Hemorrhoids have plagued humankind since time immemorial, yet many misunderstandings regarding hemorrhoidal complaints and disease still exist. Many laypersons and physicians do not understand the anorectal area and the common diseases associated with it.

This article discusses internal and external hemorrhoids. For excellent patient education resources, visit eMedicine's Esophagus, Stomach, and Intestine Center. Also, see eMedicine's patient education articles Hemorrhoids, Inflammatory Bowel Disease, Rectal Pain, and Rectal Bleeding.

Frequency:
Ten million people in the United States have hemorrhoids, which constitutes a prevalence rate greater than 4%. Up to a third of these people seek medical treatment, resulting in 1.5 million prescriptions per year. Peak age ranges from 45-65 years. The number of hospital hemorrhoidectomies is declining. A peak of 117 hemorrhoidectomies per 100,000 people was reached in 1974; this rate declined to 37 hemorrhoidectomies per 100,000 people in 1987. Obviously, outpatient and office treatment of hemorrhoids account for some of this decline.

Etiology:
Inflammatory bowel disease and hemorrhoidal problems occur frequently. Unusual presentations and findings should alert the clinician to the potential of inflammatory bowel disease. Ulcerative colitis and Crohn disease may be associated with hemorrhoids. Pregnancy is also associated with many anorectal problems.

Pathophysiology:
The term hemorrhoid usually relates to symptoms caused by hemorrhoids. Hemorrhoids are present in healthy individuals. When these vascular cushions produce symptoms, most laypersons and physicians refer to them as hemorrhoids. Hemorrhoids generally cause symptoms when enlarged, inflamed, thrombosed, or prolapsed.

Most studies agree that low-fiber diets cause smaller caliber stools, which result in straining with defecation. This increased pressure causes engorgement of the hemorrhoids, possibly by interfering with venous return. Pregnancy and abnormally high tension of the internal sphincter can also cause hemorrhoidal problems. Decreased venous return is thought of as the mechanism of action. Prolonged sitting on a toilet (eg, while reading) is believed to cause a relative venous return problem in the perianal area (a tourniquet effect), resulting in enlarged hemorrhoids. Aging causes weakening of the support structures, which facilitates prolapse. Weakening of support structures can occur as early as the third decade of life.

Straining and constipation have long been thought of as culprits in the formation of hemorrhoids. This may or may not be true. A higher-than-normal anal canal resting tone has been found in patients who report hemorrhoids. Interestingly, the resting tone is lower after hemorrhoidectomy. This change in the resting tone is the mechanism of action of Lord dilatation.

Pregnancy clearly predisposes patients to symptoms from hemorrhoids, although the etiology is unknown. Notably, most patients revert to their previously asymptomatic state after delivery.
The relationship between pregnancy and hemorrhoids lends credence to hormonal changes or direct pressure as the culprit.

Portal hypertension has often been mentioned in conjunction with hemorrhoids. Hemorrhoidal symptoms do not occur more frequently in patients with portal hypertension than in those without. Massive bleeding from hemorrhoids in these patients is unusual. Bleeding is very often complicated by coagulopathy. If bleeding is found, direct suture ligation of the offending column is suggested.

Anorectal varices are commonly found in patients with portal hypertension. Varices occur in the mid rectum, at connections between the portal system and the middle and inferior rectal veins. Varices occur more frequently in patients who are noncirrhotic, and they rarely bleed. Treatment is usually directed at the underlying portal hypertension. Emergent control of bleeding can be obtained with suture ligation. Portosystemic shunts and, more recently, transjugular intrahepatic portosystemic shunts (TIPS) have been used to control hypertension and, thus, the bleeding.

Clinical: Most laypersons and many physicians attribute all perianal symptoms to hemorrhoids. The astute physician can often listen to patient reports and ascertain the source of the problem or condition before confirmatory examination. Nonhemorrhoidal causes of symptoms (eg, fissure, abscess, fistula, pruritus ani, condylomata, viral and bacterial skin infections) should be excluded.

