



AN OVERVIEW OF THE DIAGNOSIS AND MANAGEMENT OF ACUTE PANCREATITIS: LITERATURE REVIEW

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ABSTRACT

Introduction: Acute pancreatitis is commonly caused by gallstones impaction of the pancreatic ducts or alcoholic abuse. Furthermore, the patient presents with an unfortunate condition where the pancreas is inflamed, and the victim in severe pain. **Objectives:** We wanted to review the literature and discuss the approach to diagnosis and management of acute pancreatitis. **Methodology:** PubMed database was used for article selection, and papers were obtained and reviewed. The following keys terms: acute pancreatitis and its evaluation, clinical features, diagnosis, management, and complications. **Conclusion:** Acute abdominal pain may signify many surgical conditions, and clinical judgment is central to differentiating between diagnoses. Acute pancreatitis is one of these conditions that are clinically diagnosed. Surgical intervention is not prioritized in the acute episode of inflammation, and surgeons should always opt for medical supportive care. Operative intrusion is reserved for more severe presentations of pancreatitis and its early or late complications.

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Introduction

Acute pancreatitis is commonly caused by gallstones impaction of the pancreatic ducts or alcoholic abuse, depending on which part of the world the patient is in. [1] Furthermore, the patient presents with an unfortunate condition where the pancreas is inflamed, and the victim in severe pain. While gallstones and alcoholism are the commonest causes of acute pancreatitis, other lifestyle factors are implemented, and this majorly includes dietary habits leading to hypertriglyceridemia. [2] Traumatic and iatrogenic injury is also implemented in the pathogenesis of the illness. For instance, endoscopic retrograde cholangiopancreatography which is used in the diagnostic workup may cause or worsen preexisting pancreatitis. Viral infections have also been investigated, and current culprits are cytomegaloviruses, mumps, and Epstein-Barr viral infections [3-6]. More recently, coronavirus has also been implemented as a potential cause of pancreatitis. [7] There are associated conditions with acute pancreatitis, these are mainly chronic and include diabetes mellitus, morbid obesity, and habitual smoking. In this paper, we will review the literature and discuss the approach to diagnosis and management of acute pancreatitis.

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Methodology:

We conducted the literature search within the PubMed database using the keywords: “Acute Pancreatitis” and “Clinical features” and “Diagnosis” and “Management”. After reading the abstracts, we manually selected the relevant papers for this review. In regards to the inclusion criteria, the articles were selected based on the inclusion of one of the following topics: acute pancreatitis and its evaluation, clinical features, diagnosis, management, and complications. Exclusion criteria were all other articles that did not have one of these topics as their primary endpoint.

Review:

Multiple underlying pathophysiological processes are leading to the acute episode of inflammation. Firstly, gallstones and chronic alcoholism lead to ductal obstruction, and ensuing interstitial oedema, and impaired blood flow leading to ischaemia and cellular injury. Secondly, alcohol and abdominal trauma, such as in endoscopic retrograde pancreatography, [8] may induce the release of intracellular proenzymes and lysosomal hydrolases that inevitably cause acinar cell injury. Thirdly, ductal obstruction and alcohol on top of insidious metabolic injury would lead to intracellular activation of the latter proenzymes. Eventually, all the former and latter pathways lead to interstitial inflammation, proteolysis, fat necrosis, and hemorrhage. [9] Progression of the disease would raise the mortality risk, nearly up to a third of patients may die if not managed appropriately. [10]

Clinical Features

A patient with acute pancreatitis classically presents with persistent dull pain in the central upper abdomen. This pain while sudden in onset would gradually progress in severity, and commonly radiates backward and between the shoulders. As the pancreatic inflammation increases with the presence of fat in the gastrointestinal tract, patients could present with anorexia on top of nausea and vomiting. Other patients may present with diarrhea, hence, a review of the gastrointestinal symptoms is important. The differential of acute pancreatitis includes gastric perforation, intestinal bleeding, tumors, gallstones, hepatitis, and myocardial infarction. Table 1 shows a few points of differentiation between acute and chronic pancreatitis. Electrolyte imbalance is not uncommon with gastrointestinal and endocrine organ inflammation, pancreatitis patients, in particular, may develop abrupt muscular spasmodic contractions. The electrolyte in question is calcium, as it decreases in the former condition. Calcium may be lost in both vomiting and diarrhea.

