CASE 2- Toy & Liu CASE FILES: Surgery

A 48-year-old man presents for an evaluation of burning epigastric and substernal pain that has recurred almost daily for the past 4 months. He says that these symptoms seem to be worse when he lies down and after meals. He denies difficulty swallowing or weight loss. The patient has been taking a proton pump inhibitor (PPI) on a regular basis over the past 12 weeks with partial resolution of his symptoms. His past medical history is significant for frequent early morning wheezing and hoarseness that have been present for the past few months. The patient has no other known medical problems, and he has had no prior surgeries. He consumes alcohol occasionally but does not use tobacco. On examination, he is moderately obese. No abnormalities are identified on the cardiopulmonary or abdominal examination.

What is the most likely diagnosis?

What are the mechanisms contributing to this disease process?

What are the complications associated with this disease process?
ANSWERS TO CASE 2: Gastroesophageal Reflux Disease

Summary: A 48-year-old man complains of a 4-month history of daily burning epigastric pain. It is worse after eating and lying down and improves slightly with the use of a proton pump inhibitor. He also has symptoms of reactive airway disease and hoarseness.

◆ **Most likely diagnosis:** Gastroesophageal reflux associated with silent aspiration and pharyngitis.

◆ **Mechanisms contributing to this disease process:** Abnormalities of the lower esophageal sphincter (LES), impaired esophageal clearance, and abnormal esophageal barriers to acid exposure.

◆ **Complications associated with the disease process:** Peptic stricture, Barrett’s esophagus, and extraesophageal complications.

Analysis

Objectives

1. Describe the physiologic mechanisms that prevent and the pathologic processes that lead to gastroesophageal reflux disease (GERD).
2. Understand a rational diagnostic and therapeutic approach to suspected GERD.

Considerations

This patient’s history of substernal chest pain associated with meals is typical for GERD. Hoarseness and wheezing are somewhat atypical symptoms but suggest pharyngeal reflux with silent aspiration. Although this patient denies dysphagia or weight loss, the presence of these symptoms should prompt a further workup for a malignancy.
The next step should be to confirm the diagnosis of GERD and to assess the adequacy of the medical regimen. Endoscopy should be performed to evaluate for esophagitis. The use of 24-hour pH monitoring while the patient is off medication can correlate the symptoms with episodes of reflux and quantify the severity of the reflux. Pharyngeal pH monitoring, which measures proximal esophageal acid exposure, may help to support a diagnosis of silent aspiration.

While H₂ blockers can provide symptomatic relief for mild reflux, PPIs may be superior for decreasing acid production. However, patients with extraesophageal symptoms and pharyngeal reflux may be less responsive to medical treatment. Surgical therapy is an alternative to medical therapy and is recommended if the patient does not respond to medical therapy, cannot tolerate the medications, or prefers surgical intervention.

APPRAOH TO GASTROESOPHAGEAL REFLUX DISEASE

Definitions

**Gastroesophageal reflux disease:** Symptoms of heartburn caused by acid regurgitation from the stomach into the distal esophagus.

**Barrett’s esophagus:** Replacement of the normal squamous epithelium of the distal esophagus with columnar epithelium with intestinal metaplasia, which places the patient at risk for esophageal adenocarcinoma.

**Manometry:** A procedure in which a small electronic pressure transducer is swallowed by the patient to be positioned in the vicinity of the LES. The most commonly used technique involves a 24-hour ambulatory device.

Clinical Approach

Gastroesophageal reflux, or heartburn, occurs in about 20% to 40% of the adult population. However, abnormal GERD occurs in only 60% of patients with reflux symptoms. About half of patients with abnormal reflux develop complications such as peptic strictures, Barrett’s esophagus, and extraesophageal complications. **Barrett’s esophagus** is
associated with an increased risk for esophageal adenocarcinoma. Extra-esophageal complications, postulated to be due to pharyngeal reflux and silent aspiration, include laryngitis, reactive airway disease, recurrent pneumonia, and pulmonary fibrosis.

