

A Study of Clinical Features and Management of Pseudocyst of Pancreas

Dr. Sridhar Reddy, P, Dr. B. Rajsiddharth, Dr. B. Karunakar Reddy

Department of General Surgery, Kakatiya Medical College, Warangal, Telangana State.

Abstract- BACKGROUND AND OBJECTIVES:

Pseudo pancreatic cyst is a common complication of pancreatitis. Accurate diagnosis and timely management is important. This study is to know the various etiological factors, relative frequency of occurrence of pseudo pancreatic cyst in relation to age and sex, establish accurate diagnosis by various investigations and to study various modes of management like conservative, percutaneous drainage and surgery. The different modes of treatment and their efficacy will be dealt in detail. This is necessary to know the better treatment of choice.

METHODS:

32 patients were selected, who were diagnosed as pseudo pancreatic cyst admitted in Mahatma Gandhi Memorial Hospital during August 2012 to July 2014. All the Patients underwent definitive treatment. Data related to the objectives of the study was collected.

FINDINGS:

From our study it is observed that

1. Majority of patients belonged to the age group of 31-50 years, which constituted 16(50%) patients in the study. M: F is 4.33:1.
2. Most common etiological factor was alcohol.
3. Most common mode of presentation was pain abdomen followed by abdominal distension / mass per abdomen.
4. Incidence of palpable mass was in 75% of the patients studied, but with the usage of USG and CT scan, pseudocyst was detected in all the patients.
5. Conservative treatment was useful in uncomplicated, acute pseudocysts till they regress or mature when surgery became necessary. The results of internal drainage were excellent, which was done in 56.25% of the patients in our study.
6. The postoperative complications include pain abdomen and wound infection seen in 9 patients of the study.

INTERPRETATION AND CONCLUSION:

We conclude that, the pseudo pancreatic cyst is the most common complication of pancreatitis. Early diagnosis and timely management with the use of serial USG and internal drainage for mature cyst, external drainage for complicated cyst results in good prognosis.

Index Terms- Pseudo pancreatic cyst, internal drainage, External drainage, USG, CT scan.

FUNDING: None

I. INTRODUCTION

Pancreatic pseudocyst is a localized collection of pancreatic secretions surrounded by a wall of fibrous or granulation tissue that arises as a result of acute or chronic pancreatitis, pancreatic trauma, or obstruction of the pancreatic duct by a neoplasm¹.

Pseudocysts account for about 75% of cystic lesions of the pancreas. They are distinguished from other peripancreatic fluid collections (cystic neoplasms and congenital, parasitic and extra pancreatic cysts) by their lack of an epithelial lining, high concentration of pancreatic enzymes within the pseudopancreatic cyst and formation at least 4 weeks after an episode of pancreatitis or pancreatic trauma². Pseudocyst is formed by the inflammatory response that occurs after extravasated pancreatic secretions are walled off by the surrounding structure.

The capsule of the pseudocyst can be thin fibrous tissue which can progressively thicken as the pseudocyst matures frequently; the liquid contents of the pseudocyst are gradually reabsorbed by the body, and pseudocyst resolves indicating that the communication between the pseudocyst and the pancreatic duct has closed. Persistence of a pseudocyst implies ongoing communication with the pancreatic ductal system regardless of whether the ductal system can be demonstrated radiographically or pathologically³.

NATURAL HISTORY

Pseudocysts are formed by the inflammatory response that occurs after extravasated pancreatic secretions are walled off by the surrounding structures. Their walls are composed of fibrous and granulation tissue derived from peritoneum, retroperitoneal tissue or serosal surface of adjacent viscera. The capsule progressively thickens as the pseudocyst matures, often the liquid contents of the pseudocyst are gradually reabsorbed by the body and the pseudocyst resolves, indicating that the communication between the pseudocyst and the pancreatic duct has closed. The persistence of a pseudocyst implies an ongoing communication with the pancreatic ductal system.

Pseudocyst collections, with an indistinct interface between fluid and adjacent organs, irregular contours with segments of pancreatic wall that are concave are most likely to resolve. Spherical or ovoid collections with sharp margins, especially in association with pancreatic calcifications, are likely to persist. In general, the closer to the onset of acute pancreatitis a fluid collection is detected, the more likely it is to resolve.

Fluid collection may resolve by spontaneous transperitoneal reabsorption, decompression of the collection into the pancreatic duct, or erosion of a cyst into a hollow viscus with subsequent

cyst- enteric fistula formation or rarely, by free rupture into the peritoneal cavity.

Cysts larger than 4-6cms are less likely to resolve by themselves. Smaller cysts and cysts which fail to show a decrease in size or those that shows an increase in size during a 3-4 week period of observation are unlikely to resolve. Patients with multiple pseudocysts are unlikely to resolve. Chronic pseudocyst, especially are unlikely to resolve. Traumatic cysts are less likely to resolve as they tend to be more mature at the time of presentation.

PATHOGENESIS

The pathway by which pseudocysts are formed often follows a progression which includes diffuse peripancreatic effusion, pancreatic necrosis, liquefaction, phlegmon, acute pseudocyst and finally encapsulation or maturation. In acute pancreatitis, the duct disruption leads to escape of pancreatic juice into the surrounding tissue, since there is no natural barrier. They may be located anywhere from the mediastinum to the scrotum. They are commonly found in lesser sac or anterior pararenal space.

Cysts arising in the setting of chronic pancreatitis, most often without a determinate antecedent flare of acute pancreatitis are referred to as chronic pseudocyst and generally have a mature wall on presentation. Hence the duct ruptures, owing to inspissated duct. Because the pancreatic parenchyma is firm and fibrotic, chronic pseudocyst commonly are located within the substance of the gland.

AETIOLOGY

10-20% of patient with acute pancreatitis.
20-40% of patient with chronic pancreatitis⁴.
65% pseudocysts are due to alcohol related pancreatitis.
15% pseudo cysts are due to gall stones induced pancreatitis.^{5,6}
5 to 10% are due to traumatic pancreatitis.
45-50% of pseudocysts occur in or around the head of the pancreas and the remainder are evenly distributed along the neck, body and tail of the pancreas.

CLINICAL FEATURES

90% of patients present with epigastric pain.
25-45% with abdominal mass.
50-70% with early satiety, nausea and vomiting.
20-50% with weight loss.
10% with jaundice.
10% with low grade fever.^{7,8}

Abdominal pain is the most common symptom in patients with a pseudocyst. Pseudocysts that follow an episode of acute pancreatitis are often characterized by persistence or recurrence of upper abdominal pain weeks after the initial attacks. The symptoms of early satiety, nausea and vomiting may be secondary to gastroduodenal obstruction caused by a mass effect of the pseudocyst.

More uncommon modes of clinical presentation include

1. Pruritus and jaundice secondary to common bile duct obstruction.
2. Variceal bleeding secondary to either splenic vein or portal vein obstruction.

3. Evidence of sepsis secondary to pseudocyst infection.
4. Evidence of intra-abdominal hemorrhage secondary to bleeding from a pseudo aneurysm in adjacent visceral vessels.

