

Ulcer Disease

Definition

An ulcer is an open sore, or lesion, usually found on the skin or mucous membrane areas of the body. An ulcer that is located on the protective mucosal lining of the upper digestive tract (stomach or the first part of the small intestine, called the duodenum) is referred to as a peptic ulcer. Peptic ulcers are classified by their location either in the stomach or the duodenum. When the ulcer is in the stomach it is called a gastric ulcer. When it is in the duodenum it is called a duodenal ulcer. Approximately 14.5 million people in the US have peptic ulcers. In some cases the ulcer will heal on its own without treatment, however ulcers that have not been treated tend to reappear. Most people with ulcers, called peptic ulcer disease or PUD, require treatment to relieve symptoms and prevent complications.

Pathophysiology

Peptic ulcers form when acid erodes the lining of the digestive tract. This can happen when there is excess acid in the system, or when the protective layer of mucus on the lining is broken down (making it more susceptible to damage). The two major risk factors for peptic ulcers are *H. pylori* infection in the gastric mucosa and the habitual use of NSAIDs. Most ulcers (80 percent of gastric ulcers and 90 percent of duodenal ulcers) develop as a result of infection with a bacterium called *Helicobacter pylori* (*H. pylori*). The bacterium produces substances that weaken the stomach's protective mucus and make it more susceptible to the damaging effects of acid and pepsin. NSAIDs can cause changes in the protective mucous layer of the digestive tract, leading to ulcers in some people. The risk of ulcer formation depends on multiple factors, including the NSAID type, dose, and duration of use. These along with other risk factors, singly or in combination, cause acid and pepsin concentrations in the duodenum to penetrate the mucosal barrier and lead to ulceration. Other factors that can lead to peptic ulcers include;

- 1) Increased mass of gastric parietal cells.
- 2) Serum gastrin levels that remain high longer than normal after eating and continue to stimulate secretion of acid and pepsin.
- 3) Failure of the feedback mechanism whereby acid in the gastric antrum inhibits gastrin release.
- 4) Rapid gastric emptying, which overwhelms the buffering capacity of the bicarbonate-rich pancreatic secretions.
- 5) Acid production stimulated by cigarette smoking.
- 6) Decreased duodenal mucosal bicarbonate secretion.

Genetics

Some people harbor strains of *H. pylori* with genes that make the bacteria more dangerous, and increase the risk for ulcers.

Epidemiology

Helicobacter pylori is a type of bacteria that lives in the digestive tract. *H. pylori* is very common; some data suggest that it is present in approximately 50 percent of people, however only around 10 - 15% of people who are infected with *H. pylori* develop peptic ulcer disease. *H. pylori* infections, particularly in older people, may not always lead to peptic ulcers. It is now evident that the epidemiology of peptic ulcer disease largely reflects environmental factors, primarily *Helicobacter pylori* infection, NSAID use, and smoking.

Disease Described

Ulcer disease is when a person has an open sore or sores in the upper part of the digestive tract. These ulcers can cause stomach pain and/or upset, and can lead to internal bleeding.

Signs and Symptoms

Although ulcers do not always cause symptoms (silent ulcers), the most common ulcer symptom is a gnawing or burning pain in the abdomen between the breastbone and the navel. The pain often occurs between meals and in the early hours of the morning. It may last from a few minutes to a few hours. Specifically, duodenal ulcers tend to cause abdominal pain that comes on several hours after eating (often during the night); this is due to the presence of acid in the digestive tract without a food "buffer." Eating or taking an acid-reducing medication may relieve symptoms. Other not so common symptoms include belching, nausea and vomiting, poor appetite, weight loss, feeling tired and weak, blood in the stool, and heartburn or acid reflux.

