Gastroduodenal Perforation

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KEYWORDS

• Gastroduodenal • Perforation • Ulcer-reducing surgery

KEY POINTS

- The most common cause of gastroduodenal perforation is peptic ulcer disease.
- Nonoperative management can be considered in patients with minimal symptoms who are younger than 70 years.
- Abdominal washout, ulcer biopsy, and omental patch are appropriate in most circumstances.
- Acid-reducing surgery is indicated in patients who have a history of failed medical therapy.

The cause and management of gastroduodenal perforation has changed as a result of increasing use of nonsteroidal antiinflammatories and improved pharmacologic treatment of acid hypersecretion, as well as the recognition and treatment of *Helicobacter pylori* (**Fig. 1**). As a result of the reduction in ulcer recurrence with medical therapy, the surgical approach to patients with gastroduodenal perforation has also changed over the last 3 decades, with ulcer-reducing surgery being performed infrequently.[1,2]

CAUSE

- The most common cause of gastroduodenal perforation is ulcer disease
  - Ulcer disease may be secondary to acid hypersecretion, *H pylori* infection, or from medications (steroids, nonsteroidal antiinflammatories)
- Other causes include trauma, neoplasm, foreign body ingestion, or iatrogenic (endoscopic procedures).
  - Blunt trauma resulting in gastroduodenal perforation is rare, comprising only 5% of blunt hollow viscous injuries.
  - Malignant perforations may be secondary to necrotic tumor in the stomach or duodenum that perforates or from an obstructing tumor, leading to proximal dilation and perforation.
  - Foreign bodies may cause perforation from direct injury to the stomach or duodenum or as a result of luminal obstruction.[1]

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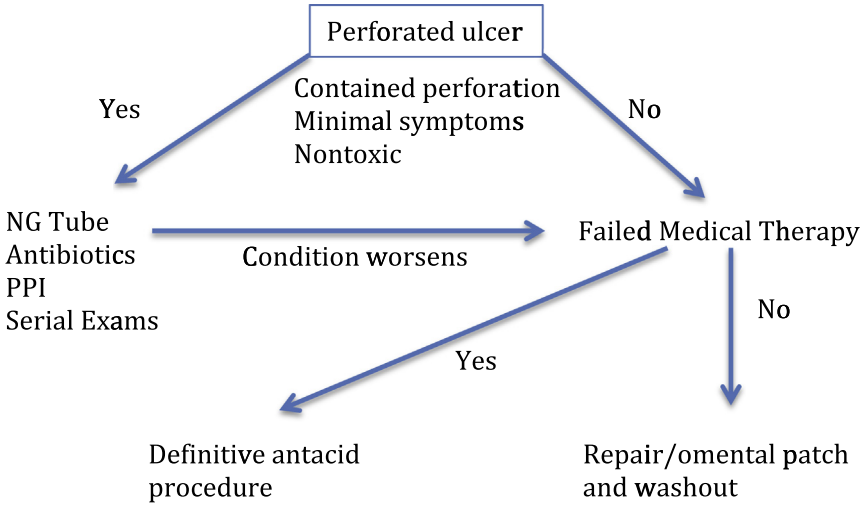

Fig. 1. Treatment of perforated gastroduodenal ulcer. Exams, examinations; NG, nasogastric; PPI, proton pump inhibitor.

PRESENTATION

- Sudden onset of severe epigastric and right upper quadrant abdominal pain in patients with a history of gastroesophageal reflux is common among those with peptic ulcer disease perforations.
- Peritonitis may be minimal in the case of contained leaks.
- Mental status changes and septic shock (fever, hypotension, tachycardia) may be observed in diffuse leakage of the perforation.

DIAGNOSIS

- Leukocytosis, metabolic acidosis, and hyperamylasemia may be present but are not sensitive.
- Upright chest radiograph may show free air.
- Computed tomography (CT) with enteral contrast shows free air, free fluid, mesenteric fat stranding, and bowel wall thickening and may localize the site of perforation. Early CT scans after traumatic injury may be falsely negative in up to 12% of cases.[3]

MANAGEMENT

Nonoperative Management

Approximately half of the perforations spontaneously seal, which raises the question as to whether these patients can be managed nonoperatively. The difficulty is identifying those patients who have sealed without compromising the outcomes for those who have not sealed while one observes them for signs of clinical deterioration.[4] Factors mandating surgical management include shock and generalized peritonitis. Risk factors that have been associated with failure of nonoperative management include age greater than 70 years, symptoms of greater than 24 hours, and lack of improvement after 12 hours of conservative therapy. Conservative therapy includes showing that there is no free extravasation of contrast and that the leak is confined either by CT or gastroduodenography. Once this information is verified, a nasogastric tube