Pancreaticoduodenectomy (Whipple Resection) in the Treatment of Chronic Pancreatitis

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The armamentarium of the pancreatic surgeon must include multiple operative techniques, to be adapted to the clinical and anatomical findings in the patient with chronic pancreatitis. Pancreaticoduodenectomy is an essential component of this armamentarium. Its indications and limitations require continued refinement.

Pancreaticoduodenectomy (Whipple operation) provides excellent results in the relief of the pain of chronic pancreatitis. The incidence of reoperation for control of pain after this procedure is less than after drainage procedures. The postoperative mortality rate in recent reports is less than 2%. Whereas resection of pancreatic tissue diminishes pancreatic function, the metabolic deficits are partially compensated by the better nutritional status resulting from pain relief and discontinuation of narcotics.

In experienced hands, pancreaticoduodenectomy would appear to be the procedure of choice in patients with small pancreatic ducts. In selected patients, it appears to be a good procedure and, possibly, the operation of choice when the disease is predominantly present in the head of the pancreas and/or the uncinate process, especially when strictures involve the common bile duct and duodenum. The authors prefer the procedure when a hard, chronically-inflamed mass is present in the head of the pancreas.

In our experience, if the suspicion of malignancy of the head of the pancreas persists at operation, pancreaticoduodenectomy is the procedure of choice. Before undertaking resection, the individual surgeon must assess his/her own experience; a low risk is essential.

Clinical Material

Twenty-eight patients with chronic pancreatitis, in whose care the senior author participated, have undergone pancreaticoduodenectomy for chronic pancreatitis. The majority of the patients had undergone other operations prior to referral, most of the operations having been related to the pancreatitis (Table 1).

Eight of the patients were female and 20 were male. The patients ranged in age from 24 to 65 years with no major concentration in any intervening decade but a median age of 41 years. Five of the patients were insulin-dependent diabetics prior to operation and 4 had experienced mild difficulties in maintaining their weight. Twelve had pancreatic calcification. Three patients were ongoing alcoholics at the time of operation. A majority of the patients had consumed excessive amounts of alcohol in the past but had abstained as they approached operation. None were narcotic addicts. No patient had hyperparathyroidism, hyperlipidemia, pancreatic divisum, nor familial pancreatitis. Only 1 of the patients had cirrhosis of the liver.

Other preoperative complications of the disease are shown in Table 2.

All of the patients had severe disease in the head of the pancreas. In 18 patients, severe pancreatic pain existed. At operation, the pancreatic mass was highly suggestive of malignancy in 6 and clinically compatible with cancer in 8 others. A normal or small pancreatic duct was present in 7 patients. One of the latter patients had an obstructing stenosis of the intra-pancreatic portion of the common bile duct, in which cancer could not be adequately excluded. Four of the 7 had stenosis of the duodenum and/or common bile duct and 4 of the 7 patients had severe pancreatic pain. Of interest are 3 patients in whom the "mass effect" was predominant in the uncinate process.

The Operation

The operation consisted of a classical Whipple resection in 22 patients, 6 others having the resection extended to include a major portion of the body of the pancreas. In the 22 patients,
Table 1. Preresection operations related to chronic pancreatitis (28 patients).

<table>
<thead>
<tr>
<th>Operation</th>
<th>No. of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cholecystectomy and examination of bile ducts</td>
<td>13</td>
</tr>
<tr>
<td>Longitudinal pancreaticojejunostomy</td>
<td>2</td>
</tr>
<tr>
<td>Exploratory laparotomy</td>
<td>11</td>
</tr>
<tr>
<td>Partial gastrectomy</td>
<td>4</td>
</tr>
<tr>
<td>Vagotomy</td>
<td>3</td>
</tr>
<tr>
<td>Internal drainage of pseudocyst</td>
<td>2</td>
</tr>
<tr>
<td>Sphincteroplasty</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 2. Preoperative status of patients (28 patients).

