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Original Research Article

A Hospital-Based Assessment of Different Surgical Approaches for the Treatment of Chronic Pancreatitis: A Retrospective Study

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Abstract

Aim: A comparative analysis of different surgical approaches for the treatment of chronic pancreatitis.

Material and Methods: It was retrospective study carried out at Department of General surgery, Netaji Subhas Medical College and Hospital, Bihta, Patna, Bihar, India for one year. Patients with chronic pancreatitis aged 18-65 yrs from our tertiary care institution was screened and selected to undergo modified lateral pancreatic jejunostomy. After obtaining valid written informed consent They was undergo either the conventional open procedure or the laparoscopic procedure according to the inclusion andexclusion participant. 50 patients of chronic pancreatitis was screened during the study period.

Results: Of the total sample size of 50participants, 23 underwent laparoscopic technique and 27underwent open method. This is 46% of the population underwent laparoscopy and 54% underwent open surgery. Statistical software used was Statistical process control. Hemorrhage is the most common complication encountered intraoperatively. On an average the blood loss encountered during laparoscopy was 104 ml, while the blood loss seen in open surgery was 123 ml. Onapplying the chi square test, p value 0.011. Hence, this is significant. Alternate hypothesis is true, that is, there is a difference in the intraoperative efficacy of open and laparoscopic pancreatojejunostomy. Blood loss encountered during laparoscopic dissection is lesser. The post-operative complications which are expected post pancreatojejunostomy includes the following; Pancreatic fistula formation, Anastomotic leak, Paralytic ileus and Wound gape. P value at the end of the Chi testis 0.265, which implies that the null hypothesis should be accepted and that there is no difference in the possibility of development of post-operative complications irrespective of the operative techniques used. By using appropriate test for statistical analysis, the p value obtained was 0.0005. Hence, the alternate hypothesis has been accepted. Laparoscopic method has been found to be better than open method in terms of the postoperativeday of starting oral feeds.

Conclusion: The two methods of pancreatojejunostomy arecomparable to each other. However, the laparoscopic method, has its advantages over the open technique in terms of lesser amount of blood loss encountered, faster onset of enteral nutrition and lesser duration of hospital stay. Intra and post-operative complication profile are similar for both methods. Post-operative endocrine insufficiency at the end of 6 months are similar for both techniques. Post-operative pain relief at the end of 3 months are also similar in both.

Keywords: Chronic pancreatitis, Surgical treatment, Laparoscopic pancreatojejunostomy

Introduction

In patients known to have chronic pancreatitis (CP), relapsing upper abdominal pain is the main reason to seek surgical treatment. A step-up approach is done, and surgery is deemed necessary when medical and Endo therapy fail to relieve the pain. Almost half of the patients have surgical intervention during the disease. Surgery first in cases of advanced CP has shown to be superior to Endo therapy in terms of pain control and a lesser number of procedures. In addition, patients having local complications due to fibrosis leading to duodenal stenosis, biliary strictures, and splenic vein thrombosis leading to gastric varices benefit from surgery. Surgery aims to relieve pain, treat complications, preserve pancreatic

reserve, and improve quality of life. [1-3] There are several proposed mechanisms to explain the pain related to CP. It is mainly attributed to pancreatic duct hypertension, raised intrapancreatic pressure leading to pancreatic ischemia, and ultimately replacing pancreatic parenchyma with fibrotic tissue. Pain relief after decompressing a dilated pancreatic duct supports the hypothesis of the origin of pain due to ductal hypertension. Similarly, supplementation by pancreatic enzymes decreases intrapancreatic pressure by reducing the pancreatic exocrine stimulation and has resulted in fewer pain scores in some patients with CP. [4-6] Pancreatic hypertension can lead to compartment syndrome-like features resulting in ischemia, which leads to pain. Surgical drainage releases this compartment effect causing relief in pain which is not achieved with endoscopic pancreatic stent placement. Bile duct and duodenal stenosis are caused by repetitive fibrosis in the plane between the pancreatic head and duodenum which is termed groove pancreatitis, which compresses the neurons located in this groove causing pain. Pancreatic fibrosis causes scarring of pancreatic tissue that can raise intraductal pressure causing pain, however, no direct relationship between the degree of fibrosis and pain has been established. [7] Classically pancreatic head has been deemed the source of pancreatic pain in most cases. The optimal timing of surgical intervention has several patient and disease-related factors, with better outcomes in terms of pain control and pancreatic reserve with intervention within three years of the onset of symptoms. On the contrary, prolonged duration of disease and regular narcotic use may lead to recurrent pain even after surgery that is attributed to central pain pathways sensitization. [8]

