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Frey's procedure in chronic pancreatitis and its relevance in pain management

[1]Dr. Harish Kumar J N, Junior Resident, Department of General Surgery, ESIC MC And PGIMSR, Bangalore.

[2]Dr. Chandrakant R Kesari, Associate Professor, Department of General Surgery, ESIC MC And PGIMSR, Bangalore.

[3]Dr. Vishak S Rao, Junior Resident, Department of General Surgery, ESIC MC And PGIMSR, Bangalore.

Corresponding Author: Dr. Chandrakant R Kesari, Associate Professor, Department of General Surgery, ESIC MC And PGIMSR, Bangalore.

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Abstract

Background: Patients with chronic pancreatitis suffered from chronic unrelenting and refractory abdominal pain which affects quality of life. Medical management with adequate analgesia and replacement of pancreatic enzyme supplements is the first line in management. The choice of surgical procedure and timing of surgery is a topic of debate. This prospective longitudinal study will explore the short-term outcomes after Frey's procedure.

Method: A total of 33 patients are selected for Frey's procedure after meticulous history taking, performing Haematological investigations, CECT abdomen, MRCP findings and patients with Izbicki pain scoring 40 and above, from march 2020 to February 2023, at ESIC-MC & PGIMSR, Rajajinagar. Pain is assessed with Izbicki score pre and postoperatively with mean duration of 6 months and results were analysed.

Results: The total patients studied in this study were 33, which comprises of 24 (72.72%) males and 9 (27.27%) females. The female to male sex ratio is 2.6:1. In this study, 21 (63.6%) had history of chronic alcohol intake and 28 patients (84.8%) were chronic smokers or tobacco users. More than 90% of 33patients underwent surgery in early stage of the disease (2-3years). After follow-up of 6 months duration, the mean pain score was reduced from 61.454 to 10.0 ($P < 0.001$) with complete pain relief in 90.81% of patients, and a significant reduction number of episodes requiring inpatient admission (from 6 to 0).

Conclusion: Our experience shows Frey's procedure results in complete and significant pain relief especially, if patients underwent surgery in early stages of disease.

Keywords: Pancreatitis; Chronic, Izbicki Pain Score; Frey's Procedure

Introduction

Chronic pancreatitis is defined as chronic inflammation with irreversible fibrosis and atrophy of pancreatic parenchyma and is commonly caused by alcohol consumption.[1] Chronic pancreatitis associated with features of chronic pain, endocrine and exocrine insufficiency which affects between 3 to 10 per lakh persons.[1] Up to 90 % CP patients develop calcifications of the pancreatic duct during long-term follow up.

Unrelenting pancreatic pain is the most dominant and disabling symptom of the disease, and can lead to narcotic addiction, dietary restriction, lifestyle modification, repeated hospital admissions, absence from work and unemployment.[2] Unlike exocrine and endocrine insufficiency, pancreatic pain in patients with chronic pancreatitis is the only clinical variable that can significantly and globally impair all aspects of quality of life.[2]

Hence, pain control should be considered as the main outcome measure in evaluating therapeutic options and should be judged against the potential risks of therapy.[2]

Current evidence suggests that surgery is more effective than endoscopic therapy in terms of more rapid, effective and sustained pain relief.[1]

The enlarged inflammatory pancreatic head is considered to be the 'pacemaker' of disease and its resection is deemed necessary to relieve pain. Until recently, pancreatic duo denectomy has been the preferred resectional procedure in patients with 'head-dominant' disease.[1,2]

Frey's is suitable procedure to treat unremitting abdominal pain of chronic calcific pancreatitis.[1,2] The anterior surface of pancreatic duct is opened and unroofed completely after all stones are extracted and head coring was done and a standard Roux-en-Y is used to create a lateral pancreaticojejunostomy.[1] The Frey's procedure provides palliation of pain in 90% of cases.[3]

The main objective of this study was to evaluate the outcome of pain relief after Frey's procedure for patients with CP at ESIC-MC & PGIMSR, Rajajinagar.

