HEMORRHOIDS

Anthony J. Senagore, MD, MS, MBA

There have been references to the medical management of symptomatic hemorrhoids dating back to the first era of written records. In fact, many of the proposed therapies are not all that dissimilar from those available today and included anal dilation, topical ointments, and destructive therapy. Even the Roman Catholic Church recognized the significance of the malady by assigning St. Fiachre as the patron saint of gardeners and hemorrhoidal sufferers.

Anatomy and Etiology

The classic orientations of the hemorrhoidal cushions are the right anterior, right posterior, and left lateral positions, although there may be intervening secondary hemorrhoidal complexes that blur this classic anatomy. The arterial blood supply, which contributes to the frequent complaint of bright red rectal bleeding, is derived from the superior rectal artery, a branch of the inferior mesenteric; the middle rectal arteries arising from the internal iliac arteries; and the inferior rectal arteries arising from the pudendal arteries [see Figure 1]. The venous drainage transitions from the portal venous system above the level of the dentate line to the systemic venous system below this level.

Although the vascular cushions contribute to the maintenance of anal continence, excessive straining results in abnormalities within the connective tissue of these cushions, producing bleeding with or without prolapse of the hemorrhoidal tissue. Recognizing the alterations that occur over time in the anal canal (to include the anal transitional zone and the anoderm) provides a strategy for the management of symptomatic hemorrhoids. At the earliest disease stages, the major manifestation is transudation of blood through thin-walled, damaged veins and/or arterioles, which may be effectively managed with astringents of local ablation of the vessels. Later, as the damage progresses to significant disruption of the mucosal suspensory ligament, a technique capable of relocating the prolapse to its normal location and fixing the tissue at that location will be required. In reality, probably a combination of all of these factors is important for the ultimate development of large prolapsing hemorrhoidal disease.

The standard classification for hemorrhoidal diseases includes four grades [see Table 1].

Figure 1. (a) Anatomy of the anal canal. (b) Operative management of hemorrhoids. A key issue is the differentiation of internal hemorrhoids from external hemorrhoids. Internal hemorrhoids (left) originate from the internal hemorrhoidal plexus, above the dentate line. External hemorrhoids (right) originate from the external hemorrhoidal plexus, below the dentate line. (c) Separate external and internal hemorrhoids are seen on the left, and a combined internal external hemorrhoidal complex is seen on the right.
Table 1  Standard Classification for Hemorrhoidal Diseases

<table>
<thead>
<tr>
<th>Grade</th>
<th>Clinical Signs</th>
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<tbody>
<tr>
<td>I</td>
<td>Bleeding</td>
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<tr>
<td>II</td>
<td>Protrusion with spontaneous reduction</td>
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<tr>
<td>III</td>
<td>Protrusion requiring manual reduction</td>
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<tr>
<td>IV</td>
<td>Irreducible protrusion of hemorrhoidal tissue</td>
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Clinical Evaluation

Bleeding, protrusion, and pain are among the most common symptoms associated with hemorrhoidal disease. However, Mazier reported (W.P. Mazier, personal communication, 1995) on a series of 500 patients with anorectal complaints they associated with their hemorrhoids, and, ultimately, only 35% of patients were found to have any significant hemorrhoidal disease. Therefore, vigilance for other colorectal disorders that may produce the same symptoms is important during the assessment of the patient [see Table 2]. The bleeding that typically occurs is bright red blood either on the toilet paper or into the commode after bowel movements and is generally painless in nature. The bleeding can become more severe as the hemorrhoids enlarge and are either partially or completely trapped in a prolapsed position. Usually, prompt reduction of the protruding mass causes this symptom to abate. Acute thromboses of internal or external hemorrhoids are usually associated with severe pain in association with a palpable perianal mass. These patients are generally quite uncomfortable, and the diagnosis is immediately obvious on clinical examination.

