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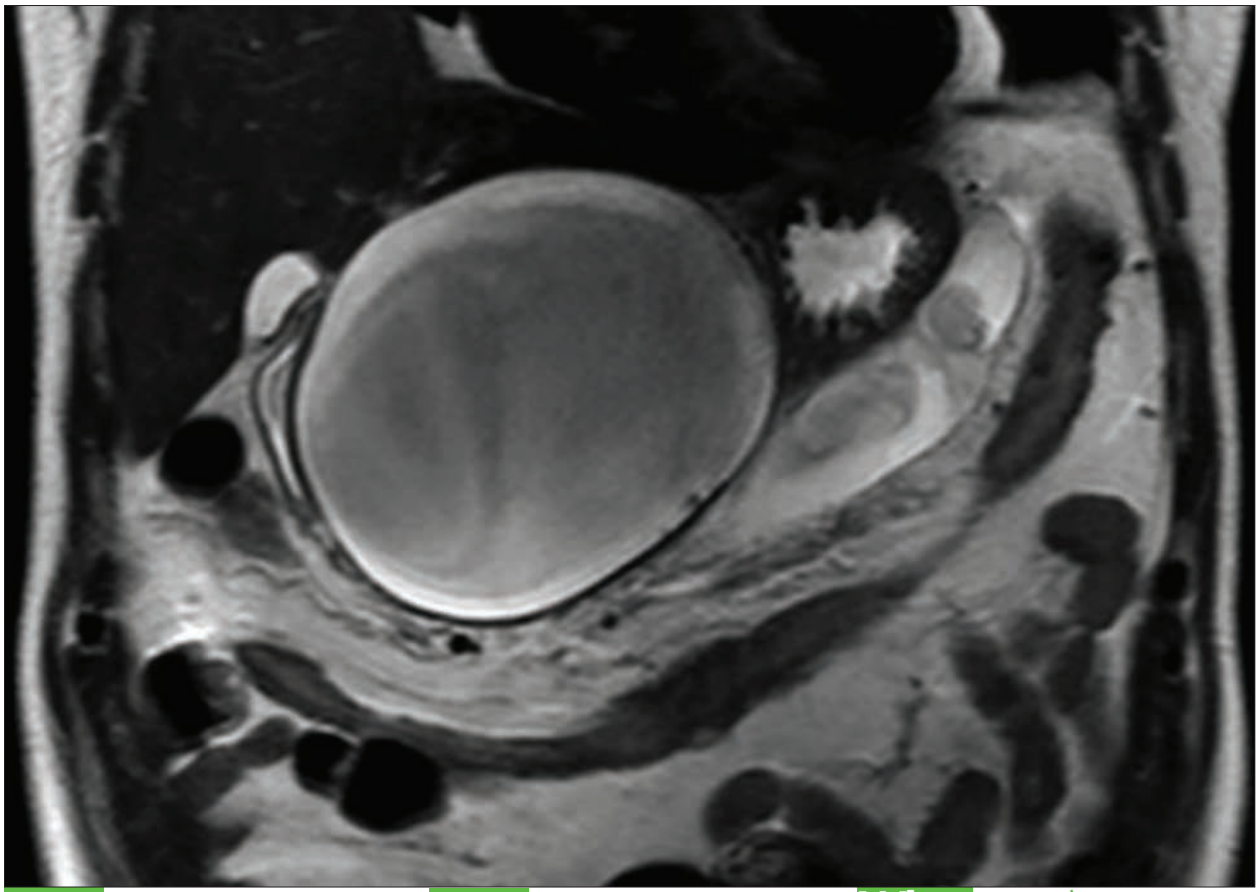


FIGURE 1
T2 weighted coronal MRI scan demonstrating an 11 cm fluid filled pancreatic pseudocyst within the head of the pancreas.
The cyst is causing compression of the gastric antrum

How should diagnosis be confirmed?

ACUTE PANCREATITIS IS CHARACTERISED BY INFLAMMATION OF THE EXOCRINE PANCREAS IN association with a local and systemic inflammatory response. It can range in severity from self-limiting, characterised by mild pancreatic oedema, to severe systemic inflammation with pancreatic necrosis, organ failure and death.

