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Study of Etiopathogenesis and Outcome of Surgical Management of Chronic Pancreatitis

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ABSTRACT

This was a non-randomized prospective observational study done in chronic pancreatitis patients in our institute over two years. Perioperative parameters and outcome of various parenchyma preserving surgeries were observed and analyzed for a follow-up period of six months. About 56% of the patients were in their prime age group of 31-45 years, thereby limiting the socio-economic status of the family. Males were predominant. (76% Vs24%). Ethanol was the primary etiological factor The pain was the primary mode of presentation About 28% of patients presented with loco-regional complications of pancreatitis. Endocrine insufficiency was present in about 44% among that 20% of the patients had reasonable glycemic control in the immediate post-op period. Exocrine insufficiency was present in 28% of the patients. Only 8 % of the population presented with both exocrine and endocrine deficiency. The results of the study in our institute, revealed the fact that the extended drainage procedure with coring out of tissue in the region of the head as proposed by Frey (resection and drainage) has high effectiveness in the treatment of pain, combined with little interference in the disease course (endocrine and exocrine function). Frey's procedure could be considered as the primary operation in patients with disabling pain as a result of CP because it is safer, more comfortable and presents less morbidity and zero mortality than alternative technique if it is performed in a high volume centre. The long term results of pain relief are more than 90%, and there may be a functional benefit in terms of preservation of pancreatic function in the long run.

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Key Words
Pancreatitis, parenchyma, ethanol, exocrine insufficiency

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INTRODUCTION

Chronic pancreatitis is an irreversible condition of the pancreas characterized by chronic progressive inflammation, fibrosis and scarring resulting in loss of both exocrine (acinar) and endocrine (islet cells) tissue[1]. TIGAR-O described predisposing risk factors as toxic-metabolic, idiopathic, genetic, autoimmune and obstructive. Trypsin metabolism and stellate cell activation in pancreas play a central pathophysiological role in chronic pancreatitis[2]. Abdominal pain remains the most debilitating symptom affecting the quality of life, apart from diabetes mellitus, steatorrhoea and weight loss in chronic pancreatitis. The treatment options for chronic pancreatitis have evolved over the past decades and they are aimed to provide permanent relief in pain with a possible attempt to support or improve the failing endocrine and exocrine functions of the pancreas[3]. Surgical treatment options have shown the potentials to provide superior long-term results compared to the pharmacological and endoscopic modalities[4].

Surgical Treatments are Broadly Divided Into[5]:

- -drainage.
- -resection.
- -combination of hybrid procedure.

The Surgery is Based on the:

- -Morphology of the main pancreatic duct.
- -Presence of head mass.
- -The associated complication of Chronic pancreatitis.

MATERIALS AND METHODS

It is a prospective and observational study conducted in Department of General Surgery, Fathima Institute of Medical Sciences, Kadapa, A.P. The study population is taken from the patients diagnosed to have chronic pancreatitis in Department of General Surgery, Fathima Institute of Medical Sciences, Kadapa, A.P. Age group, Sex, presenting symptoms, Type of surgeries performed, Complications and outcome were analyzed

Inclusion Criteria:

- Patients with classical history and radiological characteristics of chronic pancreatitis. Patients both males and females older than 12 years.

Exclusion Criteria:

- Children <12 years.
- Chronic pancreatitis patient who needs conservative management.

Investigation Details:

- Blood investigations including CBC, LFT and RFT, CA 19-9, viral markers.
- USG abdomen.

UGI Scope: To look for extraneous impression and varices in cases of hypertension.

CT Abdomen and Pelvis: To look for calcification, head mass, stones in the duct and parenchyma and diameter of the head and associated complications in the form of pseudocyst and perisplenic collaterals.

RESULTS AND DISCUSSIONS

A total number of 50 study subjects with chronic pancreatitis were managed surgically over the study period and were analysed in the study.

(Table 1): Age Groups: The age of the study subjects varied between 15-58 years, with the mean age of 38.5 years. 76% in the present study were male. Regarding the aetiology, alcohol was associated with 30 study subjects, whereas 20 stud subjects were non-alcoholic. All the study subjects were presented with abdominal pain with pain scores eight or more in 44 and less than 8 in 6 study subjects. Study subjects without predominant head calcifications or inflammatory mass with dilated duct underwent lateral pancreaticoje junostomy accounting for 16% of cases. Study subjects with small duct and predominant parenchymal calcifications were only 2 in number and Izbicki procedure was done. During the postoperative period, wound infections and pulmonary complications were more commonly seen than others.

