ORIGINAL ARTICLE

Comparison of cystrogastrotomy with cystojejunostomy in terms of post-operative morbidity

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Abstract

Objective: To compare post operative morbidity in cystogastrostomy and cystojejunostomy among pancreatic pseudocyst patients.

Stud design: Randomized clinical trial (RCT).

Study Setting and duration: Study was conducted at department of surgery, Hayatabad Medical Complex (HMC), Peshawar. Study duration was 1 years (February 2018-Febraury 2019).

Material and Methods: A sample size of 122 patients was calculated using WHO calculator. Pancreatic pseudocyst patients were selected through non probability consecutive sampling. Ethical approval and consent forms were taken from all patients under study. Patients were randomly divided into two groups using computer generated random number table on the basis of pseudocyst location with respect to stomach. Group A patients underwent cystogastrostomy while group B underwent cystojejunostomy. Patients were followed after one month for associated morbidity in terms of recurrence, failure rate and complications. Data analysis was done with SPSS version 24. Chi-square and fissure exact test was applied. P value ≤0.05 was considered significant.

Results: Total 122 patients were included in study with 1:1 randomization. There were 56(45.9%) male and 66(54.1%) female in study. Mean age of patients was 47 years±8.6SD. Recurrence was found to be high in cystogastrostomy as compared to cystojejnostomy (p=0.03). An insignificant difference in failure rate and complications of both groups was found (p>0.05)

Conclusion: Cystogastrostomy had high morbidity rate in terms of high recurrence as compared to cystojejunostomy. However, both procedures can be used according to location of pancreatic pseudocyst in resource limited areas.

Keywords: Acute pancreatitis, pancreatic pseudocysts, cystogastrostomy, cystojejunostomy, morbidity

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Introduction

Pancreatic pseudocyst is defined as localized fluid collection that contains excessive amount of pancreatic enzymes and amylase.[1] This fluid is usually surrounded by fibrous tissue (these tissues are not lined with epithelium). Pancreatic pseudocyst are caused by pancreatic ductal disruption as a result of high pancreatic ductal pressure.[2] Incidence of pancreatic pseudocysts is 0.5 to 1/100,000 adults per years.[3] Literature reported that overall incidence of pseudocysts due to acute pancreatitis is 1.6 to 4.5%. Etiology of pancreatic pseudocysts includes alcohol usage, blunt trauma, operative trauma, biliary tract diseases, penetrating trauma and idiopathic.[4] Presentation of pancreatic pseudocysts ranges from asymptomatic to abdominal catastrophe as a result of complications. These acute complications could be bleeding, rupture and infection while chronic complications include biliary obstruction, thrombosis, gastric outlet obstruction and gastric varices development. Management of pancreatic pseudocysts involves supportive medical care and drainage proce-

dures (percutaneous drainage, surgical drainage and endoscopic drainage).[5]

Cysto-gastrostomy is a surgical procedure used to for an opening creation between stomach and pancreatic pseudocysts for suitable drainage of cyst into stomach. The procedure involves conservation of pancreatic juices. Cysto-gastrostomy is divided into three catagories; surgical cysto-gastrostomy, endoscopic cysto-gastrostomy and laparoscopic cysto-gastrostomy.[6]

Cysto-jejunostomy is an effective treatment option in patients where cyst is not in apposition of stomach wall or deudenum. Cysto-jejunostomys is a safe treatment option and allows patients an early resumption of their daily activities. Cysto-jejunostomy had significant superior results in terms of anastomosis safety and morbidity. It is also effective in terms of short operative time, recurrence prevention and bowel function improvement. Recurrence rate of cysto-jejunostomy was 31.9%.[7]

Cysto-gastrostomy has success rate 87 to 99% with 1% mortality rate. However, median time for pseudocyst recurrence was more than 5-years.[8] Ahn et al reported that endoscopic ultra sounded guided cysto-gastrostomy had high success rate, low procedure related complication and low recurrence12%.[9]

Limited data is available on comparison of cysto-gastrostomy and cysto-jejunostomy in pancreatic pseudocyst. Present study aims to compare post-operative morbidity in cystogastrostomy and cysto-jejunostomy among pancreatic pseudocyst patients.

