

32-Year-Old-Woman With Abdominal Pain

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A 32-year-old woman presented to the emergency department with a 2-day history of abdominal pain. She described the pain as a sharp sensation in the epigastric region with radiation to the back. The pain was accompanied by 3 episodes of nonbloody emesis. She had been examined 1 day previously at a local urgent care facility and was given a prescription for a gastrointestinal medication that provided minimal relief. She did not have fever, chills, chest pain, dyspnea, hematemesis, hemochezia, melena, or dysuria. Her medical history was notable for anxiety, and her social history was remarkable for one glass of red wine daily with dinner. She did not use tobacco or illicit drugs. Her only medication was alprazolam.

On physical examination, the patient was in moderate distress. Her temperature was 37.4°C, blood pressure was 149/93 mm Hg, pulse rate was 93 beats/min, and respiratory rate was 18 breaths/min. Her sclerae were anicteric. Cardiopulmonary examination findings were normal, and her abdomen was soft and nondistended. She had normal active bowel sounds and tenderness on palpation of the epigastrium without rebound tenderness. No ecchymosis was evident around her umbilicus or flanks bilaterally. Laboratory values on admission included the following (reference ranges provided parenthetically): hemoglobin, 16.0 g/dL (13.5-17.5 g/dL); hematocrit, 50% (38.8%-50.0%); white blood cell count, $10.8 \times 10^9/L$ ($3.5-10.5 \times 10^9/L$); platelet count, $316 \times 10^9/L$ ($150-450 \times 10^9/L$); alanine aminotransferase (ALT), 601 U/L (7-55 U/L); sodium, 141 mmol/L (135-145 mmol/L); potassium, 3.7 mmol/L (3.6-4.8 mmol/L); serum urea nitrogen (BUN), 10 mg/dL (8-24 mg/dL); creatinine, 0.8 mg/dL (0.9-1.4 mg/dL); aspartate aminotransferase (AST), 409 U/L (8-48 U/L); albumin, 3.9 g/dL (3.5-5.0 g/dL); total bilirubin, 6.2 mg/dL (0.1-1.2 mg/dL); direct bilirubin, 3.3 mg/dL (0.1-0.4 mg/dL); alkaline phosphatase, 126 U/L (45-115 U/L); and lipase, 9360 U/L (7-60 U/L). Electrocardiography revealed normal

sinus rhythm. No focal consolidations or pleural effusions were noted on chest radiography.

1. Which one of the following is the most appropriate step in establishing the diagnosis of acute pancreatitis?

- No further diagnostic studies are indicated
- Serum amylase measurement
- Serum triglyceride measurement
- Computed tomography (CT) of the abdomen
- Abdominal ultrasonography

The diagnosis of acute pancreatitis can be established if at least 2 of the following 3 criteria are met: abdominal imaging with characteristic findings suggestive of acute pancreatitis, lipase or amylase level greater than 3 times the upper limit of normal, and abdominal pain characteristic of the disease (epigastric pain, commonly radiating to the back).¹ There is no need for further diagnostic modalities because the patient has met 2 of the 3 criteria needed to establish a diagnosis of acute pancreatitis. There is no need to measure the amylase level if the lipase level is elevated to more than 3 times the upper limit of normal. Serum triglyceride measurement can be important in identifying the etiology of pancreatitis; however, it has no utility in diagnosing pancreatitis. Computed tomography of the abdomen should be reserved for patients in whom the diagnosis of acute pancreatitis is uncertain.¹ Abdominal ultrasonography is indicated to evaluate for gallstones as a cause of acute pancreatitis; however, it is not required to establish the diagnosis of acute pancreatitis.

On admission to the hospital, morphine and ondansetron were administered every 4 hours as needed for pain and nausea. The patient was instructed to avoid oral intake as long as she continued to have emesis. Lactated Ringer solution was administered at a rate of 250 mL/h. Serum calcium and triglyceride levels were measured to evaluate the etiology

See end of article for correct answers to questions.

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of the episode of acute pancreatitis, and the values were 8.4 mg/dL (8.9-10.5 mg/dL) and 150 mg/dL (<200 mg/dL), respectively.

2. Which one of the following is the most likely cause of acute pancreatitis in this patient?

- Excessive alcohol consumption
- Hypertriglyceridemia
- Gallstones
- Pancreaticobiliary tumor
- Drugs

The patient did not report excessive alcohol use (she consumes one glass of wine at dinner), so it is an unlikely cause of her acute pancreatitis. Hypertriglyceridemia has been established as a cause of acute pancreatitis in approximately 1% to 4% of all cases; however, the patient's serum triglyceride level was normal on admission, making hypertriglyceridemia a less likely cause of acute pancreatitis in this patient. The most common causes of acute pancreatitis are gallstones and alcohol-induced pancreatitis. This patient's liver enzymes (especially ALT) and bilirubin level are elevated, which may suggest choledocholithiasis. An ALT level of 150 IU/L or greater has a 95% positive predictive value for acute gallstone pancreatitis; considering that this patient's ALT was 601 IU/L on admission, the diagnosis of gallstone pancreatitis is most likely.² Patients older than 40 years of age should be evaluated for pancreaticobiliary cancer as a potential cause of acute pancreatitis if alcohol-induced or gallstone etiologies are ruled out. The patient's only medication is alprazolam, a medication that has no association with acute pancreatitis.

3. Which one of the following values, when monitored over the first 24 hours of admission, is most predictive of mortality?

- BUN
- Hematocrit
- Heart rate
- Age greater than 55 years
- Lipase

Studies have revealed that an elevated BUN level at admission or 24 hours later is associated with a higher predictive value for mortality.³ Elevated hematocrit concentration,

heart rate, and age greater than 55 years are associated with a more severe course of acute pancreatitis, and these variables can be used for initial risk assessment.¹ Although lipase is considered when making the diagnosis of pancreatitis, it has no predictive value for mortality.

Within 6 hours of admission to the hospital, the patient's pain began to improve somewhat with morphine, and her nausea began to subside. Her BUN level remained at 10 mg/dL. She underwent abdominal ultrasonography, which revealed cholelithiasis and dilation of the common bile duct.

On the second day of hospitalization, the patient's vital signs included a temperature of 36.8°C, pulse rate of 85 beats/min, and blood pressure of 101/62 mm Hg. Laboratory studies revealed the following values: hematocrit, 43.3%; creatinine, 0.7 mg/dL; BUN, 8 mg/dL; total bilirubin, 6.8 mg/dL; direct bilirubin, 3.0 mg/dL; alkaline phosphatase, 140 U/L; ALT, 600 U/L; and AST, 390 U/L.

4. Which one of the following is the most appropriate next therapeutic step for this patient?

- CT of the abdomen and pelvis
- Endoscopic retrograde cholangiopancreatography (ERCP) followed by cholecystectomy
- ERCP and cholecystectomy in 6 weeks
- Increase intravenous fluid rate
- Discharge home

There is no reason for CT of the abdomen and pelvis in this patient; however, patients who do not improve clinically within 72 hours or have an unclear diagnosis require CT or magnetic resonance imaging (MRI) of the abdomen to evaluate for complications of acute pancreatitis¹ and, in idiopathic cases, further etiologic work-up for entities such as malignant tumors or mucinous cystic neoplasms. In patients with gallstone pancreatitis whose liver function test results are persistently elevated, especially a bilirubin level greater than 4 mg/dL, ERCP should be performed because such findings indicate that the stone is still present in the common bile duct. The ERCP should be performed during the initial hospitalization to prevent complications.⁴ If ERCP reveals a stone, the patient

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