Retro-gastric Approach for Cystogastrostomy as a Standard Technique for Treatment of Pancreatic Pseudocyst

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Aim: *To compare the retrogastric approach versus the classic anterior approach of cystogastrostomy for cases of retrogastric pseudopancreatic cyst.*

Patients and methods: *Eight patients underwent pseudopancreatic cystogastrostomy, Group A (4 patients) via retro gastric approach and Group B (4 patients) via conventional anterior approach. These operations were performed at Ain Shams University Hospitals between January 2012 and November 2013. Patients with large (more than 6 cm), long standing (more than 6 weeks) retrogastric pseudopancreatic cysts were added to the study.*

Results: *Significant decrease in the intraoperative time was found where retrogastric approach was conducted in group A. As regard the complications, postoperatively, one of the patients of group B developed upper GIT bleeding which was managed by upper GI endoscopy and another patient developed cyst recurrence which necessitated re-exploration and cystojejunostomy after failure of percutaneous methods. There were no major complications in group A. All patients were discharged between the 3rd and 8th day after the procedure.*

Conclusion: *We believe that the retrogastric approach is a simple, quick and safe alternative technique for surgical treatment of pseudopancreatic cyst.*

Key words: *Pseudopancreatic cyst, cystogastrectomy, retrogastric approach.*

Introduction:

Pancreatic pseudocyst is the most common cystic lesion of the pancreas. It occurs in association with inflammatory conditions of the pancreas such as severe acute pancreatitis, chronic pancreatitis and pancreatic trauma. Pancreatic pseudocyst can be intrapancreatic and, more commonly, extrapancreatic with the most common site of involvement being the lesser sac. Rare locations include the paracolic gutters, pelvis and the mediastinum, when it extends along tissue planes. The therapeutic options include surgical internal drainage, endoscopic drainage techniques and percutaneous catheter drainage (PCD) methods. Pancreatic pseudocyst (PP) has been defined as a collection of pancreatic juice, enclosed by a wall of fibrous or granulation tissue, which arises as a consequence of acute pancreatitis, pancreatic trauma or chronic pancreatitis. Although the indications and timing of the intervention in PP related to acute pancreatitis are still controversial, there is an agreement that large, persistent and symptomatic cysts should be drained since they are usually associated with complications. The internal drainage of PP, which is the method of choice, can be achieved by surgical or endoscopic interventions. Endoscopic therapy is a promising modality but requires experienced endoscopists and might be associated with stent-related complications, inadequate drainage, repeated interventions and risk of perforation. Surgery continues to be the chief method in PP drainage.

Patients and methods:

Eight patients underwent open cystogastrostomy surgery for PP between January 2012 and November 2013 in Ain

Shams university hospitals. The patient's mean age at presentation was 49 years (range 40-58 years). There were 7 females and one male patients.

Inclusion criteria: All the patients had non-resolving (acute pseudocysts should be allowed to mature for more than 6 weeks to allow the cyst wall to mature as this facilitates internal drainage), symptomatic (the development of symptoms is indicative of an impending complication such as rupture, hemorrhage and infection) and large cysts complicating acute pancreatitis (operative drainage was recommended for all pseudocysts larger than 6 cm). The etiologies of the acute pancreatitis were gallstones (seven patients) and hyperlipidemia (one patient). No endoscopic or percutaneous intervention was attempted before surgery and the minimal time from the onset of acute pancreatitis to surgery was six weeks (the ideal time to drain these pseudocysts internally is 6 to 8 weeks after their appearance, when the cyst is intimately attached to the surrounding structures and the surrounding inflammatory reaction is quiescent). The diagnosis was made by computerized tomography (CT) and ultrasound (US) in all cases.

Exclusion criteria: Patients with previous attempts of endoscopic drainage, recurrent cases, previous upper abdominal surgeries and patients with high anesthesia risk, were excluded from our study.

