

ORIGINAL RESEARCH ARTICLE

SURGICAL MANAGEMENT OF CHRONIC PANCREATITIS: A SINGLE CENTRE EXPERIENCE

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ABSTRACT

Chronic pancreatitis is a chronic debilitating inflammatory disease of pancreas. Ongoing abdominal pain with varying severity is the most important presentation. Surgical treatment has remained one of the most important therapeutic options with best long-term outcome in terms of pain control. Here, we present our experience in surgical management of chronic pancreatitis performed at a single tertiary level teaching hospital over a ten years (Jan 2004 to Dec 2013) period. Retrospective review of the medical records of patients of chronic pancreatitis managed surgically over ten years period was performed. Demographics, presenting symptoms, etiology, diagnostic approach, type of surgery, postoperative complications and overall symptom improvement on follow up were analyzed. Total 32 patients were operated during the study period but only 19 patients could be analyzed. Age ranged 13- 64years with male predominance (Male 15, female 4). Non-alcohol related etiology was more frequent (10, 52.6%). All of our patients had chronic abdominal pain at presentation. Only 1 patient in the series had associated steatorrhea. All of the patients had base line computed tomography (CT) scan prior to surgery and ductal anatomy was further characterized by magnetic resonance cholangiopancreatography (MRCP) or endoscopic retrograde cholangiopancreatography (ERCP). Total 9 had Frey's procedure, 8 Partington-Rochelle (two patients also had bilioenteric bypass) and 1 patient underwent pancreaticoduodenectomy. We had one perioperative death with total 21% morbidity. Overall, we had 80% pain free rate among patients on follow up. On Conclusion, when indicated, surgical management of chronic pancreatitis has excellent outcome with acceptable morbidity rate.

Keywords: Pain, Frey's procedure, Partington- Rochelle procedure

INTRODUCTION

Chronic pancreatitis is a debilitating benign progressive inflammatory disease of pancreas.¹ The condition is often characterized by wide variety of symptoms but usually chronic abdominal pain is the most important presenting feature.² The ongoing inflammatory process on the gland can finally lead to endocrine and exocrine insufficiency.³ This ongoing chronic unrelenting pain and the disabling symptoms of the disease process can lead to various consequences like narcotic addiction, dietary restrictions, life style modifications, repeated hospital admissions and finally absence from work and unemployment.⁴ Wide spectrum of complications can develop in the setting of chronic pancreatitis like pancreatic pseudocyst, stenosis of duodenum, bile

duct or colon, portal hypertension, gastrointestinal bleeding and on long run also increases the risk of pancreatic cancer.^{2,5}

No specific therapy has been developed to counteract the disease process or slowdown the progression.⁴ The treatment for this condition has been mainly directed against the symptoms or the complications developed in the course of the disease. Endoscopic and surgical approach has been the main focus of discussion and there is still ongoing debate on this matter. There are researchers who believe on step up approach and thus reserving surgical treatment only when the medical or endoscopic treatment fails except on certain scenarios.⁶ While some clinicians believe in early surgical interventions. We will discuss these issues in detail in the discussion part of this retrospective review, which was carried

out to describe our ten years experience in surgical management of chronic pancreatitis at a single centre.

MATERIALS AND METHODS

A retrospective review of patients with chronic pancreatitis operated over ten years period (Jan 2004- Dec 2013) in surgical gastroenterology units of university teaching hospital was performed. The follow up period was till Dec 2016. Tribhuvan University Teaching Hospital is a tertiary level referral and teaching hospital, which is considered as one of nation's oldest, largest and main academic institute having all kind of super specialty services within the same hospital premises. The hospital has dedicated gastrointestinal surgical units treating all kind of benign and malignant gastrointestinal diseases.

