Pancreatoduodenectomy in the Treatment of Chronic Pancreatitis

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Abstract. The value of surgical resection for patients with chronic pancreatitis has been debated on account of persistent symptoms and the morbidity of the operative procedure, both immediate and delayed. This paper explores the consequence of pancreatoduodenectomy in 175 patients with chronic pancreatitis who were operated on between 1976 and 1997. All patients were carefully selected after varying periods of conservative management. The operation was a classical Kausch-Whipple resection in 98 patients and a pylorus-preserving procedure in 67. There were four postoperative deaths (days 7, 10, 35, and 70), and only two reoperations were performed. The median number of postoperative events was one, with delayed gastric emptying being the most common (31 patients). The median length of in-hospital stay was 20 days (range: 8–215 days), but no patient was discharged until medical and social disabilities were resolved. There were seven late deaths, most of them linked to cigarette smoking and alcohol consumption; 75% of patients had a good clinical outcome, but 18 patients required further pancreatic surgery at a mean of 12 months, either a pancreatojejunostomy or a completion pancreatectomy. Diabetes occurred in 40% of patients by 5 years, and most, at some stage of their postoperative period, required pancreatic enzyme supplementation. It is suggested that resection of the pancreas provides a reasonable life-style in 75% of patients, but the outcome depends in large part on the predisposing disease.

In a review published in this journal in 1984 Howard and Zhang described their experience treating 28 patients with chronic pancreatitis [1]. At that time they considered the operation of pancreatoduodenectomy to be excellent for the relief of pain, but they warned that it was the life-style of the patient, particularly continued alcohol consumption, that posed the greater problem in the management of chronic pancreatitis. The operation by then had become a practical option in the treatment of this benign disease because the operative mortality in experienced hands was less than 2% [2–7]. In line with the lower mortality, the incidence of serious complications was noted to have greatly diminished; in a review of papers published between 1987 and 1989 reporting treatment results for 431 patients, only 7 patients (1.6%) developed a postoperative fistula of the choledochojejunostomy or the pancreaticojejunostomy [3–5, 7, 8]. Other complications, including intraabdominal bleeding which occurred postoperatively in 5 (0.12%) patients, were low. Nevertheless despite the low mortality and decreased morbidity, it is the complications that continue to be the major drawback for pancreatoduodenectomy in the treatment of chronic pancreatitis, often necessitating a prolonged period in hospital after the operation [9]. Complications may be related (1) to the surgery and can include infection or delayed gastric emptying; (2) to the behavioral factors causing the disease such as alcohol/drug or tobacco addiction; or (3) to the consequences of the disease such as diabetes and malabsorption.

The key to limiting complications is the appropriate selection of patients. The common indications for surgery are pain unrelieved by medical care, and the complications of the disease such as cyst formation, biliary obstruction, duodenal obstruction, fistula formation, and pancreatic ascites [10]. An increasingly frequent indication for surgery is the diagnostic dilemma of a pancreatic mass, often in the younger patient. Despite all benefits of modern imaging, there are some symptomatic patients who may have an underlying carcinoma; these patients now undergo resection early in their illness for is what is shown histologically to be chronic pancreatitis [11]. These patients have a good short-term and long-term outlook.

To assess the outcome of any surgical treatment for chronic pancreatitis, it is necessary to evaluate the immediate outcome of the operation and its complications; its effect on long-term pain relief and analgesic requirements, the degree of pancreatic insufficiency, and the need for replacement therapies including insulin therapy for diabetes and enzyme therapy for steatorrhea. In addition to these nutritional factors, it is necessary to determine the likelihood of socioeconomic rehabilitation. To date this has not been well done, but the increasing experience in the use of quality of life measures in pancreatic disease will enable more objective measures to be achieved [12].

Now, almost 20 years later, the situation described by Howard and Zhang [1] is unchanged and the problems remain the same. Our objective in this article is to consider the indications for surgery, the complications of surgery, and the early consequences of surgery.

Clinical Material

In our practice, 175 patients with chronic pancreatitis have undergone a pancreatoduodenectomy for chronic pancreatitis. The first patient was operated on in 1976 and the most recent in 1997. Data

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Table 1. Prior nonoperative management of patients in our series.

