

Peptic ulcer disease (PUD) is a very common ailment in the US, affecting one out of eight persons in their lifetime. Over half a million new cases are diagnosed each year, afflicting some 25 million Americans and costing over \$3 billion annually. Recent breakthroughs in the causes of ulcers now give your doctor new ways to treat ulcer disease and help prevent ulcers from ever coming back.

Normal Stomach Function

To understand how ulcers form, it is first important to understand how the normal stomach and intestines function. The stomach produces acid in response to eating food. This acid serves to start the digestive process by activating the enzyme pepsin, which can then break down proteins in food. In addition, this acid provides a hostile environment that is extremely difficult for most bacteria to survive in. After the food is mixed up and broken into small particles in the stomach, it is released into the first portion of the small intestine, or duodenum. It is here in the small intestine that the actual process of digestion and absorption of nutrients occur. To avoid digesting itself, the stomach and duodenum have special protective mechanisms. A protective coating of mucus covers the inner lining of the stomach and duodenum. There is always a delicate balance between the destructive forces of acid and the protective forces of the stomach and duodenum. This balance is such that just enough acid is made to digest food, but not enough to overwhelm this protective layer.

Causes of Peptic Ulcer

When the delicate balance between acid and the protective forces is interrupted, ulcers may form. This imbalance may be the result of having too much acid in the stomach, but this is relatively uncommon. Most of the time the imbalance is a result of a disruption of the protective mucus layer. Once this layer has been damaged the stomach acid and pepsin can eat away at the delicate tissues underneath. This can produce a crater-like hole known as an ulcer. Therefore, an ulcer is simply the result of the body digesting itself in a weakened area. While acid is generally the final cause of the injury, it is now recognized that there are important factors that permit acid to cause damage.

There are two types of ulcers. Most ulcers are related to acid and pepsin found in the stomach juices and are called "peptic ulcers." A small percentage of ulcers are caused by cancer and are called malignant ulcers. Ulcers are also named by location. Those that occur in the stomach are called gastric ulcers. Those that occur in the first part of the intestines are called duodenal ulcers. Finally, ulcers found in the "food pipe", or esophagus, are named esophageal ulcers. These may be associated with hiatal hernias and caused by acid and digestive enzymes splashing upward into the lower esophagus.

Helicobacter Pylori

Peptic ulcers were long believed to be the consequence of too much stress and spicy food. Recent studies have shown that ulcers are most often due to a bacterial infection which is curable with antibiotic treatment. This bacteria named *Helicobacter pylori* (he-lick-oh-back-ter pie-lorrie) is an unusual acid-resistant germ. It is now believed to be the major cause of ulcer disease accounting for over 90 percent of cases. Also known as *H. pylori*, this organism was first reported in the stomach of patients with ulcers in 1982 by Dr. Barry Marshall of Perth, Western Australia, but its significance was not recognized until recently.

Surprisingly, while most bacteria cannot survive in the acidic environment of the stomach, *H. pylori* appears to have no difficulty. This may occur, in part, because of its ability to burrow into the mucous lining of the stomach, thus protecting itself from the acid. In addition, this bacteria produces ammonia, which neutralizes acid in the immediate area. Infection with this bacteria appears to be confined to the lining of the stomach and duodenum and does not spread throughout the body. This infection is very real and causes the body to react by moving infection fighting white blood cells to the area. The body even produces antibodies against *H. pylori*. These can be measured by special blood tests. Without specific treatment, *H. pylori* infection can last a lifetime. As *H. pylori* invades the stomach mucus, it disrupts this protective layer and allows the corrosive stomach acid to come in direct contact with the delicate tissues below. This can lead to peptic ulcers and stomach inflammation called gastritis. In fact, chronic gastritis is the hallmark of *H. pylori* and is found in nearly all those affected. The real breakthrough is the evidence that *Helicobacter* infection is the culprit in up to 90 percent of duodenal ulcers and up to 80 percent of gastric ulcers. Most of the remaining 10 to 20 percent of ulcers are caused by aspirin, ibuprofen, and other anti-inflammatory drugs used to treat arthritis or pain.

NSAIDS (Aspirin and Arthritis Medicines)

Aspirin and NSAIDS (nonsteroidal anti-inflammatory drugs) used to treat arthritis (Ibuprofen, Advil, Motrin, Nuprin, Aleve, Anaprox, Clinoril, Dolobid, Feldene, Indocin, Lodine, Nalfon, Naproxyn, Orudis, Relafen, Tolectin, Toradol, Volteran, and many others) can also cause ulcers. These medications damage the mucus layer of the digestive tract, thus allowing acid to come in contact with the delicate lining below. On the other hand, acetaminophen (Tylenol) does not cause ulcers and may be used in ulcer patients.

