ADVANCES IN ENDOSCOPY

Current Developments in Diagnostic and Therapeutic Endoscopy

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Revealing Hidden Schatzki Rings Using the Bolster Technique

Caroline Jouhourian, MD
Gastroenterology Fellow
Clinical Instructor
Tufts University School of Medicine
Boston, Massachusetts

G&H What are the common causes of dysphagia?

CJ Dysphagia, or difficulty swallowing, can typically be categorized into either oropharyngeal or esophageal dysphagia, and has both benign and malignant sources. Oropharyngeal dysphagia can be caused by neurologic disorders such as Parkinson disease or multiple sclerosis, or by sudden neurologic damage such as a stroke. Problems within the oropharynx itself, including ulcers, trauma, or salivation issues, can also lead to oropharyngeal dysphagia.

Esophageal causes of dysphagia can be further categorized into motility (ie, achalasia), intrinsic, or extrinsic sources. Intrinsic causes include esophageal cancer; eosinophilic, lymphocytic, or reflux-induced esophagitis; esophageal tumors, strictures, rings, or webs secondary to radiation therapy or gastroesophageal reflux disease; lipoma; and postsurgical changes. Extrinsic causes of esophageal dysphagia include esophageal compression (eg, vascular compression leading to an enlarged aorta or left atrium), cervical osteophytes, lymphadenopathy or masses in the esophagus, scleroderma, Sjogren syndrome, and diffuse spasms.

G&H What is a Schatzki ring, and how common is it?

CJ A Schatzki ring is a narrowing of the lower esophagus, caused by a ring of mucosal tissue, that can lead to dysphagia. There are 2 types of rings in the esophagus, A rings and B rings. A rings tend to be seen in children and are mostly muscular in nature, whereas B rings are more common in adults and are mucosal; Schatzki rings fit into the latter category.

It is not clear how common these rings are because patients are often given a diagnosis of a Schatzki ring without clear identification (they may have another cause for their dysphagia that has not been recognized), or they are dilated for presumed Schatzki rings as a possible cause of dysphagia without actually being diagnosed. This exposes patients to the risks associated with dilation such as perforation. It is important to know that Schatzki rings only exist when a hiatal hernia is present, and often the rings are located within the hiatal hernia sac. Schatzki rings are found in approximately 6% to 15% of barium studies. Based on these statistics, Schatzki rings are not very common, but occur often enough that patients are undergoing esophagogastroduodenoscopies for dysphagia.

G&H How do Schatzki rings present when they are found?

CJ Clinically, patients usually have a gradual onset of intermittent dysphagia to solid foods. Endoscopically, patients present with a mucosal ring-like structure in the lower esophageal area above the squamocolumnar junction. Schatzki rings are usually found within the sac of a hiatal hernia and can be difficult to identify unless they are extremely narrow (compared with other rings). Patients typically begin having symptoms when the ring has a diameter patency less than 12.5 mm.

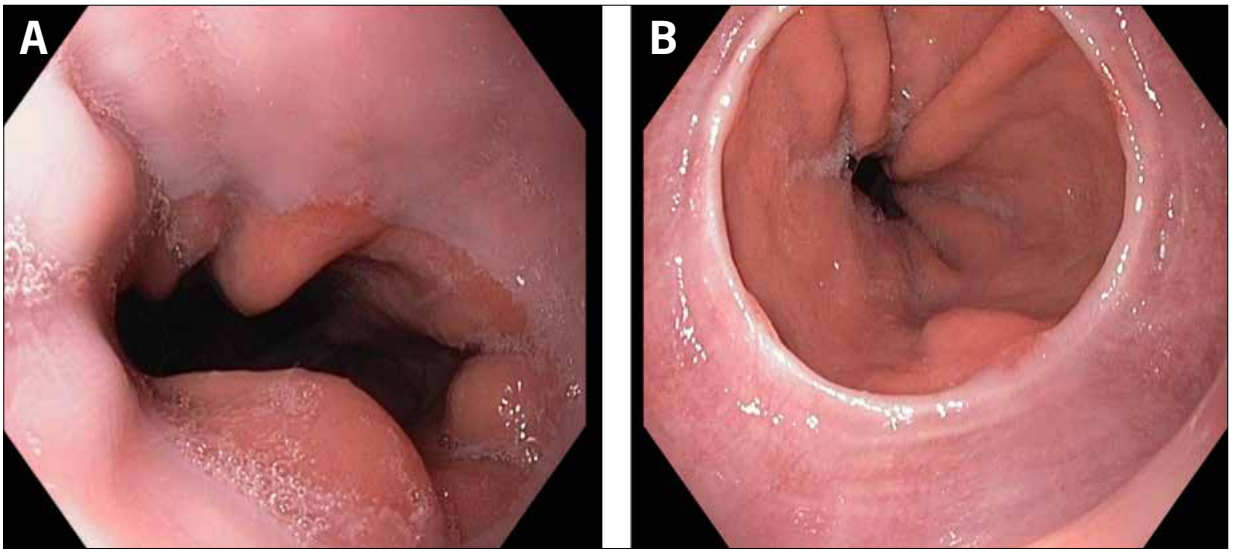

Figure 1. Endoscopic views of the gastroesophageal junction prior to compression (**A**) and after abdominal compression, revealing a Schatzki ring (**B**).

