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# The Complications of Pancreatectomy

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This paper analyses the early postoperative complications after 285 pancreaticoduodenectomies performed during the past 15 years in the Surgical University Clinic, Mannheim. There were 235 partial (Whipple) and 52 total pancreatectomies performed for pancreatic and periampullary tumors (181 patients) and complicated chronic pancreatitis (104 patients). A total of 92 complications requiring relaparotomy in 42 patients ended fatally in nine patients. The overall operative and hospital mortality rate was 3.1%. The most frequent and most dangerous were complications at or around the pancreaticojejunal anastomosis, which occurred 25 times with five deaths. Postoperative hemorrhage was seen in 16 patients; endoscopic treatment in four patients and operation in 12 patients was successful in stopping the bleeding in all but one patient. Eight biliary fistulae either ceased spontaneously (3 patients) or after operative reintervention (5 patients) without any mortality. Control of these complications depends on four lines of approach: (1) *before* operation: optimal preparation of the jaundiced patient including endoscopic transpapillary decompression of the common duct; (2) *during* operation: a meticulous and standardized technique is mandatory; (3) *after* operation: continuous observation in the surgical intensive care unit is essential for the timely detection of possible complications; and (4) early reintervention can salvage the great majority of these patients with deleterious complications.

**E**VEN IN THE LAST QUARTER of the 20th century, pancreatectomy remains one of the most formidable abdominal operations for the surgeon. Originally performed in 1909 by Kausch in Berlin,<sup>1</sup> it was perfected and popularized by Whipple in 1934,<sup>2</sup> and has since found its way into most surgical departments all over the world. Lionized by some surgeons as the "cadillac of abdominal surgery,"<sup>3</sup> morbidity and mortality of this operation are so formidable that others have abandoned it altogether.<sup>4,5</sup> Yet, others (albeit not very seriously) are trying to have it banned by law.<sup>6</sup>

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In this paper we intend to take on this argument by analysing the postoperative complications after 285 pancreatectomies. The lessons we learned from this experience hopefully will be of some use to the reader.

## Materials and Methods

To put these complications into perspective, the overall results of 285 pancreatectomies are presented in Table 1. The operations were performed at the Surgical Clinic of Mannheim (Heidelberg University) between October 1972 and April 1987. There were 172 men and 113 women. The age of these patients ranged from 23 to 75 years with a median of 53 years.

The indications for pancreatectomy in two thirds of all operations were for adenocarcinoma of the pancreas or periampullary malignancy. The preferred procedure was the Whipple operation. Total pancreatectomy was required in only 20% of these cases for reasons of radicality.

In cases where severe and complicated chronic pancreatitis was centered in the head of the pancreas, the Whipple procedure was effective in removing obstruction (of the duodenum, pancreatic, and bile ducts) and pain. Total pancreatectomy was reserved for patients with end-stage chronic pancreatitis early on in the period and has been all but abandoned for this indication since 1976. The details of our technique have been published previously.<sup>7</sup>

Nine patients died after operation in the hospital, for an overall mortality rate of 3.1%. The longest series of operations performed without any mortality were 75 consecutive Whipple procedures done between June 1976 and November 1981.

Although these results appear encouraging, the post-

TABLE 1. *Early Results of Duodenopancreatectomy in 285 Patients*

Type of Procedure	No. of Patients	Diagnosis		Operative Hospital Mortality
		Neoplasm	Pancreatitis	
Whipple operation	233	146	87	6
Total pancreatectomy	52	35	17	3
Total	285	181 (7 deaths)	104 (2 deaths)	9 (3.1%)

operative course has not been smooth all the way. On the contrary, Table 2 shows that a total of 92 complications occurred of which 42 required relaparotomy. These complications will now be analysed in detail.

### Nonsurgical Complications

There were 26 major nonsurgical complications, which are listed in Table 3. These mainly concerned pulmonary, cardiac, and hepatic problems. The latter consisted solely of transient laboratory findings (elevated transaminase levels) in jaundiced patients. In this series of 285 pancreatectomies there was not one case of postoperative renal failure or so-called hepatorenal syndrome.

The one death from bronchopneumonia occurred on the 14th postoperative day in a 49-year-old man who had total gastrectomy as well as total pancreatectomy performed for a gastric carcinoma infiltrating the pancreas. The cause of death was probably aspiration pneumonia since the abdominal findings at autopsy were normal. One 75-year-old man died of myocardial infarction after an uneventful total pancreatectomy for cancer. Another patient died of venous catheter sepsis 12 days after total pancreatectomy for end-stage chronic pancreatitis.

TABLE 2. *Complications after 285 Partial and Total Pancreatectomies*

	Whipple Operation (N = 233)	Total Pancreatectomy (N = 52)
Complications (N = 92)	72 (32%)	20 (40%)
Relaparotomies (N = 42)	38 (17%)	4 (8%)
Deaths (N = 9)	6 (2.7%)	3 (6%)

TABLE 3. *Major Nonsurgical Complications after 285 Pancreatectomies*

Complication	N	Deaths (N)
Bronchopneumonia	7	1
Pleural effusion	4	—
Myocardial infarction	1	1
Hepatic insufficiency	13	—
Venous catheter sepsis	1	1
Total	26	3

### Surgical Complications

There were 66 surgical complications, two thirds of which required reoperation. The list (Table 4) is headed both in number and severity by complications at or around the pancreatic anastomosis, followed by bleeding problems and biliary leaks. Abscesses and some more esoteric complications: chylous ascites, perforation, and jejunal torsion, conclude this list, which now will be discussed in detail.

