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Case-matched study of lesser versus greater curvature approach in laparoscopic Warshaw pancreatectomy

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Abstract

BACKGROUND: In laparoscopic distal pancreatectomy (LapDP), the pancreas is accessed in a greater curvature approach (GCA). The lesser curvature approach (LCA) has been proposed in underweight patients. The study investigated the feasibility of LCA irrespective of the body mass index (BMI).

METHODS: This retrospective study included consecutive patients scheduled to undergo LapDP with the LCA. A matched cohort (1:1) underwent GCA. Spleen preservation was performed using the Warshaw technique. Splenic perfusion was intraoperatively assessed by indocyanine green (ICG) angiography.

RESULTS: The LCA with LapDP was successful in 12/15 patients. In 2 cases, LCA had to be converted to GCA and in 1 patient to open surgery. The cohorts were well matched in sex ($P = 1.0$), age ($P = .67$), indication ($P = 1.0$), and median BMI (23.4 kg/m^2 vs 24.8 kg/m^2, $P = .41$). Splenic preservation was achieved in 14/15 patients with LCA and 4/15 patients with GCA ($P = .33$). In all LCA cases, ICG angiography indicated sufficient spleen perfusion. The groups had similar morbidity ($P = 1.0$) and hospital stay ($P = .74$).

CONCLUSIONS: LCA was feasible in 80% irrespective of BMI and provided an excellent field of exposure. ICG angiography was feasible in the Warshaw technique. Its reliability should be evaluated in prospective studies.

Laparoscopic distal pancreatectomy (LapDP) may represent a safe, effective alternative to open distal pancreatectomy in benign pancreatic diseases focused on the body or tail of the pancreas. The role of LapDP for pancreatic malignancies remains controversial. Compared with open distal pancreatectomy, LapDP has the advantage of improved intraoperative visualization, smaller incisions, less postoperative pain, less blood loss, a shorter hospital stay, and less morbidity.[1–12] LapDP has been described with and without a splenectomy. The spleen plays an important

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role in the human immune system; therefore, spleen resection should be avoided. Comparing a distal pancreatectomy with a splenectomy, spleen preservation typically results in lower infection rates, less severe complications, shorter hospital stays,[13,14] and a lower rate of clinically relevant fistulas.[15] Splenic preservation can be accomplished in 2 ways. First, the splenic artery and vein can be skeletonized, but this method is time consuming and technically demanding. Second, the splenic artery and vein can be transected at the hilum of the spleen and at the point of pancreatic transection; this method relies on the short gastric and left gastroepiploic vessels for splenic perfusion, as first described by Warshaw in 1988.[16] The latter technique has become the procedure of choice in our department. Typically, in LapDP, the lesser sac and the pancreas are accessed by dividing the gastrocolic ligament. In this so-called greater curvature approach (GCA), the visual field is limited by the stomach; therefore, the stomach must be retracted throughout the procedure. Alternatively, Suzuki et al[17] demonstrated a lesser curvature approach (LCA) accessing the pancreas by incision of the hepatogastric ligament along the lesser curvature in 2 underweight patients with low-hanging stomachs. In both cases, the LapDP was performed without splenic preservation. This LCA obviated the need for stomach retraction because using an anti-Trendelenburg position, the stomach is retained caudally by gravity. In our hospital, from 2013, the LCA has been the standard method of access in LapDP. Here, we compared the LCA to the GCA in LapDP with the Warshaw technique in a case-matched historic series of patients to determine the advantages and disadvantages.

Patients and Methods

Patients

This retrospective case series study retrieved medical records on patients who required distal pancreatectomies from January 2013 to August 2015. We included consecutive patients scheduled to undergo LapDP with LCA with the Warshaw technique. These patients were compared with a cohort of patients who underwent LapDP with a GCA from 2009 to December 2012 at the same institution. The 2 groups of patients were matched for sex, age, and indication (benign or neuroendocrine tumor [NET]). All the procedures were performed by the same surgeon (K.Z.), who had previously performed over 100 LapDPs.

Surgical techniques

Laparoscopic spleen-preserving distal pancreatectomy with LCA. The patient was placed in a French position. A Veress needle was inserted, and a CO_2 pneumoperitoneum was established with an intraabdominal pressure of 12-mm Hg. Two 10-mm and three 5-mm trocars were placed, as shown in Fig. 1. A 10-mm 30° laparoscope (Karl Storz, Tuttlingen, Germany) was inserted through the umbilical trocar. The peritoneal cavity was examined for unsuspected malignancies. The patient was placed in an anti-Trendelenburg position, and the liver was retracted ventrally with a liver paddle. LCA was preferred, when there was adequate space between the liver and the lesser curvature; otherwise, a GCA was implemented (Fig. 2). The hepatogastric ligament was dissected to allow entry into the lesser sac to expose the pancreatic body and tail (Fig. 3). LigaSure (Medtronic, Dublin, Ireland) was used for the dissection and hemostasis. During the LCA, the stomach remained in the normal position. First, the inferior border of the pancreas was exposed with a peritoneal incision, followed by thorough mobilization of the pancreas, starting at the portal vein axis. Then, the superior border of the pancreas was mobilized, and the splenic artery and vein were identified. The transection point of the pancreas was chosen according to the location of the pathologic lesion. Intraoperative laparoscopic ultrasound was used to identify the pathologic structures. After applying polymeric hemostatic clips, the splenic artery was divided at the estimated transection point of the pancreas. Next, the vein was divided with an endoscopic stapler with a vascular magazine (length 45 mm). The superior mesenteric vein was accessed by passing underneath the pancreas. The pancreas was as well divided with an endoscopic stapler (length 60 mm; Fig. 4) without over-sewing the pancreatic duct. The pancreatic tail was prepared, starting at the posterior and proceeding to the left, which resulted in exposing the hilum of the spleen. The splenic artery and vein were divided at the distal end of the pancreatic tail, before the division into segmental spleen vessels, with a linear endoscopic stapler (length 45 mm) or polymeric hemostatic clips. The short gastric and the left gastroepiploic vessels were preserved for perfusion of the spleen. The perfusion

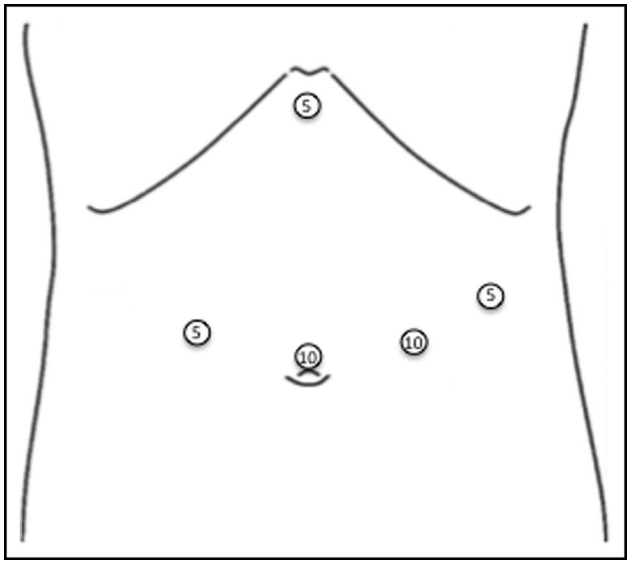

Figure 1 Placement of the trocars for laparoscopic distal pancreatectomy.