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Hemorrhoid Management: A Holistic Exploration of Conventional Methods, Herbal Remedies and Clinical Research

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Abstract: Hemorrhoids, a prevalent medical condition affecting a substantial portion of the global population, continue to pose challenges in terms of effective treatment strategies. This review article comprehensively examines diverse methods of hemorrhoid treatment, with a specific focus on herbal formulations and their clinical efficacy. In response to growing interest in natural therapies, the article thoroughly investigates hemorrhoid herbal treatment options. It highlights the utilization of various botanical agents, their traditional uses, and scientific evidence supporting their efficacy in alleviating hemorrhoidal symptoms. Special attention is given to formulations comprising plant-derived compounds, their mode of action, and safety profiles. The article synthesizes existing literature and clinical data to provide a comprehensive overview of conventional medical interventions alongside emerging herbal approaches. This evidence-based assessment aids in identifying gaps in current knowledge and areas warranting further research. In conclusion, this review article amalgamates a diverse array of hemorrhoid treatment methods, ranging from conventional medical interventions to emerging herbal formulations. As interest in holistic healthcare approaches grows, this review underscores the need for continued exploration of herbal treatments and their integration into conventional therapeutic paradigms.

Keywords: Hemorrhoids, Goligher classification, Herbal formulation, Clinical research, Phytochemicals.

1. Introduction

They are a usual anorectal ailment that shows as the acute swelling or proximal migration of anal cushions [1-2]. Hemorrhoids (HD) are generally associated with bleeding, fecal seepage, pruritus, discomfort, prolapse, and mucus discharge [3-5]. Rectal bleeding during elimination that is described as painful or not depends on whether there are prolapsing anal tissues, which are anal mucosa prominences which comprise the smooth muscle, capillary or artery vessels, plus loose connective tissue [6]. Each year, 10 million Americans claim to have hemorrhoids. Both genders show a peak incidence in the years 45 and 65 [7]. Hemorrhoidal removal is frequently requested by those with symptoms thought to be related to hemorrhoids; nevertheless, symptom control is a safer and more practical endpoint that should be made the main objective of therapy. Hemorrhoid patients have higher levels of matrix metalloproteinase, which controls extracellular proteins and tissue remodelling [8]. Because of the importance of time spent on the toilet, it is recommended that you spend no more than 3–5 minutes defecating once a day [9]. Several methods are open to treat the hemorrhoids, such as bipolar diathermy, infrared coagulation, radiofrequency ablation, Laser therapy, rubber band ligation, cryotherapy, injectable sclerotherapy, and colorectal surgery [10-11]. The movement of the anal cushion, excessive perfusion of the hemorrhoid plexus, tissue inflammation, vascular anomalies, or internal rectal prolapse are some of the elements that contribute to the aetiology [12]. As it was long believed that the upper and lower hemorrhoidal plexus' dilated blood vessels caused hemorrhoids, the actual justification may not be as simple.

It has generally been unable to pinpoint a specific origin of the disorder, but it is widely acknowledged that specific circumstances may contribute to the process in a particular patient [13]. A high degree of morbidity is linked to the onset of complications, which can be treated safely in the majority of cases, and prolonged symptoms considerably lower patients' quality of life [14]. Submucosal, fibrovascular, and arteriovenous sinusoids of the anorectum become inflamed as a result of the disorder [15-16]. When compared to healthy volunteers, patients with bothersome hemorrhoids have considerably bigger blood vessels, higher blood flow, and greater velocity [17]. The corpora-cavernorsa recti is a whole cylindrical sheet made up of sinusoids, arteriovenular anastomosis, and portosystemic connections [18]. Constipation and squeezing have been identified as prevalent influencing variables and potential contributory elements in the emergence of HD [19-20]. In 1998, Longo published the first report on prolapse or hemorrhoids working for the diagnosis of symptomatic HD [21]. Trans anal hemorrhoidal dearterialization (THD), the newest learning, may result in reduced postoperative discomfort and speedier recovery [22]. Hemorrhoid's enlarged venous sinuses have been attributed to an imbalance between arterial intake and venous drainage [23]. The daily lives of patients are significantly impacted by this illness, which can also lead to several potentially fatal consequences, such as iron deficiency anemia and cardiovascular and cerebrovascular illnesses [24-25].

2. Goligher Classification of Hemorrhoids

The Goligher classification of hemorrhoids, is a classification scheme used to categorize and describe the severity of hemorrhoids [26]. This classification system was proposed by Sir John Goligher, a British surgeon, and it consists of four grades as depicted in **Table 1**. It's worth noting that while the Goligher classification provides a useful way to categorize hemorrhoids based on their severity, it doesn't capture all the potential variations and complications that can occur with hemorrhoids. Modern medical practice might use additional descriptors and considerations to assess and manage hemorrhoids.

