Laparoscopy-assisted spleen-preserving distal pancreatectomy with conservation of the splenic artery and vein

Hironori Kaneko, Sumito Takagi, Naoki Joubara, Kunihiro Yamazaki, Yoshihisa Kubota, Masaru Tsuchiya, Yuichiro Otsuka, and Tadaaki Shiba

Department of Surgery, Omori Hospital, Toho University School of Medicine, 6-11-1 Omorinshi, Ota-ku, Tokyo 143-0015, Japan

Abstract

Herein, we report the successful performance of a laparoscopy-assisted spleen-preserving distal pancreatectomy with conservation of the splenic artery and vein for a patient with pancreatic cystadenoma, as a minimally invasive procedure with the preservation of function. The laparoscopy-assisted distal pancreatectomy procedure involved detaching the spleen and the distal pancreas from the retroperitoneum by a hand-assisted procedure, removing them from the peritoneal cavity through a small incision, and detaching the distal pancreas by ligating and transecting the short gastric artery and vein and the branches of the splenic artery and vein, while the spleen and main splenic artery and vein were preserved under direct view. The pancreatic parenchyma was transected with a stapling device (TL-30), and continuous suturing was added to the resected margin. The patient’s postoperative course was uneventful; the patient started to eat and walk on postoperative day 2 and was discharged on day 8. It is considered that the combination of hand-assisted and laparoscopy-assisted distal pancreatectomy, with conservation of the splenic artery and vein, is a minimally invasive and clinically useful technique for treating tumors of cystic disease of the pancreas with low-grade malignant potential, or benign solitary neuroendocrine tumors.

Key words Laparoscopic pancreatectomy · Laparoscopy-assisted surgery · Hand-assisted laparoscopic surgery · Distal pancreatectomy with conservation of the splenic artery and vein

Introduction

Laparoscopic surgery for diseases of the pancreas has not been actively performed due to the anatomical complexity and the requirement for more refined skills compared to other gastrointestinal surgery. However, recent developments in laparoscopic procedures and instruments, as well as in laparoscopy-assisted and hand-assisted techniques, has allowed new approaches to the surgical treatment of pancreatic disease. In particular, pancreatic cystadenomas, found more frequently now due to advances in imaging diagnostics, have malignant potential and are basically indicated for resection; the operation is intended to be function-preserving and minimally invasive. Herein, we report the successful performance of a combination of laparoscopy-assisted and hand-assisted spleen-preserving distal pancreatectomy with conservation of the splenic artery and vein, as a minimally invasive procedure with the preservation of function.

Patient and surgical technique

The patient was a 41-year-old woman. During a visit to her primary physician because of hypertension and hyperlipidemia, her blood chemistry demonstrated liver dysfunction. Imaging examination revealed a mass in the pancreas, and she was admitted to our hospital.

Blood chemistry revealed elevation of GOT (44 IU/l), GPT (74 IU/l), and lactic dehydrogenase (LDH; 435 IU/l). Serum amylase levels were normal. Tumor markers, such as carbohydrate antigen (CA) 19-9, carcino-embryonic antigen (CEA), and tissue polypeptide antigen (TPA), were within the normal range.

Abdominal ultrasonography showed a hypoechoic cystic lesion, 28 mm in diameter, with septa, in the distal pancreas.

On abdominal computed tomography (CT) and magnetic resonance imaging (MRI), a cystic lesion, 28 × 23 mm in size with multiple loculations, was found in the distal pancreas (Fig. 1a).

Endoscopic retrograde cholangiopancreatography (ERCP) did not reveal a mass in the pancreas. There
was no detectable abnormality in the main pancreatic duct, nor was there communication with a mass.

Endoscopic ultrasonography showed a hypoechoic cystic lesion with septum, and a suspected papillary elevated lesion 5 mm in diameter (Fig. 1b). Abdominal angiography revealed that there were no abnormal vascular formations, vascular compressions by a tumor, or tumor staining.

The patient was diagnosed as having a pancreatic cystadenoma with cholecystolithiasis. However, a definitive diagnosis of the pancreatic cyst was not made. Moreover, malignant potential could not be excluded because of what appeared to be a 5-mm papillary elevated lesion observed by endoscopic ultrasonography.

Laparoscopy-assisted spleen-preserving distal pancreatectomy and cholecystectomy were performed on October 6, 2001. Under general anesthesia, the patient was placed in the supine position. Trocars (10 mm) were introduced on the right of the umbilicus and at the right side of the abdomen, while 5-mm trocars were inserted at the epigastrium and left side of the abdomen under a condition of pneumoperitoneum. Next, the greater omentum was dissected to open the bursa omentalis. The splenocolic ligament was transected in order to mobilize the spleen. The retroperitoneum was dissected such that the inferior margin of the pancreas was exposed. The site of the tumor and its relationship to the splenic artery and vein were confirmed by intraoperative laparoscopic ultrasonography. Then, the trocar cite at the epigastrium was extended to 7 cm in diameter (Fig. 2) and a disk for laparoscopy (Lap-Disk; Hakko, Tokyo, Japan) was inserted, such that the spleen and the distal pancreas were detached from the retroperitoneum by a hand-assisted technique. The pneumoperitoneum was interrupted and the spleen and the distal pancreas were pulled out of the peritoneal cavity through the small incision at the epigastrium. Under direct view, the short gastric artery and vein and the branches of the splenic vein were ligated and transected, while the spleen and splenic artery and vein were preserved (Fig. 3), and the distal pancreas was detached from the spleen. The pancreatic parenchyma was transected with a stapling device (TL-30; Ethicon, NJ, USA; Fig. 4), and continuous suturing was added to the resected margin (Fig. 5). The distal pancreas was removed. The preserved spleen was placed back in the peritoneal cavity after the Lap-Disk was closed and the condition of pneumoperitoneum was created again (Fig. 6). Cholecystectomy was performed by the regular procedure. After drains had been inserted beneath the left diaphragm and at the resected margin of the pancreas and Winslow’s space, the abdomen was closed. The operative time was 150 min, and blood loss was 190 ml.