Hemorrhoidal symptoms are divided into internal and external sources. Internal hemorrhoids cannot cause cutaneous pain, but they can bleed and prolapse. Prolapsing internal hemorrhoids can cause perianal pain by causing a spasm of the sphincter complex. This spasm results in discomfort while the prolapsed hemorrhoids are exposed. The discomfort is relieved with reduction. Internal hemorrhoids can also cause acute pain when incarcerated and strangulated. Again, the pain is related to the sphincter complex spasm. Strangulation with necrosis may cause more deep discomfort. When these catastrophic events occur, the sphincter spasm often causes concomitant external thrombosis. External thrombosis causes acute cutaneous pain.

Internal hemorrhoids can deposit mucus onto the perianal tissue with prolapse. This mucus with microscopic stool contents can cause a localized dermatitis, which is called pruritus ani. Generally, hemorrhoids are merely the vehicle by which the offending elements reach the perianal tissue. Hemorrhoids are not the primary offenders.

External hemorrhoids cause symptoms in 2 ways. First, acute thrombosis of the underlying external hemorrhoidal vein can occur. Acute thrombosis is usually related to a specific event, eg, physical exertion, straining with constipation, a bout of diarrhea, or a change in diet. These are acute, painful events. Pain results from rapid distension of innervated skin by the clot and surrounding edema. The pain lasts 7-14 days and resolves with resolution of the thrombosis. With resolution of the thrombosis, the stretched anoderm persists as excess skin or skin tags. External thromboses can occasionally erode the overlying skin and cause bleeding.

External hemorrhoids can cause trouble with hygiene. The excess skin left after an acute
thrombosis (skin tags) is actually accountable for these problems. External hemorrhoidal veins found under the perianal skin obviously cannot cause hygiene problems; however, excess skin in the perianal area can mechanically interfere with cleansing.

INDICATIONS
Treat hemorrhoids only when the patient complains of them. The old adage that it's hard to make an asymptomatic patient better applies here. No matter how bad the hemorrhoids look to the practitioner, they should not be treated if they do not bother the patient.

RELEVANT ANATOMY AND CONTRAINDICATIONS
Relevant Anatomy: Hemorrhoids are not varicosities; they are clusters of vascular tissue (eg, arterioles, venules, arteriolar-venular connections), smooth muscle (eg, Treitz muscle), and connective tissue lined by the normal epithelium of the anal canal. Hemorrhoids are present in utero and persist through normal adult life. Evidence indicates that hemorrhoidal bleeding is arterial and not venous. This evidence is supported by the bright red color and arterial pH of the blood.

Hemorrhoids are categorized into internal and external hemorrhoids. These categories are anatomically separated by the dentate (pectinate) line. External hemorrhoids are hemorrhoids covered by squamous epithelium, whereas internal hemorrhoids are lined with columnar epithelium. Similarly, external hemorrhoids are innervated by cutaneous nerves that supply the perianal area. These nerves include the pudendal nerve and sacral plexus. Internal hemorrhoids are not supplied by somatic sensory nerves and therefore cannot cause pain. At the level of the dentate line, internal hemorrhoids are anchored to the underlying muscle by the mucosal suspensory ligament.

Hemorrhoids have 3 main cushions. These cushions are situated in the left lateral, right posterior, and right anterior areas of the anal canal. Minor tufts can be found between the cushions.

WORKUP
Lab Studies:
Hematocrit: This test is suggested if excessive bleeding is suspected.

Imaging Studies:
Radiography: Barium enema is suggested if proximal colonic disease must be excluded.

Diagnostic Procedures:
Examination begins with inspection and examination of the entire perianal area. Warn the patient before any probing or poking. Patient apprehension is great prior to any anal examination. Go to great lengths to reassure the patient. Gentle spreading of the buttocks allows easy visualization of most of the anoderm; this includes the distal anal canal. Anal fissures and perianal dermatitis (pruritus ani) are easily visible without internal probing. Note the location and size of skin tags and the presence of thromboses. Normal corrugation of the anoderm and a normal "anal wink" with stimulation confirms intact sensation. Digital examination of the anal canal can identify any indurated or ulcerated areas. Be sure to palpate
the prostate in all men. Because internal hemorrhoids are soft vascular structures, they are usually not palpable. Anoscopy is mandatory for viewing internal hemorrhoids. The anoscope should be a side-viewing scope. When angled well by the examiner, the side-viewing anoscope allows the soft hemorrhoidal tufts to fill the beveled end of the scope and to be appropriately evaluated. Prolapse can be observed when the patient performs a Valsalva maneuver. Flexible sigmoidoscopy is performed to exclude proximal disease. Having a patient strain while sitting on a toilet may reproduce prolapse most accurately. Examining patients while they sit on a toilet can be very helpful in indeterminate cases. Colonoscopy and barium enema are reserved for cases of bleeding without an identified anal source. These symptoms are not attributable to hemorrhoids and are considered non–outlet-type bleeding.

