

# ADVANCES IN ENDOSCOPY

Current Developments in Diagnostic and Therapeutic Endoscopy

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## Endoscopic Management of Barrett Esophagus



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### G&H What are the current guideline recommendations regarding endoscopic screening and surveillance for Barrett esophagus?

**NS** A risk-based algorithm, based upon multiple factors, is used to decide which patients should undergo screening for Barrett esophagus (BE). These factors include the presence of gastroesophageal reflux symptoms, male sex, age older than 50 years, white race, central obesity, smoking history, and family history. Thus, a man with heartburn as well as 2 or more of the above risk factors should be considered for screening. Generally speaking, women are screened less often, as both BE and esophageal adenocarcinoma are much less common in women than in men; however, women may be screened at the discretion of the clinician, using the same risk factors listed above for selection. In regard to surveillance, patients with nondysplastic BE receive surveillance counseling, and can undergo upper endoscopy on 3-year intervals. Patients with low-grade dysplasia may undergo ablative therapy, such as radiofrequency ablation (RFA), or, alternatively, endoscopic surveillance on 1-year intervals. If possible, surveillance endoscopies should be performed with a high-definition endoscope. It is important to ensure that enough samples are taken; the Seattle protocol requires 4-quadrant biopsies every 2 cm at a minimum. Patients with high-grade dysplasia are strongly recommended to undergo ablative therapy, as it has been shown to markedly decrease cancer risk.

### G&H What endoscopic techniques are available for staging mucosal disease?

**NS** There are multiple advanced endoscopic techniques that can be used to stage mucosal disease. Many are optical techniques that aim to improve the detection of dysplasia, which is challenging in the absence of nodularity. Optical modalities include optical coherence tomography, volumetric laser endomicroscopy, and a variety of staining techniques. The majority of endoscopists in the United States have some variant of narrow-band imaging or an electronic chromoendoscopy-type modality on their endoscopes. A brush-sampling technology known as wide-area transepithelial sampling (WATS, CDx Diagnostics) has been used extensively in BE and appears to increase the yield of dysplasia when used in conjunction with biopsies in comparison to biopsies alone. In the United States, endoscopic mucosal resection (EMR) is generally used when nodular epithelium is observed, and is useful as both a diagnostic and a therapeutic modality. Diagnostically, EMR helps clinicians stage BE in order to determine where the worst histology is in the BE segment, as well as the feasibility of endoscopic therapy for successful eradication of disease. Therapeutically, EMR removes the nodularity, which has a high chance of having the worst level of dysplasia in the BE segment.

### G&H What modalities can be employed for the endoscopic eradication of dysplastic and nondysplastic BE?

**NS** A wide variety of modalities are available for the eradication of BE, and the number has grown significantly in the last 15 years. Multipolar electrocoagulation

and photodynamic therapy have been used for more than 20 years for this indication, and both are effective at causing reversion of BE. However, neither technique is commonly used for large segments of BE, mostly due to difficulties with treating long segments of disease and cost. Multipolar electrocoagulation only treats what is underneath the probe; thus, it can take a relatively long time to treat even small segments of BE. Photodynamic therapy requires the administration of protoporphyrin, which is expensive and leaves patients photosensitive, meaning that they could easily get sunburned for 2 to 3 months after receiving the medication.

Currently, the most commonly used modality in the United States is RFA, which has demonstrated both high rates of complete eradication of BE as well as decreased cancer risks associated with successful treatment for low- and high-grade dysplasia. Multiple cryotherapy modalities are available as well, including liquid nitrogen spray cryotherapy (truFreeze, CSA Medical Inc) and balloon-based nitrous oxide therapy (Cryoballoon Ablation System, C2 Therapeutics). These cryotherapy devices also have been shown to completely eradicate BE in most patients treated with them. Lastly, argon plasma coagulation (APC) can be very effective for shorter segments (<3 cm) of BE, but it is not recommended for long segments due to the time involved.