Methods

Study conducted between March 2020-Febraury 2023, total 33 patients {24 (72.72 %) was males & rest 9 (27.27 %)} with chronic pancreatitis were selected for surgery.

Aims of the study is to assess the pain in chronic calcific pancreatitis in pre and post Frey's procedure by using Izbicki pain scoring.

Patients with chronic calcific pancreatitis is diagnosed after meticulous history taking, performing Haema to logical investigations, CECT abdomen and MRCP findings. Morphological changes of pancreas imaging studies MPD > 6mm duct diameter is considered as dilated duct, anteroposterior diameter greater than 35 mm and patients with multiple intraductal calculi especially in proximal part of pancreas and patients with Izbicki pain scoring 40 and above were selected for the Frey's procedure.

Inclusion criteria

Patients aged between 18-60 years, with chronic calcific pancreatitis with Izbicki pain score 40 and above, and who were willing to give informed consent were in clouded in our study.

Exclusion criteria

Patients with unfit for surgery and suspected malignancy.

During preoperative evaluation all patients routinely screened for exocrine and endocrine insufficiency which include FBS/PPBS/HBA1C, routine stool examination for fat and faecal elastase. Alcohol aetiology constitutes

about 63.6% and smoking history in 84.84%, in rest of the patient's cause is undetermined (15.15%).

The main indication for surgery is severe chronic abdominal pain which is refractory for NSAIDS and partially relieved with opiate analgesics. Plan of surgery may vary depending on pancreatic mor phology and suspected pancreatic malignancy. Until recently, Lateral Pancreatico-jejunostomy is procedure of choice in dilated MPD without any inflammatory mass in head of the pancreas. Frey's procedure is preferred surgery in dilated/ undilated MPD with multiple intraductal calculi without inflammatory mass in head/suspected malignancy.

Surgery was performed as per standard steps in MA ingots, Frey's procedure consisted of a complete Kocher Manoeuvre which helps us to control over pancreatic head in case unexpected vessel injury, complete to exposure of the head of the pancreas, identification of superior mesenteric vessels and longitudinal ductotomy of the pancreatic duct done with complete retrieving of all calculi, head coring performed in slices down to the level of the duct of Wirsung, which limit the dorsal of resection, avoids the injury to mesenteric vessels and posterior pancreatic capsule.[5] The cored-out tissue routinely sent for histopathological examination.

Pancreatojejunostomy was performed in a single layer using continuous non-absorbable sutures (PDS 3-0). Silicone tube (ADK size-32) drain was placed routinely in the subhepatic region and lesser sac near anastomotic site. The drain output monitored every-day and POD3 fluid sent to test for amylase /lipase levels. The drain was removed if output was below 20 ml/day and the drainage fluid had low amylase content.

Epidural analgesia is achieved by using Bupivacaine 0.12% or fentanyl or tramadol, was employed routinely for perioperative pain management and epidural catheter is removed usually on day 3 and clear liquids allowed on day 2, semisolid diet on day 4 depending on tolerance.

All patients postoperatively received antibiotic pro phylaxis comprising 3rd generation cephalosporins or equivalent drugs continued for 5 days. DVT prophylaxis was considered only in patient to be at high risk for thromboembolism. Postoperatively glycaemic control achieved with injection regular insulin in diabetic patients.

The severity of pain is evaluated using the Izbicki pain score, administered as a questionnaire day prior to surgery and postoperatively each month end till 6 months. The score is based on average rank values of four parameters: frequency of pain attacks, visual analogue score, analgesic medication uses and disease-related inability to work. The total score ranges from 0 to 100.

Statistical analysis

Data was entered in MS Excel, coded and analyzed in statistical software SPSS 20. Data analysis included both Descriptive and Inferential statistics procedures.