**Histologic Findings:**
Routine histological examination of hemorrhoidal tissue is usually unrewarding, especially if it is grossly examined by an experienced anorectal surgeon. Obviously, any suspicious tissue must be sent for microscopic evaluation. External hemorrhoids are classified by underlying pathology and symptoms, which include thrombosed veins, bleeding from eroded blood clots, and skin tags causing hygiene problems.

**TREATMENT**
**Medical therapy:**
Treatment is divided by the cause of symptom into internal and external treatments. Internal hemorrhoids do not have cutaneous innervation and thus can be destroyed without anesthetic. Internal hemorrhoids are classified by symptom. Grade I hemorrhoids only bleed. Grade II hemorrhoids prolapse and reduce spontaneously. Grade III hemorrhoids require manual replacement, and grade IV hemorrhoids are permanently prolapsed.

Numerous methods to destroy internal hemorrhoids are available, including rubber band ligation, sclerotherapy injection, infrared photocoagulation, laser ablation, carbon dioxide freezing, Lord dilatation, and surgical resection. All of these methods (except surgical resection) are considered nonoperative treatments and should be the first-line of treatment for all grade I and grade II hemorrhoids not responding to conservative therapy.

With experience, many third- and, on occasion, fourth-degree internal hemorrhoids can also be treated nonoperatively. All conservative treatment methods have approximately similar efficiency rates when used by experienced hands. Rubber band ligation is most common in the United States because it is the most commonly taught method in training programs. Blaisdell and Baron described and refined ligation therapy. Lord dilatation is seldom used in the United States, and many colorectal surgeons condemn its use because it essentially is an uncontrolled disruption of the sphincter mechanism.

Sclerotherapy can provide adequate treatment for early internal hemorrhoids. Cryotherapy and sclerotherapy are infrequently used today. Most experienced surgeons use 1 or 2 techniques exclusively.

Symptoms have historically been treated with dietary modifications, incantations, voodoo, quackery, and the hot poker. Molten lead has also been described as a treatment. Assuredly,
the adverse effects of these treatments have a direct relationship to whether patients relay persistent complaints to the physician or return for further treatment.

Because most physicians believe that straining and a low-fiber diet cause hemorrhoidal disease, conservative treatment includes increasing fiber and liquid intake and toilet habit retraining. Decreasing straining and constipation shrinks internal hemorrhoids and decreases their symptoms; thus, first-line treatment for all first- and second-degree internal hemorrhoids should include measures to decrease straining and constipation. Psyllium seed has produced a significant decrease in bleeding and pain compared to a placebo. The average American diet consists of 8-15 grams of fiber per day. A high-fiber diet includes more than 25 grams of fiber per day. Psyllium seed and methylcellulose are the most commonly used supplements. Many hemorrhoid symptoms resolve when treated only with dietary alterations.

Antidiarrheal agents are sometimes required in patients with symptoms and loose stools. Toilet retraining involves reminding patients that the lavatory is not the library. Patients should sit on the toilet only long enough to evacuate the lower intestines. Persistent straining or prolonged sitting can lead to engorged hemorrhoids.

Stool softeners play a limited role in the treatment of routine hemorrhoidal symptoms. Oral fiber intake and fiber supplements almost always cure constipation and straining. Remember that hemorrhoidal symptoms are due to prolapse, thrombosis, and vascular bleeding; therefore, creams and salves have a small role in treating hemorrhoidal complaints. Suppositories, except for providing lubrication, have a small role in the treatment of hemorrhoidal symptoms. Topical hydrocortisone can sometimes ease internal hemorrhoidal bleeding. The author rarely recommends typical medications (eg, suppository, cream, enema, foam) in the treatment of hemorrhoids.

