Office Management of Hemorrhoid Disease

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INTRODUCTION
Symptomatic hemorrhoids are frequently encountered by gastroenterologists in Western societies. Internal hemorrhoids are the most common cause of recurrent hematochezia in ambulatory adults. Hemorrhoids account for approximately 3.5 million physician visits and 500 million dollars in costs per annum in the USA. The gastroenterologist maintains a unique position between the conservative treatment offered by the primary care physician and the more invasive hemorrhoidectomy offered by the surgeon.

Anatomy
The dentate line is a key anatomical landmark that divides the insensitive rectal mucosa from the richly innervated anal skin. The dentate line dictates classification, sensation, and therapy of hemorrhoids. Internal hemorrhoids are cushions of fibrovascular tissue located proximal to the dentate line. They may prolapse and bleed, but are usually painless. External hemorrhoids are distal to the dentate line and are covered by richly innervated squamous epithelium of the anus. Any therapy whether it be excision or ligation must respect the dentate line if done without anesthesia. Three major cushions reside in the left lateral, right anterior, and right posterior positions. These positions are relatively fixed and allow banding “blind” in certain office techniques. The blood vessels within these cushions are sinusoids that have direct arteriovenous communications between branches of the superior and middle hemorrhoidal arteries, and the superior, rectal continence. Hemorrhoidal cushions contribute to 15–20% of the resting pressure of the anal verge and provide continence by forming complete closure of the anal canal.

Etiology & Pathophysiology
Risk factors for symptomatic hemorrhoids include low dietary fiber, chronic straining, excessive time on the commode, constipation, diarrhea, pregnancy, and family history. The underlying pathophysiology likely involves a multifactorial process involving...
venous dilation, arterio-venous distention, protrusion of congested anal cushions downward and progressive stretching and collapse of the support structure of the cushions overtime. This culminates in prolapse beyond the anal verge. Internal hemorrhoids that remain prolapsed develop ischemia, thrombosis, or gangrene. It is only in this setting that internal hemorrhoids become painful or pruritic. More often encountered is painless bleeding which occurs when the submucosal sinusoids are disrupted. The bleeding is bright red from the pre-sinusoidal arterioles.

**Classification**

Hemorrhoids are classified, first, as internal or external relative to the dentate line. (Figure 1) Hemorrhoids above the dentate line are internal hemorrhoids. Hemorrhoids below the dentate line are external hemorrhoids. External hemorrhoids are covered by the very sensitive anoderm. Internal hemorrhoids are further classified by the degree or prolapse, which has direct therapeutic and prognostic consequences:

- **Grade I** Do not prolapse below the dentate line; visible only on anoscopy
- **Grade II** Prolapse below the dentate line, but spontaneously reduce
- **Grade III** Prolapse below the dentate line, but require manual reduction
- **Grade IV** Prolapse and stay below the dentate line - not reducible

Nearly all patients with symptomatic Grade I internal hemorrhoids respond well to medical therapy. Grade II and small Grade III internal hemorrhoids respond to non-operative therapy. Large, refractory grade III and grade IV internal hemorrhoids often require surgery.

**Clinical Manifestation and Evaluation**

Symptoms attributed to hemorrhoids include bleeding, itching and pain. Internal hemorrhoids may prolapse and bleed, but are only painful when they have thrombosed, owing to their position proximal to the dentate line. Bleeding is bright red, owing to arterial bleeding from disruption of the arterial-venous connections of the sinusoids. Drops of bright red blood at the end of a
bowel movement or on tissue paper, or blood that coats solid brown stool are suggestive features, but are not reliably predictive.\textsuperscript{7} External hemorrhoids can become very painful when acutely thrombosed.

Three Myths
Three common misconceptions should be dispelled about hemorrhoids. One is the association with portal hypertension. Portal hypertension produces rectal varices rather than hemorrhoids. In fact, patients with portal hypertension are no more at risk for hemorrhoids.\textsuperscript{8} The second misconception is that hemorrhoids alone can cause a positive result on stool guaiac tests. This is not true.\textsuperscript{9} Fecal occult blood should not be attributed to hemorrhoids until the full colon is adequately evaluated. Lastly, the misconception that bleeding from hemorrhoids causes anemia.\textsuperscript{10} It cannot be overstated that patients who present with anemia require further investigation of the gastrointestinal tract.\textsuperscript{11} All patients older than 50 years or at high risk for colorectal cancer presenting with rectal bleeding or anorectal symptoms should undergo a full colonoscopy before focusing on internal hemorrhoids as the culprit.