Table 1: The Goligher classification of hemorrhoids.

Sr. No.	Grades	Symptoms	Treatment /method
1	Grades I	It may cause painless bleeding.	Dietary changes, hydration, good toilet habits, sitz baths.
2	Grades II	Prolapse during defecation and spontaneously reduce.	Increase water intake, lubricating agent and over-the-counter treatment Medical treatment: Sclerotherapy, rubber band ligation.
3	Grades III	Prolapse during defecation and must be manually reduced.	Rubber band ligation, infrared coagulation, hemorrhoidectomy, stapled hemorrhoidopexy.
4	Grade IV	Hemorrhoids are incarcerated, not reducible.	Coagulation techniques, hemorrhoidal artery ligation.

3. Hemorrhoid Treatment

Outpatient clinics routinely perform nonsurgical operations like RBL and sclerotherapy, which reduces the cost of hospital stays. These therapies also save time and lessen the number of days lost from work because difficulties are uncommon and mild. According to reports, the most common side effects of minimally invasive therapies for hemorrhoidal illness include discomfort and bleeding [27]. The treatment of hemorrhoid is depicted in **Figure 1**.

3.1 Rubber Band Ligation (RBL)

According to studies [28-29], the ligation of rubber bands is a particularly crucial, affordable, or frequently utilized method to treat internal HD of grades II to III. This operation doesn't need general anesthesia. At the base, a little rubber band is positioned. Up to their eventual removal, the shackling bands are still in situ [30]. The pile material was sucked into the ligator, and the bands can be applied using the suction method [29]. Because it has a decreased failure rate, RBL was utilized to treat internal hemorrhoids in grades I to III [31]. 10-14 days after the banded hemorrhoid sloughs off, the patient should be counselled about bleeding and this procedure should be repeated after 4-6 weeks [32]. After one hour of the surgery, the patients were discharged

home. A laxative was given to the patient to improve the bleeding and prolapse [33]. Within 24 hours of the operation, all subject was ordered to stay in bed, and feces were rigorously monitored. Normal feces were allowed after 24 hours [30]. Pregnant women or HIV-positive subjects show minimal complications in grade I–III HD; it is a reliable and effective operation [34]. RBL has been connected to substantially greater degrees of after-treatment pain or discomfort. [35]. RBL does not treat prolapsed hemorrhoids [33]. Compared to patients receiving infrared coagulation or non-infrared coagulation, those having RBL experienced more postoperative discomfort [36]. To identify any early problems, including bleeding, discomfort, vasovagal attack, and urine retention, all of the patients were monitored for one to two hours [37]. The RBL treatment contains several complications such as post-banding pain, rectal bleeding (3%), localized infection (1%), post-infection (1%) and urinary retention (1%) [38]. Bleeding has occurred in patients who are treated with rubber band ligation [39]. The most frequent serious side effect of RBL for internal HD brought on by early band slippage is delayed bleeding (DB) [40]. Some patients have to be admitted to the hospital for the management of the pain [41]. The CAES (Cap-assisted endoscopic sclerotherapy) cause pain much higher than the RBL method on the hemorrhoids [42]. The complication that occurs due to the treatment of hemorrhoids with RBL are bleeding, perineal sepsis, pylephlebitis, pyogenic liver abscess, and bacterial endocarditis [43].

