Original Article

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Clinical Outcomes of Modified Lateral Pancreatojejunostomy in Chronic Calcific Pancreatitis: A Prospective Study of 50 cases

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ABSTRACT

Background: Chronic calcific pancreatitis is a progressive pancreatic disorder characterized by ductal obstruction, intraductal calculi and chronic abdominal pain. Surgical decompression remains the standard treatment for patients with dilated pancreatic ducts and persistent symptoms. The aim of the study is to evaluate the clinical outcomes, including pain relief, pancreatic function and complications, following modified lateral pancreatojejunostomy in patients with chronic calcific pancreatitis.

Materials and methods: This prospective observational study included 50 patients with chronic calcific pancreatitis and dilated main pancreatic duct (≥6 mm) who underwent modified lateral pancreatojejunostomy. Patients were evaluated for pain relief, endocrine and exocrine function, and postoperative complications over a six-month follow-up period. Continuous variables were expressed as mean ± SD or median and categorical variables as percentages.

Results: The mean age was 36 ± 8 years (Range 29–66) with 43 males (86%) and 7 females (14%). Preoperatively, abdominal pain was the predominant symptom, present in 100% of patients, followed by steatorrhea in 60% and jaundice in 4%. Postoperatively, there was a marked reduction in symptoms, with pain persisting in only 8.3% of patients. Jaundice resolved in all affected cases, as evidenced by normalization of liver function tests. A significant proportion (62%) had impaired glucose tolerance preoperatively. No improvement of glucose tolerance was noted in post-operative period, remain unchanged in 36 patients (75%) and get worsen in 12 patients (25%) at the time of follow-up. Overall, there was a notable improvement in digestive function following the procedure with significant increase in weight gain. Post-operative complications were minimal and 4% mortality was reported during the hospital stay.

Conclusion: Modified lateral pancreatojejunostomy is an effective and safe surgical procedure for chronic calcific pancreatitis with ductal dilatation, providing significant pain relief and improved pancreatic function.

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KEY WORDS

Chronic calcific pancreatitis; Lateral pancreatojejunostomy; Puestow-Gillesby procedure; Pain relief; Pancreatic function.

INTRODUCTION

Chronic Calcific Pancreatitis (CCP) is a progressive inflammatory disease of the pancreas characterized by fibrosis, intraductal calculi and pancreatic ductal dilatation. Patients commonly present with intractable abdominal pain, malabsorption and endocrine dysfunction.[1] Surgical decompression of the pancreatic duct is indicated when conservative therapy fails to control pain.[2]

The lateral pancreatojejunostomy (Puestow-Gillesby procedure) has long been the standard procedure for

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patients with a dilated pancreatic duct, aiming to relieve ductal hypertension and preserve pancreatic tissue.[3] Partington-Rochelle procedure, a modification of Puestowprocedure that includes the limited coring of the pancreatic head with side-to-side anastomosis with a Roux-en-Y limb, have been reported to improve outcomes and reduce complications.[4,5]

Despite decades of use, there is limited prospective data evaluating the clinical outcomes of the modified Puestow procedure in chronic calcific pancreatitis, particularly in South Asian populations where the disease burden is high.[6] This study aims to prospectively assess the postoperative outcomes of modified lateral pancreatojejunostomy in patients with chronic calcific pancreatitis, focusing on pain relief, pancreatic function, and perioperative safety.

MATERIALS AND METHODS

This prospective observational study was conducted on 50 consecutive patients diagnosed with chronic calcific pancreatitis at Bangladesh Medical College Hospital, between August 2015 to September 2016 Patients were followed for six months postoperatively. Ethical approval was obtained from the Institutional Review Board and informed written consent was taken from all participant.

Inclusion criteria

- Persistent abdominal pain unresponsive to medical management
- Presence of pancreatic ductal calculi on imaging
- Main pancreatic duct dilatation ≥6 mm

Exclusion criteria

- Suspected or confirmed pancreatic malignancy
- Small duct disease (<6 mm)
- Prior pancreatic surgery
- Severe comorbid illness precluding surgery
- Patients lost to follow-up.

