

# ADVANCES IN GERD

Current Developments in the Management of Acid-Related GI Disorders

Section Editor: Prateek Sharma, MD

## Narrow-Band Imaging for Diagnosing Gastroesophageal Reflux Disease



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**G&H** How are patients with gastroesophageal reflux disease typically diagnosed?

**NR** A diagnosis of gastroesophageal reflux disease (GERD) is typically made based on symptoms. Patients with GERD usually present with heartburn, dysphagia, chest pain, and occasionally water brash. After clinical

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symptoms are established, the diagnosis of erosive GERD is confirmed by performing an endoscopy. Endoscopic assessment of the esophagus is based on certain changes in the mucosa, which are categorized within the Los Angeles classification system of GERD. However, 60% of patients have minimal mucosal changes that are associated with GERD, which are excluded from the classification system. Thus, a positive diagnosis is made in only 40% of patients using endoscopy. A third method of diagnosis is 24-hour esophageal pH metry. This test measures the pH or amount of acid that is in the esophagus over a 24-hour

period. In patients who have had normal esophageal endoscopy findings, or who have atypical symptoms of GERD, the pH test is used to give the final diagnosis of GERD. Other methods are available, such as impedance studies, but in general, the diagnosis is made by clinical symptoms, endoscopy, and a 24-hour pH study.

**G&H** What is narrow-band imaging, and how is it performed?

**NR** Narrow-band imaging is a technique in which the spectrum of white light is narrowed to specific blue and green wavelengths (410 nm and 540 nm, respectively) to better visualize changes in the mucosa. A filter is placed on a standard white-light endoscope so that only the blue or green light is shown. Because the light is not completely absorbed, the superficial mucosa is more easily identifiable than if it were seen with white light. The endoscopist is able to observe the pit pattern, blood vascular pattern, and other aspects of the mucosa.

**G&H** What are the most common indications for narrow-band imaging?

**NR** In general, narrow-band imaging is used to better visualize mucosa. The most important indication for narrow-band imaging throughout the gastrointestinal tract is the early detection of cancers or dysplastic lesions, as narrow-band imaging enables endoscopists to differentiate potentially malignant mucosa from normal mucosa. Other indications are the identification

of Barrett esophagus, colorectal polyps and tumors, and atypical dysplastic areas in the colon of patients with ulcerative colitis.

### **G&H** How does narrow-band imaging fit into the diagnostic algorithm for GERD?

**NR** Currently, there are no definite algorithms in which narrow-band imaging is used for the diagnosis of GERD; thus, this modality has not been widely used in this context. However, if a white-light endoscopy is normal,

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narrow-band imaging can be used to investigate certain lesions or small erosions that may have been missed. In patients who have nonerosive reflux disease (NERD), a subtype of GERD that has similar symptoms but an absence of esophageal mucosal erosions, narrow-band imaging allows for the visualization of subtle changes (generally at the lower end of the esophagus) that would suggest esophagitis. Additionally, intrapapillary capillary loops are normally present in a particular fashion in the esophagus. However, in patients with NERD, the number of these loops increases and they become more prominent. This increase is typical of very early GERD and can be missed by white-light endoscopy but identified with narrow-band imaging. In fact, a 2007 study by Dr Prateek Sharma and colleagues compared white-light endoscopy with narrow-band imaging and found that in patients with very early GERD, narrow-band imaging was better in identifying the lesions compared to white-light endoscopy. Overall, narrow-band imaging is effective in diagnosing GERD in approximately 50% of patients, and has a slightly higher pick-up rate of NERD.

### **G&H** What are the benefits and limitations associated with narrow-band imaging?

**NR** Aside from better visualization, a major benefit of this technique is its ease of use. A switch on the endoscope

allows endoscopists to change from white light to narrow band. However, the technique is limited in that it has not been very widely evaluated in GERD patients; more large studies are needed comparing narrow-band imaging to white-light endoscopy.

### **G&H** Have any studies assessed the sensitivity or specificity of narrow-band imaging for the diagnosis of GERD?

**NR** Studies have been conducted that have evaluated the sensitivity and specificity of this imaging modality in patients with Barrett esophagus, but not in standard GERD. However, we know that GERD can eventually progress to Barrett esophagus. The data show that a sensitivity of within 90% and a specificity of approximately 95% have been achieved with narrow-band imaging in patients with Barrett esophagus.

### **G&H** Who is the ideal candidate for this technique? In whom is it contraindicated?

**NR** The ideal candidate for narrow-band imaging is any patient with suspected early GERD, Barrett esophagus, a dysplastic lesion, or an early carcinoma in the setting of GERD who has normal findings on white-light endoscopy. There is currently no contraindication for this technique, as it does not utilize dye (spray or injection).

### **G&H** Will the use of narrow-band imaging for the diagnosis of GERD become mainstream, or will it likely remain an adjunct to other diagnostic modalities?

**NR** Narrow-band imaging is not likely to become a mainstream method of diagnosis for GERD, and will instead remain an adjunct for examination of GERD, at least until more studies have evaluated this modality.

### **G&H** What are the priorities of research in this field?

**NR** Although narrow-band imaging is more than a decade old and advances have been made, especially in early malignancy detection, there is still plenty that has to be done for GERD. The main priority of research in this field is to conduct more studies comparing narrow-band imaging to white-light endoscopy in patients with early GERD, as well as comparing narrow-band imaging with targeted biopsies. For example, the consensus with Barrett esophagus is to take 4-quadrant biopsies every 2 cm, resulting in a large sample size. Could the number of biopsies be decreased by targeting only suspicious lesions?

Future studies should address this application of narrow-band imaging to determine its usefulness. Other areas of research concern the use of narrow-band imaging to diagnose GERD in extraesophageal symptoms (eg, chronic cough; ear, nose, and throat conditions). Currently, a white-light endoscopy is negative in these patients. By using narrow-band imaging, we may increase the diagnosis of GERD in this patient population.

One of the important advances in this area has been that of better narrow-band imaging endoscopes, which are bright and provide better imaging. By using the second-generation narrow-band imaging endoscopes, we can potentially improve our diagnostic capability in patients with GERD. Large studies comparing this modality with conventional endoscopy are needed, especially in patients

with atypical GERD, early GERD, or GERD with suspected dysplastic lesions.

*Dr Reddy has no relevant conflicts of interest to disclose.*

### Suggested Reading

Arul P, Vinoth B, Alexander T, Phansalkar M, Padhi S. Correlation of narrow band imaging endoscopy and histopathology in the diagnosis of nonerosive reflux disease. *Saudi J Gastroenterol*. 2015;21(5):330-336.

Assirati FS, Hashimoto CL, Dib RA, Fontes LHS, Navarro-Rodriguez T. High definition endoscopy and "narrow band imaging" in the diagnosis of gastroesophageal reflux disease. *Arq Bras Cir Dig*. 2014;27(1):59-65.

Gawron AJ, Hirano I. Advances in diagnostic testing for gastroesophageal reflux disease. *World J Gastroenterol*. 2010;16(30):3750-3756.

Lee MM, Enns R. Narrow band imaging in gastroesophageal reflux disease and Barrett's esophagus. *Can J Gastroenterol*. 2009;23(2):84-87.