

Surgery for Chronic Pancreatitis and Different Methods of Surgeries

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Abstract

Background: Chronic pancreatitis, a benign inflammatory process of the pancreas and pain, is the most devastating symptom, for which patient seeks medical advice. It was a prospective study for 30 patients who were attended to our hospital and managed surgically during November 2020 to October 2021 at our institute.

Materials and Methods: Data are collected and analyzed. Various surgical procedures for chronic pancreatitis and their indications are noted. Pain relief, improvement of exocrine and endocrine insufficiency, and improvement of quality of life are studied.

Results: Various operative procedures are done including intraoperative Celiac plexus block in some. Puestow's, Frey's, and Whipples PD are done in these patients, which are selected according to the pathological anatomy. We observed that long lasting pain relief is observed in 90% of our patients. In two of the patient's surgery was done in acute condition with edematous pancreas. In these cases, intraoperative celiac plexus block was added. Improvement in exocrine insufficiency was observed in eight individuals and improvement in endocrine insufficiency was observed in four persons.

Conclusion: Surgery is effective in chronic pancreatitis with intractable pain and better results can be obtained with selection of procedure tailor made to the patient. Exocrine and endocrine functions may become bettered in some patients. Celiac plexus block is a useful adjunct to the surgery in selected group.

Key words: Chronic pancreatitis, Coeliac plexuses block, Frey's, Puestow's, Whipples

INTRODUCTION

Chronic pancreatitis is a progressive inflammatory disorder characterized as irreversible destruction of pancreatic parenchyma, associated with chronic pain, which is disabling and permanent loss of endocrine and exocrine function. Patients will present at a younger age with repeated attacks of severe pain abdomen, vomiting, steatorrhea, weight loss, and Type1 diabetes requiring insulin.

Recently, gene mutations associated with hereditary and idiopathic chronic pancreatitis have also been reported.^[1]

Patients come to the doctor with clinical symptoms such as maldigestion, severe weight loss, and recurrent severe upper abdominal pain. Later, in the course of the disease, endocrine and exocrine insufficiency may also develop.

The management for chronic pancreatitis is primarily of conservative and symptomatic treatment, but long-term follow-up studies showed demonstrated that about 50% of the patients might require surgical treatment at some time in their life.^[2]

Recently, some studies showed that surgery has a positive impact on the course of chronic pancreatitis, in postponing the final "BURNOUT" of the pancreas and its consequent appearance of endocrine and exocrine insufficiency. Therefore, it should be of great clinical importance in the management of chronic pancreatitis to treat the above said problems surgically before the disease has progressed to an advanced stage in which the endocrine and exocrine function has lost completely.

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Mainly two different types of surgeries have been developed based on different pathogenesis of abdominal pain. The drainage type of surgery is based on the hypothesis of parenchymal and/or ductal hypertension.^[2] The resection type approach is based on the hypothesis of perineuritis and local inflammatory. Drainage procedures include Puestow procedure, longitudinal pancreaticojejunostomy, pancreaticogastrostomy, and local resection procedures includes central pancreatectomy, distal pancreatectomy, duodenum preserving pancreatic head resection (Beger procedure), and proximal pancreatectomy – Whipple procedure or pylorus-preserving pancreaticoduodenectomy.

Aims and Objectives

The objectives of the study are as follows:

1. To study the age, sex distribution, etiology, and risk factors associated with chronic pancreatitis
2. To know the indication of surgery and type of surgery
3. To know the outcome and response of the surgical drainage procedure and resection procedure.

MATERIALS AND METHODS

Source of Data

All data were collected from the patients who presented with signs and symptoms of chronic pancreatitis to, Meenakshi Medical College Hospital and Research Institute, Kanchipuram, Department of General Surgery for treatment.

Design of the Study

It was a prospective study.

The clinical study of 30 cases of chronic pancreatitis was conducted by selecting cases presenting to Meenakshi Medical College Hospital and Research institute, Kanchipuram during a period of 2 years from November 2020 to October 2021.

