

Preoperative Evaluation of Patients with Gastroesophageal Reflux Disease

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ABSTRACT

All patients who are candidates for laparoscopic fundoplication for the treatment of gastroesophageal reflux disease (GERD) should have a symptom review, barium swallow imaging, endoscopy, esophageal manometry, and ambulatory pH monitoring. The presence of a typical primary symptom, an abnormal 24-hour pH score, and a good response to acid-suppression therapy are predictive of a successful surgical outcome. The surgeon should be particularly wary of the following types of patients who may be referred for fundoplication but not have GERD: those who do not respond to proton pump inhibitors, those without esophagitis, those with only atypical symptoms, those in whom pH monitoring was done without previous manometry, and those with a borderline reflux score, severe vomiting, severe dysphagia and heartburn, unusual symptoms, severe depression, or morbid obesity.

INTRODUCTION

THE LAST 10 YEARS have seen a tremendous increase in the number of minimally invasive operations for the treatment of gastroesophageal reflux disease (GERD). The laparoscopic approach, in fact, gives results similar to those obtained with the open approach (excellent control of symptoms in about 90% of patients), but it is associated with a shorter hospital stay, less postoperative discomfort, and faster recovery.¹⁻⁴

Many factors play a role in the success of the operation. Clearly, the performance of a technically adequate procedure is very important and entirely under the control of the surgeon. However, other factors such as a careful preoperative evaluation and patient selection also play an important role in the outcome. The following discussion summarizes our preoperative evaluation at the Swallowing Center of the University of California–San Francisco.

PREOPERATIVE EVALUATION FOR ANTIREFLUX SURGERY

All patients who are candidates for a laparoscopic fundoplication undergo the following preoperative evaluation: (1) symptomatic review; (2) barium swallow; (3) endoscopy; (4) esophageal manometry; and (5) ambulatory pH monitoring.

Symptomatic evaluation

Patients are questioned regarding the presence and duration of symptoms. Symptoms are divided into two groups: (1) *typical* (heartburn, regurgitation, and dysphagia); and (2) *atypical* (cough, wheezing, chest pain, nausea, and hoarseness). The severity of the symptom is scored from 0 (not present) to 4 (severely affecting quality of life).

It is commonly believed that the diagnosis of GERD

can be made reliably from the clinical history,^{5,6} so that if a patient complains of heartburn, it is presumed that acid reflux is present. However, when this strategy has been tested, symptoms have been found to be far less sensitive and specific than usually thought.^{7,8} For instance, our group found that among 822 consecutive patients referred for esophageal function tests because of a clinical diagnosis of GERD (based on symptoms and endoscopic findings), only 70% had abnormal reflux by pH monitoring (GERD⁺ patients).⁹ Heartburn and regurgitation were as frequent in GERD⁺ as in GERD⁻ patients, so that symptoms alone could not distinguish between those with and those without genuine reflux.

The response to proton pump inhibitors is a better predictor of the presence of abnormal reflux. For example, in our study, 75% of GERD⁺ patients, but only 26% of GERD⁻ patients, reported a good or excellent response.⁹ Similarly, in a multivariate analysis of factors predicting outcome after laparoscopic fundoplication, Campos and colleagues¹⁰ found that a clinical response to acid-sup-

pression therapy was one of three factors predictive of a successful outcome, along with an abnormal 24-hour pH score and the presence of a typical primary symptom such as heartburn.

Barium swallow

A barium swallow test provides information about the presence and size of a hiatal hernia (Fig. 1),¹¹ the presence and length of a stricture, and the length of the esophagus. This test is not diagnostic of GERD, as a hiatal hernia or reflux of barium can be present in patients who do not have GERD.

Endoscopy

Endoscopy is most often the first test performed to confirm a symptom-based diagnosis of GERD. However, this approach has several pitfalls. First, even though the goal of endoscopy is to assess the mucosal damage secondary

