



ROLE OF VARIOUS SURGICAL INTERVENTIONS IN CHRONIC PANCREATITIS.

General Surgery

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ABSTRACT

BACKGROUND - Chronic pancreatitis is a progressive inflammatory disease characterised by irreversible destruction of pancreatic tissue. An acute attack of pancreatitis is characterised by severe pain in abdomen which in later stages leads to exocrine and endocrine pancreatic insufficiency. Patients with chronic pancreatitis suffer from a decreased quality of life due to chronic abdominal pain and often require hospital admission for alleviating the symptoms. The only indication for surgery in such cases is pain and sometimes pancreatic insufficiency.

METHODS AND MATERIAL - A prospective observational study on role of various surgical interventions in chronic pancreatitis was conducted at Department of General Surgery, Grant Government Medical College, Sir J.J. Group of Hospitals, Mumbai. 64 patients of chronic pancreatitis were enrolled into the prospective observational study and followed up over a period of 15 months.

Results – Out of 64 patients, 32 (50%) were treated conservatively, 15 (23.4%) underwent endoscopy and 17 (26.6%) underwent some surgical intervention. Mean post operative pain score by visual analogue scale in the participants of the surgical intervention group was 4.82 while the endoscopy group was 5.86.

Conclusion - The treatment of pain in Chronic Pancreatitis is a step-up approach i.e., conservative management, endoscopic therapy then surgical intervention. Early surgical intervention, compared to the current step-up approach, may be better in terms of pain control and pancreatic function. Total patients with initial endoscopic or conservative medical treatment undergoing surgical intervention at later stages were found to have better outcome. It was seen that surgery is superior to endoscopy for pain control in patients with chronic pancreatitis. The complication rate and readmission were also less after surgical intervention than endoscopic intervention. Interventional radiological techniques play an important role in patient management for chronic pancreatitis who defer from surgery.

KEYWORDS

Chronic atrophic pancreatitis, Pancreatic insufficiency, Chronic abdominal pain, Surgical intervention, ERCP, Step up approach.

INTRODUCTION

Pancreas was first identified by Herophilus and Chalcedon (300 B.C) who named the organ “pancreas” meaning flesh and meat in Greek.

Chronic Pancreatitis is characterised by a progressive pancreatic inflammation and fibrosis, resulting in failure of exocrine and endocrine function. The causes of chronic pancreatitis are unknown but several factors have been identified to cause chronic pancreatitis like excessive alcohol consumption, autoimmune conditions like SLE, genetic mutations, abnormality and pathology of pancreatic duct or common bile duct and familial history of pancreatitis^[1]

Most individuals with chronic pancreatitis experience upper abdominal pain and discomfort, although some have no pain at all. The pain often radiates to the back, worsens on consumption of food, and is constant and disabling in nature. In some cases, the pain relapses as the condition worsens but that is rarely encountered. Other symptoms include Nausea, Vomiting, loss of weight, diarrhoea, poorly flushed stools.

Our study to describe our preliminary experience with the Role of various surgical interventions in chronic pancreatitis.

Methods of Collection of Data:

A Prospective study was conducted on patients who presented with Chronic Pancreatitis at our centre during the period of September 2018 to December 2019.

REVIEW OF LITERATURE

Chronic pancreatitis is a progressive inflammatory disease in which there is irreversible destruction of pancreatic tissue. Its clinical course is characterised by severe pain and in the later stages it leads to exocrine and endocrine pancreatic insufficiency. This often leads to recurrent hospitalisations, absence from work, multiple interventions and opioid addiction. The most frequent cause of chronic pancreatitis

is alcohol consumption. In addition, a genetic predisposition, use of certain types of medication, anatomic abnormalities, and autoimmunity can play a role. The pathogenesis of pain in chronic pancreatitis is incompletely understood and is likely multifactorial. In patients with an outflow obstruction of the pancreatic duct due to strictures, calculi or both, it is hypothesised that pain arises from increased ductal and parenchymal pressure. The observation that endoscopic or surgical treatment of the pancreatic duct obstruction relieves pain supports this hypothesis.