	Patients		
	All patients (n = 175)	Men (n = 138)	Women (n = 37)
Preoperative nonoperative intervention?			
No [n] (%)	73 (42)	61 (44)	12 (32)
Yes [n] (%)	102 (58)	77 (56)	25 (68)
Intervention			
Pancreatic rest with total parenteral nutrition	66	50	16
Endoscopic pancreatic procedure	15	7	8
Endoscopic biliary procedure	21	14	7
Percutaneous pancreatic cyst procedure	9	8	1
Celiac plexus block	12	10	2

regarding the patients were collected prospectively, and the patients were followed up in a specialist clinic to record their late clinical experiences. Unfortunately many patients failed to attend and thus the follow-up is incomplete on account of their wayward habits. The patients were invariably referred for an opinion on their pancreatitis from another physician or surgeon, and many had already been assessed by one of our two physicians with a specific interest in the endoscopic aspects of pancreatic disease. Few patients underwent operation without an extensive trial of conservative treatment (Table 1). Endoscopy played a major role in the preoperative management—81 patients having had some type of endoscopic intervention (Table 2). Of the 175 patients, 128 were men. The patients' median age at operation was 43 years (range: 13–74 years); there was no age difference between men (range: 13–74 years) and women (range: 21–71 years). Preoperatively 7% of patients had diabetes and 31% had steatorrhea. Significant preoperative weight loss was present in 78% of patients, with a median weight loss of 12 kg (range: 3–30 kg). The commonest etiology was alcohol, but the series included patients with idiopathic pancreatitis [13], pancreas divisum [12], gallstone-related pancreatitis [4], and a list of miscellaneous causes, as outlined in Table 3. There appeared to be no difference in presentation between the men and women. Every effort was made to wean the patients from alcohol and narcotics preoperatively, but this was not always possible, and it was not used as an absolute criterion for operation.

All patients were considered to have severe disease in the head of the pancreas with relative sparing of the body and tail of the pancreas. Forty-two percent of patients had had a previous abdominal operation (Table 4). All patients had been extensively investigated preoperatively by ultrasound, computerized tomography (CT) scanning, endoscopic retrograde cholangiopancreatography (ERCP), and more recently, magnetic resonance (MR) scanning with or without cholangiography. Angiography was not performed, although careful sequencing of the CT scan was performed to assess the vascular supply to the head of the pancreas, and if there was any doubt regarding the patency of the portal or splenic veins or the hepatic artery, careful Doppler studies were performed.

Operation

The operation consisted of a classical Kausch-Whipple resection in 98 patients and a pylorus-preserving procedure in 67. The procedure was invariably performed with a cholecystectomy. The pancreatic resection margin was 2–4 cm to the left of the portal vein, and emphasis was placed on finding relatively healthy pancreatic tissue in the body of the pancreas without duct obstruction, which had frequently been observed around the neck of the pancreas. This information was invariably gained from either the preoperative ERCP or, on occasion, a percutaneous pancreatogram of the duct if the endoscopic pancreatogram had shown obstruction of the duct within the head of the pancreas (Fig. 1). More recently, such information has been gained from an MR cholangiopancreatogram. Seven patients underwent urgent resection for complications of pancreatitis including aneurysm (n = 5), bleeding into a cyst (n = 1), and duodenal obstruction (n = 1) (Figs. 2 and 3).

Vagotomy was never performed, but the patients remained on H_2-receptor antagonists or proton pump inhibitors for 30 days after the procedure.

Reconstruction

Pancreas. The standard approach has been either an end-to-side pancreatojejunostomy or an end-to-end pancreatojejunostomy. With the end-to-side anastomosis, a direct mucosa-to-duct anastomosis was performed with a second layer of serosa to capsule sutures. Stenting of the anastomosis was not routine but was used whenever the anastomosis was not considered satisfactory.

Bile Duct. An end-to-side choledochojejunostomy was performed either with a continuous absorbable suture or multiple fine interrupted sutures, depending on the size of the duct, the continuous suture being used for the large ducts. An end-to-side gastric or duodenal anastomosis was performed 13 to 14 cm distal to the biliary anastomosis. A separate Roux-en-Y jejunal loop was not used. Considerable attention was paid to positioning of the Roux loop; on occasion it was more appropriate that the Roux loop was brought through the retrovascular defect previously occupied by the duodenum, but more usually it was placed in a retrocolic and supravascular position.

