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Non-operative management for pancreatic ascites: A case series

Katheresan V, Sivasankar A, Ponchidambaram M, Kesavan B, Somasekar RDR

ABSTRACT

Introduction: Pancreatic ascites (PA) refers to the exudative fluid collection in to the peritoneal cavity with rich amylase levels and is a rare entity. Chronic calcific pancreatitis related to alcohol abuse, tropical calcific pancreatitis, etc. may present with pancreatic ascites secondary to pseudocyst rupture or ductal disruption.

Case Series: In this case series, we have described three patients of pancreatic ascites due to non-ethanol induced chronic calcific pancreatitis who were treated successfully by non-surgical measures. Two cases of PA were managed with image guided percutaneous catheter drainage (PCD) followed by transpapillary pancreatic duct (PD) stent placement and the third case was managed with PCD alone. All three patients had resolution of PA.

Conclusion: Conservative management with PCD and PD stent placement helps in the effective management of PA in selected cases with fruitful results.

Keywords: Chronic calcific pancreatitis, Pancreatic fistula, Percutaneous drainage, Transpapillary pancreatic duct stent

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INTRODUCTION

Pancreatic ascites (PA) is a rare entity which refers to the exudative fluid collection in the peritoneal cavity with elevated amylase levels secondary to either pseudocyst rupture or PD disruption. Pancreatic ascites commonly occurs in chronic pancreatitis, though it can also occur in acute pancreatitis. Other causes include tropical calcific pancreatitis, pancreatic trauma, biliary pancreatitis, etc. Due to its infrequent occurrence, the prevalence rate of PA is very low and it is more common in men.

The traditional conservative approach with nil by mouth, parenteral nutrition, somatostatin analogues and paracentesis is fraught with limited success. With the advent of magnetic resonance cholangiopancreatography (MRCP), PD disruption can be precisely located. As a result of this, early endoscopic interventions play a substantial role in non-operative management of PA. We hereby bring to the limelight three cases of PA complicating chronic pancreatitis managed by non-surgical approach.

CASE SERIES

Three young individuals with no previous history of ethanol abuse presented to our gastrointestinal (GI) surgical unit with similar history of dull aching recurrent abdominal pain, aggravated by food intake

and relieved by analgesics along with progressive abdominal distension. Among this, one patient presented with recurrent episodes of vomiting and pain radiating to the back and one patient presented with diabetes mellitus. All three patients had frequent history of primary care hospital admissions and diagnosed to have chronic calcific pancreatitis and managed conservatively in the past (Table 1). No family history of pancreatitis.

All three patients underwent clinical examination (Table 2), laboratory investigations (Table 3), computed tomography (CT) abdomen scan (Figure 1). They were diagnosed to have PA complicating acute exacerbation of chronic calcific pancreatitis. After initial stabilization, all three underwent ultrasound guided PCD. In the initial weeks of PCD, patients had drain output of more than 1 L per day. All patients were managed conservatively with parenteral octreotide and total parenteral nutrition (TPN). They were gradually switched over to enteral feeds as tolerated. All patients showed symptomatic improvement with progressive decrease in abdominal distention.

Despite the improvement, two out of three patients had drain output more than 500 mL per day. Magnetic resonance cholangiopancreatography was taken after complete resolution of the ascites for these two cases (Figure 2). Both these patients showed proximal PD disruption (Figure 3). The other patient did not show any main pancreatic duct (MPD) abnormality on the MRCP. The first two patients were subjected to endoscopic transpapillary PD stent placement (Figure 4). Post-procedure PCD output started reducing from the first day and completely stopped within a week. Third patient was managed conservatively and after eight days of conservative management, PCD output started decreasing progressively (Table 4). All three patients had complete resolution of PA and got discharged after three weeks of admission with simple analgesics. None of them had recurrence of PA and on regular follow-up.

