

ADVANCES IN GERD

Current Developments in the Management of Acid-Related GI Disorders

Section Editor: Joel E. Richter, MD

Radiofrequency Ablation for Dysplastic and Nondysplastic Barrett Esophagus



George Triadafilopoulos, MD
Clinical Professor of Medicine
Gastroenterology and Hepatology
Stanford University School of Medicine
Stanford, California

G&H Which ablative therapies are currently being used to treat Barrett esophagus?

GT Several modalities are currently being used to treat Barrett esophagus. The leading modality is radiofrequency ablation, a process in which the affected tissue is ablated by the application of radiofrequency energy. Two techniques based on cryotherapy are also available; one is a liquid nitrogen spray that freezes and ablates the tissue, and the other is a cryoballoon, in which a nitrous oxide-filled balloon is applied to the tissue to freeze it. Additionally, endoscopic mucosal resection and endoscopic submucosal dissection are frequently used in Europe. In the United States, these approaches are used for areas of dysplasia or nodularity; the tissue is resected both for diagnostic or staging purposes and for eradication (ie, the tissue is cut using resection, and the remaining tissue is removed using ablation modalities).

G&H How does the management of nondysplastic Barrett esophagus differ from dysplastic Barrett esophagus?

GT Patients with nondysplastic Barrett esophagus are managed by surveillance. Endoscopies and biopsies should be performed periodically to assess the area of a Barrett esophagus. The guidelines do not currently recommend the performance of an eradication therapy, either resective or ablative, for nondysplastic Barrett esophagus, although

some physicians will try to eliminate or eradicate the nondysplastic Barrett esophagus at that phase.

Resective methods are performed in patients with dysplastic Barrett esophagus, specifically in areas that are recognizable endoscopically as either containing ulcerations or nodularity or are suspicious for dysplasia. The surrounding tissue that is not dysplastic is then typically removed using an ablative method.

G&H Why has ablation therapy traditionally been used for patients with dysplastic Barrett esophagus rather than those with nondysplastic Barrett esophagus?

GT Dysplastic Barrett esophagus is treated aggressively because of the imminent risk of cancer development. There are studies that report an approximately 30% probability of dysplastic Barrett esophagus converting to neoplastic or cancerous esophagus within 1 year. Given the risk of conversion to true neoplasia, which has the risk of spread metastases and local advanced disease, there is a relative degree of urgency to remove or ablate the dysplastic tissue.

G&H Are repeat sessions of radiofrequency ablation necessary?

GT Yes. Typically, both resective and ablative methods will need to be repeated 1 to 3 times in order to ensure

that the whole tissue (dysplastic or nondysplastic) has been eliminated.

G&H What side effects or adverse events are associated with these eradication therapies?

GT The side effects depend on the magnitude of the eradication therapy. In general, radiofrequency ablation and cryotherapy carry a low risk of bleeding and stricture formation, and endoscopic mucosal resection has a low risk of bleeding, perforation, and stricture formation. If an extensive, circumferential segment of Barrett esophagus is being treated, more strictures and complications may be encountered.

G&H Is surveillance needed following radiofrequency ablation?

GT Yes. There are 2 types of surveillance: initial surveillance, in which a clinician ensures that the entire area of the Barrett esophagus has been eliminated and not replaced by neosquamous epithelium, and follow-up surveillance, which occurs every 3 to 5 years to ensure that there is no recurrence of the disease. However, the idea of ablation or resection of a Barrett esophagus is to reach a point in which surveillance endoscopies will no longer be necessary. There are studies showing that the neosquamous epithelium does not harbor the genetic alterations that enable the potential of neoplastic progression, although this has not yet been proven prospectively. Therefore, the conservative and cautious approach of surveillance should be continued.

G&H How cost-effective is radiofrequency ablation therapy compared with other treatment modalities for Barrett esophagus?

GT The use of radiofrequency ablation for dysplastic and nondysplastic Barrett esophagus has been proven cost-effective, as long as the effectiveness of the treatment is more than 40%. In general, the effectiveness of radiofrequency ablation is approximately 90%. Despite the results of many cost-effectiveness studies, guidelines and insurers do not support this approach for nondysplastic Barrett esophagus. Surveillance for nondysplastic Barrett esophagus has not been proven to be cost-effective.