Descriptive statistics were used to summarize quantitative variables with mean and standard deviation, while frequency and percentages were used to summarize categorical (qualitative) variables. Inferential statistics included tests of significance and P values. Significance of Mean difference of pre-operative and postoperative pain scores within group were tested by Paired simple t test. Paired t test was also used for assessing significance of difference in mean pain scores at the end of each month till 6 months. A P-value < 0.05 was considered statistically significant.

Results

Total 33 patients {24 (72.72 %) was males & rest 9 (27. 27 %)} with chronic pancreatitis meeting our inclusion criteria were taken up for the Frey's procedure. Alcohol aetiology constitutes about 63.6% and smoking history in 84.84%, in rest of the patient's cause is undetermined (15.15%).

All patients presented with chronical epigastric pain which is radiating to back and with endocrine in sufficiency in 15 (45.50%) patients had diabetes mellitus & 18 (55.50%) patients were nondiabetic and were regularly using opiates for pain relief and pancreatic enzyme supplementation & jaundice was not observed in any patients.

The average interval from onset of symptoms of pancreatitis to surgery was 2(2-3) years. Mean serum amylase & lipase levels were 73.26 & 164.29 respectively. On either of the available imaging modalities out of CECT or MRCP, we found the average main pancreatic duct diameter was 1.32 cm with smallest pancreatic duct diameter was 0.6 cm & largest was 2.0 cm in our study. Only one patient underwent ERCP with PD stenting prior to surgery.

The most common & serious complication reported in our study was haemorrhage & postoperative pleural effusion, each accounting for 37.5% and 25% of all the major complications.

11 patients suffered from minor complication like, 5 patients had developed surgical site infections & 1 patient developed wound gape, but 1 patient developed stitch abscess. Patient suffered from SSI which was initially managed by daily dressings followed by secondary suturing at a later date.

Complications	No	Management & outcome
Haemorrhage	3	Conservative management, recovered
Pleural Effusion +Tapping	2	Conservative management, recovered
Dyselectrolytemia	2	Conservative management, recovered
Stitch abscess	1	I&D, recovered
Surgical site infection	4	Conservative management, recovered
Wound gape	1	Secondary suturing, recovered

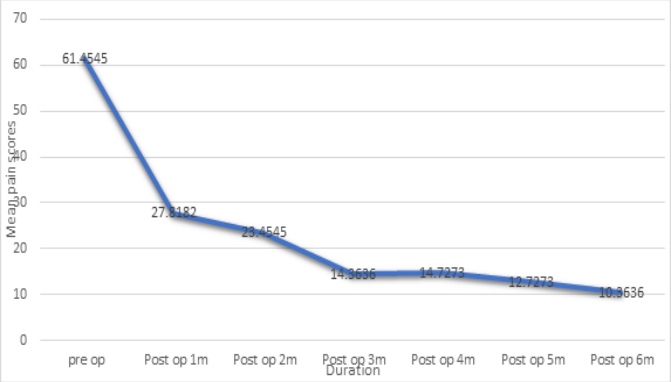
In our study, drain removal was found to be done on mean postoperative day 5-6. However, the oral intake was resumed on mean postoperative day 3 at our centre. Out of 15 patients with diabetes mellitus at presentation 6 people were on insulin for glycaemic control, during follow-up 4 patient step down to OHA and one patient continued on insulin therapy at reduced dose.

All 33 patients had required pancreatic supplementations prior to surgery and postoperatively only 4 patients needs supplementation.

Pain relief

Pain assessment was done on the day prior to surgery and end of each month till the end of 6 months of follow up. On admission the mean pain score was 61.45 out of 100 which postoperatively after 6 months dropped to 10.3636 revealing significant pain relief offered by the surgical intervention.

Graph 1:



All 33 patients had required analgesics prior to surgery and postoperatively only 3 patients required analgesics supplementation.