Surgical technique: The retrogastric approach (or lesser sac technique) was performed in 4 patients (group A) while the conventional anterior approach was performed in the other 4 patients (group B). General anesthesia with tracheal intubation was satisfactory. The patient was placed in supine position. Moderate elevation of the head of the table (reverse Trendlenburg position) facilitated exposure. The lower thorax and abdomen were prepared in the usual manner. An epigastric midline incision could have been used for this procedure. After the peritoneal cavity was reached, exploration was carried out with particular emphasis on the gallbladder and common bile duct. Fat necrosis in the omentum or transverse mesocolon was commonly found. In group A, after the field was walled off by gauze pads, the omentum overlying the cyst was opened and all bleeding points were ligated **Figure (2)**. The diagnosis of a cyst was confirmed by needle aspiration of the suspected area. The cyst was then partly aspirated to determine the thickness of the cyst wall and confirm the diagnosis. Specimens of the cyst contents were sent for culture and sensitivity, amylase and electrolyte determination and cytological examination. Guide sutures were placed into the wall of the cyst, and a 5 cm transverse opening was made at the desired level for drainage. Suction should be available for aspirating the cyst contents **Figure (3)**. The full thickness of the cyst wall was taken as a biopsy. Exploration of the interior of the cyst with the index finger was done, carefully checking for coexistent neoplasm and pocketing within the cystic cavity. The posterior gastric wall was then opened via longitudinal incision **Figure (4)**. A one-layer anastomosis using interrupted 00 vicryl absorbable sutures was performed. It was imperative that the full thickness of the stomach as well as the full thickness of the cyst wall be included in each suture **Figure (5)**.

In group B, stay sutures on anterior wall stomach were performed then, transverse gastrostomy through the anterior gastric wall. The cyst was palpated through the posterior wall of the stomach and aspiration of the contents was done. Transverse incision was done through the posterior wall of the stomach and an Ellipse of wall was sent for histopathological examination. Interrupted 00 vicryl absorbable synthetic suture through the posterior wall stomach and anterior wall cyst was performed. Good hemostasis was ensured. Upon completion of the cystogastrostomy anastomosis, the gastrotomy was closed in two layers.

All patients also underwent a cholecystectomy if this has not been done previously.

Two large bore (20 F) drains were placed in the Morison and pelvic cavities and the abdomen was closed in layers.

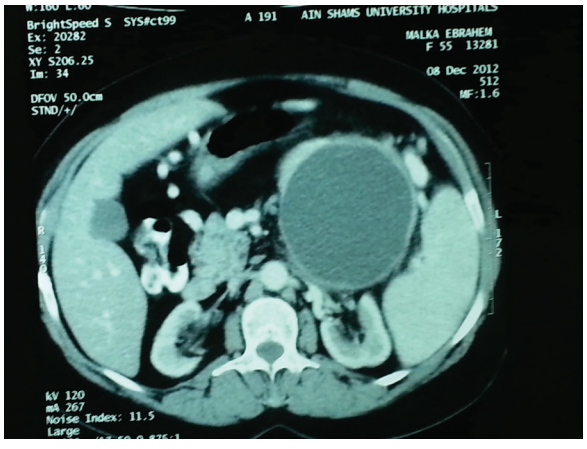

Figure (1): Pelvi-abdominal CT showing large (12 cm) pseudo-pancreatic cyst.

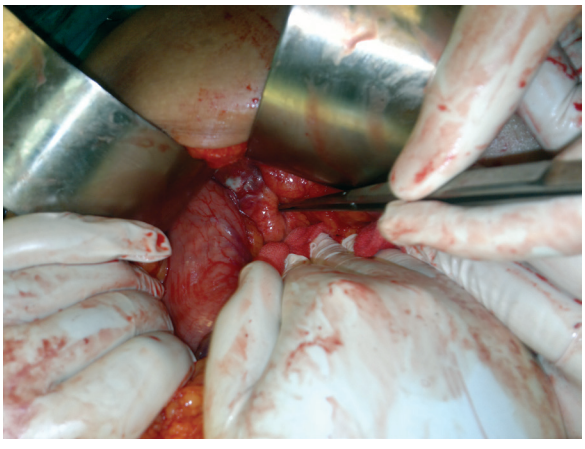

Figure (2): Exposure of the posterior gastric wall (left) and the cystic wall (right) after opening the lesser sac.