G&H Are there any patients in whom radiofrequency ablation should be avoided?

GT Yes. Patients whose comorbidities or other medical conditions limit their expected survival receive no benefit from undergoing radiofrequency ablation or cryotherapy; in fact, these procedures may expose them

to additional risks for little gain. Patients with preexisting strictures could make performing radiofrequency ablation, cryotherapy, or endoscopic mucosal resection technically challenging. However, the presence of a stricture is not an absolute contraindication.

G&H What role do proton pump inhibitors play in radiofrequency ablation therapy for nondysplastic Barrett esophagus?

GT Proton pump inhibitors play an essential role. The process of radiofrequency ablation or cryotherapy involves removing the tissue and then maintaining the area that has been burned or frozen in a relatively hypoacidic or neutral pH. In order to accomplish that, proton pump inhibitors or surgery, such as a fundoplication, are needed to sustain pH neutrality, as a neutral pH will allow the repair following the initial therapy to occur faster and more completely. Thus, the use of proton pump inhibitor therapy is a necessary adjunct to the treatment applied endoscopically.

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

GT One of the main priorities in this field is to understand the mechanism of how Barrett esophagus advances from nondysplastic to neoplastic. Many steps and parameters are involved in this process. Research is needed to identify several abnormalities that, if detected, controlled, or eliminated early, may allow clinicians to eliminate the process of neoplastic conversion.

I believe many changes will take place in the field over the next few years. More studies are comparing cryotherapy modalities with radiofrequency ablation application. Additionally, there will be an increase of patients with Barrett esophagus being seen in specialized centers of excellence, in which these modalities can be used in a structured method, follow-up is maintained, and appropriate metrics are applied to optimize such therapy. The treatment of Barrett esophagus is increasingly becoming complex, and it will be best performed by physicians who are dedicated to the management of the overall patient with Barrett esophagus and who have set in place mechanisms of proper follow-up and monitoring.

Dr Triadafilopoulos is a consultant to C2 Therapeutics and Medtronic.

Suggested Reading

Korst RJ, Lee BE. The use of radiofrequency ablation for patients with nondysplastic Barrett's esophagus. *J Thorac Cardiovasc Surg.* 2012;143(4):992-993.

Martínek J, Akiyama JI, Vacková Z, et al. Current treatment options for esophageal diseases [published online July 8, 2016]. *Ann N Y Acad Sci*. doi:10.1111/nyas.13146.

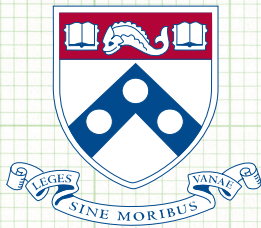
Nayna L, Emma W, Vani K. Radiofrequency ablation for low-grade dysplasia in Barrett's esophagus. *Curr Opin Gastroenterol*. 2016;32(4):294-301.

Stier MW, Konda VJ, Hart J, Waxman I. Post-ablation surveillance in Barrett's esophagus: a review of the literature. *World J Gastroenterol*. 2016;22(17):4297-4306.

Veeramachaneni N. Radiofrequency ablation for nondysplastic Barrett's esophagus: should we do it, because we can? *J Thorac Cardiovasc Surg*. 2011;142(5):1173-1174.

Wolf WA, Pasricha S, Cotton C, et al. Incidence of esophageal adenocarcinoma and causes of mortality after radiofrequency ablation of Barrett's esophagus. *Gastroenterology*. 2015;149(7):1752-1761.e1.

UNIVERSITY OF PENNSYLVANIA IBD FELLOWSHIP



The University of Pennsylvania, located in Philadelphia, offers a one-year advanced fellowship in inflammatory bowel disease. The fellowship provides training in clinical care and clinical research related to IBD. Applicants must have completed a fellowship in gastroenterology prior to starting the IBD fellowship. Applicants are not required to be US citizens.

To receive additional information or to apply for the fellowship, please submit a curriculum vitae and a personal statement to Gary Lichtenstein, MD, at Gary.Lichtenstein@uphs.upenn.edu or James Lewis, MD, MSCE, at Lewisjd@mail.med.upenn.edu.