Table 1: Comparison of Acute and Chronic Pancreatitis

	Acute Pancreatitis	Chronic Pancreatitis
Pain	Sudden sharp	Continuous dull
Pathology	Reversible inflammation	Irreversible
Progression	Chronic inflammation	Relapsing acute episodes
Complications	Necrosis, abscess, pseudocysts	Diabetes mellitus

Severe Pancreatitis

The patient presented with upper or lower gastrointestinal bleeding should be monitored for any abrupt change in their vital parameters. The surgeon should be wary of paleness and diaphoresis in a patient presenting with abdominal pain with associated melena or haematemesis. The surgeon should take note of the vital signs of these patients as they are commonly hyperthermic, tachycardia, and hypotensive. The latter signs suggestive of a shocked state needed immediate resuscitation. In patients with severe pancreatitis, signs of peritoneal irritation are apparent such as abdominal tenderness and muscular guarding. In severe pancreatic inflammation, necrosis may develop, and urgent transport to intensive treatment is necessary. [11] In the event of the latter, signs of hemoperitoneum and retroperitoneal bleeding present as Cullen and Grey-Turner’s signs, respectively. In patients who develop co-morbid intestinal obstruction, attention to diminished or absent bowel sounds is necessary.

Acute Pancreatitis Complications

Complications of acute pancreatitis are not easily identifiable by physical examination. They require further exploration by imaging. For instance, fluid collections occur in acute inflammation but are seldom clinically relevant as they resolve spontaneously. On the other hand, pseudocysts may be palpable in the epigastrium, like fluid collections they often resolve spontaneously and are observed by ultrasonographic or CT scanning. Unlike fluid collections which appear early in the clinical life of the condition, pseudocysts often develop a month after the initial pancreatitis episode. As discussed below, most resolve spontaneously, but large and symptomatic cysts often require surgical intervention.

As the gastrointestinal tract is a resourceful area for commensal bacteria, inflammation along the tract may result in intraabdominal infection. This infection may develop due to the former fluid collections or pseudocysts becoming contaminated. The problem for the patient lies in the progression of the infection into a full-blown abscess or liquefaction necrosis of the inflamed pancreas. [9] The most common organisms include *Escherichia coli*, *Pseudomonas*, and

Staphylococcus aureus. The former complications of fluid collection, pseudocysts, and intraabdominal infection are early complications of the condition. The surgeon should alert the recovering patient for certain late complications these include, in addition to the formerly mentioned early complications, a gastrointestinal bleed, perforation, or obstruction.

Diagnostic Tests

Acute pancreatitis can be diagnosed clinically, and the surgeon should not rely on laboratory findings before carefully taking anamnesis and physical examination. Instead, the surgeon uses diagnostic laboratory tests and imaging to further solidify their clinical impression. While serum lipase is more specific for acute pancreatitis, serum amylase is more readily available and is commonly markedly elevated in this condition. An elevated amylase could raise a differential of other gastrointestinal conditions including perforation, peritonitis, bleeding, and inflammation. Other important laboratory tests include complete blood count, serum glucose and cholesterol, serum lactate dehydrogenase, arterial or venous blood gases, liver function tests, and enzymes. [11]

Diagnostic Imaging

As previously mentioned, acute pancreatitis remains a clinical diagnosis, this fact signals a lessened need for imaging in routine workup of the condition. However, imaging has a solid role in the diagnosis and evaluation of complications, as well as follow-up of the clinical progression of the condition. [12] In severe pancreatitis, however, an accurate description of the inflammation type and extent is required. Initially, ultrasonography or abdominal X-ray are used. An ultrasonographic scan of the abdomen may help in identifying the most common cause of acute pancreatitis in developing nations, gallstones. Diagnostic imaging is not routinely used in acute pancreatitis, but the surgeon needs to be aware of its importance in specific clinical scenarios (Table 2). For instance, endoscopic retrograde cholangiopancreatography would best be reserved for patients with suspected cholangitis. [13]

Table 2: Diagnostic Imaging in Acute Pancreatitis

Imaging Technique	Use
Abdomen Ultrasound	Gallstones and aetiological factors
Abdomen Upright X-ray	Perforation
Endoscopic Ultrasound	Gallstones and peri-ampullary pathology
Abdominal CT scan	Severe pancreatitis
Endoscopic retrograde cholangiopancreatography (ERCP)	Diagnostic confirmation
Magnetic retrograde cholangiopancreatography	A safer alternative to ERCP

On the other hand, an abdominal X-ray in the upright position is more beneficial when aiming to diagnose intestinal perforation. Other modalities that could be used include endoscopic ultrasound, abdominal CT scan, endoscopic, or magnetic retrograde cholangiopancreatography. [14] In complicated pancreatitis, we could utilize CT or endoscopic ultrasound-guided aspiration and drainage of abscess or pseudocysts.

