Surgical palliation for pancreatic carcinoma

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Summary: A review of 122 patients treated for pancreatic adenocarcinoma from January 1978 through December 1984 was accomplished to determine patient survival and the effect of surgical palliation. One hundred patients underwent laparotomy, including biopsy only ($n = 42$), biliary bypass ($n = 30$), gastric bypass ($n = 1$), biliary and gastric bypass ($n = 14$), and curative resection ($n = 13$). Total patient median survival was 3.6 months and no patient lived 5 years. No significant difference in survival was found between the biliary bypass and combined biliary-gastric bypass groups. Only 1 of 30 patients (3.3%) undergoing biliary bypass alone without evidence of pre-operative gastric outlet obstruction developed late gastric outlet obstruction requiring gastrojejunostomy. Operative time and postoperative morbidity were greater in the biliary-gastric bypass group. These results do not support routine prophylactic use of gastrojejunostomy at the time of biliary bypass for patients with unresectable carcinoma of the pancreas.

Introduction

In recent years carcinoma of the pancreas has increased in incidence. The operative management of pancreatic carcinoma has been controversial since its beginning.¹ In 1958 Porter described 3 periods in the history of pancreatic cancer treatment.² The first period he termed the 'Pioneer period' (1935–1947) during which the surgical community learned and perfected the surgical treatment of pancreatic cancer. The second or 'Radical period' (1948–1952) was a time when more extensive procedures were being proposed to extend the disease-free margin. The 'Rational period' (1953–1957) was a time when patient selection for surgical resection became more important.

Operative mortality rates as high as 20% and 5-year survival rates of less than 5% continue to plague the surgeon attempting to treat pancreatic cancer.³ This poor outcome has prompted many to abandon more aggressive surgical resection procedures for conservative palliative procedures.

Among proponents of palliative procedures yet another controversy exists. Although most authors advocate biliary drainage for the jaundiced patient with unresectable pancreatic carcinoma, the benefit of prophylactic gastric bypass remains unclear. The present study evaluates survival and surgical palliation in patients with pancreatic carcinoma.

Materials and methods

The hospital records and tumour registry files were reviewed for patients with pancreatic adenocarcinoma treated at Memorial Medical Center and St John's Hospital, Springfield, Illinois, from January 1978 through December 1984. One hundred and twenty-two patients were treated during this period for adenocarcinoma of the head, the body or the tail of the pancreas. Patients with periampullary, duodenal or distal common bile duct cancers were excluded from this study. All diagnoses were confirmed by either percutaneous or surgical biopsy.

Information, including demographics, presenting symptoms, location of disease, extent of disease, and treatment, was obtained. The average percent reduction in total bilirubin in patients undergoing biliary-enteral bypass was determined from the highest pre-operative total bilirubin level and the lowest postoperative total bilirubin level prior to discharge from the hospital. Careful review of pre-operative symptoms, upper gastrointestinal contrast studies and intra-operative findings were used to determine the presence of impending duodenal obstruction. Operative time, the time required for return of bowel function following surgery, and hospital length of stay were recorded for patients undergoing biliary bypass alone and for those having combined gastric-biliary bypass. Delayed gastric emptying was defined as vomiting or food intolerance persisting more than 8 days postoperatively. Calculation of median survival

time (i.e. the time at which 50% of the patients were still alive) included operative deaths.

Results

One hundred and twenty-two patients were treated for adenocarcinoma of the pancreas from January 1978 through December 1984. The patient population included 73 (60%) men and 49 (40%) women. The average patient age was 66.8 years (range 41–92). Presenting symptoms are shown in Table I.

Tumour location as described by operative reports, radiology reports and pathology reports was head of the pancreas (*n* = 107, 88%) and body or tail of the pancreas (*n* = 15, 12%). The extent of the disease was confined to the pancreas in 13 (11%), while 49 patients (40%) had local spread and 60 patients (49%) had distant metastasis at the time of diagnosis. Treatment modalities and the various adjunctive therapies are outlined in Table II. All 13 patients with confined disease underwent curative resection (9 pancreatico-duodenectomies and 4 total pancreatectomies). There were 2 operative deaths in this group (15% mortality). Only 18% of patients were treated non-operatively.