The estimated UK incidence of acute pancreatitis is up to 40 cases/100,000 per year, and appears to be increasing, particularly among young women who drink excessive amounts of alcohol.[1] The mortality rate is up to 7%, increasing to 20% in patients with pancreatic necrosis.[2] Early recognition, prompt referral to secondary care and close monitoring for complications is important in improving outcomes in acute pancreatitis. This review gives an overview of current evidence-based management strategies, incorporating recommendations from both international guidelines and those recently published by NICE.

How should patients be assessed?

CAUSES

There are many causes of acute pancreatitis. However, gallstones followed by excessive alcohol consumption account for around 75% of cases in the UK.[3] Other possible triggers are outlined in table 1, p24.

In around 20% of cases the aetiology is not readily found; this is termed idiopathic pancreatitis.[3] The presence of microlithiasis is thought to account for up to 70% of cases of idiopathic pancreatitis.[4]

What are the treatment approaches?

DIAGNOSIS

The diagnosis of acute pancreatitis should be considered in any patient presenting with abdominal pain. History and examination can be indicative of the diagnosis (this is paramount in primary care); however, two out of the following three diagnostic criteria should be met:

- Typical history
- Elevated serum amylase or lipase (> 3 ULN)
- Imaging (ultrasound, CT or MRI)

»

consistent with acute pancreatitis

The most common pattern of pain is severe epigastric pain that radiates to the back, is exacerbated by movement, and is alleviated by sitting forwards. Patients may appear agitated, distressed or confused. They may give a history of anorexia, nausea, vomiting and reduced oral intake. This history may be difficult to differentiate from peptic ulcer disease, particularly perforation, and rupture of an abdominal aortic aneurysm. Both these diagnoses are life threatening, therefore it is critical that they are considered in any patient with severe abdominal pain.

Once acute pancreatitis is suspected, a detailed history should identify risk factors for pancreatic disease. Age and sex are important demographics. Gallstone pancreatitis is seen most commonly in patients with gallbladder disease, typically women over the age of 60, while alcoholic pancreatitis is seen more frequently in men, and generally at a younger age than those with gallstone pancreatitis.[1] Metabolic, medication-related, and post-procedural causes should be considered. A family history is important to exclude hereditary pancreatitis and familial cancer syndromes. All medication, and in particular new drugs, should be reviewed.

CLINICAL EXAMINATION AND ASSESSMENT

Patients may appear hypovolaemic and may be diaphoretic, tachycardic, and tachypnoeic. Pyrexia may occur early as part of the normal inflammatory response or may be due to associated infection e.g. ascending cholangitis. Abdominal examination may reveal tenderness and distension with voluntary guarding, and with reduced bowel sounds in the presence of an associated ileus.

Haemorrhagic pancreatitis is very rare but may cause ecchymoses of the periumbilical skin (Cullen's sign), within the flanks (Grey-Turner's sign) or over the inguinal ligament (Fox's sign). Other important differentials of retroperitoneal haemorrhage include ruptured abdominal aneurysm and ruptured ectopic pregnancy.

Table 1

Pathogenesis and aetiology of acute pancreatitis

Pathogenesis	Aetiology
Ductal obstruction	Gallstones Post ERCP Malignancy Mucinous tumours Pancreas divisum Sphincter of Oddi dysfunction
Acinar cell injury	Alcohol Trauma Ischaemia Drugs (e.g. corticosteroids, azathioprine and thiazides) Infection (e.g. mumps)
Defective intracellular transport	Genetic Hypercalcaemia Hypertriglyceridaemia Autoimmune

Key: ERCP = endoscopic retrograde cholangiopancreatography

'All patients with clinical findings suggestive of acute pancreatitis should be referred to hospital for urgent evaluation'

All patients with clinical findings suggestive of acute pancreatitis should be referred to hospital for urgent evaluation. As always, good clinical acumen and experience are key when assessing borderline patients for onward referral to hospital. Certainly, any objective abnormality such as persistent tachycardia, low-grade fever or tachypnoea should alert GPs to the possibility of acute pancreatitis. Any patients with severe upper abdominal pain and risk factors for acute pancreatitis should have the condition excluded by blood tests and/or imaging.

Blood tests

A number of investigations may be performed as part of the diagnostic work up. Routine blood tests including liver enzymes, triglycerides and calcium should be carried out. In the absence of choledocholithiasis, liver function tests are usually relatively normal.