Follow Up: In the immediate follow-up period, almost all the study subjects had pain relief drastically to the pain score of one. They continued to be asymptomatic for six months. One study subject was readmitted with recurrence of pain due to the recidivism. This study subject was advised with strict abstinence from alcohol and was treated with medication. All the study subjects had a mean preoperative visual analogue scale (VAS) pain scores of 8.26.

Table 1: Distribution of Patients Based on Various Parameters

	Number	Percentage
Age groups		
<15	1	2%
16-30	9	18%
31-45	28	56%
>45	12	24%
Pain Abdomen (Preop VAS Score)		
6- 8	44	88%
More than 8	6	12%
Functional insufficiency		
DM	22	44%
Steatorrhea	14	28%
Complications		
UGI bleed	1	2%
Pancreatic ascites	3	6%
Portal hypertension	1	2%
Splenic vein thrombosis	5	10%
Jaundice	7	14%
Pseudocyst	5	10%
Surgical Procedures		
Freys procedure	40	80%
Lateral pancreaticojejuno stomy	8	16%
Izbicki procedure	2	4%
Post op complications		
Wound infection	8	16%
Pancreatic leak	2	4%
Pulmonary complications	5	10%
others	2	4%

Table 2. Post-Op VAS Score After 1Month (N=50)

VAS Score	Number	Percentage
1	44	88%
2	6	12%
3	0	0

Postoperatively one month after surgery, all the study subjects had drastic pain relief with a mean score of 1.12.

Table 3. Post-op VAS Score After 6 Months

Vas score	Number	percentage
1	44	88%
2	5	10%
3	1	2%

Follow up of six months., the pain-free period is still better with a slight change in mean 0f 1.22.

Chronic pancreatitis is a benign debilitating condition associated with intractable abdominal pain, diabetes, and steatorrhea. It is a disease with poor quality of life affecting the younger population in the most productive years of life. Chronic pancreatitis is primarily a disease which can be managed by conservative treatment. However, recent studies on long-term development have shown that the majority of patients with chronic pancreatitis will not become pain-free, even after the disease has progressed for more than ten years. Until now, there has been no parameter which predicts long-term development of pain for the patients. Chronic pain syndrome and complications, like bile duct stenosis, duodenal, pancreatic duct or vascular obstruction or symptomatic pancreatic pseudocysts, make the patients seek surgical advice, frequently after years of progression. In the past, surgical procedures involving drainage as well as resection were employed successfully. Chronic pancreatitis is a predominantly male disease as evident from a recent study from India done by Balakrishnan et al. with male to female ratio of 2.3:1[6]. The present study also showed an increased preponderance to males with disease occurring three times more common than in the female.

CCP-Increasing Alcohol Trend: Epidemiologic studies have proposed an association between alcohol consumption and pancreatitis, although the exact dose-response relationship is unknown. It remains uncertain whether a threshold effect exists. In India, tropical pancreatitis is another form of chronic pancreatitis affecting the younger population on their first two decades of life. In the present study, almost 60% of the people have an association with chronic pancreatitis as compared with other studies by Irving[7].

Exocrine and endocrine Insufficiency: Chronic inflammation of pancreas promotes the development of parenchymal fibrosis, which leads to loss of pancreatic endocrine and exocrine function. The diabetes subtypes associated with exocrine disease of the pancreas (including CP) are collectively referred to as pancreatogenic or Type 3c Diabetes Mellitus (T3cDM) distinct from other subtypes of diabetes due to its brittle nature[8]. These patients have glucagon and other pancreatic hormone insufficiencies in addition to lack of insulin. In a review done by Ramsey[9], it was observed that those with established CP, DM is ighly prevalent. Previous studies estimate up to 80% of those with CP will develop DM, which generally does not develop until a couple of decades after the onset of symptoms. In contrast, in the present study, the presentation is seen in only 44% of study subjects. Exocrine pancreatic insufficiency (EPI) does not develop until approximately 90% of the exocrine pancreatic function is lost. Ramsay *et al* found EPI develops in approximately 30-80% of those with CP, whereas present study denotes only 28% of study subjects.

