

Emphysematous pancreatitis presenting as new-onset diabetes mellitus with multi-organ dysfunction: Managed successfully with medical management alone

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ABSTRACT

Emphysematous pancreatitis is one of the rare and potentially fatal complications of acute pancreatitis. We present here the case of a 69-year-old man who presented with abdominal discomfort, vomiting, and constipation with features of sepsis due to *Klebsiella pneumoniae* bacteremia and new-onset diabetes mellitus. Elevated serum lipase levels and abdominal computed tomography scan showing pancreatic necrosis with air bubbles suggestive of emphysematous pancreatitis. He was managed conservatively as the surgical intervention was deferred in view of unstable hemodynamics and thrombocytopenia. The entire emphysematous pancreatitis and sepsis resolved with medical management alone although surgical necrosectomy may be indicated at presentation.

Key words: *Klebsiella pneumoniae*, Necrosectomy, Pancreatitis

Emphysematous pancreatitis is a rare and deleterious form of acute pancreatitis. It carries significant mortality ranging up to >50%, while the overall mortality for acute pancreatitis is <5% [1,2]. Emphysematous pancreatitis is commonly seen in individuals with comorbidities that can weaken immunosuppression such as poorly controlled diabetes, chronic kidney disease, and Human Immunodeficiency Virus infection [3,4]. Usually, the management of emphysematous pancreatitis involves surgery in the form of necrosectomy, especially in the setting of multi-organ failure. However, there are conflicting opinions stating that emphysematous pancreatitis can be managed conservatively when someone is not fit enough to undergo surgery due to multi-organ involvement [5,6].

We present here a case of emphysematous pancreatitis highlighting its unique presentation with multi-organ involvement and was managed successfully with conservative management. Furthermore, we have highlighted the challenges in its management.

CASE REPORT


A 69-year-old male, known to have hypertension and hypercholesterolemia for the past 15 years, presented to the emergency department with complaints of abdominal discomfort, constipation, and multiple episodes of vomiting for the past 2 days.

On initial evaluation, he had tachypnea (respiratory rate – 28/min) with increased work of breathing with a distended non-tender abdomen.

Initial blood investigations demonstrated significant leukocytosis with a total leucocyte count of $40.7 \times 10^3/\mu\text{L}$, thrombocytopenia with a platelet count of $52 \times 10^3/\mu\text{L}$, elevated serum lipase of 387 U/L, deranged liver functions with total bilirubin 11.8 mg/dL, alkaline phosphatase 347 U/L, gamma-glutamyl transferase 288 U/L, Alanine transferase 59 U/L, Aspartate aminotransferase 40 U/L, hypoalbuminemia with serum albumin 2.6 g/dL, deranged renal functions with serum creatinine 4.39 mg/dL, serum urea 115.6 mg/dL, and severe hyponatremia with serum sodium of 100 mmol/L. His HbA1c was 6.8 and random blood sugar was in the range of more than 200 mg/dL requiring insulin for glycemic control, leading to the diagnosis of new-onset diabetes mellitus (Table 1).

Contrast-enhanced contrast tomography of the abdomen and pelvis revealed diffuse, extensive gas surrounding/within the entire pancreas, which was edematous, necrotic, and bulky. Inflammatory changes involving the surrounding fat/tissue of the pancreas/mesentery were also seen along with a small hypodense area seen in the pancreaticogastric part of the lesser sac abutting the pancreas, likely fluid/necrotic collection of $6.3 \times 2.8 \times 3.4$ cm size, as shown in Fig. 1.