Patients underwent clinical evaluation, biochemical testing (Including liver function tests and glucose levels), and imaging studies (Ultrasound, MRCP and contrast-enhanced CT scan) to assess ductal dilatation and stone burden. ERCP was performed in diagnostic and therapeutic purpose in patients having jaundice.

All patients underwent a modified lateral pancreatojejunostomy (Partington-Rochelle modification of Puestow procedure) under general anesthesia.

- Abdomen was accessed through upper midline incision.
- Longitudinal opening of the main pancreatic duct along its length including limited coring of the pancreatic head
- Complete clearance of intraductal calculi
- Side-to-side anastomosis of the pancreatic duct with a Roux-en-Y jejunal limb
- Ensured adequate decompression of the pancreatic duct.

Patient was kept nothing per-oral and Pethidine 1mg/kg body weight 12 hourly and SOS, Tramadol HCL 100mg in suppository form for 7 days as per requirement of the patients for pain kill. Oral feeding was resumed when ileus subsided. Intravenous antibiotics and Proton pump inhibitors were continued until the patient could take orally. Patients were discharged when they were ambulatory and able to tolerate an oral diet.

Primary outcome:

- Pain relief postoperatively

Secondary outcomes:

- Endocrine function (Glucose tolerance/diabetes status)
- Exocrine function (Steatorrhea, enzyme replacement requirement)
- Postoperative complications like wound infection, prolonged ileus, pulmonary atelectasis, intra-abdominal abscess, anastomotic leakage,
- Length of hospital stay
- Mortality

Data were expressed as mean ± SD or median for continuous variables and percentages for categorical variables. All analyses were performed using [Statistical software, e.g. SPSS version XX].

RESULTS

Table I Patient Demographics

Variable	Value
Total patients	50
Mean age	36±8 years
Age range	29-66 years
Male	43 (86%)
Female	7 (14%)

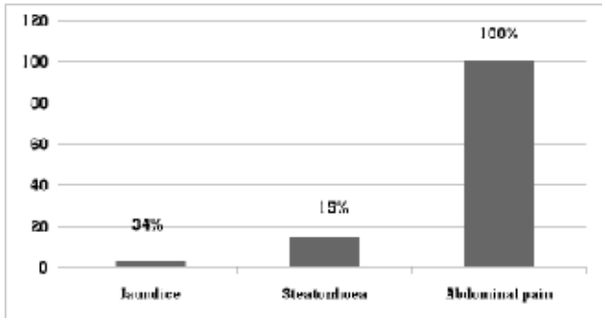

Figure 1 Distribution of Jaundice, Steatorrhoea and Abdominal pain in study population

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Table II Distribution of the Patients by Duration of symptoms

Duration of symptoms (In months)	Number (%)	Percentage
<6	5	10
6-12	7	14
12-18	14	28
18-24	24	48
Total	50	100
Mean ± SD	13.56±6.31	

Result are presented as Number and Percentage.

Table II shows that in 48% of the patients (24 Patients out of 50), duration of symptoms were within 18-24 months. 28% of the patients (14 patients out of 50) were in 12-18 months group. 14% of the patients (7patients out of 50) were in 6-12 months group and 10% of the patients (5 patients out of 50) were in less than 6 months group. Mean±SD duration of the symptoms was 13.56±6.31 months.

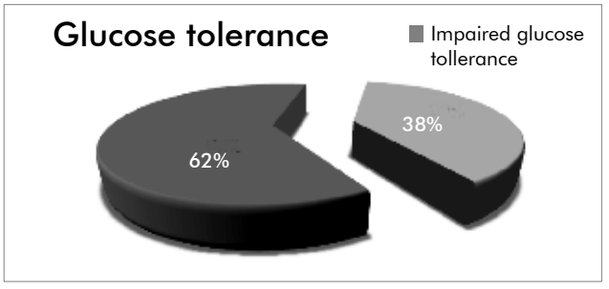

Figure II Distribution of the Patients by Glucose Tolerance

Figure 2 Shows that, 62% cases (31 patients out of 50) shows Impaired Glucose Tolerance. 38% cases (19 patients out of 50) shows normal blood glucose level.

