

REVIEW

Evaluation and management of hemorrhoids: Italian society of colorectal surgery (SICCR) consensus statement

M. Trompetto¹ · G. Clerico¹ · G. F. Cocorullo² · P. Giordano³ · F. Marino⁴ ·
J. Martellucci⁵ · G. Milito⁶ · M. Mistrangelo⁷ · C. Ratto⁸

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Abstract Hemorrhoids are one of the most common medical and surgical diseases and the main reason for a visit to a coloproctologist. This consensus statement was drawn up by the Italian society of colorectal surgery in order to provide practice parameters for an accurate assessment of the disease and consequent appropriate treatment. The authors made a careful search in the main databases (MEDLINE, PubMed, Embase and Cochrane), and all results were classified on the basis of the grade of recommendation (A–C) of the American College of Chest Physicians.

Keywords Hemorrhoids · Hemorrhoidectomy

Preoperative evaluation: symptoms, diagnosis, and classification

Symptoms of hemorrhoids

The commonest symptom of hemorrhoidal disease is painless rectal bleeding. Hemorrhoids appear to be the most common cause of minimal bright red bleeding per rectum or hematochezia [1–4], while they are the second most frequent cause of severe acute lower gastrointestinal bleeding after diverticulosis [5, 6]. Other symptoms may be prolapse, mucous discharge, itching, and feeling of a lump. Thrombosis of external hemorrhoids is responsible for acute anal pain even without bowel movements.

Hemorrhoidal disease classification

The usefulness of a classification of hemorrhoids stems from the need to choose the most suitable treatment and to have shared parameters for scientific studies.

Hemorrhoids are usually classified on the basis of their location and on the presence and severity of prolapse.

Regarding location, it is appropriate to make a distinction between *internal* and *external hemorrhoids*: Internal hemorrhoids arise above the dentate line and are topped with mucosa, while external hemorrhoids arise below the dentate line and are covered by squamous epithelium.

The most widely accepted classification is the Goligher classification [7]: bleeding but no prolapse (grade I)

Hemorrhoidal piles prolapse through the anus during straining but they reduce spontaneously (grade II)

Hemorrhoidal piles prolapse through the anus during straining and require manual reduction (grade III)

The prolapse is irreducible (grade IV)

✉ M. Trompetto
trompetto.mario@libero.it

¹ Department of Colorectal Surgery, S. Rita Clinic, Vercelli, Italy

² Unit of Emergency and General Surgery, Department of Surgical Oncological and Stomatological Sciences, University of Palermo, Palermo, Italy

³ Department of Colorectal Surgery, Barts Health, London, UK

⁴ Department of General Surgery, “A. Perrino” Hospital, Brindisi, Italy

⁵ General, Emergency and Minimally Invasive Surgery, Careggi University Hospital, Florence, Italy

⁶ Department of General Surgery, Tor Vergata University, Rome, Italy

⁷ Department of General and Minimally Invasive Surgery, University of Turin, Turin, Italy

⁸ Proctology Unit, University Hospital “A Gemelli”, Catholic University, Rome, Italy

Due to limitations in the Goligher classification that does not consider specific clinical conditions such as circumferential prolapse and possible complications such as thrombosis and due to the need for classification to evolve in step with new technologies for the treatment of hemorrhoidal disease, some authors have proposed new classification systems [8, 9]. However, these are not widely used, perhaps because of their complexity.

Diagnosis of hemorrhoidal disease

Diagnosis of hemorrhoids should start with a medical history, with great care taken to identify symptoms suggestive of hemorrhoidal disease and risk factors like constipation, followed by physical examination.

Physical examination should include an abdominal examination, inspection of the perianal tissues, anorectal digital examination, and anoscopy.

Even if hemorrhoids are seen on examination, patients with colorectal symptoms should undergo colonoscopy to rule out other abnormalities (*grade of recommendation: B*).

In low-risk patients under 50 years of age, flexible sigmoidoscopy may prove to constitute appropriate initial investigation (*grade of recommendation: B*).

Colonoscopy should be mandatory in older patients and when there is a personal and/or a family history of colorectal neoplasms, inflammatory bowel disease, altered bowel habits, recent significant weight loss, and laboratory findings of iron deficiency anemia (*grade of recommendation: B*).

Sigmoidoscopy and colonoscopy should be integrated with anoscopy or videoanoscopy that has proven to have a higher detection rate of perianal pathology (*grade of recommendation: B*).