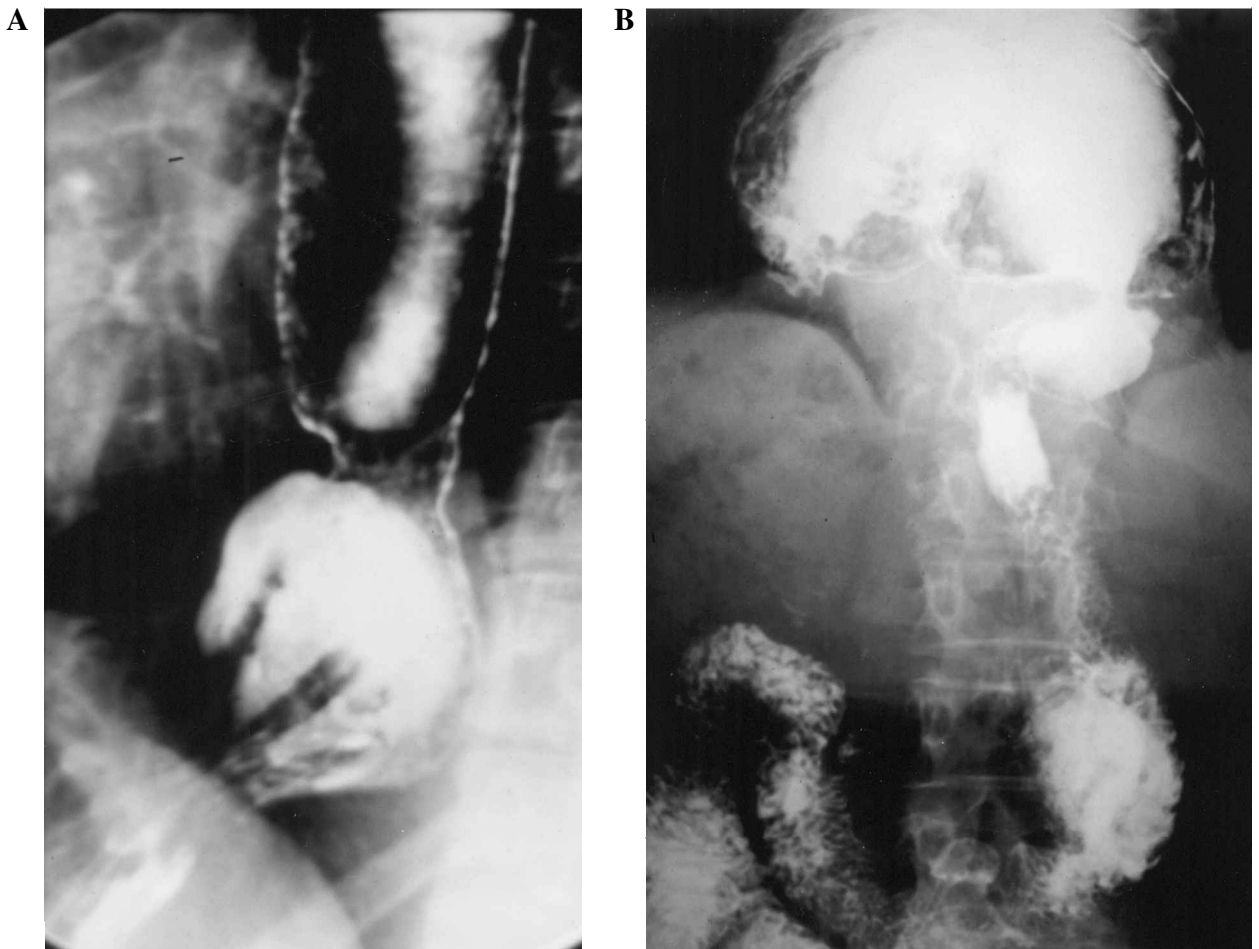


FIG. 1. Diagnostic utility of barium swallow examination. (A) Sliding hiatal hernia. (B) Herniation of entire stomach into posterior mediastinum.

to reflux, mucosal changes are absent in about half of the patients who have GERD.¹² For instance, in our study, esophagitis was absent in 54% of the patients who had positive pH monitoring studies.⁹ Second, significant interobserver variation exists for esophageal endoscopy, particularly for the low grades of esophagitis.¹³ In our study, among 247 patients with negative pH studies, 60 (25%) had been found to have grade I or II esophagitis.⁹ Therefore, we feel that the major value of endoscopy is to exclude other pathology and to detect the presence of Barrett's esophagus, which occurs in about 12% of patients with GERD.¹⁴

Esophageal manometry

Manometry provides information about the motor function of the esophagus, as it determines the length and resting pressure of the lower esophageal sphincter (LES) and the quality (amplitude and propagation) of esophageal peristalsis. In addition, it allows proper placement of the pH probe for ambulatory monitoring (5 cm above the upper border of the LES), avoiding false-positive and false-negative results, which occur in about 75% of patients when the probe is placed with the "step" technique.¹⁵

Ambulatory pH monitoring

Ambulatory pH monitoring is the most reliable test in the diagnosis of GERD, with a sensitivity and specificity

of about 92%.⁸ The results of the test are reproducible, and false-positive or false-negative results are rare. Acid-suppressing medications are discontinued 3 days (H₂-blocking agents) to 14 days (proton pump inhibitors) before the study. Diet and activity are unrestricted during the study in order to mimic a typical day of the patient's life.

The pH monitoring test is of key importance for the following reasons:

(1) It determines whether abnormal reflux is present. In our study, 30% of patients with a clinical diagnosis of GERD had a normal pH monitoring outcome.⁹ Therefore, in these patients, the test avoided the continuation of inappropriate and expensive drugs such as proton pump inhibitors or the performance of a fundoplication. In addition, it prompted further investigation that pointed to other diseases such as cholelithiasis, irritable bowel syndrome, or primary esophageal motility disorders.