Discussion

Its been a wonder to know pathophysiology of pain in chronic pancreatitis, there are two main theories which holds good for pain, First: WIRING" problems includes Peripheral sensitization, Pancreatic neuroplasticity & Central sensitization.

Secondly: "PLUMBING THEORY" includes ductal hypertension, Pancreatic parenchymal hypertension & inflamed enlarged pancreatic head.[6] We have two main surgical options for chronic pancreatitis, ductal drainage with decompression and resectional procedures. Based on studies conducted, reports on success of pain relief, current study has shown that Frey's procedure led to significant pain

relief in 90. per cent of patients and zero mortality over a mean follow-up of 6 months.

It is probable that preoperative requirement for opiate medication and continuation of alcohol consumption post operatively responds poorly to surgery.

However, the proper counselling on alcohol abstinence and smoking and with strict in follow-up postoperative period helps patients benefited from surgery in the form of a significant reduction in pain score and episodes of recurrent exacerbation of pain requiring hospital admission.

Although the character and severity of pain in chronic pancreatitis is highly variable, it is generally believed that a continuous pattern of pain implies advanced disease and the onset of complications.[16]

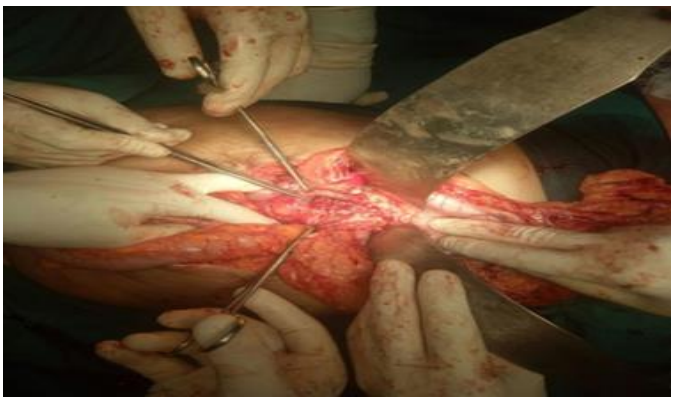


Figure 1: a) Head coring.

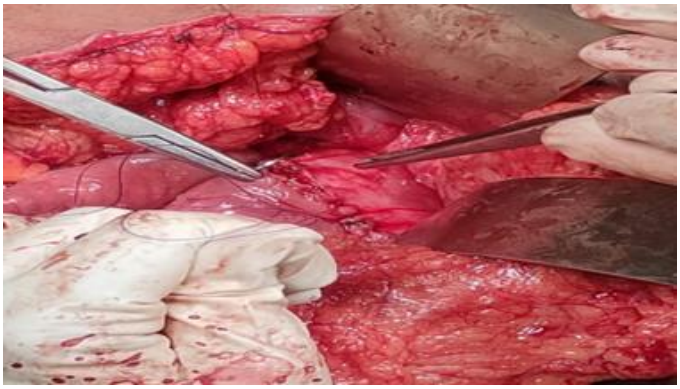


Figure 1: b) Pancreatico-jejunostomy anterior layer.

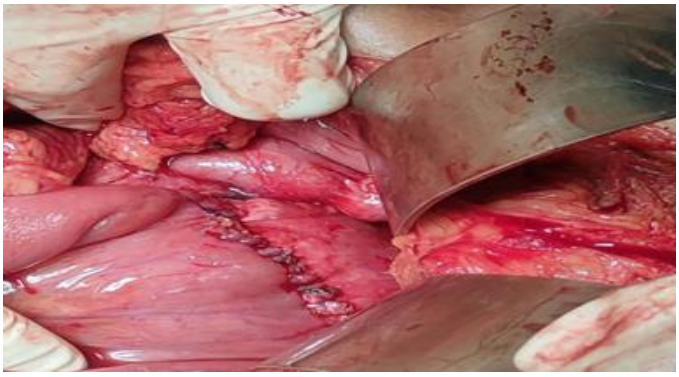


Figure 1: (c) Completed Pancreatico-jejunostomy.