Stomach. The gastric anastomosis was preferentially performed as an antecolic anastomosis, but the main criterion was the preferred lie of the loop and the length of its mesentery. Any compromise to the drainage of the loop was avoided and an alternative arrangement of the anastomoses was performed.

In our early experience patients were managed for the first 24 hours postoperatively in the intensive care unit, but since 1985 patients have been routinely returned to the general ward, breathing spontaneously and without invasive monitoring. Great attention has, however, been paid to the control of blood volume to maintain adequate urine output, and early mobilization with good chest physiotherapy to reduce the incidence of chest complications in a group of patients who invariably smoked heavily.

Results

Postoperative Complications

Disappointingly, the median length of stay has not changed greatly over the years of the study. The trend in the last 5 years showed a decrease in the length of stay, but for the series as a whole the median length of stay was 20 days (men 19 days; women 21 days) and

Table 2. Prior nonoperative intervention in patients in our series.

	Patients		
Intervention	All patients (n = 175)	Men (n = 138)	Women (n = 37)
TPN alone	47	38	9
TPN; peritoneal drain	1	1	
TPN; celiac plexus block	4	3	1
TPN; endoscopic biliary sphincterotomy ± stone extraction	4	1	3
TPN; endoscopic biliary stent	2	2	
TPN; endoscopic biliary stent; percutaneous cholecystostomy	1		1
Endoscopic biliary stent	5	4	1
Endoscopic biliary sphincterotomy	4	3	1
Endoscopic biliary stent; percutaneous pseudocyst drainage	3	3	
Endoscopic biliary sphincterotomy and transduodenal cystduodenostomy	1	1	
Endoscopic biliary sphincterotomy; celiac plexus block	1		1
Endoscopic accessory duct stent	1		1
Endoscopic accessory duct stent, TPN	2	1	1
Endoscopic accessory duct sphincterotomy ± attempted stone extraction	4	2	2
Endoscopic accessory duct sphincterotomy, celiac plexus block	1		1
Endoscopic snare diathermy accessory papilla	1		1
Endoscopic MPD stent alone	1		1
Endoscopic MPD stent; TPN	1	1	
Endoscopic MPD dilatation; endoscopic biliary sphincterotomy	1		1
Endoscopic MPD sphincterotomy/ECSWL/stone extraction	1	1	
Endoscopic MPD sphincterotomy-/-failed stone extraction	1	1	
Percutaneous aspiration of pseudocyst	2	2	
Percutaneous drainage pseudocyst; TPN	4	3	1
Celiac plexus block alone	7	7	
Abdominal paracentesis	1	1	
Nasogastric feeding	1	1	
Percutaneous drainage subphrenic abscess + liver biopsy	1	1	

TPN: total parenteral nutrition (in conjunction with pancreatic "rest"); MPD: main pancreatic duct; ECSWL: extracorporeal shockwave lithotripsy.

Table 3. Etiology of pancreatitis in the patients in our series.

	Patients		
	All patients (n = 175)	Men (n = 138)	Women (n = 37)
Alcohol	116	104	12
Idiopathic	23	12	11
Divisum	12	3	9
Gallstone	4	4	
Tropical	4	4	
Juvenile/familial	3	2	1
Trauma–blunt	2	1	1
Trauma–ERCP injury	2	1	1
Trauma –surgical injury	1	1	
Annular pancreas	1	1	
Ampullary fibrosis	1	1	
Hypercalcemia	1	1	
Radiotherapy induced	1	1	
Primary sclerosing cholangitis/ ulcerative colitis	1	1	
Amyloid	1		1
Idiopathic—"minimal change"	1		1
Brunner's gland hyperplasia	1	1	

ERCP: endoscopic retrograde cholangiopancreatography.

