

Treatment Options for Pancreatic Tumours

K M GONDAL S AKHTAR MIQBAL A A ALI T A SHAH

Department Of Surgery, K. E. Medical College/Mayo Hospital, Lahore

Correspondence to Dr. Khalid Masood Gondal, Associate Professor Surgery

A study of 46 patients with pancreatic tumours admitted in Surgical Unit of Mayo Hospital, Lahore in three years is presented. Twenty six (56.5%) were male and twenty (43.5%) were females. The mean age of the patients was 48 years. Obstructive jaundice was the commonest presentation being present in 36(78%) patients. Head of pancreas was the commonest (54%) site of lesion. Pancreaticoduodenectomy and bypass procedures were the main surgical options carried out in 33% and 39% respectively. Eight patients (17.4%) had pancreatic leakage. Mean hospital stay was 16 days. The mortality was 17.4% in this series.

Key words: Pancreaticoduodenectomy, bypass procedure, distal pancreatectomy

Tumours of pancreas are benign or malignant, and can involve any part of pancreas including head, body and tail. Head of the pancreas is the commonest site of malignant tumours. Pancreatic cancer is the fourth most common cause of cancer-related death in the Western world¹ and adenocarcinoma is the most frequent pancreatic malignancy, accounting for more than 80% of pancreatic tumours. The anatomic location of the primary pancreatic tumours has significant impact on the onset of clinical symptoms, the stage of disease at initial presentation, and ultimate survival. Distribution of tumours within the pancreatic gland is variable: approximately 70% are located in the head, 20% in the body and 10% in the tail. Patients with periampullary, pancreatic head, or uncinate process tumours are more likely to present with obstructive jaundice or gastric outlet obstruction, compared with patients with disease in the mid-body or tail of the gland.

The various procedures described for pancreatic tumours are Pancreaticoduodenectomy, Pylorus preserving Pancreaticoduodenectomy (PPPD)², Duodenal preserving pancreatic head resection (DPPHR), ventral pancreatectomy³, segmental resection of pancreas, distal pancreatectomy⁴, duct branch oriented minimal pancreatectomy⁵ and total pancreatectomy. The diagnosis carries a poor prognosis with one year mortality rate of greater than 80%. In spite of this fact it is important to identify the patient with potentially resectable disease. In such patients^{6,7} 5 years survival rate of 15-21% for pancreatic and 21-38% for periampullary carcinoma has been reported following operation. For patients with non resectable disease a variety of palliative procedures have been described which reduce the need for extensive surgery.

In our set up the patients present late and prognosis is generally poor. In order to unveil the clinical clues for the improvement of poor course of the patients with pancreatic cancer, it is important to analyze the factors which influence the outcome after surgical resection. There are several reported prognostic factors such as size of tumour⁸, grade of differentiation⁹, lymph node metastasis¹⁰, site of origin^{11,12}, icterus¹³ and so on. This study was carried to analyse the type, site, extent and

histopathological diagnosis of pancreatic tumours, different surgical procedures carried out with special note on post operative complications leading to high morbidity and mortality. The knowledge of these factors will make us more wise regarding management of pancreatic tumours and prevention of post operative complications.

Patients and methods

Between 1st January 1999 to 31st December 2001, 46 patients with pancreatic tumours were admitted in North and West Surgical Units of Mayo Hospital, Lahore. The medical record of these patients was reviewed. Presenting signs and symptoms were noted. Relevant investigations including blood C/E, urine C/E, blood urea, blood sugar, LFTs, PT, APTT, ECG, X-ray chest, USG, CT scan abdomen were carried out in all patient. ERCP and MRI were done in selected patients. The operative procedure based on clinical diagnosis and expected course of disease was explained to patient. Preoperative chest physiotherapy, fluid-electrolyte balance, anaemia and clotting profile correction were done. Perioperative antibiotics, 2nd generation cephalosporin and metronidazole were given. After operation patients were kept in ICU for 2-3 days and then shifted to the ward. All complications were recorded. Morbidity was determined with respect to number of patients. The mortality rate was defined as the total in-hospital death rate. A pancreatic fistula was defined as secretion of 30ml or more of amylase rich drainage fluid per day. Octreotide 0.1-0.2mg subcutaneous per day was given in selected patients having post operative pancreatic leakage. TPN was also given in selected patients having pancreatic fistula. Patients were followed up on OPD basis.

