

Pancreatoduodenal Resection *

Comments on Indications, Operative Diagnosis, Staged Procedures, Morbid and Lethal Factors, and Survivals

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A FAIRLY widespread belief exists that following pancreatoduodenectomy for cancer the chance of long term survival is almost negligible. Experience indicates that this attitude is not justified, particularly in reference to ampullary and duodenal malignancies.

Material

This report presents the collective experiences at Charity Hospital and Touro Infirmary, New Orleans, Louisiana from the time that pancreatoduodenectomy was first employed through the year 1956. The review embraces pancreatic resections which were combined with removal of the entire duodenum. It does not include transduodenal resection of ampullary carcinoma, a procedure followed in a few cases; nor does it include partial pancreatectomy without resection of the duodenum.

Surgical Indications

Records of 78 patients who underwent pancreatoduodenectomy in the two hospitals were available for evaluation. Among these 78 cases the indications for resection were as follows: carcinoma of the pancreas, 50; carcinoma of the ampullary region, 15; chronic pancreatitis, four; carcinoma of the duodenum, three; cholelithiasis and choledocholithiasis, two; carcinoma of the common

duct, lymphosarcoma of the duodenum, carcinoma of the stomach, and lymphosarcoma of the stomach, one each.

Operative Diagnosis

It is not always easy to ascertain at the time of operation if the obstructing lesion at the terminus of the common duct is benign or malignant. If the common and pancreatic ducts are dilated, however, the evidence is strongly in favor of a neoplastic origin for the obstruction. Needle and surface biopsies of the pancreas are not satisfactory. Transduodenal exposure of the ampullary region is indicated and, if necessary, biopsy can be done, although there is the possibility that seeding may result from this maneuver.

In the four patients with chronic pancreatitis, obstruction of the juxtaduodenal portion of the pancreatic duct was the usual finding, and resection of the head under such circumstances is an acceptable, if not universally advocated, procedure for this condition. These four patients survived the operative procedure. The two patients who were operated for choledocholithiasis probably had pancreatic duct obstruction sufficient to produce pancreatitis, although this was not clear from the pathologic reports. The two cases with choledocholithiasis in whom confusion arose as to the cause of the obstruction did not survive resection.

Single Versus Multiple Stage Procedure: Because of the high operative mor-

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tality in the surveyed hospitals, there has been revival of enthusiasm by some of the surgical staff for the two stage procedure. This has usually been accomplished with a cholecystojejunostomy as the first stage. Preliminary biliary decompression was carried out in six patients, and in these, two died, a 33 per cent mortality. The disadvantages of the two stage approach for all candidates in whom pancreatoduodenectomy is contemplated appear of sufficient magnitude to dampen any real enthusiasm for its widespread re-adoption. If resection is to be done, the single stage procedure is the one of choice. In the very ill, jaundiced patient who appears unable to tolerate definitive surgery, the best initial operation is probably cholecystostomy through an incision placed laterally, well away from the incision later to be used for resection.

Hospital Mortality Figures: Of the 78 pancreatoduodenal resections, removal of the entire pancreas along with the duodenum was accomplished in 13 patients. Eight of the 13 died, a 61 per cent mortality. Sixty-five partial pancreatectomies were done, and 33 of the patients died, a 51 per cent mortality. There was a total of 41 deaths in the series, a 53 per cent over-all mortality.

Causes of Death: Of 14 autopsied cases, acute pancreatitis was the principal cause of death in two and disruption of the pancreatic duct anastomosis the cause of death in three. The common duct anastomosis did not hold, resulting in fatal bile peritonitis in two patients. Generalized peritonitis and subphrenic abscess, the sources of which were not found, were the causes of death in two patients. Other causes of death were a gangrenous ileum in one hepatic failure in one, pneumonia in one, and uremia in one. One patient died as a result of a transfusion reaction.

Nine deaths not included in the necropsied series occurred in the first 24-hours after operation and most of these deaths could be attributed to intra-abdom-

inal hemorrhage, either at the time of operation or shortly thereafter. Increased bleeding tendencies have been noted, even when the values in the routine laboratory examinations were normal. Numerous friable veins in the pancreatic region make dissection difficult and tedious. Many of these patients are not able to tolerate slight vacillations in blood pressure.

Pancreatic Complications: Pancreatic complications were recorded in 11 patients. Pancreatocutaneous fistulae contributed to the morbidity in three patients but ultimately they recovered. Four patients developed pancreatocutaneous fistulae and died. Death was attributed to acute hemorrhagic pancreatitis in two, pancreatic necrosis in one, and peritonitis resulting from disruption of the pancreatojejunal anastomosis in one.

Biliary Tract Complications: In several patients cholecystectomy had been previously performed and in some the gallbladder was removed at the time of the definitive surgery. Of those patients whose gallbladders were retained, one patient developed a gangrenous gallbladder, one acute cholecystitis, and another purulent drainage from cholecystostomy. Two patients who died with postoperative complications had stones left in the gallbladder. Aside from the late complications developing in the gallbladder as a result of the common duct-enteric anastomosis, the occasional inadvertent deprivation of the blood supply to the gallbladder and overlooked stone in a distended gallbladder are additional reasons for removing the gallbladder at the time of the definitive procedure.

