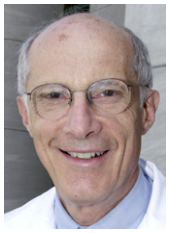
Clinical Management of Patients With Acute Pancreatitis



Bechien U. Wu[1]

Peter A. Banks[2]

[1]Center for Pancreatic Care, Southern California Permanente Medical Group, Department of Gastroenterology, Kaiser Permanente Los Angeles Medical Center, Los Angeles, California; and [2]Center for Pancreatic Disease, Division of Gastroenterology, Hepatology and Endoscopy, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts

Acute pancreatitis is the leading cause of hospitalization for gastrointestinal disorders in the United States. As rates of hospitalization for acute pancreatitis continue to increase, so does demand for effective management. We review approaches to best manage patients with acute pancreatitis, covering diagnosis, risk and prognostic factors, treatment, and complications, considering recommendations from current practice guidelines.

Keywords: Clinical Management; Fluid Resuscitation; Necrosis; Quality Improvement.

Acute pancreatitis is the leading cause of hospitalization for gastrointestinal disorders in the United States, with more than 280,000 hospitalizations each year.[1] The average length of stay at US hospitals in 2010 was estimated to be 5 days, at an aggregate cost of $2.9 billion. Mortality ranges from 3% for patients with interstitial (edematous) pancreatitis[2] to 15% for patients who develop necrosis.[3] As the rate of hospitalization for acute pancreatitis continues to increase,[4,5] so does the demand for effective management. This demand has resulted in publication of at least 14 clinical practice guidelines in the past decade.[6–10] An update to the American Pancreas Association and International Association of Pancreatology guidelines is forthcoming.

We review management strategies for acute pancreatitis, summarizing recommendations from current practice guidelines and discussing the latest research findings. These could help address quality improvement issues that arise in the care of patients with acute pancreatitis.

Diagnosis

Patients with acute pancreatitis have sudden onset of severe epigastric pain that occasionally radiates to their back. Accompanying symptoms frequently include nausea, vomiting, and fever or diaphoresis. Accurate diagnosis is important because many other conditions have similar symptoms, including acute cholecystitis, choledocholithiasis, and penetrating duodenal ulcers. Potentially life-threatening conditions to consider include a perforated viscus, an ischemic bowel, bowel obstruction, or myocardial infarction. The diagnosis of acute pancreatitis requires at least 2 of the following: typical upper abdominal pain, serum levels of amylase or lipase ≥3 times the upper limit of normal, and confirmatory findings from cross-sectional imaging analysis.

Disease Definitions: The Revised Atlanta Classification

The Atlanta Classification system was developed at a consensus conference in 1992 to establish standard definitions for classification of acute pancreatitis.[11] A recently completed revision of the Atlanta Classification provides a more detailed system that emphasizes disease severity and includes comprehensive definitions of pancreatic and peripancreatic collections.[12] There are also more complete definitions of local and systemic complications.

Definition of Local Complications

A variety of local complications have been delineated. Interstitial pancreatitis involves acute collection of peripancreatic fluid and formation of pancreatic pseudocysts. Necrotizing pancreatitis involves acute collection of necrosis and walled-off necrosis. Acute peripancreatic fluid collections develop during the early phase of interstitial pancreatitis. They are homogeneous in appearance without a well-defined wall, usually remain sterile, and frequently resolve spontaneously (Figure 1*A*). If an acute peripancreatic fluid collection does not resolve spontaneously, it could develop into a pseudocyst with a well-

Abbreviations used in this paper: BUN, blood urea nitrogen; CT, computed tomography; ERCP, endoscopic retrograde cholangiopancreatography; MRCP, magnetic resonance cholangiopancreatography; SIRS, systemic inflammatory response syndrome.

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defined inflammatory wall that contains fluid with very little, if any, solid material (Figure 1*B*).

An acute necrotic collection refers to the presence of necrotic tissue involving pancreatic parenchyma and peripancreatic tissues (Figure 2), only peripancreatic tissue (Figure 3), or in rare cases pancreatic parenchyma alone. These collections can be sterile or infected. If infected, they are called infected necrosis. After 4 or more weeks, an acute necrotic collection can become smaller but rarely disappears completely and usually evolves into walled-off necrosis. Walled-off necrosis has a well-defined inflammatory wall that contains varying amounts of fluid and necrotic debris (Figure 4).

Definition of Systemic Complications and Organ Failure

In the revised Atlanta Classification, systemic complications are defined as exacerbations of preexisting comorbidities such as chronic lung disease, chronic liver disease, or congestive heart failure, recognizing the failure of respiratory, cardiovascular, and renal organ systems.

