

# Pancreaticoduodenectomy for Benign Disease

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Ten cases of pancreaticoduodenectomy (PD) performed for benign disease are reported with all patients alive and well at an average of 7.5 years. A review of the English literature reveals that 52 patients have had a PD for benign disease in which a carcinoma had originally been suspected (incidence of 1%) with an overall surgical mortality of 9.6%. Three hundred and thirty-four cases of PD done for complications of pancreatitis have been reported with an overall mortality of 4.8%. On rare occasion, despite extensive preoperative evaluation, a patient will be explored with true uncertainty as to the diagnosis of a periampullary mass. Under these circumstances, it has been considered good surgical judgement to proceed with resection, considering that the lesion may be benign, as opposed to leaving behind an early resectable malignant lesion. Results of this review support this policy only in that if the PD is done for what turns out to be benign disease, the perioperative mortality is low, and an excellent long-term survival can be expected.

SINCE WHIPPLE'S first description,<sup>1</sup> a great deal has been written about pancreaticoduodenectomies as the treatment of choice for localized periampullary carcinomas. In certain cases, a periampullary mass is discovered but a pathologic diagnosis can not be made despite extensive preoperative evaluation and exploration. In this situation, it has been considered good surgical practice to proceed with a pancreaticoduodenectomy in hopes of curing an early resectable malignant lesion. As a result of this policy, the lesion occasionally turns out to be benign. The other occasions for which a pancreaticoduodenectomy is performed for benign disease is for complications of chronic pancreatitis of the head of the pancreas and for severe trauma to the periampullary region.

In a recent review of all the pancreaticoduodenectomies performed at The New York Hospital-Cornell Medical Center over the past 40 years, ten patients were identified for whom the procedure had been done for benign disease.<sup>2</sup> Long-term follow-up was available on all ten patients and revealed that all were alive and well with an average follow-up of 7.5 years. In four patients

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the preoperative diagnosis had been correct, including one patient with trauma to the periampullary region, one patient with leiomyoma of the duodenum, and two patients with chronic pancreatitis and chronic abdominal pain. The indication for surgery in the other six patients was the presence of a periampullary mass suspicious of being a carcinoma of which two turned out to have cystadenomas of the pancreas, three had chronic pancreatitis, and one had an impacted stone in the distal common bile duct (Table 1). The average age of these six patients was 63 years, half of whom are men and half of whom are women. Of these six patients, before operation, four complained of weight loss, two of pain, one of jaundice, one of nausea, one of pruritis, two of anorexia, three of dark urine, one of light stools, two of fatigue, and one of heartburn; none complained of diarrhea. One of the six patients is diabetic. Preoperative physical findings in these patients included tenderness in three, jaundice in four, palpable liver in three, possible palpable gallbladder in three, and none with a palpable mass. Mean laboratory values in these six patients were as follows: hemoglobin 13.7, hematocrit 40.7, W.B.C. 10.4, total bilirubin 5.4, alkaline phosphatase 404, SGOT 74, SGPT 168, protein 6.5, albumin 3.9, globulin 2.6, and amylase 109.

Including our six patients, there are 52 reported cases of pancreaticoduodenectomies performed for benign disease in which a carcinoma had originally been suspected (Table 2). Of this group, there were seven perioperative deaths. A closer look at the seven deaths includes two of which occurred in the series reported by Craighead in 1958.<sup>7</sup> In his series of 78 pancreaticoduodenectomies, the overall mortality for all 78 patients was 53%, way in excess of accepted mortality rates for the procedure. If one does not include these two deaths, the overall mortality of doing a pancreaticoduodenec-

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TABLE 1. *The New York Hospital-Cornell Medical Center Pancreaticoduodenectomies Done for Benign Disease*

Patient	Age	Sex	Date Surgery	Preop Diagnosis	Pathologic Diagnosis
1	60	F	1970	CA Pancreas	Pancreatitis
2	57	M	1975	Pancreatitis	Pancreatitis
3	67	F	1974	Pancreatitis	Pancreatitis
4	61	M	1975	CA Pancreas	Pancreatitis
5	68	F	1975	CA Ampulla	Pancreatitis
6	63	M	1963	CA Pancreas	Cystadenoma pancreas
7	57	F	1978	CA Pancreas	Cystadenoma pancreas
8	70	M	1978	CA Pancreas	Impacted gallstone
9	55	M	1978	Leiomyoma duodenum	Leiomyoma duodenum
10	10	M	1960	Duodenal hematoma (As a result of blunt trauma in a hemophiliac)	Same

tomy for what turns out to be benign disease is 9.6%. Biliary tract disease or pancreatitis accounted for 48% (25 out of 52) of the mistaken diagnoses. The overwhelming majority of pancreaticoduodenectomies performed for carcinoma result in finding carcinoma. The probability of having done a pancreaticoduodenectomy for a preoperative diagnosis of carcinoma that turned out to be benign disease is 3% for those series in Table 2, and less than 1% if all pancreaticoduodenectomies done for carcinoma are considered. Of those patients

with an equivocal preoperative diagnosis of obstructive jaundice, all turned out to have carcinoma in this series.<sup>2</sup>

Further review reveals that there are 334 reported cases of pancreaticoduodenectomies done for complications of chronic pancreatitis, (including the authors' two patients). There were 16 perioperative deaths in this group for a surgical mortality of 4.8%.<sup>7-9,16,20-40</sup> Combining this group with the others done for benign disease, the overall surgical mortality of a pancreaticoduodenectomy done for benign disease is 5.5% (Table 3).