Reproduced from Jouhourian C, Bonis PA, Guelrud M. Abdominal compression during endoscopy (the Bolster technique) demonstrates hidden Schatzki rings (with videos). *Gastrointest Endosc*. 2016;83(5):1024-1026.

G&H Should patients with dysphagia undergo a barium study first, or are they better served by referral directly to endoscopy?

CJ Clinicians tend to favor sending patients with dysphagia directly to endoscopy. Barium studies used to be a common procedure for diagnosing Schatzki rings, but they do not provide any means of treatment. With the advent of computed tomography scans and magnetic resonance imaging, and the sensitivity and specificity of these studies compared with typical radiographs, endoscopy is the preferred method.

G&H What role does the Valsalva maneuver play in highlighting Schatzki rings?

CJ The Valsalva maneuver is used in the field of radiology to help identify Schatzki rings by distending the hiatal hernia; patients lie prone and swallow a marshmallow to bring out the ring. The use of the Valsalva maneuver is center-dependent and is likely to be performed by radiologists in tertiary care centers. However, when a barium study is ordered, certain centers may require a specific indication (ie, the clinician is trying to rule out a Schatzki ring) in order to allow the maneuver to be performed. Overall, the Valsalva maneuver has helped to increase the rate of Schatzki ring detection from 7% to 100% in the field of radiology. Unfortunately, the endoscopic field has not made advances in improving the detection rate of Schatzki rings, which is why my colleagues and I conducted a study using the Bolster technique.

G&H What is the Bolster technique?

CJ The Bolster technique is a procedure in which an endoscopist applies deep and steady abdominal pressure in the epigastric region of the patient's abdomen, immediately below the ribs, with his or her fist. During this time, the endoscope should be localized in the hiatal hernia sac. After several seconds of applied pressure, the Schatzki ring within the hiatal hernia sac is exposed and identified. Thus, the Bolster technique facilitates the identification of a hidden ring within the hernia sac that may otherwise not be visualized without the application of internal abdominal pressure (Figure 1).

G&H Is the Bolster technique taught in fellowship?

CJ The Bolster technique was taught during my fellowship, and my colleagues and I are trying to expose it as an easy, minimal-risk technique that is applicable during an endoscopic procedure. Our hope is that the technique will be taught in fellowship, as it may help with the appropriate management of patients with dysphagia.

G&H What are the benefits and limitations of the Bolster technique compared with radiologic and endoscopic techniques?

CJ In radiology, a barium study with the Valsalva maneuver has a better Schatzki ring detection rate than endoscopy alone (Figure 2). However, radiology is limited by the