Table 4. Prior operative procedures among patients in our series.

|	Patients		
	All patients (n = 175)	Men (n = 138)	Women (n = 37)
Procedure(s)			
1 laparotomy	51	37	14
2 laparotomies	17	15	2
3 laparotomies	4	4	
7 laparotomies	1		1
Summary			
Cholecystectomy	39	28	11
Pancreatic cyst drainage	10	9	1
Pancreatic duct drainage	13	9	4
Pancreatic abscess drainage	6	3	3
Pancreatic other (excluding biopsy)	3	2	1
Biliary bypass	6	5	1
Transduodenal sphincterotomy/ sphincteroplasty	6	4	2
Gastrojejunostomy	6	6	
Gastrectomy	2	2	
Vagotomy	4	4	

the range was 8–215 days (men 8–215 days; women 13–60 days). There have been four in-hospital deaths—an operative mortality of 2.2%. The deaths occurred at 70 days (from sepsis), at 35 days (from bleeding), at 10 days (a cardiovascular event), and at 7 days. The last death was of a young woman who had congenital heart disease and developed a fulminating pancreatitis of the body and tail of the pancreas.

Only two reoperations were performed, one for bleeding and the other in the patient with fulminant pancreatitis for which a total pancreatectomy was performed—she died two days after the second procedure. Complications were recorded carefully, and indeed, an event that deviated the patient's course from the ideal care pathway occurred 53% of the time (Tables 5 and 6) . The median number of events per patient was one. The most frequent complication was delayed gastric emptying, which occurred in 31 patients. A pancreatic leak occurred in four patients, a biliary leak in three, and an enteric leak in two patients. Sepsis remained the greatest

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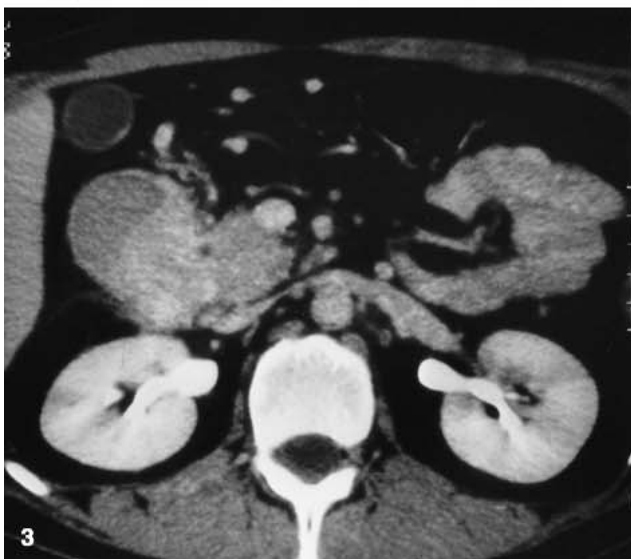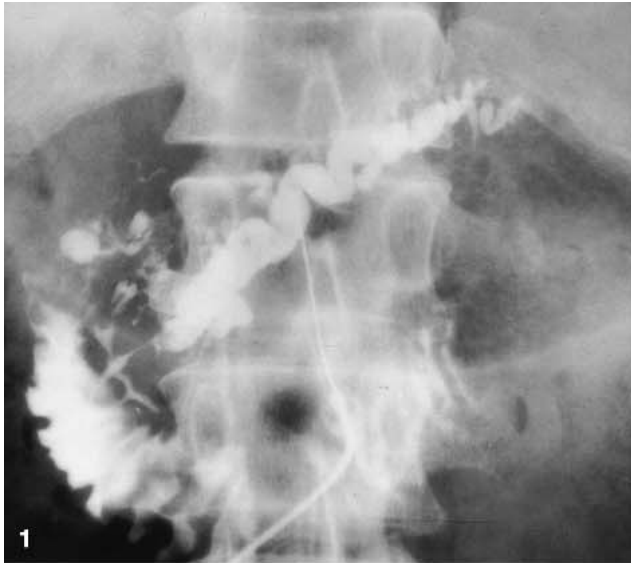
Fig. 1. Percutaneous pancreatogram showing strictured pancreatic duct within the head of the pancreas and changes of obstructive pancreatitis distally.