He was started on sodium corrective measures, fluid resuscitation, and appropriate antibiotics after drawing cultures along with other supportive measures. He was initiated on injection meropenem empirically in view of very high

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Table 1: Progress of laboratory parameters

Renal laboratory parameter	Day 1	Day 2	Day 4	Day 7	Day 14	Day 21	Day 30
Total leucocyte count ($\times 10^3/\mu\text{L}$)	45.3	36.8	12.4	8.8	5.9	9	10.6
C-reactive protein (mg/dL)	8.29	19.73	8.11	9.32	11.05	4.95	3.45
Procalcitonin (ng/ml)	14.29	40.46	4.35	3.46	14.53	3.23	0.43
Serum creatinine (mg/dl)	4.39	4.90	5.7	3.50	3.64	1.82	0.75
Serum urea (mg/dl)	115.6	134.8	173.3	115.6	177.6	117.7	42.8
Serum sodium (mmol/L)	100	104	110	129	133	140	134

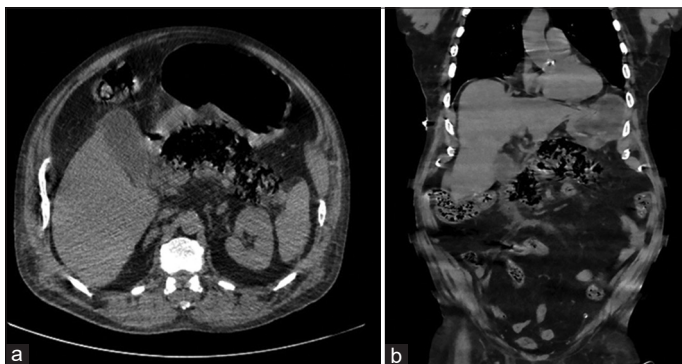


Figure 1: (a-b) Contrast-enhanced contrast tomography of the abdomen and pelvis revealed diffuse, extensive gas surrounding/within the entire pancreas, which was edematous, necrotic and bulky. Fluid/necrotic collection of $6.3 \times 2.8 \times 3.4$ cm size can also be seen

inflammatory markers and poor clinical state. His initial blood and urine cultures showed growth of *Klebsiella pneumoniae* and his antibiotic coverage was modified to injection of piperacillin and tazobactam. Our patient remained oliguric and he had to be initiated on hemodialysis in view of features of fluid overload and high-anion gap metabolic acidosis. He had to be intubated in view of a fall in the Glasgow Coma Scale for airway protection and he was initiated on mechanical ventilation. Furthermore, he showed hemodynamic deterioration and was started on vasopressor support after adequate fluid resuscitation.

We gave an option to transfer to a higher center with a surgical gastroenterology facility. On the other hand, he would not be qualifying for a procedure under general anesthesia due to hemodynamic instability and thrombocytopenia. Relatives opted to continue the management at our center itself. His antibiotic was again escalated to Inj. meropenem in view of clinical deterioration and other supportive management including enteral feeding through the nasogastric tube was continued on the lines of severe pancreatitis with multi-organ dysfunction.

Over the period of the next 10 days, he showed a gradual clinical improvement with an improvement of sensorium and urine output. Vasopressor support was gradually tapered off and he was weaned off mechanical ventilation and subsequently extubated. Further, during his hospital course, swelling and tenderness were noted in his left scrotum. Doppler scan showed the absence of vascularity in the left testis, and therefore, he underwent left orchectomy. Subsequently, oral feeding was resumed. His acute kidney injury recovered after 2 weeks of dialysis support. He was subsequently discharged in a stable condition. His follow-up computed tomography (CT) scan done at 3 months after discharge

showed complete resolution of emphysematous pancreatitis (Fig. 2). However, the pancreas appeared atrophied. He continues to require insulin at 12 units/day with glycemic levels at goal. However, at discharge, he was requiring 30 units of insulin.

DISCUSSION

Emphysematous pancreatitis carries higher morbidity and mortality compared to other forms of pancreatitis with mortality ranging up to 50% [1,3]. This form of pancreatitis is usually noted in individuals with significant comorbidities such as diabetics with poor glycemic control and immunocompromised individuals. Usually, infections in emphysematous pancreatitis are not polymicrobial, and the most common culprits are Gram-negative organisms [3,4]. Our patient developed this condition even without significant comorbidities. He was evaluated for diabetes mellitus 6 months before the current illness and was found to be negative.

The diagnosis of acute pancreatitis is made from a combination of clinical and radiological pictures and requires the presence of at least two out of the following three criteria: (a) Rise in serum amylase/lipase more than three times the normal limit; (b) Clinical abdominal pain suggestive of pancreatic involvement; and (c) Radiological picture suggestive of acute pancreatitis. For the diagnosis of emphysematous pancreatitis, CT evaluation in these individuals will reveal gas bubbles in the pancreatic parenchyma. However, the duodenopancreatic fistula and patulous ampulla of Vater can mimic the diagnosis [3,4].