Bathing in tubs with warm water universally eases painful perianal conditions. Relaxation of the sphincter mechanism and spasm is probably the etiology. Ice can relieve the pain of acute thrombosis. The author does not suggest mechanisms such as the sitz bath for symptom relief. The rigid structure of these portable bathing apparatuses can act in a similar fashion as a toilet seat, causing venous congestion in the perianal area and potentially exacerbating the problem. However, sitz baths do have a role with older patients and with immobile patients who cannot routinely get in and out of a bathtub.

Many patients see improvement or complete resolution of their symptoms with the above conservative measures. Aggressive therapy is reserved for patients who have persistent symptoms after one month of conservative therapy. Treatment is directed solely at symptoms and not at the hemorrhoids’ appearance. Many patients have been referred for surgery because they have severely swollen prolapsed hemorrhoids or very large external skin tags. When questioned, the patients are asymptomatic. An old wise professor once said, “You can't make an asymptomatic patient feel better.” Treat hemorrhoids only if they cause the patient problems. Similarly, patients often ask when they should have surgery. Remind them that their hemorrhoids do not bother anyone else, and they should opt for aggressive treatment only when symptoms become bothersome.
Treatment of the underlying disease often relieves anal symptoms. Patients with ulcerative colitis can tolerate aggressive surgery if needed. Avoid aggressive treatment in patients with Crohn disease, especially if the rectal mucosa is acutely inflamed. Drain abscesses as soon as possible, despite active disease elsewhere.

Pregnancy is associated with many anorectal complaints. Treatment is directed at symptoms. Nonoperative treatment or office thrombectomy usually relieves complaints. Operative hemorrhoidectomy is safe in pregnant women. HIV and anal disease often occur together. Again, conservative therapy is suggested, especially if immunosuppression is evident.

Surgical therapy: Operative resection is reserved for patients with grade III and grade IV hemorrhoids, patients who fail nonoperative therapy, and patients who also have significant symptoms from external hemorrhoids or skin tags. Laser hemorrhoidectomy, as opposed to conventional scalpel and electrocautery techniques, is associated with many myths. Hemorrhoidectomy factories have touted painless or decreased pain and shortened healing times as advantages to performing hemorrhoidectomies by laser. No documented studies support these claims. In fact, one prospective study found no difference between scalpel and laser hemorrhoidectomy. The reader is referred to appropriate textbooks to see descriptions of techniques used.

External hemorrhoids generally elicit symptoms due to acute thrombosis, recurrent thromboses, or hygiene problems. Manage acute thromboses and recurrent thromboses in a similar fashion. Identify the offending vascular cluster using local anesthetic in the office or clinical setting. Inject local anesthetic, then perform excision of the overlying skin and underlying veins.

Enucleation of the thrombosis alone can result in recurrence of the hemorrhoid at the same spot in the future. Excision of the underlying vein completely prevents this embarrassing event. Electrocoagulation or topical astringent (Monsel solution) provides hemostasis. Suturing the wound closed is not necessary and may cause more pain. Remember, acute thromboses spontaneously resolve in 10-14 days; thus, a patient who presents late and has diminishing pain is best left alone.

Operative resection is reserved for patients with hygiene trouble caused by large skin tags, a history of multiple external thromboses, or internal hemorrhoid trouble. Perform the operation in the outpatient setting. Proper anesthetic care (especially if local anesthesia with supplementary IV sedation), attention to perioperative fluid restriction, and careful postoperative instructions can ease the patient's recovery. Operative technique can be found in any colorectal surgical textbook.

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Acute hemorrhoidal crisis is a rare event that usually requires emergent treatment. The
mechanism of action is large internal hemorrhoid prolapse. The sphincter mechanism squeezes and strangulates the internal hemorrhoids, and the resulting spasm causes edema and, occasionally, thrombosis of the external hemorrhoids. The resulting pain and swelling is dramatic and very painful. Emergent operative resection is safe and, with conservation of the anoderm, provides good relief. Rapid pain relief with office excision of thromboses and ligation of internal hemorrhoids has been reported.

Preoperative details: Hemorrhoid surgery can usually be performed using local anesthesia with IV sedation. Regional or general anesthetic techniques are also used. Routine preoperative workup for these techniques is required. Simple distal rectal evacuation is required for a clean operative field. Distal rectal evacuation is best achieved by small-volume saline enemas.

Intraoperative details: The reader is referred to detailed surgical textbooks for specific details.