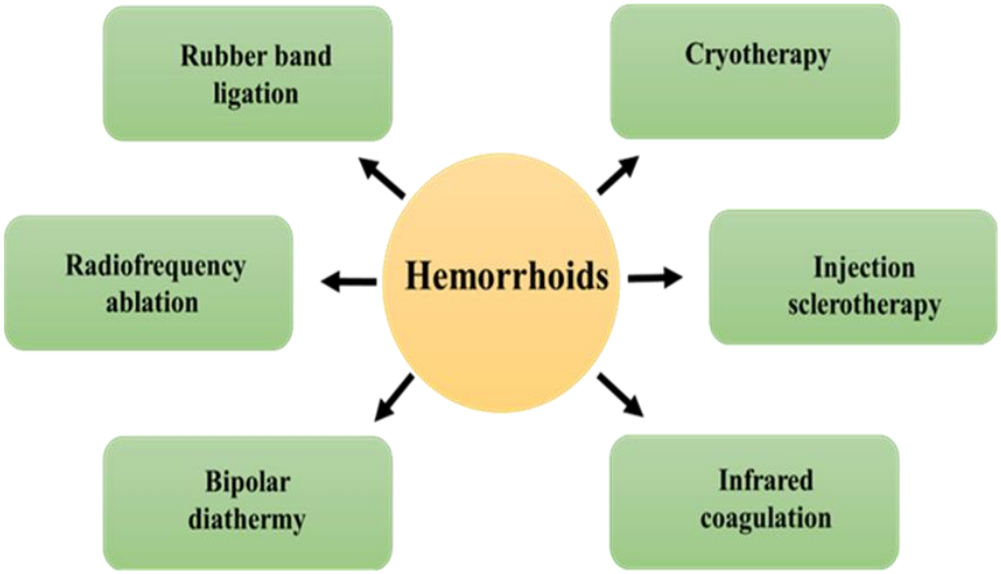

Figure 1: Hemorrhoid Treatment Strategies.

3.2 Bipolar diathermy

This bipolar technique proved safe and successful for endoscopic diagnosis of internal HD. This approach has several modifications, which are all effective in obtaining therapeutic success [44-45]. The bipolar diathermy device used in this trial consisted of a 1-cm long contact probe attached to a specially designed handle to enable its use down the disposable plastic proctoscope. The contact probe is laid on hemorrhoid, and the diathermy is controlled by a foot switch [46]. As an anti-hemorrhagic instrument, a bipolar diathermy device may precisely apply electrocautery energy to vascular structures while causing the least amount of heat distribution possible [47]. Bipolar diathermy is effective in treating hemorrhoids. A revolutionary hemostatic device called a bipolar electrothermal device can provide the exact quantity of electrocautery energy across vascular structures, along with the least amount of thermal dispersion possible. It has been demonstrated that hemorrhoidectomy using bipolar diathermy cuts down on both operating time and postoperative pain or painkiller needs [48]. In addition, the targeted bipolar ligature was used to achieve the necessary histologic modifications with less muscle damage.

3.3 Radiofrequency Ablation

In radiofrequency ablation (RFA), A radiofrequency generator attached to a ball electrode is sited on hemorrhoid tissue, causing coagulation as well as evaporation of contacting tissue. With this treatment, hemorrhoids' vascular components are reduced, and subsequent fibrosis bonds the hemorrhoidal mass to the underlying tissue [39]. RFA can be carried out as an outpatient operation utilizing an anoscope. It is a rather

painless method, although it is related to the higher risk of prolapse and recurrent bleeding [49]. The more recent radiofrequency devices allow for a quicker return to regular activities and have less postoperative pain [50]. Hemorrhoids lose their circulatory components, and subsequent fibrosis fuses them to the underlying tissue [51]. Using radiofrequency-induced thermotherapy (RFITT), one can focus heat energy locally on diseased tissue [13]. When surgery is not recommended, radiofrequency coagulation can be utilized on pregnant individuals [52].

3.4 Injection Sclerotherapy

Injection sclerotherapy is a painless mucosal attachment to the underlying muscle via fibrosis caused by a suitably positioned submucosal injection of oily phenol [53]. This method is best for the treatment of hemorrhoids in grades I & III and can be carried out while irreversible anticoagulation is present. A sclerosing solution (5% phenol in almond or vegetable oil or sodium tetradecyl sulfate) is injected into the base of a hemorrhoidal pedicle, which promotes fibrosis and fixation of hemorrhoids. When this treatment is used for anterior hemorrhoids, there are higher rates of urinary problems [54]. For injection sclerotherapy, aluminum potassium sulfate and tannic acid (ALTA) are more beneficial than phenol in almond oil (PAO), and ALTA was more successful than PAO in hemostatic [55]. Polidocanol requires fewer treatments and has a greater patient satisfaction rate, according to research comparing 3% polidocanol with 5% phenol [53]. As an alternative to surgery, sclerosing is less intrusive [54]. Sclerotherapy has a lower efficacy rate for prolapse than hemorrhoidectomy [55]. Injection sclerotherapy with 50% dextrose solution, a low-cost and physiological sclerotherapy agent, is a successful treatment for grade 1 hemorrhoids (HD) [56].