Table III Post-operative events / Clinical characteristics (Also See my previous publications)

Parameters	Numbers
Minor wound infection, wound dehiscence	5(10%)
Drain site erythema / infection	2 (4%)
Pancreatic fistula	0
Chronic wound infection/discharging sinus formation	0 (0%)
Bleeding from anastomotic site	1 (2%)
Intra-abdominal abscess	0
Paralytic ileus	3 (6%)
Left ventricular failure	1 (2%)
Pneumonia	1 (2%)
Hospital readmission	0 (%)
Revision surgery	0 (0%)
Hospital stays in days (mean ± SD, range)	10.5 ± 2.3 (6-15)
Mortality	2 (4%)

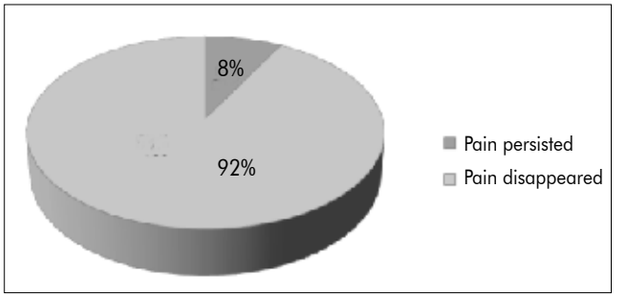

Figure 3 Effect of Abdominal Pain after Operation

Figure 3 Revealed that 91.67% (44 patients out of 48) were found abdominal pain free during follow-up time. 8.33% (4 patients out of 48) found persisting abdominal pain after operation. All patients (48 survivors) were followed up after 6 months of the operation.

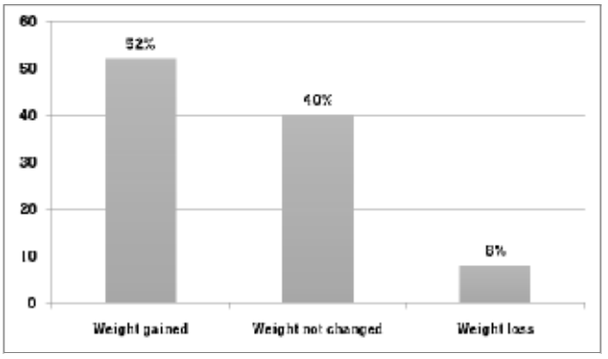

Figure 4 Post-operative Changes in Body Weight

Figure 4 Shows changes in body weights after operation. The follow-up was made in 48 survivors after 6 months of the operation. Gain of more than the pre-operative body weight at the time of follow-up was obtained in 52.08% (25 patient out of 48). Loss of more than pre-operative body weight was noted in 8.33% of the patient (4 patients out of 48). 39.58% of the patients (19 patients out of 48 survivors) remained unchanged.

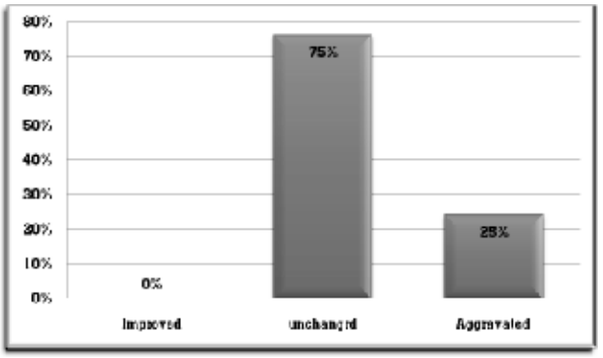

Figure 5 Post-operative Change of Glucose Tolerance

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Figure 5 Shows Oral glucose tolerance test, which was performed in 50 patients before the operation and in 48 patients after operation. It shows there is no improvement of glucose tolerance, unchanged result in 36 patients (75%) and worse result in 12 patients (25%) at the time of follow-up. All patients were followed up six months after operation.