Although an increased maximum resting anal pressure is a common finding in non-prolapsing hemorrhoids [10, 11], manometry is not routinely performed for diagnosis. However, manometry can be useful for planning surgery in cases of recurrence or if a low anal pressure is suspected at physical examination.

Anorectal endosonography is not usually performed for diagnosis of hemorrhoidal disease, but it can be useful for determining whether hemorrhoids are associated with thickening of submucosal tissue and internal and external anal sphincter [12].

Conservative treatment

Dietary counseling with appropriate intake of fiber and fluids is the first choice in non-operative treatment in patients with mild symptomatic hemorrhoidal disease.

Increased fiber and fluid intake can give some relief in patients with hemorrhoids who have moderate bleeding, pruritus, and prolapse. Constipation and different types of difficult defecation can play an important role in the development of symptomatic hemorrhoidal disease. Regular bowel habits as well as a reduction in the time on the toilet can contribute to a satisfactory control of the disease.

Fiber

Trials of fiber show a consistent beneficial effect for symptoms and bleeding in the treatment of symptomatic hemorrhoids. All results showed either a trend or a significant difference in favor of the fiber group compared with placebo [13]. (*Level of evidence: I; Grade of recommendation: B*).

Phlebotonics

Phlebotonics demonstrated a statistically significant beneficial effect on bleeding hemorrhoids in comparison with a control intervention [14] (*Level of evidence: I; Grade of recommendation: B*).

Traditional Chinese medicine

Traditional Chinese herbs were not proved as useful for stopping bleeding from hemorrhoids in a Cochrane Review [15] (*Level of evidence: I; Grade of recommendation: D*).

Outpatient treatment

Rubber band ligation

Patients with grade I, II, and III hemorrhoids who fail conservative treatment may be treated with outpatient procedures such as banding. (*Level of evidence I; Grade of recommendation: B*).

Technique

This procedure is performed in outpatients and consists of positioning an elastic band above the dentate line to strangulate the piles, leaving an area where an inflammatory process fixes the mucosa to the sub-mucosal tissue, preventing the subsequent development of new hemorrhoidal tissue. Sixty-seven percent of patients required only one treatment session, though the sessions can be repeated until there a complete response. There was a 4-week interval between the sessions [16–20].

Indications

This technique is the most widely used as non-surgical treatment for second- or third-degree hemorrhoids (Gölder classification). The most frequent exclusion criteria are first- and fourth-degree hemorrhoids, thrombosed hemorrhoids, anorectal pathologies such as fissures, fistulas, and abscess, colitis, colorectal malignancies, pregnancy, immunodeficiency, diabetes mellitus, and coagulation disorders.

Complications

The possible minor complications of the technique are pain, bleeding, thrombosis, skin tags, and prolapse [20–23]. Major complications include massive gastroenteric hemorrhage [24] liver abscesses [25], endocarditis [26], and perineal sepsis resulting in death [27].

Sclerotherapy

Patients with grade I, II, and III hemorrhoids who fail conservative treatment may be treated with sclerotherapy as outpatients. (*Level of evidence I; Grade of recommendation: B*).

Technique

Many sclerosing agents have been used [28–31]. These lead to the necrosis of hemorrhoidal tissue, thus causing moderate tissue destruction with scarring and subsequent fixation of the submucosa.

Indications

Sclerotherapy appears effective for treating second-degree hemorrhoids. The reported exclusion criteria for the technique are acute inflammation in the perianal region, hemorrhoidal thrombosis, acute irreducible hemorrhoids; cardiac, hepatic, renal and hematological diseases; pregnant or nursing mothers; hypersensitivity to local anesthetics; previous anal surgery, previous sclerotherapy; or fourth-degree proctocele, fissures, fistulas, prolapse, and other proctological conditions, colorectal neoplasia, fecal incontinence, proctitis, abscess, asthma, allergic predisposition, hypercoagulability, thrombophilia, anticoagulant therapy, hepatitis b virus or hepatitis c virus infection, Crohn's disease or ulcerative colitis, diabetes mellitus.

Results

An improvement in bleeding was reported in 100 % of patients with second- and third-degree hemorrhoids and

complete resolution in 69 % of unselected patients, 52 % in third-degree, and 88 % in first-degree hemorrhoids [28, 32, 33]. Resolution of prolapse was reported in 90–100 % of patients with second-degree hemorrhoids.

Complications

Rare but major include impotence, fatal necrotizing fascitis, and abdominal compartment syndrome following sclerotherapy [34–36].

Infrared coagulation

Patients with grade I, II, and III hemorrhoids who fail conservative treatment may be treated with infrared coagulation. (*Level of evidence I; Grade of recommendation: B*).