Material and Methods:

A randomized clinical trial was conducted at department of Surgery, Hayatabad Medical Complex (HMC), Peshawar. Study duration was one year (February 2018-Febraury 2019). Ethical committee approval were taken from hospital ethical committee and consent forms were signed by each participant of study. A sample size of 122-patients (61 patients in each group) was calculated using 95% confidence interval, 80% power of study, P1=32%[7] and P2=12%[9] using WHO calculator. Patients with pancreatic cyst were selected through non probability consecutive sampling Inclusion criteria was based upon age >18 years, both gender, pancreatic pseudocyst diagnosis based on computed tomography criteria, pseudocyst with size≥ 6 cm, pseudocyst adjacent to and not adjacent to stomach, history of acute or chronic pancreatitis and persistant pancreatic pain requiring narcotics or analgesics. Exclusion criteria include ASA (American Society of Anaesthesiologist) class IV, multiple pseudocysts, pregnant and breast feeding mothers. Patients were randomized into two groups; group-A patients were those in which cyst was in apposition of stomach wall underwent cysto-gastrostomy while in group-B those patients in which cyst was not in apposition of stomach wall underwent cysto-jejunostomy. Cysto-gastrostomy and cystojejunostomy was performed by same pancreatic surgeon. In cysto-gastrostomy after intravaneous cefazolin administration, abdomen was accessed by making an incision at middle third of umbilicus to xiphoid process. After pseudocyst localization, it was aspired and endovascular stapler was utilized for creation of cysto-gastrostomy of at least 6 cm. Nasogastric tube was left in stomach and anterior gastrostomy was closed and nasogastric tube was removed at 1st post-operative days. During cysto-jejunostomy, after general anaesthesia, patients were positioned in modified lithotomy position. Pseudocyst was found free from stomach and all mesenteric attachments were divided with harmonic scalpel for making anastomosis. Cyst cavity was perforated and fluid was undergone aspiration. Cysto-jejunostomy was usually done with effront jejunal loop with intracorporeal suturing and single layer non absorbable sutures. Patients were followed after 1-month for morbidity evaluation in both procedures. Morbidity was measured in terms of recurrence, treatment failure and complications. Data was analyzed using SPSS version 24. Mean ± Standard deviation was calculated for descriptive variables. Frequency and percentages were calculated for categorical variables. Chi-square and fissure exact test was applied. P value ≤0.05 was considered significant.

Table 1: *Recurrence and treatment failure distribution in both groups*

Recurrence	Interventional groups		Total	P value
	Group A (Cystogastrostomy)	**Group B** (Cystojejunostomy)		
No	41(33.6%)	52(42.6%)	93(76.2%)	0.03
Yes	20(16.4%)	9(7.4%)	29(23.8%)	
Treatment failure				
No	55(45.1%)	58(47.5%)	113(92.6%)	0.491
Yes	6(4.9%)	3(2.5%)	9(7.4%)	
Total	61(50%)	61(50%)	122(100%)	

Table 2: *Complication of Cystogastrostomy and Cystojejunostomy*

Complications	Interventional groups		Total	P value
	Group A (Cysto-gastrostomy)	**Group B** (Cysto-jejunostomy)		
Bleeding				
No	57(46.7%)	59(48.4%)	116(95.1%)	0.680
Yes	4(3.3%)	2(1.6%)	6(4.9%)	
Pneumoperitoneum				
No	59(48.4%)	60(49.2%)	119(97.5%)	1.00
Yes	2(1.6%)	1(0.8%)	3(2.5%)	
Peritonitis				
No	60(49.2%)	61(50%)	121(99.2%)	1.00
Yes	1(0.8%)	0(0%)	1(0.8%)	
Anastmosis leakage				
No	55(45.1%)	58(47.5%)	113(92.6%)	0.49
Yes	6(4.9%)	3(2.5%)	9(7.4%)	
Total	61(50%)	61(50%)	122(100%)	

Table 3: *Stratification of recurrence with respect to age and gender in both groups*

		Recurrence		Total	P value
	Age	No	**Yes**		
Group A (Cysto-gastrostomy)	20-40 years	20(32.8%)	0(0%)	20(32.8%)	0.00
	41-65 years	21(34.4%)	20(32.8%)	41(67.2%)	
Group B (Cysto-jejunostomy)	20-40 years	0(0%)	0(0%)	0(0%)	1.00
	41-65 years	52(85.2%)	9(14.8%)	61(100%)	
	Gender				
Group A (Cysto-gastrostomy)	Male	33(54.1%)	2(3.3%)	35(57.4%)	0.000
	Female	8(13.1%)	18(29.5%)	26(42.6%)	
Group B (Cysto-jejunostomy)	Male	19(31.1%)	2(3.3%)	21(34.4%)	0.479
	Female	33(54.1%)	7(11.5%)	40(65.6%)	
Total		52(85.2%)	9(14.8%)	61(100%)	

Results:

Total 122 patients were included in study with 1:1 randomization. There were 56(45.9%) male and 66(54.1%) female in study. Mean age of patients was 47 years±8.6SD. There were 20(16.4%) patients in age group 20-40 years and 102(83.6%) in age group 41-65 years. Type of pseudocyst was acute in 57(46.7%) patients and chronic in 65(53.3%) patients. Causes of pseudocyst include alcohol abuse in 42(34.4%), gallstones in 37(30.3%), idiopathic in 13(10.7%), hyper-triglyceridemia in 16(13.1%), post-trauma in 4(3.3%) and post-surgery in 10(8.2%) patients. Location of pancreatic pseudocyst is head in 45(36.9%), body and tail in 77(63.1%) patients.