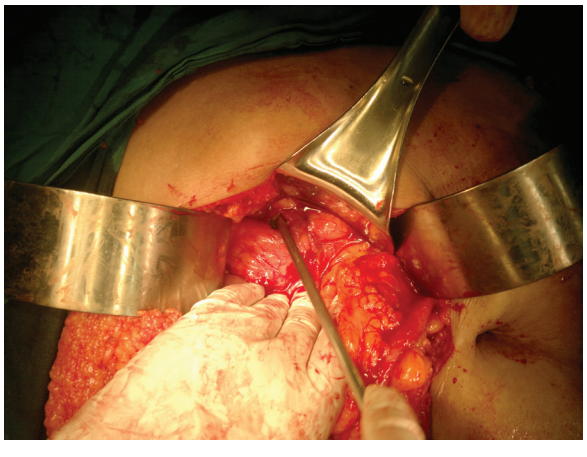

Figure (3): Opening the wall of the cyst and complete drainage of the content.

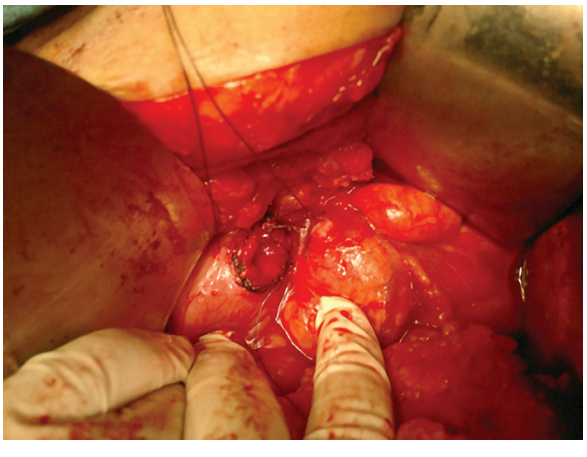

Figure (4): Posterior approach for cysto-gastrostomy. The posterior gastric wall is opened and so the cystic wall.