Diagnosis

The signs and symptoms of peptic ulcers in and of themselves are not diagnostic as they can also present with other medical conditions. However several tests do positively diagnose peptic ulcers; • Esophagogastroduodenoscopy (EGD) or upper endoscopy. An EGD (upper endoscopy) is a procedure that allows the doctor to examine the inside of the esophagus, stomach, and duodenum. A thin, flexible, lighted tube, called an endoscope, is guided into the mouth and throat, then into the esophagus, stomach, and duodenum. On the end of the tube there is a light and a tiny camera. This allows the doctor not only to view the inside of this area of the body but, also to insert instruments through the scope for the removal of a sample of tissue for biopsy which can be tested for infection. • Upper GI (gastrointestinal) series also called barium swallow. A diagnostic test that examines the organs of the upper part of the digestive system which includes the esophagus, stomach, and duodenum. A fluid called barium, a metallic, chemical, chalky, liquid used to coat the inside of organs so that they will show up on an X-ray, is swallowed. X-rays are then taken to evaluate the digestive organs. This procedure is less common than endoscopy for diagnosing ulcers, but may be appropriate for some patients. • Blood, breath, and stomach tissue tests for *H. pylori*. These tests are performed to detect

the presence of *H. pylori*. Although some of the tests for *H. pylori* may occasionally give false-positive results, or may give false-negative results in people who have recently taken antibiotics, omeprazole, or bismuth, research shows these tests can be helpful in detecting the bacteria and guiding treatment.

Treatments

The exact treatment for peptic ulcers depends on the underlying cause. The first step in the treatment is to identify the cause of the ulcer.

Treatment of *H. pylori* — *H. pylori* is treated with several medications, usually including two antibiotics and a proton pump inhibitor (PPI). Proton pump inhibitors include esomeprazole, lansoprazole, and omeprazole. Treatment for *H. pylori* usually takes two weeks.

Treatment of ulcers not due to *H. pylori* — Administration of a proton pump inhibitor (see above) or an H2 receptor antagonist including ranitidine and famotidine.

Stopping NSAIDs — Stopping NSAID consumption and using a replacement such as acetaminophen. If it is not possible for you to stop taking NSAIDs there may be a need to take a proton pump inhibitor medication as well. The PPI is to help protect the lining of the digestive tract and reduce the risk of bleeding.

Surgery - In most cases, anti-ulcer medications heal ulcers quickly and effectively, and eradication of *H. pylori* prevents most ulcers from recurring. However, people who do not respond to medication, or who develop complications, may require surgery.

Other methods of symptom relief — In addition to taking prescribed medications and avoiding NSAIDs, there are other things that can be done to relieve symptoms and help ulcers to heal:

- Quit smoking, if you smoke
- Limit the amount of alcohol you drink
- Take antacids if they relieve symptoms

References

Crowe, S. E. (2013, November 22). Patient information: Peptic ulcer disease (Beyond the Basics). Peptic ulcer disease. Retrieved March 27, 2014, from <http://www.uptodate.com/contents/peptic-ulcer-disease-beyond-the-basics>

McCance, K.L., Huether S.E., (2010). Pathophysiology: The biological basis for disease in adults and children. Philadelphia, PA: Mosby Elsevier.

Peptic ulcers. (n.d.). University of Maryland Medical Center. Retrieved March 27, 2014, from <http://umm.edu/health/medical/reports/articles/peptic-ulcers>

Soll, A. H. (n.d.). Epidemiology and etiology of peptic ulcer disease. Epidemiology and etiology of peptic ulcer disease. Retrieved March 27, 2014, from <http://www.uptodate.com/contents/epidemiology-and-etiology-of-peptic-ulcer-disease>

Stomach and Duodenal Ulcers (Peptic Ulcers). (n.d.). Johns Hopkins Medicine, based in Baltimore, Maryland. Retrieved March 27, 2014, from http://www.hopkinsmedicine.org/healthlibrary/conditions/digestive_disorders/stomach_and_duodenal_ulcers_peptic_ulcers_85,P00394/

Further readings and recommendations

<http://www.mayoclinic.org/diseases-conditions/peptic-ulcer/basics/definition/con-20028643>

http://my.clevelandclinic.org/disorders/ulcers/hic_peptic_ulcer_disease.aspx

<http://www.nlm.nih.gov/medlineplus/ency/article/000206.htm>