DISCUSSION

Chronic Calcific Pancreatitis (CCP) is a progressive disease characterized by fibrosis, ductal obstruction due to intraductal calculi, and eventual endocrine and exocrine pancreatic dysfunction.[1] Patients often present with intractable abdominal pain, malabsorption, and impaired quality of life. Surgical decompression, particularly lateral pancreatojejunostomy (Modified Puestow procedure), remains the mainstay treatment for patients with a dilated main pancreatic duct who fail medical management.[2,3]

In our study, all patients experienced preoperative abdominal pain and postoperative follow-up demonstrated a significant reduction in pain in 91.7% of patients. This finding aligns with previous literature, which reports pain relief rates ranging from 80% to 95% following ductal decompression via Puestow or modified Puestow procedures.[3-5] Pain relief after surgery is primarily attributed to decompression of the dilated pancreatic duct, removal of obstructing calculi, and reduction of intraductal pressure, which alleviates neuropathic and inflammatory stimulation of pancreatic nerves.[6] Our results reinforce that surgical intervention provides superior and sustained pain control compared with conservative therapy in patients with ductal obstruction.[1,2]

Preoperatively, 62% of our patients had impaired glucose tolerance, and 60% had steatorrhea, reflecting partial endocrine and exocrine insufficiency. Postoperatively, a majority demonstrated improvement in exocrine function, while only a small proportion developed new-onset diabetes. These outcomes are consistent with studies suggesting that early surgical decompression preserves pancreatic parenchyma and function, thereby reducing the progression to overt diabetes or severe malabsorption.[4,7] Izbicki et al. reported that longitudinal pancreatojejunostomy resulted in preserved pancreatic function in most patients over a long-term follow-up.[4] Similarly, Tandan and Reddy observed improvement in exocrine and endocrine parameters following surgical decompression in Indian patients[7] Our findings indicate that even a modified approach provides comparable functional outcomes.

Our study demonstrated minimal perioperative morbidity and low mortality. Complications such as wound infection, pancreatic fistula, or intra-abdominal abscess were rare, supporting the safety of the modified lateral pancreatojejunostomy. These results are comparable to published data, where complication rates for Puestow-type procedures range between 10–20% in most series, with low mortality.[3,5] The modification used in our cohort, which emphasizes limited head coring and side-to-side Roux-en-Y anastomosis, may contribute to reduced complications while maintaining efficacy.

Alternative surgical techniques for CCP include Frey's procedure, Beger procedure and partial pancreatectomy. Frey's procedure, which combines local resection of the pancreatic head with longitudinal ductal drainage, is often preferred in patients with small-duct disease or dominant head pathology.[8] However, in patients with a uniformly dilated duct and calculi distributed along the main pancreatic duct, the modified Puestow procedure remains a simpler, effective, and organ-preserving option.[9,10] Our study supports the continued relevance of this technique in appropriately selected patients.

The present study highlights the value of prospective evaluation of surgical outcomes in chronic calcific pancreatitis. Pain relief and functional improvement not only enhance quality of life but also reduce long-term healthcare utilization. Our results emphasize the importance of careful patient selection, including the presence of ductal calculi and ductal dilatation ≥6 mm, to optimize outcomes.

LIMITATIONS

This study has several limitations. First, it is a single-center study with a relatively small sample size (n=50). Second, the follow-up period of six months may not capture long-term recurrence of pain or delayed complications. Third, quality-of-life assessments were not formally measured, which could provide additional insight into patient-reported outcomes. Despite these limitations, the study provides valuable prospective data supporting the efficacy and safety of modified lateral pancreatojejunostomy in a South Asian cohort.

CONCLUSION

Modified lateral pancreatojejunostomy is an effective and safe surgical option for patients with chronic calcific pancreatitis and a dilated pancreatic duct. The procedure provides significant pain relief, preserves pancreatic function and is associated with minimal complications. Early surgical intervention in appropriately selected patients can substantially improve clinical outcomes and quality of life.

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DISCLOSURE

All of the authors declared no competing interests.

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