Table 1: Clinical course of the patient

Clinical history	20-year-old female	26-year-old male	23-year-old male
Clinical presentation	Recurrent abdominal pain, abdominal distension and recurrent episodes of vomiting	Recurrent abdominal pain and abdominal distension	Recurrent abdominal pain and abdominal distension
History of present illness	Dull aching type of pain in the epigastric region radiating to back, relieved by analgesics Associated with non-projectile, non-bilious vomiting	Dull aching type of pain in the epigastric region, non-radiating, aggravating factor—fatty food intake relieved by analgesics	Dull aching type of pain in the epigastric region non-radiating, aggravating factor—fatty food intake relieved by analgesics
Duration	Insidious onset and gradually progressive for the past six months	Insidious onset and gradually progressive for the past eight months	Insidious onset and gradually progressive for the past eight months

Table 2: Clinical history and examination

Present medication	History of simple analgesics intake during onset of pain	History of simple analgesics intake during onset of pain	History of simple analgesics intake during onset of pain
Past history	Five hospital admissions in the past for the similar complaints and managed conservatively	Three hospital admissions in the past for the similar complaints and managed conservatively	Three hospital admissions in the past for the similar complaints and managed conservatively
Clinical examination	Vitals stable, diffuse abdominal tenderness and free fluid abdomen	Vitals stable, epigastric tenderness and free fluid abdomen	Vitals stable, epigastric tenderness and free fluid abdomen

Table 3: Investigations

Investigations	20-year-old female	26-year-old male	23-year-old male
Liver function test	Normal Except Albumin 1.9 g/dL	Normal	Normal Except Albumin 2.1 g/dL
Ascitic fluid amylase	6800	5200	7200
Ascitic fluid albumin	3.2.	4.6	3.8
SAAG RATIO	< 1.1	< 1.1	< 1.1
Serum amylase	840 U/L	788 U/L	940 U/L
Serum lipase	680 U/L	612 U/L	784 U/L
Serum calcium	9.4	9.2	9.1
Serum electrolytes & RFT	Normal	Normal	Normal
Serum total cholesterol	170 mg/dL	164 mg/dL	168 mg/dL
Random blood sugar	180 mg/dL	247 mg/dL	162 mg/dL

Table 4: Clinical course and follow-up

Workup and management	20-year-old female	26-year-old male	23-year-old male
Timing of computed tomography taken	Sixth hospital admission	Fourth hospital admission	Fourth hospital admission
Post-pigtail drainage output	Gradually reduced from 12th day onwards	Gradually reduced from 10th day onwards	Gradually reduced from 8th day onwards
MRCP findings	Main pancreatic duct abnormality present	Main pancreatic duct abnormality present	Main pancreatic duct normal
Endoscopic stent placement	Done on 16th day of hospital admission	Done on 14th day of hospital admission	Not done
Orals started on	Second week	Second week	Second week
PCD removal	Post stent placement—6th day	Post stent placement—5th day	End of third week
PD stent removal	Four weeks after insertion	Four weeks after insertion	-
Discharge timing and follow-up medication	24 Days after admission/ simple analgesics if needed	22 Days after admission/ simple analgesics if needed	22 Days after admission/ simple analgesics if needed

PA: Pancreatic ascites, PCD: Percutaneous catheter drainage, PD: Pancreatic duct, MPD: Main pancreatic duct, TPN: Total parenteral nutrition, CT: Computed tomography, ERCP: Endoscopic retrograde cholangiopancreatography, MRCP: Magnetic resonance cholangiopancreatography, SAAG: Serum ascites albumin gradient, RFT: Renal function test

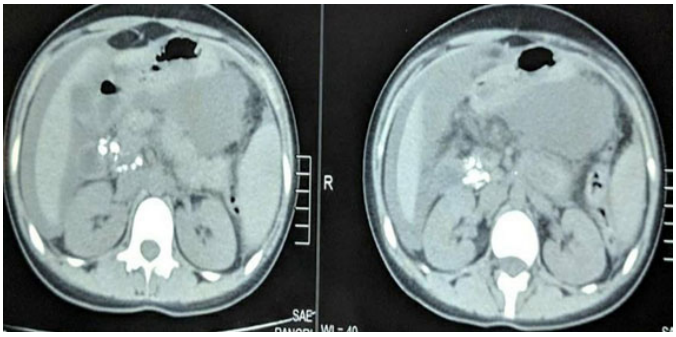

Figure 1: Plain CT abdomen shows ascites and lesser sac collection, calcification in the pancreatic head.

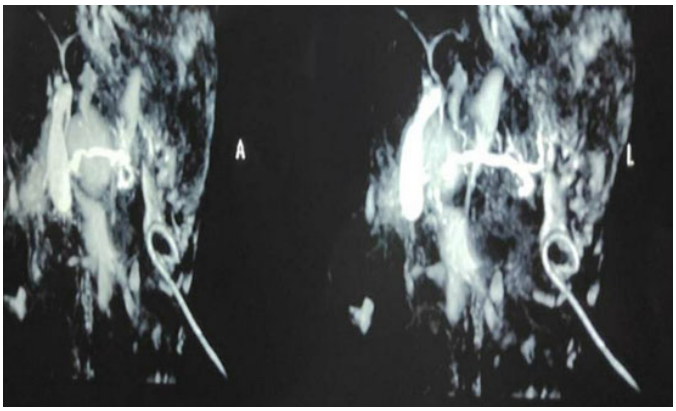

Figure 2: Post-percutaneous pigtail drainage—MRCP taken after complete resolution of ascites.