#### Complications Concerning the Pancreatic Anastomosis

The group of complications feared most is that concerned with the pancreatic remnant or its anastomosis after the Whipple operation. In 233 anastomoses there were 25 complications (11%) and one fifth of these were fatal (Table 5). There was a manifest leak in 11 cases. However, with the abdomen open at relaparotomy it is not always easy to distinguish this from severe pancreatitis in the pancreatic remnant. Such an acute postoperative pancreatitis occurred 11 times.

Three bland pancreatic fistulae closed spontaneously after 2–3 weeks. The experience from two American centers (the Lahey and Mayo Clinics) with this complication are very similar: in a total of 403 Whipple procedures there were 34 pancreatic leaks (8%) with 9 fatalities (26%).<sup>8,9</sup>

*Diagnosis.* The key to successful treatment of these complications is early diagnosis. The simple clinical

TABLE 4. *Surgical Complications, Relaparotomy, and Mortality Rates after 285 Pancreatectomies*

Complication	N	Relaparotomy	Mortality
Pancreatic leak	25	17	5
Abdominal pain	2	2	—
Bleeding			
Gastrointestinal	12	8	1
Operating field	4	4	—
Bile fistula	8	5	—
Abscess			
Hepatic	5	2	—
Abdominal	2	2	—
Chylous ascites	6	—	—
Gastric perforation	1	1	—
Jejunal torsion	1	1	—
Total	66	42	6

findings elicited by continuous observation on the surgical intensive care unit that provide first clues are: a beginning abdominal tenderness where there was none before; the tongue slightly drier than usual; a rise in temperature, pulse or respiratory rate; oliguria and a barely perceptible agitation. Laboratory findings (leukocyte count, serum amylase, creatinine levels, etc.) invariably lag behind these subtle clinical signs. The same applies to modern imaging procedures including ultrasound and CT scans performed routinely 1 week after operation.

### Case 1

A 58-year-old adipose and jaundiced patient had a Whipple procedure performed for a papillary carcinoma. Ten days later he was restless and had a slight rise in temperature and beginning epigastric rigidity. The CT scan showed an edematous pancreas and ultrasound confirmed the presence of subfascial fluid collection (Fig. 1). It was tempting just to aspirate this percutaneously. However, the clinical signs indicated something deeper and more serious, and relying on them we found a small anastomotic leak with severe pancreatitis. Removal of the remaining pancreas (total pancreatectomy) led to the recovery of this patient.

### Case 2

A 60-year-old man had a palliative biliary bypass (choledochoduodenostomy) performed elsewhere for obstructive jaundice due to carcinoma of the pancreatic head. Four weeks later we performed a Whipple procedure (including portal vein resection with a mesentericocaval anastomosis). On the second postoperative day, he had tachycardia, a

TABLE 5. *Complications Occurring at or around 233 Pancreatojejunostomies*

Complication	N	No. of Deaths
Anastomotic leak	11	4
Acute pancreatitis	11	1
Pancreatic fistula	3	—
Total	25	5

dry tongue, and epigastric tenderness. The tube placed to splint the biliary anastomosis then began to drain blood. At laparotomy the pancreatic anastomosis was intact. However, the jejunal loop draining it was distended and the pancreatic remnant had the mottled appearance of pancreatitis (Fig. 2). The explanation for this complication was a spurting bleeder, which we found on the cut surface of the pancreas. Due to a kink in the draining jejunal loop and a large obturating blood clot in that same loop, the blood had no free run-off. The resulting back pressure probably induced the pancreatitis. Again, the solution was a total pancreatectomy and the patient recovered.

In cases with a Völker drain splinting the biliary anastomosis, a leak may be demonstrated directly by injecting contrast medium into this drainage tube with the patient lying on his left side. But here again, it is the clinical signs rather than the radiologic findings of a leak that favor reintervention.

### Case 3

A 47-year-old man had a Whipple operation for a distal common duct carcinoma. One week later a routine x-ray with contrast medium

