

Totally Laparoscopic Roux-en-Y Cystojejunostomy for Large Pancreatic Pseudocyst

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ABSTRACT

With the advancement of minimally invasive technique, laparoscopic internal drainage becomes an alternative in the minimally invasive management of pancreatic pseudocyst. Although most surgical procedures are laparoscopic cystogastrostomy, laparoscopic Roux-en-Y cystojejunostomy is rarely described in current literature. We report a case of a large pancreatic pseudocyst treated with internal drainage by totally laparoscopic Roux-en-Y cystojejunostomy.

Key Words: Cystojejunostomy, Internal drainage, Laparoscopy, Pancreatic pseudocyst.

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INTRODUCTION

Pancreatic pseudocyst (PPC) is a recognized complication of acute or chronic pancreatitis and pancreatic trauma. The maturation of a cyst wall generally needs 4 to 6 weeks. During this period, PPC may spontaneously resolve. Small asymptomatic PPC can be managed by regular ultrasonic observations before maturation.¹ Intervention is recommended if PPC exceeds 6 cm in diameter, persists over 6 weeks, and develops symptoms and complications such as infection, hemorrhage, and rupture.² Drainage is the principal intervention for PPC, including external drainage, endoscopic internal drainage, open internal drainage, and laparoscopic internal drainage. Recently, laparoscopic internal drainage has become a feasible, safe, and minimally invasive treatment for PPC. We report a patient with a huge PPC who underwent totally laparoscopic Roux-en-Y cystojejunostomy.

CASE REPORT

A 52-year-old woman with an enlarging mass in the upper abdomen was admitted to the Department of Minimally Invasive Surgery at First Affiliated Hospital of Jinan University Hospital. She had a history of cholecystolithiasis and transient gallstone pancreatitis, and she had been treated successfully with laparoscopic cholecystectomy

and symptomatic treatment 7 months before admission. The general conditions of the patient were fine without abdominal pain, jaundice, and other symptoms. During physical examination, a large mass of about 20 cm × 15 cm was detected over her upper abdomen without tenderness. The body mass index of the patient was 19.1 kg/m². Laboratory parameters showed that serum alanine aminotransferase, aspartate aminotransferase, amylase, lipase, total bilirubin, direct bilirubin, and indirect bilirubin I-BIL were within normal range. Ultrasound showed a peripancreatic cystic dark space, about 17 cm × 10 cm × 10 cm in size. Computed tomography revealed several hypodense shadows in the body and the tail of the pancreas, the largest one was about 16 cm × 10 cm × 8 cm in size (**Figure 1**). Both ultrasound and computed tomography revealed no common bile duct stone and choledochectasia. All the evidence demonstrated a huge PPC related to chronic gallstone pancreatitis.

Totally laparoscopic Roux-en-Y cystojejunostomy was performed on April 19, 2013, with the patient under general anesthesia with endotracheal intubation. The patient was placed in a modified lithotomy position, and the operating surgeon stood between the legs of the patient. After conventional disinfection, pneumoperitoneum (12 mm Hg) was set up by carbon dioxide through the Veress needle. The observation port was established under the

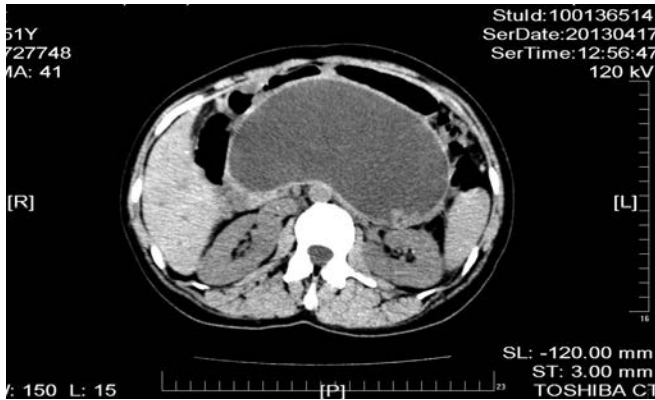


Figure 1. Preoperative computed tomography. The largest cyst was in the body and the tail of the pancreas, measuring about 16 cm × 10 cm × 8 cm.