Examination of the patient with hematochezia, although tailored by the age of the patient, should include sufficient investigations to rule out a proximal source of bleeding such as inflammatory bowel disease and neoplasia. Hemorrhoids should not be dismissed as the cause of iron deficiency anemia as this is an uncommon occurrence. The examination should include both anoscopy and proctosigmoidoscopy to allow complete assessment of the anorectum. A careful digital examination of the anal canal and distal rectum should be performed to include the prostate in men. The description of the hemorrhoids can be assessed using the grading system mentioned above; however, a clear description of the degree of enlargement, mucosal irritation, and prolapse at each of the three common locations is very important to guided therapy. A description of associated anal skin tags, which often contribute to the patient’s symptoms, should also be included.

Nonexcisional Options

Most patients evaluated for hematochezia that ultimately proves to be hemorrhoidal in origin can be managed with fiber supplementation and any of the available anal ointments. Although it is not clearly proven that constipation is causal, it appears to be of practical utility to improve bowel function and thereby reduce hemorrhoidal complaints in most early-stage patients. Similarly, the ointments available, although homeopathic, may minimize ongoing trauma to the hemorrhoidal cushions and similarly reduce symptoms. The remaining nonoperative and operative interventions should be reserved for patients with advanced hemorrhoidal disease who are unresponsive to conservative medical management [see Table 3].

Sclerotherapy

Sclerotherapy of symptomatic internal hemorrhoidal disease was described as far back as 1871 and has stood the test of time as a low–risk, highly effective means of managing early-stage hemorrhoidal symptoms, primarily bleeding. Sclerotherapy produces local tissue destruction, which simultaneously ablates small vessels in the submucosa, producing both tissue fixation and atrophy of the tissue injected due to scarification of the hemorrhoidal complex. The most common agents used today are sodium morrhuate and sodium tetradecyl sulfate. Briefly, the procedure involves anoscopic identification of the hemorrhoidal complex followed by instillation of the sclerosant into the submucosa using a 25-gauge spinal needle. The syringe should be aspirated prior to injection to avoid a direct intravascular injection. Typically, 1 to 2 mL of sclerosant is adequate. The surgeon can inject as many locations as desired because the procedure is essentially painless. It is important, however, not to circumferentially inject the anal canal because this may induce stricture formation.

Bipolar Diathermy

Bipolar diathermy converts electrical current into heat energy to coagulate the hemorrhoidal tissue, including the mucosa and submucosa. The machine generates a 2-second pulse of energy to accomplish the treatment. The

Table 2  Anal Symptoms Mistakenly Attributed to Hemorrhoids

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
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<tbody>
<tr>
<td>Pain and bleeding after bowel movement</td>
<td>Ulcer/fissure disease</td>
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<tr>
<td>Forceful straining to have bowel movement</td>
<td>Pelvic floor abnormality (paradoxical contraction of anal sphincter)</td>
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<tr>
<td>Blood mixed with stool</td>
<td>Neoplasm</td>
</tr>
<tr>
<td>Drainage of pus during or after bowel movement</td>
<td>Abscess/fistula, inflammatory bowel disease</td>
</tr>
<tr>
<td>Constant moisture</td>
<td>Condyloma acuminatum</td>
</tr>
<tr>
<td>Mucous drainage and incontinence</td>
<td>Rectal prolapse</td>
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<tr>
<td>Anal pain with no physical findings</td>
<td>Caution: possible psychiatric disorder</td>
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**Table 3 Treatment Alternatives for Hemorrhoids**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Internal (Grade)</th>
<th>External</th>
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<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Diet modification</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Sclerotherapy</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Infrared coagulation</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Rubber band ligation</td>
<td>(X)</td>
<td>X</td>
</tr>
<tr>
<td>Stapled anoplasty (PPH)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Excisional hemorrhoidectomy</td>
<td>(X)</td>
<td>X</td>
</tr>
</tbody>
</table>

PPH = procedure for prolapsing hemorrhoids; (X) = selected patients.