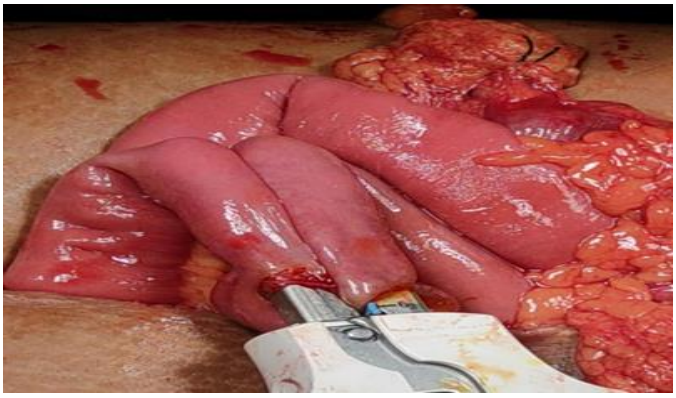


Figure 1: (d) Stapled jejuno-jejunostomy.

Although the definition of dilated pancreatic duct is variable, the reported prevalence of patients with an undilated pancreatic duct in surgical series ranges from 21 to 89 per cent.[11,12-15] In present study 7 patients had an undilated pancreatic duct (smaller than 7 mm) but this had no influence on the degree of pain relief after surgery. Until recently, pancreaticoduodenectomy has been the preferred resectional procedure in patients with 'head-dominant' disease and LPJ in dilated MPD with CP. But successive rates of these in pain relief is 50% and 70% respectively. There are only few studies were done on efficacy of Frey's procedure shows pain relief is 75-90% in CP. In this study, pain relief after Frey's procedure was independent of the aetiology of chronic pancreatitis. Its controversial that whether alcohol abstinence is affects pain control or survival in CP. New-onset diabetes develops in 5–11 per cent of patients after LR-LPJ, comparable with results after LPJ.[17-22] But in this study shows no new onset of diabetes after surgery. Frey's procedure leads to significant pain relief in patients with chronic pancreatitis.

Limitation of the study

However prolonged follow-up is required to know the effectiveness of the Frey's procedure for long term pain relief.

Conclusion

Frey's procedure is an effective surgical procedure that helps in significant pain relief in patients with chronic calcific pancreatitis.

References

1. Vikas Dudeja, John D. Christein, Eric H. Selwyn M. Vickers. Exocrine pancreas. In: Courtney M. Town send, B Mark Evers, Daniel beau champ, Kenneth L. Mattox. (Eds). Sabiston textbook of surgery. 21st ed. Phila delphia: John F. Kennedy;2016. p1531-36.

2. S Negi, A Singh, A. Choudhary. Pain relief after Frey's procedure for chronic pancreatitis: Br J Surg 2010 ;1087-95.

3. Sah DN, Bhandari RS, Singh YP, Vaidya P, Kansakar PB, Ghimire B, et al. Early outcome of Frey's procedure for chronic pancreatitis: Nepalese tertiary center experience. BMC surgery. 2019;19(1):1-8.

4. Gestic MA, Callejas-Neto F, Chaim EA, Utrini MP, Cazzo E, Pareja JC, et al. Surgical treatment of chronic pancreatitis using Frey's procedure: a Brazilian 16-year single-centre experience. 2011;13(4):263-71.

5. Anderson MA, Akshintala V, Albers KM, Amann ST, Belfer I, Brand R, et al. Mechanism, assessment and management of pain in chronic pancreatitis: Recom mendations of a multidisciplinary study group. Pancrea tology. 2016;16(1):83-94.

6. Rath S, Meher S, Basu A, Priyadarshini S, Rout B, Sharma R. Quality of Life after Frey's Procedure in Patients with Chronic Pancreatitis. Journal of clinical and diagnostic research: JCDR. 2016;10(3):10-4.