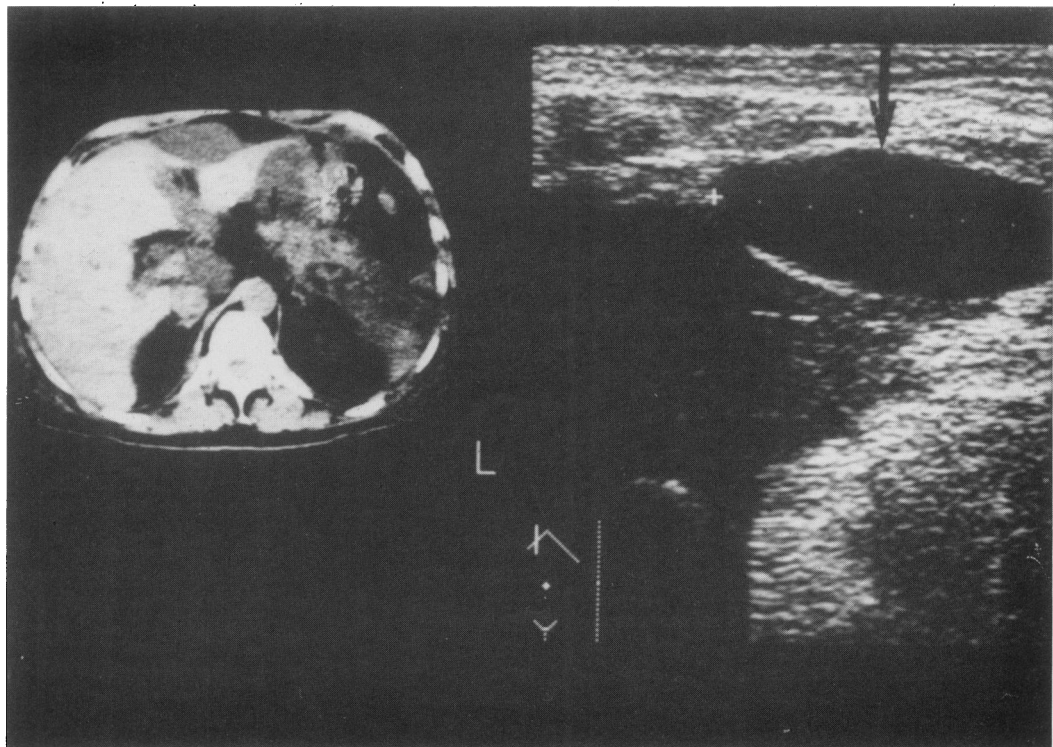


FIG. 1. *Left.* CT 10 days after Whipple procedure. Arrows point at edematous pancreatic remnant. *Right.* Ultrasound of same patient demonstrates subfascial fluid collection.

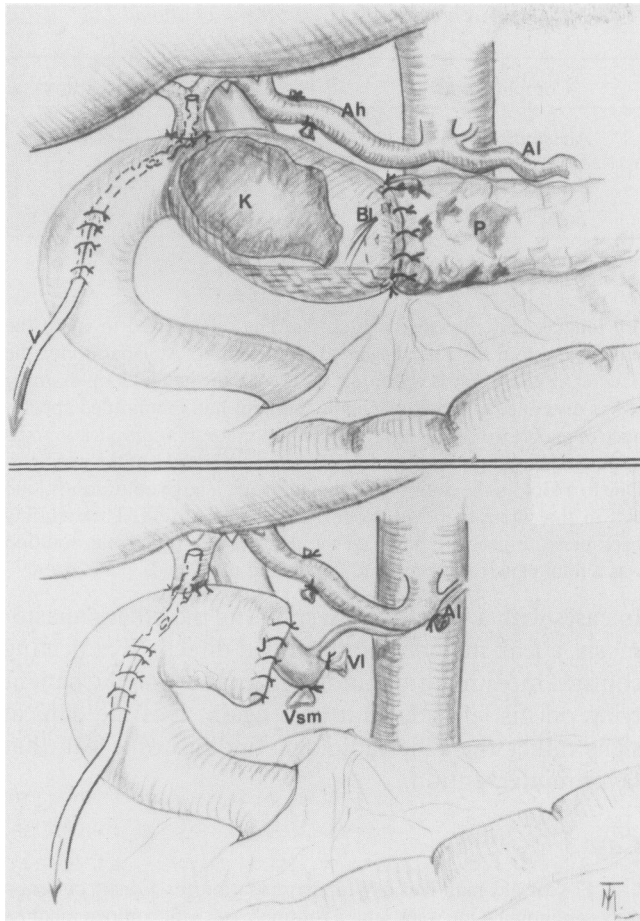


FIG. 2. *Top.* Diagram showing site of operation 2 days after Whipple procedure. Ah = hepatic artery; Al = splenic artery; V = Völker drain; K = blood clot; BL = bleeding from cut surface of pancreas; P = pancreatic remnant with pancreatitis. *Bottom.* Diagram after removal of remaining pancreas. J = jejunal stump oversewn; Al = splenic artery; VI = splenic vein. The superior mesenteric vein (V.s.m.) had been anastomosed to the inferior vena cava at the first operation.

injected *via* the transjejunal tube splinting the biliary anastomosis showed a leak at the pancreaticojejunostomy (Fig. 3). The normal clinical state of this patient permitted expectant treatment, and further control x-rays demonstrated spontaneous closure of this fistula without any intervention.

**Treatment.** Table 6 summarizes our treatment for these 25 pancreatic complications. In eight cases treatment was entirely conservative. This group includes three patients with a radiologically proven fistula. However, in these patients the clinical course was bland and spontaneous closure of the leaks followed in 2–3 weeks (Fig. 3).

In five of 11 patients the diagnosis of postoperative acute pancreatitis rested mainly on laboratory tests (*i.e.*, rise in serum amylase level). The first of these (in fact the first complication in this series) was misjudged by us: the patient died 11 days after pancreaticoduodenectomy before it became clear that her acute respiratory distress

syndrome was secondary to acute pancreatitis. This experience led us to follow the rule of early reintervention when in doubt. As a consequence, two patients were reoperated on for unusual postoperative pain, who then proved to have intact anastomoses and no abdominal pathology at all. At least these “unnecessary” relaparotomies did no harm.

