Barium Esophagram

Does It Have a Role in Gastroesophageal Reflux Disease?

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KEYWORDS

- Barium esophagogram • Gastroesophageal reflux disease
- Post-fundoplication barium appearance

KEY POINTS

- The barium esophagram is an integral part of the assessment and management of patients with gastroesophageal reflux disease (GERD) before, and especially after, antireflux procedures.
- While many of the findings on the examination can be identified with endosocopy, a gastric emptying study and an esophageal motility examination, the barium esophagram is better at demonstrating the anatomic findings after antireflux surgery, especially in symptomatic patients.
- These complementary examinations, when taken as a whole, fully evaluate a patient with suspected GERD as well as symptomatic patients after antireflux procedures.

In the age of endoscopy, pH studies, and high-resolution manometry and impedance, the barium esophagram has been deemphasized in the diagnosis and management of patients with suspected gastroesophageal reflux disease (GERD). Unfortunately, as a result, as in most luminal gastrointestinal radiology, training for this important examination has suffered, resulting in the inability of recently trained radiologists to perform an adequate examination. Nevertheless, this examination is a vital part of a patient's workup when GERD is suspected.[1–4] This examination helps define both the morphology and function of the esophagus, identifying important findings relevant to treatment as well as suggesting diagnoses other than GERD. The authors believe that the examination is essential in defining the anatomic causes of symptoms after

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antireflux surgery. At the Cleveland Clinic many, if not most patients with suspected GERD are evaluated with a barium esophagram, especially if antireflux surgery is contemplated. Furthermore, all symptomatic patients after antireflux procedures are also evaluated with a barium esophagram.

ESOPHAGRAM: IMPORTANT GENERAL ELEMENTS OF THE EXAMINATION

Several factors are important to the success of a well-performed barium esophagram. First, the complete examination should be recorded in some fashion. A DVD recorder directly set up to the fluoroscopy unit will burn a DVD of the examination. With modern PACS (picture archiving and communication system), it is now possible to capture the fluoroscopic examination directly in DICOM (digital imaging and communications in medicine) format, and save the study without the hard-copy problems of a disk. Second, to reduce radiation exposure a pulsed-fluoroscopy unit is best, generally at 15 pulses per second, to reduce frame flickering. Third, if the patient has a specific complaint, such as dysphagia, before the start of the examination, the radiologist should encourage the patient to voice these symptoms when they occur during the examination.

Just before the examination, a brief history should be elicited from the patient including the presence of dysphagia, regurgitation, chest pain, and heartburn, as well as duration of symptoms and significant weight loss. Symptoms of GERD are often similar to those of a severe dysmotility disorder, most commonly achalasia and less commonly diffuse esophageal spasm. Therefore, when a patient complains of dysphagia, the examiner must know whether it is to solids alone or to both solids and liquids. When liquid dysphagia is a significant part of the history, the patient starts in the upright position, swallowing a small amount of low-density barium. If there is any delay in emptying, or findings suggesting achalasia, such as a dilated esophagus or a bird-beak appearance of the distal esophagus, the patient proceeds to a timed barium swallow.[5] If the examiner starts the study of a patient with unsuspected achalasia with the routine, air-contrast examination, using gas-producing crystals and high-density barium, the subsequent study is largely ruined.

There are multiple phases of a barium esophagram, not all of which need be performed (**Box 1**). It is important to tailor the examination to the patient based on

Box 1
Phases of a barium esophagram

- Timed barium swallow (assesses esophageal emptying with the patient in the upright position)
- Upright phase (most often performed using air-contrast techniques)
- Motility phase performed primarily in the right anterior oblique position (performed in the semiprone position)
- Distended or full-column phase performed primarily in the right anterior oblique position (performed in the semiprone position with the patient rapidly drinking)
- Mucosal relief phase (observed at the end of the distended or full-column phase of the examination)
- Reflux assessment (after esophagus has emptied, with the patient in the supine or left posterior oblique position)
- "Solid" food assessment (13 mm barium tablet, marshmallow, or offending food)
- Gastric findings, including emptying (observing the gastric motility fluoroscopically)