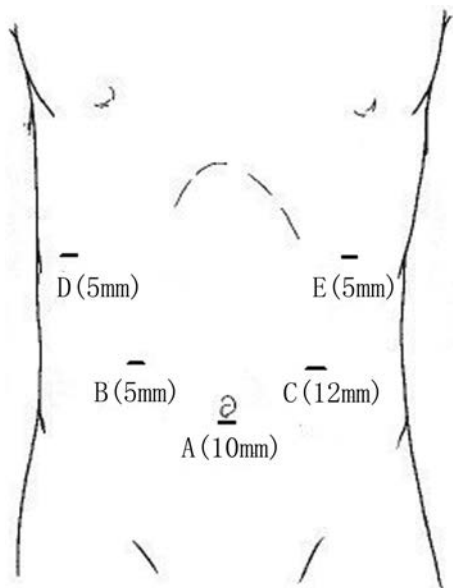


Figure 2. Configuration of trocars: port A for the laparoscope holder; port B and port C for the surgeon; port D and port E for the assistants.

umbilical margin for a 30° 10-mm laparoscope. Under direct vision of the laparoscope, 4 trocars were inserted: 1 (12 mm) at the left lumbar abdomen and 3 (5 mm) separately at the right lumbar abdomen, the left hypochondrium, and the right hypochondrium (**Figure 2**).

Through laparoscopic exploration of abdominal cavity and cavum pelvis, we found the cholecyst had been resected, and there was no adhesion and space-occupying lesion of other visceral organ. Gastrocolic ligament was dissected by the harmonic scalpel, and omentum and transverse colon were pulled upward to expose the cyst

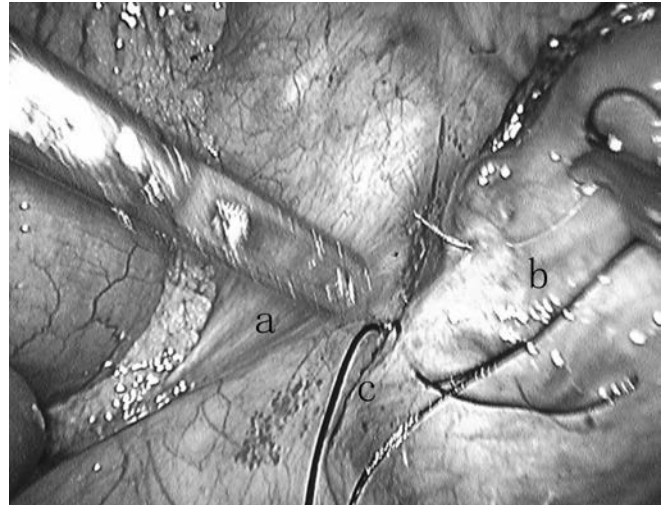


Figure 3. Side-to-side cystojejunostomy: (A) the wall of pancreatic pseudocyst; (B) the distal jejunum; (C) the anastomosis.

and the ligament of Treitz. A large yellowish-white cyst invaded the body and the tail of the pancreas, about 18 cm × 10 cm × 10 cm in size, with complete cystic wall. It was adjacent to the posterior gastric wall and approached the transverse mesocolon root inferiorly.

The jejunum was divided into 2 segments about 20 cm away from the ligament of Treitz by a linear stapler. Two small incisions were made at the jejunal wall by electrocautery, one was at the proximal jejunal incisal edge, and the other was at the distal jejunum about 50 cm away from the distal jejunal incisal edge. Two limbs of the linear stapler were inserted into each incision, and a side-to-side jejunojejunostomy was created. The anastomosis was about 5 cm wide. The residual incisions of jejunum were closed with interrupted suture. And the mesenteric defect was closed with interrupted suture to prevent internal herniation.

A 2-cm incision was made at the bottom of the cyst. The cyst wall was about 0.5 cm thick, and tissues of the cyst wall were collected for histopathologic examination. In addition to some necrotic tissue, a large amount of turbid fluid was aspirated. The distal jejunum was approximated to the cyst, and a small incision was made at the distal jejunal incisal edge. A linear stapler (Echelon Flex, Ethicon USA 60 mm-3.5 mm) was similarly inserted into the incisions of the cyst and the distal jejunum, and a side-to-side cystojejunostomy was created. The anastomosis was about 6 cm wide (**Figure 3**). The residual incisions were closed with interrupted suture. The abdominal cavity was flushed with sterile distilled water and there was no active

hemorrhage. A drain was placed beside the cystojejunal anastomosis.

