

*CASE: A 33 year old man comes to the ER complaining of abdominal pain, radiating to the back, worse after eating. He denies fevers or chills. He has felt nauseated, but has not vomited. He denies any previous medical problems. What could be causing his pain? What workup do you want to do? How do you manage him?*

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## **Acute Pancreatitis**

*Erin Sutcliffe, MD*

*Kenny Jarman, PharmD*

*Harborview Medical Center*

**Clinical Findings:** Acute, steady, upper abdominal pain, usually epigastric, sometimes right sided, less often left sided. Sometimes radiates in a band-like fashion to the back. Usually associated with persistent nausea and vomiting. Restlessness, agitation, and relief on bending forward are other notable symptoms.

**Physical Exam:** Epigastric tenderness, +/- abdominal distention. Grey-Turner's sign (ecchymotic discoloration of the flanks) and Cullen's sign (discoloration in periumbilical region) may be noted in patients with retroperitoneal bleeding from pancreatic necrosis, which is a poor prognostic sign. A pseudocyst may cause a palpable abdominal mass; obstruction of the common bile duct can cause jaundice.

### **Etiologies (BAD HITS)**

- 1) Biliary stones\*\*
- 2) Alcohol\*\*
- 3) Drugs
  - MUCH less frequent cause, different mechanisms proposed:
  - direct toxic effects (diuretics, sulfonamides, steroids)
  - immunologic reactions (sulfonamides, azathioprine)
  - indirect mechanisms (i.e. intravascular thrombosis, hyperlipidemia secondary to estrogen salicylates, valproic acid, asparaginase, azathioprine, sulindac)
- 4) Hypercalcemia – rare cause, and Hypertriglyceridemia – (TG) seen when levels are above 1000 mg/dL, not very common
- 5) Infection, viruses mainly, and Idiopathic – most common
- 6) Trauma
- 7) Surgery (post-ERCP), or Scorpion Sting  
Other rare causes: pregnancy, cystic fibrosis, alpha-1 antitrypsin deficiency, post-renal transplant, sphincter of Oddi dysfunction, familial (rare, autosomal dominant, different mechanism); congenital/anatomical (e.g. pancreas divisum, duodenal stricture); and vascular – infarct, embolic, vasculitis

### **Diagnosis**

- Amylase – sensitive, not very specific. Note that high triglycerides can cause spuriously normal amylase levels.
- Lipase – sensitivity 85-100%, more specific than amylase, but there are also multiple causes for elevated lipase
- No benefit to checking both tests
- Level of pancreatic enzyme elevation does **not** correlate with severity of disease
- To investigate etiology: serum EtOH level; fasting triglycerides, Ca+; If liver tests consistent with obstructive picture, obtain RUQ ultrasound to evaluate for gall stones.

**Prognosis:** Mortality from acute pancreatitis is 10%, usually from pancreatic necrosis causing multiple organ failure. The following prognostic scales are used to help identify patients at risk for severe pancreatitis causing organ failure or death, to help intervene earlier in their hospital course.

**Ranson's criteria (GA LAW) - admission**

- Glucose > 200
- Age > 55 years
- LDH > 350
- AST > 250 (SGOT)
- WBC > 26L

**Ranson's criteria (C HOBBS) - at 48 hours**

- Calcium < 8
- Hct decrease > 10%
- Oxygen < 60 mm Hg (pO<sub>2</sub>)
- BUN increase of > 5
- Base deficit > 4
- Sequestration of fluid > 6 L

APACHE, APACHE-2, CRP, IL-6, and urinary Trypsinogen Activation Peptide (TAP) also being used in some institutions to assess severity.

**Complications:** In descending order of likelihood: pseudocyst, (ARDS), pancreatic abscess, splenic vein thrombosis, necrotizing pancreatitis. Necrosis is the complication associated with high mortality.

