The Value of Laparoscopy in the Management of Ampullary, Duodenal, and Distal Bile Duct Tumors

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Laparoscopy identifies radiologically occult advanced disease in patients with pancreatic adenocarcinoma. The value of laparoscopy in the management of peri-ampullary tumors was determined. One hundred forty-four patients with radiologically resectable nonpancreatic adenocarcinoma, periampullary tumors were identified from a prospective database between August 1993 and December 2000. Criteria for laparoscopic unresectability included histologically proved peritoneal or hepatic metastases, distant nodal involvement, arterial involvement, and local extension outside the resection field. Median age at operation was 70 years (range 31 to 87 years) and 56% of the patients were men. An adequate laparoscopy was performed in 134 cases (93%). Laparoscopy identified 13 patients (10%) with unresectable disease. Of 121 patients with laparoscopic resectable disease, 111 (92%) went on to subsequent resection; CT correctly predicted resectability in 82%. Laparoscopy spared 36% of unresectable patients a nontherapeutic laparotomy. Patients with resectable disease were treated by pancreaticoduodenectomy (n = 91, 76%), ampullectomy (n = 12, 10%), duodenal resection (n = 10, 9%), or bile duct excision (n = 6, 5%). The addition of diagnostic laparoscopy to dynamic CT scanning in this selected patient population identifies an additional 10% of patients with unresectable disease. We believe that laparoscopy should be used in a selective manner for preoperative staging of patients suspected of having nonpancreatic periampullary tumors. (J GASTROINTEST SURG 2002;6:139–146.) © 2002 The Society for Surgery of the Alimentary Tract, Inc.

KEY WORDS: Laparoscopy, upper GI malignancy, staging, pancreatic cancer

Several series have demonstrated that the routine use of diagnostic laparoscopy for patients with pancreatic adenocarcinoma identifies occult metastatic disease in up to 50% of patients deemed resectable by preoperative radiologic studies.1–10 Although the yield of positive laparoscopy that avoids unnecessary laparotomy is highly dependent on the quality of the radiologic studies and the site of the primary tumors, these patients may be spared a nontherapeutic laparotomy and may quickly move on to other types of treatment without fear of complications. However, for resected patients, critics have argued that the procedure results in an increase in total operative expenses suggesting that a more selective approach would be more cost-efficient.

In an attempt to better define the role of diagnostic laparoscopy in the management of peripancreatic malignancies, we have evaluated several subsets of these patients on the basis of histologic findings or tumor location.11,12 For the current study, we sought to evaluate the value of routine diagnostic laparoscopy in a cohort of patients with a presumptive diagnosis of periampullary tumors that were not pancreatic adenocarcinomas. These patients would be expected to have a high resectability rate if radiologically not contraindicated.

METHODS

Patients

Patients with radiologically resectable nonpancreatic adenocarcinoma, periampullary tumors were identified from our prospective endosurgical database of procedures performed between August 1993 and December 2000. Patients were excluded if they were diagnosed with adenocarcinoma of the pancreas or...
islet cell tumors of the pancreas. All patients were brought to the operating room and underwent extended multiport laparoscopic staging immediately before laparotomy, and resection if indicated. Our approach to laparoscopic staging has been described previously. In brief, a 10 mm Hasson trocar is placed at the umbilicus, and up to three working ports are placed along the line of the intended bilateral subcostal incision. All peritoneal surfaces are inspected, and the liver is palpated and inspected on all sides after mobilization. The transverse colon is elevated, the omentum is swept cranially, and the root of the mesentery and ligament of Treitz are examined. The left lobe of the liver is elevated and the lesser omentum is incised. The stomach is elevated and the lesser sac is evaluated with special attention to the common hepatic artery and nodes. The laparoscopic ultrasound probe is introduced from the right side of the patient and is used to examine the liver for occult metastases. The probe is placed on the stomach to provide a window into the head of the pancreas where the portal vessels can be evaluated.

Definitions

All patients had contrast-enhanced thin-cut CT scans of the abdomen. In general, patients were considered resectable if they had disease that would be encompassed by a standard surgical resection. Criteria for radiologic unresectability were major arterial involvement, long segment portal vein/mesenteric vein involvement, or metastatic disease. Patients were deemed unresectable at diagnostic laparoscopy or laparotomy if they were found to have histologically proved peritoneal or hepatic metastases, distant nodal involvement, arterial involvement, or local extension outside the resection field.

Diagnostic laparoscopy was considered adequate if histologic confirmation of metastatic disease was obtained. Criteria for inadequate negative laparoscopy included inability to obtain pneumoperitoneum, operative time less than 10 minutes, or failure to complete the standard staging algorithm.

Resection was defined as removal of an organ or organs with curative intent. Biliary or gastric bypass, common duct exploration, and exploratory laparotomy were not considered resections.

Survival data are reported only for patients with a confirmed tissue diagnosis of malignancy.

Data

Clinical, pathologic, and perioperative data were obtained. Surgical variables included adequacy of diagnostic laparoscopy, results of laparoscopy, findings at open exploration, and type of open operation. Survival was calculated from date of operation to death or last follow-up.

Statistics

Positive predictive value (PPV) was calculated using the formula:

$$PPV = \frac{\text{Number resected}}{\text{Number resectable by test}}$$

to determine the ability of a test to predict curative resection. Univariate analysis was conducted using chi-square analysis for measures of association and log-rank analysis for survival. Binary logistic regression was used for multivariate analysis of variables associated with resectability and the need for biliary and/or gastric bypass.

RESULTS

Demographics

The prospective peripancreatic laparoscopy database contained more than 1000 patients for the 7-year period examined. Review of the database identified 144 patients whose final diagnosis was not pancreatic adenocarcinoma and who were brought to operation with radiologically resectable disease in the periampullary region. All patients had at least one dynamic CT scan as part of their evaluation, and 122 patients (85%) underwent endoscopic retrograde cholangiopancreatography. The median age at operation was 70 years (range 31 to 87 years), and 80 (56%) patients were men.

Laparoscopy

Fig. 1 displays the surgical findings and outcomes for the entire cohort. Median length of the laparoscopic procedure was 39 minutes (±32 minutes), and laparoscopic ultrasound was used in 55% of all procedures. Diagnostic laparoscopy was adequate in 134 patients (93%). Of these patients, laparoscopy identified 13 (10%) with unresectable disease, including six patients with liver metastases, five with peritoneal spread, and two with other metastatic disease. Four of these patients went on to palliative bypass surgery. An inadequate laparoscopy was performed in 10 patients.

Open Exploration

Of the 121 patients with laparoscopic resectable disease, 111 (92%) went on to resection. Laparoscopy had failed to diagnose three patients with liver