(2) It establishes a correlation between symptoms and episodes of reflux. This is particularly important when atypical symptoms such as cough or wheezing are present, as 50% of these patients do not experience heartburn, and 50% do not have esophagitis on endoscopy.¹⁶ In these patients, we use a pH probe with two antimony sensors spaced 15 cm apart (5 and 20 cm above the upper border of the manometrically determined LES) in order to determine the proximal extent of the reflux (Fig. 2).¹⁷ The pH monitoring tracings need to be analyzed for a temporal correlation between an episode of cough and an episode of reflux (signified by a drop of the pH to <4.0).

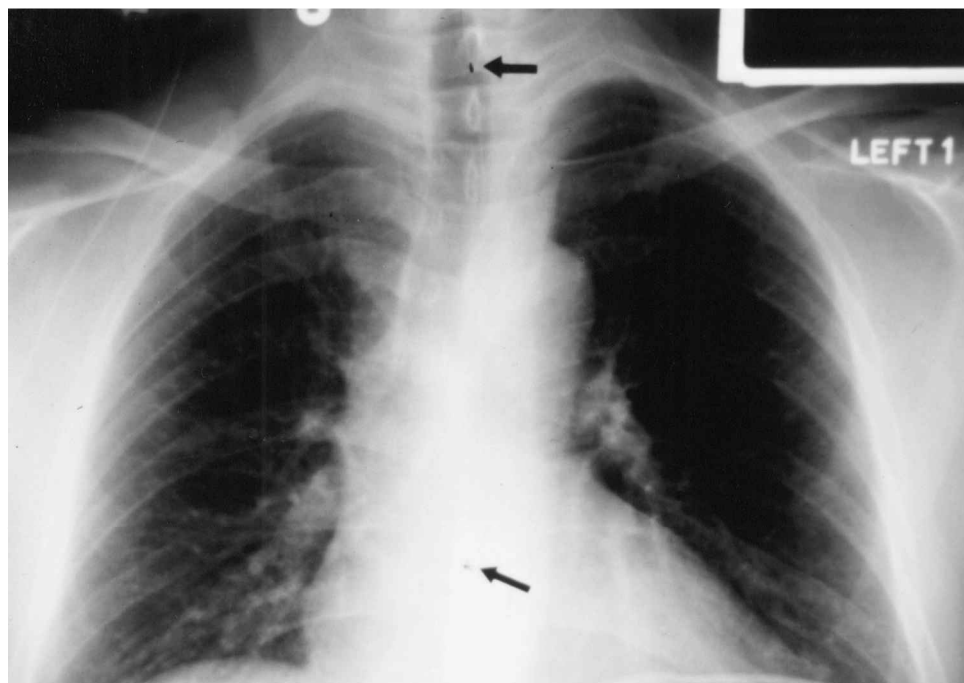


FIG. 2. Ambulatory pH monitoring with dual pH sensors. Chest radiograph shows proper positions of two sensors.

An episode of coughing is considered to be induced by reflux if it occurs within 3 minutes of an episode of reflux in the distal or the distal/proximal esophagus. In a study of the effect of laparoscopic fundoplication on GERD-induced respiratory symptoms, we found that pH monitoring helped identify the patients most likely to benefit from antireflux surgery. Following surgery, in fact, respiratory symptoms resolved in 83% of patients when a temporal correlation between cough and reflux was found on pH monitoring but in only 57% when this correlation was absent.¹⁶

(3) It stages the disease according to severity. The pH monitoring and esophageal manometry findings allow us to stratify patients according to the severity of the disease, identifying a subgroup characterized by worse esophageal motor function (defective LES, abnormal esophageal peristalsis), more acid reflux in the distal and proximal esophagus, and slower acid clearance. As a consequence, these patients experience more stricture formation and Barrett's metaplasia.¹⁸ It is very important to identify these patients early, as they should benefit from early antireflux surgery.

CONCLUSIONS

Gastroesophageal reflux disease is a functional disorder, and the success of a laparoscopic fundoplication is judged by resolution of symptoms. It is therefore essential to select patients who are most likely to benefit from our intervention. Beware of the following patients referred for fundoplication (*decalogue* of the laparoscopic surgeon):

1. *Patients who do not respond to proton pump inhibitors.* Look for another cause for the symptoms.
2. *Patients with no esophagitis on endoscopy.* Confirm the diagnosis by pH monitoring.
3. *Patients with atypical symptoms only (cough, chest pain).* Always perform pH monitoring to determine the presence of abnormal reflux and the correlation between reflux and symptoms.
4. *Patients in whom pH monitoring is done without previous manometry.* False-positive or false-negative results may occur secondary to incorrect positioning of the pH probe.
5. *Patients with a borderline reflux score.* Repeat the study, and make sure that the symptoms correlate with episode of reflux.
6. *Patients with severe vomiting.* Rule out gastric pathology.
7. *Patients with severe dysphagia and heartburn.* Rule out achalasia and esophageal cancer.
8. *Patients with unusual symptoms (abdominal pain, halitosis).* Rule out other diseases.

9. *Patients with severe depression.* Treat the depression first.
10. *Patients with morbid obesity.* Treat the obesity.

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