PAPERS AND SHORT REPORTS

Endoscopic sphincterotomy before pancreaticoduodenectomy for ampullary carcinoma

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Abstract

Pancreaticoduodenectomy remains the operation of choice for carcinoma of the ampulla of Vater, but the presence of severe jaundice in almost all patients with ampullary neoplasia is a major contributory factor to the high incidence of complications and hospital mortality after the operation. To achieve biliary decompression in five patients endoscopic sphincterotomy was performed at the time of endoscopic retrograde cholangiopancreatography. The procedure was successful in achieving biliary drainage in all cases and was without appreciable morbidity. All five patients subsequently underwent identical resections, the interval to operation being decided by the speed of resolution of the jaundice; minor pancreatic leaks in two patients were the only complications. None of the patients died.

These results suggest, therefore, that endoscopic sphincterotomy should be performed at the time of duodenoscopy if an obstructive ampullary tumour is found.

Introduction

Tumours arising from the area of the ampulla of Vater carry a more favourable prognosis than carcinomas arising in the acinar tissue of the pancreas.^{1 2} The disappointing results that follow radical surgery for carcinomas of the pancreas have led many surgeons to reserve pancreatic resection for only periampullary tumours. Even in specialist centres, however, pancreaticoduodenectomy is associated with a hospital mortality of at least 10%,³⁻⁵ which rises to 25-30% in non-specialist hospitals.^{6 7} Morbidity is also an appreciable problem after this operation,

with important complications occurring in over 50% of cases.^{2 3 8} A major contributory factor to these complications is the presence of biliary stasis and jaundice.^{2 3} This has led to the suggestion that to reduce operative mortality biliary decompression should be performed before definitive resection is undertaken, particularly in deeply jaundiced patients.^{3 4 9-11}

We report here on five consecutive patients (treated between February and July 1980) in whom successful biliary decompression was achieved by endoscopic sphincterotomy 11-36 days before pancreaticoduodenectomy. The subsequent surgical resection was without appreciable morbidity, and none of the patients died.

TABLE 1—Clinical details and results of investigations

Case No	Sex	Age (years)	Duration of history (weeks)	Weight loss (kg)	Results of investigations
1	M	75	3	6	Ultrasonography: dilated intra-hepatic ducts; dilated common bile duct ERCP: ulcerated ampullary tumour
2	M	63	8	20	Ultrasonography: technically unsuccessful PTC: grossly dilated system; complete obstruction near termination of common bile duct ERCP: ulcerated ampullary tumour
3	M	58	12	10	Ultrasonography: dilated intra-hepatic ducts; distended gall bladder; common bile duct not identified with certainty ERCP: irregular enlarged papilla, macroscopically neoplastic
4	F	50	3	0	Ultrasonography: distended gall bladder; biliary tree not identified otherwise with certainty PTC: unsuccessful (unable to cannulate) ERCP: ulcerated ampullary tumour
5	F	77	8	8	Ultrasonography: dilated intra-hepatic duct; dilated common bile duct ERCP: deeply ulcerated ampullary tumour

PTC = Percutaneous transhepatic cholangiography. ERCP = Endoscopic retrograde cholangiopancreatography.

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Patients, methods, and results

All five patients were anorectic with the clinical features of obstructive jaundice. Four had lost a considerable amount of weight, though none had experienced any abdominal pain. Table I shows the clinical data on the patients and results of investigations. Grey-scale abdominal ultrasonography was used as an early diagnostic procedure in all five patients: it was technically unsuccessful in one patient and showed only a distended gall bladder in another. In both cases percutaneous transhepatic cholangiography was performed next since the site of obstruction remained unknown. One patient was investigated elsewhere: ultrasonography showed a dilated intrahepatic system and distended gall bladder and was followed by endoscopic

TABLE II—Details of endoscopic sphincterotomy

Case No	Ducts entered	Ease of procedure	Haemorrhage at time of procedure	Complications after procedure	Time to operation (days)
1	Common bile duct	Easy	Slight	None	20
2	Pancreatic duct, common bile duct	Easy	Very slight	None	20
3	Pancreatic duct, common bile duct	Difficult ("precut")	None	Increased amylase activity	11
4	Common bile duct	Slight difficulty	Moderate	None	21
5	Common bile duct	Easy	Moderate	None	36

