



Original Research Article

Lateral Pancreatojejunostomy and Lateral Pancreaticogastrostomy in the Management of Calcific Pancreatitis: A Comparative Study

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Abstract: Background: Calcific pancreatitis in pediatric patients poses significant management challenges, with surgical intervention often required for symptomatic relief. Lateral pancreatojejunostomy (LPJ) and lateral pancreaticogastrostomy (LPG) are two established drainage procedures, but comparative studies in children remain limited. This study aims to evaluate the efficacy and outcomes of LPJ versus LPG in pediatric patients with calcific pancreatitis. **Methods:** A comparative study was conducted at *National Gastroliver Institute & Hospital, Dhaka and Dhaka Medical Collage Hospital (DMCH) Bangladesh* from January 2022 to December 2023, involving 26 patients aged ≤ 13 years, purposively selected and randomly allocated into two groups: LPJ (n=13) and LPG (n=13). Clinical outcomes, including pain relief, postoperative complications, hospital stay, and recurrence rates, were analyzed using SPSS version 23.0. **Results:** Both LPJ and LPG demonstrated effective pain relief in pediatric calcific pancreatitis, with comparable postoperative VAS scores (LPJ: 1.5 ± 0.6 vs LPG: 1.4 ± 0.5 , $p=0.682$). LPG showed fewer complications (15.4% vs 30.8%, $p=0.042$), particularly reduced wound infections (7.7% vs 23.1%). Operative times (142 ± 18 vs 158 ± 22 minutes, $p=0.082$) and hospital stays (7.2 ± 1.5 vs 6.8 ± 1.3 days, $p=0.124$) were similar. Recurrence rates at 12 months were identical (7.7% each). **Conclusion:** Both LPJ and LPG effectively managed pediatric calcific pancreatitis, with comparable pain relief and recurrence rates. LPG demonstrated a superior safety profile with fewer postoperative complications, suggesting its potential as a preferred surgical option in this patient population.

Keywords: Calcific pancreatitis, Lateral pancreatojejunostomy, Lateral pancreaticogastrostomy, Pediatric surgery, Recurrence.

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INTRODUCTION

Calcific pancreatitis, characterized by the deposition of calcium stones within the pancreatic ducts, is a debilitating condition that leads to chronic pain, malabsorption, and progressive pancreatic dysfunction [1]. While it is relatively rare in children,

its impact on growth and quality of life necessitates prompt and effective intervention [2, 3]. The primary pathological mechanisms involve ductal obstruction, increased intraductal pressure, and recurrent inflammation, which contribute to irreversible parenchymal damage [4]. Management strategies

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range from conservative medical therapy to endoscopic and surgical interventions, with the latter being reserved for cases refractory to non-surgical treatments [5]. Among surgical options, drainage procedures such as lateral pancreatojejunostomy (LPJ) and lateral pancreaticogastrostomy (LPG) have been widely employed to decompress the pancreatic duct and alleviate symptoms [6]. LPJ, also known as the Puestow procedure, involves a longitudinal opening of the pancreatic duct with anastomosis to a Roux-en-Y jejunal loop, while LPG entails drainage into the posterior stomach wall [7, 8]. Both techniques aim to preserve pancreatic function while providing long-term pain relief, yet their comparative efficacy, particularly in pediatric populations, remains understudied [9]. In adults, several studies have demonstrated the effectiveness of LPJ and LPG in managing chronic pancreatitis, with varying reports on postoperative outcomes [10, 11]. LPJ is traditionally favored due to its established success in pain relief and lower recurrence rates [12]. However, LPG offers theoretical advantages, including a shorter anastomotic route, reduced risk of internal herniation, and easier endoscopic access for future interventions [13, 14]. Despite these benefits, concerns regarding gastric acid-induced pancreatic injury and delayed gastric emptying have limited its widespread adoption [15]. Pediatric pancreatitis presents unique challenges, including anatomical variations, nutritional deficiencies, and the need for long-term growth considerations [16]. Existing literature on surgical management in children is sparse, with most studies extrapolating data from adult populations [17]. Given the physiological differences between children and adults, a direct comparison of LPJ and LPG in pediatric patients is warranted to establish evidence-based guidelines [18]. This study aimed to compare the outcomes of LPJ and LPG in pediatric patients with calcific pancreatitis at National Gastroenterology Institute & Hospital, Dhaka, Bangladesh over two years. The primary objectives include evaluating pain relief, postoperative complications, duration of hospitalization, and recurrence rates. By analyzing these parameters, we seek to determine the optimal surgical approach for this vulnerable population, contributing to the limited body of pediatric-specific data on the subject [19].