Pain and Other Associated Complications: The pain was the most common presenting symptom and severe pain with VAS score of 8 or more was seen in 88% of study subjects in the present study, making it the most common indication for surgery. Seven study subjects had jaundice at the time of presentation and one had melena. Three study subjects presented with sudden onset abdominal distention were found to have pancreatic ascites. Further evaluation revealed Pseudocyst and splenic vein thrombosis in 10% of study subjects each. It is estimated that splenic vein thrombosis (SVT) develops in approximately 10-20% of patients with CP[9]. Of which, only 4% developed left-sided portal hypertension and UGI bleed depending upon the variceal status. Therefore, routine splenectomy is not recommended in all patients having splenic vein thrombosis[10]. The prevalence of SVT in the present study was 10% and only 2% of the study subjects had sinistral hypertension and melena. Splenectomy was added along with a drainage procedure in that particular study subject only. The prevalence of pseudocysts in those with CP has been estimated to at approximately 20-40%[9]. Most of them can be incorporated along with pancreaticoje junostomy and seldom warrants a separate anastomosis. In the present study, we found pseudocysts in five (10%) of study subjects and none required any new procedure.

Jaundice: Biliary obstruction secondary to bile duct stricture is a common complication in patients with CP with an incidence ranging from 3-46% depending upon clinical picture[11]. One-fourth of patients with CP develop jaundice during the disease are at increased risk of developing fibrotic strictures of the intrapancreatic portion of the common bile duct, which may occur in up to 25% of those with calcific CP. In a study done by Negi *et al.*, 17 per cent of patients had

a history of persistent jaundice and transient in the remaining two patients (3 per cent)[12]. In the present study, jaundice was present in seven study subjects (fourteen percent) of which five (ten per cent) had persistent disease and other two (four per cent) had transient jaundice, the latter was treated conservatively. Jaundice resolved with the drainage of a pseudocyst if it was the primary cause of biliary obstruction. In these study subjects, after drainage of the pseudocyst intraoperative cholangiography was performed to confirm relief of the obstruction. If intraoperative cholangiography after drainage reveals residual obstruction, a bilioenteric bypass should be performed. Other causes of jaundice are associated choledocholithiasis which can be formed denovo or due to stricture. Regarding the Management of asymptomatic elevation of Serum Alkaline Phosphatase (SAP) in CP patients with biliary stricture is controversial. In the series reported by Frey[13], the incidence of secondary biliary cirrhosis was 7.3%., hence biliary drainage was recommended in patients with raised SAP (three times standard) that persists longer than o n e month. Jaundice in patients with biliary obstruction could be transient or persistent. Transient jaundice which is typically seen during acute exacerbations recedes with a resolution of the inflammatory process. Abdallah *et al.* and other researchers have also reported that conservative treatment is warranted for transient jaundice. But biliary decompression is recommended only when jaundice persists for >one month or in patients with a progressive rise in SAP also requires biliary drainage. Pancreatic ascites is a rare complication of CP, they may or may not be associated with pancreatic pseudocysts and they present a high morbidity. Most of the patients settle with conservative management with one third requiring surgery due to the formation of an internal fistula.Three study subjects in the present study had pancreatic ascites, which were managed conservatively during the acute episode and once ascites subsided, primary pathology was dealt with surgery.

Surgeries Done: Negi et al. analyzed 134 patients with CCP and in them, only 48.8 per cent underwent Frey's procedure. Longitudinal pancreaticojejunostomy was performed in 67 patients, 50%, pancreaticoduo denectomy in four 3% and distal pancreatectomy in three (2%). It was believed parenchyma hypertension as a predominant cause of pain in 80% of the present study subjects as they had bulky head and parenchymal calcifications within. Hence, for better pain relief in such a population, the Freys procedure was preferred. In particular, two of the present study subjects had severe pain with narrow MPD and multiple parenchymal calcifications. This subset was tackled with Izbicki procedure. Eight study subjects had dilated duct with atrophied pancreas without head mass or calcifications. It was assumed that in these study subjects, the pain was mainly due to ductal hypertension and so dealt with lateral pancreaticoje junostomy alone.