In group-A (cysto-gastrostomy), 20(16.4%) had recurrence while 41(33.6%) did not had recurrence. Similarly among all patients in group-B (cysto-jejunostomy), 9(7.4%) had recurrence while 52(42.6%) did not had recurrence (p=0.03). In group-A (cysto-gastrostomy), 6(4.9%) showed treatment failure while 55(45.1%) did not show treatment failure. Among all the patients in group-B (cysto-jejunostomy), 3(2.5%) patients showed treatment failure while 58(47.5%) did not show treatment failure (p=0.49) as shown in table-1.

Complications were found to be higher in cysto-gastrostomy as compared to cysto-jejunostomy (bleeding 3.3% vs 1.6%, p=0.68, pneumoperitoneum 1.6% vs 0.8%, p=1.00, peritonitis 0.8% vs 0% p=1.00, anastomosis leakage 4.9% vs 2.5% p=0.49 respectively) as shown in table-2.

In group-A (cysto-gastrostomy) and group-B (cysto-jejunostomy), elder age group had recurrence as compared to younger age group (p=0.00, p=1.00 respectively). In group-A (cysto-gastrostomy) and group-B (cysto-jejunostomy), females had high recurrence as compared to males (p=0.000, p=0.479 respectively) as shown in table 3.

Discussion:

Pancreatic pseudocysts are very common pancreatic cystic lesions. These pseudocysts lesions accounts for 75-80% of all such pancreatic lesions.[10] These pseudocysts may be result of acute and chronic pancreatitis with common symptoms of nausea, pain and vomiting. Cysto-

gastrostomy and cysto-jejunostomy are two surgical interventions in management of pancreatic pseudocyst according to location of cyst.[11]

In present study, total 122-patients of pancreatic pseudocyst were included. In this data recurrence was found to be high in cysto-gastrostomy as compared to cysto-jejnostomy (p=0.03). Oh et al. reported that recurrence rate of surgical cysto-gastrotomy was 5% as compared to endoscopic cysto-gastrostomy.[12] However, park et al reported that cysto-jejunostomy is an ideal procedure when cyst in not in apposition with stomach or duodenal wall with minimum recurrence rate.[13] Another similar study reported that surgical cysto-gastrostomy had 9% recurrence as compared to other treatment options for pancreatic pseudocyst.[14]

In present study, failure rate was found to be lower in cysto-jejunostomy as compared to cysto-gastrostomy. Palanivelu et al reported that cysto-gastrostomy and cysto-jejunostomy are preferred procedures in resource limited areas. Both procedure can be performed with staplers and sutures. However, cysto-jejnostomy had less failure rate as compared to cysto-gastrostomy. In both procedures use of stapled anastomosis is easier to perform and prevent post-operative leakage.[15]

In present study most common etiology for pancreatic pseudocyst was alcohol use and gallstones. Shama et al reported that most common cause of pancreatic pseudocyst is gallstones.[16] However, Yang et al reported that alcohol abuse and post surgical trauma are most common causes of pancreatic pseudocysts.[17]

In present study, complications including bleeding, pneumoperitoneum, peritonitis, anastomosis leakage were lower in cysto-jejunostomy as compared to cysto-gastrostomy (p>0.05). SW et al reported that laparoscopic cysto-gastrostomy had lower complications as compared to surgical cysto-gastrostomy (0% vs 10%).[18] Another similar study reported that anastomosis leakage is most common complication in cysto-gastrostomy as compared to cysto-jejunostomy.[19]

Limitations: it was a small scale randomized trial that limits generalisability of study.

Conclusion:
Cysto-gastrostomy had high morbidity rate in terms of high recurrence as compared to cysto-jejunostomy. However, both procedures can be used according to location of pancreatic pseudocyst in resource limited areas.

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

Dr. Bakhtiar Ullah, collected the data, and helped in introduction writing.

Dr. Siddique Ahmad, critically review the article and made final changes.

Dr Rizwan Ahmed Khan, collected the references and helped in discussion writing.

Dr. Amir Zeb, collected the data, references and did the interpretation of the data.

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