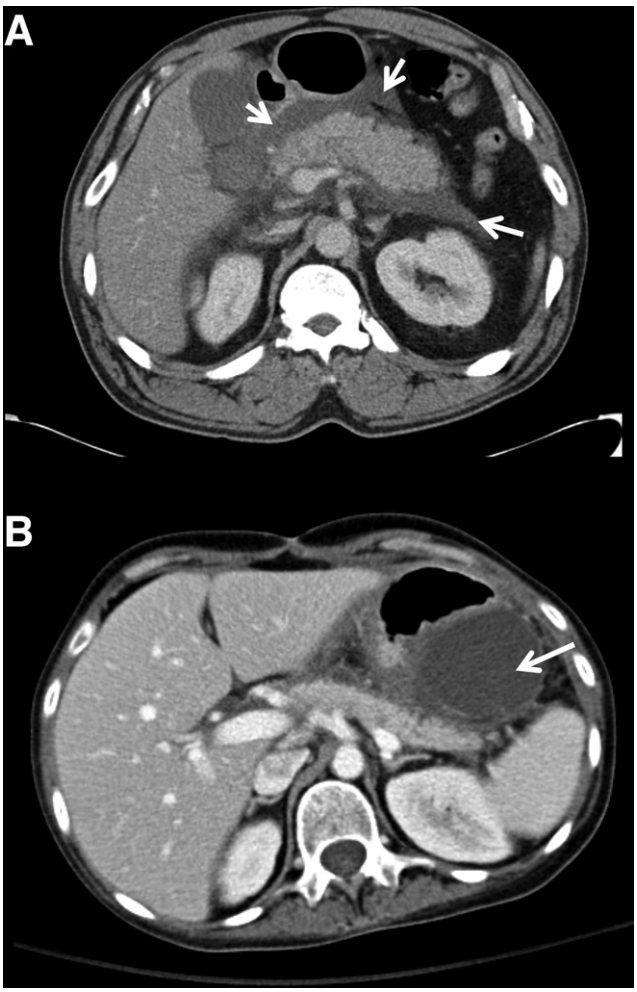

Figure 1. (*A*) Interstitial pancreatitis with acute peripancreatic fluid collection. Peripancreatic fluid collection (*arrows*) is poorly defined with homogeneous fluid density. (*B*) Resolving interstitial pancreatitis with pseudocyst. A pseudocyst (*arrow*) is typically a round or oval encapsulated collection with homogeneous fluid density.

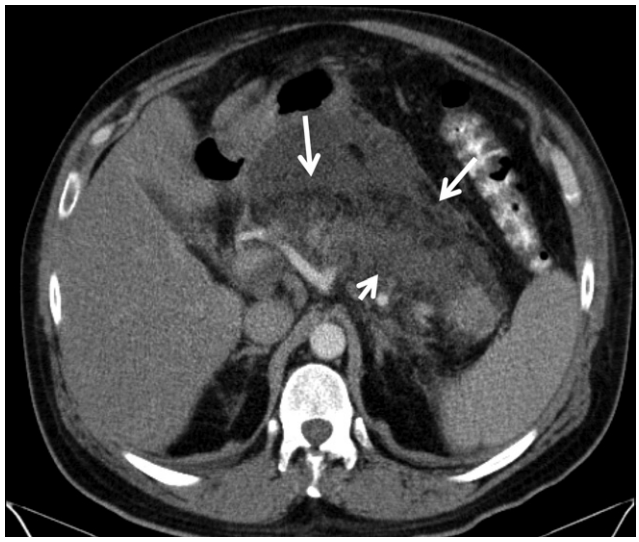

Figure 2. Pancreatic and peripancreatic necrosis. This image shows an acute necrotic collection involving both the pancreas (*large arrow*) and peripancreatic tissue (*arrowheads*).

The scoring system that has been chosen to characterize organ failure is the modified Marshall scoring system.[13] The modified Marshall system classifies disease severity on a scale from 0 to 4, so that the overall evaluation of organ dysfunction can be more completely delineated and characterized over time. In this system, organ failure is defined by a score of ≥ 2 for one or more of these organ systems.

Definition of Severity

The revised Atlanta Classification recognizes 3 degrees of severity. Mild disease is defined as acute pancreatitis not associated with organ failure, local complications, or systemic complications. Most patients with mild acute pancreatitis do not require pancreatic imaging analysis and are usually discharged within 3 to 5 days of onset of illness. Moderately severe acute pancreatitis is defined

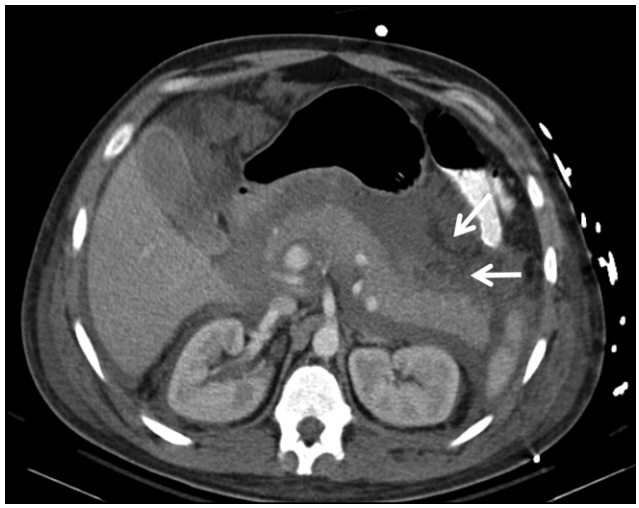

Figure 3. Acute peripancreatic necrosis is an acute necrotic collection that is heterogeneous in density. Here, the pancreas itself is inflamed (*arrows*) but not necrotic.