Research Article

Early outcome of ٣ trocars anterior approach of laparoscopic cystogastrostomy in treatment of pancreatic pseudocyst

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Abstract
Background: In the era of minimally invasive surgery, laparoscopy has a great role to play in the management of pseudocyst of pancreas. We present our surgical experience in the management of pancreatic pseudocysts. Materials and Methods: The total number of cases was ١٥ cases, with ٩ males and ٦ female patients. Age ranged from ١٤ to ٦١years old. Seventy three patients presented with pain abdomen. Ten patients had abdominal mass on clinical examination. Predisposing factors were gallstones in ٥ cases, trauma in ١٠ cases and. Results: All the cases were successfully operated with intraoperative complication in ٢ cases only. Laparoscopic cystogastrostomy was donein all cases. The mean operating time was ٧٤ minutes. Mean blood loss was ٢٨٥ ml. Mean hospital stay was ٩ days. We had no mortality in the postoperative period. Conclusion: Anterior approach of Laparoscopic cystogastrostomy has low morbidity and mortality and low complication rates and good outcomes are reported for the immediate postoperative period and appear to be reproducible even though the number of cases is small.
Keywords: Pancreatic pseudocyst — Laparoscopy — Cystogastrostomy — External drainage — Pancreatitis

Introduction
Pancreatic pseudocysts (PPs) constitute about ٧٠-٨٠٪ of all masses in the pancreas (Aljarabah and Ammori, ٢٠٠٧) They constitute the most common complication of chronic pancreatitis, occurring in ٢٠٪–٣٨٪ of patients with this condition, as well as up to ٥٪–١٥٪ of patients with acute pancreatitis. Asymptomatic PP can be managed expectantly, frequently resolving without complications, whereas symptomatic, enlarging, or large (>٦ cm in diameter) ones frequently require treatment. (Lutfi et al., ٢٠١٠).

Pancreatic pseudocyst develops in both acute and chronic pancreatitis. It is an entity likely to either remain asymptomatic or develop devastating complications. Despite being diagnosed easily, treatment exercise is still at crossroads whether in the form of internal or external drainage or endoscopic, laparoscopic, or open intervention with a good radiological guidance. The therapeutic dilemma whether to treat a patient with a pancreatic pseudocyst, as well as when and with what technique, is a difficult one. (Khanna, Tiwary and Kumar, ٢٠١٢).

Although the indication 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, endoscopic or laparoscopic interventions (Ferguson and Prachand ٢٠١٦).

Pancreatic pseudocysts have been treated surgically for over ٤٠ years, and this approach is still frequently used currently. With the advancements in surgical techniques, newer techniques such as internal drainage via cystogastrostomy and

cystojejunostomy have been well established, and the permanent resolution of pseudocysts has been reported in ٩١٪ to ٩٧٪ of patients (Dedemadi et al., ٢٠١٦).

Over the past decade minimally invasive techniques (laparoscopic and endoscopic approaches) for pancreatic pseudocyst drainage and debridement have been developed, although no optimal approach has been standard given the range of clinical and anatomic variations. Also, there is lack of systematic reviews comparing laparoscopic and endoscopic treatment for PP. So, the decision between endoscopic and laparoscopic approach is still controversial (Zhao, Feng and Ji, ٢٠١٦).

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 (Simo et al., ٢٠١٤).

Laparoscopic cystogastrostomy techniques are reported to result in adequate internal drainage and debridement of PP with minimal morbidity and mortality. Numerous techniques have been reported for laparoscopic PP surgery thus far, including anterior and posterior cystogastrostomies, endoscopy-assisted surgery and cystojejunostomy. However, there is no consensus on the appropriate technique of laparoscopic surgery and the conclusions were usually built up on individual preferences (Sharma et al., ٢٠١٦).

There have been various debates in the literature regarding the advantages and disadvantages of both the anterior and the posterior approach to PP. The anterior approach is felt to be the technically easier procedure but requires two anastomoses: posterior staple line between stomach and cyst and anterior gastric wall gastrostomy closures (Ferguson and Prachand ٢٠١٦).

On the other hand, the posterior approach is reported to have better visualization and allow for a large anastomosis but is felt to be more difficult to learn. A retroperitoneal approach has also been described; however, its effectiveness needs to be confirmed (Matsutani et al., ٢٠٠٧).

Patients and methods

This retrospective and prospective study for Fifteen patients with pancreatic pseudocysts, in whom Laparoscopic cystogastrostomy was indicated, were included in this study. Patients were either collected from emergency room by traumatic pancreatitis and pseudocyst formation after trauma or collected from the Surgery Outpatient Clinics with previous history of repeated attacks of pancreatitis or from the Internal Medicine and Tropical Department in Minia University Hospital.

Patient inclusion criteria:

- Symptomatic cysts.
- Rapidly enlarging cysts.
- Cyst diameter of more than ٦ cm.
- Six weeks after the development of the cyst.
- Development of complications such as infection , obstruction of the bile duct, duodenum and other adjacent organs.