Fig. 2. Computed tomography (CT) scan showing two pseudoaneurysms (short arrows) within a blood-filled collection in the head of the pancreas (long arrow) in a patient who was known to have chronic pancreatitis from alcohol excess. The patient had been admitted with acute onset of severe pain and hypotension, and an urgent pancreatoduodenectomy was undertaken, from which the patient made an uneventful recovery. He remains well at 7 years.

Fig. 3. CT scan showing a large duodenal "mass" causing obstructive pancreatitis and gastric outlet obstruction. Histopathology revealed the mass to be Brunner's gland hyperplasia.

Table 5. Postoperative complications, deaths, and lengths of stay in the patients in our study.

	Patients		
	All patients ($n = 175$)	Men ($n = 138$)	Women ($n = 37$)
Complications			
None	81 (47%)	64 (47%)	17 (46%)
1	54	44	10
2	25	17	8
3	8	8	
4	3	1	2
5	3	3	
Not recorded	1	1	
Median number	1	1	1
Reoperations	2	1	1
In-hospital deaths	4	3	1
Length of stay (days)			
Median	20	19	21
Range	8–215	8–215	13–60

problem and required the greatest amount of care. The various events that occurred in the postoperative period illustrate the conscientious care required to ensure a successful technical outcome.

Many of these patients had problems with social circumstances, narcotic addiction, and a predilection for alcohol. It was considered inappropriate to allow the patients home without resolving all their minor problems because they tended to cope poorly with any complication. Indeed, it was our aim to try to ensure that weight was stable, diet adequate, and dependence on narcotics negligible before discharge from hospital. This postoperative plan was reflected in the length of postoperative stay. A pancreatic care nurse followed the patients by telephone during the initial post-discharge period, and the patients were seen in the clinic on a regular basis.

Postoperative Outcome

An ideal operation will be completely effective in relieving pain, overcoming the complications observed preoperatively, and preserving pancreatic endocrine function. The treated patient should be able to resume an unrestricted diet apart from the need of some enzyme supplementation. He or she should be able to return to previous employment and establish normal relationships with their environment. Unfortunately, these factors are often difficult to assess because of social problems and the level of alcohol abuse.

Death has been a comparatively rare event, with seven late deaths occurring between 4 and 127 months postoperatively, all but

Table 6. Postoperative complications.

	Patients		
	All patients (n = 175)	Men (n = 138)	Women (n = 37)
Complication			
Leak			
Pancreatic	4	3	1
Biliary	3	2	1
Enteric	2	2	
Delayed gastric emptying	31	24	7
Sepsis			
Central venous catheter	12	11	1
Pyrexia of unknown origin	12	10	2
Chest	14	11	3
Peripheral central venous catheter	2	1	1
Septicemia	2	1	
Wound	5	4	1
Urinary tract	5	1	4
Intraabdominal	7	5	2
Biliary drain	8	7	1
Pancreatic drain	5	4	1
Subhepatic drain	1	1	
Hepatic abscess	4	4	
Residual pseudocyst	1	1	
Subphrenic	1	1	
Throat infection	1	1	
Bleeding			
Minor (< 4 g fall in hemoglobin)	2	1	1
Major (≥ 4g fall in hemoglobin)	2	1	1
Portal vein tear/splenic injury (on table)	1	1	
Hepatic artery thrombosis (leading to abscess)	1	1	
Respiratory failure	2	1	1
Adult respiratory distress syndrome	2	1	1
Pleural effusion	1	1	
Pneumothorax	2	1	1
Pancreatitis	1		1
Fecal fistula	1		1
Pulmonary embolus	2	2	
Left ventricular failure	1	1	
Ascites (massive)	1	1	
Alcohol withdrawal	2	2	
Confusional state	3	3	
Electrolyte imbalance	1	1	
Pre-renal failure	1	1	
Diarrhea	1	1	
Excessive drainage from biliary drain	1	1	

two in patients in whom the etiology for chronic pancreatitis was alcohol (Table 7). The frequency of cardiovascular causes for death is of note, and illustrates the common etiological factors, namely alcohol and smoking, which link these diseases. Many of the complications were aggravated by the presence of diabetes which accounted for the death of the patient with adult respiratory distress syndrome,who developed fulminant septicemia.