### **G&H** What are the important factors to consider when choosing a modality to treat patients?

**NS** Multiple benefits and limitations are associated with each modality that should be considered before treating a patient. The amount of tissue involved is important; certain modalities are easier to apply to long segments of BE, whereas other modalities are better suited to short segments. For instance, RFA has a 4-cm-long circumferential balloon-based treatment that can be applied relatively quickly to even long segments of BE. Focal treatments, such as APC, require clinicians to point the device at a segment of BE and then trigger it to remove the segment. It could take 30 minutes to treat 6 cm of BE with this modality, which can become cumbersome. Anatomic and logistic issues should also be considered. For instance, if a segment of BE has a stricture in it, applying a circumferential radiofrequency device may be difficult because the stricture could impede the device from making sufficient contact with the tissue that needs to be treated. In such a situation, a spray device such as APC or spray cryotherapy may be more advantageous. Lastly, the history of the patient is important. For example, a patient who is treated 3 times in a row with RFA and is not experiencing progress may benefit from being

switched to a different modality, in the hope that the cells are more susceptible to eradication by a different modality.

### **G&H** What adverse events are associated with these endoscopic procedures?

**NS** For the majority of the procedures listed, chest pain is a common and expected side effect. The pain is usually not severe; patients in the AIM Dysplasia (Ablation of Intestinal Metaplasia Containing Dysplasia) trial who underwent RFA rated their pain, on average, as a 2 out of 10. Patients are typically sent home with a narcotic analgesic for their pain. The literature suggests that cryotherapy may be associated with a little less chest pain than with RFA, but the reports are still early. Strictureing occurs in 5% to 10% of patients, and bleeding occurs in less than 2%, depending on the modality that is used. With the currently used technologies, perforation is extremely uncommon, and death is even more rare.

### **G&H** How common is recurrence of disease following endoscopic treatment?

**NS** Unfortunately, recurrence is not an uncommon event. Meta-analyses show that approximately 8% to 10% of patients who are treated with endoscopic therapies for BE will have recurrence every year. This may become less common the farther out the patient is from the ablation. However, patients who were followed for 3 or more years had a cumulative recurrence rate of greater than 20%. Luckily, recurrences tend to be small in amount, are often at a lower level of dysplasia than what the patient was originally treated for, and are usually easily amenable to repeat therapy. However, surveillance endoscopy is still recommended after successful eradication of BE.

### **G&H** Is there a role for endoscopic therapy in the management of buried glands?

**NS** Currently, no good data are available to guide clinicians in the management of buried glands, which occur in at least 25% of patients. The challenge for most endoscopic units is in finding a reliable method of detecting buried glands; optical modalities such as volumetric laser endomicroscopy may be beneficial. When a buried gland is discovered, it is unclear what should be done: should patients undergo just continued surveillance, should the whole segment or only the specific section be ablated again, or should EMR be employed? Fortunately, studies have demonstrated that buried cancers are rare; thus, when nondysplastic buried BE is found on routine

biopsy, clinicians should not feel a need to alarm patients about it. Pragmatically, for now, I have just been continuing surveillance for patients who are found to have nondysplastic buried BE. Patients with dysplastic buried BE have been undergoing retreatment, either by EMR if an abnormality in the mucosal contour is visible, or by an ablative technique in the area of the biopsy if no abnormality is seen.

### **G&H** Are any endoscopic tools for the management of BE currently under development?

**NS** A hybrid APC device that is under development may improve the current APC technology with respect to safety and efficacy for treating BE. Cryotherapy devices continue to undergo evolution to make them more user-friendly and effective. Companies are continuing to improve EMR technology; recently, a new EMR device (Captivator, Boston Scientific) was released, which may provide some advantages over the older technology.

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

**NS** The main priority is to improve screening to identify patients who could benefit from early intervention. Already, research into this area has led to the development of a nonendoscopic screening modality for BE (Cytosponge, University of Cambridge). More research is needed on surveillance strategies; it is unclear how often patients should be followed and how best to understand their risk. It would also be beneficial to determine the ideal method of sampling the mucosa during surveillance

examinations. Lastly, research is needed to identify how to care for patients who have undergone successful endoscopic therapy, including the amount of acid suppression that is needed and how often patients with apparently successful ablation should undergo follow-up endoscopic surveillance examinations. A recent analysis of 2 large databases suggests that current guidelines for postablation endoscopic surveillance may be needlessly aggressive, and postablation surveillance intervals can be liberalized.

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### **Suggested Reading**

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