Interventional Therapy-

Patients with failed medical management will be referred for endoscopic intervention by an experienced endoscopist. The goal of the initial endoscopic intervention will be to drain the pancreatic duct by means of a pancreatic stent made up of polyethylene. Stone removal in the absence of large (diameter ≥ 7 mm) intraductal stones in the pancreatic duct, patients will undergo an ERCP for stone removal^[2]. After sphincterotomy, a complete stone removal will be attempted. If stone removal is incomplete one or more pancreatic stents will be inserted and further stone removal will be attempted at the following ERCP. If large intraductal stones (diameter of ≥ 7 mm) are identified in the pancreatic duct on pre-intervention imaging studies, the patient will first undergo extracorporeal shock-wave lithotripsy (ESWL). After lithotripsy, stone fragments will be removed during the subsequent endoscopic intervention^[3]. This will benefit the patients by relieving obstruction thereby decreasing the pain, although this relief may be temporary.

The role of chronic pancreatitis in treatment of chronic pancreatitis and its complications are as follows-

1) Major and minor papilla sphincterotomy

Endoscopic sphincterotomy is only documented therapy in patient with pain due to mild to moderate changes of the duct and absence of stones and a biliary sphincterotomy is performed along.

2) Common bile duct stricture

Common Bile Duct (CBD) strictures that are due to inflammation or pressure from a pseudocyst are reversible. Biliary drainage prevents development of secondary biliary cirrhosis and is indicated in presence of cholangitis or raised serum alkaline phosphatase persisting >4 weeks. Multiple plastic stents offered better resolution and relief in 90% of patients. Self-expanding metallic stent (SEMS) which are uncovered, partially covered or fully covered have been used in patients with resistant stricture and those unfit for surgery. They can also be used as a bridge to surgery as small length SEMS do not interfere with a subsequent surgical procedure.

3) Pancreatic Calculi

Pancreatic ductal calculi are the end result of CP. Extra-corporeal shock wave lithotripsy (ESWL) has been extensively used for fragmentation for large pancreatic calculi and remains the procedure of choice. ESWL is performed successfully using a 3rd generation electromagnetic lithotripter with bi-dimensional fluoroscopy and ultrasonography targeting facility. Epidural anaesthesia is used in the majority of patients. Recurrence of pain is due to recurrence of stone formation, ongoing pancreatitis or any other mechanism of pain. Stone recurrence rate between 22% - 35% has been reported.^[7,8] The protocol followed by Asian Institute of Gastroenterology for ESWL of large PD calculi are as follows-

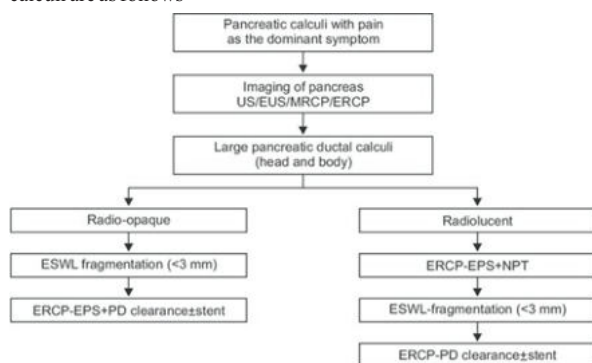


Fig.1-The protocol followed by Asian Institute of Gastroenterology for ESWL of large PD calculi

US, ultrasound; EUS, endoscopic ultrasound; MRCP, magnetic resonance cholangiopancreatography; ERCP, endoscopic retrograde cholangiopancreatography; ESWL, extracorporeal shock wave lithotripsy; EPS, endoscopic pancreatic sphincterotomy; PD, pancreatic duct; NPT, naso-pancreatic tube.

4) Pancreatic Ductal Strictures

Pancreatic strictures are a common consequence of CP and could be due to inflammation or fibrosis. The resultant upstream hypertension is a common cause of pain which causes upstream hypertension. Dilatation followed by stent placement is the ideal therapy for isolated strictures in the head region. Large stents have longer patency and are preferred over small calibre stents^[8,9]. The majority of patients who require re-stenting for pain recurrence after the removal of PD stents do so within one year. Therefore, if a patient remains symptoms free for 1 – 2 years after PD stent removal. Single large bore stents have been placed across the stricture and exchanged every 6 months or when the patients become symptomatic again^[10].

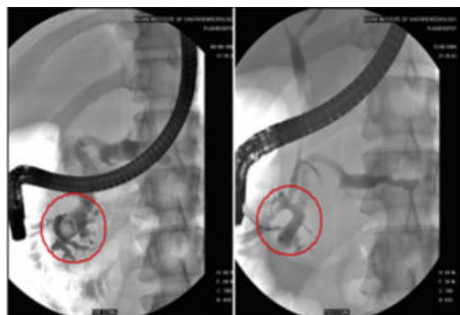


Fig.2-Single Pancreatic Duct (PD) stent with a single large PD calculus in the head area. On the other picture the diameter of PD has decrease.