An elevated ALT at presentation suggests a likely biliary origin, with a level ≥ 150 IU/L having a positive predictive value of 95% in predicting a gallstone aetiology.[5] Raised creatinine and urea suggest acute kidney injury secondary to intravascular depletion. Amylase remains the traditional test of choice for diagnosing acute pancreatitis. Elevated levels of serum amylase or lipase (> 3 ULN) support, but are not pathognomic for, a diagnosis of acute pancreatitis. Hyperamylasaemia is also associated with severe cholecystitis, peritonitis, intestinal obstruction, mesenteric infarction, ruptured aortic aneurysm and perforated peptic ulcer.

Conversely, amylase and lipase may not reach the diagnostic threshold in cases of acute pancreatitis (e.g. in those with chronic pancreatitis); it is therefore necessary to have a low threshold for initiating treatment in suspected cases.

The diagnostic performance of these tests decreases in the hours and days after the onset of acute pancreatitis, and so additional investigations should be performed if there is suspicion of missed or established acute pancreatitis. Early and serial C-reactive protein (CRP) testing is used in acute pancreatitis as an indicator of severity and progression of inflammation.

Imaging

Radiographic studies are not used for diagnosis of acute pancreatitis, but may determine aetiology and exclude alternative diagnoses. Trans-abdominal ultrasound is the preferred initial study in suspected gallstone pancreatitis, with a sensitivity of up to 75% in detecting pancreatic inflammation.[6] CT scanning has a role in patients who become systemically unwell, septic or who do not improve, when it may indicate an alternative diagnosis e.g. perforation or local complications e.g. pancreatic necrosis.

For serial examinations, MRI is gaining favour with the use of MR cholangiopancreatography (MRCP) offering several advantages including improved depiction of pancreatic and peripancreatic collections, see figure 1, p23.

In patients considered to have idiopathic acute pancreatitis, after negative work up for biliary aetiology, endoscopic ultrasound (EUS) should be considered to detect microlithiasis and cross sectional imaging should be reviewed to exclude pancreatic neoplasm, particularly relevant in patients over 50 years old.

INITIAL TREATMENT

Although the majority of patients with acute pancreatitis have a mild clinical course, in order to detect those that may develop severe disease, close observation of all patients and early intervention is required. Many patients that develop severe disease seem well on admission yet deteriorate over subsequent days.

Initial treatment should begin even before the diagnosis is confirmed, and is

focused on fluid resuscitation and symptom control with analgesia and antiemetics. Goal-directed rehydration with Ringer's lactate solution (or Hartmann's) is the fluid of choice.[7] Adequate early fluid resuscitation is the single most important aspect of medical management, reducing organ failure and mortality rates.[8]

Effective pain control is important in order to prevent diaphragmatic splinting and thereby reduce the risk of respiratory complications. The most commonly used drugs are opiates either for breakthrough pain or as patient-controlled analgesia. Severity scoring (CRP, Atlanta or APACHE II scores are commonly used). It is also important at this stage to identify high-risk patients, in whom prompt referral to critical care for organ support, tight control of blood sugar and early correction of electrolyte abnormalities, is often pivotal.

'Early fluid resuscitation is the most important aspect of medical management, reducing organ failure and mortality rates'

Patients with severe acute pancreatitis who also have ultrasound-proven bile duct stones or patients with cholangitis or jaundice should undergo urgent endoscopic retrograde cholangio-pancreatography (ERCP) to relieve biliary obstruction. Antibiotics are not recommended for non-infected pancreatitis, as there is no clear evidence of benefit.[9] Prophylactic antibiotics have not been shown to reduce mortality, extra-pancreatic infections, or the need for surgical intervention.[10]

Severe acute pancreatitis is a catabolic state that is aggravated by inherent difficulties in delivering and utilising nutrition. Patients should eat as tolerated unless they have severe abdominal pain, in which case they are kept nil by mouth until the abdominal pain has subsided.[11]

If pain persists, or they cannot meet nutritional requirements, enteral tube feeding should be commenced.[12] Parenteral nutrition should be reserved for patients who are unable to reach nutritional goals with nasojejunal feeding.[12]

COMPLICATIONS

Local complications include pancreatic necrosis and pancreatic collections. These complications may present both during the acute episode and to GPs after an episode of 'missed' pancreatitis, or following hospital discharge. Upper abdominal pain, bloating, early satiety, nausea, vomiting and signs of infection including pyrexia, sweats and tachycardia are common presentations of these complications. Indications to drain pancreatic collections include infection and symptomatic sterile necrosis.[12]

The choice and progression of intervention depends on individual patient factors including the anatomy of the collection and may involve an endoscopic (see figure 2, below) or radiological approach.