COMPLICATIONS

A. Infection

Less than 5% of patients with pseudocyst develop a true infection, marked by a clinical presentation of fever, leukocytosis and increased pain^{9, 10}. The aspiration of purulent fluid from the pseudocyst confirms the presence of an infection. Open operative drainage allows for the complete evacuation of all infected material and external drain may be placed under direct vision. A pancreatic abscess is one clinical situation in which percutaneous drainage is clearly the treatment of choice. Success rates of up to 85% have been reported in multiple series^{11, 12, and 13}.

B. Haemorrhage

Arterial hemorrhage may occur in up to 10% of patients with pancreatic pseudocysts.^{9, 14, 15} the most common source of pseudocyst associated bleeding is the splenic artery, with the gastro duodenal and pancreatic duodenal arteries, also accounting for a significant number of hemorrhage events.¹⁶ Bleeding may also occur from portal, superior mesenteric, or splenic veins, although this occurs less commonly. This is due to erosion of the vessel wall leading on to pseudo aneurysm formation and eventual rupture. Massive bleeding from the varices of the stomach can occur in cases of chronic pancreatitis complicated by a pseudocyst.¹⁷

CT scan with intravenous contrast is an appropriate confirmatory test in a stable patient but angiography may be necessary for diagnosis and also provides a mode of treatment. Embolization of the pseudo aneurysm or source vessel is attempted as an initial management in a haemodynamically stable patient. Most of these haemorrhages may be effectively controlled by current embolic techniques.^{18, 19, 20, 21} Patients in whom embolic therapy fails, who re-bleed, or who are haemodynamically unstable require emergency surgical exploration.

C. Obstruction

Duodenal obstruction is the most common manifestation of mechanical obstruction secondary to pseudocyst formation, obstruction of the stomach, esophagus, jejunum and colon may be identified²²⁻²⁶. Obstruction of the mesenteric vessels and portal venous system (particularly the splenic vein) may lead to extra hepatic portal hypertension that causes splenomegaly and gastric varices²⁷. Pseudocysts have also been described as obstructing other retroperitoneal structures such as IVC and the ureters.

Congestive heart failure secondary to cardiac compression by a mediastinal pseudocyst has also been reported²⁸. Biliary obstruction secondary to pseudocyst formation is also well described, and it leads to complications and cirrhosis. Although biliary obstruction may be caused by direct compression of the bile duct by a pseudocyst, most patients have an associated stricture of the intra-pancreatic portion of the bile duct that does not improve with pseudocyst drainage alone²⁹.

D. Rupture

Spontaneous rupture, the least common complication of pseudocyst formation, occurs in less than 3% of patients. Pseudocyst that ruptures anteriorly into the peritoneal cavity or posteriorly into the pleural cavity may lead to the development of

pancreatic ascites or pancreatic pleural effusion, respectively³⁰. Rupture into the peritoneal cavity may lead to severe acute abdominal pain resulting from chemical peritonitis. Rupture can also occur into adjacent hollow viscus. Silent rupture of a pseudocyst may also occur. Some pseudocysts are presumed to resolve by rupture or fistulization into an adjacent portion of the stomach or of small bowel, similar to operative endoscopic enteric drainage. No further therapy is needed in these circumstances.

INVESTIGATIONS

Persistent hyper amylasemia following attack of pancreatitis is clue to the presence of pseudocyst formation; it is present only in 50% of patients.

- A. *Ultrasound* : USG is 90% accurate and 98% specific in visualizing pancreas. In 1/3rd of the patients gas obscures the pancreas.
- B. *CT scan*: Contrast enhanced CT scan is the modality of choice for the frontline evaluation of a pseudo pancreatic cyst in the modern era⁴⁹.It provides additional information about retroperitoneal extension of fluid collections and relationship between pseudocyst and adjacent enteric lumen that is not available from USG.
- C. *ERCP*: ERCP demonstrates abnormalities of the pancreatic duct in up to 90% of the patients with pseudocysts. It should not be done routinely. ERCP is indicated in patients with jaundice to differentiate between common bile duct compression by the cyst and a stricture of the intrapancreatic portion of the common duct caused by fibrotic pancreases. In the former case, cyst drainage alone would relieve the jaundice, while in the latter case a biliary bypass procedure is required. As it may introduce infection into a previously sterile cyst, ERCP should be performed only when cyst drainage is to be done within 48 hours.
- D. *Angiography*: Is useful in patient who has had bleeding complications from pseudocyst or those who have portal hypertension. The finding of splenic vein thrombosis with left sided portal hypertension is an indication for splenectomy in patients undergoing operation for drainage of pseudocysts. There is also therapeutic use of angiography to control bleeding from pseudocyst.
- E. *MRI Scan*: The use of MRI has been advocated to predict whether solid debris with in a pseudocyst will prevent adequate percutaneous drainage³². Conventional MRI also has the potential advantage of being coupled with MRCP to help to define pancreatic duct anatomy relative to pseudocyst³³.
- F. *Barium Meal*: Is used in patients when there are features suggestive of compression to adjacent structure by the pseudocyst, mainly the stomach.
- G. *Percutaneous Aspiration*: To differentiate pseudocyst from other cyst of the pancreas, fluid is analyzed for amylase content, cytology and relative viscosity.

MANAGEMENT OF PANCREATIC PSEUDOCYSTS

- Observation

- Percutaneous Aspiration/Drainage
- Endoscopic Aspiration/Drainage
- Trans papillary Endoscopic Drainage Or Stenting
- Operative Approaches(Open Or Laparoscopic)
- Internal Drainage
- External Drainage
- Pancreatic Resection

Currently, treatment of patients with pancreatic pseudocysts is based on the clinical setting, the presence or absence of symptoms, the age and size of the pseudocyst, and the presence or absence of complications.

TIMING OF THE DRAINAGE

- A pseudocyst that occurs after an episode of alcohol-related pancreatitis has to be observed for 4 to 6 weeks with regular follow up and ultrasound examinations of the abdomen.
- After 6 weeks, observation should continue if the size of the cyst is less than 6cm and the patient is asymptomatic or if there is decrease in size.
- Therapy is indicated if the patient is symptomatic or if the cyst is more than 6cm, the cyst is increasing in size, the cyst is infected, or there is a suspicion of malignancy.
- Observation is unnecessary and immediate drainage is safe in cysts that have a mature wall or in those arising in chronic pancreatitis.
- Asymptomatic pseudocysts regardless of size and duration can be safely observed, provided that they are carefully monitored and are not increasing in size

PERCUTANEOUS ASPIRATION

It is aimed at aspirating all pseudocyst fluid at one procedure, without leaving an indwelling drainage catheter. Fewer than 50% of patients undergoing this technique, have complete resolution of their pseudocyst¹². The remaining patients will require repeat aspiration. Patients with pseudocyst in the tail of the pancreas and volume less than 100ml with low intracystic amylase levels are the best candidates for the percutaneous aspiration³⁴.