The diagnosis of chronic pancreatitis in our series was made on the basis of clinical symptoms and imaging studies. Abdominal CT scan was routinely performed to characterize the disease. ERCP was not used as a diagnostic tool by us but if it was already performed during the routine evaluation of chronic abdominal pain before being referred to us; the findings were taken into consideration and used to guide the surgical plan. MRCP was performed to delineate the ductal anatomy if the CECT scan was inadequate. Similar to others in the literature, we also considered enlargement of pancreatic head when the anteroposterior diameter of the pancreatic head on cross sectional imaging was 3.5cm.⁴ Additionally, the dilatation of the duct was considered significant if the maximum duct dilation was 7mm. Endoscopic ultrasound is not yet available within the country and none of our patient had it performed from abroad. So, we didn't perform any preoperative histological diagnosis and the diagnosis of chronic pancreatitis was made only postoperatively on biopsy samples. In our hospital, the usual trend in managing chronic pancreatitis has been similar to that of step up approach upgrading from medical to endoscopic to surgical approach in step up fashion except when there are indications to proceed directly to endoscopic or surgical treatment. Thus, surgical management is offered to patients who had failed medical or endoscopic treatments, largely dilated

duct with impacted multiple stones, multiple ductal strictures, loco regional complications of chronic pancreatitis like biliary or adjacent bowel stenosis, inflammatory mass or any suspicion of malignancy. In this review of ours, we have only included the patients who were managed surgically. So, we do not have data on how many patients were turned down for surgery or were not referred to us by gastroenterologist and general surgeons. Thus we also do not have exact data of patients with chronic pancreatitis being managed by medical treatment or endoscopic therapy. We noticed that all of our patients analyzed had dilated duct and this stresses on the fact that we have been very selective to choose the candidates with dilated ducts only except when there is an inflammatory mass with suspicion of malignancy and is amenable to some form of resection.

The operative strategy for us was also guided by pancreatic ductal morphology, presence of pancreatic head enlargement, and suspicion of malignancy and presence of pancreatitis related loco regional complications. Drainage only procedure, Partington-Rochelle longitudinal pancreatojejunostomy was used for dilated duct but without pancreatic head enlargement. If both ductal dilatation and the head enlargement were present, Frey's procedure,⁷ which combines longitudinal drainage of the duct with local head resection in the form of coring out, was performed. For patients with enlarged head only and if there was any suspicion of malignancy, pancreaticoduodenectomy was choice. Concomitant biliary decompression was proposed operation for those patients who had biliary strictures, bile duct stones or history of cholangitis. This was intended to perform either opening the intra pancreatic portion of the duct and incorporating into the same pancreatoenteric anastomosis or decompressing with a separate bilioenteric anastomosis. Distal pancreatectomy was reserved for the patients with disease confined to body or tail.

Third generation cephalosporin was routinely used as prophylactic antibiotic and was to be continued postoperatively for those with history of cholangitis. Deep venous thrombosis prophylaxis was also used selectively in patients deemed high risk. Postoperative analgesia was maintained by epidural or parenteral routes and patients were started on

oral analgesia in a stepladder approach, as soon as possible. All postoperative complications were graded by Clavien- Dindo classification system of surgical complications.⁸

Preoperative variables studied included indications of surgical intervention, patient demographics, etiology of pancreatitis, frequency and duration of pain prior to surgery and diagnostic modalities used. Intraoperatively, among other parameters type of surgery was noted. All postoperative complications were noted and classified as described above and patients advised to follow up regularly. However, timing of follow up couldn't be fixed as many patients hailed from distant places and they intended follow up depending upon their suitability. Improvement on pain along with other postoperative outcome was recorded during follow up. At times, if patient couldn't make it for follow up for a prolonged period, phone calls were made to assess their postoperative status. Visual analogue scale was used to assess pain both pre and postoperatively.

RESULT

Total of 32 patients of chronic pancreatitis were operated during the study period. However, complete medical records were missing for 13 of our patients and thus we could only analyze 19 patients. Age ranged between 13 to 64 years with majority (17, 89.4%) of our patients being under 50years. There was male predominance (15, 79%) in our series. Alcohol has been the main etiology worldwide for chronic pancreatitis. However, in South Asian countries like India and Nepal, we frequently encounter a separate group of chronic pancreatitis seen in young individuals and usually termed as tropical pancreatitis, the etiology behind it is not exactly well known.⁹ We divided the etiology into two groups, alcohol related and non-alcohol related chronic pancreatitis. Both of the etiologies made a similar contribution (alcohol related 9, 47.6% and non-alcohol related 10, 52.3%).

