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Case Report

A case of massive pancreatic fluid collection managed with percutaneous pigtail drainage as step-up approach

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ABSTRACT

A 19-year-old male presented to us with complain of acute epigastric pain for 2 weeks duration. The pain was dull aching in nature, radiating to back. On examination he was of average built and nutrition, dysnoic and tachypnoic with pulse rate of 140 /min, respiratory rate 26 /min, blood pressure 140/80 mmHg, saturation on room air 90%, bilateral (b/l) pedal edema present. On per abdomen examination abdomen was distended, fullness was present in bilateral upper abdomen. So, after thorough investigation, diagnosis of acute necrotizing pancreatitis was made and subsequently planned for ultrasonography (USG) guided percutaneous pigtail drainage as step-up approach in view of multiple loculated collections. Nasojejunal tube was inserted for entral nutrition. First perihepatic collection was drained on day 1, then lesser sac and pelvis drainage was done on day 2. At times, the collections may extend into the subhepatic space from the lesser sac through foramen of Winslow. Such subhepatic collections are intraperitoneal rather than retroperitoneal and there is a significant risk of peritoneal leak during endoscopic transmural drainage that may cause peritonitis. The collections may extend to either or both paracolic gutters retroperitoneally and at times to pelvis. In these retroperitoneal collections where endoscopic transmural drainage that may cause peritonitis, percutaneous pigtail drainage as a step-up approach is a feasible option.

Keywords: Step-up approach, Acute pancreatitis, Peripancreatic collection

INTRODUCTION

Pancreatic fluid collections (PFC) are a common complication of acute pancreatitis. As the revised Atlanta criteria, PFCs are classified as acute if occurred within 4 weeks after episode of pancreatitis, or chronic if occur after 4 weeks of episode of pancreatitis.[1] Acute collections are divided into: acute peripancreatic fluid collections (APFC) and acute necrotic collections (ANC); chronic fluid collections are divided into: pseudocysts or walled off pancreatic necrosis (WOPN). Symptomatic or infected collections require drainage which can be performed surgically, percutaneously, or endoscopically. Traditionally, the management has primarily been surgical. However, with better understanding of pathophysiology emphasis is now on minimal invasive procedures. Performing PFC drainage requires Adequate and fundamental knowledge of diagnostic and basic therapeutic procedures.

CASE REPORT

A 19-year-old male presented to us with complain of acute epigastric pain for 2 weeks duration. The pain was dull aching in nature, radiating to back. The pain was associated with episodes of nausea and vomiting consisted of recently eaten food particles. History of abdominal distension was present, insidious in onset and gradually progressive in nature. There was no history of addiction to smoking or alcohol. On examination he was of average built and nutrition, dysnoic and tachypnoic with pulse rate of 140/min, respiratory rate 26/min, blood pressure 140/80

mmHg, saturation on room air 90%, bilateral (b/l) pedal edema present. On per abdomen examination abdomen was distended, fullness was present in bilateral upper abdomen. Diffuse tenderness and guarding were present. Free fluid abdomen was present.

Resuscitation was done and on evaluation of his blood investigations were done as shown in Table 1 and radiological imaging was done shown in Figures 1 and 2 and summarized in Table 2.

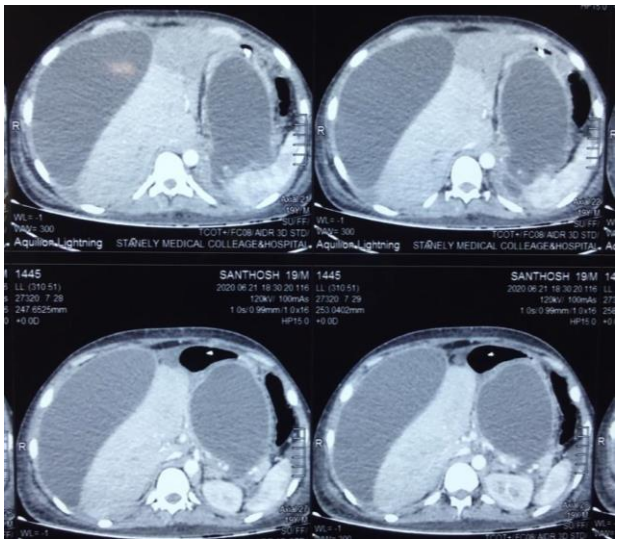

Figure 1: CECT abdomen showing massive collection in perihepatic space and in lessar sac.

So, after thorough investigation, diagnosis of acute necrotizing pancreatitis was made and subsequently planned for USG guided percutaneous pigtail drainage as step-up approach in view of multiple loculated collections. Nasojejunal tube was inserted for entral nutrition. First perihepatic collection was drained on day 1, then lessar sac and pelvis drainage was done on day 2 (Figures 3 and 4). Immediate and 24 hours drain output was as shown in Table 3.

Table 1: Blood investigations at time of admission.