PERCUTANEOUS CATHETER DRAINAGE

It involves placement of an indwelling catheter into a pseudocyst by the Seldinger technique using ultrasound or CT guidance. The pseudocyst is normally entered through a flank or transgastric approach and the tract may be dilated to accept a catheter ranging in size from no.7 F to no.14 F. Contraindications to percutaneous drainage includes the presence of significant pancreatic necrosis or solid debris in the pseudocyst, lack of a safe access route, pseudocyst hemorrhage, and complete obstruction of the main pancreatic duct. The common complications of percutaneous catheter drainage are drain tract, persistent or recurrent pseudocyst and pancreatic cutaneous fistula.

ENDOSCOPIC APPROACH

Flexible upper GI endoscopy is used to localize and drain pseudocysts by creating a fistulous tract between the pseudocyst

and the stomach or duodenum²⁷. This communication is made using electrocautery, and an end prosthesis is left in place to stent open the fistula. Endoscopic drainage usually requires for the pseudocyst to be located in the head or body of the pancreas which is apposed to and bulging into the intestinal lumen. Endoscopic ultrasound can be used to visualize the pseudocyst and to choose a site for drainage. The complication of the procedure includes hemorrhage from the gastric or duodenal wall and perforation.

Trans ampullary pancreatic stent-is applicable in pseudocyst which has obvious communication with main pancreatic duct shown by ERCP. If possible, stent is placed through the ampulla, along the pancreatic duct and into the lumen of the pseudocyst; the tip of stent is placed as close as possible crossing any intervening stricture of the pancreatic duct. Complications include post procedure pancreatitis, bleeding and abscess formation secondary to stent obstruction.

OPERATIVE APPROACH (OPEN/LAPAROSCOPY)

Internal drainage

The three standard options include –

- i. Cystojejunostomy to a roux-en-y jejunal limb- advised when a pseudocyst is located at the base of the transverse mesocolon and is not adherent to the posterior gastric wall.
- ii. Cystogastrostomy- faster procedure and is advised when the pseudocyst is adherent to the posterior wall of the stomach.
- iii. Cystoduodenostomy - advised when the pseudocyst is in the pancreatic head or uncinata process that lie within 1cm of the duodenal lumen. Complications include – duodenal leak and subsequent fistula.

Cystojejunostomy and cystogastrostomy have comparable morbidity, mortality and recurrence rates^{35,36}.

External drainage

Is indicated when gross infection is found at the site of operation or an immature thin walled pseudocyst is present which will not allow safe internal drainage. On aspiration if purulent material is found, the content of the pseudocyst cavity is completely evacuated. Then atleast one closed suction drainage catheter is placed into the cavity and is brought out through the abdominal wall. Complications include pancreatic cutaneous fistula, most of which heals spontaneously.

Pancreatic resection

Distal pancreatectomy is done for pseudocyst located in the body or tail of the gland. After distal pancreatectomy, a roux-en-y pancreatico-jejunostomy to the remnant pancreas may be required to decompress an obstructed abnormal proximal pancreatic duct. Pancreatico-duodenectomy is advised in

symptomatic pseudocyst present in the head of the pancreas associated with an inflammatory mass. In this case pylorus preserving pancreatico-duodenectomy is the procedure of choice.

II. MATERIALS AND METHODS

SOURCE OF DATA:

- Current study was a prospective study conducted at Mahatma Gandhi Memorial Hospital, attached to Kakatiya Medical College, Warangal, Telangana State, India.
- Total 32 patients of pseudo pancreatic cyst, fulfilling the inclusion criteria were included in the study.

STUDY PERIOD: Study was conducted from August 2012 to July 2014

The following inclusion and exclusion criteria were used:

INCLUSION CRITERIA:

- a) Patients diagnosed as pseudo pancreatic cyst with help of diagnostic procedure like
USG abdomen, Barium meal, CT scan Abdomen.
- b) Admitted patients of both sex and all age groups.

EXCLUSION CRITERIA:

- a) All the true cyst of pancreas.
- b) Neoplastic cystic swelling of pancreas.
- c) Hydatid cyst of pancreas.
- d) Congenital cysts of pancreas.

METHODOLOGY:

This study has included both adults and pediatric age group patients. Patients with diagnosis of pancreatitis were monitored. During the course of their illness, if they developed features suggesting of pancreatic pseudocyst, USG of abdomen was done and if it confirmed the presence of pseudocyst these patients were included in our study. Those patients only with or chronic pancreatic or peripancreatic fluid collection without evidence of encapsulation on USG were excluded from the study.

All patients with acute pseudocyst were managed conservatively by withholding oral intake, giving IV fluids, analgesics and antibiotics as long as they had pain abdomen, vomiting or ileus. They were then followed up if the cyst did not regress. Follow up continued till the wall of the cyst matured. All mature cysts were treated surgically. Data like duration of hospital stay, conservative management and its results and surgical procedure done and their results, complications if any, progress of the pseudocyst on follow up were carefully recorded.

III. OBSERVATIONS AND ANALYSIS

The results obtained were analyzed as follows.

TABLE – 1: AGE DISTRIBUTION

Age in years	No.of patients	Percentage
≤10	2	6.25
11-30	10	31.25
31-50	16	50
≥51	4	12.5

In our study of 32 patients, the age of patients was from 1 years to 65 years. Pseudo pancreatic cyst was common in age group 31 – 50 (50%) with mean of 40 years. (Figure 1) This was probably due to alcohol use which was common in this age group.

Figure 1: Showing age distribution of patients

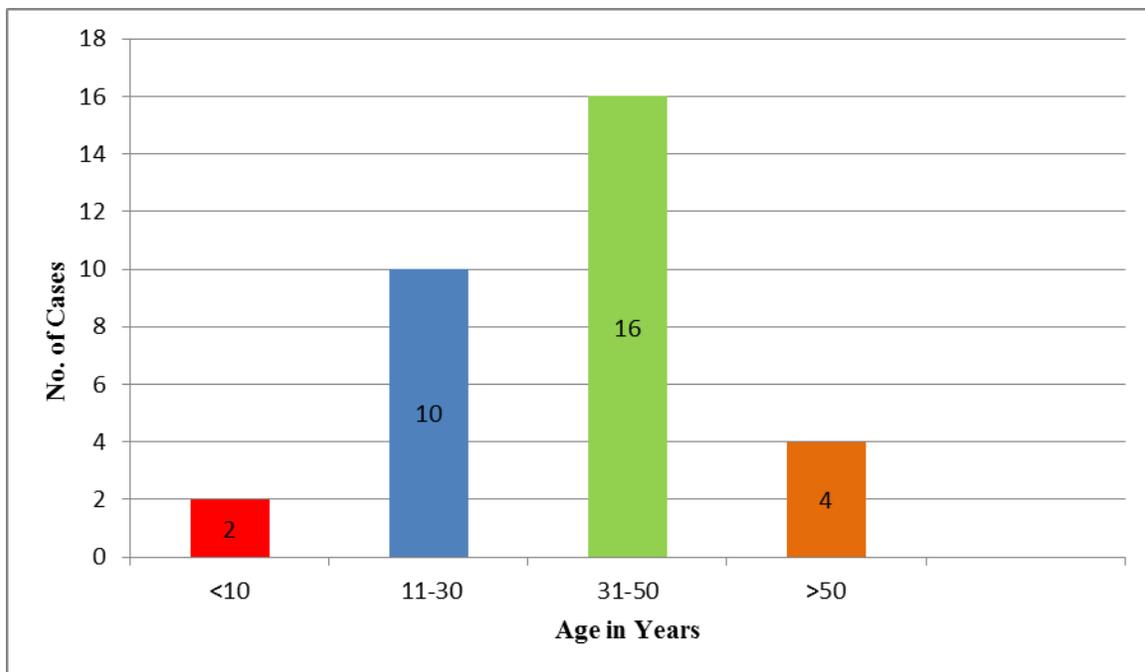


TABLE – 2: SEX INCIDENCE

Sex	No.of patients	Percentage
Male	26	81.25
Female	6	18.75

In our study of 32 patients, there were 26(81.25%) male patients and 6(18.75%) female patients indicating that the disease is more common in males with ratio of male to female is 4.33:1. (Figure 2) This again was due to a higher alcohol intake in males.

