ORIGINAL ARTICLE

The role of prophylactic gastrojejunostomy in un-resectable peri-ampullary carcinomas

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Abstract:

Objectives:To evaluate the role of prophylactic gastrojejunostomy in preventing late gastric outlet obstruction in patients with advanced periampullary tumors.

Material and Methods:This case series study was conducted at Surgical "D" ward of Khyber Teaching Hospital Peshawar from January 2014 to December 2017 and included 33 patients with advanced unresectable periampullary carcinoma. They underwent prophylactic retrocolicgastrojejunostomy alone or in combination with a biliodigestive procedure. Patients with resectable tumors and those with previous history of gastric surgery were excluded from this study.

Results: Out of these patients 20 patients were males and 13were femaleswith mean age of 59.78± 5.97. All patients underwent ultrasound and CT scan and 10 patients had pre-op ERCP. Retrocolic-gastrojejunostomy was performed after the tumor was found unresectable. Wound infection was the commonest complication which occurred in 7 patients, common in those with co-morbidities. Biliary leakage occurred in 5 patients, 3 of these patients had pre-operative biliary intervention. Post-operative cholangitis occurred in 3 patients while 4 patients had minor leak from the drain site which improved with conservative management. Four patients developed urinary tract infection, while three patients had signs of delayed gastric emptying which responded to conservative treatment. The mean hospital stay was 8.09±3.39 days and there was no mortality and no patient developed gastric outlet obstruction during the minimum follow up period of 2 months.

Conclusion: Prophylactic gastrojejunostomy in patients with unresectable peri-ampullary tumor is a safe procedure with negligible morbidity and mortality and significantly decreases the risk of late gastric outlet obstruction.

Keywords: Gastrojejunostomy, palliative surgery, unresectable peri-ampullary carcinoma

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Introduction:

Peri-ampullary carcinoma (carcinoma head of pancreas, distal bile duct, ampulla of Vater or duodenum) is a common cause of death in both USA and UK.[1] The median survival is 8 to 12 months for patients with locally advanced, unresectable disease and only three to six months for those with metastatic disease at presentation.[1] Surgical resection (pancreatico-duodenectomy) offers the only chance of cure. However, only 15 to 20 % of patients have resectable disease at initial diagnosis; the majority have either locally advanced or metastatic cancer.[1] The prognosis of peri-ampullary cancer is poor even in those with potentially resectable disease. Despite potentially curative resection, the five-year survival following pancreatico-duodenectomy is only about 20%.[2,3,4]

The most common presenting symptom of peri-ampullary carcinoma is obstructive jaundice which occurs in 70%-80% of patients.[5] Abdominal pain radiating to the back is present in about 25% of patients.[5] At the time of diagnosis 30 to

50% of the patients present with complain of nausea and vomiting but actual obstruction of the duodenum visible on endoscopic or radiological examination occurs less frequently, however as the disease progresses so does the percentage of duodenal obstruction increase.[6]

Retrospective review of surgical series and prospective randomized trials of endoscopic palliation have demonstrated that late gastric outlet obstruction, requiring gastro-enterostomy develop in 10 to 20% of patients with unresectable peri-ampullary tumour.[7]

A controversy over surgical bypass is whether gastric bypass should be done routinely or not. Many surgeons do not prefer prophylactic gastro-jejunostomy because of fear of high morbidity associated with this procedure and its failure to significantly prevent gastric outlet obstruction.[7]

The purpose of this study was to review the results of prophylactic gastro-jejunostomy in patients with advanced peri-ampullary carcinoma and to study the mortality and morbidity associated with it.

Material & Methods:
This study was carried out in surgical "D" unit of Khyber Teaching Hospital, Peshawar from January 2014 to December 2017. A total of 33 patients were included in this study. All these patients were operated to perform pancreatico-dudenctomy but were found to have advanced malignancy and therefore underwent prophylactic retrocolic-gastrojejunostomy with or without a biliodigestive procedure to prevent future gastric outlet obstruction.

All those patients with advanced peri-ampullary malignancy which was unresectable at operation were included in the study. The patients with resectable tumour or those with history of previous gastric surgery were excluded form the study.

33 patients (20 males and 13 females) who underwent palliative surgical bypass were followed for atleast 2 months. Data of all patients was entered in a pre-formed proforma and was than analyzed using SSP version 10 to calculate the percentage, mean and standard deviation. Of all the patients with advanced peri-ampullary tumour 9 were diabetics, 8 were hypertensive and 4 had previous history of cholecystectomy. Five patients were smokers, 4 were using snuff (naswar) and four of these patients had histories of other malignancies in their families.