Diagnosis
While many patients with anorectal complaints will ascribe their symptoms to “hemorrhoids”, a careful history and examination will often reveal other anorectal pathology. Careful external inspection of the anus and perirectal area may reveal thrombosed external hemorrhoids, but also anal fissures, fistula, condylomata, rectal abscess, locally advanced rectal cancer, proctitis or pruritus ani. Meanwhile painless bleeding will often require an exam complemented by flexible sigmoidoscopy, colonoscopy or anoscopy. Digital rectal examination is usually unable to detect internal hemorrhoids unless prolapsing or thrombosed. Besides internal hemorrhoids, painless rectal bleeding can also be caused by colorectal carcinoma, polyps, anal fistula, rectal varices, Kaposi sarcoma, and telangiectasias. A painful digital rectal examination should raise the suspicion of concomitant anal fissure which is not uncommon.

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Medical Treatment
Conservative treatment begins with the universal recommendation to add fiber to the diet, increased fluid intake, and avoid prolonged straining or sitting on the commode. Prospective studies have shown improvement in pain and bleeding from hemorrhoids with dietary fiber supplementation, though the evidence has not been overwhelming. Over the counter sitz baths, suppositories, and topical analgesics and corticosteroids provide symptomatic relief, but no evidence supports their use in reducing actual hemorrhoid swelling, bleeding or prolapse. Long term use of corticosteroid creams is harmful and should be discouraged. Grade I and II hemorrhoids have a decent chance of resolution with medical therapy alone. Taking all comers, the majority of patients presenting with symptomatic hemorrhoids improve with a bowel management program alone.

Non-Surgical Procedures
When these conservative measures fail, non-surgical procedures are recommended, which is particularly the case with Grade II and small grade III hemorrhoids. It is here where the gastroenterologist can offer an alternative before invasive surgical excision. All of these procedures affix the hemorrhoidal tissue back onto the muscle wall and do not require anesthesia. While they are not excisional, they ablate the mucosa of the hemorrhoid by controlled necrosis via various mechanisms. These include:

- Sclerotherapy
- Bipolar Diathermy
- Direct Current Electrotherapy
- Infrared Coagulation
- Rubber Band Ligation

Sclerotherapy is the oldest method and involves injecting a sclerosant (mixture of phenol in oil, quinine, urea and hypertonic saline) into the submucosa at the base of the hemorrhoid through an anoscope using a spinal needle. The technique is suitable for smaller hemorrhoids. Cure rates are reported to be 90%.
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Recurrence rates are 30% at 4 years. Significant pain is a limiting factor in this method and has reported in 12-70% of cases.

Bipolar Diathermy, direct current electrotherapy, and infrared coagulation all involve coagulating, occluding and obliterating the hemorrhoidal vascular pedicle proximal to the dentate line. The area of tissue then sloughs and leaves an ulcer that fibrosis at the treatment site. Bipolar diathermy success rates range from 88-100% in randomized trials with first, second and third degree hemorrhoids. Multiple applications are required at the same site, and 20% of cases require excisional hemorrhoidectomy. Direct electrotherapy has fallen out of favor because of lengthy treatment times (10 minutes) required to obtain coagulation despite similar success rates (88%) in first, second and third degree hemorrhoids. A new method using a disposable probe that plugs into any electrosurgical generator is now available. (Figure 1)

Infrared photocoagulation (IRC) produces infrared radiation from a tungsten-halogen lamp which is directed via a polymer probe tip. Office based IRC (Figure 2) and through the scope probes (Figure 3) are available. These are required to make contact with the base of the hemorrhoid under direct vision to deliver 0.5 to 2 second pulses. These pulses are delivered to all 3 hemorrhoids in positions at base of the hemorrhoid column (Figure 3a) Success rates range from 67-96% in first and second degree hemorrhoids. Multiple hemorrhoids can be treated at once. The swiftness and notably rare incidences of pain and bleeding have made this the most commonly used method amongst the three coagulant therapies.