Other variations on the use of energy to destroy internal hemorrhoids include infrared coagulation and Ultroid (direct current) therapy (Ultroid Hemorrhoid Management System, Vascular Technologies, Tampa, FL). The infrared coagulation employs a tungsten halogen lamp that generates heat energy generally for a 1.5-second period, resulting in destruction of the mucosa and submucosa at the application site. The depth of penetration of this injury is usually 3 mm. Conversely, the Ultroid system uses electrical current that is applied for up to 10 minutes per complex treated. Ultimately, all of these modalities are a variation on the theme of local tissue destruction and fixation of the hemorrhoidal tissue at the appropriate level.

There is probably no advantage of one technique over the other; however, the acquisition cost of the machines and cleaning between procedures should be considered.

**Hemorrhoidal Ligation with Rubber Bands**

Barron was the first to describe hemorrhoidal banding using rubber bands in 1963. Since this original description, there have been a multitude of reports confirming both the safety and the efficacy of the procedure, especially for grade 4 hemorrhoids.
II and III internal hemorrhoids. There is minimal pain both during and after the procedure, assuming that the band is placed above the level of the dentate line [see Figure 4 for a demonstration of this technique]. Discomfort immediately after band placement may be reduced by the injection of a local anesthetic agent; however, this does not appear to be a long-lasting benefit.24 Banding does carry the rare but frequently fatal complication of postbanding sepsis, which is heralded by the symptoms of increasing rectal pain, fever, and inability to void.25–28 It is essential to treat these symptoms early and aggressively with early antibiotic treatment coupled with aggressive surgical drainage.25

Bayer and colleagues reported a series of 2,934 patients with 79% of patients achieving complete relief of symptoms following a single session of banding at only one or two locations.20 Using this approach, patients required multiple sessions for control of symptoms (two sessions, 32%; three sessions, 17%; four sessions, 25%; and five or more sessions, 20%). Although the multiple sessions required are a negative aspect of this technique, only 2.1% of patients required excisional hemorrhoidectomy. It may be possible to achieve a similar outcome with a shorter duration of therapy, albeit at the expense of greater posttreatment pain, by banding all symptomatic hemorrhoidal sites at the initial visit.20,29 Banding techniques appear to be durable after initial control of symptoms, with 69% of patients maintaining long-term relief and only 7.5% ultimately requiring excisional hemorrhoidectomy.21 This method is cost effective in treating grade II hemorrhoids, as shown by McKenzie and colleagues in a randomized controlled trial comparing banding with stapled hemorrhoidopexy (SH).21 The authors found that the cost for SH was £1,483 greater than for rubber band ligation (95% CI 1,339 to 1,676), and there was no evidence of statistical difference in quality of life years despite higher recurrence rates for banding (OR = 0.18, 95% CI 0.03 to 0.86) at 12 months.

**Excisional Hemorrhoidectomy**

Similarly, as with any surgical procedure, the decision to proceed to excisional hemorrhoidectomy requires a reasoned discussion of the risks and benefits and should probably be preceded by failure of either medical or nonexcisional options. Selection of an excisional procedure is usually predicated by findings of significantly thickened and enlarged hemorrhoids that prolapse or remain fixed outside the anal canal. Associated symptoms caused by hemorrhoidal prolapse include discomfort, anal seepage, and difficulties with anal hygiene. Excisional hemorrhoidectomy can also be a highly effective strategy for acutely thrombosed [see Figure 5] and gangrenous internal hemorrhoids. The most important technical issue when excising gangrenous internal hemorrhoids is to recall the classic three locations (right anterior, right posterior, and left lateral) for the hemorrhoidal columns. Injection of local anesthetic with 1:100,000 epinephrine into the base of the columns and several minutes of gentle pressure will reduce the edema and visualization of the columns. Excision may then proceed while safely ensuring broad intact anoderm between the excision sites. A simple trick to ensure this is to pinch the base of each column as tightly as possible with a DeBakey forceps and incise immediately beneath the forceps. This will restrict the amount of anoderm excised. Although acutely thrombosed external hemorrhoids are not truly hemorrhoids, surgical excision may also be warranted when