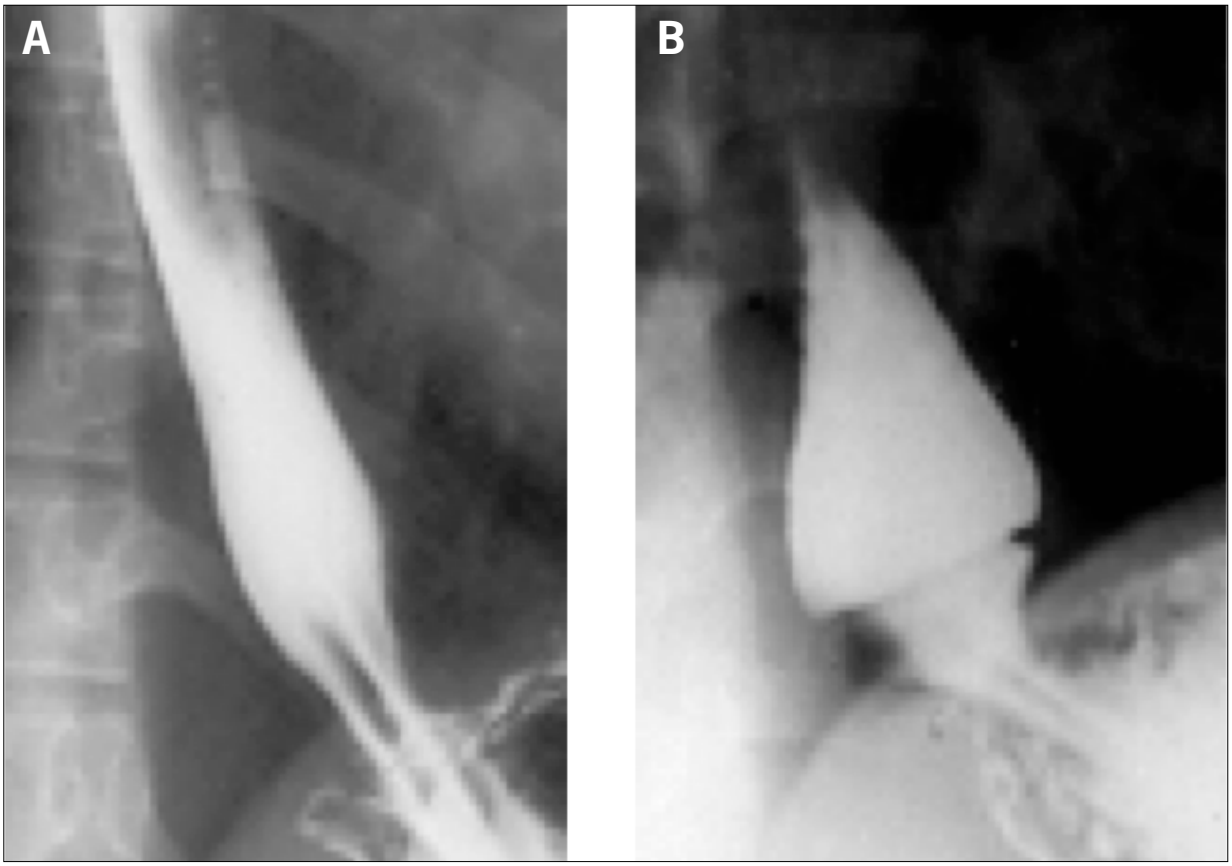

Figure 2. Barium studies demonstrate a normal barium swallow (**A**) compared with a patient with a Schatzki ring (**B**).

inability to attain pathology, the lack of treatment, and the risk of radiation exposure. Endoscopy alone has pretty poor detection and sensitivity rates for Schatzki rings, but in conjunction with the Bolster technique, it is able to treat rings without exposure to radiation. The Bolster technique can increase the detection rate of Schatzki rings for endoscopists similar to how the Valsalva maneuver improved detection in radiology, while allowing patients to bypass radiographic examination completely.

G&H Once Schatzki rings are located, how are they treated or managed?

CJ There are 2 techniques to treat Schatzki rings. The first is dilation, either via balloon or Savary dilators (Cook Medical); this has been the technique used for decades. The second technique is ablation of the ring, in which an endoscopist uses forceps and removes small sections of the ring in a 360-degree manner to ablate the entire ring. This method was first described in 2014 by Gonzalez and colleagues.

G&H Could you please describe the design and key findings of your study?

CJ My colleagues and I conducted a retrospective analysis of 30 patients in a single tertiary care center under the direction of a single endoscopist. Each patient had a prior diagnosis of a Schatzki ring, either via endoscopy or radiographic imaging (eg, gastrointestinal series or barium swallow studies). All 30 patients underwent endoscopy, and 26 had identifiable Schatzki rings without the need for the Bolster technique. Four patients, in whom endoscopy alone could not identify a Schatzki ring, received the Bolster technique. In these 4 patients, my colleagues and I were able to identify Schatzki rings. Thus, approximately 13% of the 30 patients required the Bolster technique for diagnosis. As for treatment, we found that patients had increased symptomatic management of their dysphagia once the Schatzki ring was identified and ablated.

G&H What were the limitations of your study?

CJ Our study was a small, retrospective, single-center study. However, one of the interesting aspects was that the sensitivity of Schatzki ring detection was much higher, even without the Bolster technique, compared to what has been reported in other studies (87% vs 58%, respectively). It is unclear if this result is due to spectrum bias in the

enrolled patients and the fact that they had a prior history of a Schatzki ring. Therefore, we would recommend a larger, multicenter study that assesses the ability to detect Schatzki rings with or without the Bolster technique.

G&H What other future research is needed in this field?

CJ It would be interesting to study the long-term outcomes of these patients, as in the past, endoscopists have preemptively dilated patients without a clear diagnosis of a Schatzki ring. These patients often return and are serially dilated over time. The question is raised as to whether endoscopists are treating a misdiagnosis. Do these patients actually have an intrinsic esophageal issue, or is their dysphagia due to a motility problem? In addition, increasing the detection rate of Schatzki rings may help with the proper management of these patients and may lead to better symptomatic relief. It would be beneficial to follow these patients over a longer course of time and clinically compare them with patients without identifiable Schatzki rings.

Dr Jouhourian has no relevant conflicts of interest to disclose.

Suggested Reading

Gonzalez A, Sullivan MF, Bonder A, Allison HV, Bonis PA, Guelrud M. Obliteration of symptomatic Schatzki rings with jumbo biopsy forceps (with video). *Dis Esophagus*. 2014;27(7):607-610.

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