Technique

Infrared coagulation consists of a direct application of infrared waves resulting in a necrosis of the protein within the hemorrhoids.

Indications

It is mostly used in for first- and second-degree hemorrhoids.

Results

Some studies show results similar to rubber band ligation [37–39].

Complications

Some studies demonstrated a very high percentage of recurrence or persistence of the disease, particularly in patients with third- and fourth-degree hemorrhoids [37]. Data are insufficient for assessment of the long-term efficacy of the technique.

Transanal hemorrhoidal dearterialization (THD)

THD appears to be a potential treatment option for second- and third-degree hemorrhoids. Clinical trials and longer follow-up are needed to establish a possible role for this technique [40, 41]. (*Level of evidence III; Grade of recommendation B*).

Doppler assistance in ligating the hemorrhoidal vessels prior to hemorrhoidal mucopexy may not be necessary. (*Level of evidence I; Grade of recommendation B*).

Operative time was significantly longer with the use of Doppler, and the postoperative pain score was significantly higher. More complications and unscheduled postoperative events in the Doppler group were reported with no difference in recurrence rates [42, 43].

THD is associated with significantly lesser postoperative pain if compared to stapled hemorrhoidopexy (SH). Both techniques are equally effective in the short term with similar rates of complications and recurrence [44–49]. (*Level of evidence I; Grade of recommendation B*).

Compared with hemorrhoidectomy, dearterialization with mucopexy resulted in similar postoperative pain and morbidity and a similar 24-month cure rate [50, 51] (*Level of evidence II; Grade of recommendation B*).

Technique

Based on the technique described by Morinaga in 1995 [52], this approach aims to correct the underlying pathophysiological mechanisms of the disease, both the hemorrhoidal engorgement and bleeding (by progressive shrinkage of piles) and the prolapse (by scarring fixation, following plication, of elongated and prolapsing rectal mucosa/submucosa to the rectal muscle). Using this technique, a hemorrhoid-sparing operation can be performed, avoiding the excision of any recto-anal tissue.

In the first phase of its application, this procedure provided only the ligation of the hemorrhoidal arteries; however, a quite high recurrence rate was found [53]. More recently, the addition of the “mucopexy” (also called “recto-anal repair”) has made possible to effectively treat the muco-hemorrhoidal prolapse, making the indications wider and significantly reducing the recurrence rate.

Indications

Doppler-guided (DG) THD should be reserved for patients presenting active hemorrhoidal disease despite lifestyle/diet interventions, drug therapy, and minor office procedures, such as rubber band ligation or sclerotherapy. Indications should be established on the basis of the patient’s symptoms and physical findings. If the main complaint is bleeding, this can be addressed by dearterialization alone, ligating the hemorrhoidal arteries along the low rectal circumference. In case of bleeding associated with hemorrhoidal or mucosal prolapse, mucopexy should be added to the dearterialization. In fact, mucopexy can be regarded as an “on-demand” step of the DG-THD procedure, depending also on the location and severity of mucosal prolapse (in terms of its length). The prolapsing hemorrhoidal piles and rectal mucosa must be reducible in order to reach their respective anatomical sites. Therefore, fibrosed piles should not be treated with DG-THD. This

distinction should be the basis for possible indication for DG-THD in some cases of fourth-degree hemorrhoids to the DG-THD approach as suggested by some papers and guidelines [54].

Complications

Pain was the most frequently reported postoperative complication following DG-THD, experienced by up to 38 % of operated patients (hemorrhoidal artery ligation (HAL): range 0–38 % of patients; THD: range 0–35 % of patients). However, in the majority of series, the incidence of pain was <10 %. A few papers reported tenesmus following the operation, which was more frequent in patients who underwent mucopexy. Postoperative bleeding was reported in up to 18 % of patients (HAL: range 0.9–18 %; THD: range 0–13 %). Hemorrhoidal thrombosis was observed in up to 8.6 % of patients (HAL: range 2.3–6.7 %; THD: range 0–8.6 %), being in the majority of papers <3 %. Anal fissure was considered as a postoperative complication in up to 2.1 % of patients (HAL: range 0.9–2.1 %; THD: range 0.6–1.5 %). Urge to defecate is infrequently described as a transient postoperative symptom, possibly related to the tenesmus and the acute inflammatory process. In the literature, there is no mention of any life-threatening complication, nor other morbidity observed after different surgical procedures (i.e., rectovaginal fistula, rectal necrosis, retrorectal hematoma, events needing stoma formation).