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**Figure 4** Operative management of hemorrhoids: the elastic ligation technique for internal hemorrhoids. (a) The hemorrhoidal tissue is identified. (b) The hemorrhoid is grasped and pulled through the drum. (c) The elastic band is applied to the base of the hemorrhoid.
Figure 5  Operative management of hemorrhoids. (a) A massive edema and thrombosis, as seen in the postpartum rosette of tissue, can be reduced after a local anesthetic is injected and the muscle is allowed to relax. (b) Circumferential thrombosed and prolapsing internal hemorrhoids with associated involvement of the distal anoderm of the anal canal are visualized in the preoperative state. (c) The reduction of edema within the circumferentially thrombosed and prolapsing hemorrhoids after injection of a local anesthetic agent with 1/200,000 epinephrine. (d) Even with significant edema and thrombosis, the classic hemorrhoidal pedicles can be reduced and identified after injection of the thrombosed hemorrhoidal complex with local anesthetic and 1/200,000 epinephrine, along with gentle pressure. This is an important step to limit unnecessary excision of anoderm and the resultant risk of anal stenosis.
they are large and identified within 72 hours. These external thromboses are usually easily managed in the office setting with local anesthesia and complete excision with or without skin closure.

Options for excisional hemorrhoidectomy include the following techniques: Milligan-Morgan hemorrhoidectomy, Ferguson closed hemorrhoidectomy, Whitehead hemorrhoidectomy, and the more recently described SH. The procedures are usually performed in the operating theater after minimal preoperative preparation of the bowel. Operative treatment of hemorrhoids, like the vast majority of anorectal procedures, is often taught to be performed in the prone-flexed position [see Figure 6]. However, the left lateral modified Sims position is a very convenient position and much easier on the surgical team, especially the anesthesiologist. The use of lasers for excisional hemorrhoidectomy offers no advantage and in fact causes delayed healing, increased pain, and increased cost. Anesthetic selection is usually left to the anesthesiologist and patient; however, local anesthesia supplemented by the administration of intravenous narcotics and propofol is highly effective and short acting. The use of spinal anesthesia, although effective, may increase the risk of postoperative urinary retention due to a higher intraoperative administration of intravenous fluids.

The Milligan-Morgan hemorrhoidectomy, which is widely practiced in Europe, was originally described in 1937, and its efficacy has been subsequently documented in many series. This technique includes resection of the entire enlarged internal hemorrhoid complex, ligation of the arterial pedicle, and preservation of the intervening anoderm. The distal anoderm and external skin are left open to minimize the risk of infection in the wounds. The results from this technique have shown it to be a safe and effective means for managing advanced hemorrhoidal disease. However, the fact that the external wounds are left open for delayed healing can be a cause of considerable discomfort and prolonged morbidity after this procedure. The closed Ferguson hemorrhoidectomy was proposed as an alternative to the Milligan-Morgan technique and enjoys a similar large body of evidence regarding its safety and efficacy. This technique employs an hourglass-shaped (centered at the midportion of the anoderm) excision of the entire internal/external hemorrhoidal complex, preservation of the internal and external anal sphincters, and primary closure of the entire wound [see Figure 7]. Occasionally, it is necessary to undermine flaps of anoderm and perianal skin to allow removal of intermediate hemorrhoidal tissue while preserving the bridges of anoderm between pedicles. This technical adjustment avoids postoperative strictures.