In a group of five patients, treatment was confined to lavage and drainage. Twice the leak had not yet led to any significant peritonitis or pancreatitis. These were both successfully treated by a combination of measures (Fig. 4): the pancreatic duct was occluded with Ethibloc and sutured, the jejunum was oversewn, and an irrigation and suction tube was placed to drain the pancreatic stump.

The very poor condition of three patients did not permit anything more than renewed drainage to be done. Only one of these patients survived.

There were 12 patients in whom the radical solution, namely total pancreatectomy, seemed unavoidable. Two patients died of uncontrollable erosive hemorrhage. However, in 10 of 12 patients, total removal of the remaining pancreas was life-saving.

**Prevention.** There have been many ingenious suggestions for the prevention of these complications at or around the pancreatic anastomosis. So far there only has been one certain prophylaxis: that is to avoid it altogether by doing a total pancreatectomy whenever the pancreatic remnant is very friable and the duct narrow.<sup>10</sup>

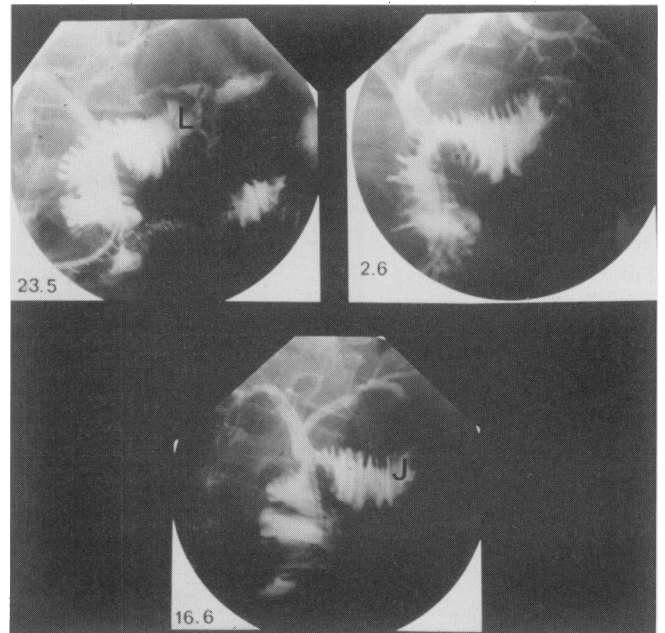


FIG. 3. X-ray with contrast medium injected through tube splinting the hepaticojejunostomy. L = leak of contrast medium through the pancreaticojejunostomy; J = the anastomosis has healed 24 days later.

TABLE 6. Treatment of 25 Postoperative Pancreatic Complications

Complication	N	Treatment			No. of Deaths
		Conservative	Drainage	Total Pancreatectomy	
Anastomotic leak	11	—	5 (2 deaths)	6 (2 deaths)	4
Acute pancreatitis	11	5 (1 death)	—	6	1
Pancreatic fistula	3	3	—	—	—
Total	25	8 (1 death)	5	12 (2 deaths)	5

All variations of the standard end-to-end telescope pancreaticojejunostomy have not produced better results. It does not seem to matter if additional cover is given by jejunoplication,<sup>11</sup> whether the pancreas is buried within the stomach wall,<sup>12</sup> whether three separate loops of gut are used for the gastric, biliary, and pancreatic anastomoses,<sup>13</sup> and whether the pancreatic duct is drained,<sup>14</sup> ligated, occluded, or oversewn, or all three.<sup>15</sup> Even doing nothing to the pancreatic remnant except for leaving a drain in its vicinity has been attempted.<sup>16</sup> That leaves us with the truism that in the end only a meticulous and standardized technique will lower the rate of this complication. And, once it has occurred, only its speedy detection and treatment by early reoperation can save the patient.

#### Postoperative Hemorrhage

Postoperative bleeding was the second common complication occurring in 16 patients (5.6%), requiring relaparotomy in 12 and ending fatally in one (Table 7).

Hemorrhage arose within the gastrointestinal tract in 12 cases, mostly from the gastroenterostomy and never from an acute stress ulcer. The presence of a day-and-night endoscopy service is invaluable here. Immediate gastroscopy can locate the site of bleeding and was successful in stopping it by laser or injection therapy in four cases.

In all but one of the remaining eight patients, relaparotomy and an additional suture stopped the bleeding. This fatality was partly due to our too-conservative approach: the oozing from the gastrojejunal suture line did not appear to be serious and endoscopic therapy was successful at first; the patient rebled, aspirated, and relaparotomy came too late. Four patients (not counting those with anastomotic leaks) bled from one of the large retroperitoneal vessels. In each patient, timely relaparotomy and suture successfully stopped the hemorrhage.

#### Case 4

A 61-year-old adipose and jaundiced man had a Whipple resection performed for pancreatic carcinoma. Ten days later, total pancreatectomy was done because of a acute pancreatitis in the remnant. He recovered from both operations and was discharged home three weeks later. However, he was readmitted 6 days later with pyrexia and re-

peated vomiting of small amounts of blood. The endoscopist located the site of the bleeding by threading the endoscope into the proximal jejunal loop; a trickle of blood was seen clearly coming from the sutured jejunal stump (Fig. 5, top).