Pathophysiology

Normal physiologic mechanisms are important in preventing abnormal gastroesophageal reflux. For example, abnormalities in the resting pressure, intra-abdominal length, or number of relaxations of the LES can contribute to abnormal reflux. The LES normally serves as a zone of increased pressure between the positive pressure in the stomach and the negative pressure in the chest. A hypotensive or incompetent LES can result in increased reflux. The crural diaphragm, which is attached to the esophagus by the phrenoesophageal ligament, also contributes to the normal barrier against reflux. When the LES is abnormally located in the chest, as with a hiatal hernia, the antireflux mechanism may be compromised at the gastroesophageal (GE) junction. Also, the esophagus normally undergoes transient relaxations, but patients with abnormal GERD experience an increased number and duration of relaxations. Other proposed contributory factors include abnormal esophageal clearance of acid and decreased mucosal resistance to acid injury.

Workup Patients with self-limiting or mild GERD symptoms do not automatically require a further workup. Those with long-standing or atypical symptoms (wheezing, cough, hoarseness), recurrence of disease after the cessation of medical therapy, or unrelieved symptoms when taking maximal-dose PPIs should undergo diagnostic testing to confirm the diagnosis and to rule out complications of GERD. Also, patients who are being considered for a surgical antireflux procedure should undergo further evaluation. While not all surgeons routinely perform all four studies, a standard workup prior to a surgical antireflux procedure includes endoscopy, manometry, 24-hour pH probe testing, and barium esophagography (Table 2–1).

Treatment The initial treatment of patients with GERD consists of behavioral modifications (Table 2–2) and medications as needed. However, for patients with esophagitis or significant symptoms, the main-
The stay of medical acid suppression is PPI therapy. High-dose PPI therapy may be required for severe symptoms or refractory esophagitis. A lack of any symptomatic relief with PPIs suggests the possibility of an alternative diagnosis.

Surgical therapy is an alternative to medical therapy and is indicated in patients with documented GERD who have persistent symptoms when taking maximal-dose PPIs, are intolerant to PPIs, or who do not wish to take lifelong medications. Although several antireflux operations are available, the standard operation is laparoscopic Nissen fundoplication, which involves performing a 360-degree

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**Table 2–1**

**DIAGNOSIS OF GASTROESOPHAGEAL REFLUX DISEASE**

<table>
<thead>
<tr>
<th>TEST</th>
<th>PURPOSE OF TEST</th>
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<tbody>
<tr>
<td>Endoscopy</td>
<td>Evaluates for erosive esophagitis or Barrett’s esophagus, or alternative pathology. Biopsy for suspected dysplasia or malignancy.</td>
</tr>
<tr>
<td>Barium esophagogram</td>
<td>Identifies the location of the gastroesophageal junction in relation to the diaphragm. Identifies a hiatal hernia or shortened esophagus. Evaluates for gastric outlet obstruction (in which case fundoplication is contraindicated). Can demonstrate spontaneous reflux.</td>
</tr>
<tr>
<td>pH monitoring for 24 h</td>
<td>Correlates symptoms with episodes of reflux. Quantitates reflux severity.</td>
</tr>
<tr>
<td>Pharyngeal pH monitoring</td>
<td>Correlates respiratory symptoms with abnormal pharyngeal acid exposure.</td>
</tr>
<tr>
<td>Manometry</td>
<td>Evaluates the competency of the lower esophageal sphincter. Evaluates the adequacy of peristalsis prior to planned antireflux surgery. Partial fundoplication may be indicated if aperistalsis is noted. Can diagnose motility disorders such as achalasia or diffuse esophageal spasm.</td>
</tr>
<tr>
<td>Nuclear scintigraphy</td>
<td>May confirm reflux if pH monitoring cannot be performed. Evaluates gastric emptying.</td>
</tr>
</tbody>
</table>
### Table 2–2
TREATMENT OF GASTROESOPHAGEAL REFLUX DISEASE

<table>
<thead>
<tr>
<th>Therapy Type</th>
<th>Treatment Options</th>
</tr>
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<tbody>
<tr>
<td>Behavioral therapy</td>
<td>Avoidance of caffeine, alcohol, and high-fat meals</td>
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<tr>
<td></td>
<td>Avoidance of meals within 2–3 h of bedtime</td>
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<td></td>
<td>Elevation of the head of the bed</td>
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<td></td>
<td>Weight loss in obese individuals</td>
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<td></td>
<td>Smoking cessation</td>
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<tr>
<td>Medical therapy</td>
<td>Antacids</td>
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<tr>
<td></td>
<td>Histamine-2 blockers</td>
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<td></td>
<td>Proton pump inhibitors</td>
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<td></td>
<td>Prokinetic agents</td>
</tr>
<tr>
<td>Surgical therapy</td>
<td>Laparoscopic or open antireflux procedure</td>
</tr>
<tr>
<td>Endoscopic therapy</td>
<td>Radiofrequency energy directed to the gastroesophageal junction</td>
</tr>
<tr>
<td></td>
<td>Endoscopic endoluminal gastroplication</td>
</tr>
</tbody>
</table>

