Barrett's Esophagus: An Overview

What is the esophagus?

The esophagus is a muscular tube that connects the mouth to the stomach. It moves the food we swallow from our mouths to our stomachs, where it can be digested. The esophagus is usually about 25 cm (10 inches) long and meets the stomach at the gastroesophageal junction (GE junction). At the GE junction, there is a circular muscle that wraps around the esophagus called the lower esophageal sphincter. This is not a muscle that we can control on our own. Normally, it opens only to let food from the esophagus into the stomach or during vomiting. The lower esophageal sphincter muscle prevents food and acid in the stomach from coming back up into the esophagus.

The lining of the esophagus is called the mucosa, which protects the esophagus from things that might cause damage, like stomach acid. The cells that make up the mucosa are replaced at a fast rate to help fix the damage that happens during everyday eating. The cells in the mucosa are arranged as flat cells in many layers (called "stratified squamous epithelium").

What is Barrett's esophagus?

Barrett's esophagus happens when the cells that make up the lining of the esophagus change as a result of frequent damage, and do not grow back normally. This change, called metaplasia, puts a person at higher risk of cancer. Instead of being made up of flat cells in many layers ("stratified squamous epithelium"), there is a single layer of tall-shaped cells ("columnar epithelium"), which are considered pre-cancerous.

How is Barrett's esophagus related to esophageal cancer?

People with Barrett's esophagus have a higher risk of developing cancer of the esophagus, though overall the risk to an individual of cancer or death is low. There are two kinds of esophageal cancer based on how the cancer cells appear under the microscope: squamous cell cancer and adenocarcinoma. Barrett's esophagus increases one's risk of esophageal adenocarcinoma. For that reason, Barrett's esophagus is considered a " premalignant " disease, meaning that while it is not cancer, it can become cancer.

Based on a number of studies in the United States, the risk of developing adenocarcinoma if you have Barrett's esophagus is about 0.5% per year. Men have a higher risk of developing esophageal adenocarcinoma than women for reasons that we don't fully understand. Though the overall risk of developing esophageal adenocarcinoma is low, Barrett's esophagus is still very important clinically because treatments for Barrett's are more successful than treatments for esophageal cancer. Learn more about esophageal cancer.

What causes Barrett's esophagus and am I at risk?

It is not known exactly how many adults in the United States are affected by Barrett's esophagus, but it is thought to be anywhere from 1.6 to 6.8% of people. It is more common in developed countries with predominantly Caucasian populations (eg.
United States, Europe). Specifically, Barrett's esophagus is most common among white males who have a history of chronic gastro-esophageal reflux symptoms.

The most common cause of Barrett's esophagus is gastroesophageal reflux disease (GERD), or heartburn. When a person has GERD, acid from the stomach splashes up into the esophagus causing repeated damage to the lining of the esophagus. Many people with Barrett's esophagus have a history of heartburn or acid regurgitation lasting at least 10 years. Some people, however, develop Barrett's esophagus without ever having any reflux symptoms. Anyone with GERD is at risk for Barrett's esophagus. We don't currently know what makes some people with GERD develop Barrett's esophagus while others don't. The following risk factors for Barrett's esophagus are well-known: age greater than 50 years, male gender, white (Caucasian) race, chronic GERD, hiatal hernia (a condition where part of the stomach protrudes into the chest, increasing acid reflux into the esophagus), and obesity. Though less common and less well-studied, bulimia with vomiting also increases the risk of Barrett's esophagus due to damage to the esophagus from repeated vomiting.

How can I prevent Barrett’s esophagus?

Measures to prevent Barrett’s esophagus are primarily to treat chronic GERD. Work with your provider to determine a plan that includes medications such as antacids, stopping use of tobacco products, managing weight and changing your diet to include small frequent meals and avoiding eating for three hours before going to sleep. Avoiding bending over after eating a meal and raising the head of your bed may help lessen the amount of acid being regurgitated. You also want to avoid foods that increase your GERD symptoms, which may include spicy, high fat, dairy or acidic foods.

What screening tests are available?

The American Gastroenterological Association does not recommend screening the general population for Barrett's esophagus. Screening is reserved for those with chronic and/or frequent symptoms of GERD and with two or more risk factors for Barrett’s esophagus or esophageal adenocarcinoma (age greater than 50, Caucasian, obese, history of smoking, current or family history of Barrett's esophagus, or esophageal adenocarcinoma). Screening for females is not recommended due to the lower risk factor as compared to men. However, screening could be recommended for women who have multiple risk factors. The risk factors are the same for women and men.

Screening for Barrett's esophagus is controversial because it is hard to predict who has Barrett's esophagus. In addition, there is a lack of evidence to guide screening, and the screening is invasive and expensive. Before any screening is performed, the current health and life expectancy of a patient should be considered. Screening for Barrett's esophagus is an upper endoscopy (a procedure in which, after being sedated, a camera attached to a long, thin tube is inserted into the mouth and down into the throat to visualize the esophagus) or an unsedated transnasal endoscopy (a procedure in which a long, thin tube is inserted into the nose and down into the throat to visualize the esophagus).

What are the signs of Barrett’s esophagus?

There are no signs in particular of Barrett’s esophagus but there can be signs of the GERD that causes it. GERD can cause heartburn, belching, nausea, regurgitation, bitter taste in the mouth, abdominal discomfort and dry cough.

How is Barrett's esophagus diagnosed?