The operation time was 120 minutes, and the volume of blood loss was 10 mL. Vital signs of the patient were uneventful intraoperatively. Complete blood count, alanine aminotransferase, aspartate aminotransferase, amylase, and lipase revealed normal range postoperatively. Nasogastric tube and catheter were removed on postoperative day 1, and the patient was able to ambulate mildly. Anal exhaust occurred on day 2. Liquid diet was restored on day 3. Histopathologic examination supported PPC diagnosis. As of the 8-month follow-up, she is recovering well without infection, anastomosis leakage, and other complications. Ultrasound showed that the PPC was completely resolved.

DISCUSSION

The options available for drainage of PPC are controversial, including external drainage, endoscopic internal drainage, open internal drainage, and laparoscopic internal drainage. External drainage is a simple method and mainly applied in emergency cases of secondary infection, rupture, or hemorrhage, but it is reported that recurrence is more likely to occur with high rate of infection and pancreatic fistula.^{3,4} Endoscopic internal drainage is an alternative; however, the effect of drainage is not always satisfactory due to the inadequate communication created, and hemorrhage and perforation often happen. All these disadvantages of endoscopic drainage lead to a high rate of failure and recurrence.^{5,6}

Surgical internal drainage refers to the anastomosis between PPC and gastrointestinal tract, including cystogastrostomy and Roux-en-Y cystojejunostomy, which is the most common operation procedure. Conditions determining the feasibility of cystogastrostomy are as follows: (1) PPC is adherent to the posterior wall of the stomach, or shares the same wall with the stomach; (2) PPC is confined to the lesser curvature; (3) PPC does not approach the transverse mesocolon or gastrocolic ligament with a high position; and (4) the anatomic structure of the posterior wall of the stomach is clearly visible. With the exception of the preceding conditions, Roux-en-Y cystojejunostomy is a preferred procedure.⁷ Although the positions of PPC are various, tension-free anastomosis can be ensured due to considerable removability of the nonfunctional jejunal loop. Compared with external drainage and endoscopic internal drainage, surgical internal drainage is more effective with a higher rate of success,^{8–10} additionally it allows for a histopathologic examination to exclude

malignancy.¹¹ In open internal drainage, exposure is difficult due to the deep position of the pancreas. Trauma to the patient is great, and hospital stay is long. The rate of postoperative complications such as anastomotic bleeding, leakage, and recurrence increase. Retrospective analysis reveals that open surgery has higher complication (16%) and mortality (2.5%) rates than endoscopic drainage does.¹²

With the emergence of minimally invasive surgery, the laparoscopic technique has been applied to manage PPC. Frantzides et al¹³ introduced the experience of treating PPC with laparoscopy in 1994. Laparoscopic internal drainage is a minimally invasive alternative with fewer complications and a lower recurrence rate than those of open surgery. Patients recover faster with more cosmetic abdominal incisions.^{4,14–16} Most of current literature focuses on laparoscopic cystogastrostomy.^{7,17–22} Laparoscopic cystogastrostomy has a higher rate of upper gastrointestinal hemorrhage, and recurrence often occurs due to inadequately wide anastomosis. Infection can occur when gastric content enters the cyst. Reports of laparoscopic Roux-en-Y cystojejunostomy are rarely seen.^{7,23,24} It is a relatively complicated procedure requiring advanced laparoscopic skills and perhaps a longer operative time due to the need for 1 more anastomosis. It provides effective drainage and prevents cyst infection caused by reflux. And blood loss and hospital stay decrease distinctly.

In our case, we performed the surgery after the cyst wall had been mature and thick enough. Cystojejunal anastomosis was made at the lowest position of the cyst, and it benefited drainage. Adequately wide anastomosis is critical to prevent recurrence. The anastomoses in our case were 5 cm to 6 cm wide, preventing recurrence and anastomotic stenosis. The length of the nonfunctional jejunal loop was 50 cm, and the tension of anastomosis and rate of leakage decreased.

Our initial success suggests that totally laparoscopic Roux-en-Y cystojejunostomy is technically feasible, safe, and effective for minimally invasive management of huge PPC. Further randomized comparative trials are required before the procedure can be widely accepted.

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