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Study on Various Surgeries and their Outcome in Management of Chronic Pancreatitis

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Abstract

Aim: To prospectively study the different surgeries and their outcome in management of Chronic pancreatitis.

Method: Patients were investigated with transabdominal Ultrasound and then with contrast enhanced computerized tomography (CECT). Other investigations like Magnetic resonance cholangiopancreaticography (MRCP), Endoscopic Retrograde Cholangio Pancreaticography (ERCP) were used when appropriate. Patients underwent surgery for chronic pancreatitis.

Results: Mean ± SD of Hospital stay for Freys is 9.7 ± 0.53 days, for Partington - Rochelle is 9.06 ± 0.6 days, for Begers is 11.66 ± 0.57 days and for Whipples is 14.4 ± 0.54 days. Mean ± SD of VAS postop 6 months of Freys is 1.73 ± 1.19, for Partington - Rochelle is 1.31 ± 0.47, for Begers is 1.33 ± 1.1 and for Whipples is 2.6 ± 1.9. Mean ± SD of VAS postop 1 year of Freys is 1.6 ± 1.3, for Partington - Rochelle is 1.12 ± 1.4, for Begers is 0.66 ± 0.57 and for Whipples is 2.6 ± 1.94. Mean ± SD SF 36 postop 1 year of Freys is 78.96 ± 14.6, for Partington - Rochelle is 81.1 ± 13.6, for Begers is 85.3 ± 7.76 and for Whipples is 85.6 ± 10.9.

Conclusion: Operative time of Whipples procedure is greater than that of Begers, Freys and Partington Rochelle procedures in decreasing order. Blood loss of Whipples procedure is greater than that of Begers, Freys and Partington Rochelle procedures in decreasing order. Duration of hospital stay in whipples procedure is greater than that of Begers, Freys and Partington Rochelle procedures in decreasing order.

Keywords: Abdominal pain; Chronic pancreatitis; Magnetic resonance cholangiopancreaticography; Endoscopic Retrograde Cholangio Pancreaticography.

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Introduction

Chronic pancreatitis is a chronic benign disease often characterized by recurrent episodes of abdominal pain accompanied by progressive pancreatic exocrine and endocrine insufficiency. Although the disease was first described by Friedrich in 1878, there is yet incomplete understanding of the pathophysiology and natural history of the disease. The management of patients with chronic pancreatitis remains a challenge because of the limited understanding of the pathophysiological process of the disease, the unpredictability of clinical evolution and the controversies between diagnostic criteria and therapeutic options. Worldwide the main aetiological factor is alcohol abuse, and the most common symptom is relentless chronic abdominal pain.

This disease is primarily treated by non surgical modalities like Non Steroidal Anti Inflammatory Drugs, opium analgesics, enzyme replacements

and pancreatic duct stenting with poor long term outcome and little improvement in health related quality of life. Upto 50% of these patients will undergo some form of surgical management.

Surgery has been the mainstay of treatment in patients with intractable pain unresponsive to medical therapy. Surgery remains an excellent option for patients with chronic pancreatitis[81.] Various studies in literature show variable results regarding the outcomes of surgery[1] in chronic pancreatitis, reasons being non uniformity in the patient selection, in the surgical technique and the unpredictable natural history of the disease process. In view of this there is a dilemma prevailing among the treating physicians, gastroenterologists and surgeons regarding the surgical management of chronic pancreatitis.

Quality of life (QoL) is a clinically and biologically meaningful outcome for the patient. Historically, surgical and interventional outcomes have been measured in clinical and objective terms using end points such as morbidity, mortality, and disease-free survival.

Health related quality of life, subjectively perceived by the patient, is becoming a major issue in the evaluation of any therapeutic intervention, mainly in patients with chronic or hard to cure diseases, where the aim of the intervention is to keep patients either symptom-free and able to live in the community for a long time, or to reduce the discomfort caused by the disease. In particular, in chronic pancreatitis patients, only surgeons and endoscopists have explored the quality of life in relation to their interventional approaches; however, only a few of them have used structured and validated questionnaires. Most of the available studies in this regard have mainly focused on measuring the control of the symptoms (pain) rather than measuring the patient's perceived well being and health related quality of life (HRQL).

The available studies[1-5] with respect to health related quality of life in chronic pancreatitis are based on western population where alcoholic chronic pancreatitis is predominant. There are various surgeries done for chronic pancreatitis to improve pain scores and quality of life.