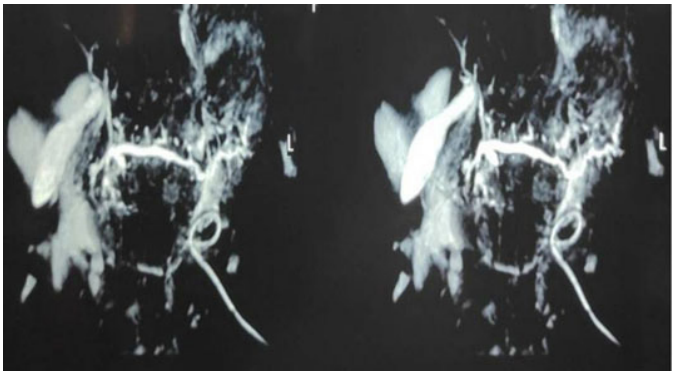

Figure 3: MRCP shows abrupt termination of the pancreatic duct in head region—Proximal stricture in the main pancreatic duct with upstream dilatation/Main pancreatic duct diameter: 5 mm.

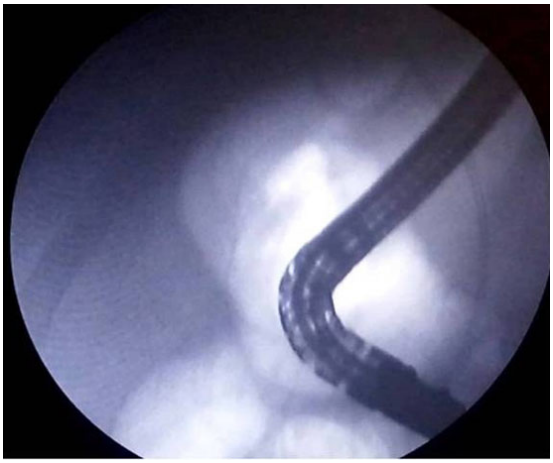

Figure 4: Endoscopic transpapillary pancreatic duct stent placement.

DISCUSSION

Pancreatic ascites is a rare entity complicating either acute or chronic pancreatitis. The first report of pancreatic ascites was published by Smith in 1953 which describes two cases of ascites with chronic pancreatitis [1]. Pancreatic ascites commonly occurs in the setting of chronic pancreatitis possibly as a result of ductal hypertension due to strictures and intraductal calculi. Pancreatic ascites in chronic pancreatitis is also refractory to the traditional conservative measures unless the ductal obstruction is relieved. Pancreatic ascites occurs secondary to either pseudocyst rupture or pancreatic duct dehiscence or both. Pancreatic ascites should be considered in any patient with chronic ascites and with history of chronic alcohol abuse, chronic pancreatitis, or abdominal trauma [2].

Our case series of three patients with pancreatic ascites in the setting of non-ethanol induced chronic pancreatitis is still rare. Chronic non-alcoholic pancreatitis can be idiopathic or due to tropical calcific pancreatitis (TCP) or fibrocalculous pancreatic diabetes (FCPD). Pancreatic ascites is differentiated from other causes of ascites like chronic liver disease or ascites due to tuberculosis by ascitic fluid amylase level of more than 1000 IU/L and a total protein of more than 3 g/dL [3, 4]. In our case series, diagnosis of PA is made with patient's history, imaging evidence of ascites with altered pancreatic morphology and elevated amylase level in the ascitic fluid.

Management of patients with pancreatic ascites is challenging, as it is more common in the setting of chronic pancreatitis which per se causes nutritional depletion. The protein rich exudative ascites further leads to hypoproteinemia. The ascitic fluid further impairs the distensibility of the stomach leading to early satiety with consequent poor oral intake. In some cases with major pancreatic ductal disruption, the progressive and rapid accumulation of fluid leads to abdominal compartment syndrome with vital organ dysfunction [5, 6] especially in the acute pancreatitis setting.