Figure 2: Shows sex distribution of patients.

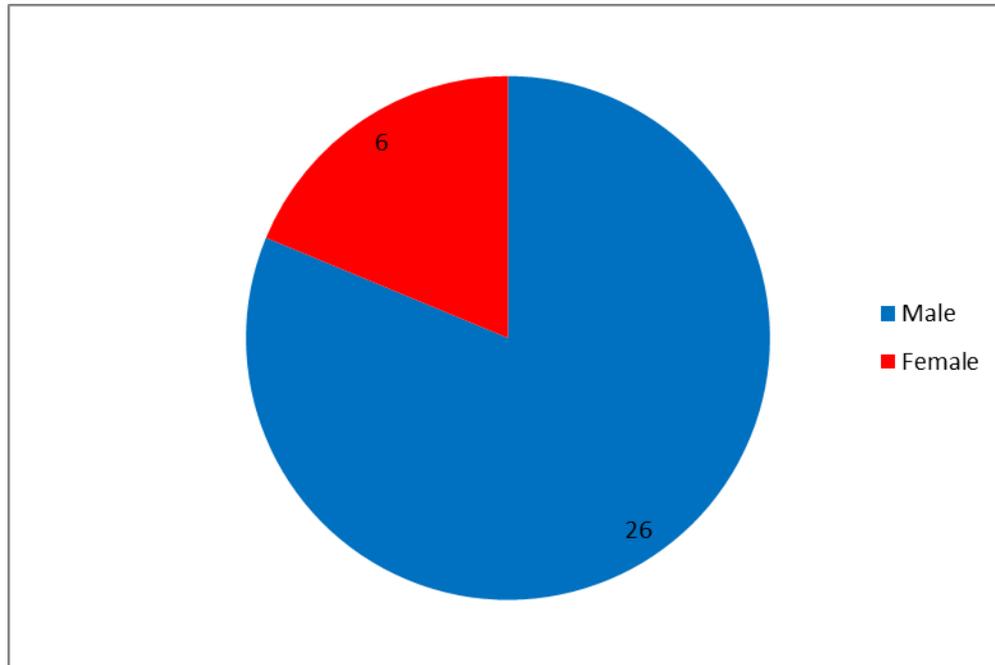


TABLE – 3: SYMPTOMS

Symptoms and signs	No.of patients	Percentage
Abdominal Pain	32	100
Nausea/vomiting	24	75
Abdominal distension	24	75
Anorexia	8	33.33
Fever	6	18.75
Weight loss	4	12.5
Jaundice	1	3.12

The commonest symptom was upper abdominal pain which was present in all patients (100%), followed by nausea/vomiting which was present in 75% of the patients and abdominal distension (mass) present in 75% of the patients. (Figure 3)

Figure 3: Shows number of patients with symptoms.

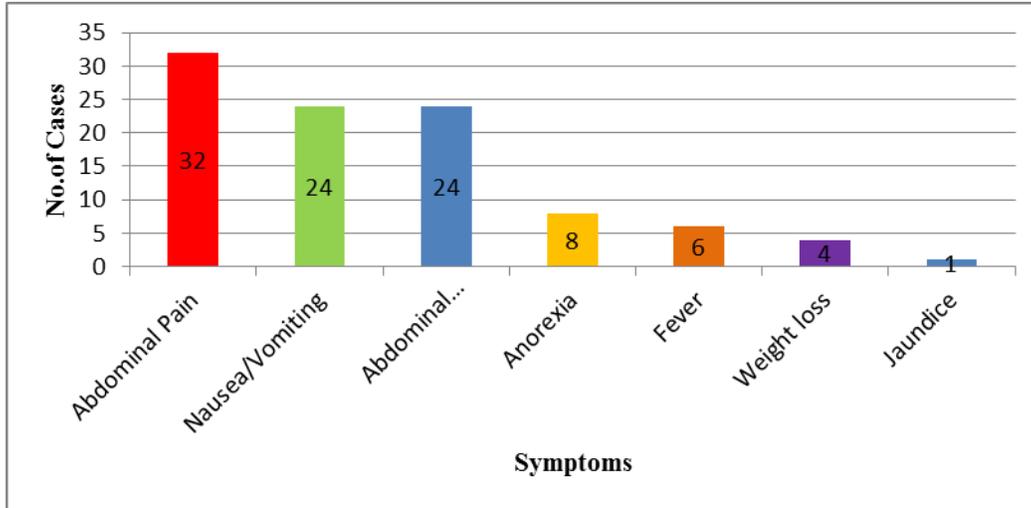


TABLE – 4: SIGNS

Signs	No. of cases	Percentage
Mass abdomen	24	75
Ascites	1	3.12
Ileus/intestinal obstruction	1	3.12
Abdominal tenderness	32	100

The commonest sign was upper abdominal tenderness which was present in all the patients (100%), followed by mass per abdomen which was present in 75% of the patients. (Figure 4)

Figure 4: Shows number of patients with signs.

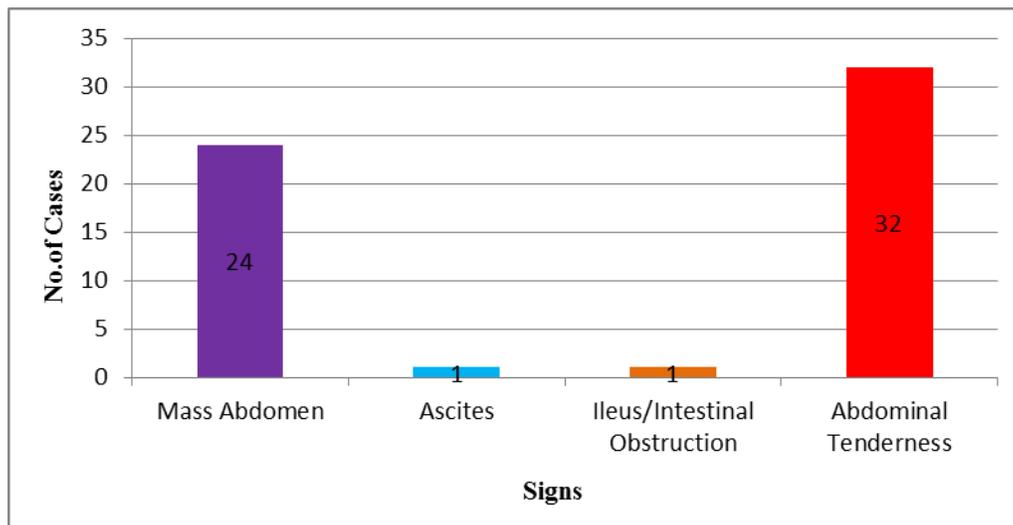


TABLE: 5 RISK FACTORS

Risk factors	No. of cases	Percentage
Alcohol	21	65.62
Blunt trauma	2	6.25
Biliary disease	2	6.25
Idiopathic	7	21.87

The commonest risk factor was alcohol consumption which was present in 5.62% of the patients, followed by idiopathic in 21.87%, blunt trauma was present in 6.25% and biliary disease in 6.25% patients.