Gas within pancreatic parenchyma is usually indicative of infected pancreatic necrosis. Most commonly, the culprit organisms include Gram-negative bacteria with *Escherichia coli* being the most common isolate. Other common causative organisms are *Klebsiella*, *Pseudomonas*, *Clostridium perfringens*, and *Enterobacter*. Rare cases of emphysematous pancreatitis secondary to *Mycobacterium* infection have also been noted [4].

The mainstay of management of necrotic emphysematous pancreatitis as per the current standard of care is endoscopic/percutaneous drainage and/or surgical necrosectomy [3,4]. However, there are certain reports mentioning successful management of emphysematous pancreatitis with conservative measures as stated by Page and Ratnayake [7]. Conservative management of emphysematous pancreatitis works along the same lines as management of acute pancreatitis with intravenous fluids, enteral feeds, and appropriate antibiotics covering the most common causative organisms [1,7]. New-onset diabetes mellitus is also a known complication of acute pancreatitis

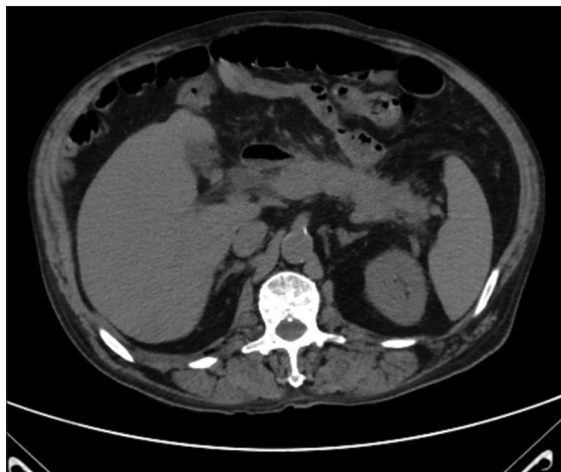


Figure 2: Follow-up CT scan at 3 months after discharge showed complete resolution of emphysematous pancreatitis

and a study conducted by Das *et al.* [8] showed that patients with acute pancreatitis often develop pre-diabetes and/or diabetes mellitus after discharge from the hospital and have a greater than a two-fold increased risk of diabetes mellitus over 5 years.

Our case was also complicated by a series of infections needing sequential modification of antibiotics as per culture and sensitivity reports. A longer antibiotic therapy was needed as the source was not immediately controlled in the absence of surgical intervention [9]. This long-term antibiotic use can itself lead to some complications as was seen in our case as *Clostridium difficile* infection leading to diarrhea which was treated by oral metronidazole [10]. The findings of avascular testis in our patient highlight that despite modern critical care, septic emboli/thromboemboli continue to complicate the recovery of patients admitted to the critical care units. Prompt recognition and immediate goal-directed therapy are of paramount importance in the management of these embolic events [11].

Management of this case has given us the experience that even severe emphysematous pancreatitis can be successfully managed conservatively. Surgical intervention in the form of surgical necrosectomy or percutaneous drainage should be considered if a patient shows signs of clinical deterioration on medical management. Risks and benefits must be weighed judiciously before proceeding with surgical interventions as pancreatic necrosectomy is a major surgery, leading to significant tissue handling and fluid shifts which can, further, worsen the organ functions, particularly in patients who are critically ill requiring support for maintenance of hemodynamics. For example, in our patient, surgical intervention was deferred, in view of high vasopressor support and thrombocytopenia.

CONCLUSION

We describe here a case of severe emphysematous pancreatitis in a patient with few comorbidities. In spite of multi-organ involvement, surgical intervention was deferred in this case due to systemic instability. Although his medical conservative management was continued, he showed steady improvement and was subsequently discharged in a stable condition. Further studies are warranted in this area and clear guidelines should be framed regarding the need for surgical intervention for patients with emphysematous pancreatitis.

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