- **Pseudocyst.** Can be drained surgically, percutaneously (via IR), or endoscopically. Criteria for drainage not clear cut, but consider if patient has persistent symptoms for > 4-6 wks or if the pseudocyst becomes infected. Fistula, pseudoaneurysms, rupture, and hemorrhage can develop if chronic pseudocyst is not drained.
- **Abscess** may be seen as “soap bubble sign” on upright abdominal x-ray. Diagnose by Gram stain of fluid aspiration (usually CT-guided). Treat with surgical debridement & drainage immediately.

**Management:** Usual management includes bowel rest aggressive hydration with IVF and pain meds. Treat underlying cause of pancreatitis, eg. provide insulin to poorly controlled diabetics w/ high triglycerides, GI consult for ERCP if gallstone, cessation of offending drug.

- *Nasogastric tube/suction:* Recommended in moderate-severe pancreatitis or in those with ileus, nausea, or vomiting.
- *High TG:* Obtain detailed history as some patients have secondarily high triglycerides from alcohol, obesity, diabetes, some meds. Try to lower TG to < 1000, restrict dietary fat, cease alcohol intake. Recommend fish oils, lipid-lowering agents.
- *When to feed:* When nausea, vomiting, and pain subside, initiate clear liquid diet and advance as tolerated; there should be progress to oral intake within 5 days. If no improvement in 48-72 hours, investigate for complications.
- *Should we follow amylase and/or lipase levels to evaluate improvement/resolution:* NOT typically done, they do not reflect disease severity.
- *Patients with high APACHE or Ranson's scores:* If the patient deteriorates or meets criteria for severe/necrotizing pancreatitis, get abdominal CT scan.
  - If >30% necrosis, initiate broad-spectrum antibiotics such as imipenem. If no clinical improvement after 1 wk, consider aspiration of fluid. If evidence of infection, attempt drainage. If sterile, continue antibiotics 4-6 weeks.
  - Empiric antibiotics for pancreatitis with fever is controversial; most now recommend initiating antibiotics only in response to CT findings.

- Possible indications for necrostomy: continued clinical deterioration, pus on aspiration.
- Feed patients enterally (high protein, low fat) whenever possible as less risk of infection from TPN and maintenance of intestinal barrier. Switch to TPN in 2-4 days if patient not meeting nutritional goals.
- *If gall stones:*
  - ERCP indicated for obstructive liver tests and jaundice, or if liver tests not responding to supportive therapy. Usually not done in acute period unless patient has cholangitis or sepsis.
  - Cholecystectomy should be considered following recovery and prior to hospital discharge in any patient with gallstone pancreatitis. In severe or necrotizing disease, wait 3-4 weeks for possibility of infection to be ruled out. Pre-op ERCP or cholangiogram recommended if probability of common bile duct stones is high to prevent recurrent pancreatitis. Recurrent pancreatitis without evidence of gall stones or alcohol use may be due to microlithiasis; elective cholecystectomy should be considered.

*Case Follow-up: The patient had been binge drinking two days prior to arrival. His lipase was elevated; he was diagnosed with acute pancreatitis. Treatment included NPO, aggressive IV fluids, and pain meds. He tolerated a full diet on hospital day #3. He was encouraged to abstain from alcohol.*

### Clinical Pearls

- Amylase and lipase are sensitive but not very specific. No need to follow values to determine resolution of pancreatitis.
- Goal is to prevent progression to pancreatic necrosis; use prognostic indicators such as Ranson's criteria to help determine need for CT scan to evaluate for this and other complications of pancreatitis.
- Gall stone pancreatitis is an indication for cholecystectomy; timing depends on clinical course.
- Start investigation for complications such as pseudocyst and necrosis if the patient is not improved in 48-72 hours.
- Above all, rely on your clinical judgment; if a patient appears to be worsening, act quickly to diagnose complications and initiate appropriate therapy.
- Treatment is hydrate, hydrate, hydrate

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