Method of Collection of Data

All the patients with suspected chronic pancreatitis were investigated, offered individualized treatment, and followed up.

The institution where this study was conducted is equipped to carry out all necessary investigations, which helped in diagnosing and treating the cases.

These include an ultrasound scan, computed tomography, upper gastrointestinal endoscopy, ERCP, and barium meal which was immensely helpful in arriving at the diagnosis of chronic pancreatitis.

Plan for Data Analysis

The clinical outcomes were documented using a standard proforma. The collected data were analyzed

by comparing them with various standard studies on chronic pancreatitis.

Inclusion Criteria

1. Patients with classical history and radiological characteristics of chronic calcific pancreatitis were included in the study.

Exclusion Criteria

The following criteria were excluded from the study:

1. Patients with chronic calcific pancreatitis who are not willing to abstain from alcohol
2. Patients with poor performance status
3. Patient with pancreatic malignancy.

Investigation Details

- Blood investigations including CBC, liver function tests and RFT, CA 19-9, Viral markers.
- USG abdomen: To look for pseudocyst.
- Portal Doppler: To look for associated portal hypertension.
- UGI Scope: To look for extraneous impression and varices in cases of portal hypertension.
- CECT 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.
- CECT abdomen: CT-Angiography – To look for pseudoaneurysms around pancreas. MRCP and MRI – To look for the status of CBD in cases presenting with jaundice and cholelithiasis.

OBSERVATIONS AND RESULTS

Age Distribution

A total number of 30 patients who were diagnosed to have chronic calcific pancreatitis successfully managed were included in the study. The age of the patients varies from 15 to 58 years. The most of the patients were in their active earning period of life, 36–45 years [Table 1].

Table 1: Age distribution

Age in years	No. of patients	Percentage
15–25	3	10
26–35	8	26.6
36–45	15	50
≥0.	4	13.3

Table 2: Sex distribution

Sex	No. of patients	Percentage
Male	25	83.3
Female	5	16.6

In our study, there were 25 (83.3%) male patients and 5 (16.6%) female patients out of 30, indicating that the disease is more common in males with a male to female ratio of 5:1 [Table 2].

Regarding the etiology of chronic calcific pancreatitis, alcohol was associated with 19 patients, and 11 patients were considered to be tropical [Table 3].

Clinical Presentation

Among the clinical presentations, all the patients were presented with abdominal pain, and the pain score was more than 8 for 18 patients and <8 for 12 patients. In addition to pain, the other clinical presentation are shown in [Table 4].

Table 3: Alcohol history

Cause	Number	Percentage
Alcohol	19	61
Non-alcohol	11	39

Table 4: Clinical presentation

Presentation	No. of patients	Percentage
Exocrine insufficiency	8	25
Endocrine insufficiency	4	13
Any complications (biliary obstruction, splenic vein thrombosis, duodenal obstruction)	-	-

Table 5: The morphological characteristics

Findings	Number
Mpd dilatation	25
Mpd calculi	20
Parenchymal calcification	5
Parenchymal atrophy	5
Inflammatory head mass	3
Abscess	1

Table 6: Surgical procedures

Name of the procedure	Number
Modified Puestow method	24
Freys procedure	2
Begers procedure	2
Whipples procedure	2

Table 7: Post-operative complications

Complications	Number
Wound infection	5
Atelectasis	3
Hepaticojejunostomy leak	1
Pancreatic leak	1
Delayed gastric emptying	1

Surgical Procedures

The patients have been chosen according to the diameter of the duct, presence of an inflammatory mass in the head region, and associated with other complications in the form of the pseudocyst, portal hypertension, and jaundice.

Post-operative Complications

As like any other surgeries, the complications following the surgical procedures for chronic calcific pancreatitis were,

Follow-up

In the immediate follow-up period, all the patients had pain relief drastically to the pain score of one and continue to be asymptomatic for a period of 6 months.

