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Retroperitoneal Approach for Surgical Treatment of Infected Pancreatic Necrosis

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Abstract **Infected pancreatic necrosis is the most severe form of acute pancreatitis. Without proper management, the mortality rate is very high. Surgical debridement of the infected necrotic tissue and drainage are mainstays of therapy. Several methods of surgical debridement and drainage have been advocated. Various techniques of transperitoneal necrosectomy and drainage are among the recommended surgical treatment. However, reoperation for repeated debridements is usually required and some complications related to the transperitoneal approach may be encountered. The retroperitoneal approach is an alternative which has been previously proposed and reported with satisfactory outcome.**

A 42-year old male with infected pancreatic necrosis who underwent repeated surgical removal of the necrotic tissue by retroperitoneal approach via a flank incision is presented. The patient had daily debridement for 14 consecutive days and then changed to once every 2 days with 20 re-operations overall by the retroperitoneal approach during this admission. Massive amounts of necrotic materials were obtained during the early period and decreased to a minimal amount until surgery was discontinued and replaced by daily irrigation of the retroperitoneal area via a tube drain. The patient's clinical condition gradually improved with the flank wound progressively decreasing in size and eventually closing spontaneously. He was discharged on the 80th day after the first operation without evidence of pancreatic exocrine or endocrine insufficiency.

The advantage of this retroperitoneal approach is the avoidance of disturbing the intraperitoneal hollow viscus and subsequent formation of gastrointestinal fistulas. Furthermore, early enteric feeding can be initiated and patient's recovery is enhanced by improved nutritional status.

Introduction

Acute necrotizing pancreatitis is a severe form of pancreatitis with reported mortality rate around 15-50%.[1-3] The mortality rate of a patient with infected pancreatic necrosis may exceed 60%.[4] Current management of necrotizing pancreatitis is still controversial in some areas. Although the indications for operative treatment in sterile necrotizing pancreatitis have not been well established, infected pancreatic necrosis is generally accepted as an absolute indication for surgery. Several methods of surgical treatment of this dreadful entity have been recommended with variable outcome.[5-8] A case of infected pancreatic necrosis managed by repeated debridement and irrigation by the retroperitoneal

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approach via a flank or lumbar incision is presented.

Case Study

A 42-year-old male patient was admitted at King Chulalongkorn Memorial Hospital in September 2001 with chronic right upper quadrant abdominal pain. The patient had laparoscopic cholecystectomy for symptomatic gallstones 2 years previously. After surgery, he had recurrent attacks of upper abdominal pain which was diagnosed as acute pancreatitis and was repeatedly admitted for 3 times during the previous 2 years. He was successfully treated by conservative management in each admission.

The patient underwent endoscopic retrograde cholangiopancreatography (ERCP) and sphincterotomy shortly after this admission. There was no abnormality demonstrated by ERCP. However, a few hours after ERCP, he developed severe right upper quadrant abdominal pain and progressive abdominal distention. The serum amylase level was 1540 unit/L and the diagnosis of post ERCP pancreatitis was made. Conservative treatment including intravenous fluid administration and NPO was initiated. Two days later his condition deteriorated in spite of intensive therapy. He was dehydrated and restless. His blood pressure was 90/60 mm/Hg with pulse rate of 105/minute, respiratory rate of 32/minute, and body temperature of 38°C. Physical examination revealed signs of peritonitis at the right side of the abdomen. Acute abdomen series demonstrated dilatation of the small and large bowel and air bubbles around the right kidney. CT of the abdomen revealed fluid collection around the right kidney, the duodenum, and the pancreatic head with multiple abscesses formation. At this time, the diagnosis of perforated duodenum was suspected and urgent exploratory laparotomy was deemed necessary. He was then taken to the operating room for exploratory laparotomy.

Under general anesthesia, a long midline incision was made. Upon entering the peritoneal cavity, no intraabdominal pathology was identified. A large blackish fluid collection was found in the retroperitoneal area of the right side of the abdomen, extending from the level of first lumbar vertebra to the pelvic cavity. An extended Kocherization was then performed and approximately 500 ml of foul smelling fluid was recovered from the right retroperitoneal area. There was extensive necrotic tissue around the pancreatic head, the duodenum, and the right kidney. No perforation of the duodenum was found. Inflammatory edema of the pancreatic head and peripancreatic saponification were also observed. Aggressive debridement of the infected necrotic tissue was subsequently carried out. Cultures of the fluid and necrotic materials from the right retroperitoneal area revealed Enterobacter species. The final diagnosis was infected pancreatic necrosis.

Further Surgical Management Plan

Since reoperations for repeated debridement of the right retroperitoneal area were necessary to control the infective process, a flank approach to the right retroperitoneal area was planned to avoid entering the intraperitoneal cavity.

Under general anesthesia, the patient was placed in a left lateral position. A 15-centimeter long incision was made from the tip of the twelfth rib on the right side to the lateral border of the rectus abdominis muscle at the level about half-way from the umbilicus to the pubic symphysis (Figure 1). The right external oblique, internal oblique, and transversus abdominis muscles were splitted and cut along its fibers and the right retroperitoneal area was entered. The peritoneum was retracted medially and the infected necrotic materials were removed until no obvious devitalized tissue was recovered (Figure 2). Then the retroperitoneal area was copiously irrigated with large amounts of warm saline solution. At the end of the operation, the flank wound was loosely packed with moist laparotomy pads.