Figure 5: Risk factors contribution for Pancreatitis.

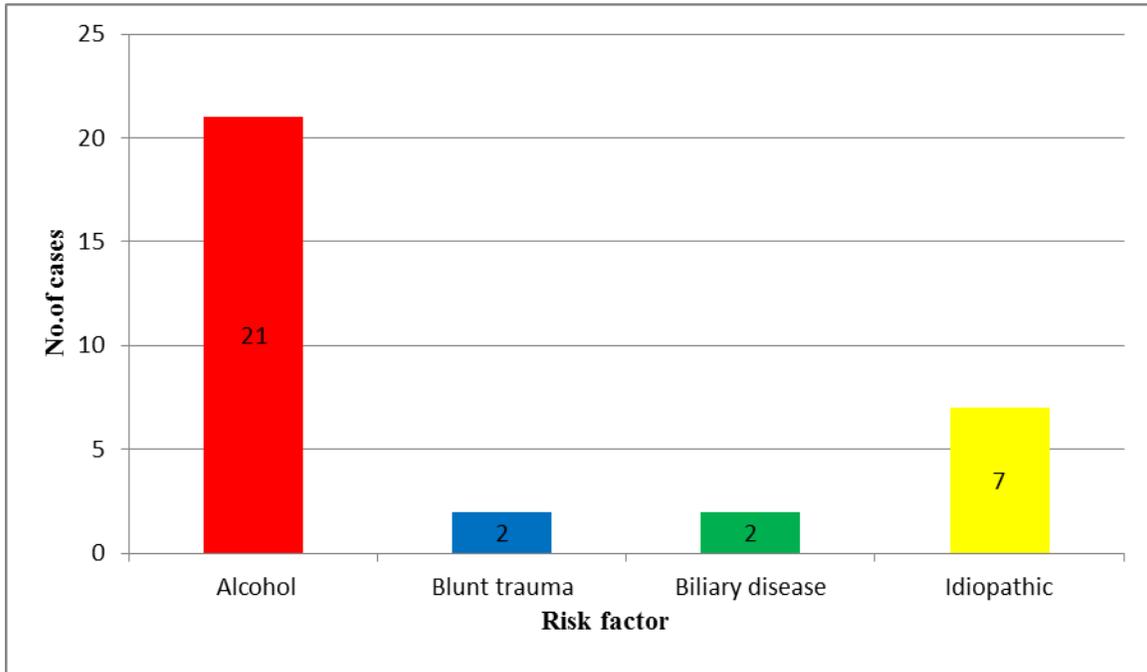


TABLE: 6 ASSOCIATED COMPLICATIONS

Complications	No .of cases	Percentage
Infection	6	18.75
Ascites	1	3.12
Obstruction	1	3.12
Rupture	-	-
Hemorrhage	-	-

Infection was the complication found in 18.75% of patients followed by ascites and obstruction, 3.12% in each groups and there were no cases of rupture and hemorrhage.

Figure 6: Complications in patients

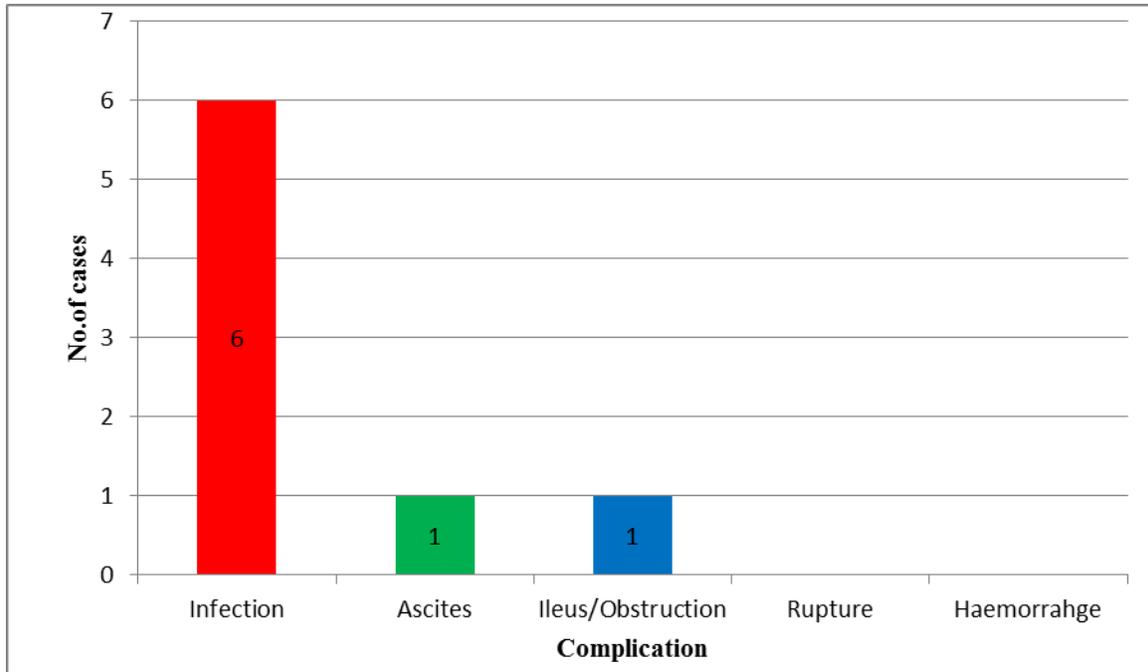


TABLE: 7 INVESTIGATIONS

Investigation findings	No .of cases	Percentage
Increased serum amylase	8	25
Increased ascitic amylase	1	3.12
Barium meal(+ve)	8	25
USG(+ve)	32	100
CT scan (+ve)	32	32

Ultrasound was the basic investigation done in all patients (100%). Barium meal was done in 25% of the patients with complaints suggestive of adjacent organ compression mainly stomach. CT-scan was done in all patients to know the extent and complication of the cyst that could not be made out by ultrasound. Serum amylase was done in all the patients and the results were positive in all the patients of acute pancreatitis (8 cases) and ascitic amylase was done in 1(3.12%) of the patients and result was positive.

Figure 7: Shows investigations done in patients.

