Hemorrhoids are normal anatomic structures that may become symptomatic due to various mechanisms. Hemorrhoidal disease can be distinguished from other anorectal problems by obtaining a careful history and a physical examination using inspection, digital rectal examination, anoscopy, and rigid or flexible sigmoidoscopy. Symptomatic external hemorrhoids are best treated by surgical excision. Internal hemorrhoids are treated based on the amount of prolapse and their association with external hemorrhoids. The definitive diagnosis and treatment can be accomplished in the office or outpatient setting.

INTRODUCTION

Most physicians perceive hemorrhoids as pathologic. In fact, hemorrhoids are normal anatomic structures, as demonstrated by their presence in babies (1). Patients and physicians may initially ascribe symptoms of rectal bleeding and pain to hemorrhoids without considering the other likely and more dangerous possibilities such as colorectal cancer. Hemorrhoidal disease is clearly important in so far as symptoms are common; however, other pathologic states may mimic hemorrhoidal symptoms. A detailed patient history, coupled with a relatively simple office-based examination, is usually sufficient to establish hemorrhoidal disease as the cause of a patient’s symptoms.

ANATOMY AND PATHOPHYSIOLOGY

Hemorrhoidal tissue is normal anatomically. The anal canal extends from the anal verge to the pelvic floor
Diagnosis and Contemporary Management of Hemorrhoids

A SPECIAL ARTICLE

(Figure 1). The lower half of the anal canal is lined by squamous epithelium, and the upper anal canal above the pectinate line is lined by columnar epithelium. Internal hemorrhoids are located above the pectinate line and are lined by columnar epithelium. External hemorrhoids are covered by squamous epithelium. Anatomically, there are three dominant sets of internal and external hemorrhoids situated in the left lateral, right anterior, and the right posterior positions (Figure 2). Hemorrhoids are characterized histologically by a thick submucosa composed of blood vessels with some smooth muscle, elastic fibers, and connective tissue. These vascular cushions are believed to actually contribute to finer control of continence. The sensory innervation of the internal and external hemorrhoids also differs. The mucosa overlying internal hemorrhoids senses pressure and is relatively insensitive to pain, whereas the squamous epithelium overlying the external hemorrhoids has exquisite sensitivity to painful stimuli. Both the sensory innervation and epithelial surface lining explain the significant differences in symptoms with pathologic enlargement of these hemorrhoids (Table 1).

The pathogenesis of abnormally enlarged and symptomatic hemorrhoids has been explained by several theories, including varicose veins, vascular hyperplasia, and sliding anal lining theory (1). Regardless of the underlying abnormality producing symptomatic hemorrhoids, faulty diet and bowel habits contribute to symptomatic hemorrhoids. Constipation, as defined by infrequent hard bowel movements or prolonged straining to defecate, is undesirable and contributes to more engorgement of the hemorrhoidal tissue than occurs with more frequent, easier bowel actions.

HISTORY

Myriad anorectal complaints can arise from hemorrhoids. Bleeding and swelling are the two most common symptoms (2). Bleeding arises from irritation of the fragile lining overlying the internal hemorrhoids and is characteristically painless and bright red.

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bleeding, particularly with prolapse. In addition, colorectal cancer is often associated with some alteration in bowel habits, which is not expected with hemorrhoidal bleeding. While a small amount of bleeding is common, pain is the dominant complaint among patients with anal fissures. Pain associated with anal fissures characteristically is exacerbated by bowel movements. Proctitis can produce significant bleeding, but usually is associated with mucus and more urgency resulting from the inflammatory process involving the rectum. In patients with limited, very distal proctitis, however, the symptoms can be identical to the bleeding associated with internal hemorrhoids. Pruritus ani with significant perianal excoriation can certainly produce red bleeding, but the symptoms secondary to irritation of the skin usually predominate. Rarely, severe hemorrhoidal bleeding can produce anemia and require transfusion. Even when there is typical hemorrhoidal bleeding and little else to suggest a more proximal lesion, a full evaluation of the colon must be done, especially when the patient has anemia, a family history of colorectal cancer, or a personal history of colorectal polyps or cancer (3).