Hence this study was carried out in these patients to analyze various surgeries and their outcome in management of chronic pancreatitis.

Materials and Methods

This is a prospective study conducted in the department of surgical gastroenterology Narayana Medical College, Nellore from September 2014 to December 2016. Approval of the study was obtained from the Human Research Ethics Committee (Medical) of the NTR University of health sciences Vijayawada, protocol number SS14540702. All participants were provided with written informed consent.

Study population is taken from the patients diagnosed to have Chronic Pancreatitis in the Department of Surgical Gastroenterology, Narayana Medical Collegeand Hospital.

Chronic pancreatitis was defined by features consistent with irreversible pancreatic inflammation, i.e., clinical, structural or functional abnormality of the pancreas[5.] Classical pancreatic type of pain radiating to back with imaging showing parenchymal, ductal abnormalities and calcification are taken into the study.

In this study, we defined tropical pancreatitis based on its most distinctive features: patients with typical pancreatic type pain with onset at less than 30 years of age. Imaging showing large irregular coarse calculi in the main pancreatic duct (intraductal or both intraductal and intraparenchymal)[6], subjects who are not chronic alcoholics (defined by 80 gm/day for at least 5 years) and lastly who did not have any other specific cause for the pancreatitis.

Alcoholic chronic pancreatitis is defined as patients with features of chronic pancreatitis. Chronic alcoholism is defined by intake of 80 g or more of ethanol/day for at least five years[7-9], and imaging showing small speckled intraparenchymal calcification or calcification in the secondary ducts.

Fasting plasma glucose value ≥ 126 mg/dL and/or a post prandial plasma glucose value ≥ 200 mg/dL, confirmed on two occasions, and/or requirements of insulin or oral hypoglycemic drugs is diagnosed as Diabetes mellitus. Steatorrhea is defined as passage of large, bulky, greasy semisolid or liquid stools with fecal fat > 15 grams/ day is considered as steatorrhea.

The patient's socioeconomic status is considered low when he/she is below poverty line as defined by planning commission government of India. All the patients in the study belong to low socioeconomic status.

Patients were investigated with transabdominal Ultrasound and then with contrast enhanced computerized tomography (CECT). Other investigations like Magnetic resonance cholangiopancreaticography (MRCP), Endoscopic

Retrograde Cholangio Pancreaticography (ERCP) were used when appropriate. Presence of Inflammatory head mass is defined as head mass measuring >3.5 cm on CECT in a patient of chronic pancreatitis. Pancreatic calcifications are classified in to intra ductal only, intraparenchymal only and both intra ductal and intra parenchymal based on imaging with CECT abdomen.

Patients underwent surgery for chronic pancreatitis if they had any one of the following feature. Patients were advised surgery only when they are willing to abstain from alcohol after surgery.

1. Intractable pain not relieved by medication-most common indication
2. Intractable pain requiring high and toxic doses of analgesics for control of pain.
3. Recurrent episodes of pain with acute exacerbation of chronic pancreatitis affecting daily activities requiring hospital admissions.

Inclusion Criteria

a) Chronic alcoholic Pancreatitis, Tropical Pancreatitis, Idiopathic chronic Pancreatitis.

b) All patients with 1. Severe intractable pain refractory to analgesics.
   2. Inflammatory mass of the pancreatic head
   3. Large persisting symptomatic pancreatic pseudocyst
   4. Inflammatory process suspected to be associated by malignant process
   5. CBD stenosis causing persistent jaundice

c) Main pancreatic duct diameter of at least 4mm is taken as the criteria for the surgical procedure.

Exclusion Criteria

1. Patients not willing to have regular follow up and not willing to respond to the SF 36 health survey after surgery.
2. Patients having multiple surgeries for chronic pancreatitis.
3. Patients not willing for abstinence of alcohol.

SF 36 and Visual Analogue Score (VAS)

Health related Quality of life (HRQL) scores of these patients are calculated with the help of Short form $36v_2$. Short-Form Health Survey (SF-36) questionnaire is well known for its comprehensiveness, brevity and high standards of reliability and validity.[10-14] We chose the SF-36 questionnaire over other generic health related quality of life measures because it has demonstrated excellent reliability and validity when employed with diverse medical conditions including chronic pancreatitis.