Three patients were readmitted with a recurrence of pain due to the resumption of alcohol. Patients with endocrine insufficiency had good glycemic control with a decreased dosage of insulin compared to the pre-operative dose of insulin, mainly in case of drainage procedure. Patients with exocrine insufficiency had improvement in steatorrhea, and there is weight gain postoperatively. The average pain score of the patient, which was 8 preoperatively, has come down to 1 in the immediate post-operative period.

Pain relief was more in case of inflammatory mass operated by freys procedure as it was believed that pain-sensitive is mostly located in the head of pancreas. Pancreatic insufficiency was slightly improved in patients subjected to the longitudinal pancreaticojejunostomy group. There is slight steatorrhea in case of resection procedures, especially in the case of Whipple's procedure and freys procedure.

Quality of Life

Although no formal instrument measuring the quality of life was used, quality of life after surgery was inferred from the results graded both by a degree of pain relief and activity status. The median number of hospital admission fell after surgery for all procedures from two admissions per year to none by 12 months after surgery, which was maintained during follow-up. There was a significant increase in those in regular employment after surgery. Twenty-eight of 30 (93.3%) patients rated as in good health were employed [Tables 5-9].

DISCUSSION

The therapy for chronic pancreatitis consists primarily of conservative and symptom-related treatment, but long-term follow-up studies have demonstrated that about 50% of the patients will undergo surgical treatment at some time in the course of the disease.

The main indication for the surgical treatment of chronic pancreatitis is to alleviate severe pancreatic pain and to

Table 8: Incidence of alcohol abuse and results of surgery after pancreaticojejunostomy for chronic pancreatitis

Study	Year	Number	Alcohol abuse	Operative mortality	Late deaths	Relief of pain
Greenlee <i>et al.</i>	1990	100	100	(4)	3 (3)	75
Hakaim <i>et al.</i>	1994	50	60	0 (0)	5 (10)	89
Sharma <i>et al.</i>	1998	58	0	4 (7)	4 (7)	99
Present study		30	19	0 (0)	0 (0)	28

Table 9: Comparison of morbidity after surgery with Izbicki *et al.* and current study.^[8]

	Present study Number-Percentage	Izbicki <i>et al.</i> ^[8] Number-Percentage
MORBIDITY	3/30-10%	6/45-13.3%

manage pancreatitis-related locoregional complications, improve the quality of life by decreasing the intensity and repeated attacks of pain, and also in improvement in the exocrine and endocrine function of the remaining pancreas in case of chronic pancreatitis. According to the conventional wisdom, an operative procedure for chronic pancreatitis, as a palliative measure on an already functionally impaired gland, it should be as conservative as possible to limit the occurrence especially of endocrine failure. Out of six, five had the most relief of pain. Longitudinal pancreaticojejunostomy (LPJ) is safe because it preserves gland there less incidence of exocrine and endocrine deficiency in patients postoperatively.

We had no post-operative death with LPJ (mortality 0%). Many authors have reported a low mortality rate (0 %). During follow-up, no patients died at a mean of 13 months after the operation, which is comparable with the reported rate. Pain relief was classified as good in 27 of 30 patients (90%) who underwent surgery for intractable pain.

Etiology-alcohol

In our study, among the alcoholic chronic pancreatitis, 2 of 19 patients (20%) continued to consume alcohol. Lankisch *et al.* and Lauer *et al.* demonstrated that only 13–20% of deaths in patients with chronic pancreatitis are directly related to pancreatitis.^[3]

In our study, the type of surgery or the etiology of chronic pancreatitis did not influence the long-term outcome of a patient with chronic pancreatitis.

Pain Relief

In our study, operative therapy not only led to long-lasting pain relief in the majority of patients operated but also resulted in a significant increase in the proportion of patients able to work or function normally in society from 9% to 82%, according to a better quality of life.