A new method for processing flexible endoscopic sclerotherapy is called CAES (cap-assisted endoscopic sclerotherapy). The unique shape of the CAES endoscopic needle, which typically uses a long needle, helps prevent iatrogenic harm from ectopic injection and helps precisely manage the injection angle, direction, and depth under direct eyesight [12,57]. With professional advice, this method has grown to be a popular, flexible endoscopy treatment in China [58]. Internal hemorrhoids may be easily and successfully treated using the CAES, which is less unpleasant and doesn't require anesthetic [59]. The complications associated with sclerotherapy are chemical hepatitis, adult respiratory distress syndrome, recto-urethral fistula, necrotizing fasciitis, anorectal necrosis, rectal necrosis, abdominal compartment syndrome, impotence, and acute liver injury [60-64]. Another study evaluated the effectiveness and safety of Sclerotherapy (ST) with 3% polidocanol foam for second- & third-degree HD. 66 patients underwent a single ST session. The study found that ST is effective with a success rate of 78.8% after one session and 86% after two sessions. There were no intraoperative complications or drug-related side effects. The mean operative time was 4.5 minutes. The treatment improved symptoms and anal continence significantly.

Thus, the study concludes that ST with 3% polidocanol foam is a harmless, economical, or repeatable diagnosis for HD [65]. Literature reports that rubber band ligation and polidocanol foam sclerotherapy are common treatments for HD, but their comparative effectiveness and safety have not been well-studied. A study aimed to address this gap by randomly assigning 120 patients with hemorrhoidal disease to either rubber band ligation or polidocanol foam sclerotherapy. The primary outcomes were therapeutic success (relief of symptoms) or recurrence rates. Both treatments were found to be effective, but polidocanol foam sclerotherapy had a higher complete success rate (88.3% vs 66.7% with rubber band ligation). Patients who received polidocanol foam sclerotherapy also needed fewer diagnostic sessions and experienced lower recurrence rates. Complications were more common with rubber band ligation (30% vs 10% with polidocanol foam sclerotherapy), but they were mostly minor. There were no severe complications in either group. Thus, both treatments are effective for grades I-III hemorrhoidal disease, but polidocanol foam sclerotherapy appears to be more effective in terms of complete success, requiring fewer treatment sessions, and having lower recurrence rates and fewer complications [66]. In 2022, a recent study aimed to compare the effectiveness or safety of Polidocanol foam sclerotherapy (PFS) in treating Hemorrhoidal Disease in patients with or without bleeding disorders (BD). Over 18 months, 228 patients, along with the symptomatic internal HD grades I-III, were enrolled, with 73 having BD. PFS was used in all cases, and both groups were followed up for a year. The BD group had a little larger average number of sessions (1.68 vs. 1.43), and the total success rate was 93.4%. Bleeding was recorded in 4.8% of instances, and complications in 11.4% of cases. However, there were no significant differences in effectiveness, recurrence, or complication rates between BD and non-BD groups. Thus, PFS is an effective and safe treatment for HD in both groups [67].

3.5 Cryotherapy

The cryotherapy equipment is anatomically intended to apply cold therapy directly to the hemorrhoid tissue. The direct administration of cold has been found to give instant alleviation of pain, itching, and inflammation. Two plastic components make up the instrument. The crown features a curved tip that makes it easier to slide into the rectum. The foundation is wider than it is long. The two components (crown & base) meet and are linked at the base. The crown is 4.56 centimetres in height, and 3.25 cm is the maximum diameter. The base is 6.19 cm long and 0.71 cm tall. After bringing the instrument home, the patient was advised to put it in the freezer for at least 3 hours before using it. This device can cause vasoconstriction, tissue hypoxia, analgesia, and muscular relaxation when applied topically and is based on cold treatment [2]. The goal of endoscopic cryotherapy was to reduce the hemorrhoids' bleeding. For five to seven seconds, a nitrogen gas-filled pear-shaped cryoball was administered to the region. After thawing, the treated region went white and then purple, but there was no visible bleeding. After 3 months, the second cryotherapy treatment is applied [68].

3.6 Infrared Coagulation

Internal hemorrhoids are treated using infrared coagulation devices to treat bleeding and prolapsing hemorrhoids grade I and II [69]. Non-endoscopic systems that include a power unit along with the tungsten-halogen lamp are used for IRC [70]. Tissue is coagulated by creating heat using infrared light rather than an electric current in infrared coagulation (IRC) [71]. Internal hemorrhoids treated using IRC cause a mild burn with less tissue damage, reduced scarring and tissue fixation, which causes hemorrhoids to decrease and eventually disappear [72]. The infrared coagulator generates infrared radiation that induces tissue to coagulate or water in the cell to evaporate, which reduces the hemorrhoid bulk [52]. Localised intravascular coagulopathy is caused by the coagulation of stagnant blood in large lesions, which activates thrombin and initiates the conversion of fibrin to fibrinogen [73]. Internal haemorrhoids' signs and symptoms, including bleeding, prolapse, pain, itching, burning and soiling, are improved significantly after endoscopic IRC [74]. A total of three to four IRC pulses were delivered for 1.5 seconds at hemorrhoid’s bases while the person being treated remained in the posture of left lateral decubitus. To lessen the area's sensitivity and make the anoscope's passage easier, local 5% xylocaine jelly was put on the anus and proctoscope. Rectal bleeding is seen in 5 to 25% after infrared coagulation [52].