Other Associated Surgeries: In addition to the standard surgery, In the present study included other procedures to Address the accompanying complications due to chronic pancreatitis. One study subject who had a splenic vein thrombosis with sinistral portal hypertension and UGI bleed was tackled with distal pancreatectomy+splenectomy. Splenectomy was performed in a patient with splenic vein thrombosis who had preoperative variceal bleeding owing to segmental portal hypertension in a study done by Negi *et al.* In a study by Nagi *et al.,* Eight patients (13 percent) had segmental portal hypertension and splenectomy was performed in two who had a history of bleeding from gastric varices. Four of the present study subjects had significant parenchymal tail calcifications with accompanying small pseudocysts which required distal pancreatectomy alone without splenectomy along with the primary procedure. Biliary drainage is recommended only when jaundice persists for more than one month or when there is a progressive rise in SAP. holangitis and choledocholithiasis should invariably be managed with surgical biliary drainage. Options for surgical bilioenteric bypass in these patients are cholecystojejunotomy (CDJ) and Choledo choduodenostomy (CDD). In the present study, out of 7 study subjects who had jaundice, two cases had transient jaundice which settled spontaneously. Other 2 case were directly dealt with one HJ and one CDD each during definitive surgery. While endoscopic stenting can provide short-term relief of symptoms, multiple series had reported poor longterm results with a high incidence of stent blockage, migration and reintervention even with self-expanding metal stents. Hence it is preferred to deal with such patients with surgical biliary drainage after tiding over the crisis with ERCP and stenting. All three study subjects who underwent endoscopic biliary stenting in the present study had undergone CDD or HJ during definitive surgery for CCP. At present endoscopic biliary drainage as a sole treatment modality in CCP with BBO is restricted to patients with overt cholangitis or patients who are unfit for surgical intervention. Advantages of CDD are that it preserves the normal flow of bile into the duodenum and is easy to construct. However, it may not be possible in patients with long bile duct stricture and associated duodenal obstruction. The main advantage of CDJ is that it can be easily performed in all kinds of stricture. It also avoids Sump syndrome and related cholangitis. The selection of a particular drainage procedure should be based on

factors like size of the common bile duct, length of bile duct stricture, presence of associated duodenal obstruction and requirement of associated pancreatic drainage. Four study subjects had associated gallstones and Cholecystectomy was done even if they were asymptomatic as it may increase the morbidity if its related complications occur later. Also, simple Cholecystectomy did not add to operative time significantly. Post OP complications: During the postoperative period, wound infections and pulmonary complications were more commonly seen. Wound infection in the present study accounts for about 16% of the study subjects. These study subjects were managed with regular dressings. Pulmonary complications are the next common complication in the present study. These pulmonary complications were managed by simple incentive spirometry and chest physiotherapy. The pancreatic leak was the third most common complication in the study in about 4% of study subjects. The pancreatic leak is defined as drain amylase level 3 times higher than serum amylase level after 3rd postoperative day. The pancreatic leak in the present study was managed conservatively. In the present study, all study subjects presented with abdominal pain as their chief complaint and their measured Visual analogue scale (VAS) pain scores were eight or more in 44 (88 per cent) and VAS score less than eight was seen in 6 (twelve per cent) study subjects. In the immediate follow-up period, almost all study subjects had pain relief drastically to the pain score of one and continued to be asymptomatic for six months. One study subject was readmitted with recurrence of pain due to the recidivism. This study subject was advised strict abstinence from alcohol and was managed with Opioid analgesics. From the present study, all study subjects had mean preoperative pain scores of 8.26. One month after surgery, all study subjects had significant pain relief with a mean score of 1.12. During the follow-up period of 6 months, the pain relief continued to be persisting with an only slight change in mean VAS score to 1.22. Various results from a period of decades studies show that the postoperative pain-free status is independent of the surgical procedure done. As much as up to 90% of the patients have pain free period for over several years of follow-up. After 1.5 years, freedom from pain was the same for both interventions. However, perioperative morbidity was significantly lower after the Frey procedure. In the present study, though the numbers were less, the outcome in terms of pain relief and functional preservation were similar amongst different surgical procedures.

CONCLUSION

From the present study, we found that chronic pancreatitis occurs mostly due to alcohol intake and present with pain as a predominant symptom, which gets significantly relieved following parenchyma preserving surgeries.

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