In the majority of series, the overall recurrence rate ranged between 3 and 24 % (HAL: 3.3–24 %; THD: 3–20 %). Reoperation, due to the recurrence of symptoms, was necessary in 2.7–22 % of patients (HAL: 2.7–22 %; THD: 4.1–17.8 %) [55, 56].

Stapled hemorrhoidopexy

Stapled hemorrhoidopexy is an effective technique for the treatment of hemorrhoids but carries a significantly higher incidence of recurrence and additional operations compared with conventional hemorrhoidectomy (*Level of evidence I; Grade of recommendation: A*).

SH was associated with less operating time, earlier return of bowel function, shorter hospital stay, less pain, with a faster functional recovery with shorter time off work, earlier return to normal activities, and better wound healing when compared to conventional hemorrhoidectomy (*Level of evidence I; Grade of recommendation: A*).

Both SH and LigaSure hemorrhoidectomy are probably equally valuable techniques in modern hemorrhoid surgery (*Level of evidence I; Grade of recommendation: B*).

Technique

The technique consists of a circumferential rectal mucosectomy which results in lifting of the anorectal mucosa (hemorrhoidopexy), [56, 57], restoring the normal anatomy of the anal canal and enabling the hemorrhoidal cushions to perform their role in continence, as opposed to haemorrhoidectomy techniques that only excise abundant tissues. However, the stapler operation may also influences the blood flow, leading to an improvement in venous reflux [58–61].

Results

Since the introduction of this procedure, a large number of studies have reported on its safety and efficacy. The short-term benefits of SH have clearly been demonstrated in studies on short-term outcomes and reviews [58–61].

Undoubtedly, SH is quicker to perform and patients experience less postoperative pain, postoperative bleeding, wound complications and constipation, and shorter hospital stay and return to their normal activities earlier. Furthermore, the requirements for non-surgical and surgical reinterventions and the readmission rate were similar following SH and conventional hemorrhoidectomy [61].

Some meta-analyses when looking at long-term outcomes after SH and conventional hemorrhoidectomy found higher recurrence rates following SH [61–63].

The operating time for SH was significantly longer when compared to LigaSure hemorrhoidectomy. Moreover, the incidence of residual skin tags and prolapse was significantly lower in the LigaSure group than in the SH group. The data also indicated that the incidence of recurrence was significantly lower in the LigaSure group than in the SH group [62, 63].

Complications

Up to 10 % of the patients in the SH group can experience some form of procedure related event [61], and minor and major complications have been reported [64, 65].

Excisional hemorrhoidectomy

Open and closed hemorrhoidectomies are both fairly efficient treatments for hemorrhoids, without serious drawbacks. The closed method has no advantage in postoperative pain reduction, but wounds heal faster, though the risk of wound dehiscence is high [66–68]. (*Level of evidence II; Grade of recommendation B*).

Treatment with the LigaSure technique results in significantly less immediate postoperative pain, reduced blood loss, and reduced operative time without any adverse effect as regards postoperative complications, convalescence, and incontinence. However, it may not confer any advantage over the conventional operation in terms of postoperative pain, length of hospital stay, or time taken to return to work or normal activities. (*Level of evidence II; Grade of recommendation B*).

Technique

Nearly 30 years ago, the technique described by Alan Parks was the better choice for treatment. This technique includes hemorrhoidectomy with preservation of the anal canal mucosa, reducing the surgical wound dimensions and leading to a shorter healing time, as well as less stenosis than with conventional techniques. The surgery was performed with a Y-shaped incision made at the mucocutaneous junction, between the upper mucosa of the anal canal and the anorectal junction, as an inverted racket incision; the vascular pedicle was separated from the mucosa and the sphincter plane, connecting it afterward; the mucosa was closed with a running suture, leaving a small area open in the perianal region for draining.

Closed hemorrhoidectomy (Ferguson operation), the most frequently used and recommended technique in the USA, results in less postoperative pain and rapid wound healing. There are many prospective randomized trials comparing Milligan–Morgan and Ferguson hemorrhoidectomy. Most of them do not demonstrate any superiority of the one technique over the other in term of postoperative pain and complications. It should be noted that a partial breakdown of the anal sutures is likely to occur after the Ferguson procedure in up to 25 % of patients.

Authors who perform open hemorrhoidectomy (Milligan–Morgan operation), widely used in Europe, report similar rates of healing and postoperative pain.

Indications

Grade III–IV hemorrhoidal prolapse is the most common indication for excisional surgical treatment.