Barrett's esophagus is diagnosed by upper endoscopy with multiple biopsies. During endoscopy, a flexible tube with a camera on the end is passed through the mouth and down the esophagus into the stomach and duodenum, the first part of the small intestine. Upper endoscopy lets your provider look at the insides of these organs and find ulcers, abnormal growths, and other conditions like Barrett's esophagus. During endoscopy, multiple biopsies are taken and the tissue is looked at under a microscope to see changes in the cells of the mucosa that look like Barrett’s esophagus. Biopsies are also important to make sure that there is no cancer present. All biopsies should be examined by two or more pathologists, preferably at least one of whom is an expert in pathology of the esophagus.

How is Barrett’s esophagus staged?

The severity of Barrett's esophagus is described in two ways:
The presence and degree of dysplasia.
The amount of disease (measured by the Prague Criteria).

Dysplasia describes an abnormal appearance of cells under a microscope. More highly-abnormal cells are more likely to become cancer. Dysplasia can be either low-grade or high-grade, and exists on the following spectrum:

1. Metaplasia
2. Low-grade dysplasia.
3. High-grade dysplasia.
4. Invasive cancer.

The Prague C&M Criteria are a set of standardized rules that allow your care team to determine how severe Barrett's esophagus is. The "C" refers to Circumferential extent of disease and the "M" refers to Maximum extent of disease. The "C" is determined by measuring the distance from the GE junction to the highest location where metaplasia is present around the entire circumference of the esophagus. The "M" is the distance from the GE junction to the highest location of metaplasia. The higher the Prague C&M numbers (eg. C3 M5), the more severe the Barrett's esophagus and the higher the risk of developing cancer.

How is Barrett's esophagus treated?

Treatment in people with Barrett's esophagus is aimed at reducing acid reflux. This is often done by using medications. However, surgery and methods of endoscopic eradication can also be used.

Medication

There are several medications that may be prescribed, such as proton pump inhibitors (eg. omeprazole, lansoprazole, pantoprazole, etc) and H2-blockers (eg. ranitidine). These medications work by lowering the amount of acid that is produced in the stomach. Generally, proton pump inhibitors are more effective than H2-blockers. In recent years, there has been interest in whether aspirin can reduce the risk of esophageal adenocarcinoma. At this time, aspirin and non-steroidal medications should not be routinely prescribed to patients with Barrett's esophagus unless indicated as treatment for another medical condition.

Surgery

There are also several anti-reflux surgeries, such as fundoplication, that can be done to control reflux. Unfortunately, there are no randomized, controlled studies that show that either acid suppression therapy or anti-reflux surgery reduces the risk of developing cancer of the esophagus. Therefore, the American College of Gastroenterology does not recommend anti-reflux surgery or high dose proton pump inhibitors for the prevention of adenocarcinoma of the esophagus – though these therapies can and should still be used to treat symptoms of chronic reflux.

In some cases, an esophagectomy may be done which is the removal of part or all of your esophagus. Your esophagus is then rebuilt using parts of your stomach or large intestine.

Endoscopic Eradication

Endoscopic eradication (also called endoscopic ablation) is the attempt to remove abnormal cells through techniques that are done during endoscopy. It is done to try to get rid of the abnormal cells, while saving as much of the normal esophagus as possible. There are several different types of endoscopic eradication, including radiofrequency ablation, cryotherapy, photodynamic therapy, or endoscopic mucosal resection. Endoscopic eradication is recommended for patients with high-grade dysplasia with the goal of getting rid of all abnormal areas of mucosa. Patients with low grade dysplasia may also be treated with endoscopic eradication, but may also be followed only with endoscopic surveillance (a set schedule of endoscopies to keep an eye on abnormal cells). It is common for recurrence of Barrett’s esophagus after ablation therapy. Your provider will continue to monitor you using endoscopy per their recommended schedule.

- Radiofrequency ablation uses electricity and heat to damage cells, and is aimed at the abnormal areas.
- Photodynamic therapy uses a chemical called a photosensitizer and a light source. The photosensitizer is applied to tissues or areas the clinician wants to eradicate; when light is directed at those cells, the reaction between light and the photosensitizer causes cell death.
- Cryotherapy uses extreme cold to get rid of damaged cells.
Endoscopic mucosal resection is a procedure where part of the lining of the esophagus is surgically removed and is recommended especially when the suspicion for cancer is high.

Patients receiving eradication therapy should be referred to a center that specializes in the treatment of esophageal and stomach cancer for possible treatment with surgical removal of the entire esophagus.

Clinical Trials

There are clinical research trials for most types of cancer, and every stage of the disease. Clinical trials are designed to determine the value of specific treatments. They can be used to evaluate medications or treatments to prevent cancer, detect it earlier, or help manage side effects. Clinical trials are extremely important in furthering our knowledge of this disease. It is through clinical trials that we know what we do today, and many exciting new therapies are currently being tested. Talk to your provider about participating in clinical trials in your area. You can also explore currently open clinical trials using the OncoLink Clinical Trials Matching Service.

Follow-Up Care

Although it is not common for Barrett’s esophagus to lead to esophageal cancer, it is still important to follow your provider’s suggestions for treatment and follow-up care. It is also important to follow the screening guidelines and schedule you are given for imaging if you are at risk for developing esophageal cancer.

This article serves as an introduction to Barrett's esophagus. More information about esophageal cancer and its treatment can be found OncoLink. You should talk to your provider if you are concerned about Barrett's esophagus or esophageal cancer.

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