Although a higher proportion of patients with tropical chronic pancreatitis patients had pain relief following surgery, we did not find any correlation between pain relief in alcoholic pancreatitis and those who were not alcoholic. This result was similar to the report reported by Brinton *et al.*^[4] who reported results of lateral pancreaticojejunostomy in 39 patients This is, in contrast, to a report by Sato *et al.*, who found that over a mean period of 9.1 years, only 50% of patients with alcoholic pancreatitis had a good result after surgery compared to 83% of those who had non-alcoholic pancreatitis.^[5]

Endocrine and Exocrine Insufficiency

The operation resulted in an improvement of the patient's diabetic status, with about 3 of 4 patients (75%) who were dependent on a high dose of insulin before surgery being taking a low dose of insulin, and euglycemic status was achieved. Exocrine pancreatic dysfunction was improved in 75% of patients who had steatorrhea preoperatively. Similar experiences have been reported from India in patients with tropical calcific pancreatitis. Sidhu *et al.* have shown that there was a significant improvement of endocrine insufficiency and slight improvement of exocrine insufficiency in patients with tropical chronic pancreatitis undergoing modified Puestow procedure in a long-term follow-up study.^[6] In our study, there was no difference in pancreatic insufficiency between and resection group, which is similar to a report from Mayo clinic study by Sakorafas *et al.*^[7]

Coeliac Plexuses Lock

Coeliac plexuses block is particularly useful in case of not much dilated pancreatic duct. Adding coeliac plexus neurolysis to the current standard procedure in a single sitting as a part of multimodal approach will provide additional benefit to the patient not only by improving the psychological well-being but also by reducing the opioid intake thereby leading to a better quality of life various studies and RCTs on coeliac plexus block also have shown to improve QOL in both chronic pancreatitis.^[8]

Quality of Life after Surgery in Chronic Pancreatitis

The EORTC-QLQ has now been applied in two prospective and randomized trials comparing surgical techniques in patients with chronic pancreatitis, which stress the

draining or the resectional aspects of treatment to varying degrees.^[8,9] Statistically significant changes in symptoms and functional levels were observed. In both trials, the patients' overall quality of life improved considerably. Relief of symptoms, especially of pain, fatigue, and loss of body weight, accounted for the improvement of physical status, working ability, and emotional and social functioning.^[10]

Post-operative Complications

In our study, one patient who undergone Whipple's surgery for chronic pancreatitis had hepaticojejunostomy leak on POD5. We managed the patient by repeated aspiration of a collection in the peritoneal cavity by ultrasound aid. The leak came down in 5 days. Another patient who has also undergone Whipple's had a pancreatic leak from the pancreaticogastrostomy anastomosis. She was managed by strict NBM and ryles tube aspiration. As the fistula was low output fistula, it resolved in 5 days.

Morbidity and Mortality

Lateral pancreaticojejunostomy is a relatively safe procedure despite its magnitude. The post-operative morbidity rate of 13.3% was within an acceptable range.

Association with Pancreatic Cancer

Preclinical epidemiologic and studies demonstrate that chronic pancreatitis is associated with the development of pancreatic cancer. Maisonneuve and Lowenfels^[11] presented a multicentre historical cohort study of 2015 patients with chronic pancreatitis followed for at least 2 years. The standardized incidence risk ratio for the development of pancreatic cancer was 16.5 and 14.4 at 2- and 5-year follow-up, respectively, for the risk of developing pancreatic cancer. However, in our study, we have excluded the cases with pancreatic malignancy changes.

CONCLUSION

Operative management of CP, when indicated, can be done safely with good results in terms of relief of abdominal pain, weight gain, and quality of life. Significant improvement

in pancreatic exocrine insufficiency and endocrine insufficiency after surgery can be expected. Resectional procedures will have higher early morbidity. Unsuspected and unnoticed malignancy is a common etiology for late deaths. Continued use of alcohol intake is associated with poor pain relief and quality of life. Biomarkers are needed for early identification of CP and assessment of abdominal pain, as well as and robust databases and epidemiological studies to better define chronic pancreatitis and predict its outcomes. At the same time, better means are needed to measure the exocrine pancreatic function in a reliable, non-invasive, and reproducible manner.

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