

Laparoscopic distal pancreatectomy for neuroendocrine tumors of the pancreas

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Abstract: The incidence of incidentally discovered nonfunctioning pancreatic neuroendocrine tumors (PNETs) is increasing because of the widespread use of radiologic imaging studies. Due to their mostly small size, PNETs in the body and tail of the pancreas are suited for laparoscopic surgery. This video described our technique of laparoscopic distal pancreatectomy with and without preservation of spleen and splenic vessels for PNET. The decision on preservation of spleen and splenic vessels was made according to the relative location of tumors to the splenic vessels.

Keywords: Pancreatic neuroendocrine tumor; laparoscopy; distal pancreatectomy; spleen preservation

Submitted Nov 14, 2017. Accepted for publication Dec 21, 2017.

doi: 10.21037/gs.2017.12.09

View this article at: <http://dx.doi.org/10.21037/gs.2017.12.09>

Introduction

Recently the incidence of nonfunctional pancreatic neuroendocrine tumors (PNETs) has increased because of better detection and improved diagnosis. Surgical resection remains the only potentially curative treatment for localized PNETs (1,2). With advances in laparoscopic techniques, laparoscopic pancreatic surgery is becoming an alternative to open pancreatic surgery in selected patients with PNET (3). Particularly small PNETs located in the pancreatic body and tail may be a suitable indication for laparoscopic surgery. Recent studies have demonstrated that laparoscopic distal pancreatectomy can be a safe and effective procedure in the treatment of PNET. Laparoscopic surgery had less operative blood loss and shorter hospital stay compared to open distal pancreatectomy without compromising oncologic outcomes and survival (3-5).

Spleen preservation during distal pancreatectomy is performed in patients with benign or low grade malignant tumor to avoid the risk of postoperative infectious complications after splenectomy (6). With the refinement of laparoscopic skills, efforts have been made to preserve the splenic vessels preferred to avoid spleen-related

complications (7). However, the impact of preservation of the spleen or splenic vessels on perioperative outcomes of distal pancreatectomy has not been fully determined. The choice of operative type of laparoscopic distal pancreatectomy is dependent on various factors, including tumor location, tumor grade or size, and surgeon's preference.

This video article describes our laparoscopic distal pancreatectomy with and without preservation of spleen and splenic vessels for small nonfunctioning PNETs (*Figure 1*).

Operative techniques

Patient selection

Laparoscopic distal pancreatectomy was performed when there was no evidence of tumor invasion to other organs except the left adrenal gland, spleen, and splenic vessels on preoperative radiologic images. The decision on preservation of spleen and splenic vessels was made according to the relative location of tumors to the splenic vessels. The spleen and splenic vessels were preserved unless the tumor was close to the splenic hilum, or malignancy was suspected.



Figure 1 The video shows laparoscopic spleen and splenic vessel-preserving distal pancreatectomy and laparoscopic distal pancreatectomy with splenectomy in two patients with PNETs (8). Available online: <http://asvidett.amegroups.com/article/view/22509>

Operative procedure

Under general anesthesia, patients were placed in the supine position and tilted into the reverse Trendelenburg position with left-side-up adjustment. A pneumoperitoneum was created through a 12-mm infra-umbilical port. Intra-abdominal pressure was maintained below 13 mmHg. The operator and scopist were positioned to the right side of the patient and the assistant stood on the opposite side of the patient. Two main ports (12- and 5-mm ports) for the operator were inserted in the right upper abdomen. Two additional 5 mm ports for the assistant were placed in the left upper abdomen. A flexible laparoscopy was employed.

The lesser sac was entered after dividing the gastrocolic ligament using an energy device: an ultrasonic shear (Harmonic scalpel®, Ethicon, Cincinnati, USA) or a bipolar vessel-sealing device (LigaSure™, Medtronic, Minneapolis, USA). After wide opening of the gastrocolic and gastrosplenic ligament, the body and tail of the pancreas was entirely exposed. The stomach was fixed to the abdominal wall using sutures to maintain a good working space. The inferior border of the pancreas was dissected until the splenic vein was exposed. Care was taken not to make a defect in the transverse mesocolon to prevent the development of an internal hernia. Thereafter the superior border of the pancreas was dissected until the splenic artery was exposed. After isolation of the splenic artery, a tunnel was created between the posterior surface of the pancreas and splenic vessels. Next the pancreas was transected with a 60 mm endoscopic linear stapler.

When distal pancreatectomy with preservation of spleen

and splenic vessels were performed, the distal pancreas was dissected meticulously off the splenic vessels in a medial-to-lateral fashion. Small branches of the splenic vessels encountered during dissection are controlled using a bipolar vessel-sealing device without prerequisite dissection, sometimes along with the surrounding pancreatic parenchyma when the splenic vessels are embedded into the parenchyma. This technique was useful in reducing the risk for bleeding during complete dissection of the small splenic vessel branches, especially when the splenic vessels were deeply located in the pancreas parenchyma. When distal pancreatectomy with splenectomy was performed, the splenic artery and vein were ligated and divided using Hem-o-lok clips® (Weck Teleflex Medical, Research Triangle Park, NC, USA). Lymph nodes around the splenic vessels were dissected. As the dissection was continued laterally as far as the spleen, the superior and inferior attachments of the distal pancreas were divided. Finally the short gastric vessels were divided.

After careful hemostasis and irrigation, fibrin glue was sprayed on the pancreatic resection margin. A closed suction drain was placed near the pancreatic stump through a 5 mm port in the left upper abdomen. The surgical specimen was bagged and extracted through a small extension of the umbilical port.

Comments

This video suggests the technical feasibility and safety of laparoscopic distal pancreatectomy in patients with small nonfunctional PNETs. However, a large scale study with long-term follow-up is needed to confirm the oncologic safety of laparoscopic distal pancreatectomy for PNETs.

Acknowledgements

None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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Cite this article as: Hyun IG, Yoon YS, Han HS, Cho JY, Choi Y, Kim S, Kim KH. Laparoscopic distal pancreatectomy for neuroendocrine tumors of the pancreas. *Gland Surg* 2018;7(1):54-56. doi: 10.21037/gs.2017.12.09