted into the retroperitoneal space has been marked. The figure also shows duodenostomy performed by inserting the drain through the wall of the free intestinal loop and cholecystostomy using the Petzer's catheter.

Our therapeutic success makes it possible to recommend our technique for extensive duodenal wall defects as an alternative to pancreatoduodenectomy. However, to establish definitive indications for this type of surgery, it is necessary to evaluate its efficacy in further patients with a similar pathology.

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