Recurrent Epigastric Pain in an 82-Year-Old Woman

July 01, 2002
By Reiko Kayashima, MPH [1], E. William Johnson, MPH [2], Jared Acoba, MD [3], and Jinichi Tokeshi, MD [4]

An 82-year-old woman who had recently arrived from Japan presented to the emergency department with a 3-day history of abdominal pain that began immediately after she swallowed several pills with a small amount of water. The severe, intermittent pain radiated to the patient’s back and worsened with meals. The patient denied chills, nausea, vomiting, coughing, diarrhea, and constipation. She had well-controlled type 2 diabetes mellitus and hypercholesterolemia, and had undergone an appendectomy 50 years earlier.

The patient was in moderate distress. Her temperature was 38.3C (101F); blood pressure, 116/44 mm Hg; pulse rate, 88 beats per minute; and respiration rate, 19 breaths per minute. Epigastric and right upper quadrant tenderness with no rebound or guarding was noted; Murphy’s sign was negative. The white blood cell (WBC) count was 18,500/μL, with 7% bands and 89% neutrophils. Liver function test results and amylase and lipase levels were normal; there was no occult blood in the stool.

An ECG showed normal sinus rhythm with no ischemic change; cardiac enzyme levels were normal. An abdominal ultrasound scan and a hepatic 2,6-dimethyliminodiacetic acid scan were negative for gallbladder disease. Chest and abdominal films were unremarkable.

The pain initially resolved after the patient received a GI cocktail (Donnatal, Mylanta, and Xylocaine); she was given a proton pump inhibitor and admitted to the hospital. On the second hospital day, the pain returned and atrial fibrillation was noted; abdominal findings remained unchanged. The patient was afebrile; her WBC count was normal. A CT scan of the abdomen revealed small bilateral pleural effusions but no abdominal pathology. The atrial fibrillation resolved spontaneously.

Two days later, the patient again complained of epigastric pain and experienced atrial fibrillation. Because of her recent airplane trip, a spiral CT scan of the thorax was obtained to assess for pulmonary embolism. The study demonstrated mediastinal air posterior to the esophagus (Figure 1) and a possible distal esophageal perforation, which was confirmed by a meglumine diatrizoate esophagram that revealed extravasation of the contrast confined to the mediastinum (Figure 2).

Broad-spectrum intravenous antibiotics were initiated. Total parenteral nutrition and intravenous...
hydration were started; nothing was given by mouth. On hospital day 17, a follow-up esophagram showed that the esophageal perforation had resolved and a round filling defect in the distal esophagus persisted, which suggested the presence of a foreign body (Figure 3). An esophagogastroduodenoscopy revealed a pill within a plastic casing lodged in the esophageal mucosa at the site of the perforation (Figure 4). The dime-size wrapped pill was removed endoscopically without complications. The patient was able to tolerate a clear diet and was discharged from the hospital 2 days later.

CAUSES OF ESOPHAGEAL PERFORATION
Instrumental injury accounts for 33% to 48% of all esophageal perforations; trauma or forceful vomiting (Boerhaave syndrome, see CONSULTANT, May 2001, page 831) and diseases of the esophagus also can cause perforation. Esophageal perforation following foreign body ingestion is rare; children, elderly persons with dentures, prisoners, and psychiatric patients are at greatest risk. Sharp- or rough-edged objects, such as bones, coins, needles, toys, and batteries, can pierce and perforate the esophagus spontaneously or during their removal by endoscopy. Impacted foreign objects also can cause slow pressure necrosis, weaken the mucosa, and lead to perforation. Pill-induced esophageal injury resulting in perforation has been reported. For our patient, 2 possible modes of injury are likely: the sharp object perforated the distal esophagus, or the sharp foreign body partially penetrated the mucosa and induced a pressure necrosis that led to perforation. A similar case of a pill becoming a foreign body has been reported, but we found no instances in the literature of such an impaction causing esophageal perforation.