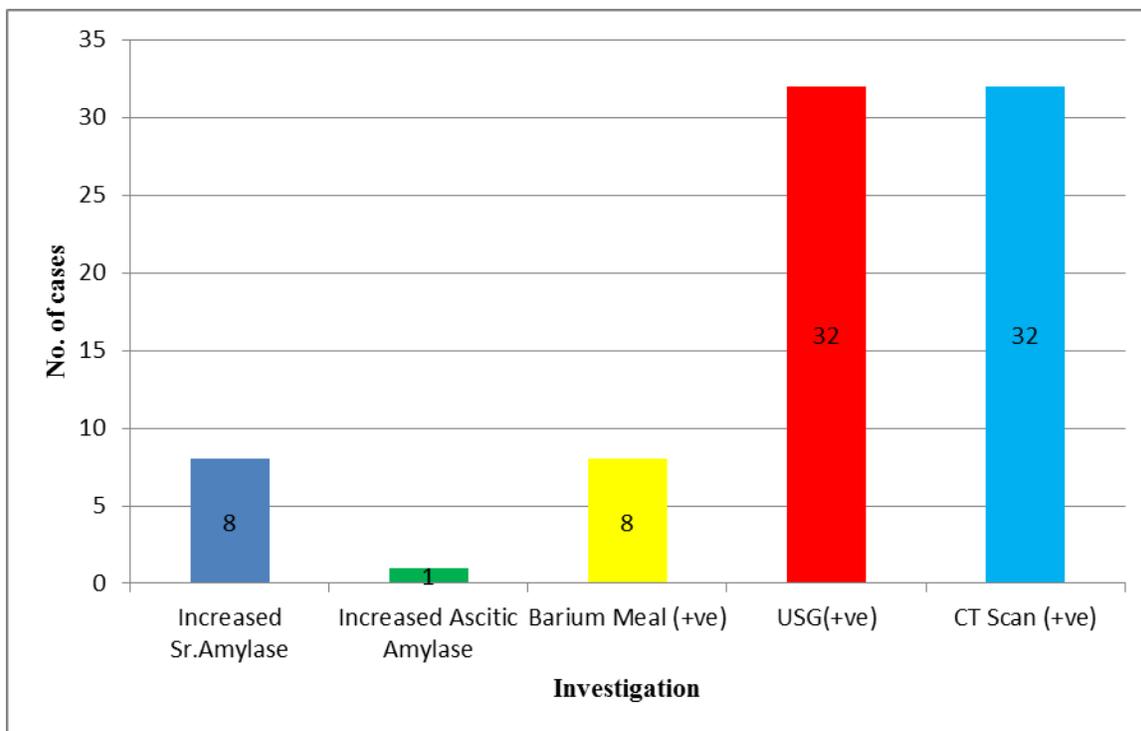


TABLE: 8 TREATMENT

Treatment	No. of cases	Percentage
Conservative	6	15.62
Percutaneous aspiration	2	6.25
External catheter drainage	7	21.87
Cystogastrostomy	16	50
Cystojejunostomy	2	6.25
Distal pancreatectomy	-	-

The commonest treatment was cystogastrostomy in 50% of the patients followed by external catheter drainage in 21.87%, conservatively managed in 15.62% and percutaneous aspiration and cystojejunostomy was done in 6.25% of patients in each group.

Figure 8: Shows treatment given for patients.

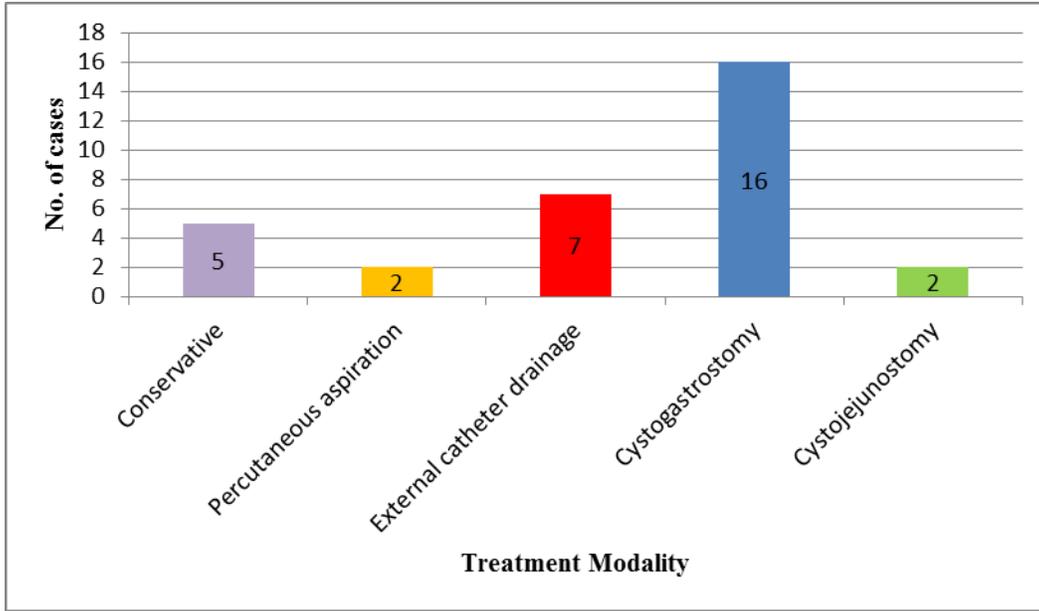
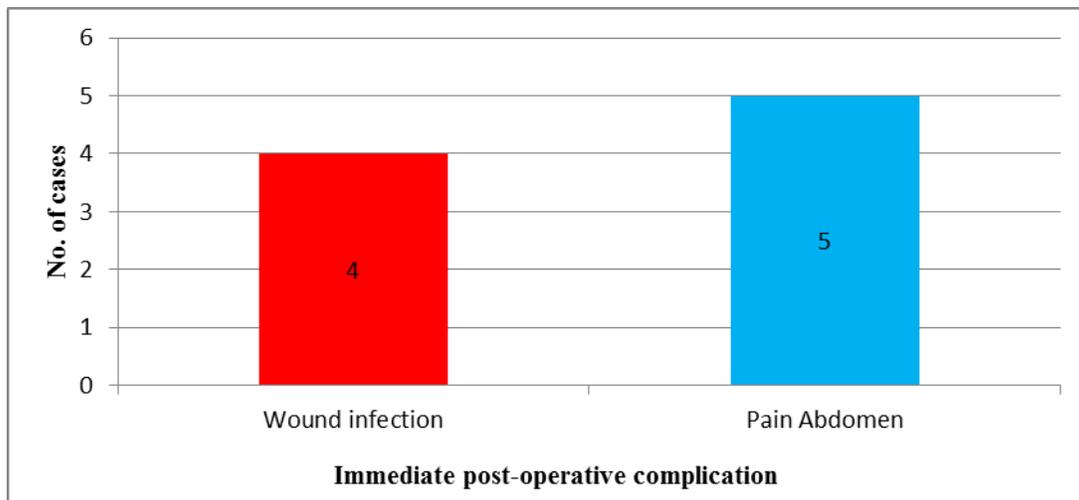


TABLE: 9 IMMEDIATE POSTOPERATIVE COMPLICATIONS

Complications	No .of cases	Percentage
Wound infection	4	12.5
Pain abdomen	5	15.62

Immediate postoperative persistent pain abdomen was present in 15.62% of patients and wound infection in 12.5% of patients.
 Figure 9: Patients with immediate post-operative complications



IV. DISCUSSION

Sex incidence:

Out of 32, 26 patients were male and 6 patients were female. This is compared with the study of V.Ustoff et al (2000)³⁷ and C.Palanivelu et al (2007)³⁸.