Of those who survived, 75% had a good clinical outcome as defined by having either no symptoms or only symptoms of minor indigestion or bowel disturbance corrected by appropriate medication. Thus, 75% of patients were able to return to a normal life. It is of note that there was progressive improvement over a period of years and a stable level of achievement was not reached for 5 years. Eighteen patients required further pancreatic surgery at a median of 12 months (range: 2 days to 141 months). The invariable indication for surgery was pain, the operation undertaken being a pancreatojejunostomy or completion pancreatectomy. The outcome of

this operation was poor, with only half of the patients gaining benefit from the surgery. Perhaps the most difficult problem with these patients is the steady increase in the incidence of diabetes, which was observed to rise steadily over the first 5 years postoperatively to reach an incidence of 40%. The poor glycemic control in some of the patients who have diabetes, and the complications, particularly infectious, that may occur as a consequence, require constant vigilance. Sepsis, particularly biliary sepsis in the diabetic is notoriously difficult to diagnose, often presenting late with a liver abscess (Fig. 4). Enzyme deficiency requiring replacement therapy at some stage after resection is almost universal, but by 5 years 40% of patients adapt their diet sufficiently to require no replacement therapy and accept the occasional loose stool. Reviewing these patients in the clinic, two distinct groups emerge, those who live a normal life and require little medical supervision apart from those with diabetes, and the second group who remain as failures due to their abnormal life-styles having not responded to the usual measures of social care.

Discussion

Pancreatoduodenectomy can be performed safely with a low mortality, and in the series described, none of the deaths after operation occurred in the last 10 years. A mortality rate of 3% or less is acceptable for pancreatoduodenectomy for chronic pancreatitis [13] as it is for such surgery for pancreatic cancer [14, 15]. The surgery is more complex than that for pancreatic cancer, in that the inflammation associated with chronic pancreatitis will obliterate tissue planes, and frequently alter the usual anatomical relationships of the vessels such that extra vigilance is required to dissect out the hepatic artery which may become involved with the pancreatic mass. In addition, the superior mesenteric vein and portal vein may be encapsulated by the area of inflammation, and inopportune dissection can lead to damage and even splitting of the vein in a diagonal direction, which can make control difficult and subsequent repair without compromise of flow impossible. Reconstruction or even ligation of the superior mesenteric vein may be necessary to salvage the situation [16, 17].

Late deaths are frequently reported and vary between 8.8% and 23.9% [18–23] (Table 7). They are often related to the underlying associated risk factors in the etiology of chronic pancreatitis—hence the occurrence of stroke, myocardial infarction, suicide, smoking-related cancers, and diabetic misadventures. In our experience cirrhosis has not yet been a major associated risk factor, but the absence of this finding must relate to case selection. Despite the relationship with pancreatic cancer [24], no patient in this series has died of pancreatic cancer, although one patient previously included in this series re-presented with metastases in the liver. Re-examination of the original pathology revealed a 5-mm duct cell cancer causing the duct stricture that was considered the cause of the pancreatitis.

Patients with chronic pancreatitis are at risk of developing postoperative complications because of their longstanding illness. No less than 38% of this series of patients have had one or more courses of parenteral nutrition prescribed to overcome nutritional imbalance with associated weight loss, or to allow intestinal rest to enable the inflammation within the pancreas to lessen pending surgery. Previous conservative procedures had been undertaken to alleviate the complications of the disease in 33% of the series, and 42% had undergone a variety of previous operative procedures during their longstanding and debilitating illness. Careful preop-

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Table 7. Late deaths in our series.

Sex	Age at death (years)	Etiology of pancreatitis	Completion pancreatectomy (months post PD)	Died (months post PD)	Cause of death
Male	47	Alcohol		4	Suicide
Male	70	Alcohol		15	Myocardial infarction
Male	36	Alcohol		18	Congestive cardiac failure
Female	57	Idiopathic		20	Carcinoma stomach
Female	29	Alcohol		29	Pulmonary emboli/ARDS
Male	36	Alcohol		36	Metabolic/myocardial infarction
Male	36	Alcohol		40	Sepsis-/ARDS
Female	42	Alcohol	13	52	Cerebral infarct
Female	76	Idiopathic		60	Cardiac failure
Male	47	Alcohol		65	Unknown
Male	56	Alcohol		83	Myocardial infarction
Female	62	Alcohol		119	Alcohol-related
Male	43	Alcohol	15	127	Diabetic complication

PD: pancreatoduodenectomy; ARDS: adult respiratory distress syndrome.

