

A case of chronic pancreatitis treated by laparoscopic duodenum-preserving pancreatic head resection

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Abstract

Pancreaticoduodenectomy (PD) has long been used for chronic pancreatitis (CP), but greatly affects the postoperative quality of life. A new procedure called duodenum-preserving pancreatic head resection (DPPHR) has been introduced, and has little effect on the structure and function of the digestive system. With the development of minimally invasive surgical techniques, treatment of CP can be performed with laparoscopic DPPHR (LDPPHR). We present a case of CP that was successfully treated with LDPPHR. The postoperative pathological diagnosis was pancreatitis, demonstrating the feasibility of LDPPHR. We recommend this minimally invasive surgical method as preferred treatment for CP.

Key words: chronic pancreatitis (CP); duodenum-preserving pancreatic head resection (DPPHR); laparoscopic

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As a benign inflammatory disease, chronic pancreatitis (CP) is characterized by the progressive conversion of pancreatic parenchyma to fibrous tissue, with associated complications, and may require surgical treatment. The incidence of CP is about 0.01% [1]. In the vast majority of patients with CP, pain is the presenting symptom. However, CP can lead to obstructive jaundice and digestive tract obstruction. The treatment of CP includes medical management and surgical intervention. From initial treatment with pancreaticoduodenectomy (PD) to current management with duodenum-preserving pancreatic head resection (DPPHR), surgical procedures are continually improving, resulting in decreased surgical trauma. With the development of minimally invasive surgery, most of these procedures can be performed laparoscopically, with further reduction in surgical trauma.

Case report

A 46-year-old woman was admitted to our department with vague abdominal pain. She had a 6-month history of recurrent epigastric pain, which caused great distress. She agreed to treatment after CP was diagnosed.

Physical examination was nonspecific. Abdominal ultrasonography revealed a large mass in the head of the pancreas. Contrast-enhanced thin-section computed tomography revealed a mass of the pancreatic head, with a dilated main pancreatic duct. The mass was highly suspected of being inflammatory. Magnetic resonance cholangiopancreatography and endoscopic retrograde pancreatography demonstrated dilatation and tortuosity of the main pancreatic duct, suggesting the presence of CP. Serum amylase, urine amylase, serum carbohydrate antigen (CA) 19–9, serum carbohydrate antigen (CA) 125, and carcinoembryonic antigen (CEA) levels were within normal limits; indices of liver and kidney function were all within normal limits. With the initial diagnosis of CP, pain management was instituted. Six months later, with the failure of medical management and endoscopic interventions, she requested surgery. She reported progressive severity, and described her pain as unmanageable. Pancreatic head resection was planned and a laparoscopic operation was performed. During the operation, a mass was detected in the pancreatic head. DPPHR was performed. The resected specimen was a solid mass on macroscopic examination. Postoperative pathological examination showed chronic inflammation

in the pancreatic parenchyma.

Surgical procedure

The patient was placed in the supine position, with anti-Trendelenburg position (10–30°) as necessary. A 12-mm trocar was placed slightly below the umbilicus, and a pneumoperitoneum was established. Two 12-mm trocars were then placed lateral to the first trocar in the right and left midclavicular lines. Two 5-mm trocars were then placed at the right and left infracostal arch at the anterior axillary lines. The operating surgeon stood on the right side, and the assistant stood on the left. The camera surgeon stood between the legs of the patient. With access established successfully, the entire abdomen was laparoscopically examined to exclude abnormalities. The gastrocolic omentum was opened to access the gastrohepatic omentum. Then the gastrohepatic omentum was opened to visualize the pancreas. The stomach was inverted. Plastic vascular clips were placed on the gastroduodenal artery, which was then resected. In order to expose the entire pancreatic head, we skeletonized the gastrocolic trunk and resected the branches. Most of the pancreatic head was resected, preserving a 0.5-cm wide area of parenchyma close to the duodenum to avoid damage to the biliary duct. The small bowel was cut 40 cm distal to the ligament of Treitz. With careful hemostasis, the distal small intestine was raised cephalad to establish a pancreaticojejunal anastomosis. Approximately 40 cm distal to the pancreaticojejunal anastomosis, a tension free retrocolic side-to-side enteroenterostomy was performed. We placed a drain alongside the anastomosis. Recovery was smooth and uncomplicated, and the patient was discharged on postoperative day 9. She was satisfied with her postoperative quality of life.

