

ORIGINAL RESEARCH

Rare Case of Acute Necrotising Pancreatitis without an Elevated Serum Lipase

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ABSTRACT

Context Acute necrotising pancreatitis is a potentially devastating gastrointestinal condition that has a fatality risk of up to 40% in hospitalised patients who develop multi-organ failure. Diagnostic criteria rely on characteristic abdominal pain, elevated serum lipase or amylase levels and radiological features on CT or MRI as per the revised 2012 Atlanta classification. Serum lipase is very useful in the diagnosis of acute pancreatitis with a high negative predictive value of 94-100%. Acute necrotising pancreatitis without an elevated serum lipase is rare, with only 3 cases reported in previous literature. **Case** We describe the case of a 64-year-old man who presented with idiopathic severe acute, necrotising pancreatitis without an elevation in serum lipase. **Conclusion** This case demonstrates the potential benefit of early abdominal imaging in patients presenting with classic clinical features of acute pancreatitis, despite a normal serum lipase.

INTRODUCTION

Acute pancreatitis is a common and potentially devastating gastrointestinal condition that must be considered when assessing patients with abdominal pain in the emergency department. Currently there is an estimated yearly incidence of 33 per 100,000 person-years [1] with an approximate increase of 3% per year globally [2]. Acute pancreatitis causes an estimated 11% loss in quality of life [3] and has an overall mortality of approximately 1% [4]. Approximately 10% of patients develop necrotising pancreatitis [5], with risk of fatality reaching as high as 40% in hospitalised patients who develop multi-organ failure [6]. Furthermore, there are also major health economic impacts as a result of this condition and its associated complications, which are expected to increase over time [3].

The aetiology of acute pancreatitis is varied with the commonest triggers being gallstone disease (~40%) and alcohol consumption (~20%). Hypercalcaemia, hypertriglyceridemia, trauma, medications, infection and recent Endoscopic Retrograde Cholangio Pancreatography (ERCP) are also relevant risk factors [7, 8] for acute pancreatitis.

As per the 2012 revised Atlanta classification [5], diagnostic criteria include 2 out of the 3 following features: characteristic abdominal pain (classically epigastric pain that radiates to the back), lipase and/or amylase levels three times the upper limit or normal and radiographic evidence of pancreatitis on Computed Tomography (CT) or Magnetic Resonance Imaging (MRI). Whilst serum lipase is not generally thought to correlate with disease severity [9], it is very useful in the diagnosis of acute pancreatitis with a high negative predictive value of 94-100% [10, 11]. Acute necrotising pancreatitis without an elevated serum lipase is rare, with only 3 cases reported in previous literature.

Our report describes the case of a 64-year-old man who presented with idiopathic severe acute, necrotising pancreatitis without an elevation in serum lipase.

CASE REPORT

Our patient is a 64-year-old man who initially presented with 2 days of worsening epigastric pain, difficulty breathing and vomiting. He had a past medical history of osteoarthritis, did not take any regular medications, did not consume alcohol and was a non-smoker.

On admission, he was febrile, tachycardic and required 3 litres of supplemental oxygen to maintain his oxygen saturation. Abdominal examination findings were significant for epigastric tenderness with associated guarding. He was not jaundiced. Laboratory tests (**Table 1**) demonstrated anaemia, an elevated white cell count, high C-reactive protein, normal renal function, slightly deranged liver tests and a normal serum lipase of 40 u/L.

A CT scan of the chest, abdomen and pelvis demonstrated a large peripancreatic collection containing gas (**Figure 1**) and fluid extending into the left and right paracolic gutters

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as well as complex bilateral pleural effusions. Based on the clinical features and imaging findings, he was diagnosed with acute necrotising pancreatitis.

He was initially stabilised with aggressive fluid resuscitation and broad-spectrum antibiotics.

During his admission, the peripancreatic necrotic collection was managed with AXIOS stent insertion and necrosectomy (**Figure 2**). There was no evidence of cholelithiasis on abdominal imaging. His calcium and triglyceride levels were within normal limits.