Fig. 4. CT scan showing multiple hepatic abscesses in a poorly controlled diabetic 11 years after pancreatoduodenectomy for alcoholic calcific pancreatitis. Antibiotic therapy plus enteral feeding and strict diabetic control during a prolonged hospital admission resulted in resolution of the abscesses.

erative management of such patients appears mandatory to achieve a good outcome.

Because of the number of previous operations and procedures to which these patients have been subjected, careful technical surgery is required [25]. Today the difficulties of the dissection can be overcome by good surgical technique and anesthetic resuscitation, but the outcome, and particularly the immediate complications, are related to the surgical skill in reconstruction of the pancreatic, biliary, and gastric anastomoses. The pancreatic anastomosis presents less technical difficulty in patients with chronic pancreatitis than in than those with pancreatic cancer because the duct is fibrous and surrounded by atrophic and fibrosed pancreas. Nevertheless, a pancreatic fistula, defined as the drainage of more than 50 ml of amylase-rich fluid on or after postoperative day 10, can occur in up to 18% of patients with benign disease [26], but in those with evidence of pancreatitis in the same series—from the Johns Hopkins' group—it was only 5%, similar to the 2.2% described in our series. Biliary and enteric leaks were similarly uncommon.

The most common complication in this series was delayed gastric emptying, which was defined as an inability to manage oral fluids after 14 days; this occurred in 18% of patients, similar to other series treating both benign [26] and malignant disease [27–29]. Post-

operative delayed gastric emptying is due to a number of factors secondary to altered pathophysiology of the gastrointestinal tract after pancreatoduodenectomy. Preoperative factors such as diabetes mellitus and prior abdominal surgery have been reported to be involved in the occurrence of delayed gastric emptying [30], but the most common cause is undoubtedly intra-abdominal complications [31].

The present study highlights the problem of sepsis, which afflicts major surgery; some 80 episodes were noted in the 175 patients. Many of these were comparatively minor, but others required intervention and specific therapy that delayed the patient's recovery. The other complications emphasize the care with which these patients have to be nurtured during the perioperative period. This level of care illustrates the lessons being learned in pancreatic cancer surgery; it is not so much the surgeon who ensures a good outcome but the team [32]. Care of the pancreatic patient requires a team approach following protocols to limit and contain complications so that the low mortality can be maintained and the morbidity decreased. For patients who have had a difficult, stressful, and prolonged postoperative recovery, it is difficult to return home and—often on their own—to cease relying on the buttress of alcohol, drugs, tobacco, and inadequate diet that likely characterized the chronic course of the disease.

Pain is the common problem in patients with chronic pancreatitis; preoperatively it is the indication for surgery and postoperatively it is the indicator of surgical failure. Yet that failure is not entirely an indicator of technical consequence. Built into the surgical relief of pain are the factors of personality and previous history. A 75% success rate is commonly described [13, 32], but much of that success depends on the ability to wean the patient from alcohol. Failure to do so predisposes to a poorer result. In our series alcohol use or a chronic pain problem were invariably present in those patients who went on to total pancreatectomy, and the results were poor in that 51% of 59 patients so treated had continued pain postoperatively and were classified as a poor result [23]. The pain, the addiction, and the alcoholism remained, and were further reminders of the poor selection of those patients. That the source of the pain is the pancreatic remnant [25] is not supported by these data, although instances do occur in which an obstruction occurs at the anastomosis. A magnetic resonance scan with secretin stimulation will substantiate this diagnosis.

It has been suggested that diabetes aggravates the problems as-

sociated with pancreatic surgery. Although this is true, it is remarkable how well patients can manage their diabetes even after a total pancreatectomy, provided drug and alcohol dependence are controlled. It is important to be aware that there is a progressive increase in the incidence of diabetes over time postoperatively. Traverso and Kozarek found that 32% of patients developed diabetes after surgery, and by 5 years 37 of their 52 patients (71%) were diabetic [25]. They believe that this progression of diabetes is due to continued chronic inflammation and fibrosis in the pancreatic remnant after surgery, a finding supported by the progressive increase in diabetes after surgery.