At laparotomy we found a pulsating false aneurysm at this point, possibly emanating from the eroded stump of the splenic artery (Fig. 5, bottom). High clamping of the aorta, exposure of the aneurysm, and suture of the leak stopped the bleeding, and the patient was discharged 12 days later.

In the American experience (Lahey and Mayo Clinics) there were a total of 54 hemorrhagic complications after 403 pancreaticoduodenectomies (13%) in which 27 ended fatally.<sup>8,9</sup> Routine stress ulcer prophylaxis, prompt endoscopic diagnosis, and early revision, if necessary, can save most of these patients.

The role of vagotomy in the prevention of bleeding in patients who have a pancreatectomy is controversial. The ulcerogenic potential of partial or total pancreatectomy has prompted some clinics to recommend prophylactic truncal vagotomy for all of these patients.<sup>17,18</sup> In our experience anastomotic ulcers have not been a problem even on late follow-up, and a prophylactic va-

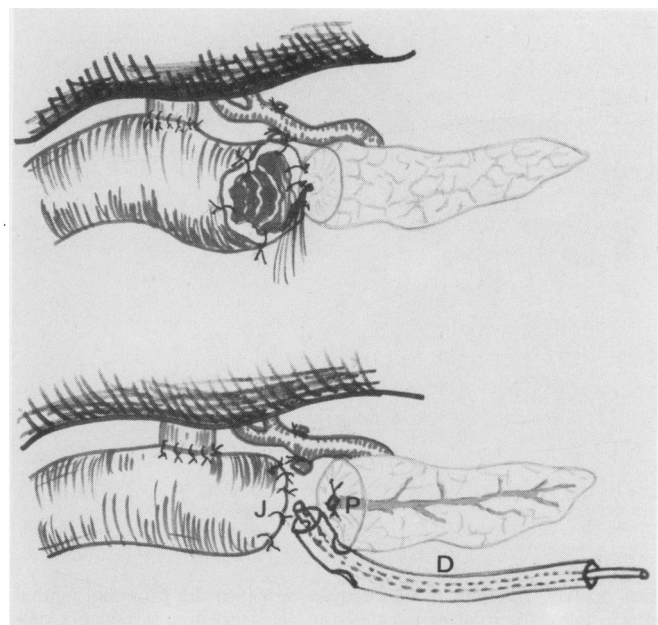


FIG. 4. Top. Breakdown of pancreaticojejunostomy after Whipple procedure. Bottom. Repair by occlusion of pancreatic duct (P) with Ethibloc, closure of jejunal stump (J), and irrigation-suction drain (D).

TABLE 7. Hemorrhagic Complications, Relaparotomy, and Mortality Rate after 285 Pancreatectomies

Site of Hemorrhage	N	Relaparotomy	Mortality
Gastrointestinal	12	8	1
Operative field	4	4	—
Total	16	12	1

gotomy is unlikely to influence bleeding problems in the early postoperative period.<sup>19,20</sup>

### Biliary Fistula

Biliary leaks after partial or total pancreatectomy are rare and relatively harmless in our experience (Table 8). We came across eight such instances of 285 patients at risk (3%) and all survived. The Lahey and Mayo Clinics

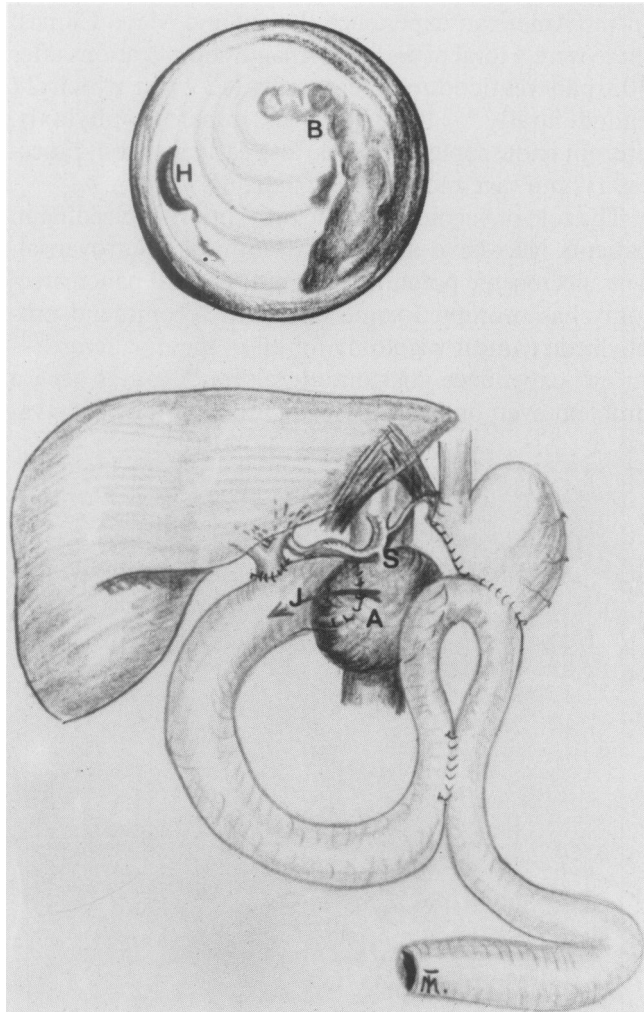


FIG. 5. *Top.* Diagram of endoscopic view into the proximal jejunal stump following total pancreatectomy. H = opening of hepaticojejunostomy draining bile; B = blood clot and fresh blood entering the jejunal stump. *Bottom.* Diagram of situation following total pancreatectomy with false aneurysm (A), arising from ligated splenic artery (S), and penetrating into the jejunal stump (J).