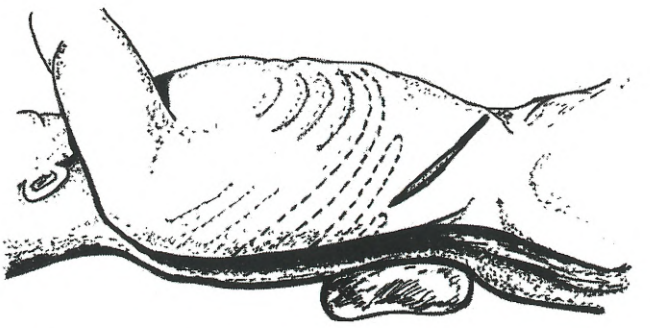


Figure 1 Right retroperitoneal area is entered through an incision made from tip of the twelfth rib to lateral border of the rectus abdominis muscle, half-way between the umbilicus and the pubic symphysis, with the patient lying in a left lateral position.

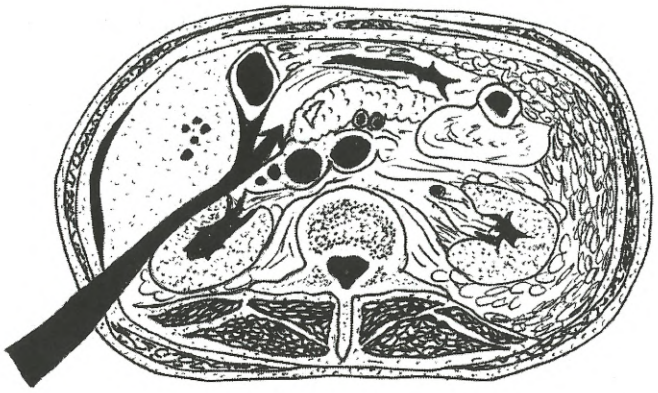


Figure 2 Cross-section to show surgical plane to the retroperitoneal area for necrosectomy.

The patient was taken to the operating room for such debridement once a day for 14 consecutive days before changing to once every 2 days. He received overall 20 re-operations by this retroperitoneal approach during this admission. Massive amounts of necrotic materials were obtained in each re-operation during the early period and decreased to a minimal amount until surgery was discontinued and replaced by daily irrigation of the retroperitoneal area via a tube drain. The patient's clinical condition improved with time. The flank wound progressively decreased in size and eventually closed spontaneously. He was completely recovered and was discharged on the 80th day after the first operation without evidence of pancreatic exocrine or endocrine insufficiency. He subsequently developed incisional hernia at his right flank which was successfully repaired in January 2003.

Discussion

Infected pancreatic necrosis is an extremely serious condition known to all experienced surgeons. Diagnosis of infected pancreatic necrosis can be made by either recovery of organisms from the peripancreatic fluid obtained from percutaneous aspiration (FNA) or evidence of abscess formation from computed tomography.[9,10] The patient in this report had preoperative evidence of peripancreatic abscesses from computed tomography which was subsequently verified by positive culture for Enterobacter species of the necrotic materials removed from the peripancreatic area.

Although survival without surgical interventions or drainage has been reported[11], this practice is not recommended by most investigators.[12] Without surgical interventions or drainage, the mortality rate approaches 100%[13]. Surgical management of infected pancreatic necrosis has long been an interesting issue. Several methods of surgical approach have been advocated. Conventional surgical treatments including debridement of the peripancreatic necrosis, placement of multiple drains with formal abdominal closure were frequently performed in the past. The mortality from such treatment was unacceptably high, ranging from 30-60%, owing to the recurrent or persistent sepsis.[14-19] Open or semi-open drainage in which the debridements are initially performed in the operating room and followed by repeated open dressing changes every 24 to 48 hours has been shown to improve survival with the mortality rate around 10-20%.[20-22] Some investigators advocated repeated debridements followed by closure over lavage catheters with the mortality rate below 20%.[7,23-25] Recently, laparoscopic necrosectomy and drainage in the management of the infected pancreatic necrosis have been performed with satisfactory outcome.[26-29] This novel technique is safe and effective only in the hands of surgeons experienced in laparoscopic surgery with full facilities for critical care management. The applicability to employ laparoscopic necrosectomy in most hospitals in Thailand is doubtful.

Retroperitoneal approach via lumbar incision is another method for necrosectomy in patients with infected pancreatic necrosis. This approach has been recommended by several investigators.[30-34] The advantage of this approach is the avoidance of disturbing the intraabdominal hollow viscus which is a major drawback of the transperitoneal open drainage technique. Serious complications associated with repeated transperitoneal necrosectomy are formation of gastrointestinal fistulas which are difficult to manage and may worsen patients' clinical conditions. We have occasionally encountered such complications with the open drainage of the infected pancreatic necrosis and have changed our method of repeated debridements of the necrotic tissue to retroperitoneal approach via a flank incision as described in this report. In the author's opinion, this method is appropriate for patients whose pathological process is confined to one side of the retroperitoneal area and no surgical treatment for intraabdominal pathology is required.

This presented case was a good candidate for the retroperitoneal approach since the infected area was localized to the right side of the retroperitoneal area. With this technique, necrosectomy could be adequately performed from around the right kidney and adrenal gland to the pelvic cavity. The intra-peritoneal cavity was not entered so the patient was able to continue enteric feeding in spite of repeated general anesthesia for debridement.

Conclusion

A case of infected pancreatic necrosis which was successfully treated by the retroperitoneal approach with repeated necrosectomy is reported. The advantages of this method are avoidance of the development of gastrointestinal fistulas and early employment of enteric feeding. This approach is a good alternative for surgeons encountering this highly lethal situation.

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