Stress

Extreme physical stress, such as that associated with major trauma or burns, can cause ulcers. On the other hand, while emotional stress and tension can cause an “upset stomach” and may even make an existing ulcer worse, they are no longer felt to be a major cause of ulcers. Certainly stress management is important in the healing process of an ulcer. Avoiding or reducing pressure at work or home is important, as is getting a good night’s sleep. Stress management programs are locally available for those who need a little extra help in learning to cope with the stresses of daily life.

Diagnosis

Very often an ulcer will cause some symptoms that should alert you. These may include a gnawing, burning pain in the upper abdomen between the navel and the breastbone. This may feel similar to a hunger pang. This pain is often worse on an empty stomach and relieved temporarily by food, antacids, or milk. This pain might awaken you at night. Some patients have no pain but simply present because of nausea, anemia (low blood counts), or the presence of blood in the stool (black tarry looking stools, or microscopic amounts of blood seen on a stool sample). In the past, doctors relied on a barium x-ray of the upper gastrointestinal tract, or Upper GI Series, to diagnose an ulcer. While this study was valuable in diagnosing ulcers, a more accurate diagnostic technique, Endoscopy, was introduced in the mid 1970’s. This technique involves a direct examination of the inner lining of the esophagus, stomach and duodenum by passing a thin soft flexible tube with a miniature video camera through the mouth and down into the upper digestive tract. Done under “twilight sleep” sedation, this test is quite simple and painless. Endoscopy also permits the doctor to take a sample of the lining, called a biopsy, to rule out cancer and to determine if *Helicobacter pylori* is present.

Peptic Ulcer Complications

If you dig too deep in the earth and hit a water pipe, the water gushes forth. It’s the same in your stomach. Within the wall of the stomach and intestines are many blood vessels that carry nourishment to the digestive tract. An ulcer is like a crater, if it becomes deep enough it can eat into one of these vessels and begin to bleed. With every heartbeat blood is pumped out of circulation and into the stomach or intestine. Eventually, the patient either begins to vomit blood or it passes down through the intestines and out the rectum. If the rate of bleeding is rapid, the blood looks fresh and red. At a slower rate of blood loss the vomit is described looking like “coffee grounds” and the stools are black like tar. A bleeding ulcer is a medical emergency. If enough blood is lost the body can no longer maintain blood pressure and dizziness and weakness occurs. As more blood is lost, the pressure drops further and there is a risk of heart attack, stroke or death. Bleeding ulcers often require special treatment such as emergency surgery, though some can be treated using Endoscopy to cauterize the vessel and stop the bleeding. Medications are then used to heal the ulcer crater.

Treatment

There are four major goals of ulcer treatment:

- Relieving pain
- Preventing complications such as bleeding, perforation and blockage
- Healing the ulcer
- Preventing the ulcer from coming back.

While a variety of medicines designed to reduce acid (Tagamet, Zantac, Pepcid, Axid, Prilosec, or Prevacid) or coat the stomach (Carafate) have been very effective in achieving the first three goals, the fourth goal has been difficult to achieve, until recently. New research has revealed that if *H. pylori* infection is cleared by antibiotics, the rate of ulcers returning can be reduced from over 80 percent to less than 10 percent in the first year after healing. This dramatic improvement in ulcer therapy prompted the National Institute of Health to recommend that all ulcer patients who have *H. pylori* infection be treated with antibiotics in addition to standard acid-reducing medications.

Surgery

Surgical therapy for ulcer disease is rarely needed. This is generally recommended for ulcers that are complicated by massive bleeding, perforation or blockages. Surgery may also be utilized for gastric ulcers that do not heal with medicine. When acid reflux causes ulcers to form in the esophagus, surgery is sometimes necessary to “tighten” the lower esophageal valve. With the availability of antibiotics to cure ulcer disease, it is expected that the future need for ulcer surgery will continue to decline.

Diet

Not long ago, it was believed that ulcer patients should eat a very strict diet consisting of baby food, milk products and other bland foods. Since that time, it has been learned that these dietary restrictions are not necessary for the great majority of ulcer patients. Some modifications may be helpful, such as avoiding caffeine and alcohol, though you are the best judge of which foods to avoid. These would be the ones that predictably produce discomfort or don’t agree with you.