

**Case Report**
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## Experience of Laparoscopic Duodenum Preserving Pancreatic Head Resection

Hu Lei

Department of Hepatobiliarypancreatic Surgery, The First People's Hospital of Yunnan Province, Affiliated Hospital of Kunming University of Science and Technology. 157 Jinbi Road, Xishan District, Kunming City, Yunnan Province, China

**ABSTRACT**

**Background:** In the era of rapid development of laparoscopic technology, laparoscopic duodenectomy with preservation of the head of pancreas (laparoscopicduodenum preserving pancreatic head resection, LDPPHR) is difficult to operate, so there are few reports.

**Methods:** A case of this operation performed by the Department of Hepatobiliary surgery of the first people's Hospital of Yunnan Province in March 2021 was analyzed retrospectively.

**Results:** The operation of the patient was smooth, no serious complications occurred, recovered well, and was discharged smoothly.

**Conclusions:** LDPPHR is safe and feasible in accordance with the indications. LDPPHR is worth popularizing.

**\*Corresponding author**

Hu Lei, Department of Hepatobiliarypancreatic Surgery, The First People's Hospital of Yunnan Province, Affiliated Hospital of Kunming University of Science and Technology. 157 Jinbi Road, Xishan District, Kunming City, Yunnan Province, China. Tel No: 152 8719 4832; E-mail: hulei77958@126.com

**Received:** June 20, 2022; **Accepted:** June 23, 2022; **Published:** June 30, 2022

**Keywords:** Laparoscopic Duodenum Preserving Pancreatic Head Resection, Improved Beger, The Head of Pancreas Retrospectively

Pancreatic duodenectomy, (PD) or pylorus preserving pancreatic duodenectomy, (PPPD) in the past was seen as a placeholder disease of traditional operation scheme of head of pancreas retrospectively. With the development of medicine, there are more and better surgical options. In 1972, Beger et al. proposed duodenum preserving pancreatic head resection (DPPHR) in the treatment of chronic pancreatitis, which has become one of the surgical options for benign or partial low-grade malignant tumors in the head of the pancreas [1].

In the era of rapid development of laparoscopic technology, laparoscopic duodenum preserving pancreatic head resection (LDPPHR) was poorly reported due to its difficult operation. The department of hepatobiliary Surgery in our hospital successfully performed 1 case of this operation in March 2021. The relevant data are summarized as follows.

**Clinical Data**

A 37-year-old female patient was admitted to the hospital due to pancreatic head occupation. The patient had no jaundice before surgery, and no abnormalities in tumor markers CA19-9, CEA and CA125 were observed. Color ultrasound suggested slightly high echoic nodules in the pancreatic head area, which was considered to be occupied by the pancreatic head. CT showed: irregular mixed low-density shadow was observed on plain scan of the head of the pancreas, with an unclear boundary of about

3.1cm×2.8cm. The degree of enhancement of enhanced scan was lower than that of surrounding normal pancreas parenchyma, so more consideration was given to occupying space (Figure 1). Magnetic resonance examination revealed space occupation at the head and neck junction of the pancreas (Figure 2). After informing the patient and his family of the condition and treatment options, the patient signed and agreed to undergo laparoscopic duodenal and pancreatic head resection.