Patient exclusion criteria:

- Cyst diameter less than ٦ cm.
- General contraindications for laparoscopy such as previous upper abdominal laparotomies, severely cardiac patient.
- Pregnancy.

Surgical steps

- Anterior gastrotomy at the summit of the cyst as the first step.
- The harmonic scalpel is an excellent tool for bloodless incision in the anterior gastric wall.
- After anterior gastrotomy, multiple interrupted everting stitches with silk were made from the edges of the gastrotomy to the anterior gastric wall about ٢ cm away from the gastrotomy wound.
- This maneuver aided in keeping the gastrotomy wound open, especially after decompression of the cyst.
- We aspirated the fluid partially from the pseudocyst under laparoscopic visualization, by using percutaneous transgastric puncture with a Veress needle.

- Diagnostic aspiration was done under direct vision using a veress needle attached to a ١٠ ml syringe.
- A ٤ cm stoma was created using the Endo GIA white cartilage between the cyst and the stomach, which was made easier by lifting of the stay suture on the pseudocyst.
- Hemostatic sutures were placed with either continuous or interrupted absorbable sutures (polyglactin ٢/٠) between the posterior gastric wall and the anterior wall of the cyst.
- The cyst cavity was examined using the ٣٠_ telescopes and all
- the necrotic material was debrided using a large fenestrated bowel grasper.
- The cyst cavity was irrigated thoroughly and the nasogastric tube was placed within the cyst.
- Intracorporeal sutures with ٢/٠ polyglactin were used to close the anterior gastrotomy.

  Post-operative follow-up
- All patients undergo follow up in surgical outpatient clinic after ١ month then ٦ months then ١ year
- Follow up epigastric pain, nausea & vomiting clinically and follow up abdominal U/S radiologically.

Results

This study was conducted in El-Minia University Hospital after being approved by the faculty ethical committee. This study included ١٥ patients presented to emergency room by trauma or outpatient clinics or admitted in the hospital with radiological evidence of pancreatic pseudo-cyst. All cysts were initially detected with ultrasound and were further investigated with computed tomography (CT scan), As detected by imaging studies In abdomial U/S The pancreatic pseudocyst size its length range from ٦ to ٢١ cm with mean (SD) of ١٠.٢, (٣.٥٧) and its Diameter range from ٦ to ١٥ cm with mean (SD) of ٨.٦, (٢.٥), In abdomial CT The pancreatic pseudocyst size its length range from ٦ to ٢١ cm with mean (SD) of ١٠.٦, (٣.٦) and its Width range from ٦ to ١٥ cm with mean (SD) of ٨.٨, (٢.٥).

Discussion

In this study the results as regard Main Etiology of Pancreatic pseudocyst was ٦٦.٦٪ of patients due to trauma while in the results of Simo et al., (٢٠١٤) ٥٠٪ of patients due to Gall stones, while in the results of Aljarabah and Ammori (٢٠٠٧) ٥١٪ of patients due to alcohol abuse.

In the results of Palanivelu et al., (٢٠٠٧) the predisposing factors were gallstones in ٥٨ cases (٥٤٪), alcohol in ٢٠ cases (١٨.٥٪), trauma in eight cases (٧.٥٪) and previous distal pancreatectomy for serous cystadenoma of the tail of the pancreas in one case. In ٢١ cases (١٩٪), there were no detectable predisposing factors.

In the results of Mori et al., (٢٠٠٢). The underlying causes were: gallstone pancreas-titis (٥٧.١٪) followed by alcoholic pancreatitis (٢٨.٦٪), and chronic pancreas-titis of unknown origin (١٤.٣٪).

Absence of alcoholic pancreatitis in the current study as an etiology of pancreatic pseudocyst is due the culture of the community in which the study was conducted.

In this study, the main complaint of our patients was abdominal pain (٧٣.٣٪) followed by abdominal mass (٦٦.٧٠٪) then nausea and vomiting (٥٣.٣٪), while in the results of Simo et al., (٢٠١٤) Presenting symptoms included abdominal pain in (٧٧٪) of patients and associated nausea/ emesis in (٥٠ %). Early satiety, diarrhea, and anorexia were reported less frequently. Weight loss was reported by (٤١٪) of the cohort, while in the results of Palanivelu et al., (٢٠٠٧) (٤٨.٢٪) of patients had mass in the abdomen on clinical examination (٤١ in the epigastric region and ١١ in the left hypochondrium).

In this study the results as regarding mean size of pancreatic pseudocyst in CT finding was ١٠.٦ cm which was similar to the mean size in the results of Khaled et al., (٢٠١٤) as it was ١٠ cm, while in the results of Aljarabah and Ammori (٢٠٠٧) was ١٣ cm, while in the results of Simo et al., (٢٠١٤) was ١٣.٧٢ cm.