Material and Methods

It was retrospective study carried out at Department of General surgery, Netaji Subhas Medical College and Hospital, Bihta, Patna, Bihar, India for one year. Patients with chronic pancreatitis aged 18-65 yrs from our tertiary care institution will be screened and selected to undergo modified lateral pancreatic jejunostomy. After obtaining valid written informed consent They will undergo either the conventional open procedure or the laparoscopic procedure according to the inclusion andexclusion participant. 50 patients of chronic pancreatitis will be screened during the study period. Age between 18-65 years. Diagnosis of chronic pancreatitis, based on clinical symptoms and morphologic changes (e.g., calcifications and ductal changes) detected by imaging studies; pancreatic functional insufficiency; or both. Obstruction of the pancreatic duct due to stenosis, intraductal, extraductal or both, with dilatation of the duct by at least 7 mm proximal to the obstruction, as determined by Magnetic Resonance Cholangio Pancreatography, Abdominal Computed Tomography, or both Severe, recurrent pancreatic pain insufficiently relieved by non-narcotic analgesics or requiring opiates and Patients who are willing to give consent were included in this study. Patients with Enlargement of the pancreatic head >4 cm, Contraindications to surgery, American Society of Anesthesiologists class IV, Severe portal hypertension, Gastrectomy with Billroth II reconstruction, other pancreatitis-related complications requiring surgery, Previous pancreatic surgery, Suspectedpancreatic cancer with Life expectancy <2 yr, Pregnancy and Patients not willing to give consent were excluded from the study.

Results

In our study, of surgical management of chronic pancreatitis, has included only pancreatojejunostomy done via both open and laparoscopic method. Distal pancreatectomy was not performed for any of the 50 participants of the study, as none of them required the same for their management. Of the total sample size of 50 participants, 23 underwent laparoscopic technique and 27underwent open method. This is 46% of the population underwent laparoscopy and 54% underwent open surgery. Statistical software used was Statistical process control.

Table 1: Age distribution of the study.

Mean age (years)	Group		p-value
	Laparoscopic Surgery	Open Surgery	
	35.5	37.7	0.52

Table 2: Gender distribution of the study.

Gender	Laparoscopic Surgery	Open Surgery	Total N (%)
Male	14 (61)	13 (48)	27 (54)
Female	9 (39)	14 (52)	23 (46)
Total	23 (100)	27 (100)	50 (100)

Chi Square=0.52, p value=0.47 (Insignificant)

Table 3: Blood loss.

Mean Blood loss	**Laparoscopic Surgery**	**Open Surgery**	p-value
(ml)	104	122.6	0.001

Hemorrhage is the most common complication encountered intraoperatively. On an average the blood loss encountered during laparoscopy was 104 ml, while the blood loss seen in open surgery was 123 ml. Onapplying the chi square test, p value 0.011. Hence, this is significant. Alternate hypothesis is true, that is, there is a difference in the intraoperative efficacy of open and laparoscopic pancreatojejunostomy. Blood loss encountered during laparoscopic dissection is lesser.

On an average open surgery lasts for 260 mins, while laparoscopic surgery lasts for 317 mins, p value calculated using the Chi square test was 0.000000000002. This means that the difference is significant and not by chance. The alternate hypothesis accepted and null hypothesis refuted. There is a difference between the two

operative methods for the formation of a lateral pancreatojejunostomy. The various intraoperative complications which were encountered intraoperatively are; Difficult anastomosis, Difficulty to identify the MPD, Iatrogenic perforation and technical difficulty. The frequency of their occurrence has been tabulated. Appropriate test of statistical analysis was used. P value obtained was 0.10472. Null hypothesis was accepted. However, one should keep in mind that the study is beingundertaken in a tertiary care hospital with high volume ofpatients, with the procedure being done by trained hands.

Table 4: Duration of procedure.

Procedure duration (minutes)	**Group**		**p-value**
	Laparoscopic Surgery	**Open Surgery**	
	317	260	**0.002**

Table 5: Intraoperative complications.

Type of complications	**Number of cases**		
	Laparoscopic Surgery	**Open Surgery**	**Total**
Difficult anastomosis	1	-	1
Difficulty to identify theMPD	3	-	3
Iatrogenic perforation	-	1	1
Nil	14	27	41
Technicaldifficulty	4	-	4

P value (Chi Test) = 0.10472 (insignificant).

Table 6: Post-operative complications.

Type of complications	**Groups**		
	Laparoscopic Surgery	**Open Surgery**	**Total**
Nil	22	20	42
Pancreaticfistula	-	1	1
Paralytic ileus	-	2	2
Wound gape	-	5	5

P value (Chi Test) = 0.265488 (insignificant).