The common duct anastomosis did not always heal well, as choledochocutaneous fistula occurred in two patients. Three patients developed intraperitoneal leak of the choledochojejunal anastomosis.

Gastro-intestinal Hemorrhage: The occurrence of gastro-intestinal hemorrhage following resection of the duodenum and

head of the pancreas has been ascribed to several factors peculiar to this procedure. Diversion of the alkaline content of the bile and pancreatic secretion away from the gastrojejunal anastomosis by means of cholecystostomy, and by placing the gastrojejunal anastomosis proximal to the common and pancreatic duct anastomoses, allows the acid secretion of the stomach to bathe the gastrojejunal anastomosis and contributes to the formation of peptic ulcer. Another factor is the small amount of stomach removed in the usual resection for pancreatoduodenal malignancy.

In the immediate postoperative period seven patients bled massively from the gastro-intestinal tract, and three of the seven died as a result of the hemorrhage. Later, four patients bled. The first of these patients bled six months after resection and at exploration was found to have a recurrence of the malignancy. The second patient bled one year after resection; and while no definite ulcer was discovered at exploration, a 75 per cent gastric resection was carried out. A third individual bled massively three years after resection and at operation was found to have numerous recurrences. Five years following resection a fourth was explored after a bleeding episode; the surgeon interpreted a scarred anastomosis as indicating a healed ulcer, and a 75 per cent gastric resection was done.

Total Pancreatectomy: Thirteen patients underwent total pancreatectomy. In five of these cases, three for ampullary carcinoma, one for bile duct carcinoma, and one for duodenal carcinoma, the operator in each instance thought that he was dealing with carcinoma of the pancreas. It is questionable whether total pancreatectomy was indicated. Although total pancreatectomy has been suggested as a means of lowering the mortality from resection since the anastomosis between the cut end of the pancreas and the intestine is eliminated, these figures point to a higher mortality

with total pancreatectomy. The number of total pancreatectomies carried out for ampullary carcinoma emphasizes the need for transduodenal exposure of the ampullary region for all lesions in order that the tail, and possibly the body, can be preserved when dealing with ampullary carcinoma. Of the remaining eight cases, pancreatic carcinomas were resected in seven and gastric lymphoma in one.

Diabetes Mellitus: One sequela following total removal of the pancreas is diabetes mellitus. In reviewing the records of 13 patients who were subjected to total pancreatectomy, eight of these patients died in the immediate postoperative period. Of the eight that died, only two were thought to have lived long enough for diabetes to be a factor: in one the surgical diabetes was controlled, in the other the patient died in a stage of refractory diabetic acidosis on the eleventh postoperative day.

Of the five who survived the procedure to go home, two were considered under control on twenty units of regular insulin a day, and another, a moderate diabetic, on fifty-five units of NPH insulin a day. The fourth patient had severe "brittle" diabetes, having several episodes of insulin shock alternating with diabetic coma after departure from the hospital, and death at home was ascribed by his local physician to coronary artery disease. These four patients were dead within the year. The fifth survival was controlled on small quantities of PZI in the hospital. One month postoperatively he was readmitted in severe insulin shock and despite energetic measures to combat the effects of the insulin, died three days later.

Survival in Pancreatic Carcinoma: Fifty patients had resections for carcinoma of the pancreas. Of these 23 left the hospital alive. Nine were dead within one year, three were dead within two years, and one within three years. Three are living, but their malignancies have recurred. Five are lost to follow up. One patient has survived

for nine years, and another for eight years. Both are asymptomatic.

Survival in Ampullary Carcinoma: Of 15 patients who had resections for ampullary carcinoma, nine left the hospital alive. Two died within the first year. One death was ascribed to heart disease by his local physician, and cause of death in the other was not determined. One is living but has recurrence of the lesion. The other six are living and well. One was operated on less than one year ago, another one year ago, and two three years ago. One has survived for five years and another six years.

Survival in All Types of Malignancy: To recapitulate, two of 50 patients with carcinoma of the pancreas have survived for more than five years. Two of 15 patients with ampullary carcinoma have survived for more than five years. One of three patients with duodenal carcinoma has survived for more than five years. The four patients with carcinoma of the bile duct, carcinoma of the stomach, lymphosarcoma of the duodenum and lymphosarcoma of the

stomach have died. Of the 72 patients who were operated upon for malignancy in this region, five have survived past five years, and several patients with ampullary lesions more than likely will survive past this time.

Summary

Although the operative mortality is high in patients who have undergone pancreatoduodenal resection, some may live for years in a normal state of health. Of 78 patients seen at Charity Hospital and Touro Infirmary, New Orleans from January 1, 1945, until December 31, 1956, 72 had resections for malignancy. Five of these have survived more than five years. Of the five survivals, two had carcinoma of the pancreas. One of the patients is still living nine years after operation, and the other eight years. Two had ampullary carcinoma: one is living six years after operation and the other five years. The fifth had duodenal carcinoma, and he has survived nine years following resection.