

ADVANCES IN GERD

Current Developments in the Management of Acid-Related GI Disorders

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Role of the Barium Esophagram in Antireflux Surgery



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G&H What information can a barium esophagram provide?

MB A barium esophagram is an imaging procedure that can be used to examine the structure and function of the esophagus. The most useful parts of the barium esophagram are probably its ability to examine bolus transfer and to look for structural changes; endoscopy is already quite good at examining the mucosa (the third aspect of the examination). I consider the barium esophagram to be complementary to endoscopy, as subtle strictures are sometimes very difficult for an endoscopist to see during endoscopy. It could be argued that motility can be examined with high-resolution manometry instead, but part of the problem is that these patients often have nonspecific symptoms; thus, a barium esophagram can help determine the next steps for the patient (ie, determine whether the problem appears to be a motility or anatomic issue). For example, if a peptic stricture is found during a barium esophagram, the patient most likely has reflux and should be examined for Barrett esophagus.

G&H When is this test indicated?

MB In my opinion, a barium esophagram should be used as the first examination in all patients with dysphagia (but not those with odynophagia). The timed barium swallow component of the test is particularly useful in patients with significant liquid dysphagia, achalasia, or other causes of severe dysmotility. It is a very quick and easy way to determine how effectively the esophagus is

emptying. The amount of emptying can be objective evidence as to whether a patient's symptom improvement is justified. Thus, in a patient with significant liquid dysphagia, I always start out with a timed swallow. The patient is given a specified amount of barium (250 cc), which he or she drinks over 45 seconds, and then spot films of the entire barium column are taken at 1, 2, and 5 minutes. If the esophagus does not empty within 1 minute, the patient should undergo manometry to characterize the dysmotility.

G&H Is a barium esophagram part of the standard diagnostic workup before antireflux surgery?

MB Before antireflux surgery, patients undergo assessment to confirm the presence of reflux, which nowadays generally means a 48-hour Bravo esophageal pH test. Most patients also undergo an endoscopy. At the Cleveland Clinic, my colleagues and I always perform a barium esophagram before and after antireflux surgery—so we must be getting useful information—but most surgeons and gastroenterologists do not use this test regularly. Part of the reason is that the barium esophagram, and fluoroscopy in general, has become a dying art, and I do not think that we will ever get back to where we were 20 years ago. With the advent of endoscopy, it has been increasingly difficult to get residents trained and interested in performing what they see as low-tech, old procedures compared with newer, higher-tech procedures, such as magnetic resonance imaging and computed tomogra-

phy. This is unfortunate because I think that the barium esophagram does have an important role in patients undergoing antireflux surgery, particularly because it can determine whether the esophagus is foreshortened. (If it is, some surgeons believe that a lengthening procedure, or Collis gastroplasty, along with a Nissen fundoplication, is required before a patient can undergo antireflux surgery.)

G&H Is there also a role for performing a barium esophagram after antireflux surgery?

MB Yes. In fact, this is one of the areas in which the test can provide very useful information. If the test is performed correctly, it is possible to obtain a very good anatomic portrayal of the fundoplication, the esophagus, and the stomach. For example, it is possible to determine whether the fundoplication has been disrupted, whether there is a recurrent hernia, and whether the wrap is too tight or too long, and the test can provide a qualitative assessment of gastric emptying (which is important because one of the complications of antireflux surgery is injury to the vagus nerve). Although a barium esophagram is not quantitative, like a gastric emptying study, it can help the radiologist understand, from an anatomic point of view, the cause of symptoms such as dysphagia, recurrent reflux, gas bloating, inability to belch, and early satiety, which the radiologist can then communicate to either the surgeon or the gastroenterologist.

G&H Have there been any studies evaluating this test?

MB There has been some work done, primarily at Wake Forest University in the 1980s and 1990s, showing the value of this test, but this was not prospective research comparing the test with endoscopy. Most of the studies that have been performed have centered on the use of the test after antireflux surgery, but they would more accurately be described as anecdotal or pictorial essays describing normal and abnormal findings. To my knowledge, thus far, no one has ever conducted a good postoperative study showing the information that can be obtained from a barium esophagram and how the test aids in the care of patients.

G&H What are the advantages and disadvantages of a barium esophagram compared with endoscopy?

MB A barium esophagram can show anatomic information that an endoscopist may not be able to visualize. In particular, after antireflux surgery, a barium esophagram does a good job of revealing what is really going on with a fundoplication, with the gastroesophageal junction relative

to the diaphragm and with the position of the wrap relative to the esophagus and the stomach. A barium esophagram can also determine if the wrap is too tight relative to bolus transfer or to the passage of a 13-mm barium tablet.

One of the disadvantages of this test is that it does not have endoscopy's ability to provide an immediate biopsy specimen.

G&H How does the timed barium swallow component of this test compare with a gastric emptying study?

MB The timed barium swallow is a measure of esophageal emptying. It can be assessed quantitatively by using the barium height and width or area change during the 5-minute examination. The timed barium swallow is also equally effective qualitatively. In contrast, the gastric emptying study assesses gastric emptying with scintigraphy.

G&H Are there any difficulties with or contraindications to performing a barium esophagram in patients after antireflux surgery?

MB Barium is considered to be fairly harmless and inert, so it is generally not contraindicated in any patients, except those who have significant aspiration. The only adverse effect is possible constipation. The test is not difficult to perform in patients who can physically and mentally cooperate. Obviously, there are individuals in whom the test is more difficult to perform because of comorbid conditions. For instance, if a patient cannot stand or is immobile, it is difficult or impossible to perform a complete examination.

One of the most important components of this test is knowing how to perform it properly. This can be difficult because not that many doctors are being trained for this test anymore. I have heard surgeons and gastroenterologists, when they find out that I perform barium esophagrams, say that they cannot get this test at their institution.

It also does not help that reimbursement for the examination is very low. It takes only 5 minutes to read a computed tomography scan, but it takes 15 minutes to perform and interpret a barium esophagram. When the relative value unit (RVU) system was first constructed, it was assumed that more technologically advanced or newer examinations were more complex and more difficult to either perform or interpret. Because fluoroscopic examinations have been performed for years, and the technology is not as advanced as that of computed tomography or magnetic resonance imaging, the RVUs assigned to fluoroscopic examinations are lower than those for newer examinations. As a result, in the same time that it takes for a barium esophagram, a radiologist can read

at least 3 computed tomography scans and make a lot more money. And, the skill level and training required to perform a computed tomography scan and those for a barium esophagram are equal. We are not being reimbursed for the skill and time that a barium esophagram takes to perform well.

G&H What training is necessary to perform a barium esophagram well?

MB Training requires a high volume of cases and a good teacher to demonstrate the proper technique. It also helps for radiologists to be part of a team of surgeons and gastroenterologists who value the test and all work together and learn from one another. Radiologists should be involved in the management and care of these patients.

G&H What are the next steps in research in this area?

MB It would be helpful to determine the relative value of a barium esophagram performed by a properly trained individual in a patient with dysphagia, compared with high-resolution manometry, endoscopy, and impedance. Although such a study would be difficult to conduct because of its scope, it would offer an objective evaluation of all of these tests, which would provide very useful information for practitioners. Naturally, I am biased toward

the value of the barium esophagram and believe that it is complementary to existing standard management and adds to the diagnostic picture. The question is whether a barium esophagram is actually needed. Most gastroenterologists would probably say no, but I think that is because they have not worked with individuals who can perform this test well.

Dr Baker has no relevant conflicts of interest to disclose.

Suggested Reading

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