4. Hemorrhoids Herbal Treatment

Injectable sclerotherapy, cryotherapy, laser therapy, bipolar diathermy, rubber band ligation, infrared coagulation, or other procedures are potential diagnoses for high-grade internal bleeding. Hemorrhoid are connected with some serious downsides, such as rectal discomfort, pain, recovery time, hospitalization, expense, and much more. In addition, these treatments are associated with rectal pain and discharge requiring general anesthetic, septic complications like death, pain and require time for recovery, Fear of hospitalization, financial burden, and length of disability, which can cause hemorrhoids or minor sores to progress, impotence, urinary retention, and abscesses [75]. Due to the widespread usage of medicinal herbs and their refined dry extract, traditional medicine has increased in commercial value [76-77]. To combat these complications, researchers explore plant-derived medications for the safe and effective management of hemorrhoids. Furthermore, over 80% of the world's population also prefers to take herbal remedies to treat this common ailment. Various plants utilised for managing the hemorrhoids are depicted in **Table 2**.

Table 2: List of herbs used for the management of hemorrhoids.

Sr. No.	Plant Botanical name (Family)	Part used	Route of administration	Mechanism of action	References
1	*Myrtus communis* (Myrtaceae)	Leaves	Smoke, topical	Pro-inflammatory enzymes like COX and LOX are inhibited by the antioxidants myricetin and quercetin.	[78]
2	*Brucea antidysenterica* (Simaroubaceae)	Fruit or leaf	--	It contains quassinoids and triterpenes, responsible to inhibit	[79]

				COX-2 expression and reduce prostaglandin synthesis.	
3	*Terminalia chebula* (Combretaceae)	Fruits	Oral (jam)	Inhibition of the COX enzyme	[80]
4	*Berberis vulgaris* (Berberidaceae)	Fruits	Oral	It lowers IL-1, TNF-α, iNOS, ICAM-1, IL-6 and NF-κB activation levels.	[81]
5	*Phyllanthus emblica* (Phyllanthaceae)	Fruits	Oral	Preventing the synthesis of the pro-inflammatory cytokines TNF-α, IL-1 and IL-6.	[82]
6	*Mangifera indica* (Anacardiaceae)	Fruits	Oral	Inhibiting NF-κB, a crucial transcription factor, suppresses cytokines involving TNF-α and IL-6.	[83]
7	*Salvadora persica* (Salvadoraceae)	Stems	Topical	By reducing the synthesis of cytokines, including TNF-α, IL-1 and IL-6.	[84]
8	*Tamarix aphylla* (Tamaricaceae)	Roots	Smoke, topical	Blocking the creation of TNF-α, IL-1 and IL-6, cytokines that trigger inflammation	[85]
9	*Vitex agnuscastus* (Lamiaceae)	Aerial parts	Oral	Inhibition of inflammatory cytokines, particularly IL-1β and TNF-α.	[86-87]
10	*Matricaria chamomilla* L. (Aristolochiaceae)	Flowers	Topical (oil)	Inhibiting the inflammatory markers COX-2 enzyme and oxidative stress.	[88]
11	*Solanum melongena* (Solanaceae)	Fruits	Oral, topical	Inhibition of inflammatory cytokines, such as IL-6 and TNF-α.	[89]
12	*Portulaca oleracea* (Portulacaceae)	Leaves	Oral (fresh juice)	Inhibits TNF-α, IL-6 and other pro-inflammatory cytokines.	[90]
13	*Croton macrostachyus* (Euphorbiaceae)	Bark	--	Decreases the generation of inflammatory mediators by inhibiting COX, LOX, and phospholipase A_2 (PLA_2).	[91-92]
14	*Potentilla reptans* (Rosaceae)	Aerial parts	Topical (boiled)	Inhibits the COX and LOX enzymes from making prostaglandins leukotrienes.	[93]
15	*Adiantum capillus-veneris* (Adiantaceae)	Aerial parts	Topical	Avoids IL-1β and TNF-α by increasing the influx of antibodies to the acute site.	[94]