The Whitehead hemorrhoidectomy, described in 1882, was devised to eradicate the enlarged internal hemorrhoidal tissue in a circumferential fashion and to relocate the prolapsed dentate line that is often a component of prolapsing hemorrhoids. Although this technique enjoyed a long period of widespread application, it was subsequently largely abandoned because of the high rates of mucosal ectropion and anal stricture [see Figure 8]. The technique has enjoyed renewed support, with several authors documenting minimal stricture rates and no occurrences of mucosal ectropion. Despite these promising reports, the Whitehead procedure is technically demanding because of the need to accurately identify the dentate line and relocate it to its proper location.

**Instrumentation for Excisional Hemorrhoidectomy**

The use of advanced instrumentation versus scalpel or scissors needs to be assessed using a strategy of comparative effectiveness given the current climate of cost consciousness in health care. The efficacy of cold steel is unquestioned in hemorrhoidectomy. The theoretical value of the energy-based cutting devices is simultaneous tissue division and coagulation with a reduction in the need for suturing tissue. The disadvantage of these devices is significantly greater cost.

The first energy cutting tool applied to hemorrhoidectomy was standard monopolar electrocautery; however, it is usually used in conjunction with various degrees of wound closure by suture, ranging from pedicle ligation only to complete wound closure. Despite the value of hemostasis, the thermal spread leaves patients with significant postoperative pain compared with SH. The Stapled or Open Pile Procedure (STOPP) trial study group compared diathermy hemorrhoidectomy with SH in a randomized controlled trial for grade III and IV hemorrhoids. Hemorrhoidal prolapse was corrected equally by either operation at 1 year, but total pain scores were significantly higher in the first 14 days using diathermy (daily 25.2 versus 36.8, p = .002; peak 41.7 versus 61.1, p < .001). Similar findings were reported by Thaha and colleagues looking at grade II, III, and IV hemorrhoids, but the superiority of diathermy excision was related to prolapsed control at 1 year (p = .087).

Laser technology has been evaluated as both a means of cutting hemorrhoidal tissue and a technique for ablation; however, laser surgery is simply a different strategy for tissue destruction. Conversely, Zahir and colleagues assessed the neodymium:yttrium-aluminum-garnet (Nd:YAG) laser for excision and coagulation of residual tissue and reported a reduction in postoperative pain and a greater percentage of patients returning to work at 1 week. Hodgson and Morgan evaluated a series of patients with second-
Figure 7  Operative management of hemorrhoids: an excisional hemorrhoidectomy. (a) An elliptical incision is made in the perianal skin. (b) A continuous suture is used in a three-point placement in such a way as to incorporate skin edges and muscle. (c) The elliptical defect is closed, and the dead space is obliterated. (d) The beginning of the dissection of the hemorrhoidal complex from distal to proximal with identification of the intersphincteric groove and the surface of the internal anal sphincter, which should be preserved to avoid continence issues postoperatively. (e) The appropriate dissection of the hemorrhoidal complex off the surface of the internal anal sphincter and narrowing of the incision toward the vascular pedicle at the level of the anorectal junction. (f) The positioning of the clamp on the vascular pedicle to allow manipulation of the pedicle to its appropriate location at the anorectal junction for ligation and suture fixation with 3-0 polyglycolic acid suture. (g) The appropriate suture ligation and fixation of the hemorrhoidal pedicle at the anorectal junction. (h) The technique of gently undermining the anoderm to allow removal of smaller dilated hemorrhoidal veins adjacent to the main pedicle without sacrifice of additional anoderm. (i) The final wound after correctly ligating and fixing the hemorrhoidal pedicle at the anorectal junction so that it lies flat within the canal. In addition, the rectal mucosa, anoderm, and perianal skin are reconstructed. The suture is brought out through the end of the wound and then out on the skin to minimize the creation of skin tags.
of the LigaSure technique with a standard Milligan-Morgan hemorrhoidectomy confirmed reductions in operating time and early postoperative pain.53 A meta-analysis compared hemorrhoidectomy with the LigaSure technique with conventional excisional techniques and found similar cure rates, but decreased operative times, pain, wound healing times, and time off from work were all in favor of the LigaSure excision for hemorrhoidal disease.56 A competing technology is the Harmonic scalpel (Ethicon Inc., Cincinnati, OH), which relies on a rapidly reciprocating blade to generate heat for coagulation and tissue transection. The largest reported experience was provided by Armstrong and colleagues with 500 consecutive excisional hemorrhoidectomies.56 They reported a low postoperative hemorrhage rate (0.6%). The overall postoperative complication rates were low, with urinary retention in 2%, fissure in 1%, and abscess/fistula in 0.8%. Several subsequent prospective randomized comparisons of diathermy with a Harmonic scalpel failed to confirm any advantages between the two tools.57–59 A randomized controlled trial from Abo-hashem and colleagues compared bipolar electrocautery hemorrhoidectomy with the Harmonic scalpel and found favorable results in regard to pain scores and return to work, but complications were similar except for urinary retention, which was significantly less frequent in the Harmonic group (9.4% versus 34.4%, p < .05).60

