Techniques in Gastrointestinal Endoscopy (2010) 12, 62-66

Techniques in
GASTROINTESTINAL
ENDOSCOPY
www.techgiendoscopy.com

Screening for Barrett's esophagus

Matt Atkinson, MD, Amitabh Chak, MD

Case Western Reserve University, Cleveland, Ohio.

KEYWORDS:
Barrett's esophagus;
Screening;
Unsedated;
Capsule;
Cost;
Esophageal adenocarcinoma

Barrett's esophagus (BE) increases the risk for development of esophageal adenocarcinoma. Because of the rapid rise in incidence of esophageal adenocarcinoma, screening for BE with subsequent surveillance when found has been proposed as a method of early detection. Sedated endoscopy, however, is too expensive for widespread screening. As a result, other techniques, including unsedated transnasal esophagoscopy and capsule esophagoscopy, have been proposed to expand screening programs.

Barrett's esophagus (BE) is a condition in which the normal squamous epithelium of the esophagus is replaced with metaplastic intestinal-type epithelium. This epithelium can progress sequentially from metaplasia to low-grade dysplasia to high-grade dysplasia and finally to invasive adenocarcinoma. BE is associated with a 0.5% annual incidence of high-grade dysplasia or esophageal adenocarcinoma.[1] Esophageal adenocarcinoma is a deadly illness for which the prognosis depends on early detection. Given the stage-like progression of BE from dysplasia to adenocarcinoma, identification and endoscopic surveillance of patients with BE could reduce mortality from esophageal adenocarcinoma. This strategy is supported by data showing that esophageal adenocarcinoma detected during surveillance programs is found at an earlier stage than those detected outside of surveillance programs.[2-4]

Screening the entire population for BE is unreasonable and costly, so risk factors for BE have been identified, including age over 50, white race, male gender, obesity, smoking, and gastroesophageal reflux disease (GERD).[2-11] Professional society guidelines recommend consideration on an individual basis of screening endoscopy in older patients (particularly white males over age 50) with long-standing symptoms of GERD. Further, these guidelines recommend consideration of endoscopic surveillance of patients diagnosed with BE.[12-14] To date, no prospective, randomized, controlled trials have evaluated the benefits of surveillance.

More controversial, and currently not recommended outside the research setting, is the concept of screening asymptomatic patients for BE. BE is known to be present in patients without GERD,[15] and up to 57% of patients with esophageal adenocarcinoma have never reported symptoms of typical GERD.[16-18] As a result, a significant portion of patients at risk for esophageal adenocarcinoma will not be screened under current guidelines.

Because of the large population that could benefit from screening, in lieu of controlled trials, cost analyses have been performed. Modeling studies comparing screening and surveillance of patients over age 50 (predominantly white males) with standard upper endoscopy to no screening have shown incremental cost-effectiveness ratios between $10,440 and $86,833 per quality-adjusted life year (QALY)[19-21] or between $4,530 and $12,140 per life year gained,[22,23] depending on different modeling assumptions and surveillance intervals. Given the standard incremental cost-effectiveness ratio that society is willing to pay of $50,000 per QALY, this would theoretically make screening appear cost-effective. However, these studies have a number of limitations, including: (1) underestimating costs, (2) failure to consider the impact of screening on quality of life, (3) overestimating the accuracy of endoscopy and biopsies, and (4) overly optimistic assumptions of patient compliance with screening.[24] As a result, research

The authors have no direct financial interests that might pose a conflict of interest in connection with the submitted manuscript.

The illustration for Figure 1 of this manuscript was redrawn by Jason LeVasseur, applied art studio (www.appliedartstudio.com).

Address reprint requests to Amitabh Chak, MD, Case Western Reserve University, School of Medicine, Wearn 247, University Hospitals Case Medical Center, 11100 Euclid Avenue, Cleveland, OH 44106. E-mail: Amitabh.Chak@UHhospitals.org

1096-2883/10/$-see front matter © 2010 Elsevier Inc. All rights reserved.
doi:10.1016/j.tgie.2010.02.009

efforts have evaluated unsedated examinations and capsule esophagoscopy as ways to reduce the cost of screening. Additionally, efforts are underway to identify the patient population that would benefit most from screening examinations. Currently, screening for BE, while widely practiced, is controversial and should be considered on a case-by-case basis. The purpose of this article is to review the techniques available for screening.

Screening methods

Standard sedated upper endoscopy

Evaluation for BE on upper endoscopy requires knowledge of the anatomy of the gastroesophageal junction (Figure 1). Examination of the esophagus begins with gastric decompression (a stomach full of air will impede full opening of the esophagus). Once the stomach is deflated, the endoscope is withdrawn slowly, seeking the diaphragmatic attachment. This can be identified as the point at which the esophagus (or cardia in the case of a hiatal hernia) expands and collapses during breathing or when the patient is asked to sniff ("sniff" test). The next landmark to identify is the top of the gastric folds (the transition between the gastric rugae and the smooth esophagus). The final landmark is the squamocolumnar junction (or z-line) where the gastric mucosa abruptly transitions to squamous mucosa. Normally, the top of the gastric folds coincides with the attachment of the diaphragm and the squamocolumnar junction. In a hiatal hernia, the top of the gastric folds is found proximal to the diaphragmatic attachment but coincides with the z-line. BE is suspected endoscopically when the squamocolumnar junction is proximal to the top of the gastric folds (Figure 2). When the distance between the top of the gastric folds and the z-line is less than 3 cm, short-segment BE is diagnosed, whereas a distance greater than 3 cm is consistent with long-segment BE.