Medical Management

While acute pancreatitis is a surgical condition, the initial management is mostly supportive care. [15] This is done in the form of nutritional support and adequate fluid resuscitation to account for the gastrointestinal loss. [10] There is evidence for the superiority of Ringer's lactate over normal saline in the resuscitation of these patients. [16] Once the patient is stabilized, the surgeon should encourage oral feeding, and avoid maintaining the patient on parenteral feeding. [13]

By contrast, in severe pancreatitis, an immediate transfer of the patient to the intensive care unit is warranted. The severity of pancreatitis can be determined using the Glasgow-Imrie criteria for acute pancreatitis (Table 3). [17] In addition to supporting nutrition and fluid replacement, antibiotics are indicated in severe pancreatitis as infective necrosis may ensue. These patients would present with severe abdominal pain, markedly disturbed vital signs, and most notably a high fever. In other patients with moderate to mild pancreatitis, an antibiotic prescription is not advisable. Furthermore, in alcoholic patients, a counseling referral should be attempted, as to not cause further episodes. [13]

Table 3: Glasgow-Imrie Criteria for Severity of Acute Pancreatitis

Imaging Technique	Use
Abdomen Ultrasound	Gallstones and aetiological factors
PaO ₂	<59.3 mmHg (7.9 kPa)
Age	>55 years
WBC	>15 x 10 ⁹ /μL (10 ⁹ /L)
Calcium	<8 mg/dL (2 mmol/L)
BUN	>44.8 mg/dL (serum urea >16 mmol/L)

LDH	>600 IU/L
Glucose	>180 mg/dL (10 mmol/L)
Albumin	<3.2 g/dL (32 g/L)

Surgical Management

In most patients, conservative therapy is effective in controlling the inflammation episode. Surgical intervention is not necessarily directed at the pancreas, and in patients confirmed by ultrasound to have symptomatic gallstones, a cholecystectomy would be indicated. [14] This is because a cholecystectomy has been shown to reduce the risk of recurrence by a clinically significant margin. [18] For the same reason, administering codeine is best avoided as it causes contraction of the sphincter of Oddi and causes recurrence of acute pancreatitis in patients who underwent a cholecystectomy. [19] Another cause of pancreatitis includes disrupted anatomy of the pancreatic ducts. In the latter case, a stent is placed by endoscopic retrograde cholangiopancreatography to facilitate drainage. [14] This procedure may sometimes be contraindicated or fails to produce symptomatic relief. In these advanced scenarios, surgical operative intervention through distal pancreatectomy may prove suitable.

Patients with acute pancreatitis may develop pseudocysts, pancreatic abscesses, or infected necrotic tissue. In pseudocysts, the treatment depends on the size of the cyst, commonly resolving naturally in small asymptomatic patients. In symptomatic or cysts increasing in size, a percutaneous approach to aspirate the cyst is commonly used. Other methods to resolve the pseudocyst include endoscopic transpapillary or transmural, and alternatively surgical intervention. If an abscess is diagnosed then similar to pseudocysts, it would require drainage through a percutaneous catheter. The patient would require antibiotics thereafter, and if the abscess persists or recurs, then debridement of the infected area and further drainage may be required. Finally, in necrotic pancreatitis, an image-guided aspiration or necrosection could be used. Evidence has also shown safe and superior surgical intervention of a particular 4-step method in minimally invasive necrosection of affected pancreatic tissue. [20]

Conclusion

Acute abdominal pain may signify many surgical conditions, and clinical judgment is central to differentiating between diagnoses. Acute pancreatitis is one of these conditions that are clinically diagnosed. Surgical intervention is not prioritized in the acute episode of inflammation, and surgeons should always opt for medical supportive care. Operative intrusion is reserved for more severe presentations of pancreatitis and its early or late complications.

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