



ORIGINAL ARTICLE

Retroperitoneal laparoscopic debridement and drainage of infected retroperitoneal necrosis in severe acute pancreatitis



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Summary Objective: To explore the effect of retroperitoneal laparoscopic debridement and drainage on infected necrosis in severe acute pancreatitis.

Materials and methods: This retrospective study included 18 patients with severe acute pancreatitis (SAP) undergoing retroperitoneal laparoscopic debridement and drainage from May 2006 to April 2012 in our hospital. All patients had infected retroperitoneal necrosis and single or multiple peritoneal abscesses. Eleven patients transferred to our hospital were treated with the retroperitoneal laparoscopic debridement and drainage within 24–72 hours after admission. Conservative treatments were given to eight patients. Retroperitoneal laparoscopic debridement and drainage were applied 3–11 days after admission.

Results: All patients had infection of necrotic pancreas or peripancreatic tissues. Twelve patients had organ failure. Three patients underwent secondary surgery. Laparotomy with debridement and drainage were applied to one patient who had a huge lesser sac abscess 7 days after first surgery. The other two patients were given secondary retroperitoneal laparoscopic debridement and drainage. One case was complicated by retroperitoneal hemorrhage, four cases had pancreatic leakage, and no intestinal fistula was found. The patients' heart rate, respiration, temperature, and white blood cell count were significantly improved 48 hours after surgery compared with those prior to surgery ($p < 0.05$). The average length of stay in hospitals was 40.8 days (range, 6–121 days), and the drainage tube indwelling time was 44.4 days (range, 2–182 days).

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Conclusion: Retroperitoneal laparoscopic debridement and drainage is an SAP surgical treatment with a minimally invasive procedure and a good effect, and can be applied for infected retroperitoneal necrosis in early SAP.

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1. Introduction

Severe acute pancreatitis (SAP) is often accompanied by infectious pancreatic necrosis, necrosis and infection of peripancreatic tissue, and pancreatic pseudocyst infection. Most patients have severe systemic inflammatory responses, some of them even accompanied by multiple organ failure (MOF). The mortality rate of SAP is as high as 30% (14–62%).¹ Infection of necrotic pancreas or peripancreatic tissues is the main cause of MOF and increased mortality. At present, the consensus of the treatment for infected pancreatic or surrounding tissue necrosis is to apply adequate drainage.² Because the traditional laparotomy with debridement and drainage has a large traumatic injury and a high mortality rate, the application of minimally invasive techniques is attracting more and more attention.^{2–4} The minimally invasive techniques being used for infected retroperitoneal necrosis in SAP include percutaneous drainage, peroral transgastric/transduodenal necrosectomy, laparoscopic percutaneous drainage, and hand-assisted laparoscopic debridement and drainage.^{4–8} As a minimally invasive surgery, retroperitoneal laparoscopic debridement and drainage is rarely reported to be used for infected necrosis of SAP.⁹ Delayed laparoscopic retroperitoneal debridement and drainage was thought to be carried out only when retroperitoneal liquefaction occurs.¹⁰ Here, we retrospectively analyzed 18 patients admitted to our hospital from May 2006 to April 2012, who underwent retroperitoneal laparoscopic debridement and drainage of SAP, to investigate the efficacy and the timing of surgery.

2. Materials and methods

2.1. General information

Eighteen patients (10 males and 8 females, average age 47.3 years, range 32–78 years) were included in this study. All studies were approved by the ethics committee of the First Affiliated Hospital of PLA General Hospital and carried out under the institutional guidelines. Contrast-enhanced abdominal computed tomography (CT) scan indicated infection of necrotic pancreas or peripancreatic tissues, and abscesses in the lesser sac, left anterior pararenal space, retroduodenal space, and paracolic gutters (Table 1). Fifteen patients had family history of biliary stones, one patient had a history of hyperlipidemia, and two patients had drinking history. CT scan showed Grade C, Grade D, or Grade E. CT severity index was 5.4 ± 1.6 , Acute Physiology and Chronic Health Evaluation II (APACHE II) score was 13.3 ± 5.4 , and Ranson score was 4.6 ± 1.2 .

Except for infected pancreatic or surrounding tissue necrosis, some patients were complicated with lack of effective circulating blood (9 cases), hypoxemia (6 cases), and acute renal failure (2 cases; Table 2).

2.2. Surgical approaches

After general anesthesia, the patients were placed in the lateral position (60°) with the affected side up. Right lateral position was used if the abscess was located in the lesser sac, pancreatic tail, left perinephric space, or left paracolic gutter. Left lateral position was used in the cases where the abscess was located in the pancreatic head, retroduodenal space, right perinephric space, or right paracolic gutter. The waist was boosted to allow better exposure. An armpit pad was used, side pads, and front and rear sides of the body were fixed with position frames. The skin was incised about 12 mm on the posterior axillary line and 2 cm under the 12th costal margin. Long curved forceps were used to separate muscles and fascia bluntly. The peritoneum was pushed away to avoid going into peritoneal cavity after injury during finger dissection of the retroperitoneal space. A water capsule filled with 300–400 mL of normal saline for 3–5 minutes was used to expand retroperitoneal space, and form a lacuna. A 12-mm Trocar (Hangzhou Kang Ji medical instrument co., LTD, Hangzhou, China) was placed after removal of normal saline and the water capsule. A 10-mm transverse incision was created 1 cm above the iliac crest in the midaxillary line. Forceps were used to separate muscles and fascia bluntly to the retroperitoneal space. A 10-mm Trocar was placed and inflated until the retroperitoneal space pressure showed 10–14 mmHg. Then, the viewer was used. A 5-mm Trocar was inserted at 2 cm below the anterior axillary line of costal arch under endoscopic direct observation. The perirenal fascia was opened along the front of the psoas muscle from retrocolic space and until the pancreatic tail (Fig. 1). Then, it was opened along the top of the pancreatic tail until the top part of pancreas and the lesser sac was reached. The pus was sucked out and necrotic tissues

Table 1 Number, percentage, and distribution of areas of necrosis ($n = 18$).

Necrotic sites	No.	%
Lesser sac	15	83
Left perinephric space	11	61
Right perinephric space	2	11
Left paracolic gutter	6	33
Right paracolic gutter	2	11
Retroduodenal	2	11

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