

Laparoscopic pancreaticoduodenectomy

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Abstract: Laparoscopic pancreaticoduodenectomy (LPD) is one of the most complex operations in general surgery. With the development and maturation of surgical technology, more and more of such surgeries have been reported each year. Five LPDs have been performed in our department in the past year. We have achieved very satisfying clinical results with very few complications. The average operation takes 6.5 hours, which is significantly shorter compared to prior operations. In addition, the average hospitalization time was significantly shortened. Here we present a case report on one of the LPDs.

Keywords: Laparoscopic pancreaticoduodenectomy (LPD); surgical procedure

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Patient

A female patient, 58 years old, with right upper abdominal pain for one month was admitted to our hospital. Upon physical examination no positive symptoms and signs were found. Total bilirubin was 12.7 $\mu\text{mol/L}$, direct bilirubin was 4.0 $\mu\text{mol/L}$, and CA199 was 10.4 U/mL. Abdomen enhanced CT showed an occupational lesion on the duodenal papilla with dilatation of both the extrahepatic bile duct and the common bile duct. After all preoperative examinations were performed, and no exclusion criteria were met for LPD, LPD was performed on July 23, 2014, under general anesthesia.

Surgical procedure

After anesthesia, the patient lay in a supine position and was covered with aseptic surgical towels. A 1 cm incision on the middle line right below the navel was made, and an artificial 14 mmHg pneumoperitoneum was generated. A 10 mm telescope trocar was placed through the puncture. No metastasis was found in the abdominal cavity; liver cholestasis and bile duct dilatation was identified. One 12 mm trocar was placed on the right anterior axillary line 2 cm above the navel (the major operation orifice). One 5 mm trocar was placed on the left anterior axillary

line 2 cm above the navel, and another two 5 mm trocars were placed on both the left and right axillary lines 2 cm below the costal margin respectively. The bottom of the gallbladder and the liver round ligament were suspended to reveal the hepatoduodenal ligament. Dissection of lymph nodes on the hepatoduodenal ligament and the hepatic artery was performed. On the upper edge of the pancreas, the gastroduodenal artery was transected and the lesser omentum was opened. At the lower edge of the pancreas, the right gastroepiploic vein was transected to clear the way to the posterior of the pancreas from the front of the superior mesenteric vein. A Kocher incision was made; the duodenal loop along with the head of the pancreas was gradually turned up to the left, to the front of the inferior vena cava. The duodenum was transected at 1cm from the pylorus, a pancreatic transection was made on the neck, the common hepatic duct was transected at the level of the cystic duct, and the jejunum was transected at about 10cm from the Treitz ligament. The horizontal part of duodenum was dissected, and finally the uncinate process was removed and the Whipple specimens were released. Reconstruction of the digestive tract adapted the Child style. Pancreaticojejunostomy was performed with end-to-end anastomosis using a 0.3 cm silicone tube in the pancreatic duct, and a continuous suture was used. The suturing method for the cholangioenterostomy was a



Figure 1 Laparoscopic pancreaticoduodenectomy (3). Available online: <http://www.asvide.com/articles/383>

continuous suture on the posterior wall and an interrupted suture on the anterior wall. An incision of 5 cm in size on the middle line of the upper abdomen was made through which the specimen was removed, and gastrointestinal anastomosis was performed before the incision was closed. Once again inspection was done through the telescope to check for satisfactory anastomotic suture. After peritoneal lavage with warm distilled water, and no significant active bleeding was found in the surgical wound, the mesangial hiatus was closed. A shunt was placed in both upper and lower edges of the pancreatic anastomosis, all trocars were removed, and incisions were sutured.

This surgical procedure took 450 min to finish successfully (Figure 1). The total blood loss was about 100 mL and no blood transfusion was needed. Postoperative recovery showed flatus on day 4 after surgery. The stomach tube was removed on day 5, and the patient could uptake liquid diet and performed minor ambulation movements. The patient had defecation on day 6. Body temperature remained normal after surgery. Serum amylase tested as normal. The patient had little peritoneal drainage and the shunts were removed on day 10 post-surgery. The patient was discharged 12 days after the operation. The pathology report is as follows: the patient had a duodenal papilla protruded signet-ring cell carcinoma (1.2 cm × 0.8 cm × 0.5 cm). The upper and lower transection margins of duodenum, pancreas, and common bile duct were all negative. Lymph nodes (liver duodenal intestine, 0/2; duodenum mesangial, 0/2; and free lymph nodes, 0/1) were all negative. No adverse complaint from the patient was obtained during follow-up.

This surgical procedure has a shorter operation time, fewer complications, and a shorter hospital stay that owes its advantages to laparoscopic surgery. However, LPD has a

high technical requirement, especially for the reconstruction of the gastrointestinal anastomosis. Surgeons require a longer learning curve, which is a challenge for the young doctor. Our hospital has been performing laparoscopic surgery for many years, including laparoscopic gastrectomy, laparoscopic distal pancreatectomy (1), laparoscopic middle pancreatectomy (2), laparoscopic common bile duct cyst excision, etc. We have accumulated substantial experience in laparoscopic surgery, and have overcome many technical challenges in laparoscopic pancreatic surgery, such as lymph node dissection, uncinata process removal and reconstruction of the digestive tract. Nevertheless, due to the rarity of LPD surgery undertaken in our hospital, we are still far from highly skillful in uncinata resection. Therefore, there is still space for improvement and further shortening of the operation time.

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