**Figure 2–1. Nissen fundoplication.** The fundus of the stomach is wrapped around the distal esophagus and sutured.
wrap of the fundus of the stomach around the GE junction to create a valve effect (Figure 2–1). Long-term success with antireflux surgery exceeds 90%. Recently, two newer endoscopic endoluminal techniques have been developed to treat reflux: delivery of radiofrequency energy to the GE junction and endoluminal suturing of the GE junction. Further prospective data are required.

Comprehension Questions

[2.1] A 62-year-old man with congestive heart failure and emphysema has symptoms of substernal chest pain and regurgitation after meals and at bedtime. He obtains incomplete relief of his symptoms with ranitidine. An endoscopy confirms mild esophagitis. Which of the following is the most appropriate next step?

A. Reassure him that continued occurrence of symptoms while receiving therapy is normal.
B. Prescribe a PPI.
C. Schedule him for 24-hour pH monitoring, manometry, and a barium esophagogram for further evaluation.
D. Schedule him for laparoscopic Nissen fundoplication.

[2.2] A 51-year-old woman has a 6-month history of substernal chest pain and vague upper abdominal discomfort. She has been taking antacid therapy with minimal relief and has had a negative upper endoscopy. Which of the following is the best next step in her work-up?

A. Barium esophagogram to evaluate for a hiatal hernia
B. Performing manometry to rule out a motility disorder such as diffuse esophageal spasm or achalasia
C. Refer the patient for cardiac work-up as a potential cause of her chest pain
D. Refer to psychiatrist for possible conversion reaction.

[2.3] A 45-year-old male has had a diagnosis of GERD for 3 years with treatment with H-2 blocking agents. Recently, he has complained
of epigastric pain. An upper endoscopy was performed showing Barrett’s esophagus at the distal esophagus. Which of the following is the best next step in the treatment of this individual?

A. Initiate a PPI  
B. Advise the patient to continue to take the H-2 blocker  
C. Advise surgical therapy involving gastrectomy and esophageal bypass  
D. Discontinue the H2-blocker and initiate antacids

[2.4] A 24-year-old man with long-standing GERD, currently taking PPIs, is being evaluated for possible surgical therapy. Which of the following is an indication for surgery?

A. Inability to tolerate PPIs  
B. Incomplete relief of symptoms despite a maximum dosage of medical therapy  
C. The patient’s desire to discontinue medication  
D. All of the above

Answers

[2.1] B. Given the patient’s comorbidities, he is not a good candidate for surgical therapy. PPIs are the medication of choice and should be the next step after the failure of H2 blockers in this patient.

[2.2] C. When chest or epigastric pain does not respond to antacid therapy, and especially with a negative upper endoscopy, etiologies other than GERD (such as cardiac pain) should be considered. Documentation of a hiatal hernia does not necessarily correlate causally to her symptoms.

[2.3] A. The next step in medical therapy for GERD is the addition of a PPI. The patient has been symptomatic and developed Barrett’s esophagitis on an H2-blocker and therefore additional therapy is needed for relief of symptoms and to decrease the progression of the Barrett’s esophagitis to adenocarcinoma. An anti-reflux surgery (such as the Nissen fundoplication) is an option, but not gastrec-
tomy and esophageal bypass. This patient also needs endoscopic surveillance of the Barrett’s esophagus.

[2.4] D. The indications for surgery are relative and are determined in part by the patient; thus, inability to tolerate or a desire to discontinue medical therapy is a reason for operative management.

**CLINICAL PEARLS**

- Diagnostic endoscopy should be performed when patients have long-standing GERD symptoms and when patients’ symptoms are refractory to medical treatment.
- Patients with GERD may develop pulmonary and laryngeal symptoms.
- Adenocarcinoma of the esophagus is a complication of long-standing GERD.
- Surgical therapy for GERD is indicated in patients with documented GERD who have persistent symptoms while taking maximal-dose PPIs, cannot tolerate PPIs, or do not wish to take lifelong medications.

**REFERENCES**