Open (surgical) necrosectomy is no longer recommended in necrotising pancreatitis.[13] In general, many patients are suitable for a step-up approach, starting with conservative management and then either percutaneous drainage, or endoscopic transluminal drainage in selected patients within specialist centres.

Pseudocysts are sterile fluid collections occurring > 4 weeks after the initial episode.[14] They may resolve spontaneously however do require drainage in the case of complications (infection, biliary or duodenal obstruction) or if the patient is symptomatic with pain. Endoscopic cystgastrostomy is the preferred drainage option although percutaneous drainage may be considered in unfavourable anatomy.[12]

GALLSTONE PANCREATITIS

All patients presenting with gallstone pancreatitis should be considered for cholecystectomy when they are well enough to undergo surgery. In cases of mild biliary pancreatitis cholecystectomy should ideally be performed during the index admission or within two weeks of discharge, as interval cholecystectomy is associated with a significant risk of readmission for recurrent biliary events.[15]

In cases of severe gallstone pancreatitis cholecystectomy may need to be delayed until collections have improved, unless the patient is well enough for surgery and the gallbladder is some distance from the collection.[12]

In surgically unfit or frail patients, ERCP with biliary sphincterotomy may be considered as definitive treatment although the risks of sphincterotomy should be weighed against the risk of recurrent biliary events.[16]

PROGNOSIS

Most patients with mild acute pancreatitis will improve within one week of conservative management and be well enough for discharge. Long-term prognosis depends on the aetiological factors and patient compliance with lifestyle modifications. Mild acute pancreatitis generally resolves and leaves pancreatic function intact, although many patients progress to recurrent acute pancreatitis or chronic pancreatitis.

In cases of severe acute pancreatitis, patients often require input from rehabilitation teams after discharge. Late complications are often »

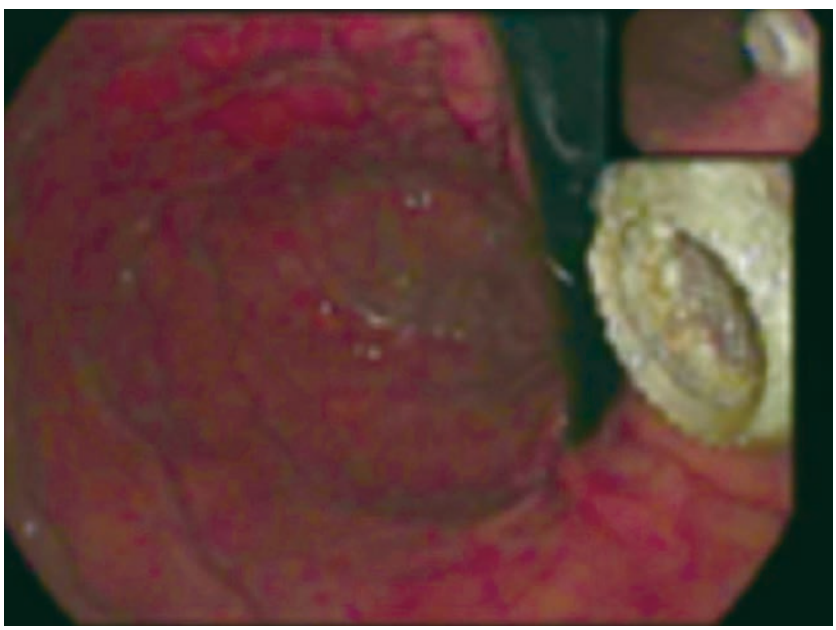


FIGURE 2
Endoscopic view of a cystgastrostomy. In this case a lumen-apposing metal stent has been used for the endoscopic drainage of infected pancreatic necrosis

key points

SELECTED BY

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Acute pancreatitis is characterised by inflammation of the exocrine pancreas in association with a local and systemic inflammatory response. Early recognition, prompt referral to secondary care and close monitoring for complications is important in improving outcomes in acute pancreatitis. Gallstones followed by excessive alcohol consumption account for around 75% of cases in the UK.