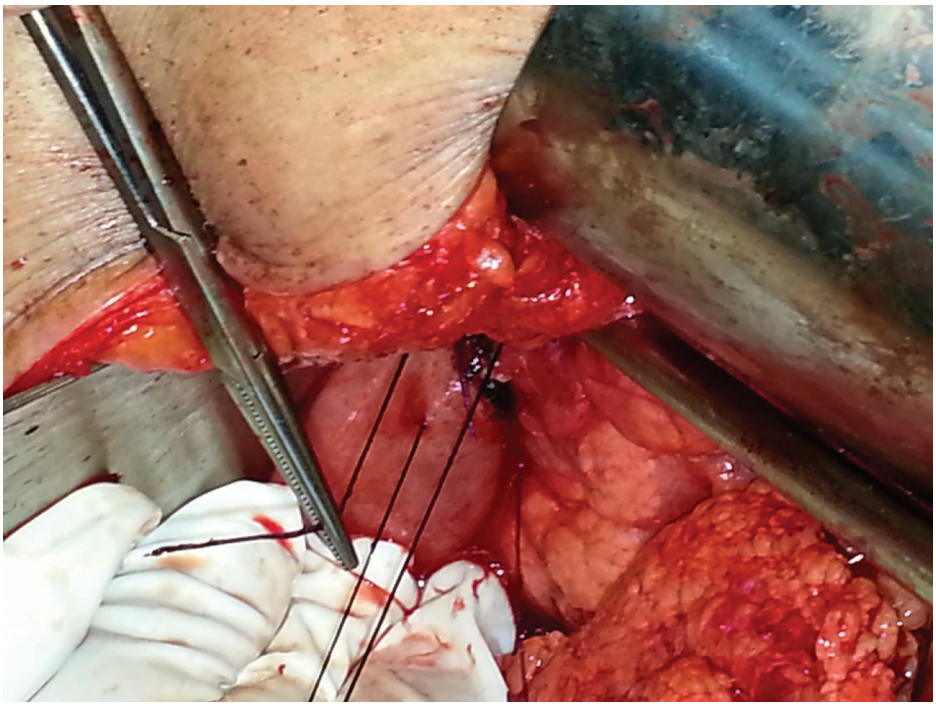

Figure (5): Anastomosing the posterior wall of the stomach to the cyst via the lesser sac.

Table (1): Distribution of patients' characteristics in both patients' groups.

	Group A	Group B	Total
No. of patients	4	4	8
No. of males	1	0	1
No. of females	3	4	7
Age	40-52 (average 46)	43-58 (average 50.5)	40-58 (average 49)
Cause of pseudopancreatic cyst: Pancreatitis hyperlipidemia	 3 1	 4 0	 7 1

Table (2): Intra-operative findings.

	Group A	Group B
Intra-operative time	64	105
Uniloculated cyst	2	3
Multiloculated cyst	2	1

Table (3): major postoperative complications.

	Group A	Group B	Management
Upper GIT bleeding	0	1	Endoscopic argon laser photocoagulation
Recurrence	0	1	cystojejunostomy

Follow-up: Patients were followed up at regular intervals at 1,3,6 and 12 months for recurrence by clinical (including symptoms and signs) and radiological evidence in the form of CT abdomen.

Results:

Eight patients were included in our study, seven females and one male patient. Seven patients had acute pancreatitis due to gall stones while one patient had hyperlipidemia as a cause for his unresolving pancreatitis **Table (1)**. All had non-resolving pancreatic pseudocysts (more than 6 weeks) and of a size larger than 6 cm (the range was 8 to 21 cm in our study–average 14.5 cm).

All patients underwent open cystogastrostomy, in group A, the retrogastric approach was adopted while in group B, conventional anterior approach was performed.

As regards the intra-operative differences between both techniques, the main advantages for the retrogastric approach of cystogastrostomy were: first, the significantly lower intra-operative time. In group A, the overall operative time was 64 minutes while in group B it was 105 minutes. This was explained by the fact that two anastomoses were required for the classic approach while single anastomosis was done in the posterior approach. Secondly, was the better exposure and exploration of the cyst from inside and outside for the presence of septa or other cysts which facilitate pocketing of the cyst (3 cases were found intra-operatively to be Multiloculated) **Table (2)**. Thirdly, larger anastomosis could be done allowing more drainage and finally more tissues could be biopsied and to be sent for histopathology.

Major Postoperative complications were absent in group A apart from one case of wound infection which was managed conservatively while in group B one case developed acute upper GIT bleeding. After resuscitation, urgent upper GIT endoscopy was done which revealed bleeding from the line of cystogastrostomy and endoscopic

control was sufficient.

Patients in group A were allowed for oral intake as early as 2nd postoperative day and were discharged on 3rd to 5th day while in group B, oral intake was started on the 3rd or 4th day and were discharged on 6th to 8th day.

No cases of recurrence were recorded after 12 months of follow up in group A as confirmed by abdominal CT scan while in group B, a single case of recurrence occurred after 6 months. The patient symptoms recurred in the form of persistent dyspepsia and by CT abdomen the recurrence was confirmed. Trial of endoscopic drainage was performed but was a failure. This necessitated reoperation and cystojejunostomy was performed due to excessive adhesions.