Results

During the study period of three years from 1st January 1999 to 31st December 2001, 46 patients of pancreatic tumours involving any part of pancreas were admitted in surgical unit of Mayo Hospital, Lahore which is the main teaching hospital of the city. Twenty six (56.5%) were male and 20(43.5%) were female. The majority of patients presented in 5th decade of life. The mean age of the

Treatment Options for Pancreatic Tumours

patients was 48 years. The age incidence of the tumour has been shown in table No.1

Table 1. Age

Age range	N=	%age
21-30 Years	4	8.5
31-40 Years	8	17.5
41-50 years	10	22
51-60 years	18	89
61-70 years	6	13

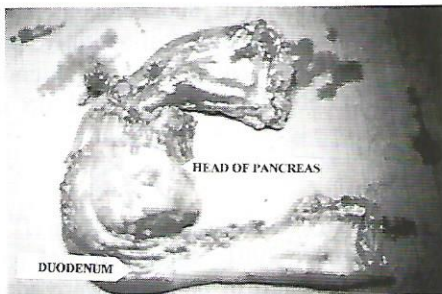
Obstructive jaundice was the main presenting symptom being present in 36(78%) of the patients and in these patients the tumour was mainly involving the periampullary region and head of pancreas. Pain epigastrium and left hypochondrium was the chief complaint of patients presenting with tumour involving body and tail of pancreas. Forty (95%) patients complained of weight loss. Preoperative diabetes was present in 10(22%) patients. On basis of preoperative investigations and operative findings head of pancreas was the commonest of site of lesion being present in 27(59%) patients. Periampullary tumour was second commonest (20%) (Table 2)

Table 2 Site of tumour

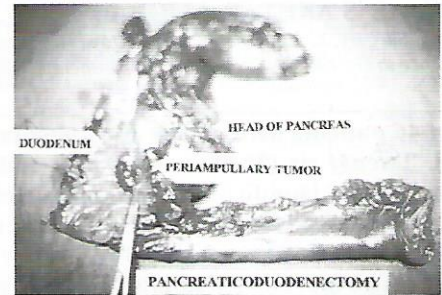
Site of tumours	n=	%age.
Head	27	59
Body	6	13
Head and body	1	2
Periampullary	9	20
Tail	3	6

Depending upon the site and type of tumours various procedures performed include Whipple pancreaticoduodenectomy, pylorus preserving Pancreaticoduodenectomy, total pancreatectomy, tripple bypass, cholecystostomy only, distal pancreatectomy with splenectomy and open closure (Table 3). (Photograph 1,2,3)

Photograph 1: Pancreaticoduodenectomy for carcinoma head of pancreas



Photograph 2. Pancreaticoduodenectomy for periampullary carcinoma



Photograph 3. Distal pancreatectomy with splenectomy for tumour body of pancreas

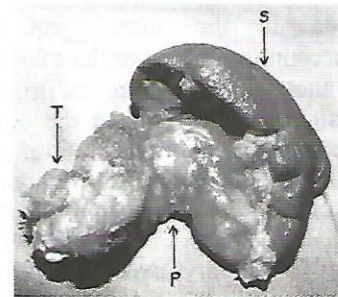


Table 3. Operative options

Operation	n=	%age
Whipple procedure	6	13
Pylorus preserving Pancreaticoduodenectomy	9	19
Total pancreatectomy	1	2
Bypass procedures	13	29
Cholecystostomy	2	4
Distal pancreatectomy & splenectomy	9	20
Open closure and biopsy	1	2

Patients were shifted to ICU and after 2-3 days to the surgical unit. Pancreatic fistula was the main complication present in 8(17%) patients (Table 4).

Table 4 Postoperative complications

Complications	n=
Pancreatic leakage	8
Re-exploration	2
Pelvic collection	1
Wound infection	5
Atelectasis	4
Multiorgans failure	2

Pancreatic leakage was noted 3rd to 4th postoperative day. On development of fistula octreotide 0.1-0.2mg

subcutaneous was started in 4 patients and response was excellent. Fistula stopped in these patients within a week of treatment. In other four patients, the fistula output varied and took one month in complete closure. Two of these had to be re-explored. Hospital stay varied between 5-28 days with mean of 16 days (Table 5).