TABLE 8. Biliary Leakage and its Treatment after 285 Pancreatectomies

Site of Leak	N	Therapy			Mortality
		Con-servative	Operative Drain	Suture	
Hepatico-jejunostomy	4	2	2	—	—
Biliary drainage	2	—	2	—	—
Accessory bile duct	2	1	—	1	—
Total	8	3	4	1	0

reported on 46 biliary fistulae with four deaths after 441 pancreatectomies.<sup>8,9</sup>

True anastomotic leaks occurred in four cases, two of which required renewed drainage. The other two fistulae sealed off spontaneously. Twice the bile leaked due to dislocation of the Völker drainage tube, used to splint the biliary anastomosis (Fig. 6). Removal of this drain solved the problem. Currently we use such splints only if the bile duct is narrow (less than 10 mm in diameter).

Leakage from an accessory bile duct, overlooked at the first operation, required a new anastomosis in one case only.

### Miscellaneous Complications

*Abscess.* Seven genuine abscesses either hepatic or intra-abdominal were readily located by means of ultrasound or CT (Fig. 7). Percutaneous drainage under ultrasound guidance was possible in three of these cases; the remainder required operative drainage (Table 4).

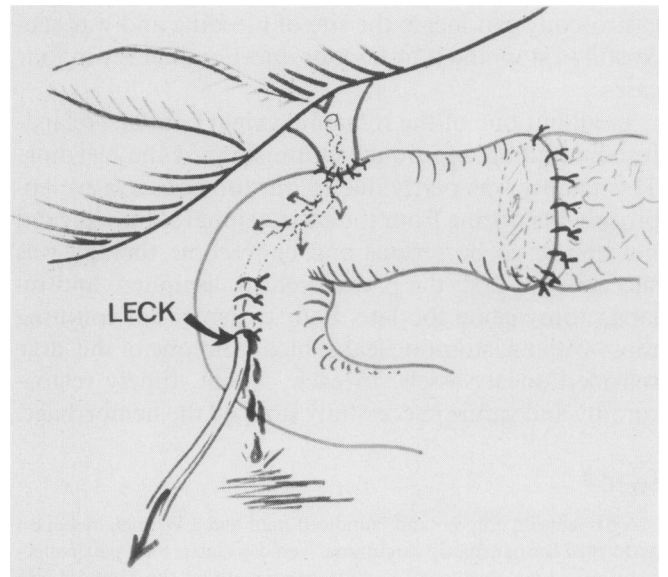


FIG. 6. Diagram demonstrating leakage of bile from the site of exit of the Völker drain.

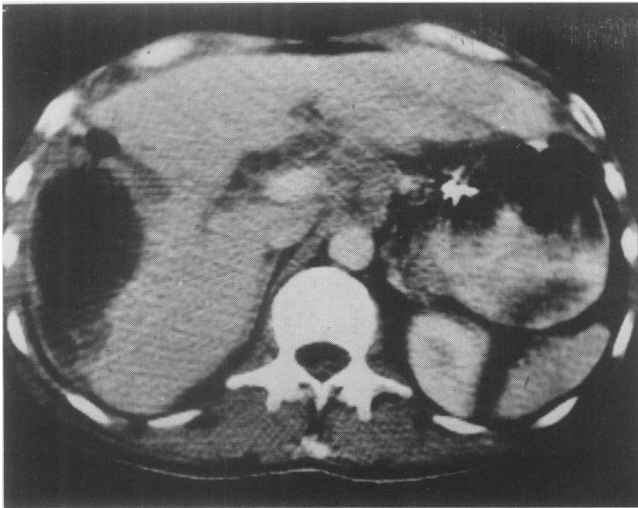


FIG. 7. CT demonstrating hepatic abscess after a Whipple procedure.

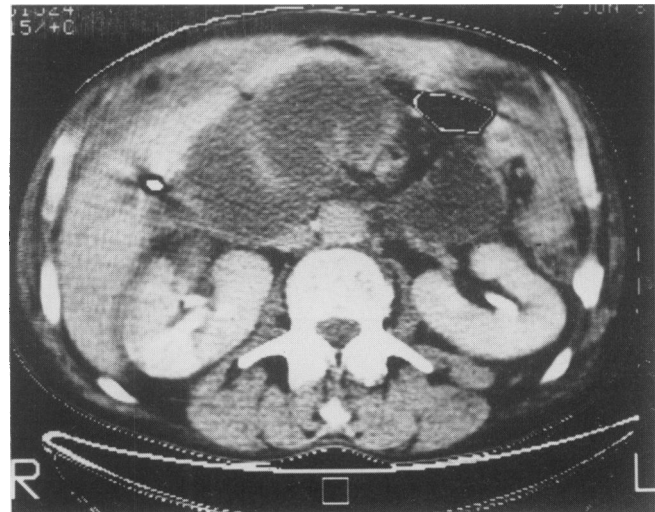


FIG. 8. CT 8 days after a Whipple procedure showing dilated, edematous jejunal loop in the immediate subhepatic space.