Complications

Pain following hemorrhoidectomy is a common occurrence, and studies have evaluated the use of LigaSure in hemorrhoidectomy [69–74]. In a Cochrane Review comparing conventional hemorrhoidectomy to LigaSure, there was a trend for less pain and a lower incidence of complications associated with LigaSure, but most results were not significantly different [71].

In particular after the Milligan–Morgan technique, anal stenosis and some loss of the sensitive anal mucosa have been reported. Analysis of the long-term results after the Milligan–Morgan and Ferguson techniques has also pointed out an incidence of fecal incontinence of 6 %.

Thrombosed external hemorrhoids

Most patients with thrombosed external hemorrhoids benefit from surgical excision within 72 h of the onset of symptoms [75–77]. Moreover, symptoms last over 3 weeks with conservative treatment (*Level of evidence II; Grade of recommendation: D*).

Although most patients treated conservatively will experience eventual resolution of their symptoms, excision of thrombosed external hemorrhoids results in more rapid symptom resolution, a lower recurrence rate, and longer remission intervals. Most excisions can be safely performed in the office setting, although extensive large thrombosed hemorrhoids and those extending into the anal canal may require a more formal surgical approach in the operating room. The thrombosis should be excised along with overlying skin to leave a wide open wound, rather than simply incised and drained, to reduce the risk of local recurrence. Thrombosed external hemorrhoids seen late, with symptoms improving and the clot already resorbing, may be allowed to resolve without excision [75–77].

Conservative treatment

Analgesics and stool softeners, flavonoids, topical heparin, nifedipine, and glyceryl trinitrate ointment may be beneficial (*Level of evidence II; Grade of recommendation: D*).

Surgical treatment

Most patients with thrombosed external hemorrhoids benefit from surgical excision within 72 h of the onset of symptoms (*Level of evidence I; Grade of recommendation: B*).

Stapled hemorroideectomy is a feasible treatment for selected patients with an acute hemorrhoidal crisis (*Level of evidence III; Grade of recommendation: D*).

Heparin treatment was found to significantly improve healing and resolution of acute hemorrhoids, with 91 % of patients on heparin treatment exhibiting more pronounced improvement in condition in all measured symptoms and signs compared with the traditional treatment [78, 79].

Excision allows better results compared to incision or 0.2 % glyceryl trinitrate in reduction in pain, symptoms,

recurrences, and number of persistent anal skin tags. No difference in symptoms after 1 month was reported [80]. Outpatient excision under local anesthesia of a thrombosed external hemorrhoid can be safely performed with a low recurrence and complication rate while offering a high level of patient of acceptance and satisfaction [81].

Patients with acute hemorrhoidal crisis may be successfully treated with highly standardized and bioavailable mixture of flavonoids and triterpenes in order to avoid or to delay, invasive procedures (if the acute crisis resolves) [82].

A single injection of botulinum toxin into the anal sphincter seems to be effective in rapidly controlling the pain associated with thrombosed external hemorrhoids and could be an effective conservative treatment for this condition [83].

The use of topical nifedipine is a reliable new option in the conservative treatment of thrombosed external hemorrhoids [84].

Hemorrhoidectomy could be proposed [85]; however, conservative treatment for prolapsed thrombosed internal hemorrhoids is associated with shorter inpatient stay and less anal sphincter damage than with surgical treatment [86].

Stapled hemorroideectomy is a feasible treatment for selected patients with an acute hemorrhoidal crisis and has a similar complication rate to that of conventional excisional hemorroideectomy. Stapled hemorroideectomy is superior as regards postoperative pain, operation time, hospital stay, and return to normal activity. However, older patients with anemia or a prolonged hemorrhoidal crisis are unsuitable for this procedure [87–89].

Hemorrhoids and pregnancy

Although the exact prevalence of hemorrhoidal disease during pregnancy is unknown, the condition is common, and the prevalence of symptomatic hemorrhoids is higher in pregnant than in non-pregnant women.

Due to its frequent association with constipation and increased endopelvic pressure, pregnancy often brings on hemorrhoids that can even thrombose, requiring specialist treatment. Although conservative treatment, closed hemorroideectomy has been successfully performed without risk to the fetus [90].

Conservative treatment

Rutosides seem to be effective in reducing symptoms of hemorrhoids in pregnant women [91] (*Level of evidence I; Grade of recommendation: B*).

Surgical treatment

Surgery should be used as last resort because medical treatment is sufficient in almost all cases [92] (*Level of evidence IV; Grade of recommendation: D*).

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all participants included in the study.

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