TABLE 2. *Previously Reported Pancreaticoduodenectomies Done for Benign Disease in Which a Carcinoma Had Originally Been Suspected*

Author	No. Cases	Diagnosis	Follow-up	
Warren	1975 <sup>3</sup>	7	6-Pancreatitis 1-Cystadenoma	
Gilsdorf	1973 <sup>4</sup>	5	Stone or pancreatitis	1 Periop death
Child	1966 <sup>5</sup>	4	Biliary tract disease	
Porter	1958 <sup>6</sup>	1		Well at 6 yrs. postop
Craighead	1958 <sup>7</sup>	2		2 Periop deaths
Cattell	1949 <sup>8</sup>	3		1 Periop death
Longmire	1956 <sup>9</sup>	2		Well at 5.5 yrs. postop
Bowden	1954 <sup>10</sup>	3		1-Well at 3 yrs. postop 1-Well at 5 mos. postop 1-Died at 8 mos. postop
Aston	1973 <sup>11</sup>	3	1-Calculus 1-Adenoma 1-Adenoacanthoma	
Gatti	1974 <sup>12</sup>	1	Pancreatitis	
Hilst	1959 <sup>13</sup>	6	3-Pancreatitis 1-Myoblastoma 2-Adenomatous hyperplasia	1-Well at 8 yrs. postop
Carlson	1950 <sup>14</sup>	1		Died 9th day postop
Tsuchiya	1971 <sup>15</sup>	1		Well at 10 mos. postop
Sato	1970 <sup>16</sup>	1		
Turner	1978 <sup>17</sup>	1		
Ruilova	1976 <sup>18</sup>	1		
Denker	1972 <sup>19</sup>	4	1-Lymphoma 1-Unknown 1-Gallstone 1-Ectopic pancreas	2 Operative deaths 1-Well at 2 yrs. 1-Well at 6 yrs.
Cohen	1982	6	3-Pancreatitis 1-Gallstone 2-Cystadenoma	All alive & well Average follow-up of 7.5 years
		52		7 Periop deaths

TABLE 3. *Surgical Mortality of Pancreaticoduodenectomies Done for Benign Disease; Cumulative Prior Reported Cases*

Pancreaticoduodenectomy for Benign Diseases	Perioperative Deaths
334 for pancreatitis	16
46 for suspected carcinoma	5
380	21
$\frac{21}{380} = 5.5\%$ overall surgical mortality for benign disease	

Pancreaticoduodenectomies done for trauma have been well reported with an overall mortality of 30% in the 50 cases reviewed by Yellen in 1975.<sup>40</sup> The intraoperative mortality is higher in this setting because of several factors, including associated major vascular injuries, and the major postoperative mortality can be attributed to a combination of post-traumatic respiratory insufficiency, acute renal failure, and post-traumatic; coagulation disorders as opposed to the procedure itself.

### Discussion

Unfortunately, most carcinomas of the periampullary region are discovered too late and are considered unresectable at the time of presentation. Of those considered operable, only few come to resection at the time of exploration. Child reported a resectability rate of 9.6%, 68%, 26%, and 43% for carcinoma of the pancreas, ampulla of Vater, common bile duct, and duodenum, respectively.<sup>5</sup> Even more disheartening is that, of those patients undergoing a pancreaticoduodenectomy for cure, the results are poor, with five-year survivals of 0 to 14% for pancreatic adenocarcinoma, 22 to 39% for ampullary carcinoma, 11 to 30% for common bile duct carcinoma, and 29 to 41% for duodenal carcinoma.<sup>2,5,11,42,43</sup> Because of the even more dismal results of other treatment modalities, resection of an early malignant lesion still may be the only chance for survival in the rare patient in which a localized periampullary lesion is discovered. In the great majority of cases, a correct preoperative diagnosis should be made by the proper preoperative work-up. A history of painless jaundice, weight loss, or constant abdominal pain after prolonged jaundice will alert the astute clinician to the probability of carcinoma. Preoperative studies including ERCP and CT scans will help confirm the diagnosis. Common confusing lesions such as common duct stones and chronic pancreatitis must be carefully ruled out as well as possible. Only rarely will a patient be explored with true uncertainty as to the diagnosis of the periampullary mass. It is only under these rare circumstances

that an experienced surgeon should proceed with resection of the localized periampullary mass, considering it may be benign, as opposed to leaving behind a possible early resectable malignant lesion. Results of this review further support this policy only in that if the pancreaticoduodenectomy is performed for what turns out to be benign disease, the perioperative mortality is 5.5%, and an excellent long-term survival can be expected.

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