The SF-36 provides an estimate of the perceived health status and well-being, and it is based on 36 multiple-choice questions, measuring eight different domains: four in the area of physical health: physical functioning (PF), role limitation physical (RP), bodily pain (BP) and general health (GH) and four in the area of mental health: role limitation-emotional (RE), vitality (VT), mental health (MH) and social functioning (SF) (Appendix I).

Two areas were evaluated by means of two comprehensive indices computed by using the eight domains of the questionnaire. The physical health (PH) and mental health (MH). Finally the total SF36 score is calculated for the all patients using above domains.

Visual analogue score (VAS) is use to evaluate the pain coping capacity of individual subjectively, which is known for its great sensitivity for reliable measurement of subjective phenomena of various qualities of painVAS 100 mm or 10 cm line starting from 0 to 100. VAS is analyzed in two ways, one dividing the VAS scores as follows 0 to 4 mm (0 – 0.4) is no pain; 5 to 44 mm (5–4.4) is mild pain; 45 to 74 mm (4.5–7.4) is moderate pain; and 75 to 100 mm (7.5–10) is severe pain.[15,16] Percentage of patients falling in each category is calculated. Second way is calculating the absolute change and percentage of change in the pain scores.

The $SF36v_2$ questionnaire will be in Telugu (Indian language) which is the local language and in English (Britain). Cases were explained indetail about the questionnaire and how to mark the response in their mother tongue. The SF36 scores and visual analogue score are acquired preoperatively in the hospital, at 6 months and 1 year of surgery when patient visits the hospital for follow up.

Stastical Analysis: The statistics in this study were analyzed with the help of SPSS statistics version 17. For comparision of four surgeries one way ANOVA test is used. Post operative complications are defined as follows:

Complication	Definition
Wound infection	Any evidence of infection (i.e. erythema, purulent discharge ,induration) requiring antibiotic treatment or evidence of dehiscence.
Pancreatic fistula[17]	Defined as any measurable volume of fluid on or after postoperative day 3 with amylase content greater than three times the serum amylase activity.
Post pancreatectomy Hemorrhage	Haemetemesis or melena and no other source of ongoing blood loss or the sudden appearance of frank blood either in NG tube or per rectum with subsequent fallin hemoglobin of 2 gm/dl and requiring blood transfusion or reoperation or radiological intervention
Acute respiratory failure	Respiratory distress requiring intubation or the need of intubation or mechanical ventilation for more than 24h post-operatively.
Enteric leak	Leakage of enteric contents from intra operative drains, and/or, radiologically confirmed fluid collection, requiring surgical endoscopic or radiological intervention.
Bile leak	Bilious drainage from intra-operatively placed drains, and/or, radiological confirmed fluid collection, requiring surgical endoscopic or radiological intervention.
Chest infection	Presence of body temperature >38^{o}C,abnormal elevation of WBC count or positive sputum gram stainor culture along with clinical or radiological signs of chest infection and requiring intravenous or oral antibiotic treatment.
90 day mortality	Death during the initial hospitalization or within 90-days of hospital discharge.
Hospital stay	The number of days in hospital from the time of operation.

Results

Between 2014–2016, 80 patients underwent surgery for chronic pancreatitis. There were sixty three males and seventeen females with a ratio of 3:1. Among them fifty six patients underwent Freys procedure, sixteen patients underwent Partington – Rochelle procedure, three patients underwent Begers procedure and five patients underwent Whipples procedure.

Table 1: Operative Time in minutes (min).

Surgery	Number	Range	Mean ± SD
Freys	56	180–260	224.46 ± 21.9 min
Partington	16	160–200	181.25 ± 13.1 min
Begers	3	300–320	310 ± 10.0 min
Whipples	5	320–360	346 ± 16.7 min

Mean ± SD of Operative time in minutes for Freys is 224.46 ± 21.9, for Partington - Rochelle (PR) is 181.25 ± 13.1, for Begers is 310 ± 10 and for Whipples is 346 ± 16.7. According to one way Anova Test, p value is < 0.001 and is significant (Table 1).

Table 2: Blood Loss (ml)

Surgery	Number	Range	Mean ± SD
Freys	56	110–400	190.53 ± 59.98 ml
Partington	16	100–200	177.5 ± 29.32 ml
Begers	3	280–300	290 ± 10.0 ml
Whipples	5	330–400	374 ± 27.0 ml

Mean ± SD of blood loss for Freys is 190.53 ± 59.98 ml, for Partington - Rochelle is 177.5 ± 29.32 ml, for Begers is 290 ± 10 ml and for Whipples is 374 ± 27 ml. According to one way Anova Test p value is < 0.001 and is significant (Table 2).