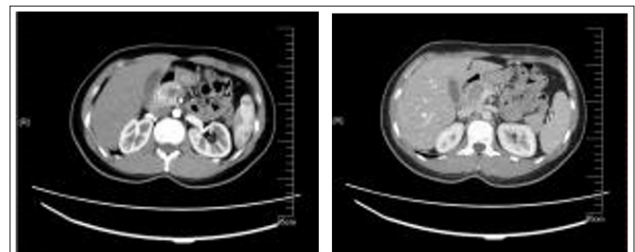


Figure 1

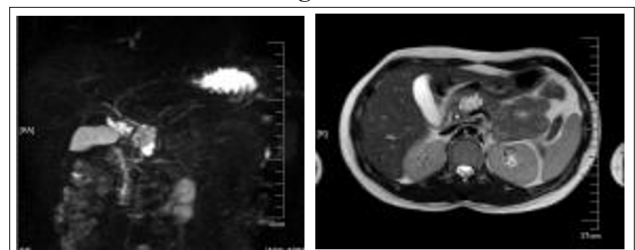


Figure 2

## Sugure

Patients were placed in supine position, and towels were disinfected after anesthesia took effect. An incision was made at the upper margin of the umbilicus with a length of about 5.0cm and an incision of about 1.0cm at 2.0cm below the costal edge of the right side. The laparoscopic poke card poked holes into the abdomen in turn. Conventional abdominal exploration showed no tumor metastasis, and ultrasound scalpel was used to hit the aperitif colon ligament to expose the pancreas. There is a 3.0cm diameter mass at the neck of the pancreas near the head of the pancreas. The retro pancreatic tunnel was opened above the portal vein, the Kocher incision was opened, and the branch vessels were ligated with a ligature pin clamp. The medial margin of the duodenum should be preserved at 0.5~1.0cm when the pancreatic neck is transected. The inferior pancreaticoduodenal artery and the first jejuna artery should be protected to prevent ischemia of the horizontal part of the duodenum. Ultrasound knife was used to transection the pancreas near the caudal side of the pancreatic body from the tumor, turn the pancreas to the cephalic side, and gradually strip the pancreas from the posterior peritoneum to preserve the posterior arterial arch on the dorsal membrane of the pancreas, so as to prevent the common bile duct and ampulla Vater from ischemia. The branch vessels near the head of the pancreas and the main pancreatic duct of the head of the pancreas were ligated with a laparoscopic clamp, absorbable ligature clamp and a series of intracavitary clamps. Pancreatic tumor was resected and duodenum-preserving pancreatic head resection was performed. The intraoperative frozen pathological examination after family members' examination suggested that the pancreatic head tumor was benign, and the tumor was paraffin waxed. Checking that no overflow, pancreatic juice, bile and intestinal juice under the common bile duct segment and duodenum without damage, about 15.0cm from the distal flexor tendon using electric nail straight cutting anastomotic and warehouse transection of cavity mirrors jejunum, using ultrasonic knife in pancreatic body mesocolon line a diameter of about 3.0cm incision, pull distal jejunum to pancreatic tail section, looking for the pancreatic duct, A pancreatic duct drainage tube was placed in the distal main pancreatic duct, and an incision with a diameter of 0.5cm was made about 2.0cm away from the broken end of the distal jejunum. Adenotubulojejunostomy was performed with absorbable surgical sutures, and no bleeding, pancreatic leakage or intestinal leakage was detected. Jejunum-jejunal anastomosis was performed at about 60cm from the pancreatic duct jejunal anastomosis using linear cutting stapler and nail bin. A drainage tube was placed at the Wentschner's foramina and the pancreatic intestinal anastomosis, and the abdomen was closed layer by layer after checking the correct instruments and dressings.

## Result

The operation duration was 290 minutes, the intraoperative blood loss was 50ml, and no blood transfusion was performed. Postoperative pathological report: (immune histochemical results of pancreatic head tumor were micro cystic serous cystadenoma). No serious complications such as hemorrhage, pancreatic leakage, biliary leakage, duodenal fistula, and common bile duct stenosis were found after operation.

## Discussion

DPPHR is an important surgical procedure in the treatment of benign or partial low-grade malignant masses on the head of pancreas, with the premise of preserving the integrity of digestive tract, and improving the prognosis and quality of life of patients. Therefore, a variety of improved procedures have been developed, such as Frey surgery, Beme surgery, Takada surgery, etc [2-4]. In this case, a modified Beger procedure was performed under a

single hole. A little pancreatic tissue was retained at the stump of the medial margin of the duodenum, but pancreaticoenterostomy, electrocoagulation and ligation of the main pancreatic duct were not performed here [5]. LDPPHR is another advance of DPPHR. Indications of DPPHR: ① Chronic pancreatitis and its resulting mass type on the head of the pancreas; ② Pancreatic duct calculi at the head of the pancreas; ③ Benign mass, borderline or low grade malignant mass in the head of pancreas; ④ pancreatic trauma; ⑤ pancreatic mitosis deformity [6-9]. The therapeutic range of LDPPHR is similar to DPPHR. The key and difficulty of LDPPHR surgery is to ensure blood supply of duodenum and bile duct [10]. The anterior and posterior pancreatic duodenal arcs are crucial. Because it is bidirectional blood flow, theoretically retaining either side of the aortic arch can ensure the duodenum and bile duct function. The gastroduodenal artery often gives off the anterior duodenal artery, and the superior mesenteric artery gives off the inferior anterior pancreaticoduodenal artery [11]. The posterior pancreaticoduodenal aortic arch is located on the dorsal side of the head of the pancreas and can be shown by Kocher incision. In Berger method, pancreatic tissue of 0.5~1.0cm at the stump of the medial margin of the duodenum was subtotal resection of the pancreatic head to protect the anterior and posterior aortic arches. It is important to maintain the integrity of the posterior pancreatic fascia during operation. Although Kocher incision risks damage to the posterior aortic arch, it is suitable for surgical exploration and identification of the posterior pancreaticoduodenal aortic arch [12]. It is up to the surgeon to cut Kocher. In this operation, Kocher was opened without injury to the posterior pancreaticoduodenal arch. Advantages of LDPPHR surgery: safe and feasible, minimally invasive surgery with clear vision and fast recovery; The intact duodenum makes the physiological function of digestive tract unimpaired. The tail of the pancreatic body and the intestine-pancreatic axis exist, and insulin secretion and blood glucose regulation are not infringed [13]. The surgical team should have rich knowledge of endoscopic anatomy theory and be skilled in operating endoscopic instruments. In conclusion, LDPPHR surgical resection scope is small, small trauma, although the operation is difficult, but patients benefit a lot. It is believed that with the continuous efforts of hepatobiliary surgeons, the operation of LDPPHR will become more skilled and more patients will benefit.

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