Table 1. Laboratory Tests on Admission

Laboratory Investigation	Value	Reference range
Haemoglobin (g/l)	109	130 - 170
White cell count (10 ⁹ /L)	16.4	4.0 - 12.0
Platelet count	356	150 - 400
C-reactive protein (mg/L)	178	< 5.0
eGFR	> 90	> 90
Creatinine (umol/L)	74	60 - 110
Urea (mmol/L)	4.1	3.5 - 8.0
Serum lipase (u/L)	40	0 - 160
Serum amylase (u/L)	23	20 - 300
Alanine transferase (g/L)	24	May-40
Aspartate transferase (g/L)	32	< 35
Gamma glutyl transferase (g/L)	107	< 65
Alkaline phosphatase (g/L)	147	30 - 110
Bilirubin (umol/L)	11	< 21
Blood glucose (mmol/L)	9.1	3.6 - 7.7

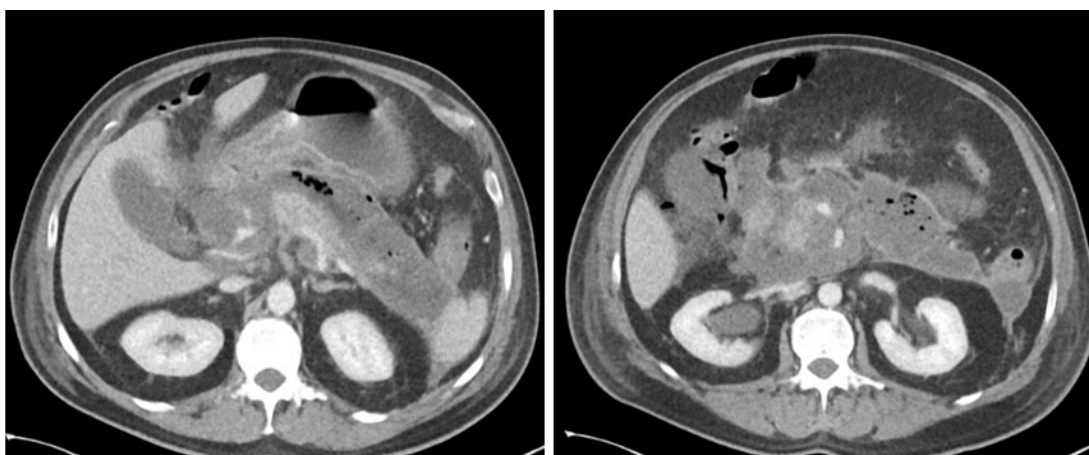


Figure 1. Acute Necrotising Pancreatitis with Peripancreatic Collection.

Peripancreatic collection containing gas and fluid most prominent around the pancreatic head with surrounding peripancreatic fat stranding in keeping with acute necrotising pancreatitis.

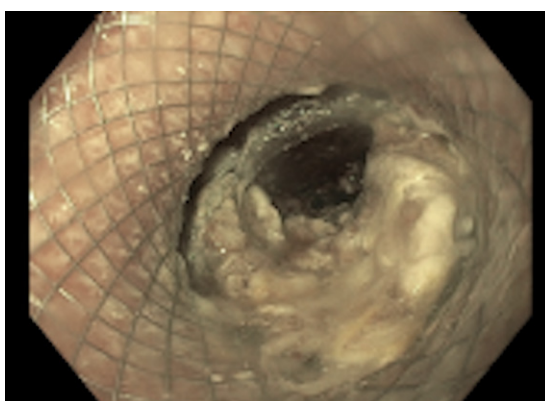


Figure 2. Necrosectomy

Endoscopic necrosectomy to manage peripancreatic necrotic collection. Necrosal can be visualised flowing into the stomach via an AXIOS stent in order to allow drainage. In this case, three necrosectomies were performed during the patient’s admission to completely remove the necrosal.

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Bilateral pleural effusions were managed by video-assisted thoracoscopic washout and decortication. His admission was further complicated by methicillin sensitive *S. aureus* bacteraemia which was treated with intravenous flucloxacillin. After a prolonged hospital admission, he was discharged home. His lipase was never elevated during his admission.