Pain is the main important symptom of chronic pancreatitis, which can occur as a continuous or with periodic relapses and remissions. In our series 100% of our patients had chronic pain with varying amount of duration. Pain of chronic pancreatitis in our series was episodic type of pain and none having a continuous type. Median duration of pain

at the time of presentation was 12 months (range: 3 months- 3years). Average pain score was 6 and severity being either moderate or severe in all the cases (Table 1). When we analyzed type of analgesics being used, we found that none of our patients were on long-term strong opioids use as they were on either regular Non-steroidal anti-inflammatory drugs (NSAIDs) or other weak opioids like tramadol or in combinations of those two. Alongside with pain, few cases had associated symptoms or consequences of chronic pancreatitis at the time of presentation. Other symptoms associated included diabetes mellitus; jaundice, gastrointestinal bleeding and only one patient in our series had clinical symptoms correlating with steatorrhea.

Table 1 Clinical Characteristic

Variables	n (total= 19)
Age distribution (in years)	
10- 19	4
20- 29	3
30-39	5
40- 49	5
≥ 50 years	2
Sex distribution	
Male	15
Female	4
Pain score (VAS)	
Mild (<4)	0
Moderate(4- 7)	7
Severe (>7)	12
Symptoms at presentation	
Pain only	10
Pain with jaundice	2
Pain with DM	4
Pain with DM & steatorrhea	1
Pain with gastrointestinal bleeding	2

All patients had a base line CT scan prior to surgery. Similarly, MRCP was performed in 15 patients and in remaining 4 patients, who already had ERCP, further MRCP was not performed. Largely dilated ducts (Figure 1), ductal stones and parenchymal calcifications were universal findings in all our cases (Table 2). Type of surgery performed depended upon findings as described previously. We performed all operations with open approach.

Frey's (Figure 2) and Partington- Rochelle procedure were the most commonly performed procedures. One of our patient who had presented with massive gastrointestinal bleeding, had pseudoaneurysm of superior pancreaticoduodenal artery which could not be managed with coil embolisation underwent pancreaticoduodenectomy. One of the patients in the series had migration of stent after endoscopic therapy and presented with gastrointestinal bleeding. He subsequently underwent angiographic embolization. However, patient was operated as embolization failed to stop bleeding. The patient did well after surgery.

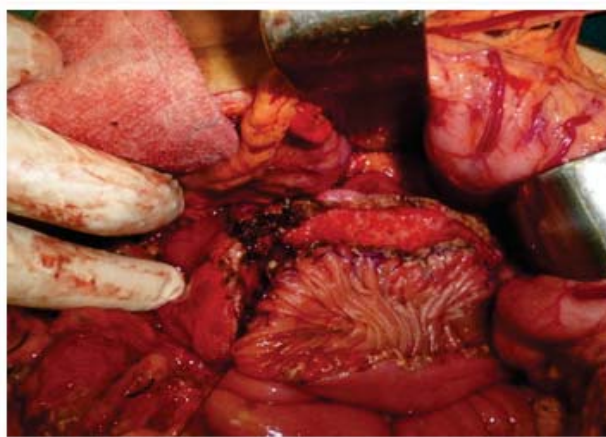


Figure 2 Pancreatojejunostomy being preformed after coring out of head and longitudinal opening of the duct - Frey's procedure

Table 2: Characteristic findings on Imaging

Findings	n (total= 19)
Parenchymal calcifications	19
Pancreatic ductal stones	19
Dilated pancreatic duct (>7mm)	19
Pseudocyst	5
Biliary dilatation	2
Parenchymal atrophy	5

Table 3: Type of Surgical intervention

Type of Surgery	n (total= 19)
Partington- Rochelle procedure	6
Frey's procedure	9
Partington- Rochelle procedure with choledochojejunostomy	2
Pancreaticoduodenectomy	1
Ligation of pseudo aneurysm	1