Table 3: Hospital Stay (days)

Surgery	Patients No.	Range	Mean ± SD
Freys	56	9–11	9.7 ± 0.53 days
Partington	16	8–10	9.06 ± 0.6 days
Begers	3	11–12	11.66 ± 0.57 days
Whipples	5	14–15	14.4 ± 0.54 days

Mean ±SD of Hospital stay for Freys is 9.7 ± 0.53 days, for Partington - Rochelle is 9.06 ± 0.6 days, for Begers is 11.66 ± 0.57 days and for Whipples is 14.4 ± 0.54 days. According to one way Anova Test p value is < 0.001 and is significant (Table 3).

Table 4: Visual Analogue Score Preop

Surgery	Patient No.	Range	Mean ±SD
Freys	56	3.0–10.0	8.32 ± 1.34
Partington	16	3.0–10.0	7.8 ± 1.79
Begers	3	8.0–10.0	9.0 ± 1.0
Whipples	5	3.0–10.0	7.6 ± 2.7

Mean ±SD of VAS preop of Freys is 8.32 ± 1.34, for Partington - Rochelle is 7.8 ± 1.79, for Begers is 9.0 ± 1.0 and for Whipples is 7.6 ± 2.7 (Table 4).

Table 5: Visualanaloguescore Postop6 months

Surgery	Patient No.	Range	Mean ±SD
Freys	56	0.0–6.0	1.73 ± 1.19
Partington	16	1.0–2.0	1.31 ± 0.47
Begers	3	0.0–2.0	1.33 ± 1.1
Whipples	5	1.0–6.0	2.6 ± 1.9

Mean ±SD of VAS postop 6 months of Freys is 1.73 ± 1.19, for Partington - Rochelle is 1.31 ± 0.47, for Begers is 1.33 ± 1.1 and for Whipples is 2.6 ± 1.9. According to one way ANOVA Test *p* value is 0.16 and is not significant (Table 5).

Table 6: Visual Analogue Score Postop 1 year

Surgery	Patient No.	Range	Mean ±SD
Freys	56	0.0–6.0	1.6 ± 1.3
Partington	16	0.0–6.0	1.12 ± 1.4
Begers	3	0.0–1.0	0.66 ± 0.57
Whipples	5	1.0–6.0	2.6 ± 1.94

Mean ±SD of VAS postop 1 year of Freys is 1.6 ± 1.3, for Partington - Rochelle is 1.12 ± 1.4, for Begers is 0.66 ± 0.57 and for Whipples is 2.6 ± 1.94. According to one way ANOVA Test, *p* value is 0.13 and is not significant (Table 6).

Mean ±SD SF 36 preop of Freys is 26.6 ± 15.7, for Partington - Rochelle is 31.1.6 ± 14.5, for Begers is 40.6 ± 27.7 and for Whipples is 33.6 ± 20.7.

Mean ±SD SF 36 post op 6 months of Freys is 69.3 ± 20.2, for Partington - Rochelle is 67.6 ± 21.5, for Begers is 84.6 ± 8.6 and for Whipples is 76.4 ± 20.7.

According to one way ANOVA Test, *p* value is 0.5 and is not significant.

Table 7: Sf 36 Post OP 1 year

Surgery	Patient No.	Range	Mean ±SD
Freys	56	30.0–99.0	78.96 ± 14.6
Partington	16	43.0–99.0	81.1 ± 13.6
Begers	3	79.0–94.0	85.3 ± 7.76
Whipples	5	70.0–96.0	85.6 ± 10.9

Mean ±SD SF 36 postop 1 year of Freys is 78.96 ± 14.6, for Partington - Rochelle is 81.1 ± 13.6, for Begers is 85.3 ± 7.76 and for Whipples is 85.6 ± 10.9. According to one way ANOVA Test, *p* value is 0.6 and is not significant (Table 6).

Discussion

Chronic pancreatitis is a benign debilitating condition associated with intractable abdominal pain, diabetes, and steatorrhea. It is a disease with poor quality of life affecting young population in the most productive years of life.