16	*Semecarpus anacardium* (Anacardiaceae)	Fruits	Topical (smoke)	Inhibiting COX enzyme activity.	[83]
17	*Coffea arabica* (Rubiaceae)	Seeds	Oral	Caffeine, one of coffee's bioactive substances, has been proven to stop the making of cytokines which induce inflammation, including IL-1, TNF-α and IL-6.	[95]
18	*Camellia sinensis* (Theaceae)	Leaves	Topical (boiled)	Blocking the production of pro-inflammatory cytokines and enzymes such as NF-κB and COX-2.	[96]
19	*Xanthium strumarium* (Asteraceae)	Leaf	--	Preventing the action of inflammatory-causing enzymes like COX-2 and 5-LOX.	[97]
20	*Smilax china* (Smilacaceae)	Roots	Oral	COX-2 and other cytokines and enzymes are downregulated to aid in the reduction of edema.	[98]
21	Syzygium guineense (Myrtaceae)	Total plant	--	Reduced the elevated amounts of inflammatory cytokines like COX-2 and iNOS	[99]
22	*Olea europaea* (Oleaceae)	Stem	--	Decrease in the levels of COX-2 and iNOS.	[91, 99]
23	*Bryonia alba* (Cucurbitaceae)	Roots	Topical (oil)	Inhibiting two pro-inflammatory enzymes, i.e., COX-2 and iNOS.	[91]
24	*Clutia lanceolata* (Euphorbaceae)	Leaf, Fruit	--	The activity of COX-2, 5-LOX and inflammatory proteins was reduced.	[97]
25	*Phoenix dactylifera* (Arecaceae)	Fruits	Oral	Inhibiting the harmful enzymes COX-2 and iNOS.	[100]
26	*Moringa arabica* (Moringaceae)	Seeds	Topical (oil)	Decreasing the production of IL-1, IL-6, PGE_2, TNF-α, and nitric oxide in LPS macrophages.	[85]
27	*Alhagi maurorum* (Fabaceae)	Flowers	Oral, smoke	Decreasing the production of IL-1β and TNF-α levels in cultured macrophages.	[101-102]
28	*Aloe macrocarpa* (Aloaceae)	Latex	--	Reduced the pro-inflammatory cytokines like IL-6 and TNF-α in cultured macrophages.	[97]
29	*Aloe pirottae* (Xanthorrhoeaceae)	Leaf	--	Pro-inflammatory cytokines like TNF-α were considerably decreased.	[103]

30	*Apium graveolens* (Apiaceae)	Leaves	Oral (decocted)	Decreasing inflammatory cytokines such as IL-6, COX-2 and TNF-α.	[104]
31	*Oxalis acetosella* (Oxaliaceae)	Seeds	Oral	Decreasing pro-inflammatory cytokines TNF-α and IL-1β.	[85]
32	*Lepidium sativum* (Brassicaceae)	Leaves	Smoke	Decreasing IL-6 and TNF-α levels in cultured cells.	[105]
33	*Peganum harmala* (Nitrariaceae)	Seeds	Topical	Decreasing pro-inflammatory cytokines IL-1β and IL-6.	[106]
34	*Hypericum perforatum* (Hypericaceae)	Aerial parts	Topical	Decreasing pro-inflammatory cytokines IL-1β, IL-6 and TNF-α.	[107-108]
35	*Iris germanica* (Iridaceae)	Roots	Topical (oil)	Reduce inflammation by operating on cells which release IL-1, IL-6 and other inflammatory agents.	[109]
36	*Curcuma zedoaria* (Zingiberaceae)	Roots	Topical	By limiting the inflammatory response of TNF-α and NF-κB.	[110]
37	*Punica granatum* (Lythraceae)	Flowers	Oral, topical	Decreasing pro-inflammatory cytokines like TNF-α, IL-6 and IL-1β.	[111]
38	*Juglans regia* (Juglandaceae)	Seeds	Oral, topical (ash)	Inhibiting NF-κB and IL-6.	[112]
39	*Vitis vinifera* (Vitaceae)	Fruits	Topical (ash)	Reducing IL-1β, TNF-α, COX-2, iNOS and other pro-inflammatory mediators.	[113]
40	*Boswellia sacra* (Burseraceae)	Gum	Oral (with sugar)	Reducing leukotrienes, which are strong inflammatory mediators, from being produced by 5-LOX.	[114]
41	*Murdannia nudiflora (Fabaceae)*	Root	--	Decreasing TNF-α and IL-6 expression.	[115]
42	*Allium ampeloprasum* (Amaryllidaceae)	Leaves	Oral, topical	Decreasing pro-inflammatory enzymes COX-2 and 5-LOX.	[116]
43	*Allium sativum* (Alliaceae)	Flower	--	Suppressing COX-2 expression and reducing prostaglandin E_2 levels, thereby reducing inflammation.	[117]
44	*Plantago major* (Plantaginaceae)	Leaves and seeds	Oral, topical (enema)	The iridoids, flavonoids, and aucubin have been demonstrated in several preclinical studies to lower oxidative stress and inflammation	[118]