Postoperative complications were graded according to the Clavien-Dindo classification system of surgical complications. We had total of 4 complications and thus our overall morbidity rate was 21%. We had one complication in each grade of grade II (Pneumonia), IIIa (abdominal collection requiring radiological drainage), IVb (Patient developed postoperative hypoglycemia and required intensive care unit management) and V. One grade V complication was a postoperative mortality in a patient who had pancreaticoduodenectomy for bulky pancreatic head in setting of chronic pancreatitis and also presented with gastrointestinal bleeding. This patient required multiple transfusions and developed multi organ failure.

Postoperative average hospital stay was seven days. All the patients were advised for follow up on discharge. Total 3 patients lost to follow up after surgery and even an attempt of telephonic contact failed. One patient died 3 years after surgery but completely unrelated to his death. However, he had been completely pain free at his last follow up. With a follow up range of minimum of 3 months to 42 months, total ten patients have remained completely pain free. However, 4 patients presented with recurrence of pain at least after 12 months of surgery. Out of these 4 patients, only 2 patients actually had pain related to chronic pancreatitis and two had pain unrelated to chronic pancreatitis. One patient had gastritis and the other patient developed symptomatic gallstones for which the patient underwent an open cholecystectomy. Overall, those patient who were on follow up, we had 85% pain



Figure 1 CT scan showing large dilated duct with parenchymal atrophy

free rate. All of the four patients, who preoperatively had diabetes, were continued postoperatively on medical management of diabetes. Within the limited time period for follow, none of our patients had developed new onset diabetes.

DISCUSSION

Many theories have been put forth to describe the mechanism of pain in chronic pancreatitis. Chronic inflammation leads to ductal strictures and fibrosis and thus causes ductal obstruction and finally exacerbating the ductal hypertension.¹⁰ Chronic inflammation also leads to changes in peripancreatic nerves and cortical plasticity.^{11,12,13} Compartment syndrome with abnormal proliferation of peripancreatic nerves, activation of neurons containing inflammatory peptides and hyper sensitization of nerve endings contribute to the intractable pain of chronic pancreatitis.¹² The character and severity of pain however is highly variable. The continuous pain pattern has been thought to be associated with advanced disease and onset of complications.¹⁴ In our series; none of the patients had continuous pain. All of them had episodic type with different frequencies and interval prior to presentation. Study done by Negi et al demonstrated that a continuous type of pain pattern was more likely to be associated with failure of pain relief after the surgical intervention.⁴ This might have been a very important reason for having very good outcome in terms of pain control in our series as none of our patients presented with continuous type of pain. Pain control after surgery has also been thought to be related with use of alcohol.¹⁵ However, some are of the opinion that use of alcohol is more related to long-term survival rather than pain control.^{16,17} We presumed that the abstinence from alcohol also contributed to significant pain control postoperatively, in those having alcohol as the cause of chronic pancreatitis. There has been growing evidence in the literature that the progression of both the endocrine and exocrine functions can be minimized by decompressive surgeries.^{18,19} One of the prospective studies by Malka et al demonstrated that the risk of diabetes in patients with chronic pancreatitis is not influenced by the type elective procedure except distal pancreatectomy.²⁰ During

the limited period of follow up in our series, none of the patients had developed new onset of diabetes and those who preoperatively were on medications could be continued on the same medications without further worsening of the diabetes. Only one patient in our series had developed clinical evidence of steatorrhea at the time of presentation. It has been seen that exocrine insufficiency can arise even before chronic pancreatitis is diagnosed but is more common to appear after about 10 years of onset of overt manifestation of chronic pancreatitis.² Decompensation with steatorrhea occurs only when lipase secretion decreases below 90%.²¹ But, exocrine insufficiency can still cause malnutrition and weight loss in absence of steatorrhea. The absence of morphological evidence of chronic pancreatitis is no guarantee of normal pancreatic function.²