An ultrasound abdomen is usually the first and basic investigation in such cases. A pancreas protocol multidetector CT of the abdomen can usually decipher the pancreatic pathomorphology with utmost precision. Magnetic resonance cholangiopancreatography is a valuable and viable tool in delineating the MPD morphology and site of ductal disruption, only after draining the ascitic fluid. A secretin stimulated MRCP increases the accuracy of detecting the site of ductal disruption, though not widely available. Endoscopic retrograde cholangiopancreatography (ERCP) is an invasive investigation and can aggravate pancreatitis. It is usually used as a diagnostic cum therapeutic tool.

Treatment modalities for PA include conservative medical measures, endoscopic intervention, and if refractory, surgical management is opted. Conservative management constitutes nil per oral, TPN along with use of somatostatin analogues like octreotide is the initial step of management followed by image guided PCD placement to drain the ascitic fluid. Percutaneous catheter drainage placement is done with the premise that continuous drainage of the ascitic fluid leads to apposition of peritoneal surfaces with possible sealing of the disrupted PD site. Once the ascitic fluid is drained, an MRCP is done to delineate the ductal anatomy. In addition, endoscopic management like PD sphincterotomy and transpapillary PD stent placement has a definite positive result especially in patients with PA complicating chronic pancreatitis. Endoscopic retrograde cholangiopancreatography is also considered when there is a persistent or progressively increasing drain output and MRCP has failed to identify the site of MPD disruption. In our case series, one patient was managed conservatively with PCD alone and two patients were managed with both PCD and endoscopic PD stent.

Endoscopic retrograde cholangiopancreatography is an essential tool in the evaluation of patients with PA to locate the site of duct disruption and, subsequently, for placement of a transpapillary PD stent to bridge the fistulous area. Pancreatic fistulas are classified into three types, depending upon the anatomic position of the leak and PD anatomy. Type 1 pancreatic fistula indicates leakage from small side branches or from the distal end of the pancreatic duct. Type 2 pancreatic fistula refers to leakage from the main pancreatic duct. Type 3 leaks are post-surgical fistulas (occur after major surgical procedures like distal pancreatectomy or pancreaticoduodenectomy) [7]. Most of the pancreatic leaks can be managed by endoscopic interventional methods. During ERCP injection of contrast is kept to a minimum to reduce the risk of infection [8]. Other than pancreatic ascites, pancreatic duct stent placement is also helpful in pseudocyst and pancreaticopleural fistula with ductal communication [9].

ERCP has its own pros and cons. Proximal ductal disruptions can successfully be managed with a PD stent. The cons being the associated risk of aggravation of pancreatitis, inability to stent PD disruptions beyond a tight stricture or distal ductal disruptions. In addition there is always an associated risk of infection due to the procedure. In our series both cases had proximal ductal disruptions and were successfully stented.

Disconnected pancreatic duct syndrome (DPDS) is characterized by complete transection that results in a variable portion of the upstream pancreatic parenchyma becoming disconnected from the main pancreatic duct downstream [10]. This isolated segment of the pancreas will continue to produce its secretions leading to pancreatic ascites. The isolated portion of the pancreas cannot be reached from the papilla and therefore the leak cannot be bridged endoscopically. Initially DPDS has required surgical management, but nowadays nonsurgical endoscopic alternatives are available [11, 12].

Endoscopic PD stenting offers an effective and safer first line therapy for patients with PA. The efficacy of the procedure persists after long-term follow up. Surgical

intervention is necessary when medical and endotherapy fails. The surgery may become difficult in this condition due to the presence of pseudocyst or abscess and inflammation in the peripancreatic tissue [13]. Although few studies favor early surgical intervention with early recovery [14–16], this case series supports the existing data in four prior reported studies [1, 17–19]. Though endotherapy yields fruitful results, endotherapy and surgery are not mutually exclusive and complementary modalities.

In our case series, we have successfully managed PA with non-surgical measures which include PCD and endoscopic transpapillary PD stent placement. There was no recurrence of pain or PA at a mean follow-up of six months. Since this is a rare condition, randomized controlled studies to assess the superiority of endotherapy over surgery may not be practically feasible.

CONCLUSION

Image-guided PCD along with endoscopic PD stenting is a viable option in the management of PA complicating chronic pancreatitis in selected patients. Endotherapy effectively shortens the duration of the disease process and hence the morbidity in PA.

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Author Contributions

Katheresan V – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Sivasankar A – Analysis of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in

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Ponchidambaram M – Analysis of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Kesavan B – Analysis of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Somasekar RDR – Analysis of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Authors declare no conflict of interest.

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All relevant data are within the paper and its Supporting Information files.