PRESENTATION
The presenting symptoms of esophageal perforations may differ according to the perforation's location (cervical, thoracic, or abdominal). The classic triad—pain, fever, and the astinal air—is associated with perforation at all 3 sites. Patients with cervical perforation commonly have subcutaneous emphysema and chest pain; those with thoracic perforation, such as this patient, often complain of upper back and abdominal pain. Laboratory investigations may reveal leukocytosis. Odynophagia and dysphagia are frequent complaints when a foreign object is present in the esophagus.

DIAGNOSIS
The history is the most important component in the evaluation of a suspected esophageal foreign body. Had this patient initially reported that she had swallowed several pills, a delay in diagnosis may have been avoided. When symptoms develop immediately after instrumentation, the diagnosis of esophageal perforation is obvious. However, in cases of noniatrogenic perforation, diagnosis is more difficult. Plain chest films and upright abdominal films are valuable and suggest perforation in 90% of patients. Findings can include pneumomediastinum, subcutaneous emphysema, mediastinal widening, mediastinal air-fluid levels, pleural effusion, pneumothorax, and hydrothorax. In the remaining 10% of patients with suspected esophageal perforations who have unremarkable plain films, an esophagram is useful. Wood; plastic; and thin metals, such as aluminum, are not radiopaque. This patient's chest film was normal, but the esophagram demonstrated a persistent round filling defect that suggested a foreign body. Meglumine diatrizoate is the contrast agent of choice because it is water-soluble and readily...
resorbed from the mediastinum or pleural space. Note that extravasation of water-soluble contrast media is not seen in 50% of cervical perforations and in 20% to 25% of thoracic perforations.\(^9\) When these studies are negative and a high level of suspicion persists, consider dilute barium, which is more sensitive in detecting smaller leaks. If contrast radiography fails to confirm the diagnosis, a CT scan may be helpful.

**MANAGEMENT**

Optimal management for esophageal perforation remains controversial. Generally, the patient's underlying esophageal pathology, the hemodynamic consequences of the perforation, and the extent of the perforation influence the decision to perform surgery.\(^5\)

**Surgery.** Absolute indications for operative intervention include pneumothorax, pneumoperitoneum, mediastinal emphysema, systemic sepsis, shock, and respiratory failure.\(^10\) Drainage alone, drainage and primary repair, and drainage and esophageal diversion or esophagectomy are the surgical techniques used. Aggressive surgical intervention may reduce mortality but can be associated with significant morbidity, including strictures and recurrent leaks with prolonged hospitalization and multiple operations.\(^13\)

**Medical therapy.** Criteria for nonoperative management of esophageal perforation are:

- A clinically stable patient.
- An instrumental perforation that is detected before major mediastinal contamination has occurred or a perforation whose diagnosis has been so long delayed that the patient is able to tolerate the injury, obviating the need for surgery.
- An esophageal disruption that is well contained within the mediastinum or a pleural loculus.\(^11,14\)

Treatment includes broad-spectrum intravenous antibiotics, intravenous hydration, nothing by mouth, nasogastric suction, and total parenteral nutrition.\(^15\) A surgeon needs to monitor the patient as well. Antibiotics are continued until extramural tears are no longer evident, which is typically 14 days.\(^5\)

First performed 55 years ago,\(^16\) immediate surgical intervention has been the mainstay of treatment; however, the recent introduction of more effective antibiotics, improved parenteral alimentation and nonoperative methods of irrigation and drainage, and the emphasis on early diagnosis have led to a cautious trend toward nonoperative treatment.\(^11\) Mortality among patients who received nonsurgical treatment is between 0% and 10%.\(^11,15,17\)

Studies conducted between the 1950s and the 1990s indicated an overall mortality of between 9% and 39% among patients with nonmalignant esophageal perforation.\(^18\) Common causes of death include sepsis and multiorgan failure.\(^19\) However, regardless of the type of therapy chosen, it has been repeatedly shown that delays in diagnosis and treatment are associated with increased morbidity and mortality.\(^5\)

This patient's pathology was contained in the mediastinum. She was clinically stable and, therefore, a good candidate for nonoperative therapy. Despite the delay in diagnosis, close evaluation and standard conservative treatment resolved the perforation, and the foreign body was removed successfully.

**References:**

**REFERENCES:**


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