45	*Chelidonium majus* (Papaveraceae)	Gum	Topical	Suppressed COX-2 enzyme.	[119]
46	*Citrus medica* (Rutaceae)	Peels	Oral, topical	Reducing COX and LOX.	[120]
47	*Sesamum indicum* (Pedaliaceae)	Seeds	Oral (oil)	Inhibiting pro-inflammatory enzymes such as COX and LOX.	[121]
48	*Aloe vera* (Xanthorrhoeaceae)	Gum	Topical	Reducing IL-1β and other pro-inflammatory cytokines such as TNF-α.	[122-123]
49	*Cyperus longus* (Cyperaceae)	Roots	Oral	TNF-α and IL-6, two anti-inflammatory cytokines, slow down the rate at which certain enzymes, including COX and LOX.	[124]
50	*Nardostachys jatamansi* (Valerianaceae)	Aerial parts	Oral	Inhibiting TNF-α, IL-6 and IL-1β.	[85]
51	*Colchicum autummale* (Colchicaceae)	Roots	Topical	Inhibiting pro-inflammatory cytokines like TNF-α, IL-1 and IL-6.	[125]
52	*Nicotiana tabacum* (Solanaceae)	Leaf	--	Inhibiting many inflammatory pathways, including NF-κB.	[104]
53	*Ficus carica* (Moraceae)	Leaves	Topical (enema)	Antioxidants present in *Ficus carica*, may lessen inflammation by lowering oxidative stress.	[28]
54	*Achyranthes aspera* (Amaranthaceae)	Root, leaf	--	Inhibiting COX-2 and LOX activity	[126-127]
55	*Agave sisalana* (Agavaceae)	Stem	--	Inhibiting pro-inflammatory enzymes such as COX and LOX.	[128]
56	*Albizia gummifera* (Fabaceae)	Branches & Root	--	Reducing the synthesis of IL and TNF-α.	[128]
57	*Cucumis prophetarum* (Cucurbitaceae)	Root	--	Blocking pro-inflammatory cytokines like TNF-α.	[129]
58	*Solanum incanum* (Solanaceae)	Fruit	--	Reducing TNF-α and other pro-inflammatory cytokines, including IL.	[130]

5. Herbal Formulation for the Management of Hemorrhoids

Herbal formulations have been utilized for centuries in various traditional systems of medicine to alleviate the symptoms or manage hemorrhoids effectively. These remedies often incorporate plant-based ingredients known for their anti-inflammatory, astringent, and soothing properties. However, it's crucial to remember that although these treatments might offer comfort, they may not eliminate severe cases of hemorrhoids, and medical intervention might be necessary. Furthermore, when formulating a herbal remedy for hemorrhoids, it's crucial to consider the proper proportions of herbal ingredients to ensure maximum efficacy and minimal side effects. Scientific validation of these formulations can also enhance their safety and effectiveness. Before using any herbal medicine, people should also speak with a healthcare provider, particularly if they are

pregnant, nursing, or using any other drugs. A balanced diet, regular exercise, and maintaining good hygiene practices also contribute to the comprehensive management of hemorrhoids alongside herbal formulations. Various herbal formulations for the management of HD are depicted in **Table 3**.

Table 3: Herbal formulation for the management of hemorrhoids.

Sr. No.	Formulation	Chemical constituents /composition	Mechanism of action	Outcomes	Reference
1	Arshkeyt tablet	*B. variegate*, *M. azedarach*, *C. dactylon*, *M. ferrea*, *P. pinnata*, *A. campanulatus*, Triphala Guggul *Arshoghni vati* and *M. pudica*	Arshkeyt™ contains herbal components that have hemostatic, anti-inflammatory, analgesic and wound-healing qualities.	Isabgul powder and 2% lidocaine gel were much less successful at treating haemorrhoids than Arshkeyt™, a 7-day package.	[131]
2	Rectal cream	Tribenoside, Lidocaine	This cream aids in stimulating lymphatic drainage, improves capillary permeability and boosts venous tone.	Lastly, tribenoside + lidocaine may be a fast, successful, and reliable method of curing haemorrhoids given that right away symptom relief was reported 10 minutes after the dose and remained up to 10–12 hours.	[132]
3	Alum Suppositories	Beeswax Theobroma oil, Alum, Shea butter	The alum effect includes blocking immune cell activity, which reduces goblet cell proliferation, lymphocyte infiltration, and blood vessel dilatation and congestion.	The histopathology evaluation and recto-anal coefficient of the alum suppositories show anti-hemorrhoidal activity when compared with diclofenac sodium.	[133]
4	Tablets for Anoc-H	Several examples of plants include *Nagkesar Euphorbia* hirta) (Messuaferrea), *Mimosa pudica*, *Berberis aristate* Dugdhika (and Daruharidra	By decreasing RANTES and VEGF, anoac-H could reduce inflammation. Anoac-H's capacity to stop bleeding haemorrhoids was due to its impact on RANTES and VEGF downregulation, migration and inflammation.	The clinical research proves that 95% of patients who obtained Anoac-H therapy for bleeding haemorrhoids recovered.	[134]
5	Proctilor® ointment	Zn-L-Carnosine	By suppressing inflammatory changes and tissue	Proctilor® ointment does not show any side effects or adverse	[135]

