

What is the Best Minimally Invasive Surgical Options for Pancreatoduodenectomy ? : Laparoscopy assisted technique (Open Pancreatic anastomosis through mini-laparotomy)

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Introduction

Pancreaticoduodenectomy (PD) has long been considered one of the most challenging abdominal operations for several reasons, including the anatomy and the postoperative serious complications. In recent years, use of minimally invasive surgery has increased, and laparoscopic pancreatic resections have been proven to be technically feasible and safe for the patient, especially in the case of distal pancreatectomies. Although laparoscopic PD has been shown to be safe, feasible, cost effective, and able to reduce hospital stay without an increase of overall complications, scientific evidence on whether laparoscopic PD offers oncologic outcomes equivalent to those of the open approach is still lacking. With regard to surgical technique, there are currently 2 trends in laparoscopic PD: one is to perform a fully laparoscopic PD and the other is to perform a hybrid approach, in which the dissection phase is carried out laparoscopically and reconstruction is done using a small laparotomy.

I do laparoscopic PD with hybrid intervention ; the dissection phase was performed laparoscopically, and then I made a small incision for performing pancreatis, biliary and gastrojejunal anastomoses. The reason for doing this is that safety must be the primary concern during the reconstruction phase because of the serious postoperative complications that can arise.

Surgical Steps

Position and placement of the trocars

The patient's position is in supine position. I used 5 trocars, and camera port was placed approximately 1 cm above the umbilicus. After inspection of the abdominal cavity, 1 other 12-mm trocar is the placed in the right mid-clavicular line 5 cm cranial to the camera trocar. Then, two 5-mm trocar is placed 1 to 2 cm under the xiphoid process in the left and the right side, to retract the stomach from the field of view during the intervention. Additionally, we use another 5-mm trocar for retraction placed in the left anterior axillary line at the umbilicus height.

Laparoscopic surgical procedures

First, the left transverse colon is grasped and retracted cranially, as the surgeon grasps and retracts to the left proximal jejunum. This exposes the Treitz ligament, the inferior mesenteric vein, and the duodenojejunal junction. Treitz ligament is widely incised, and both distal duodenum and 5 to 8 cm of proximal jejunum are fully mobilized from peritoneal attachments. Proximal jejunum and its mesentery are divided with a stapler and ultrasonic dissector, respectively. After that, greater omentum is divided to the level of the pylorus and pyloric transection is performed using a 60mm stapler. After gastric transection, the lesser sac is entered with an ultrasonic dissector. Next, careful dissection of the inferior border of the pancreatic body and neck is performed. Both splenic vein and superior mesenteric vein (SMV), and sometimes inferior mesenteric vein, must be visualized at their confluence and freed from their fat attachments. Once the pancreatic neck is widely exposed, pancreatic transection is performed by an ultrasonic dissector. Totally dissecting common hepatic arteries until the gastroduodenal artery (GDA) is reached. Complete suprapancreatic lymphadenectomy to this level exposes the portal vein above the superior pancreatic border. A retrograde cholecystectomy is performed, the common bile duct is sectioned just above its junction with the cystic duct, and posterior dissection is completed following the portal vein until the specimen is totally freed. Next, the hepatic flexure of the colon is fully mobilized from the pancreatic head; the gastrocolic trunk of Henle is identified and carefully divided. Then, the right colon is freed from its retroperitoneal attachments, and a wide Kocher maneuver is performed, freeing the anterior surfaces of inferior vena cava, aorta, and left renal vein, until reaching the left peritoneal fold opened during duodenojejunal junction dissection. The duodenum is then passed under the mesenteric vessels to the right side of the patient. From this step to the end of the operation, dissection is carried out from the caudal to the cephalad aspect of the patient. Carefully, the surgeon grasps the second duodenal portion and retracts it to the right and cephalad, as the assistant gently retracts the SMV to the left of the patient using an aspirator.

Anastomosis procedures

After checking for bleeding, a 5 cm midline incision is performed. After extraction of the specimen, the reconstruction phase begins with pancreaticojejunostomy anastomosis. Pancreaticojejunostomy was performed with duct to mucosa anastomosis with double suture. The inner layer was duct-to-mucosa with interrupted 5-0 polypropylene sutures, and a short internal stent was used. The outer layer was a seromuscular envelope with interrupted 4-0 polyglactin Lembert sutures. End-to-side hepaticojejunostomy was performed 15 cm proximal to the pancreaticojejunostomy with single-layer interrupted sutures. An antecolic duodenojejunosomy was constructed using a 2-layered anastomosis. After reconstruction, a tube gastrostomy was performed routinely instead of using a nasogastric tube. A closed suction, silicon drain (Jackson-Pratt, Baxter Health Care Corp., Deerfield, IL), was placed from the right upper quadrant posterior to the pancreaticojejunal and biliary anastomoses.