TABLE III—Results of liver function tests before and after sphincterotomy and after operation

	Case No				
	1	2	3	4	5
<i>Before sphincterotomy</i>					
Alkaline phosphatase (IU/l)	244	283	481	579	88
Bilirubin ($\mu\text{mol/l}$)	350	575	47	393	60
Albumin (g/l)	35	41	36	30	41
<i>Before operation</i>					
Alkaline phosphatase (IU/l)	105	124	206	144	77
Bilirubin ($\mu\text{mol/l}$)	107	62	18	38	13
Albumin (g/l)	35	37.5	41	38	41
<i>Two weeks after operation</i>					
Alkaline phosphatase (IU/l)	76	124	174	146	
Bilirubin ($\mu\text{mol/l}$)	63	23	10	9	
Albumin (g/l)	34	37	38	31	

Reference ranges: alkaline phosphatase 28-92 IU/l; bilirubin $<17 \mu\text{mol/l}$ (0.99 mg/100 ml); albumin 34-50 g/l.
Conversion: SI to traditional units—Bilirubin: $1 \mu\text{mol/l} \approx 58 \mu\text{g}/100 \text{ ml}$.

TABLE IV—Details of operation and postoperative recovery

Case No	Operation	Histology	Gland metastases	Duration of intravenous feeding (days)	Complications	Days to discharge
1	Uncomplicated	Well-differentiated adenocarcinoma	No	3-8	None	20
2	Uncomplicated	Papillary adenocarcinoma	No	3-6	Slight wound infection	23
3	Uncomplicated	Well-differentiated adenocarcinoma	Yes	3-15	Slight pancreatic leak into drain	29
4	Uncomplicated	Well-differentiated adenocarcinoma	No	3-24	Pancreatic leak through drain	40
5	Uncomplicated	Poorly differentiated adenocarcinoma	No	3-9	None	31

retrograde cholangiopancreatography. In the two remaining patients ultrasonography clearly showed a dilated common bile duct, implying obstruction at its lower end, and so endoscopic retrograde cholangiopancreatography was performed as the next procedure.

Table II gives details of the endoscopic sphincterotomy. In one patient a "precut" procedure was necessary to gain access to the common bile duct. This patient subsequently had transient amylasaemia; none of the others had complications. The interval to operation was decided by the rapidity of resolution of the jaundice, such that only one patient was clinically jaundiced at the time of operation (table III).

Table IV summarises details of the operation and postoperative recovery. All five patients underwent identical resections, only one having spread to the lymph nodes. All patients were fed parenterally from the third postoperative day until gastrointestinal function had returned completely to normal. Two patients developed pancreatic

leaks through the drain splinting the pancreaticojejunal anastomosis, so they were fed intravenously for slightly longer than the three others. All five patients were fit and well at review six weeks after discharge from hospital.

Discussion

Pancreaticoduodenal resection provides the best chance of "cure" in most patients with tumours of the ampulla of Vater. Unfortunately, while long-term prognosis may be good the operation is associated with appreciable mortality and morbidity. Much of this is due to the complications of haemorrhage, serious infections, and renal failure, all of which are related to bile stasis. Haemorrhage, occurring from both the wound and the gastrointestinal tract, is a serious problem in around 15% of operations.^{2 3 8} It is not controlled by treatment with vitamin K, suggesting that it is not entirely explained by prothrombin deficiency. A clear relation exists between the complications of renal failure and haemorrhage and the severity of jaundice; thus bilirubin concentrations above $350 \mu\text{mol/l}$ ($20 \mu\text{g}/100 \text{ ml}$) are associated with increased mortality.^{3 7} This led to the suggestion that preliminary bile drainage would reduce the risk of operative resection. Until recently the only way of achieving this was by surgical decompression, which meant a two-stage operation. This practice was criticised because the first operation may result in technical problems at the second. In addition, complications may arise from the first procedure, leading to considerable delays in undertaking the definitive operation, thereby reducing the chance of successful resection and worsening the ultimate prognosis. While it is generally agreed that the first operation may cause problems at the second, there is little evidence to suggest that staged surgery worsens the ultimate prognosis.¹²

With the advent of endoscopic retrograde cholangiopancreatography and its therapeutic offshoot endoscopic sphincterotomy, not only can an accurate preoperative diagnosis be achieved but also the opportunity arises to provide adequate biliary drainage without using an intra-abdominal procedure. Successful sphincterotomy through ampullary tumours has been briefly described^{13 14} but has usually been used as a palliative procedure in patients regarded as too unfit for a major operation rather than as a deliberate measure before resection. We first decided to use this procedure after an earlier young man had developed serious complications, including renal failure, after undergoing endoscopic retrograde cholangiopancreatography

for a similar tumour. The procedure proved easier to perform than we had expected, and we have not had any serious haemorrhage or other complication develop after it.

