

MALCOLM M. BILIMORIA, CONSTANTINE T. FRANTZIDES,  
MINH LUU, AND LUIS E. LAGUNA

## Minimally Invasive Distal Pancreatectomy

The role of laparoscopy continues to evolve as part of the armamentarium of the modern day pancreatic surgeon. In the late 1980s and early 1990s, laparoscopy emerged as a tool to diagnose metastatic disease and assess tumor resectability in patients with pancreatic cancer. Laparoscopic evaluation of the abdomen prior to a major pancreatic resection can avoid a laparotomy in patients with metastatic disease not seen on a preoperative computed tomography (CT) scan. Today, with the improved sensitivity of CT scanning and magnetic resonance imaging, occult metastases uncovered by laparoscopy are becoming less common, and so many pancreatic surgeons have de-emphasized the staging laparoscopy. Some data suggest, however, that diagnostic laparoscopy can reveal small peritoneal metastasis in 5% to 15% of patients with a negative CT scan. The use of laparoscopic ultrasound for the determination of pancreatic tumor resectability has been partially replaced by high-resolution CT scanning and endoscopic ultrasound. Laparoscopic ultrasound still is useful, however, in the resection of pancreatic neuroendocrine tumors, because some of the tumors that are not found on preoperative imaging subsequently may be located with the ultrasound technology.

Since the mid-1990s, the use of laparoscopy for resection of pancreatic tumors has increased steadily. Resectional procedures range from the enucleation of neuroendocrine tumors to pancreaticoduodenectomy for periampullary carcinoma. In 2002, there were fewer than 70 reported cases of laparoscopic distal pancreatectomy; in 2006, however, there were more than 400 reported cases, and new series are being published at an increasing rate. This rapid growth of laparoscopic distal pancreatectomy has left many questions as to the benefit, complications, and overall indications for this technically difficult laparoscopic procedure. In this chapter we will present our perspective on this procedure and its related issues.

### OPERATIVE INDICATIONS

There appears to be no consensus on whether any pancreatic disease should be excluded from a laparoscopic resection. One issue with laparoscopic resection for pancreatic cancer is port site metastasis. Currently, it is difficult to know whether a laparoscopic distal pancreatectomy for malignant disease, particularly adenocarcinoma, will produce a high rate of wound implants,

carcinomatosis, and a decreased overall survival. Recent data from the literature on colorectal cancer suggest that the incidence of port site metastasis after laparoscopic resection is not different from that of wound site implantation after open resection. Extrapolating the data from colon cancer to pancreatic cancer may be troublesome, so some authors continue to advocate laparoscopic distal pancreatectomy only for benign lesions. A multi-institutional prospective randomized study might determine the effectiveness of laparoscopic pancreatectomy for the treatment of adenocarcinoma, but whether such a trial is feasible is difficult to know. Precise preoperative indications and contraindications for laparoscopic pancreatic resection of a presumed malignancy have not been defined at this point in time.

### PREOPERATIVE EVALUATION, TESTING, AND PREPARATION

Prior to embarking on a laparoscopic distal pancreatectomy the surgeon should try to obtain a tissue diagnosis. Endoscopic ultrasound (EUS) is useful for this purpose and is especially relevant if adenocarcinoma is suspected. When cases of intraductal papillary mucinous neoplasia are suspected, the EUS also can help determine the extent of disease. For suspected neuroendocrine tumors, an octreotide scan is important to rule out multifocal disease; in addition, preoperative serum biochemical markers should be drawn for the purpose of postoperative surveillance. If there is a reasonable probability that a splenectomy will need to be performed in conjunction with the distal pancreatectomy, then prophylactic vaccinations (pneumococcal, meningococcal, and *Haemophilus influenzae*) should be administered 2 weeks prior to operation.

### PATIENT POSITIONING AND PLACEMENT OF TROCARS

The patient is placed supine on the operating table with the left side of the body rotated to no more than 45 degrees. Alternatively, the patient can be placed in the “French” position, which allows the surgeon to operate between the patient’s legs. A Hasson cannula is placed infraumbilically, and a diagnostic laparoscopy is performed. Routine laparoscopic ultrasound of the liver may be performed for