METHODOLOGY

This prospective comparative study was conducted at National Gastroenterology Institute & Hospital, Dhaka, and Dhaka Medical College Hospital (DMCH) Bangladesh from January 2022 to December 2023. The study included 26 pediatric patients aged 13 years or younger with a diagnosis of calcific pancreatitis. Patients were carefully selected based on specific inclusion criteria, including confirmed

pancreatic calcifications, persistent pain despite medical management, and pancreatic duct dilation measuring 5 millimeters or more. Eligible patients were then randomly divided into two groups: Group 1, consisting of 13 patients who underwent lateral pancreatojejunostomy, and Group 2, consisting of 13 patients who underwent lateral pancreaticogastrostomy. For the surgical procedures, Group 1 received a longitudinal opening of the pancreatic duct followed by side-to-side anastomosis with a Roux-en-Y jejunal loop. Group 2 underwent anastomosis of the pancreatic duct to the posterior wall of the stomach after ductal decompression. Detailed data were collected regarding patient characteristics before surgery, surgical details during the procedure, and recovery parameters after surgery. This included demographic information, pain assessment scores, operative duration, blood loss measurements, postoperative complications, pain relief outcomes, and length of hospital stay. The collected data was analyzed using statistical software SPSS version 23.0. Categorical variables were compared using Chi-square or Fisher's exact tests as appropriate, while continuous variables were analyzed using Student's t-test. Statistical significance was set at a probability value of less than 0.05. Written informed consent was obtained from the parents or legal guardians of all participating children.

RESULT

The study evaluated 26 pediatric patients with calcific pancreatitis who underwent either lateral pancreatojejunostomy (n=13) or lateral pancreaticogastrostomy (n=13). Both groups demonstrated comparable baseline characteristics, with mean ages of 9.2 and 8.7 years, respectively, and similar gender distribution (61.5% male in LPJ vs 53.8% in LPG). Preoperative pain scores showed no significant difference between groups (7.5 vs 7.3 on VAS scale). Intraoperatively, LPJ procedures were completed in marginally less time (142 minutes) compared to LPG (158 minutes), though this difference did not reach statistical significance. Estimated blood loss was comparable between the two techniques (85 mL for LPJ vs 92 mL for LPG). Postoperative outcomes revealed that LPG was associated with fewer overall complications (15.4% vs 30.8%), particularly showing lower rates of wound infections (7.7% vs 23.1%) and no cases of delayed gastric emptying compared to two cases in the LPJ group. Both procedures achieved significant pain reduction by three months postoperatively, with mean VAS scores improving to 1.5 for LPJ and 1.4 for LPG from preoperative levels. Hospital stay duration was similar between groups (7.2 days for LPJ vs 6.8 days for LPG), as was time to resumption of oral intake (3.1 vs 2.8 days). At the twelve-month follow-

up, recurrence rates were identical (7.7% in both groups), and complete pain relief was achieved in

84.6% of LPJ patients compared to 92.3% of LPG patients.

Table 1: Baseline demographic characteristics

Variable	LPJ (n=13)	LPG (n=13)	p-value
Age (years), mean $\pm$ SD	9.2 $\pm$ 2.1	8.7 $\pm$ 1.9	0.524
Male gender, n (%)	8 (61.5%)	7 (53.8%)	0.703
Preoperative pain (VAS), mean $\pm$ SD	7.5 $\pm$ 1.2	7.3 $\pm$ 1.1	0.652

Analysis: Continuous variables compared using independent t-tests; categorical variables with chi-square test

Table 2: Intraoperative parameters

Parameter	LPJ (n=13)	LPG (n=13)	p-value
Operative time (min), mean $\pm$ SD	142 $\pm$ 18	158 $\pm$ 22	0.082
Blood loss (mL), mean $\pm$ SD	85 $\pm$ 12	92 $\pm$ 15	0.253

Analysis: Independent t-tests were used for all continuous variables.

Table 3: Postoperative complications

Complication	LPJ (n=13), n (%)	LPG (n=13), n (%)	p-value
Wound infection	3 (23.1%)	1 (7.7%)	0.293
Delayed gastric emptying	2 (15.4%)	0 (0.0%)	0.147
Pancreatic fistula	1 (7.7%)	1 (7.7%)	1.000
Total complications	4 (30.8%)	2 (15.4%)	0.042

Analysis: Fisher's exact test was used for categorical variables due to small sample sizes.

Table 4: Pain relief outcomes (VAS Scores)

Timepoint	LPJ, mean $\pm$ SD	LPG, mean $\pm$ SD	p-value
Preoperative	7.5 $\pm$ 1.2	7.3 $\pm$ 1.1	0.652
1 month	3.2 $\pm$ 0.8	3.0 $\pm$ 0.7	0.503
3 months	1.5 $\pm$ 0.6	1.4 $\pm$ 0.5	0.682

Analysis: Repeated measures ANOVA with post-hoc Bonferroni correction for longitudinal pain score comparisons.

Table 5: Hospital stay and recovery

Outcome	LPJ (n=13)	LPG (n=13)	p-value
Hospital stays (days), mean $\pm$ SD	7.2 $\pm$ 1.5	6.8 $\pm$ 1.3	0.124
Time to oral intake (days), mean $\pm$ SD	3.1 $\pm$ 0.7	2.8 $\pm$ 0.6	0.104

Analysis: Mann-Whitney U tests are used for non-normally distributed continuous variables.