CT and magnetic resonance imaging (MRI) are complimentary diagnostic methods for further describing pancreatic changes and loco regional findings.² In particular MRCP is always advisable to be performed to obtain detail information about the pancreatic duct system.² Endoscopic ultrasound (EUS) has been found to be very important in evaluating the early form of disease. When in doubt, EUS guided biopsies have helped further in diagnosing the disease. However, EUS is not yet available in our country. Thus none of our patients in our series had this investigation performed. ERCP is no longer performed solely for the diagnostic purpose as it is associated with higher morbidity (overall, 5- 10%) and mortality (0.3%).² However, ERCP can be an important diagnostic tool in rare instances when both MRCP and EUS have been performed without yielding a definitive diagnosis.² In most of the series in literature, the operating strategy is based on pancreatic ductal morphology, presence of pancreatic head enlargement, suspicion of malignancy and presence of pancreatitis related locoregional complications.^{2,4} Pancreaticoduodenectomy has been in use for the head dominant disease.⁴ Duodenal- sparing procedures like Beger (Duodenum preserving head resection, DPHR) or Frey (Local resection of head with longitudinal pancreatojejunostomy, LR- LPJ) procedures have been found to be good alternatives to pancreaticoduodenectomy.⁴ Frey's procedure has been technically easier and associated with lower

morbidity than Beger's procedure with equivalent pain relief.²² Total 9 (47.3%) of our patient had Frey's procedure. In our institute, Beger procedure has not been adopted and pancreaticoduodenectomy is reserved for cases with high suspicion of malignancy. Only one patient in our series had pancreaticoduodenectomy. Negi et al reported their outcome of 134 patients of chronic pancreatitis undergoing Frey's procedure.⁴ With a median follow up of 6.4 years, there was 75% partial or complete pain relief and also demonstrated a significant reduction in median number of episodes requiring hospitalization. Due to its technical easiness and equally a good postoperative outcome, Frey's procedure is being preferred type of surgery in centers like ours.

There has been ongoing debate on endotherapy vs. surgical therapy for management of chronic pancreatitis. The aim of both the procedure is to alleviate the pressure in the pancreatic duct and ensure adequate drainage of the pancreatic secretions. Medical management still plays a role for small duct disease. Till date, two randomized trials have been performed to compare endotherapy with surgery. Dite et al demonstrated similar pain relief rate with either of the procedures at one year.²³ However, at 5 years follow up more surgically treated patients were pain free compared with endotherapy (37% vs. 14%). Similarly another randomized trial by Cahen et al demonstrated that the surgical group had significantly more subjects with complete or partial pain relief (75% vs. 32%) at 24 months follow up.²⁴ Despite the fact that surgery has better pain control, because of its lower degree of invasiveness, endotherapy is still been advised reserving surgery as second line therapy for patients in whom endotherapy fails or is ineffective.

Yang et al recently published a systematic review on early surgery for chronic pancreatitis.⁶ Total 11 studies were included in qualitative synthesis. The review suggested that the early surgery might increase the likelihood of achieving postoperative pain relief and could prevent the development of pancreatic insufficiency. The early surgery could also reduce the risk of repeated intervention. Almost half of the patients undergoing initial endoscopic treatment had to receive further intervention and half of the patients eventually required surgery.

Currently, a randomized controlled trial has been designed to evaluate the benefit, risks and cost of the early surgical intervention compared with the current stepwise treatment approach for chronic pancreatitis. The study popularly known as ESCAPE (Early surgery versus optimal current step up practice for chronic pancreatitis) trial is a randomized controlled, parallel, superiority multicenter trial designed by the Dutch Pancreatitis Study Group.²⁵

CONCLUSION

This review represents the outcome of surgical management of chronic pancreatitis in a tertiary level hospital of a developing nation who are still striving enough to produce a good outcome in resource limited set ups. This study does have some limitations as study specifically looks into surgical management without any updates on medical and endoscopic management. Moreover, being a retrospective study in nature we don't have data on how many patients were denied surgery even though they had indications for surgery. The review demonstrates the adaptation of decompressive procedures, especially the Frey's procedure in managing patients with chronic pancreatitis and by achieving acceptable morbidity and comparable outcome.

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