Swelling associated with hemorrhoids can result from prolapsed internal hemorrhoids or external hemorrhoids. Other than the swelling, the symptoms differ. Internal hemorrhoids that prolapse may produce pressure and some mucous and/or bloody soiling. Acute

![Figure 2. Prolapsed internal hemorrhoids (arrow). RP = right posterior quadrant. RA = right anterior quadrant. LL = left lateral quadrant.*](image)

There may be a minimal amount of red blood present on tissue paper upon wiping or an impressive amount such as red blood squirting into the toilet bowl during defecation. Sometimes the patient will notice red blood striping the side of the stool as it passes over an irritated internal hemorrhoid. If there is significant prolapse of the inflamed hemorrhoid, and the prolapsed hemorrhoid does not spontaneously reduce in size, there may be bloody staining or frank bleeding onto the underclothing. Similarly, prolapsing internal hemorrhoids may also lead to symptoms of minor fecal incontinence. The status of a patient’s sphincter influences the symptoms. Elderly patients with diminished sphincter tone will tend to have prolapsed internal hemorrhoids and may have a component of fecal staining, along with a mucous discharge caused from prolapse and wicking of fecal debris along the prolapsed hemorrhoids. This produces both a hygiene problem and itching.

It is important to recognize that other conditions can produce symptoms identical to those described above. Bleeding from a hemorrhoid must be distinguished from bleeding from colorectal cancer, an anal fissure, proctitis, or severe pruritus. Typically, bleeding from a malignancy is associated with some mucus, although the same can hold true with hemorrhoidal

![Figure 3. Acutely thrombosed external hemorrhoid.*](image)
external hemorrhoidal swelling is usually very painful and not associated with bleeding or mucus discharge. An acutely swollen, painful, perianal nodule is usually due to a thrombosed external hemorrhoid (Figure 3).

Thrombosed hemorrhoids may involve both the internal and external components, or one or the other independently. More commonly, isolated external hemorrhoidal thrombosis will occur at a single site, although a patient may have thromboses of multiple hemorrhoids externally or in combination with thromboses of the internal hemorrhoids. This will frequently occur or worsen during the third trimester of pregnancy or in the immediate postpartum period. The patient may view this situation as an emergency because of the significant associated discomfort. Within the first few days of the thrombotic event, the pain, edema, and tenderness are impressive and significant; however, by about 5 or 6 days after the initial thrombosis, the inflammatory reaction and edema begin to subside, and the patient has less pain. Along the way, pressure necrosis of the overlying skin or mucosa overlying a thrombosed internal hemorrhoid may develop. The patient may notice the passage of clotted blood and perhaps some fresh red blood. At the same time, the tense swelling of the thrombosed hemorrhoid may decrease, and the pain will diminish.

PATIENT EVALUATION

The first step in evaluating the patient with suspected hemorrhoidal symptoms is to obtain a complete history, which should include the following:

- Elicit typical symptoms.
- Determine whether the symptoms relate to internal or external hemorrhoids or both.
- Inquire as to the patient’s bowel habits (i.e., if there are any changes in stool frequency, consistency, size).
- Determine the nature and character of any bleeding, and consider further work-up to rule out a proximal gastrointestinal source.
- Determine whether the patient has a family history of colon or rectal neoplasia or inflammatory bowel disease.

A physical examination begins with inspection of the perianal area. Enlarged external hemorrhoids should be noted along with any evidence of acute thromboses. Careful digital rectal examination is then undertaken to determine whether other anal canal or distal rectal pathology is present, such as a painful anal fissure or a rectal neoplasm. The anal canal should be carefully inspected by anoscopy. Rigid proctoscopy or flexible sigmoidoscopy can complete an office evaluation, but often should be deferred if the external hemorrhoid is very tender. In women, it is important on

Table 2
Grading System for Internal Hemorrhoids

<table>
<thead>
<tr>
<th>Hemorrhoids</th>
<th>Symptoms</th>
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<tbody>
<tr>
<td>First-degree</td>
<td>Bleed but do not prolapse</td>
</tr>
<tr>
<td>Second-degree</td>
<td>Prolapse to beyond the anal verge with defecation but spontaneously reduce after defecation</td>
</tr>
<tr>
<td>Third-degree</td>
<td>Prolapse with defecation but require digital reduction</td>
</tr>
<tr>
<td>Fourth-degree</td>
<td>Non-reducible prolapsed internal hemorrhoids</td>
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</tbody>
</table>