7. Fragulidis GP, Vezakis A, Dellaportas D, Sotirova I, Koutoulidis V, Kontis E, et al. Puestow modified procedure in the era of advanced endoscopic inter ventions for the management of chronic lithia sic

pancreatitis. A two cases report. International journal of surgery case reports. 2015; 15:85-8.

8. Ke N, Jia D, Huang W, Nunes QM, Windsor JA, Liu X, et al. Earlier surgery improves outcomes from painful chronic pancreatitis. Medicine. 2018;97(19).

9. Zhou Y, Shi B, Wu L, Wu X, Li Y. Frey procedure for chronic pancreatitis: evidence-based assessment of short-and long-term results in comparison to pan crea to duo denectomy and Beger procedure: a meta-analysis. Pancreatology. 2015;15(4):372-9.

10. Riediger H, Adam U, Fischer E, Keck T, Pfeffer F, Hopt UT et al. Long-term outcome after resection for chronic pancreatitis in 224 patients. J Gastrointest Surg 2007; 11: 949–959.

11. Schnelldorfer T, Lewin DN, Adams DB. Operative management of chronic pancreatitis: long-term results in 372 patients. J Am Coll Surg 2007; 204: 1039–1045.

12. Nealon WH, Thompson JC. Progressive loss of pancreatic function in chronic pancreatitis is delayed by main pancreatic duct decompression. A longitudinal prospective analysis of the modified Puestow procedure. Ann Surg 1993; **217**: 458–466.

13. Delcore R, Rodriguez FJ, Thomas JH, Forster J, Hermreck AS. The role of pancrea to jejunostomy in patients without dilated pancreatic ducts. Am J Surg 1994; 168: 598–601.

14. Massucco P, Calgaro M, Bertolino F, Bima C, Galatola G, Capussotti L. Outcome of surgical treatment for chronic calcifying pancreatitis. Pancreas 2001; 22: 378–382.

15. Ramesh H, Jacob G, Lekha V, Venugopal A. Ductal drainage with head coring in chronic pancreatitis with small-duct disease. J Hepatobiliary Pancreat Surg 2003; 10: 366–372.

16. Andr´en-Sandberg A, Hoem D, Gislason H. Pain management in chronic pancreatitis. Eur J Gastroenterol Hepatol 2002; 14: 957–970.

17. Rios GA, Adams DB, Yeoh KG, Tarn sky PR, Cunningham JT, Hawes RH. Outcome of lateral pan creatico jejunos to my in the management of chronic pan creatitis with nondilated pancreatic ducts. J Gastrointest Surg 1998; 2: 223–229.

18. Frey CF, Mayer KL. Comparison of local resection of the head of the pancreas combined with longitudinal pan creatico jejunos to my (Frey procedure) and duo denum-preserving resection of the pancreatic head (Beger procedure). World J Surg 2003; 27: 1217–1230.

19. Scuro LA, Vantini I, Piubello W, Micciolo R, Talamini G, Benini L et al. Evolution of pain in chronic relapsing pancreatitis: a study of operated and nonoperatic patients. Am J Gastroenterol 1983; 78: 495–501.

20. Leger L, Lenriot JP, Lemaigre G. Five-to-twenty-year follow-up after surgery for chronic pancreatitis in 148 patients. Ann Surg 1974; 180: 185–191.

21. Strate T, Bachmann K, Busch P, Mann O, Schneider C, Bruhn JP et al. Resection vs drainage in treatment of chronic pancreatitis: long-term results of a randomized trial Gastroenterology 2008; 134: 1406–1411.

22. Izbicki JR, Bloechle C, Broering DC, Knoefel WT, Kuechler T, Broelsch CE. Extended drainage versus resection in surgery for chronic pancreatitis: a prospective randomized trial comparing the longitudinal pancreatico jejunos to my combined with local pancreatic head excision with the pylorus-preserving pan crea to duodenec to my. Ann Surg 1998; 228: 771–779.