**Chylous ascites.** Chylous ascites occurs relatively rarely considering the extensive lymph node dissection that occurs with every pancreatectomy for cancer.<sup>21</sup> It can reach alarming proportions of several liters per day even requiring parenteral nutritional support. In each of our 6 cases secretion ceased spontaneously within 1 or 2 weeks.

**Gastrointestinal fistula.** Leakage of the gastrojejunal anastomosis, reported to occur in around 2% of cases,<sup>8</sup> was not seen in this series. However, one gastric perforation occurred high on the greater curvature of the stomach 7 days after total pancreatectomy with splenectomy. The cause was a small area of necrosis following ligation of the short gastric vessels. After this experience, we always secure the greater curvature with a row of Lembert sutures after total pancreatectomy.

**Gastrointestinal necrosis.** The following case report describes this curious complication.

#### Case 5

A 57-year-old jaundiced man had a carcinoma of the pancreatic head removed by a Whipple operation. After an uneventful course he had a fever, brief epigastric pain, and dyspnea on the seventh postoperative day. Since the patient seemed to improve spontaneously, we were inclined to blame this brief episode on a mild basal pneumonia, particularly since a chest x-ray seemed to confirm this.

On the next day a routine CT control showed some curiously dilated loops of bowel in the upper abdomen (Fig. 8). When the patient had another spike of temperature (39 C), we decided to reoperate. The proximal jejunal loop draining the pancreatic remnant and bile duct was grotesquely dilated and ischemic due to torsion at the Braun jejunostomy. Again there was no choice but to convert the Whipple into a total pancreatectomy and to bring up the next loop of jejunum for a new biliary anastomosis (Fig. 9).

This case emphasized once more that postoperative respiratory distress only rarely is primarily of pulmonary origin (even if x-ray evidence seems to support this

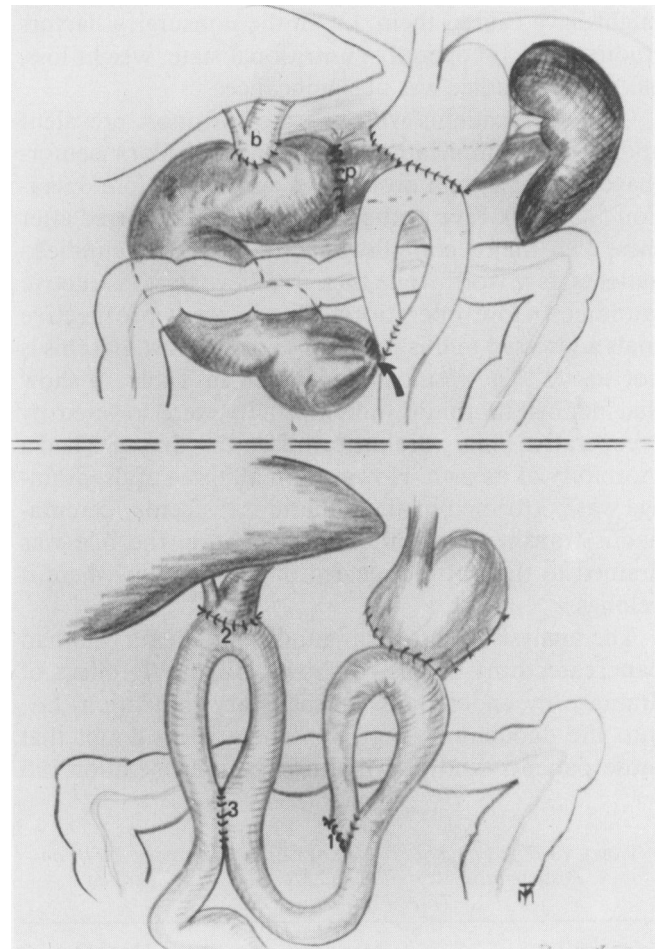


FIG. 9. *Top.* Diagram of operative site after a Whipple pancreatectomy. Arrow points to torsion of the proximal jejunal loop at the Braun jejunostomy. *b* = hepaticojejunostomy; *p* = pancreaticojejunostomy. *Bottom.* Operative site after the removal of the offending jejunal loop, remaining pancreas, and spleen. 1 = oversewn jejunum at site of Braun anastomosis; 2 = new hepaticojejunostomy; 3 = new jejunostomy.

TABLE 9. Influence of Preoperative Obstructive Jaundice on the Occurrence and Mortality of Postoperative Pancreatic Leaks and Bleeding Problems in 41 Patients

Complication	With Jaundice		Without Jaundice	
	N	No. of Deaths	N	No. of Deaths
Pancreatic leak	23	4	2	1
Postoperative bleeding	12	1	4	0
Total	35	5	6	1

view). The real cause lies below the diaphragm in the operative field.

### Discussion

On analysing these 92 complications after 285 pancreatectomies, one begins by looking for risk factors that might have caused them. Of all the nonsurgical factors studied (age, preoperative nutritional state, weight loss, etc.) only jaundice was of significance.