Table 5 Hospital stay

Days	No. of Pts.
05-07	3
08-14	10
15-22	26
23-28	07

Eight patients (18%) died and main cause of death was septicaemia (4 patients), chest complications in form of ARDS (2 patients) pulmonary embolism (one patient) and myocardial infarction (one patient).

On histopathological examination, one patient had simple cyst in tail of pancreas. One patient presented with tumour of body of pancreas and distal pancreatectomy was carried out and report was tuberculosis of pancreas. One patient with tumor of head of pancreas on clinical examination had no malignancy and was because of chronic pancreatitis. In 22 patients resection was carried out and histopathology showed adenocarcinoma with varied degree of differentiation. One patient with lesion of body of pancreas had insulinoma on histopathology. (Table 6).

Table 6 Histopathology

Histopathology	No. of Pts.
Well differentiated adenocarcinoma	8
Moderately differentiated adenocarcinoma	10
Poor differentiated adenocarcinoma	4
No malignancy	1
Tuberculosis	1
Simple cyst	1
Insulinoma	1

Patients having diagnosis of malignancy had consultation with oncologist and patient with tuberculosis was put on anti-tuberculous therapy with good response. Postoperative blood sugar was monitored in all patients and 4 patients developed diabetes mellitus and managed with insulin

Discussion

Tumours of the pancreas remains a challenging problem for gastrointestinal surgeons. Significant progress has been made in diagnosis, preoperative staging, and safety of surgery; however long-term survival after resection is unusual, and cure is rare.

Our diagnosis of pancreatic tumours was mainly based on USG and CT scan, but the accuracy of these radiological investigations in defining the resectability can be poor. In six of our patients we had to do bypass

procedure, which were considered resectable on CT scan. So additional assessment by laparoscopy has been proposed. In one study, out of 109 patients laparoscopy identified 29 patients with non resectable disease that had been defined as resectable on CT scan confirming our observations. The adenocarcinoma was the commonest tumour in our series (48%). One patient with preoperative diagnosis of tumour body of pancreas had tuberculosis, one patient with encapsulated tumour involving body of pancreas had insulinoma.

Surgery of pancreatic tumour originally had a risk of complications but resection is the treatment that offers best long term survival as demonstrated by a recent study by Sener et al¹⁴ of more than hundred thousands patients. The reduced mortality rate after pancreatic resection has been a major achievement in surgery over recent decade¹⁵.

In certain specialized units the safety of pancreatic resection has increased and mortality has decreased between 0-6%. Large series of Pancreaticoduodenectomy without operative death have been reported by single institution^{16,17}. In our series the higher mortality rate was because of late presentation, advance disease, old age, obstructive jaundice and lack of specialized units and proper intensive care facilities. The morbidity in our series is comparable to others¹⁸ which is in the range of 40-60%. Pancreatic fistula and septic sequelae are important complication. Seventeen percent of our patients had pancreatic fistula and results are comparable to other studies. All cases except two settled on conservative treatment. Reoperation for pancreatic fistula and complications of pancreatectomy may be necessary only in those with an early high out put fistula in combination with early postoperative multi organ failure.

Morbidity and mortality can be minimized through perfect perioperative management and optimized care in intensive care unit. Attention should also be given to proper surgical technique and standardized reconstruction of gastrointestinal tract specially pancreaticojejunostomy as this is the commonest site of leakage. Some studies have also mentioned the perioperative use of octreotide¹⁹. We used the octreotide in half of patients with pancreatic fistula and compared with other half. A satisfactory response was noted. We recommend the use of octreotide prophylactically to prevent this drastic complication which has been reported to be 10% in several centers of excellence^{20,21}.