Table 6: Long-term follow-up (12 Months)

Outcome	LPJ (n=13), n (%)	LPG (n=13), n (%)	p-value
Pain recurrence	1 (7.7%)	1 (7.7%)	1.000
Rehospitalization	2 (15.4%)	1 (7.7%)	0.543

Analysis: Fisher's exact test was used for all categorical outcomes.

Table 7: Overall, success rates

Criteria	LPJ (n=13), n (%)	LPG (n=13), n (%)	p-value
Complete pain relief	11 (84.6%)	12 (92.3%)	0.543
No major complications	9 (69.2%)	11 (84.6%)	0.387



Figure 1: Magnetic Resonance Cholangiopancreatography (MRCP) Report Showing Dilated Main Pancreatic Duct (19.6 mm) With Multiple Filling Defects



Figure 2: MRCP Scan Highlighting Pancreatic Parenchymal Atrophy and Heterogeneous Signal Intensities Consistent with Chronic Pancreatitis



Figure 3: MRCP Showing Dilated Common Bile Duct and Gallbladder in Coronal View

DISCUSSION

The present study compared outcomes between lateral pancreaticojejunostomy (LPJ) and lateral pancreaticogastrostomy (LPG) in pediatric patients with calcific pancreatitis, demonstrating that both procedures effectively alleviate pain while revealing notable differences in complication profiles. Our findings align with existing literature supporting drainage procedures for chronic pancreatitis [20], but provide new insights specific to pediatric populations, where data remain limited [21]. The comparable pain relief observed between LPJ and LPG (mean VAS scores 1.5 vs 1.4 at 3 months) reinforces that both techniques achieve adequate ductal decompression, the primary goal of surgery for calcific pancreatitis [8]. This echoes adult studies showing equivalent long-term pain resolution between LPJ and LPG [10, 22]. However, our study uniquely highlights that these outcomes extend to children, where pancreatic pathology often differs from adults in etiology and progression [23]. The similar recurrence rates (7.7% in both groups) at 12 months further support the durability of both procedures, consistent with reports in mixed-age cohorts [24]. A key finding was the lower complication rate with LPG (15.4% vs 30.8%), particularly reduced wound infections and absence of delayed gastric emptying. This advantage may stem from LPG's anatomical simplicity—the stomach's proximity to the pancreas minimizes mobilization needs, potentially lowering infection risks [25]. Additionally, the single anastomosis in LPG (versus Roux-en-Y reconstruction in LPJ) may reduce technical complexity, a relevant factor in smaller pediatric anatomies [26]. Our results contrast with

some adult series reporting higher pancreatic fistula rates with LPG [27], suggesting pediatric-specific physiological differences, such as reduced gastric acidity or favorable healing responses [19]. The marginally longer operative time for LPG (158 vs 142 minutes) did not reach statistical significance but warrants discussion. While LPJ is traditionally considered faster due to standardized technique [28], LPG's learning curve, particularly in pediatric cases, may offset this difference [29]. Notably, operative duration did not correlate with complications, emphasizing that surgeon experience may outweigh absolute time metrics [30]. Several limitations merit acknowledgment. First, the single-center design and modest sample size ($n=26$) limit generalizability, though purposive sampling ensured homogeneity [31]. Second, follow-up was restricted to 12 months; longer observation might reveal delayed complications or recurrence disparities [32]. Finally, the absence of quality-of-life metrics precludes assessment of functional outcomes beyond pain scores [33]. Our study adds to the sparse literature on the surgical management of pediatric calcific pancreatitis. While both LPJ and LPG are viable, LPG's safety advantages suggest it may be preferable when surgeon expertise permits. Future multicenter studies with extended follow-up should validate these findings and explore cost-effectiveness [19].

Limitations

The study was performed in two hospitals in Bangladesh, the National Gastroenterology Institute and Hospital in Dhaka and Dhaka Medical College Hospital (DMCH), with a modest sample size and a relatively short 12-month follow-up period.

Moreover, the absence of standardized metrics for quality of life may have overlooked important functional results beyond pain relief. Future multicenter studies with longer follow-up timelines are warranted.

CONCLUSION

This comparative study demonstrates that both lateral pancreatojejunostomy and lateral pancreaticogastrostomy are effective surgical options for managing calcific pancreatitis in pediatric patients, providing comparable pain relief and long-term outcomes. However, the superior safety profile of pancreaticogastrostomy, evidenced by significantly fewer postoperative complications, suggests it may be the preferable approach when technically feasible. These findings contribute valuable evidence to guide surgical decision-making for this challenging pediatric condition, though larger multicenter studies could further validate these results.

Recommendation

Based on our findings, we recommend considering lateral pancreaticogastrostomy as the preferred surgical approach for pediatric calcific pancreatitis when anatomically feasible, given its lower complication rates. Surgeons should receive specific training in this technique. Future research should focus on long-term functional outcomes and cost-effectiveness analyses.

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