Evaluation of those patients receiving biliary bypass procedures revealed choledochojejunostomy to be most effective in reducing total bilirubin (Table III). Only 2 of the 30 patients who underwent palliative biliary bypass procedures developed subsequent gastric outlet obstruction (Table IV). One of these patients, however, had evidence of partial gastric outlet obstruction on a pre-operative upper gastrointestinal barium study and went on to complete obstruction within 4 weeks. The other patient developed this complication 4 months after biliary diversion, requiring an uneventful gastrojejunostomy. Therefore only 1 of 30 patients (3.3%) without pre-operative gastric outlet obstruction developed late obstruction following biliary bypass alone. Of the 14 patients who had palliative combined biliary and gastric bypass procedure, 3 (21.4%) had clinical or radiographic pre-operative gastric outlet obstruction. None of these patients developed late gastric outlet obstruction. In the remaining 11 patients, the absence of pre-operative symptoms and intra-operative findings of duodenal obstruction suggested the gastroenterostomy was performed prophylactically.

The hospital stay, length of operation and time required for resolution of postoperative ileus for patients having biliary or combined biliary-gastric bypass are shown in Table V. The operative mortality was similar for the two groups. Although not statistically significant, the operative morbidity for patients undergoing combined biliary-gastric

Table I Presenting symptoms (%) in 122 patients with carcinoma of the pancreas

Pain	77	(63)
Weight loss	63	(52)
Jaundice	62	(51)
Nausea	33	(27)
Anorexia	31	(25)

Table II Treatment modality (%) in 122 patients with carcinoma of the pancreas

Non-operative	22 (18%)
Diagnostic laparotomy	42 (34%)
Palliative bypass	45 (37%)
-Biliary (30)	
-Gastric (1)	
-Biliary and gastric (14)	
Curative resection	13 (11%)
Adjunctive therapy	55 (45%)
-Radiation (7)	
-Chemotherapy (34)	
-Both (14)	

bypass was nearly twice that of patients having the biliary bypass alone. Three of the 14 patients (21%) undergoing combined biliary-gastric bypass had delayed gastric emptying. None of these 3 patients had pre-operative gastric outlet obstruction, and no patient having biliary diversion alone developed this complication.

Median survival time for all patients was 3.6 months and there were no 5-year survivors. Survival for patients undergoing surgical intervention (4.2 months) was significantly improved over patients treated non-operatively (1.8 months, *P* = 0.0004), which probably reflects the extent of disease. There was no significant difference in survival between patients undergoing a palliative procedure (5.5 months) and those undergoing curative resection (7.5 months), which may reflect the high operative mortality (15%) seen in the latter group. The longest survivor was a patient receiving resection for cure (42 months). There was no significant difference in survival for those receiving biliary bypass alone (4.5 months) compared to combined biliary-gastric bypass patients (9.5 months).

Survival among all patients receiving adjuvant radiation and/or chemotherapy (4.8 months) was similar to that for patients receiving none (2.5 months). However, in the subgroup of patients with local extension of disease who received surgical palliation, adjuvant therapy significantly improved survival (11.5 vs 3.6 months, *P* = 0.004).

Table III Biliary – enteric bypass procedures in 44 patients with carcinoma of the pancreas

	<i>n (%)</i>	<i>Average % reduction in total bilirubin</i>
1. Choledochojejunostomy	19 (43)	69.0 + 18.2
2. Cholecystojejunostomy	14 (32)	46.9 + 33.6
3. Choledochoduodenostomy	10 (23)	38.6 + 28.7*
4. Jejunohepatostomy	1 (2)	—

* *P* < 0.05 vs choledochojejunostomy

Table IV Palliative bypass procedures in 44 patients with carcinoma of the pancreas

<i>Type</i>	<i>n</i>	<i>Pre-operative gastric outlet obstruction</i>	<i>Late gastric outlet obstruction</i>
Biliary	30	1 (3.3%)	2 (6.7%)
Biliary and gastric	14	3 (21.4%)	0

Table V Outcome of palliative bypass procedures in 44 patients with carcinoma of the pancreas