Extra corporeal shock wave lithotripsy (ESWL)-

Shock wave generation occurs in degassed water, focused by reflection of primary wave using hemispherical disc or an acoustic lens and delivered in the body using water cushion or water basin. Shock waves are focused on the most distally located stone first. A total of 3000-5000 shockwaves are delivered in one session lasting 45-60 minutes^[4].

Indications include recurrent attacks of pancreatic pain, moderate to marked changes in the pancreatic ductal system, larger calculi in PD >5mm and obstructing ductal stones.^[5]

Surgical Treatment-

Several factors including intractable pain, biliary or pancreatic duct obstruction, duodenal obstruction, pseudocyst or pseudoaneurysm formation, inability to rule out malignant disease can lead to surgical intervention.

Surgical intervention is based upon several clinical scenarios. The choice of surgical procedure depends on the symptoms requiring palliation and the presence or absence of pancreatic ductal dilatation.

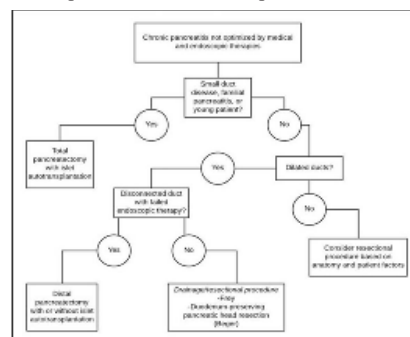


Fig 3: Simple guide to surgical decision making

Patients with dilated pancreatic duct, large duct disease (>7mm) require decompression procedures and non-dilated duct or small duct disease require resection procedure^[6].

Therefore, different types of surgeries are for different types of clinical scenarios have been proposed.

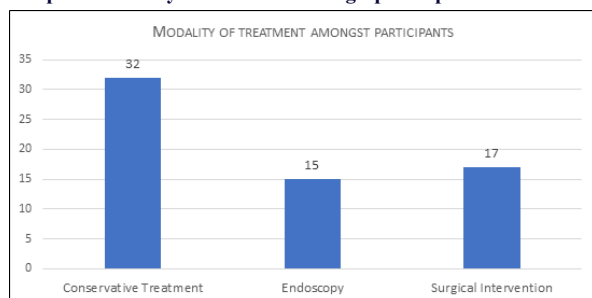
Table.1-Operative Approaches To Chronic Pancreatitis

Procedure	Category	Disease feature (s) of ideal candidate	Technique	Notes
Longitudinal pancreaticojejunostomy	Drainage	Dilation of the main pancreatic duct	Pancreatic duct is opened along the length of the anterior surface of the pancreas, Roux limb of jejunum is anastomosed to the open duct	Modification of the original Puestow procedure that had the additional features of distal pancreatectomy and splenectomy
Duodenum-preserving pancreatic head Resection (DPPHR) (Beger)	Drainage Resection	Disease localized in the pancreatic head, duodenum, and/or common bile duct	Pancreatic neck is transected, and the diseased pancreatic head is resected leaving a cuff of pancreatic	Berne modification to this procedure involves coring out the diseased pancreatic head and draining the main

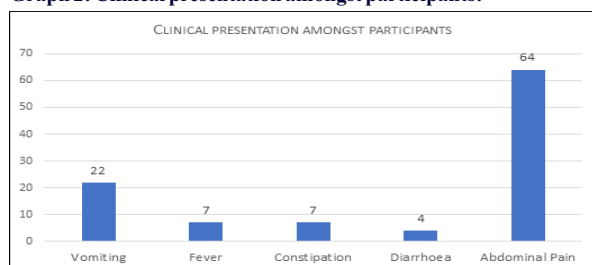
			disease along the duodenum Roux limb of jejunum is than anastomosed as bridge between the pancreatic remnant on the duodenal wall and the distal pancreas	pancreatic duct without pancreatic transection
Frey	Drainage Resection	Main pancreatic duct dilation and disease of the head of the pancreas	Resection of the pancreatic head while leaving residual pancreas on the duodenum Main pancreatic duct is opened and a lateral Pancreatico-jejunojejunostomy is performed	In contrast to the DPPHR the pancreatic neck is not transected Modification s exist involving varied degrees of pancreatic head Resection
Partial Pancreatectomy	Resection	Intraductal papillary mucinous neoplasm, suspected malignancy	Pancreatico-duodenectomy Distal pancreatectomy	Pancreaticoduodenectomy may be performed with or without pylorus preservation
Total Pancreatectomy	Resection	Intractable disease, hereditary pancreatitis, small duct or minimal change pancreatitis		May be performed with or without islet autotransplantation ^a