Figure 4. Rectal prolapse. Note the concentric folds, unlike the hemorrhoidal clusters seen in Figure 2.*

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physical examination to exclude the presence of a rectocele, which is a most common but underestimated cause of constipation in women. If an evaluation shows unequivocal evidence of pathologic hemorrhoids (including flexible sigmoidoscopy), is completely consistent with the patient’s history, and there are no other abnormalities shown on examination, no further evaluation may be necessary (4). However, colonic screening is warranted for patients 50 years of age and who have no other risk factors. In the patient with a family history of colon cancer/neoplasia, anemia, or an equivocal examination or unusual symptoms, a complete colonoscopy is in order. It is important to examine the patient in the sitting position on a commode while the patient strains to best determine whether symptoms of prolapse are related to prolapsing internal hemorrhoids or rectal prolapse (Figure 4).

A grading system for hemorrhoidal prolapse is frequently used. Internal hemorrhoids are rated as first-, second-, third-, and fourth-degree (5). This classification is important, since it helps determine the most suitable treatment (Table 2). A treatment algorithm is shown outlining our evaluation process (Figure 5).

**MEDICAL TREATMENT**

The medical management of hemorrhoids is appropriate in many settings. If the patient has a history of hard bowel movements and must strain for extended periods of time to initiate defecation, the emphasis on changing bowel habits may be rewarded with a significant decrease in symptoms. A high-fiber diet or the addition of a fiber supplement or bulking agent such as Metamucil®, or Citracel®, and perhaps the use of a...
topical lubricating ointment such as Anusol® or even Preparation H® or suppositories can be useful in this regard. A common complaint associated with fiber products is increased flatulence and can vary with the product. With all the fiber products, adequate fluid intake is vital; otherwise, these fiber products will have a constipating effect. Sodium docusate, a surfactant, may be useful for patients who cannot tolerate additional fiber in their diet.

For the patient whose dominant complaints indicate bleeding internal hemorrhoids, the grade of the hemorrhoids is pertinent to the decision-making. Rubber band ligation of internal hemorrhoids, promoted by Barron (6) in the early 1960s, can be accomplished in the office setting and takes advantage of the relative lack of sensitivity of the internal hemorrhoidal tissue (Figure 6). The application of one or two rubber bands to the tissue just above the internal hemorrhoids is generally tolerated, with patients denying severe pain (Figure 7). It is essential to place the bands at least 1 cm above the dentate line to avoid pain. There is some pressure discomfort for a few days. The ligated tissue sloughs within a week and the ulcerated base becomes scarred, thereby reducing the amount of tissue to prolapse. Rare complications include hemorrhage or infection. Infrared coagulation is an alternative treatment for enlarged symptomatic internal hemorrhoids, but this is less effective than rubber band ligation (7). First-degree hemorrhoids can be successfully man-

SURGICAL THERAPY

Surgical excision should be considered when medical or non-excisional treatment options have failed or are not appropriate. Hemorrhoidectomy should be considered as the first line treatment of fourth-degree internal hemorrhoids and in many cases of third-degree hemorrhoids. Especially when hygiene is problematic, frequently prolapsing hemorrhoids result in discomfort.
and fecal seepage. Also, because of the location and presence of pain fibers, hemorrhoidectomy is recommended for associated symptomatic external hemorrhoids, especially in cases of recurrent external hemorrhoidal thromboses.

Thrombosed external hemorrhoids can result in severe anal pain and present as a painful edematous bluish lump. Hot baths and rest are often effective but prompt surgical excision can shorten the length of recovery and is recommended based on symptoms and duration of pain. If pain lessens within a few days, then excision is not recommended. If excision is indicated, it can be performed in the office or emergency room (Figure 8). Anesthesia consists of infiltrating the area with a local anesthetic agent containing a weak epinephrine solution (i.e., 0.25% bupivacaine with 1:200,000 epinephrine). An elliptical piece of overlying skin with the associated thromboses is excised, and the incision is left open. External hemorrhoidal skin tags can develop if thromboses are not excised, but these can be removed at a later time also using local anesthesia. External hemorrhoidal thromboses that recur, usually more than three times, may require hemorrhoidectomy. Thrombosed hemorrhoids are particularly common in weight lifters, glass blowers, or athletes involved in strenuous training.