The size of the pseudocyst is known to be an important predictor of the success of operative drainage, In the experience of Yeo and colleagues: ٦٧٪ of pseudocysts > ٦cm in diameter required surgical treatment in contrast to ٤٠٪ of those < ٦cm. Similarly, O'Malley and colleagues noted that pseudocysts < ٤cm in size resolved spontaneously at a mean of ٢–٦ months after diagnosis, although in one case resolution did not occur until ٢٨ months. It thus appears that small, asymptomatic cysts can be managed safely by observation and do not require surgical intervention even if they are still present after several months. Ammori listed both large (>٦ cms.) and persistent (>٦ weeks) as indications for internal drainage of the pseudocyst.

In this study the operative time ranged from ٥٨ to ٨٨ minutes, with mean of ٧٤ minutes. The results of Khaled et al., (٢٠١٤) showed a mean operative time of ٦٢ minutes ranging between ٢٥–٢٥٠ minutes in the laparoscopy group, while in the results of Aljarabah and Ammori (٢٠٠٧) operative time ranged from ٦٠ to ٣٠٥ min with mean of ١٥٢ min.

In the results of Palanivelu et al., the mean operative time for laparoscopic trans-gastric cystogastrostomy group was ٨٦ minutes while in the results of Simo et al., (٢٠١٤) mean operative time was ٢٢٠ ± ٦٥ min while in the results of Oida et al., (٢٠٠٩) operative time ranged from ٥٥ to ١٢٠ min with mean of ٨٦ min. while in the results of Šileikis et al., (٢٠١٦) mean operative time was ١٤٥ ± ٣٧.٦ min

In this study the intraoperative blood loss ranged from ١٠٠ to ٧٠٠ mL with mean of ٢٨٥mL and two patients received an intraoperative blood transfusion while in the results of Simo et al., (٢٠١٤) the intraoperative blood loss ranged from ٢٠ to ١,٠٠٠ mL the mean estimated blood loss was ٢٢٣ ± ٢٥٩cc and eight patients received an intraoperative blood transfusion.

In the results of Aljarabah and Ammori (٢٠٠٧) the intraoperative blood loss ranged from ٣٠ to ٣٥٠ mL the mean estimated blood loss was ٨٩ cc. While In the study of Crisanto-Campos et al., (٢٠١٥) the mean intraoperative blood loss was ١٥١ ml (٢٠-٣٠٠ ml).

Two patients in this study bled considerably during the operation and were converted to open ١٣.٣٪; while in the study of Aljarabah and Ammori (٢٠٠٧) seven patients were Converted to open ٦٪, similar to Khaled et al., (٢٠١٤) who had two conversions (٦.٧٪) to open surgery due to uncontrolled intraoperative bleeding from the PP, while in the results of Palanivelu et al., (٢٠٠٧) and also Fernandez-Cruz et al., (٢٠٠٥) No patients were converted to open.

In this study The Postoperative hospital stay ranged from ٦ to ١٧ days with the mean ٩±٣.١ while in the study of Aljarabah and Ammori (٢٠٠٧) Postoperative hospital stay ranged from ٢–٣٢ days with the mean ٥ days, while in the study of Simo et al., (٢٠١٤) Postoperative hospital stay ranged from ٤–٥٠ days with the mean ١٤ days, while in the study of Oida et al., (٢٠٠٩) Postoperative hospital stay ranged from ٧-١٠ days with the mean ٨.٣ days, while in the results of Palanivelu et al., (٢٠٠٧) Postoperative hospital stay ranged from ٣-٢٢ dayswith the mean ٥.٦ days.

In this study the results as regarding the complications occur in four patients (Two of them had intraoperative bleeding, one developed postoperative nausea and vomiting and one developed postoperative pancreatitis). While in the study of Aljarabah and Ammori (٢٠٠٧) two patients were developed complications in the form of intrabdominal hematoma and abscess formation while in the study of Crisanto-Campos et al., (٢٠١٥). Only one patient (٥.٩٪) had a complication associated with the procedure. Due to the presence of blood output through the drain, he underwent a diagnostic laparoscopy that revealed bleeding from the subxiphoid trocar insertion site, which was controlled laparoscopically.

In the study of Simo et al., (٢٠١٤) eight patients were developed complications two of them developed intraoperative bleeding while the other six were not procedure-related. One patient had seizures

postoperatively, which were thought to be a reaction to levofloxacin. A second patient had changes in mental status on postoperative day ١٤ with respiratory distress and required reintubation for ٤٨ h. A third patient had prolonged hospitalization complicated by line sepsis, ventilator dependence, deconditioning, and dysphagia requiring short-term total parenteral nutrition. Two patients had postoperative dysphagia, nausea and vomiting. Last patient developed postoperative dehydration while in the study of Šileikis et al., (٢٠١٦) ٢١.٤٪ of patients had early minor complications (postoperative hemorrhage which required endoscopic haemostasis and haemotransfusion), but no major complications.

Conclusion

 Anterior approach of Laparoscopic cystogastrostomy has low morbidity and mortality and low complication rates and good outcomes are reported for the immediate postoperative period and appear to be reproducible even though the number of cases is small.

 Three Trocars of Anterior approach of Laparoscopic cystogastrostomy is successful minimally invasive technique for cystogastrostomy creation and pancreatic debridement which is highly effective and safe.

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