Based on our experience we believe that endoscopic sphincterotomy should be undertaken at the time of duodenoscopy if an obstructive ampullary tumour is found. We have not yet determined the optimum period between the procedure and subsequent resection, but this will probably depend on the speed of resolution of the jaundice. Certainly results of previous studies would suggest that a three- to four-week delay is unlikely to prejudice long-term survival.

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Five year follow-up of effects of treatment of mild and moderate hypertension

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Abstract

A five-year follow-up study of the effects of treating patients with both mild and moderate hypertension was performed. The patients were identified during a hospital-based community survey of hypertension. A total of 961 patients were divided into four groups. The first group, the controls, were age- and sex-matched normotensive subjects selected sequentially from the same survey. The second group were patients defined as well-controlled hypertensives; the third group were patients whose blood pressures were less well-controlled; and the fourth group consisted of patients who, for various reasons, were not treated and as such acted as an untreated control group. Both mortality and morbidity were considerably greater in the untreated patients than in the normal subjects. The well-controlled hypertensive patients showed no difference in either morbidity or mortality from normal subjects. The less well-controlled patients had a significantly greater cardiovascular morbidity but no excess mortality over groups 1 and 2. This was true for both mild and moderate hypertension and for women as well as men.

These findings therefore confirm the conclusions of other recent studies that good control of hypertension at all levels and in both sexes is justified by the reduction in morbidity and that even less than excellent control is of considerable benefit.

Introduction

The treatment of moderate to severe hypertension reduces morbidity and mortality,^{1 2} and recent studies³⁻⁵ have suggested that the same is true for mild hypertension. A weakness of the

two most recent surveys of the treatment of mild hypertension has been the lack of control groups, whether of normotensive or of uncontrolled subjects, and therefore only groups of patients on differing levels of treatment have been compared.

We compared the morbidity and mortality of treated and untreated patients with mild and moderate hypertension. Three distinct groups of patients with well-controlled, moderately controlled, and uncontrolled hypertension were compared with a normotensive group of age- and sex-matched controls. We report the results of our follow-up after five years and compare our results and conclusions with those of other studies.

Patients and methods

Asymptomatic hypertension was detected in the community by a hospital-based survey using a programme of home visits, details of which have already been published.⁶ Hypertension was defined as a systolic blood pressure over 140 mm Hg or a diastolic pressure (phase 5) over 95 mm Hg. All patients who were selected in this series had their blood pressure taken on two separate occasions at home and on a further two occasions in a hospital clinic before they were included as hypertensive by the above criteria. During the study a series of age- and sex-matched normotensive controls were also recruited. A total of 961 patients were recruited, of whom 382 formed the normotensive control group (group 1); 392 formed the well-controlled hypertensive group (group 2), defined as those whose blood pressure on more than 80% of occasions was below 140/95 mm Hg—that is, resorted to our arbitrarily defined normal levels. Group 3 comprised 111 patients whose blood pressure was above 140/95 mm Hg on at least 20% of occasions. Group 4 comprised 76 patients who, for various reasons (including patient and doctor preference) remained untreated and formed a hypertensive control group. All patients were followed up for five years and were seen regularly.

The antihypertensive drugs used in this study were beta-blocking agents except where contraindicated; 98% of patients received these agents. At each visit blood pressure was checked and cardiovascular morbidity recorded. For those patients who had died, the cause of death was recorded either from our own knowledge or the general practitioner's records and checked with the relatives. Cardiovascular morbidity was defined as transient cerebral ischaemic attacks, completed cerebrovascular accidents, hypertensive encephalopathy, cardiac failure, cardiac infarction, or myocardial ischaemic episodes. There was one case of aortic aneurysm.

During the study a history of smoking, dietary, and exercise habits was also recorded but no advice was given on these habits. The records of the lipid values and other investigative findings formed part of a separate study and are not recorded here.

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