The post-operative complications which are expected post pancreatojejunostomy includes the following; Pancreatic fistula formation, Anastomotic leak, Paralytic ileus and Wound gape. P value at the end of the Chi testis 0.265, which implies that the null hypothesis should be accepted and that there is no difference in the possibility of development of post-operative complications irrespective of the operative techniques used. By using appropriate test for statistical analysis, the p value obtained was 0.0005. Hence, the alternate hypothesis has been accepted. Laparoscopic method has been found to be better than open method in terms of the postoperativeday of starting oral feeds.

Table 7: Post-operative endocrine function.

Post op-endocrine insufficiency	Group		Total
	Laparoscopic Surgery	Open Surgery	
Improved	6	4	10
New onset	5	7	12
Status quo	-	4	4
Worsened	11	13	24
Total	22	28	50

Chi Square = 0.4787

Table 9: Post-operative improvement in pain.

Post op-endocrinepain	Group		Total
	Laparoscopic Surgery	Open Surgery	
Improved	16	19	35
Status quo	6	8	15
Total	22	27	50

Chi Square = 0.734

The p value of the comparative study applied turns out to 0.007. This is significant. Hence the alternate hypothesis has been accepted, that is there is a difference betweenthe two operative methods with the minimally invasive technique being considered by better at least in terms of the length of hospital stay. The p value calculated after applying the appropriate test of statistical analysis is 0.55, which is not significant. Hence there is no statistically proven significance in the findings of open and laparoscopic techniques of repair. Post-operative pain relief was obtained in 35 of the 50 patients who enrolled in the study. 15 of the patients out of 50 was found to no significant improvement in pain relief. One has to also bear in mind that the patients who are complaining of same pain profile at the end of the procedure are also the same patients who developed post-operative complications. P value on application of chi square test is 0.734. This value signifies that there is no statistical significance between the 2 modes of surgery.

Discussion

A total of 50 patients participated in the study. Of 50 patients, 23 underwent laparoscopic method of surgery and 27 underwent open method of surgery. This accounts for 46% of the cases being done through the laparoscopic route and 54% of the cases being done via the opentechnique. Average age of a patient undergoing laparoscopic pancreatojejunostomy was 35.5 years and the average age of a patient undergoing open surgery was 37.7 years. This can be compared to a mass retrospective study conducted in the Institute of post graduate medical education and research, Delhi, 2019 wherein the median age of surgery was found to be 31 for open and 32 for laparoscopic technique.[4] In terms of gender distribution, 27 males (54%) and 23 (46%) females underwent the above mentioned procedures. Quoting the mass study conducted at the Institute of post graduate medical education and research, Delhi, 2019, 63% of the population who underwent either of the two procedures were males. In terms of blood loss, by comparing the two techniques there is a clear difference between the amount of blood loss encountered in the 2 modalities. On an average 104 ml was observed in patients who underwent laparoscopic pancreatojejunostomy. Open method was met with a blood loss of 127 ml. This can be compared to the blood loss of 100ml, 120ml for laparoscopic and open surgeries as reported by senthilnathan et al. [5] However, a confounding factor of the study can be the fact that laparoscopic techniques are undertaken by experienced hands only. Comparing the two operative techniques, the average time taken for the completion of laparoscopic method was 317 mins, while that of open surgery was 260 mins. [9] The difference turned out to be statistically significant and not due to any bias. Tantia et al and Senthilnathan et al reported an operation time of 220-277 min for LLPJ and 271-377 min for patients withadditional surgical procedures. [6,7] However, Palanivelu et al reported operation time from 110 to 225 min, which was lower than that of our study. [7,10] Various intraoperative complications which were encountered during our study. Among the patients who underwent laparoscopy, difficult anastomosis was encountered in 1 patient, difficulty to identify the MPD was seen in 3 patients, technical difficulty was encountered in 4 patients. Among the patients who underwent open repair -Iatrogenic perforation occurred in one patient. On comparing the two groups however, the difference was found to be insignificant. This means that2 techniques have similar complication profile, and eitherof the two method can be adopted when the surgery is being performed by trained professionals in high volume centers. In a study undertaken by IPGMER, Delhi, 4 participants of