Investigations	Value	Investigations	Value
Hb	9.1	Creatinine	0.8
TLC	16,100	Na	134
Platelets	5.2 lacs	K	4.3
Urea	20	Total bilirubin	2.2
Total cholesterol	82	H	13
Triglycerides	159		

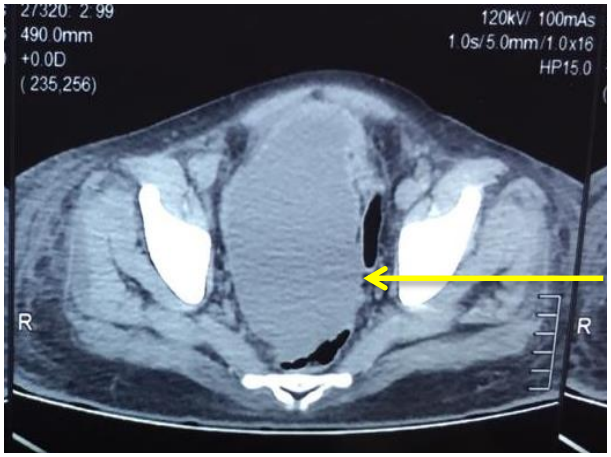

Figure 2: CECT abdomen showing collection in pelvis posterior to bladder.

Table 2: Radiological imaging findings.

Radiological imaging	Findings
USG abdomen	Large loculated fluid noted in the right perihepatic region 11×18×10 cm
	Another loculated fluid collection in pelvis adjacent to bladder 10×9×9 cm
CECT abdomen	A well-defined multiloculated hypodense collection 10×11 cm noted replacing the body and tail of pancreas extending into lesser sac
	A loculated hypodense collection 11×13×31 cm noted in perihepatic region in right paracolic gutter displacing liver and bowel loops, medially
	Another hypodense collection noted in pelvis, posterior to bladder
	Multiple hypodense collection noted in perigastric region
	Left mild pleural effusion
	Moderate pericardial effusion
	Impression-acute necrotizing pancreatitis with multiple peripancreatic fluid collection

Initially pancreatic fluid amylase was high, above 3000 U/l, which on day 7 reduce to 62 U/l. Fluid culture shows growth of *Klebsiella*, antibiotic given as per sensitivity, nasojejunal feed started on day 2 post pigtail drainage and increased gradually. Patient improved over the time tachycardia and tachypnea settled, oral diet started along with NJ feed. All three-pigtail output comes to minimal on 7th day post pigtail drainage (Figure 5). Repeat CT abdomen repeated on 10th day post drainage shows minimal collection in residual cavity and patient was discharged in stable condition with pigtail and NJ tube *in situ* to review after 1 week.

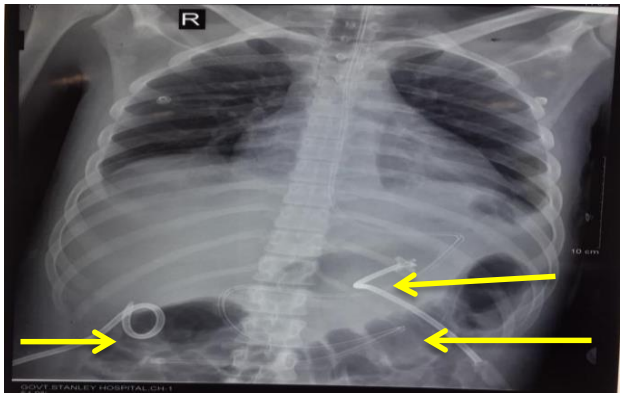

Figure 3: X-ray chest showing pigtail insitu in perihepatic space and in lessar sac with nasojejunal tube, left pleural effusion present.

Figure 4: Stat output of 1.6 l from perihepatic space after pigtail drainage.

Table 3: Drain output.

Site of collection	Stat output (l)	Initial 24-hour output (l)
Perihepatic	1.8	3.6
Lessar sac	1.1	1.6
Pelvis	0.8	1.2

Figure 5: Patient on post drainage day 7 with three pigtail *in situ* with minimal collection with nasojejunal tube for entral feeding.

