

ADVANCES IN GERD

Current Developments in the Management of Acid-Related GI Disorders

Section Editor: Prateek Sharma, MD

Diagnostic Testing for Barrett Esophagus



Prateek Sharma, MD
 Professor of Medicine
 Division of Gastroenterology and Hepatology
 University of Kansas School of Medicine and VA Medical Center
 Kansas City, Kansas

G&H What is the importance of Barrett esophagus in relation to esophageal cancer?

PS Barrett esophagus is the only known premalignant condition of esophageal adenocarcinoma, the incidence of which continues to rise in the United States and among the Western population. Barrett esophagus is diagnosed in approximately 10% of patients undergoing endoscopy for chronic symptoms of gastroesophageal reflux disease (GERD), which include heartburn and regurgitation. However, GERD is not the only risk factor for Barrett esophagus; up to 5% of patients without chronic GERD are diagnosed with Barrett esophagus.

G&H What diagnostic tests can be used to screen for Barrett esophagus?

PS Endoscopy with biopsy is the current standard of care for making a diagnosis of Barrett esophagus. Specifically, endoscopy is used to identify a columnar-lined esophagus in the distal portion. If the columnar lining is 1 cm or greater, biopsies should be obtained from the esophagus. Documented intestinal metaplasia confirms the diagnosis of Barrett esophagus. The most important aspect at the time of endoscopy is to recognize the anatomic gastroesophageal junction and determine if columnar lining greater than 1 cm extends above this landmark.

G&H What benefits and limitations are associated with endoscopy with biopsy?

PS There are major benefits to upper endoscopy; it allows for direct visualization of the esophageal mucosa and specifically for assessing for any changes that may

The most important aspect at the time of endoscopy is to recognize the anatomic gastroesophageal junction and determine if columnar lining greater than 1 cm extends above this landmark.

indicate dysplasia or cancer within Barrett esophagus. Any visible lesion, such as a nodularity, erosion, or friability, should raise suspicion for neoplasia and should be biopsied.

Although it is the gold standard for making a diagnosis of Barrett esophagus, endoscopy with biopsy

has certain limitations and complications (although rare). It is an invasive method and requires sedation to be performed, and patients have to take a day off from work in order to undergo the test. Occasionally, intestinal metaplasia and dysplasia can be missed, even with biopsy. Bleeding and perforation are rare but reported complications of endoscopy.

G&H What tools are currently available to eradicate cells before they become cancer?

PS If patients have Barrett esophagus without dysplasia, they are enrolled into surveillance programs. These patients undergo endoscopy every 3 to 5 years, with the goal of identifying either high-grade dysplasia or early esophageal adenocarcinoma with biopsy. If high-grade dysplasia or cancer is observed, patients should undergo treatment to prevent invasive adenocarcinoma. For endoscopic treatment, clinicians should first use endoscopic resection to remove the abnormal, raised, or nodular areas. The remainder of the flat Barrett esophagus is then ablated using radiofrequency ablation, hybrid argon plasma coagulation, or cryotherapy.

G&H What tests are coming on the market to diagnose Barrett esophagus? How are they performed?

PS A number of noninvasive tests are being evaluated. Some of these tests are already on the market, while others are undergoing testing and are not ready for clinical use. The capsule-based volumetric laser endomicroscopy (VLE) test (NvisionVLE Imaging System, NinePoint Medical) consists of a tethered capsule that is attached to a laptop computer. The patient swallows the capsule, which, with the help of the tether, the clinician can move back and forth and adjust to the area of the gastroesophageal junction and the esophagus. The capsule provides 3-dimensional VLE images of the esophagus and the gastroesophageal junction. By looking at those images and at the position of the lens and the cells, the clinician can start making a diagnosis of intestinal metaplasia and dysplasia.

The Cytosponge (Medtronic) technique also uses a capsule attached to a string. Within the capsule is a sponge. The patient swallows the capsule, which, upon reaching the stomach, loses its outer covering and expands into a bristled sponge. As the string is pulled back through the gastroesophageal junction and the esophagus, the bristles collect cells. Those cells can then be tested for the presence of trefoil 3 factor, which can help determine whether the patient has Barrett esophagus.

EsoCheck (Lucid Diagnostics) is a balloon that is attached to a tether. The device is positioned back and forth in the area of the gastroesophageal junction and

In order to fit in a clinician's practice, the test has to be as good as upper endoscopy and, at the same time, cost significantly less.

the distal esophagus to collect cells for a panel of markers that would indicate whether the patient has Barrett esophagus.

One of the challenges with all of these noninvasive tests is that they are still undergoing trials. Thus, endoscopy with biopsy continues to be the gold standard. Even if one of these tests has a positive result, patients will still have to undergo endoscopy to confirm the presence of Barrett esophagus and, more importantly, that there is no dysplasia and/or cancer. These abnormal areas may still need to be resected or undergo targeted biopsy.

G&H How will these new tests fit into clinicians' practices?

PS These tools hold promise in office-based testing. For example, rather than scheduling patients in an outpatient clinic for an endoscopy to screen for Barrett esophagus, clinicians can run some of these noninvasive tests in their office.

G&H What are the economic implications of these new tests?

PS The diagnostic performance of the new noninvasive tests continues to be tested in studies, and they need to show high accuracy. Cost-effectiveness studies that compare these new tests with endoscopy with biopsy then need to be conducted. A device can be noninvasive and safe, but a high cost can make its use prohibitive. In order to fit in a clinician's practice, the test has to be as good as upper endoscopy and, at the same time, cost significantly less.

G&H What are the priorities of research?

PS The main priority is to identify the patient population that needs screening. All society guidelines recommend against screening the general population and propose targeted screening. We know what the risk factors are for esophageal adenocarcinoma—chronic reflux symptoms, high body mass index, increased abdominal circumference, smoking, and presence of hiatal hernia—but we still need a simplified scoring mechanism that can stratify these risk factors and determine which patients should be screened.

Dr Sharma serves as a consultant for Olympus. He has received grant support from US Endoscopy, Fujifilm, Ironwood Pharmaceuticals, and Medtronic.

Suggested Reading

- Codipilly DC, Iyer PG. Novel screening tests for Barrett's esophagus. *Curr Gastroenterol Rep.* 2019;21(9):42.
- Katzka DA. Recent advances in non-invasive esophageal tissue sampling. *Curr Gastroenterol Rep.* 2017;19(3):9.
- Sami SS, Iyer PG. Recent advances in screening for Barrett's esophagus. *Curr Treat Options Gastroenterol.* 2018;16(1):1-14.
- Sanghi V, Thota PN. Barrett's esophagus: novel strategies for screening and surveillance. *Ther Adv Chronic Dis.* 2019;10:2040622319837851.
- Shen K, Zhang S, Ma S, Zhang H. Molecular markers and diagnostic model specific for Barrett's esophagus. *J Comput Biol.* 2019;26(12):1367-1378.
- Singh T, Sanghi V, Thota PN. Current management of Barrett esophagus and esophageal adenocarcinoma. *Cleve Clin J Med.* 2019;86(11):724-732.
- Steele D, Baig KKK, Peter S. Evolving screening and surveillance techniques for Barrett's esophagus. *World J Gastroenterol.* 2019;25(17):2045-2057.