<table>
<thead>
<tr>
<th>Status</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe disease in head of pancreas</td>
<td>28</td>
</tr>
<tr>
<td>Severe pancreatic pain</td>
<td>18</td>
</tr>
<tr>
<td>Firm mass in head of pancreas</td>
<td>14</td>
</tr>
<tr>
<td>Mass in head of pancreas without severe pain</td>
<td>6</td>
</tr>
<tr>
<td>Pancreatic pseudocysts in head of pancreas</td>
<td>5</td>
</tr>
<tr>
<td>Predominance of disease in uncinate process</td>
<td>3</td>
</tr>
<tr>
<td>Failed longitudinal pancreaticojejunostomy</td>
<td>2</td>
</tr>
<tr>
<td>Duodenal stenosis</td>
<td>3</td>
</tr>
<tr>
<td>Common bile duct stenosis</td>
<td>8</td>
</tr>
<tr>
<td>Pancreatic calcification</td>
<td>12</td>
</tr>
<tr>
<td>Splenic vein thrombosis</td>
<td>3</td>
</tr>
<tr>
<td>Jaundice</td>
<td>6</td>
</tr>
<tr>
<td>Normal or small pancreatic ducts</td>
<td>7</td>
</tr>
<tr>
<td>Diabetes (insulin-dependent)</td>
<td>5</td>
</tr>
<tr>
<td>Malnutrition (mild)</td>
<td>4</td>
</tr>
<tr>
<td>Cirrhosis of liver</td>
<td>1</td>
</tr>
<tr>
<td>Continuing alcoholism</td>
<td>3</td>
</tr>
<tr>
<td>Narcotic addiction</td>
<td>3*</td>
</tr>
</tbody>
</table>

*Questionable in 1 patient.

gastrojejunostomy, was isolated and used proximally as the conduit from the pancreas and biliary tract to the afferent limb of the gastrojejunostomy. Jejunoojejunostomy was then performed to restore continuity distal to the gastrojejunostomy.

Three patients had previously had a Roux-Y constructed for internal drainage of a pseudocyst (1 patient) and longitudinal pancreaticojejunostomy (2 patients). The preexisting Roux-Y jejunal limb proved too short for further use in reconstruction and was sacrificed. Immediate postoperative care emphasized maintenance of plasma volume, utilizing liberal volumes of human albumin. Ventilatory support and Swan-Ganz monitoring were utilized as indicated.

Early Postoperative Complications

The hospital complications occurring in the postoperative period were relatively minor, none being life-threatening (Table 3). All of the patients tolerated operation well, convalescence being more rapid than with patients undergoing pancreaticoduodenectomy for cancer. A single fistula was not a major problem. One malnourished patient, after a prolonged operation, developed decubitus necrosis of the back of both heels. There was no hospital mortality.

Late Management

Patients, having been maintained on therapy designed to minimize gastric acidity early in the postoperative course, were not usually treated with antacids or hydrogen-ion blockers after leaving the hospital. The pancreaticojejunostomy stent was usually removed between 2 and 8 weeks after operation. This stent was relatively fragile and might not have endured more prolonged utilization. Since most of the patients had a common duct of normal diameter at the time of operation, the T-tube, having been inserted through the anastomosis, was left in place for 4–12 months after operation in order to prevent fibrous stricture.

Delayed Complications

The late postoperative complications are shown in Table 4. Two patients required rehospitalization for obstruction of the jejunal limb between the pancreaticojejunostomy and the choledochojejunostomy. In each instance, operative correction, 2 and 3 years respectively after resection, relieved the intermittent symptoms. No patient developed evidence of choledochojejunal stricture nor was pancreaticojejunal stricture recognized. One patient, diabetic prior to operation, required rehospitalization because of difficulties in treatment of diabetes. This was a patient who had had resection of the head and body of the pancreas and had continued alcoholic intake which was the...