DISCUSSION

PFCs are a common complication of pancreatitis. PFCs develop secondary to either fluid leakage or liquefaction of pancreatic necrosis following acute pancreatitis, chronic pancreatitis, surgery or abdominal trauma.[2,3] PFCs include acute fluid collections, acute and chronic pancreatic pseudocysts, pancreatic abscesses and pancreatic necrosis. The type of fluid collections is generally classified as per the revised Atlanta classification as acute PFCs that occur in interstitial edematous pancreatitis.[1] These may either resolve spontaneously or evolve into a pancreatic pseudocyst after around 4 weeks with a well-defined mature wall. Pseudocyst contains predominantly pancreatic fluid with little or no necrotic debris and is typically extrapancreatic. They may also be classified as ANCs that occur in early phase of acute necrotizing pancreatitis. ANC usually evolve into a localized collection termed as WON after around 4 weeks which is surrounded by a radiologically identifiable wall. The fluid collections, collectively termed PFCs may remain sterile or get infected. About 5-15% of pancreatitis episodes were complicated by the development of pseudocysts.[4] 15% of pancreatitis episodes were complicated by pancreatic necrosis, and approximately 33% of those with necrosis are complicated by infected necrosis.[5] Previously, the management had primarily been surgical. But with better understanding of pathophysiology and new technological advances, now the emphasis was on minimal invasive procedures. Presently, drainage was recommended only for symptomatic collections, the available options for drainage in symptomatic PFCs included surgical drainage, percutaneous drainage using radiological guidance and conventional endoscopic transmural drainage. Adequate nutritional support was an essential step in the management of PFCs. Enteral feeding should be implemented in patients with moderate to severe pancreatitis. Jejunal feeding remains the preferred route of enteral nutrition. Surgical drainage was an efficacious therapy, with published pseudocyst recurrence rates between 2.5-5% post-drainage, but complication rates approaching 30% in some studies.[6] Surgical cystogastrostomy involved an open or laparoscopic procedure in which an anastomosis was created between the lumen of the cyst cavity and the stomach or small bowel using suturing or stapling devices.[7]

A randomized comparative trial by Varadarajulu et al looking at surgical versus endoscopic cystogastrostomy found that while the two techniques yielded similar technical success and complication rates, endoscopic therapy was associated with a shorter hospital stay, a lower overall cost, and better mental health and physical health component scores among patients.[8] Percutaneous drainage involves placement of an external drainage catheter into the pseudocyst using real-time imaging guidance, usually with computed tomography (CT) or ultrasound (US) with fluoroscopy. Percutaneous catheter drainage (PCD) is generally used for draining acute collections and infected collections. PCD can be used as a primary modality, as an

initial procedure in the step-up approach or as a salvage management of residual or infected collections.

Initial studies comparing surgical drainage to percutaneous drainage found both procedures to be efficacious.[9,10] However, more recent comparative studies have generally favored percutaneous drainage, with some studies even demonstrating a mortality benefit.[11,12] A retrospectively study reviewed 81 patients compared endoscopic drainage with percutaneous drainage found that equal technical success rates and adverse events rates between the techniques, but a decreased re-intervention rate, a shorter hospital stay, and a decreased number of follow-up abdominal imaging studies among patients drained endoscopically.[13] A systemic review of 11 studies with 384 patients showed an overall success rate of 56% using PCD as primary drainage in patients with infected collections. Seventy percent of patients had infected necrosis and an average of 2 catheters were placed. Adverse events such as external fistulae occurred in up to 27% of patients.[14] At present, due to its lower morbidity rate compared to the surgical and percutaneous approaches, endoscopic treatment may be the preferred first-line approach for managing symptomatic PFCs.[15-17] Endoscopic ultrasound-guided drainage (EUS-GD) is less invasive than surgery and does not require general anesthesia. The morbidity rate is lower, recovery is faster and the costs are lower.[17,18] EUS was associated with higher technical success (95% versus 35-66%) and a trend toward lower adverse event rates (0-4% versus 13-15%) than conventional direct puncture technique in 2 randomized controlled trials.[19,20]

Sadik et al noted a 94% success rate and 5% complication rate in simple pseudocysts versus 80% success rate and 30% complication rate in infected pseudocysts.[21] Similarly, Varadarajulu et al found a 93.5% success rate and 5% complication rate vs a 63% success rate and 16% complication rate in sterile vs infected pseudocysts.[22]

A step-up approach consists of conservative treatment with antibiotics, placement of a percutaneous drain catheter followed by if required minimally invasive necrosectomy either video-assisted retroperitoneal debridement (VARD) or endoscopic in patients with infected collections.[23,24] In a randomized controlled trial, the Dutch pancreatitis group compared minimally invasive step-up approach with open necrosectomy (PANTER trial) and showed that the primary endpoint (composite of major complications and death) was lower in the step-up approach (69% versus 40%, p=0.006).[23] In the step-up approach group, 35% patients could be treated successfully with percutaneous drainage only obviating the need of VARD. There was no difference in mortality, but new onset multiple organ failure, diabetes, and incisional hernia were less in the step-up group.[23] Open surgery may still be required for patients with extensive necrosis who fail minimally invasive surgery and those with complications such as bowel perforation and hemorrhage due either to pancreatitis or iatrogenic.[25] In a single-center study of 305 patients with collections associated with necrotizing pancreatitis, 193 patients underwent endoscopic interventions including endoscopic drainage alone or with necrosectomy; 7% of patients who underwent early intervention at <4 weeks required open surgery for salvage of refractory necrosis or complications such as bowel perforation.[26]

CONCLUSION

At times, the collections may extend into the subhepatic space from the lesser sac through foramen of Winslow. Such subhepatic collections are intraperitoneal rather than retroperitoneal and there is a significant risk of peritoneal leak during endoscopic transmural drainage that may cause peritonitis. The collections may extend to either or both paracolic gutters retroperitoneally and at times to pelvis. In these retroperitoneal collections where endoscopic transmural drainage that may cause peritonitis, percutaneous pigtail drainage as a step-up approach is a feasible option.

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