That there is undoubted progression of the inflammatory process after surgery suggests that pancreatitis is not a self-limiting process, but once started leads inevitably to obstruction of the pancreas and relief of pain, so fulfilling the original hypothesis of Ammann and colleagues [33]. This may be true, but the time that process takes would ensure that most patients could not be rehabilitated, or would succumb to complications of their disease, yet is a reminder that surgery may not be the only way forward. Good medical management may forestall surgery with or without the use of antioxidants [34]. However, our study shows that surgery can be performed safely with good results, and that it can lead to a normal life pattern in 75% patients, provided patient selection is appropriate.

Résumé. La valeur de la résection chirurgicale chez le patient porteur de pancréatite chronique est un sujet de débat essentiellement en raison de la persistance des symptômes et de la morbidité de la chirurgie, à la fois immédiate et tardive. Ce travail explore les conséquences à long terme de la duodéno-pancréctectomie chez 175 patients souffrant d'une pancréatite chronique, opérés entre 1976 et 1997. L'indication chirurgicale a été portée chez tous ces patients après des périodes variables de traitement conservateur. L'intervention a été une résection classique de type Kausch-Whipple chez 98 patients et un procédé comportant une conservation du pylore chez 67. Il y avait quatre décès postopératoires (jours 7, 10, 35 et 70), et seulement deux réinterventions ont été nécessaires. Le nombre médian de complications postopératoires a été d'un; 31 patients ont eu des troubles de la vidange gastrique, complication la plus fréquente. La durée médiane de séjour hospitalier a été de 20 jours (extrêmes 8–215 jours) mais aucun patient n'est sorti avant que les problèmes médicaux et sociaux ne se soient complètement résolus. On a noté sept décès tardifs, souvent en rapport avec la consomation d'alcool et du tabac; 75% des patients avaient un bon résultat clinique, mais 18 patients ont nécessité une chirurgie pancréatique complémentaire 12 mois en moyenne après, soit une anastomose pancréaticojéjunale soit une résection résiduelle. A cinq ans, on a remarqué un diabète chez 40% des patients, et pour la plupart, une substitution enzymatique s'est avérée nécessaire dès la période postopératoire. On suggère que la résection pancréatique fournit une certaine qualité de vie chez 75% des patients, mais l'évolution dépend surtout de la maladie sous-jacente.

Resumen. El tratamiento quirúrgico de la pancreatitis crónica está muy discutido por la persistencia de los síntomas tras la operación y la morbilidad precoz y tardía en el postoperatorio. En este artículo se exponen los resultados de la duodenopancreatectomía en 175 pacientes intervenidos entre 1976 y 1997. Todos los enfermos fueron operados tras un tratamiento conservador más o menos prolongado. En 98 casos se realizó una duodenopancreatectomía estándar a lo Whipple y en 67 una duodenopancreatectomía conservando el píloro. La mortalidad postoperatoria fue de 4 casos a los 7, 10, 35 y 70 días de la intervención; 2 casos requirieron una reintervención. La complicación postoperatoria más frecuente (31 casos) fue un enlentecimiento del vaciado gástrico. La estancia hospitalaria media fue de 20 días (rango 8–215 días) pues no se dio de alta a ningún paciente hasta que estuvieran resueltos sus problemas médicos y sociales. Se constataron 7 fallecimientos tardíos, casi siempre relacionados con el consumo de tabaco y alcohol. En el 75% de los casos los resultados clínicos fueron buenos, pero 18 pacientes requirieron reintervenciones a los 12 meses (como promedio); se efectuaron o una pancreatoyeyunostomía o una resección total del remanente pancreático. A los 5 años, el 40% de los pacientes eran diabéticos y la mayoría en el periodo postoperatorio precoz, precisó de terapia enzimática restitutiva. Sugerimos que la resección pancreática proporciona una razonable calidad de vida a pacientes con pancreatitis crónica. Sin embargo, los resultados tardíos dependen de la enfermedad subyacente.

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