Pre-operatively all patients had upper GI endoscopy, CT scan abdomen and ultrasound abdomen as an initial tool for diagnosis. ERCP was done in 10 patients as an additional tool for diagnosis. All patients had FBC, blood urea and sugar, HBS, anti HCV as a routine investigation before undergoing surgery. All the patients were given general anesthesia for operation. Patients were put in supine position and midline laprotomy incision was used to open abdomen. Visceras as well as the tumour was assessed. The tumour was assessed for respectability. Hepatic metastasis, ascities, malignant nodules over the omentum and intestines, involvement of major viscera and vessels and fixation to the posterior abdominal wall were considered as unresectable tumour. Retrocolic-gastrojejunostomy using 55mm linear cutting stapler (Ethicon)was performed as a palliative procedure in those patients considered having unresectable peri-ampullary tumour. Post-operatively all patient were shifted to ward. All patients were given IV 3rd generation cephalosporines, narcotic analgesics and IV fluids. Development of wound infection, UTI, gastric aspiration required, development of anastomosis leakage and the length of stay in the hospital were all noted and entered in the preformed proforma. The patients were followed up for 2 months post-operatively for any complication like development of late gastric outlet obstruction.

Results:
Our study included 33 patients with unresectable peri-ampullary tumour. Most of the patients (83%) presented with obstructive jaundice, 63% had pain and 67% had weight loss while 37% of the patients had nausea and vomiting.

Table-1: Patients characteristic according to bypass procedure and incidence of complications

Procedure	No	M/F	Mean age and range	Complications
Gastrojejunostomy	14	7/7	62.60 (51-75)±SD	Wound infection(1) Urinary tract infection (1) Delayed gastric emptying (1) Upper gastrointestinal bleeding (1)
Gastrojejunostomy+ Choledochojejunostomy	09	7/2	57.40 (49-70)±SD	Bile leakage (1) Cholangitis (1) Leaking drains (1) Urinary tract infection (1) Delayed gastric emptying (1) Anemia (1)
Gastro-jejunostomy +Hepatico-jejunostomy	06	5/1	56 (52-61)±SD	Wound infection (1) Urinary tract infection (1) Bile leakage (1) Delayed gastric emptying (1) Anemia (2)
Gastrojejunostomy +Cholecystojejunostomy	04	2/2	54.67 (51-63)±SD	Bile Leakage (1) Urinary tract infection (1) Delayed gastric Emptying (1) Anemia (1)

Table-2: Procedure

Procedure	Frequency	Percent	Valid Percent	Cumulative Percent
Gastro-jejunostomy	14	42.4	42.4	42.4
Gastro-jejunostomy+ Choledochojejunostomy	6	18.2	18.2	60.6
Gastro-jejunostomy +Hepatico-jejunostomy	4	12.1	12.1	72.7
Gastrojejunostomy +Cholecystojejunostomy	9	27.3	27.3	100.0
Total	33	100.0	100.0	

Table-3: Diagnosis

Procedure	Frequency	Percent	Valid Percent	Cumulative Percent
ca head of pancreas	23	69.7	69.7	69.7
ca in disatal CBD	6	18.2	18.2	87.9
ca of ampula of vater	3	9.1	9.1	97.0
ca deudenum	1	3.0	3.0	100.0
Total	33	100.0	100.0	

The tumour was considered unresectable when at operation it was noted to have involved major blood vessel, there were liver metastasis or peritoneal implants or any combination of these. All the patients underwent prophylactic palliative procedure in the form of gastro-jejunostomy with choledocho-jejunostomy in 9 patients, gastro-jejunostomy with hepatico-jejunostomy in 06 patients, 04 patients had gastrojejunostomy with cholecysto-jejunostomy while in 14 patients only gastro-jejunostomy was performed. The mean hospital stay was 8.09±3.39 days. wThe most common complication was wound infection which occurred in 12% of patients. Leakage from the drain site was seen in 12% of patients. Billiary leakage was seen in 8% of patients while post op cholangitis was seen in 4% of patients. Urinary tract infection developed in 6% of patients. 2 patients had post op upper GI bleeding and 5 patients had signs of delayed gastric emptying. All complications responded well to conservative management.

31 patients were followed up for a mean period of 7.39±2.64 months while 2 patients were lost to follow up after four months of regular follow up. During the follow-up period none of the patients developed gastric outlet obstruction, five patients developed signs of delayed emptying but they responded well to conservative management and by remaining nill by mouth, gastric aspiration, IV fluids and bed rest for a few days. All the patients were under the treatment of oncologist during the follow up period.