Sex	C.Palanivelu et al	V.Ustoff et al	Present study
Male	70.37%	75%	81.25%
Female	29.63%	25%	18.75%

The incidence of pseudo pancreatic cyst is predominated in males; this is due to the fact that alcohol consumption is common in males compared to females.

Age distribution:

32 cases of pseudo pancreatic cyst have been studied. Out of 32 cases, 2 were of pediatric age group and 30 were of adult groups.

In our study the common age group was 31-50 years (50%) cases, this is compared with a study group of C.Palanivelu, et al (2007) and V.Usatoff, et al (2000).

Age in years	C.Palanivelu et al	V.Ustoff et al	Present study
Mean age group	44	39	40

This result was probably due to alcohol consumption was more in this age group. There were 2 patients under pediatric age group; the cause was unknown. There were 4 patients over the age of 51 in our study.

Clinical features:

The commonest presenting symptoms were pain abdomen and abdominal distension/ mass per abdomen. These were compared with the study group of C.Palanivelu, et al (2007) and V.Usatoff, et al (2000).

Clinical feature	C.Palanivelu et al	V.Ustoff et al	Present study
Pain abdomen	54.63%	100%	100%
Mass per abdomen	9.25%	70%	75%

All patients in our study group presented with pain abdomen and mass per abdomen in 75% of the patients.

Risk factors:

The commonest risk factor in our study was alcohol consumption. This is compared with the following study groups.

Risk factor	C.Palanivelu et al	V.Ustoff et al	Present study
Alcohol Consumption	18.52%	71.42%	65.62%

Alcohol consumption was the commonest risk factor.

Complications:

The commonest complication was infection followed by ascites. This is compared with V.Ustoff et al (2000).

Complication	V.Ustoff et al	Present study
Infection	8.03%	18.75%
Ascites	1.7%	3.12%

Treatment:

Treatment commonly employed in our study was internal drainage; done in 56.25% of patients. This is compared with the following study groups.

Treatment	C.Palanivelu et al	V.Ustoff et al	Present study
Internal drainage	92.6%	3%	56.25%
External drainage	7.4%	40%	18.75%

In a study done by Kim KO, Kim TN (2013)³⁹, conservative management was done in 19.42% of patients. In our study conservative management was done in 15.62% of the patients and percutaneous aspiration in 6.25% of patients in our study group.

Postoperative complications:

In our study the commonest complication was persistent pain abdomen followed by wound infection in immediate postoperative period. This is compared with the study group of Tuula kiviluoto et al (1989) and V.Usatoff, et al (2000).

Complication	Tuula kiviluoto et al	V.Ustoff et al	Present study
Pain abdomen	29%	10%	15.62%
Wound infection	2%	4%	12.5%

Immediate postoperative complications in our series include, persistent pain abdomen, present in 15.62% of the patients and wound infection in 12.5% of the patients.

In our study most of the patients were followed up to periods varying from 3-6 months. There were no complications except recurrence in 2 patients. 3 of the patients were lost to follow up.

V. SUMMARY

Pancreatic pseudocyst represents a common problem in patients with acute and chronic pancreatitis.

- Male patients continue to predominate with incidence of 81.25%.
- Maximum incidence is in the age group of 31-50 years.
- Abdomen pain and tenderness are the most common presenting signs and symptoms seen in 100% of patients.
- Incidence of palpable mass was in 75% but with usage of USG and CT-Scan, pseudocyst was detected in all the patients.
- Uncommon presentations were jaundice, ascites and fever.
- Fever was present in 6 patients, in cases of infected pseudocyst.
- The most common etiological factor was alcohol consumption, which was present in 65.62%. This is followed by idiopathic group which constitutes 21.87%, blunt trauma and biliary disease constitutes 6.25% each.
- USG was the best investigating method for the diagnosis of pseudocyst and was able to detect pseudocyst in all the patients, though extent and complication were clarified by CT-scan. Barium meal was done in 25% of the patients to know the degree of compression on the stomach.
- Infection was a common complication present in 18.75% of patients followed by ascites and obstruction in 3.12% of cases each. The patients with infection and ascites were managed by external catheter drainage.

- Conservative treatment is useful in uncomplicated, acute pseudocysts till they regress or mature when surgery became necessary.

- USG guided aspiration was done in 6.25% of patients who refused surgery and recurrence was seen in all these patients.

- The results of cystogastrostomy and cystojejunostomy was excellent. The choice of procedure was decided upon the location of the pseudocyst, its contents and general condition of the patient. External drainage was done in 21.87% of the patients with infected pseudocyst and in patient with ascites.

VI. CONCLUSION

- The disease was most common in the age group 31-50 years and was seen mainly in males.
- Most common cause for the pseudocyst is alcohol induced, followed by idiopathic.
- Most common presentation is pain abdomen with abdominal tenderness.
- Ultrasonography and CT_Scan were the most useful investigations for diagnosis and follow-up. Barium meal was required in selected cases.
- Acute pseudocysts were treated conservatively, infected cysts required external drainage. Percutaneous aspiration resulted in recurrence in our cases.
- Anastomoses of the cyst to the nearby bowel, either cystogastrostomy or cystojejunostomy was done in the majority of cases with good results.
- Most common post operative complications are persistent pain abdomen and wound infection.
- Total duration of hospital stay ranged from 10 to 15 days.
- Follow up was done for 3 to 6 months, 3 cases lost in follow up. Recurrence is seen in two cases who refused re-admission.