Of the 41 patients who had the two most prevalent and serious complications, a pancreatic leak or hemorrhage, 35 (85%) had obstructive jaundice before operation (Table 9). Five of the six deaths that occurred after these two major complications occurred in jaundiced patients. Is it worthwhile then to relieve this obstructive jaundice before operation? Three recent prospective trials addressed to this problem seem to show that this is not so.<sup>22-24</sup> The results summarized in Table 10 show that neither morbidity nor mortality were lowered by preoperative biliary drainage; in fact, this drainage had a morbidity of its own. However, in all three trials, drainage was performed by the rather unsatisfactory percutaneous transhepatic route. Furthermore, the bile was drained to the outside instead of into the gut where it belongs.

The analysis of our own jaundiced patients who had pancreatectomy seems to show a favorable effect of drainage by endoscopic transpapillary intubation, *i.e.*, into the duodenum (Fig. 10). There is no doubt that those patients who had drainage before operation did

TABLE 10. The Value of Preoperative Biliary Drainage (PTD) on Postoperative Morbidity and Mortality as Studied in Three Prospective Trials

First Author	Morbidity		Mortality	
	With PTD	Without PTD	With PTD	Without PTD
Hatfield (1982) <sup>22</sup>	14%	15%	14%	15%
McPherson (1984) <sup>23</sup>	33%	42%	32%	19%
Pitt (1985) <sup>24</sup>	46%	53%	8%	5%

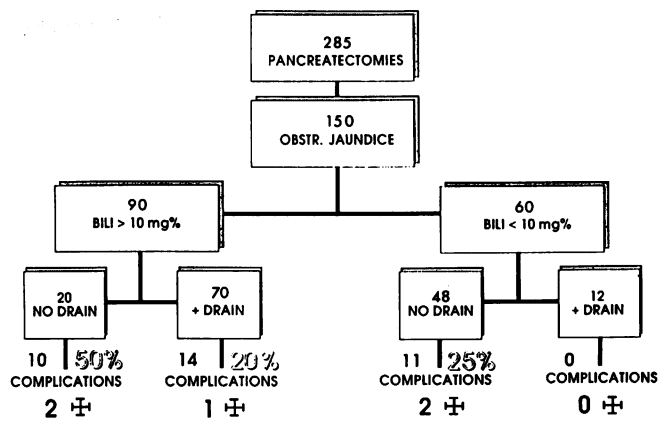


FIG. 10. Morbidity and mortality after pancreatectomy (partial and total) in a 150 patients with obstructive jaundice. Irrespective of the severity of jaundice (90 patients with bilirubin levels above, and 60 with bilirubin levels below 10 mg%), those drained before operation had less postoperative morbidity and mortality.

much better regarding complications and mortality irrespective of the severity of the obstructive jaundice.<sup>25</sup> However, this study was retrospective and not randomized. Perhaps the discrepancy between the results as shown in Table 10 can be explained by the different methods of biliary drainage used and by the fact that in obstructive jaundice the recovery of hepatic functions depends on many factors: the intensity and preoperative duration of jaundice and the length of the decompression. As Koyama and co-workers showed, it takes at least 4–6 weeks of decompression before hepatic mitochondrial functions return to normal.<sup>26</sup> This is probably longer than is feasible in cancer patients. For these reasons, we believe that the discussion on this question of preoperative decompression is not yet closed. Until it is, we will drain all jaundiced patients, if this can be done easily, at the time of the initial endoscopic cholangiography.<sup>27</sup> We have in so far revised our position, which used to favor one-stage pancreatectomy even in severely jaundiced patients.<sup>25</sup>

An additional risk factor possibly responsible for impaired healing of the pancreatic anastomosis is ischemia due to celiac artery occlusion.<sup>28</sup> With routine preoperative angiography one encounters few cases with such an occlusion and perfusion of the hepatic and splenic arteries *via* pancreatoduodenal arcades. The unavoidable division of these vessels during a Whipple procedure could theoretically cause ischemia of the pancreatic remnant. In actual practice this danger is overrated since other collaterals probably come in. None of our patients with surgical complications had evidence of celiac occlusion on routine preoperative angiography. Conversely, in our six patients with such a vascular obstruction, occlusion of the gastroduodenal artery did not measurably reduce



flow in the hepatic artery nor were there any postoperative complications.

One final risk that deserves mention is the surgeon himself. It seems axiomatic that formidable operations such as partial and total pancreatectomy should be concentrated in those centers where experience can keep complications to a minimum or at least deal with them successfully should they occur.<sup>29,30,31</sup> Such centers all over the world are now reporting large pancreatectomy series with low morbidity and mortality rates under 5%.<sup>11,32,33</sup> However, the pioneer days of pancreatectomy are over, and towards the end of this century the well-trained "occasional pancreatectomist" may produce equally good results,<sup>34</sup> provided that he adheres to the following rules: (1) optimal preoperative preparation of the patient, including neutralization of the deleterious effects of obstructive jaundice and malnutrition as far as possible; (2) meticulous attention to detail in the performance of the operation itself; and (3) continuous, close observation of the patient in the postoperative period so as to detect complications on time.

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