Discussion:

The peri-ampullary carcinoma can be managed by pancreatico-duodenectomy.[1,3] The role of pancreatico-duodenectomy for palliation of advanced peri-ampullarycancer is limited. The advanced peri-ampullarycancer was defined as locally unresectable, distant metastasis or both. If it can not be resected through pancreatico-duodenectomy than surgical palliation is done to manage these cases.[8] The goal of palliative management is to relieve biliary obstruction, to relieve cholangitis and pruritis, it also relieve duodenal obstruction and provide relief from pain due to involvement of the celiac pluxes.[9]

Recently endoscopic palliation of duodenal obstruction using large caliber metallic stent has been reported although this experience has been limited.[10,11,12] Prophylactic gastro-jejunostomy was mentioned as routine procedure by many authors in patients undergoing lapratomy for unresectable pancreatic cancer.[13,14] A gastro-jejunostomy as the original surgical procedure was never shown to increase the surgical mor-

tality rate. However patients who required a second surgery their mortality rate approached to 25 %.[15]

There is still controversy remaining about the results of these studies regarding the role of prophylactic gastro-enterostomy and their efficacy as a routine surgical procedure in these cases.[16]

In a study by Schelling and Bosch the incidence of gastric outlet obstruction after prophylactic gastro-enterostomy was not significantly lower in comparison to the frequency of obstruction in patients who did not havegastro-enterostomy.[17]

In a review by Sarr and Cameron of over 8,000 surgically managed patients 13% of patients who did not undergo gastric bypass at their initial surgical procedure required a gastro-jejunostomy before death.[18] In addition, 20% of the remaining patients died with symptoms of duodenal obstruction.[18] In a review of over 950 patients by Singh et al, 21% of patients required gastro-jejunostomy at a later date.

Finally, in a met analysis review by Watanapa and Williamson of over 1,600 reported cases, duodenal obstruction requiring a gastric bypass developed at a mean of 8.6 months in 17% (range 4% to 44%) of patients who underwent biliary bypass alone.[20] In none of these reviews a gastro-jejunostomy at the original surgical procedure increase the surgical mortality rate. All these reviews advocated routine prophylactic gastro-jejunostomy in patients undergoing lapratomy for unresectable pancreatic cancer.

Some other series have shown an increase in post-operative morbidity rates, primarily delayed gastric emptying, with prophylactic-gastrojejunostomy. Doberneck and Berndt reported an overall mortality rate of 18% and an incidence of postoperative delayed gastric emptying of 26%.[21]

In a retrospective series reported by Egrari and O'Connell, 50 patients with unresectable pancreatic cancer underwent biliary decompression without prophylactic gastro-jejunostomy. Duodenal obstruction developed in only 4 of the 50 patients (8%); they required reoperation for therapeutic gastro-jejunostomy.[22]

Similarly, in a series from Memorial Sloan-Kettering, the addition of a prophylactic gastro-jejunostomy was associated with a significant increase in the peri-operative morbidity rate.[23] Further more, the occurrence of delayed gastric emptying in this series was associated with a significantly increased peri-operative morbidity rate. These authors also concluded that the overall poor prognosis with unresectable pancreatic cancer does not warrant prophylactic gastric bypass.

The first prospective, randomized trial of gastro-jejunostomy performed for un-resectable peri-ampullary carcinoma by Keith and Cameron supported the role for prophylactic gastro-jejunostomy in patients undergoing lapratomy for unresectable peri-ampullary carcinoma.[18]

In the our study also gastro-jejunostomy was not associated with gastric outlet obstruction in the follow up period and at the same time it was not associated with higher morbidity and mortality. Therefore it can be said that combined biliary and gastric bypass in a locally advanced carcinoma head of pancreas is practical and cost effective operation in a country like ours where costs of stents is beyond the reach of many patients.

Our study mainly focuses on whether to perform a prophylactic gastro-jejunostomy or not. It can be done prophylactically at the initial diagnostic lapratomy or later when symptoms of gastric outlet obstruction develop, however in this study it was performed at the time of initial operation.

At the end it can be said that prophylactic retrocolic-gastro-jejunostomy is a safe procedure with negligible mortality and normal morbidity. It has the advantage of dealing with duodenal obstruction which may develop later. Therefore prophylactic retrocolic-gastro-jejunostomy is an appropriate treatment for patients with unresectable peri-ampullary tumor.

Conclusion:
In conclusion, this study shows negligible perioperative surgical morbidity and mortality and strongly supports the prophylactic use of retrocolic-gastro-jejunostomy in patients with periampullary cancer found to have unresectable disease.

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Role and contribution of authors:
Dr. Iftikhar Muhammad Khan, collected the references, data and did the initial writeup.

Dr. Zainab Rehman, helped in collecting the references and data.

Dr. Parkha Rehman, collectin the data, references and helped in introduction writing, and review the artical criticaly and made the final changes.

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