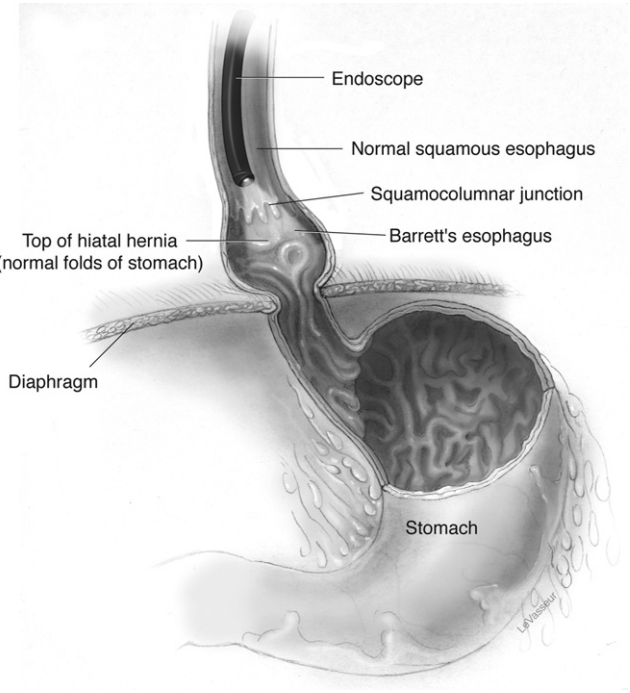

Figure 1 Anatomy of hiatal hernia and BE.

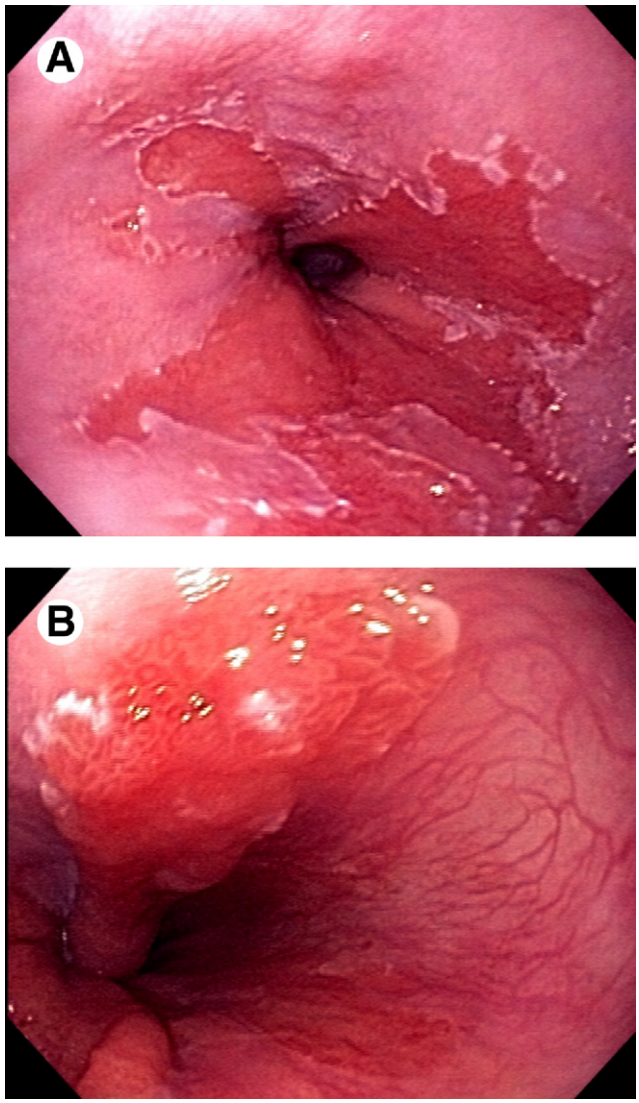

Figure 2 Endoscopic pictures of BE. (A) Nondysplastic BE. (B) BE with a nodule of high-grade dysplasia. (Color version of figure is available online at www.techgiendoscopy.com.)

In an attempt to uniformly classify BE, the Prague C & M criteria were developed.[25] The extent of circumferential BE (denoted C) as well as the maximal extent (denoted M) is noted. For example, a segment of BE that is circumferential from 35 to 40 cm with tongues of BE that extend up to 33 cm would be labeled as C5M7 for 5 cm of circumferential BE and 7 cm maximum extent.

Some controversy exists as to the best way to identify the gastroesophageal junction. Whereas the Prague C & M criteria use the upper extent of the gastric folds to identify the end of the esophagus, other groups use the disappearance of the distal esophageal palisade vessels as the land-