either group developed intra operative complications. Post-operative complications which were encountered within 3 months of the procedure. In our study, patients developed paralytic ileus, one developed wound gape and one patient developed pancreatic fistula. There is no statistical difference between the two surgical techniques. In a study conducted by IPGMER, Delhi 6 patients of laparoscopic study and 4 patients of open study, reported post-operative complications. The complication profile in our study, is better as compared this above mentioned study. Oral feeds were started on the 4th day of surgery on an average in patients of laparoscopic pancreatic- jejunostomy. While in case of patients who underwent open pancreatojejunostomy, the oral feeds were started on day 5. There is statistical significance in this finding. Length of hospital stay before discharge was found to be on an average 8 in case of laparoscopic cases, while being 10 in case of open surgeries. According to Adolf et al the range of hospital stay is 3-12 days for either mode of procedure and this is in keeping with the result of our study.[8] Post-operative weight gain was calculated in patients after 3 months. It was noticed that patients who underwent laparoscopic method showed an averageweight gain of 4.2 kgs while, those patients who underwent open surgery had 3.9 kg weight gain. Diabetic control appeared to have improved in 6 patients who underwent laparoscopic approach. Diabetic control seemed to improve in 4 patients who underwent open surgery. 5 patients who underwent laparoscopic surgery developed new onset diabetes while 7 patients who underwent open surgery developed new onset endocrine insufficiency. In 11 patients who underwent laparoscopic surgery, the diabetic control was found to have worsened, while the diabetic control of 13 patients who underwent open surgery worsened. In our series, most of the patientsdid not show improvement in endocrine and exocrine functions of the pancreas, rather a significant proportion of patients showed deterioration of these functions. Similar to our study, Adolf et al reported long-term pain relief in 93% of patients, but there was no improvement in endocrine and exocrine functions. However, Palanivelu et al and Sielezneff et al reported improved or static endocrine and exocrine functions following surgery. In none of the patients who underwent surgery did the pain worsen after the surgery.[9] Pain relief improved in 16 patients who underwent laparoscopic repair and 19 patients who underwent opens surgery. The post-operative pain relief remained the same in 6 patients who underwent laparoscopic surgery and 8 patients who underwent open surgery. This was found to be of no statistical significance. Schnelldorfer et al reported the experience of 372 patients, out of which only 50% the patients had significant pain control, 62% of the patients returned to work.[10] Hence, laparoscopic method can be preferred over the open technique. However, this study is limited by the fact that the procedures were performed by trained hands in a high-volume centre where apt, state of the art technology is available, such as vessel sealer like ligasure cautery, ultrasound energy using harmonic scalpel and an adequate viewing screen. Hence, the findings can be affected by the surgical skill of the surgeon involved and various technical difficulties.

Conclusion

The two methods of pancreatojejunostomy are comparable to each other. However, the laparoscopic method, has its advantages over the open technique in terms of lesser amount of blood loss encountered, faster onset of enteral nutrition and lesser duration of hospital stay. Intra and post-operative complication profile aresimilar for both methods. Post-operative endocrine insufficiency at the end of 6 months are similar for both techniques. Post-operative pain relief at the end of 3 months are also similar in both.

References

1. Ambore V, Vismaya KB, Rashid R. Comparative study of surgical management of chronic pancreatitis. Int Surg J 2023;10:1934-9
2. Zafar HB. Surgical Management of Chronic Pancreatitis: A Systemic Review. Cureus. 2023 Mar 6;15(3):e35806. doi: 10.7759/cureus .358 06. PMID: 36891174; PMCID: PMC9986717.
3. Ghorbani P, Dankha R, Brisson R, D'Souza MA, Löhr J-M, Sparrelid E, Vujasinovic M. Surgical Outcomes and Trends for Chronic Pancreatitis: An Observational Cohort Study from a High-Volume Centre. *Journal of Clinical Medicine*. 2022; 11(8):2105. https:// doi. org/10.3390/jcm11082105.
4. Nealon WH, Townsend CM, Thompson JC. Operative drainage of the pancreatic duct delays functionalimpairment in patients with chronic pancreatitis. A prospective analysis. Ann Surg. 1988;208:321-9.
5. Senthilnathan P, Babu S, Vikram A, Sabnis SC, Gurumurthy SS, Vijay NA, et al. Laparoscopic longitudinal pancreaticojejunos tomy and modified frey's operation for chronic calcific pancreatitis. BJS. 2019;3:666-71.
6. Tantia M, Matsumoto I, Shinzeki M, Asari S, Goto T, Hironori Y, et al. Short and long term results of modified frey's procedurein patients with chronic pancreatitis: A retrospective Japanese single centerstudy. Kobe J Med Sci. 2014;60:E30-6.
7. Palanivelu C, Shetty R, Jani K, Rajan PS, Sendhilkumar K, Parthasarthi R, et al. Laparoscopic lateral pancreaticojejunostomy: A new remedy for an old ailment. Surg Endosc . 2006;20:458-6.
8. Adolff M, Schlogel M, Arnauld JP. Ollier JC. Role of pancreaticojejunostomy in the

treatment of chronicpancreatitis: Study of 105 operated patients. Chirugie.1991;117:251-57.
9. Sielezneff I, Malouf A, Salle E, Brunet C, Thirion X, Sastre B. Long term results of lateral pancreaticojejunostomy for chronic alcoholic pancreatitis. Eur J Surg. 2000;166: 58-64.
10. Schnelldorfer T, Lewin DN, Adams DB. Operative management of chronic pancreatitis: Long term results in 372 patients. J Am Coll Surg. 2007;204: 2039-45.
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