References

1. Huguier M, Mason NP. Treatment of cancer of the exocrine pancreas. *Am J Surg* 1999; 177: 257.
2. Beger HG, Krautzberger W, Bittner R, Buchler M, Limm J. Duodenum preserving resection of the head of the pancreas in patients with severe chronic pancreatitis. *Surgery* 1985; 97: 467-73.
3. Ryu M, Takayama W, Watanabe K, Hgonda I, Yamamoto H, Arai Y. Ventral pancreatic resection for adenoma and

Treatment Options for Pancreatic Tumours

- low grade malignancies of the head of the pancreas. *Surg Today Jpn Surg* 1996; 26: 476-81.
4. Ikeda S, Matsumoto S, Maeshiro K, Miyazaki R, Okamoto K, Yasunami Y. Segmental pancreatectomy for the diagnosis and treatment of small lesions in the neck or body of the pancreas. *Hepatogastroenterology* 1995; 42: 730-3.
 5. Yamaguchi K, Shimizu S, Yokohata K, Noshiro H, Chijiwa K, Tanaka D. Ductal branch oriented minimal pancreatectomy: two cases of successful treatment. *JH Hep Bil Panc Surg* 1999; 6: 69-73.
 6. Warshaw AL, Fernandez del Castillo C. Pancreatic carcinoma. *N Engl J Med* 1992; 326: 455-65.
 7. Parker SL, Tong T, Bolden S, Wingo PA. Cancer statistics. 1996. *CA Cancer J Clin* 1996; 46: 5-27.
 8. Fortner JG, Klimstra DS, Senie RT, Maclean BJ. Tumour size is the primary prognosticator for pancreatic cancer after regional pancreatectomy. *Ann Surg* 1996; 223: 147-53.
 9. Yamaguchi K, Enjoji M. Carcinoma of the pancreas: a clinicopathologic study of 96 cases with immunohistochemical observations. *Jpn J Clin Oncol* 1989; 19: 14-22.
 10. Sato T, Saitoh Y, Noto N, Matsuno S. Factors influencing the late results of operation for carcinoma of the pancreas. *Am J Surg* 1978; 135: 582-6.
 11. Mannell A, Weiland LH, vanHerrden JA, Ilstrup DM. Factors influencing survival after resection for ductal adenocarcinoma of the pancreas. *Ann Surg* 1986; 203: 403-7.
 12. Yamaguchi K. Carcinoma of the uncinat process of the pancreas with a peculiar clinical manifestation. *Am J Gastroenterol* 1992; 87: 1046-50.
 13. Yamaguchi K, Nishihara K, Tsuneyoshi M. Non icteric pancreas head carcinoma fares worse than icteric pancreas head carcinoma. *J Surg Oncol* 1992; 49: 253-6.
 14. Sener SF, Fremgen A, Meneck HR, Winchester DP. Pancreatic cancer: a report of treatment and survival trends for 100313 patients diagnosed from 1985-1995, using the National Cancer Database. *J Am Coll Surg* 1999; 189: 1-7.
 15. Trede M, Saeger HD, Schwall G, Rumstadt B. Resection of pancreatic cancer – surgical achievements. *Langenbecks Arch Surg* 1998; 383: 121-28.
 16. Cameron JL, Pitt HA, Yeo CJ, Lillemoe KD, Kaufman HS, Goleman J. One hundred and forty five consecutive pancreatoduodenectomies without mortality. *Ann Surg* 1993; 217: 430-5.
 17. Trede M, Schwall g, Saeger HD. Survival after pancreatoduodenectomy. 118 consecutive resections without an operative mortality. *Ann Surg* 1990; 211: 447-58.
 18. Trede M, Carter DC. The complications of pancreatoduodenectomy and their management. In: Trede M, Carter DC, eds. *Surgery of the Pancreas*. Edinburgh: Churchill Livingstone. 1993; 629-44.
 19. Pederzoli P, Bassi C, Falconi M, Gamboni MG. Efficacy of octreotide in the prevention of complications of elective pancreatic surgery. Italian study Group. *Br J Surg* 1994; 81: 265-9.
 20. Cullen JJ, Sarr MG, Ilstrup DM. Pancreatic anastomotic leak after pancreatoduodenectomy: incidence, significance and management. *Am J Surg* 1994; 168: 295-8.
 21. Marcus SG, Cohen H, Ranson JH. Optimal management of the pancreatic remnant after Pancreatoduodenectomy. *Ann Surg* 1995; 221: 635-45.