Probably the best guidance on this topic is the study by Chung and colleagues, who evaluated scissor/Milligan-Morgan, Harmonic scalpel, and bipolar scissors for hemorrhoidectomy.61 The Harmonic scalpel demonstrated superior early pain scores to scissor; however, the long-term recovery was similar between the groups. Therefore, the cumulative data suggest that patient benefits are modest for any of the energy-delivering techniques and the cost differential is significant.

Procedure for Prolapsing Hemorrhoids

Another option for advanced hemorrhoidal disease is a circular stapled approach to reduction of the hemorrhoidal tissue with fixation of the reduced complex by the deep partial-thickness resection of rectal wall. The procedure is referred to as the procedure for prolapsing hemorrhoids (PPH).62 The technique employs a transanal purse-string suture placed 0.5 cm above the top of the hemorrhoidal complex to allow partial resection of the rectal wall in less sensitive distal rectum above the hemorrhoidal tissue. The procedure provides for a repositioning of both the anoderm and hemorrhoidal columns to the appropriate locations within the anal canal and fixation of these structures via the rectal staple line as well as a reduction in vascular in-flow to the hemorrhoids.

Since the introduction of the PPH technique, there have been a large number of prospective randomized trials comparing this approach with excisional hemorrhoidectomy, although interest in the United States appears to be waning.63-66 Most of the data support the concept that PPH is associated with a lesser degree of early postoperative pain and a general reduction in the duration of this pain after surgery.63-66 A multicenter trial comparing PPH with Ferguson closed hemorrhoidectomy confirmed similar benefits and reported a reduction in the need for early reoperation.

Figure 8  Operative management of hemorrhoids. Stenosis and ectropion often result from radical circumferential (Whitehead) procedures.
for complications in the PPH group. There have been a number of meta-analyses; however two recent assessments confirmed the benefits of less pain and reduced operative time and hospital stay in addition to an earlier return to normal activity compared with the standard excisional techniques. Complications did not differ, but the rate of recurrence may be higher in PPH. Similar findings and found that due to a shorter operative time and hospital benefits of PPH. The final publication took into account cost a higher recurrence rate to take advantage of the short-term rectum directly that it is a matter of discretion as to whether to accept proportional risk. Seventeen studies were involved in these studies, the most common early post-operative event was postoperative pain. Residual protrusion, bleeding, and fever were complications documented with an incidence over 3%. When the studies with a follow-up of 1 year or more were analyzed (six of 17 publications), the incidence of prolapse was 10.8%, of bleeding was 9.7%, and of pain on defecation was 8.7%.

Postoperative Management after Hemorrhoid Surgery

Postoperative management of the hemorrhoidectomy patient is primarily focused on effective analgesia, avoidance of urinary retention, and constipation. A variety of analgesic regimens have been recommended, usually consisting of a combination of oral and parenteral narcotics. The use of local infiltration of bupivacaine into the wounds and perianal skin has been variably successful in long-term pain reduction. A new long-acting bupivacaine delivery system has shown additional efficacy, albeit at a significant increase in the cost of care.