DISCUSSION

We present a unique case of acute necrotising pancreatitis without a raised serum lipase, an uncommon entity that highlights the importance of early abdominal imaging in the diagnosis of patients presenting with clinical features of acute pancreatitis.

Acute pancreatitis is driven by inflammation. An acute insult drives aberrant activation of digestive enzymes in pancreatic acinar cells, predominantly trypsin which manifests in autodigestion and subsequent pancreatic inflammation [12]. The inflammatory process may be localised to the pancreas, with potential for localised complications such as necrosis (with associated infection of necrotic collection), pancreatic pseudocyst formation and walled off necrosis. The release of proinflammatory mediators such as tumour necrosis factor alpha and digestive enzymes into the circulation can also result in a profound inflammatory response which may lead to systemic complications including sepsis, multi-organ failure and shock [13].

Serum lipase is considered to be the most sensitive blood test in establishing the diagnosis of acute pancreatitis in the emergency department [14]. While serum amylase is also often used, it can be elevated in conditions other than acute pancreatitis such as cholecystitis, salivary gland pathologies, inflammatory bowel disease, renal and liver failure [15]. Previous studies have shown lipase to be more sensitive and specific than amylase [16], with a negative predictive value of 94-100% likely due to the fact that lipase is mainly produced by and stored in pancreatic acinar cells. Lipase is typically released over 3-6 hours, peaking at 24 hours and remains elevated for 1-2 weeks [17]. In the case described, the patient experienced approximately 48 hours of symptoms prior to presentation to the emergency department. As a result, it was unusual and unexpected for serum lipase to remain within normal limits given the peripancreatic fat stranding and evidence of pancreatic necrosis demonstrated on CT.

To the best of our knowledge, there have only been 3 other cases of necrotising pancreatitis without an elevated lipase reported in the literature. Shah et al. described a case of gallstone-induced necrotising pancreatitis in a 66-year-old-man with multiple cardiovascular comorbidities who subsequently died due to multi-organ failure [18]. Mathur et al., described the case of a 32-year-old male with end-stage-renal-disease presenting with acute

necrotising pancreatitis and retroperitoneal haemorrhage subsequently leading to death [19]. Sudarsanam et al., described a case of a 35-year-old man who developed COVID-associated acute necrotising pancreatitis who went to make an uneventful recovery after a period of supportive care [20].

In our case, the patient presented to hospital with acute severe necrotising pancreatitis of unclear aetiology with a normal serum lipase. He experienced approximately 48 hours of epigastric pain, vomiting and dyspnoea and did not have any significant past medical history predisposing to acute pancreatitis. A potential theory for the normal serum lipase in our case was the extensive necrosis with peripancreatic necrotic demonstrated on CT by the time of presentation. Given the robust inflammatory response and subsequent necrosis of pancreatic tissue, there may not have been sufficient levels of acinar cells in the remaining pancreas to manifest in elevated serum lipase. However, given he presented only 48 hours after developing symptoms it is peculiar that lipase levels were not elevated. Furthermore, the previous cases describing a similar phenomenon of acute necrotising pancreatitis without elevated lipase all occurred in males as was the patient that we described. This may point to an underlying sex-related mechanism contributing to this phenomenon however this is purely conjecture and more evidence is required to further explore the validity of this claim.

Contrast-enhanced CT is generally accepted as the first line imaging modality in patients with suspected acute pancreatitis [12], though MRI has been shown to be as sensitive and may be more appropriate in situations where contrast enhanced CT is otherwise contraindicated such as a contrast allergy or impaired renal function [21]. While previous evidence has suggested that early imaging may not be associated with improved clinical outcomes [21, 22], our case demonstrates the potential utility of early imaging in patients presenting with characteristic abdominal pain to the emergency department in allowing the timely diagnosis of acute necrotising pancreatitis when serum lipase levels are not elevated [23].

CONCLUSION

In conclusion, our case highlights the potential benefit of early abdominal imaging in patients presenting with classic clinical features of acute pancreatitis, despite a normal serum lipase.

CONFLICT OF INTEREST

The authors have no potential conflicts of interest.

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