OBSERVATION AND ANALYSIS

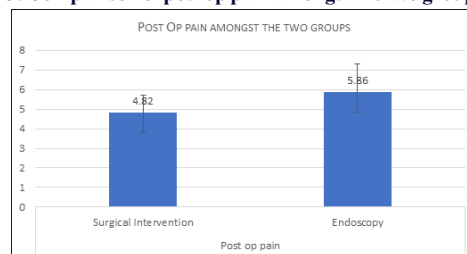
Graph 1: Modality of treatment amongst participants:



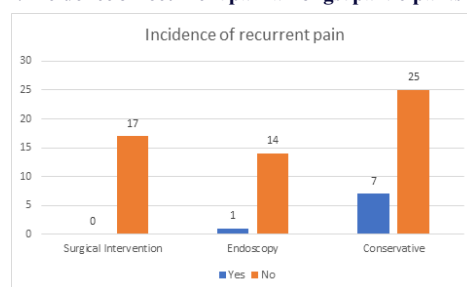
Graph 2: Clinical presentation amongst participants:



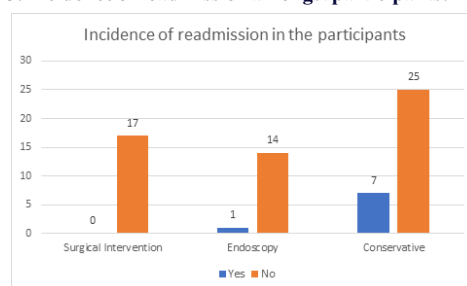
Graph 3: Comparison of post op pain amongst the two groups:



Graph 4: Incidence of recurrent pain amongst participants



Graph 5: Incidence of readmission amongst participants:



The complex, heterogenous nature of the pancreas results in chronic pancreatitis manifesting in a variety of clinical presentations. Pain is the hallmark symptom of chronic pancreatitis, usually epigastric which radiates to the back or to the left upper abdomen, and it is the most common cause of admission.

RESULTS

In our study, 32 (50%) were treated conservatively, 15 (23.4%) underwent endoscopy and 17 (26.6%) underwent some surgical intervention.

Amongst the total of 64 participants, 22 had vomiting, 7 had fever, 7 had constipation, 4 had diarrhoea and all 64 had abdominal pain. Out of the total of 64 participants, it was noted that Mean post operative pain score by visual analogue scale in the participants of the surgical intervention group was 4.82 while the endoscopy group was 5.86.

1 participant in the endoscopy group and 7 participants from the group that had undergone conservative treatment complained of recurrent pain.

Amongst the total of 64 participants, 1 participant in the endoscopy group and 7 participants from the group that had undergone conservative treatment required re admission for unresolved symptoms.

In the recent years increasing evidence tested the step-up approach, and multiple studies suggest the superiority of surgery compared to conservative and endoscopic measures. Surgery can be considered at an earlier phase than it is now, preferably within 3 years of symptomatic Chronic Pancreatitis^[7].

CONCLUSION

The treatment of pain in Chronic Pancreatitis is a step-up approach i.e., conservative management, endoscopic therapy then surgical intervention. Pain is the only indication for surgery and sometimes pancreatic insufficiency can warrant surgical intervention. Strategy of early surgical intervention, compared to the current step-up approach, may be better in terms of pain control and pancreatic function.

With the initial experience with patients who had undertaken conservative treatment previously or underwent endoscopic management but still had persistent pain, surgical management proved helpful in such cases. The complication rate and readmission were also less after surgical intervention than endoscopic intervention.

The coming years will undoubtedly herald a fundamental shift towards earlier and more frequent surgical treatment of chronic pancreatitis. This view is supported by convincing data that conservative and endoscopic treatment produce relatively poor symptom control, with majority of patients inevitably progressing to exocrine and endocrine insufficiency.

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