Ketorolac has demonstrated considerable efficacy in managing posthemorrhoidectomy pain. The use of alternative administration routes for narcotics either by patch or subcutaneous pump has been successful in controlling pain; however, the management of these routes of administration can be risky in the outpatient setting because of the risk of narcotic-induced respiratory depression and is therefore not recommended. The most appropriate regimen following outpatient hemorrhoidectomy appears to be intraoperative use of ketorolac, sufficient doses of oral narcotic analgesics for home administration, and supplementation of the narcotics by an oral nonsteroidal medication.

Urinary retention is a frequent postoperative problem following hemorrhoidectomy, ranging in incidence from 1 to 32%. A variety of strategies have been used to treat the problem; the best approach, however, seems to be a strategy of prevention that includes limiting perioperative fluid administration to 250 mL, an anesthetic approach that avoids the use of spinal anesthesia, avoidance of anal packing, and an aggressive oral analgesic regimen.

Early postoperative bleeding (< 24 hours) occurs in approximately 1% of cases and represents a technical error requiring return to the operating theater for resuturing of the offending wound. Delayed hemorrhage occurs in 0.5 to 4% of cases of excisional hemorrhoidectomy at 5 to 10 days postoperatively. The etiology has been held to be early separation of the ligated pedicle before adequate thrombosis in the feeding artery can occur. The bleeding in this scenario is usually significant and requires some method for control of ongoing hemorrhage. Options include return to the operating theater for suture ligation or tamponade at the

Doppler-Guided Hemorrhoidal Dearterialization

A new technique that is gaining popularity is Doppler-guided hemorrhoidal artery ligation (DGL), or transanal hemorrhoidal dearterialization (THD) depending on the manufacturer. The Doppler-guided technique is simultaneous reduction of the arterial blood flow, reduction of the prolapse (or mucoscopy), and tissue destruction by oversewing the reduced hemorrhoidal tissue. A specifically designed proctoscope is used coupled with a Doppler transducer. At the distal end, there is a small window that allows suturing of the rectal mucosa 2 to 3 cm above the dentate line. The reduction of blood flow is thought to lead to shrinkage of the hemorrhoidal complex. In addition, a mucoscopy can be performed that lifts up the prolapsing tissue into its normal anatomic position. Giordano and colleagues published an extensive review of the current evidence on THD looking specifically at the safety and effectiveness of the technique. Sixteen of the 17 articles that met the inclusion criteria were observational studies, and the study quality ranged from low to very low. The majority of patients treated had grade II to III disease. Of the 1,996 patients who were involved in these studies, the most common early post-operative event was postoperative pain (18.5%). Residual protrusion, bleeding, and fever were complications documented with an incidence over 3%. When the studies with a follow-up of 1 year or more were analyzed (six of 17 publications), the incidence of prolapse was 10.8%, of bleeding was 9.7%, and of pain on defecation was 8.7%.

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bedside by Foley catheter or anal packing.8-9) The subsequent outcome after control of secondary hemorrhage is generally good, with virtually no risk of recurrent bleeding. It may be helpful to irrigate the distal colorectum with post-hemorrhage enemas or at the time of intraoperative control of bleeding to avoid confusion when the residual clots pass per anum.

Conclusion

The management of symptomatic hemorrhoidal disease should be adapted to the clinical presentation of the patient and the severity of the symptoms. The vast majority of patients can be managed in an office setting, often without any procedure. Proceeding from the least invasive means of eradicating the hemorrhoidal tissue, ultimately to excisional hemorrhoidectomy, should be done in conjunction with the desires of the patient.

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Acknowledgment

Figures 1, 2, 7b, and 7c Tom Moore