<i>Type</i>	<i>Hospital stay (days)</i>	<i>Oral intake resumed (days)</i>	<i>Length of operation (min)</i>	<i>Operative** mortality (%)</i>	<i>Operative morbidity (%)</i>
Biliary	*11.4 + 5.3	4.1 + 1.7	130 + 54.1	13	26
Biliary and gastric	14.0 + 6.1	6.2 + 2.9	188 + 30.9	14	43

*Mean values ± s.d. (all differences not significant); **death within 30 days of operation

Discussion

The debate over palliative versus radical surgery for pancreatic carcinoma continues. Since the first surgical review was published by Sauve in 1980¹ various treatment methods have been proposed. In 1975 Shapiro³ studied 48 patients with cancer limited to the pancreas or adjacent tissues. Half of the patients underwent a Whipple procedure while the other half had a palliative biliary bypass. He found the mean survival was not significantly increased by resection. Similarly Roukema *et al.*⁴ concluded that, for patients with cancer confined to the head of the pancreas, the Whipple procedure did not offer a significant advantage over lesser procedures in survival. Although no patient lived 5 years in this study, the present authors still advocate curative resection in patients with confined disease since it is the only chance for cure.

The role and type of palliative procedures for unresectable pancreatic carcinoma have also been topics of debate. Most authors agree that biliary bypass is beneficial in the jaundiced patient. However, the best type of surgical bypass has been controversial. Sarr and Cameron, in a review of the literature (1965–1980),⁵ evaluated the effectiveness

of using the gallbladder versus the common bile duct for bypass. Although mortality was not different, they found that recurrent jaundice and cholangitis occurred in up to 10% of patients following cholecystojejunostomy but did not occur after choledochojejunostomy. We also prefer choledochojejunostomy, since the present study demonstrates a more effective reduction in bilirubin when compared to cholecystojejunostomy or choledochoduodenostomy. Although endoscopic intubation has recently become a successful alternative to operative biliary bypass in many centres, it is not routinely performed in our patients because of the reported higher rate of cholangitis and the need for repeated hospital admission for changes of the stent.^{6,7}

The reported incidence of subsequent gastric outlet obstruction following biliary diversion alone for unresectable pancreatic carcinoma has varied from 2% to 50%.⁵ Many feel that the frequency of this complication justifies routine gastroenterostomy, especially since addition of this procedure to biliary bypass does not appear to increase operative mortality.^{8–12} One must be critical of several of these studies, however, since either no mention of impending duodenal obstruction at the time of

biliary bypass is made,⁸⁻¹⁰ or patients with pre-operative evidence of gastric outlet compromise are included when calculation is made of the incidence of subsequent gastric outlet obstruction from tumour.^{11,12} We would not argue the use of gastroenterostomy in these patients. This subgroup of patients with pre-operative gastric obstruction, however, represented only 11% of all those palliated in this study and 19% in another recent series.¹³ The incidence of late gastric outlet obstruction in patients without pre-operative evidence is more important since gastric bypass then becomes a true prophylactic procedure. The incidence in the present study was only 3.3% and would probably be lower in others if patients with pre-operative duodenal obstruction were excluded.

More important than incidence alone may be the morbidity associated with prophylactic gastroenterostomy in deciding its routine use. Sarr found that length of hospital stay was significantly longer for patients undergoing combined biliary-gastric bypass compared to biliary diversion alone.¹² This was thought to reflect the high incidence of delayed

gastric emptying (22 of 107 patients) seen in those undergoing gastroenterostomy. Shantz similarly found a high incidence of delayed gastric emptying (14%) following gastroenterostomy¹⁴ that was not seen after biliary diversion alone. In the present study, 3 of 14 (21.4%) patients undergoing combined biliary-gastric bypass developed delayed gastric emptying; none of these 3 patients had pre-operative evidence of duodenal compromise, suggesting a defect in motility caused by this operation. No patient undergoing biliary diversion alone developed this complication. In addition to this increased morbidity seen with combined biliary-gastric bypass, operative time was also increased by an average of 58 minutes.

In conclusion, although still controversial, the low incidence of late gastric outlet obstruction in this study combined with the increased morbidity associated with gastroenterostomy does not support the routine prophylactic use of this procedure in patients with unresectable adenocarcinoma of the pancreas.

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