Rubber band ligation involves completely encircling the redundant mucosa, vascular bundle, and connective tissue with a ligating rubber band. The process must be at least 1-2 cm proximal to the dentate line lest severe immediate pain due to the innervation of the anoderm. The pain can only be relieved by cutting the rubber band, which is a technically challenging feat. Although internal hemorrhoids can be banded using an upper endoscope with a variceal ligation kit, there is a move towards office banding. During colonoscopy or sigmoidoscopy, the internal hemorrhoids are seen during retroflexion but may be missed if air is not suctioned from the rectum (see Figure 4). Figure 2 shows where the band should be placed in relation to the dentate line regardless of the method used. Two commonly used in-offices devices are available. One involves an instrument that physically grasps the mucosa and pulls the tissue into the applicator, and other involves an accessory suction device that sucks the mucosa into the applicator itself. (Figure 5) There are no reported differences in efficacy. Success rates are high and durable, ranging from 80-90% of patients with resolved or improved symptoms on 5 year follow-up. Complications of rubber band ligation include minor bleeding in less than 5% of cases and severe bleeding in 1-2%. Rare incidences of pelvic sepsis occurring after rubber band ligation have been reported, carrying a high mortality rate (~30%). Patients should be
instructed to seek medical care urgently if symptoms of fever, increased perianal pain, or new onset of urinary retention following the procedure.

Multiple randomized controlled trials have compared each of the above method with one another, but no single has compared all 5 at once. Two meta-analyses concluded that rubber band ligation and infrared coagulation are the most effective. One meta-analysis reported that ligation was more effective because it had more durable benefits, requiring fewer additional treatments for symptomatic recurrence than did coagulation and sclerotherapy. However, in a randomized crossover trial comparing rubber band ligation versus infrared coagulation, rubber band ligation resulted in more pain and minor bleeding than infrared coagulation. The use of both ligation and infrared coagulation in combination was 97% successful. Most notably, despite ligation having more pain and bleeding, there was no preference amongst patients for one over the other.

Surgical Hemorrhoidectomy

Overall, 5-10% of patients with hemorrhoids will require surgery – the vast majority are grade III-IV. Surgical hemorrhoidectomy is indicated in the following scenarios:

- Failure of Medical and Nonoperative Therapy
- Symptomatic third-degree, fourth-degree, or significant mixed internal and external hemorrhoids
- Symptomatic hemorrhoids in the presence of a concomitant anorectal condition that requires surgery
- Patient preference after discussion of the treatment options with the referring physician and surgeon.

Surgical hemorrhoidectomy is the most effective and durable treatment overall for third and fourth degree hemorrhoids. Recurrence following a hemorrhoidectomy is quite rare. However, morbidity is higher, especially with respect to incontinence, postoperative pain, urinary retention, bleeding, infection, and anal stenosis. Most patients do not return to work for 2-4 weeks. The stapled hemorrhoidectomy, developed in 1998, is equally safe as conventional hemorrhoidectomy (open or closed), but with shorter operating time, convalescence and post-operative disability. Effectiveness long term as of yet cannot determined absolutely but hemorrhoid symptoms can recur years later.

CONCLUSION

Hemorrhoids are normal fibrovascular structures underlying the rectal mucosa and anal skin. Physiologically they maintain the continence of the anus. Symptomatic hemorrhoids bleed, itch or hurt, and require therapy. The dentate line heralds the presence of pain fibers distally, and any intervention must be well proximal to it if done without anesthesia. The degree of prolapse has significant therapeutic implications. For the majority of patients with symptomatic grade I hemorrhoids, lifestyle and dietary changes are effective. Hemorrhoids that fail conservative measures (grade II, III) may be amenable to non-operative procedures that can be done by the gastroenterologist safely in the office setting without anesthesia, including rubber band ligation and infrared photocoagulation. While rubber band ligation seems more durable than photocoagulation, it appears to come at the expense of more pain and minor bleeding. However, patients do not seem to favor one over the other. Surgical hemorrhoidectomy, including a newer stapled technique, is the last line of therapy, and provide the most durable and effective response for refractory hemorrhoids, but expectedly with higher complication rates and prolonged convalescence.