Discussion:

A pancreatic pseudocyst is an extravasated collection of exocrine pancreatic juice surrounded by a fibrous membrane made of adjacent viscera and parietal wall devoid of an epithelial lining. Appearance of post-inflammatory cyst results from leak of pancreatic juice from damaged pancreatic ducts, however it might be also a result of obstruction of the pancreatic duct by plugs or precipitated proteinaceous or local fibrosis. Pseudocysts develop in up to 25% of patients after acute pancreatitis.[1]

Pancreatic pseudocyst should be suspected in patients with acute pancreatitis whose symptoms fail to resolve within 7 to 10 days or in patients with chronic pancreatitis who complain of persistent pain, nausea, or vomiting.[2]

US is cost-effective non-invasive procedure but limited in evaluation of the pancreas and retroperitoneum. Pelvi-abdominal CT is the primary modality used for the evaluation of cystic pancreatic lesions. MRI may be used to distinguish cystic neoplasm from pseudocyst.[3,4]

Conservative treatment should always be considered the first option (pseudocysts should not be treated just because they are there). Observation (conservative treatment) of a patient with a pseudocyst is preponderantly based on the knowledge that spontaneous resolution can occur.[5]

The results of percutaneous or endoscopic drainage are probably more dependent on the experience of the interventionist than the choice of procedure.[6] Surgical internal drainage is the mainstay of treatment. These operations include cystogastrostomy, cystoduodenostomy, or cystojejunostomy (depending on the site of the pseudocyst) and can be done either through a standard laparotomy or laparoscopically.[7] For retrogastric pancreatic pseudocysts, cystogastrostomy is performed. Classically, in most studies discussing pancreatic pseudocysts, cystogastrostomy is done via anterior approach through the anterior gastric wall but posterior approach cystogastrostomy may prove better substitute.[8] Our study was conducted to find out if this posterior approach could be standardized for management of retrogastric pancreatic pseudocyst.

Several parameters were taken into consideration. First was the intraoperative time. Posterior approach cystogastrostomy requires less time in comparison to a conventional anterior approach (64 minutes versus 105 minutes) and this can be put down to the fact that no anterior gastrotomy was performed in the posterior approach making it more simple and faster procedure.

The second advantage that we found for the Posterior approach cystogastrostomy is the ability to completely expose and drain this pathological cyst with intraoperative diagnosis and management of multiple cystic lesions or intracystic adhesions thus decreasing the possibility of recurrence. In our study, all cystic lesions could be approached, all adhesions are dissected thus recurrent cysts didn't occur in the posterior approach while single case of recurrence was found in the anterior approach.[9]

Also, theoretically speaking, it would be an opportunity to take biopsy from any suspected solid wall lesion which would be easily missed in the classic anterior approach.

The fact that only one anastomosis is needed in the posterior approach while two anastomoses for the anterior approach, as a fact it decreases the intraoperative time

as discussed before, but also decreasing the possible complications that may occur at these lines of anastomosis, for example anastomotic leakage (no case was reported in our study) or hemorrhage (one case in the anterior approach group), thus favoring the posterior approach as a safer procedure.

A significant postoperative advantage of the posterior approach is the ability to start oral feeding as early as 2nd day and thus the patient can be discharged as early as 4th postoperative day. This would decrease the economic burden on the patient and the society because of less hospitalization days and early return to work.[10]

In the era of minimally invasive surgery, laparoscopy has a great role to play in the management of pseudocyst of pancreas. Early studies adopted the classic anterior approach, but the posterior approach proved more suitable and became the standard approach in laparoscopic cystogastrostomy.[11,12,13]

Due to rarity of these cases, it is recommended that further studies should be conducted so more statistically significant results could be obtained.

Conclusion:

We think that the posterior approach for surgical treatment of retrogastric pseudopancreatic cyst should be replacing the classic anterior approach as a safe, simple, and fast alternative.

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