The diagnosis of acute pancreatitis should be considered in any patient presenting with abdominal pain. History and examination can be indicative of the diagnosis; however, two out of the following three diagnostic criteria should be met: typical history; elevated serum amylase or lipase (> 3 ULN); imaging (ultrasound, CT or MRI) consistent with acute pancreatitis. The most common pattern of pain is severe epigastric pain that radiates to the back, is exacerbated by movement, and is alleviated by sitting forwards. Patients may appear agitated, distressed or confused. They may give a history of anorexia, nausea, vomiting and reduced oral intake. All patients with clinical findings suggestive of acute pancreatitis should be referred for urgent evaluation.

Gallstone pancreatitis is seen most commonly in patients with gallbladder disease, typically women over the age of 60, while alcoholic pancreatitis is seen more frequently in men, and generally at a younger age than those with gallstone pancreatitis. Elevated ALT at presentation suggests a likely biliary origin, with a level ≥ 150 IU/L having a positive predictive value of 85% in predicting a gallstone aetiology.

Amylase remains the test of choice for acute pancreatitis. Elevated levels of serum amylase or lipase (> 3 ULN) support, but are not pathognomic for, a diagnosis of acute pancreatitis. The diagnostic performance of these tests decreases in the hours and days after the onset of acute pancreatitis, and so additional investigations should be performed if there is suspicion of missed or established acute pancreatitis. Early and serial CRP testing is used as an indicator of severity and progression of inflammation.

Local complications include pancreatic necrosis and pancreatic collections. These complications may present both during the acute episode and to GPs after an episode of 'missed' pancreatitis, or following hospital discharge. Upper abdominal pain, bloating, early satiety, nausea, vomiting and signs of infection including pyrexia, sweats and tachycardia are common presentations of these complications. Mild acute pancreatitis generally resolves and leaves pancreatic function intact, although many patients progress to recurrent acute pancreatitis or chronic pancreatitis. Late complications are often permanent and classically relate to pancreatic destruction. Exocrine insufficiency is a common consequence of severe disease that will result in severe nutritional deficiencies if not addressed by an experienced multidisciplinary team. NICE recommends six monthly HbA_{1c} measurement and bone mineral density assessments every two years, in order to monitor for the development of diabetes and osteopenia/osteoporosis.

permanent and classically relate to pancreatic destruction. Exocrine insufficiency is a common consequence of severe disease that will result in severe nutritional deficiencies if not addressed by an experienced multidisciplinary team. Patients should be counselled on how to take pancreatic enzyme replacement and on dose escalation.

'Post-pancreatitis diabetes is seen in those patients that survive severe acute pancreatitis'

The endocrine pancreas is more resistant to insult, but post-pancreatitis diabetes is seen in those patients that survive severe acute pancreatitis. The loss of the moderating effect of glucagon on hypoglycaemia makes glucose control very difficult to achieve in many patients and specialist diabetic input is often required. Strictures of the common bile duct may present with jaundice while strictures of the pancreatic duct may present with recurrent pain or pancreatitis.

'All patients with pancreatitis, irrespective of the cause, should be advised that alcohol might exacerbate their symptoms'

SECONDARY PREVENTION

The aetiology should be identified, and a plan to prevent recurrence should be initiated before hospital discharge. Those with alcohol-induced pancreatitis should receive alcohol cessation advice both during and following their hospital admission and may need onward referral to alcohol support services.

All patients with pancreatitis, irrespective of the cause, should be advised that alcohol might exacerbate their symptoms.

As discussed, cholecystectomy should be performed promptly in those with biliary pancreatitis.

Reviewing medications and stopping those associated with acute pancreatitis should be performed during the hospital admission, but it is important that GPs bear this in mind before restarting medications. The most recent NICE guideline recommends six monthly HbA_{1c} measurement and bone mineral density assessments every two years, in order to monitor for the development of diabetes and osteopenia/osteoporosis, respectively.[17] Effective communication between primary and secondary care is crucial to assist both teams in providing the extensive support that these patients often require.

Competing interests: None

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