Various techniques for surgical hemorrhoidectomy are used, but wide or deep excision and removal of more than three hemorrhoids must be avoided. Performed in a hospital setting as an outpatient procedure, these procedures may utilize an anal block with a local anesthetic and a weak epinephrine solution plus hyaluronidase (i.e., 30 mL of 0.25% bupivacaine with 1:200,000 epinephrine plus 150 units of hyaluronidase) or with the patient undergoing regional or general anesthesia.

The closed Ferguson hemorrhoidectomy technique is commonly performed in this country (5). Patients can be positioned prone, in lithotomy position, or in Sim’s position and are given intravenous sedation. The procedure employs the removal of the major affected hemorrhoidal complexes (i.e., right anterior, right posterior, left lateral groups). The external hemorrhoidal portion is dissected off the internal and external anal sphincter muscles and the dissection is extended proximally, freeing the internal hemorrhoidal component off the internal anal sphincter muscle. A clamp or a suture ligature is applied to the apex of the internal hemorrhoidal component and the tissue is excised. The

(continued on page 46)

Table 3

<table>
<thead>
<tr>
<th>Pitfalls and Pearls of Therapy</th>
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<tbody>
<tr>
<td><strong>External Hemorrhoids</strong></td>
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<tr>
<td>‣ Treat anticoagulated patients with sitz bath only. Clot will resolve within 2 to 3 weeks.</td>
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<tr>
<td>‣ Pregnant patients must lie on their left side during the procedure.</td>
</tr>
<tr>
<td>‣ Treatment of thrombosed hemorrhoids requires excision, not incision of the thrombosis. The latter method may lead to clot reaccumulation and recurrent symptoms.</td>
</tr>
<tr>
<td><strong>Internal Hemorrhoids</strong></td>
</tr>
<tr>
<td>‣ Rubber band ligation should not be performed on immunocompromised or anticoagulated patients.</td>
</tr>
<tr>
<td>‣ Internal hemorrhoid should not be electively treated without examining the colon to exclude malignancy in patients &gt;50 years old or with other risk factors.</td>
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arterial pedicle at the apex of the internal hemorrhoidal component is suture-ligated, and the wound is repaired from the apex to the dentate line with a reinforced suture line. The external portion of the wound extending distally from the dentate line may also be closed. This technique preserves intervening anodermal bridges, and with use of a large anal retractor, the complication of anal stenosis can be avoided.

The hemorrhoidectomy technique, widely used in Europe, is similar to the above technique, employing the removal of the internal hemorrhoidal complex with ligation of arterial pedicle at the apex and preservation of intervening anoderm; however, the external wounds are left open (8).

More recently, the closed circular stapled hemorrhoidectomy (PPH) has been proposed for treating prolapsed internal hemorrhoids (9). This technique reduces and excises the prolapsed internal hemorrhoidal mass. The results appear promising in terms of decreasing pain and enhancing recovery, but the device is costly. This procedure is suitable for patients with large symptomatic internal hemorrhoids without a significant external hemorrhoidal component.

Common postoperative problems and complications of surgical hemorrhoidectomy include postoperative pain, urinary retention, early postoperative or delayed hemorrhage, constipation, and fecal impaction (10). Postoperative care is directed at preventing or alleviating these common problems and includes the use of analgesics (narcotics or non-steroidal anti-inflammatory medications such as ketoralac, ibuprofen), antispasmodics (diazepam), hot sitz baths, bulk agents, and laxatives as needed to maintain bowel movements. Less common complaints include fecal incontinence, pruritus ani, recurrent hemorrhoids, infection, anal stenosis, and mucosal ectropion/wet anus. Although hemorrhoidectomy is unpopular, most patients return to normal activity within a week. It can, however, easily take 4 weeks before a patient feels completely comfortable.

Table 3 includes notable pitfalls and pearls relative to treatment of both external and internal hemorrhoids. Symptomatic external hemorrhoids are best treated by surgical excision. Internal hemorrhoids are treated based on the amount of prolapse and their association with external hemorrhoids. The definitive diagnosis and treatment can be accomplished in the office or outpatient setting.

Figures 2, 3, 4, 6, 7, and 8 are courtesy and property of the American Society of Colon & Rectal Surgeons, Arlington Heights, Illinois.

References