The pattern of sex distribution M: F ratio (3:1) is comparable with the other studies from Indian subcontinent.[18]

In the present study mean operating time of Freys is 224 ± 21.4 min. According to Hildebrand *et al.* it is 240 ± 62 min. This is comparable to the present study.[19]

In the present study mean operating time of Partington Rochelle is 181.25 ± 13.1.

According to William H. Nealon *et al.*[20] it is 147.3 ± 19.2 min. This is comparable to the present study. In our study mean operating time of Begers is 310 ±10 min. According to Farkas et al. it is 142.5 ± 4.9.[20]

In the present study mean operating time of Whipples is 346 ± 16.7 min. According to Hildebrand *et al.*[19] it is 360 ± 182. According to Rebecca J McClaine *et al.*[22] it is 360 min. These are comparable to the present study.

Blood loss: The mean Blood loss of Freys is 190 ± 59 ml.

Duration of hospital stay: In the present study mean duration of hospital stay of Partington Rochelle 9.06 ± 0.6 days and according to William nealon *et al.*[20] it is 9.3 ± 1.1 days. This is comparable to the present study. In the present study mean duration of hospital stay of Begers is 11.6 ± 0.5 days and according to Farkas et al.[21] the duration of hospital stay was 8.05 ± 0.9.

In the present study mean duration of hospital stay of Whipples is 14.4 ± 0.5 days and according to Farkas *et al.*[21] it is 13.8 ± 3.9 days. This is comparable to the present study.

Quality of life: In the present study Quality of life in freys preop is 26.6 ± 15.7, postop 6 months is 69.37 ± 20.2 and after 1 year is 78.96. Izbicki *et al.*[22] study of 61 patients found that patients who underwent Frey's procedure had quality of life score of 71%. According to Hildebrand *et al.*[19] preop it is 33.3 and post op it is 58.3. These are 24 months follow up studies.

In the present study Quality of life in Whipples preop is 33.6 ± 20.7, postop 6 months is 76.4 ± 20.7 and postop 1 year is 85.6 ± 10.9. According to Hildebrand *et al.*[19] it is 25 and post op it is 66.7. This is a 24 month follow up study. In the present study Quality of life after Begers preop is 40.6 ± 27.7, postop 6 months is 84.6 ± 8.6 and postop 1 year is 85.3 ± 7.7.

In the present study quality of life after Partington Rochelle in preop is 31.1 ± 14.5, postop 6 months is 67.6 ± 21.5, postop 1 year is 81.1 ± 13.6. Quality of life is improved when compared

with preop scores after 6 month and 1 year in the present study. This is in accordance with Vamsi *et al.*[23]

Pain score: In the present study VAS in freys in preop is 8.3 ± 1.34, postop 6 month 1.7 ± 1.1 and postop 1 year 1.66 ± 1.37. According to Rath *et al.*[24] it is 8.5 ± 10, 4.54 ± 6.5, 5.15 ± 6.5. It is a 50 month follow up study. In the present study VAS in Partington Rochelle preop is 7.8, postop 6 month 1.3, postop 1 year is 1.1.

In the present study In Begers preop is 9, postop 6 mon is 1.3 and postop 1 year is 0.6. According to strate *et al.*[25] it is 1.25. In the present study in Whipples Preop is 7.6, postop 6 mon is 2.6 and postop 1 year is 2.6.

Beger procedure has shorter hospital stay compared to whipples procedure in our study and this is in accordance with study by Klempa *et al.*[26]

Beger and whipples procedure are comparable in pain relief and quality of life in our study and this in accordance with Muller *et al.*[27]

Freys and whipples are comparable in pain relief and quality of life in our study and this is in accordance with Strate *et al.*[10]

Begers and freys are comparable in pain relief and quality of life in our study and this is in accordance with Izbicki *et al.*[22] and strate *et al.*[10]

Conclusion

Operative time of Whipples procedure is greater than that of Begers, Freys and Partington Rochelle procedures in decreasing order. Blood loss of Whipples procedure is greater than that of Begers, Freys and Partington Rochelle procedures in decreasing order. Duration of hospital stay in whipples procedure is greater than that of Begers, Freys and Partington Rochelle procedures in decreasing order. Visual analogue score in post op 6 months and 1 year is not significant between four surgeries. Quality of life in post op 6 months and 1 year is not significant between four surgeries.

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