Discussion

CP is a benign inflammatory disease in which the pancreatic parenchyma converts to fibrous tissue. The main symptom is pain in the majority of CP patients, possibly due to intraductal and interstitial hypertension, with neurogenic and central sensitization [2–4]. With disease progression, the pain will become persistent and intractable. When medical management fails, endoscopic intervention can be performed. Surgery is the last resort when all other measures have failed. Surgery for CP can be divided into two categories: drainage or removal. Simple drainage refers to longitudinal pancreatic duct jejunal anastomosis; this preserves healthy tissue, but does not remove inflammatory tissue, especially in the pancreatic head, which is considered to be the “pacemaker” of pancreatic pain. The efficacy is only 50%, and the procedure can only be applied in patients

with pancreatic duct enlargement. The removal surgery initially applied in CP was the standard Whipple procedure. As simple drainage procedures do not ensure sufficient pain relief in patients with enlargement of the pancreatic head [2, 5], resection of the pancreatic head should be a central feature of any surgical procedure [2]. DPPHR was first performed by Beger and colleagues [6–7]. Modified procedures include the Frey operation, Buchler operation, Imaizumi operation, and others. The most important advantage of this procedure is preservation of blood glucose levels and control of enteric motility [8]. The Frey procedure improves overall drainage by decompressing both the main and small ducts in the pancreatic head [2], but resection of the pancreatic head, or “pacemaker,” is incomplete, leading to the recurrence of symptoms. Despite efficacy demonstrated in randomized controlled trials, PD/LPD has very limited application for this benign disease due to high morbidity and mortality associated with the procedure [2, 9–10]. As an additional limitation, PD/LPD usually disrupts digestive function, and endocrine and exocrine functions are impaired, resulting in decreased postoperative quality of life. When compared with DPPHR, PD/LPD is associated with significant side effects due to resection of the duodenum, pylorus, and bile duct [11–13]. Similarly, pylorus-preserving PD is seldom used due to higher postoperative morbidity [14]. In recent years, DPPHR has gradually replaced PD [15–17]. However, no procedure is ideal for CP [17].

Many pancreatic diseases including CP are now routinely treated by laparoscopic surgery [18–20]. Initial medical treatment is recommended in order to avoid surgery [2]. However, early surgical pancreatic drainage is beneficial for preservation of function, which is important for a patient with CP [21–25], as well as for pain control. Early surgical intervention can reverse the pathologic process rather than simply suspending or stabilizing it [26]. We performed our first laparoscopic DPPHR (LDPPHR) procedure on the present case, which was diagnosed with CP in 2014. We had a relatively clear preoperative diagnosis, other than the possibility of a malignant tumor, so we performed minimally invasive surgery with LDPPHR. We modified the Beger procedure. Without resorting to a Kocher incision, we protected the retroperitoneal small blood vessels. Blood flow in retroperitoneal branches to the duodenum (especially the descending branches) was retained in order to avoid the formation of a retroperitoneal effusion and subsequent infection. Under the premise of sparing at least one pancreaticoduodenal arch, we resected the pancreatic head. This procedure is not only more thorough than the Beger and Frey procedures for removal of diseased tissue, but also reduces the operative steps, as well as the possibility of postoperative complications. We did not cut the pancreas without first isolating the portal vein, thus

reducing intraoperative bleeding. We retained a thin layer of pancreatic parenchyma between the common bile duct and duodenum, and posterior to the common bile duct, thereby avoiding postoperative bile duct ischemia and subsequent complications.

Compared with open surgery, laparoscopic surgery is more difficult. In some cases, the patient may be converted to an open procedure. Thus, the patient who requests LDPPHR should be carefully evaluated. A dilated diameter of the duct of Wirsung greater than 4 mm is essential, making it convenient to perform pancreaticojejunostomy using laparoscopic instruments. A history of acute pancreatitis is a contraindication, but surgery can still be performed at least six months following an attack. Of course, before LDPPHR is performed, malignant tumors must be excluded.

In conclusion, LDPPHR is feasible, but patients should be carefully selected. The highly technical procedure must be carefully performed by experienced surgeons. In order to reduce postoperative complications, the surgeon should be familiar with the anatomy and the essentials of the operation.

Conflicts of interest

The authors indicated no potential conflicts of interest.

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