REFERENCES

- [1] Ernest L. Rosato, Christopher J. Sonnenday, Keith D. Lillmoe, Carles J. Yeo. Pseudocyst and other complications of pancreatitis. In : Shackelford's surgery of alimentary tract. Carles J Yeo, Danies T. Dempsey, Andrews Khein, et al.,7th Ed., Saunders Elsevier. 2013; p.1144-1167.
- [2] Bradley EI. III, Gonzalez AC, Clements JJ, Jr: Acute pancreatic pseudocysts: Incidence and implications. *Ann Surg* 1976;184:734.
- [3] Nealon W, Walser E. Duct drainage alone is sufficient in operative management of pancreatic pseudocyst with chronic pancreatitis. *Ann Surg* 2003;237:614.
- [4] Grace PA and Williamson RCN. Modern management of pancreatic pseudocysts. *Br J Surg* 1993; 80:573-581.
- [5] Imrie CW, Buist I J, Shearer NIC: Importance of cause in the outcome of pancreatic pseudocysts. *Am J Surg* 1988;156:159.
- [6] Nguyen BIT, Thompson JS, Edney JA, et al: Influence of the etiology of pancreatitis on the natural history of pancreatic pseudocysts. *Am J Surg* 1991;162:527.
- [7] Ephgrave K, Hunt JL: Presentation of pancreatic pseudocysts: Implications for timing of surgical intervention. *Am J Surg* 1986;151:749.
- [8] Mullins RJ, Malangoni MA, Bergamini TM, et al: Controversies in the management of pancreatic pseudocysts. *Am J Surg* 1988;155:165.
- [9] Vitas GJ, Sarr MG: Selected management of pancreatic pseudo-V J cysts: Operative versus expectant management. *Surgery* 1992;111:123.
- [10] Heider R, Meyer AA, Galanko JA, Behrns KE: Percutaneous drainage of pancreatic pseudocysts is associated with a higher failure rate than surgical treatment in unselected patients. *Ann Surg* 1999;229:781.
- [11] von Sonnenberg E, Wittich GR, Casola G, et al: Percutaneous drainage of infected and noninfected pseudocysts: Experience in 101 patients. *Radiology* 1989;170:757.
- [12] Grosso M, Gandini G, Cassinis MC, et al: Percutaneous treatment of 74 pancreatic pseudocysts. *Radiology* 1989;173:493.
- [13] Adams DB, Harvey TS, Anderson MC, et al: Percutaneous catheter drainage of infected pancreatic and peripancreatic fluid collections. *Arch Surg* 1990;125:1554.
- [14] Yeo CJ, Bastidas JA, Lynch-Nyhan A, et al: The natural history of pancreatic pseudocysts documented by computed tomography. *Surg Gynecol Obstet* 1990;170:411.
- [15] Adams DB, Zellner JL, Anderson MC: Arterial hemorrhage complicating pancreatic pseudocyst: Role of angiography. *J Surg Res* 1993;54:150.
- [16] Stabile BE, Wilson SE, Debas HT: Reduced mortality from bleeding pseudocysts and pseudoaneurysms caused by pancreatitis. *Arch Surg* 1983;118:45.
- [17] Li Tiegang MD, Wang Nana & Zhao Min MM: *American Journal of Emergency Medicine*-2011 : volume 29, issue9; pages 1238e1-1238e3.
- [18] Huizinga WKH, Kalidcen JM, Bryer JV, et al: Control of major hemorrhage associated with pancreatic pseudocysts and pseudoaneurysms caused by pancreatitis. *Br J Surg* 1984;71:133.
- [19] Steckman ML, Dooley MC, Jaques PF, et al: Major gastrointestinal hemorrhage from peripancreatic blood vessels in pancreatitis: Treatment by embolotherapy. *Dig Dis Sci* 1984;29:486.
- [20] Balachandra S, Siriwardena AK: Systematic appraisal of the management of the major vascular complications of pancreatitis. *Am J Surg* 2005;190:489.
- [21] Bergert H, Dobrowolski F, Caffier S, et al: Prevalence and treatment in bleeding complications in chronic pancreatitis. *Langen-becks Arch Surg* 2004;389:504.
- [22] Aranha GV, Prinz RA, Greenlee HB, et al: Gastric outlet and duodenal obstruction from inflammatory pancreatic disease. *Arch Surg* 1984;119:833.61
- [23] Propper DJ, Robertson EM, Bayliss AP, et al: Abdominal pancreatic pseudocyst: An unusual case of dysphagia. *Postgrad Med J* 1989;65:329.
- [24] Winton TL, Birchard R, Nguyen KT, et al: Esophageal obstruction secondary to mediastinal pancreatic pseudocyst. *Can J Surg* 1986;29:376.
- [25] Woods CA, Foutch PG, Waring JP, et al: Pancreatic pseudocyst as a cause for secondary achalasia. *Gastroenterology* 1989;96:235.
- [26] Landreneau RJ, Johnson JA, Keenan RJ, et al: "Spontaneous" mediastinal pancreatic pseudocyst fistulization to the esophagus. *Ann Thorac Surg* 1994;57:208.
- [27] McCormick PA, Chronos N, Burroughs AK, et al: Pancreatic pseudocyst causing portal vein thrombosis and pancreatopleural fistula. *Gut* 1990;31:561.
- [28] Lee FY, Wang YT, Poh SC: Congestive heart failure due to a pancreatic pseudocyst. *Cleve Clin J Med* 1994;61:141.
- [29] Warshaw AL, Rattner DW: Facts and fallacies of common bile duct obstruction by pancreatic pseudocysts. *Ann Surg* 1980;193:33.
- [30] Lipsett PA, Cameron JL: Internal pancreatic, fistula. *Am J Surg* 1992;163:216.
- [31] Morgan, Katherine. A. MD, Adams, David B. MD, FACS: *Current Surgical Therapy* 2014 ;Pages 454-458.
- [32] Morgan DE, Baron TH, Smith JK, et al: Pancreatic fluid collections prior to intervention: Evaluation with MR imaging compared with CT and US. *Radiology* 1997;203:773.
- [33] Barishma MA, Yucel EK, Ferrucci JT: Magnetic resonance cholangiopancreatography. *N Engl J Med* 1999;341:258.
- [34] Duvnjak M, Duvnjak L, Dodig M, et al: Factors predictive of the healing of pancreatic pseudocysts treated by percutaneous evacuation. *Hepatogastroenterology* 1998;45:536.
- [35] Lehman GA: Pseudocysts. *Gastrointest Endosc* 1999;49:S81.
- [36] Newell KA, Liu T, Aranha GV, et al: cystogastrostomy and cystojejunostomy equivalent operations for pancreatic pseudocysts? *Surgery* 1990; 108:635.
- [37] Usatoff V, Brancatisano R, and Williams RCN. Operative treatment of pseudocysts in patients with chronic pancreatitis. *Br J Surg* 2000;87: 1494-1499.
- [38] Palanivelu. C, Senthil Kumar. K, Madhan Kumar. MV, Rajan. PS, Shetty. AR, Jani. K, Rangarajan. M, Mahesh Kumar. GS: Management of pancreatic pseudocyst in the era of laparoscopic surgery- Experience from a tertiary centre; *Surg Endosc*. 2007 Dec ;21(12):2262-7.
- [39] Kim Ko, Kim TN. Acute pancreatic pseudocyst; incidence, risk factors and clinical outcomes: *Pancreas* 2012 ;41(4);577.81.

AUTHORS

First Author: Dr. Sridhar Reddy Patlolla, Senior Resident, Dept of General Surgery, Kakatiya Medical College, Mahatma Gandhi Memorial Hospital, Warangal, Telangana State-506007. E-mail: sridhar258@gmail.com.

Second Author: Dr. Bantu Rajsiddharth, Associate Professor, Dept of General Surgery, Kakatiya Medical College, Mahatma Gandhi Memorial Hospital, Warangal, Telangana State-506007. E-mail: dr.rajsiddharth@gmail.com.

Third Author: Dr. Bande Karunakar Reddy, Professor and Head of the Department, Dept of General Surgery, Kakatiya Medical College, Mahatma Gandhi Memorial Hospital, Warangal, Telangana State-506007. E-mail: bandekr@gmail.com.

Corresponding Author : Dr. Bantu Rajsiddharth. E-mail: dr.rajsiddharth@gmail.com. Alternate E-mail: sridhar258@gmail.com. Contact No. 9866666650, 9676143980.

Contributors:

1. Dr. Sridhar Reddy Patlolla
2. Dr. Bantu Rajsiddharth
3. Dr. Bande Karunakar Reddy