			damage, this substance has beneficial effects on HD.	events in the patient. It reduces the VAS score, HDSS score, and SHSHD score, all describe a level of pain and bleeding.	
6	Hemoheal cream	The oil of *Esamum indicum* L., this plant mukul and *Allium ampeloprasum* L.	The hemoheal cream contains ingredients that have anti-inflammatory activity, wound healing and act as anti-hemorrhoidal activity.	Hemoheal cream shows a positive effect on improving Diagnostic signs and complaints in haemorrhoid patients.	[136]
7	Musk Haemorrhoid Ointment from Mayinglong	Artificial bezoar, Borax, amber, synthetic musk, pearl and borneol.	It promotes blood circulation, reduces and relieves swelling, opens meridians, relaxes knots, simplifies anxiety, increases muscle regeneration, and has medicinal benefits.	This ointment heals the postoperative wounds of haemorrhoids, boosts local blood flow, and assists in mitigating unease, edema and sensitivity	[137]
8	Gangtai ointment	Papaverine hydrochloride, borneol, carbonized sanguisorba root, hydrochloric acid nicotine, Sapindales,	The ointment helps to shrink the blood vessels, stop bleeding, avoid wound inflammation, reduce pain, and inhibit bacteria.	The wound exudate scores were significantly reduced at 7 and 14 days following the application of an ointment to treat hemorrhoids.	[137]
9	Diltiazem ointment	2% diltiazem	It functions by preventing extracellular calcium ions from entering the human internal anal sphincter nucleus, hence preserving oxygen and resulting in pain alleviation and relaxed muscles.	Topical diltiazem ointment greatly decreases postoperative pain in hemorrhoidectomy with no serious side effects.	[138]
10	Apamarga Kshara paste	*Apamarga, Chitraka*, *Shamkha nabhi*, Shukti	*Apamarga Kshara* does several tasks, comprising incision, excision, debridement, rubbing, and indirect burning of the tissue.	Combining *Apamarga Kshara* application with the IRC method is the most effective way of curing internal haemorrhoids of both the primary and secondary degrees.	[72]

6. Clinical Data

Clinical studies on hemorrhoids play a pivotal role in understanding the condition's causes, symptoms, and treatment options, enabling healthcare practitioners to make informed decisions for patient care. These studies have shed light on various aspects of hemorrhoids, contributing to advancements in medical knowledge and patient management. Research has focused on investigating the prevalence and risk factors associated with hemorrhoids. Studies have shown that factors like age, pregnancy, obesity, or sedentary lifestyle can increase the likelihood of developing hemorrhoids. Additionally, genetic predisposition and dietary habits have also been explored as potential contributors. Clinical trials have evaluated different treatment approaches for hemorrhoids, ranging from conservative measures to surgical interventions. These studies have examined the effectiveness of over-the-counter creams, ointments, and suppositories in alleviating symptoms such as pain, itching, and inflammation. Furthermore, they have assessed the outcomes of slightly invasive methods like sclerotherapy, rubber band ligation, or infrared coagulation, that seek to reduce or eliminate hemorrhoidal tissue. In conclusion, clinical studies on hemorrhoids have deepened our understanding of this common medical condition and guided the development of various treatment modalities. They continue to inform medical practice by highlighting effective interventions and preventive measures, ultimately improving the quality of life for individuals affected by hemorrhoids. Various clinical studies are depicted in **Table 4**.

Table 4: Clinical data.

ID	Sponsor	Title	Study	Outcomes	Diseases	Status	Phase	References
NCT01961739	University Hospital Dubrava	For the treatment of symptomatic hemorrhoids, apply 2% lidocaine topically.	N-138, Randomized, Quadruple	The topical formulation of the 2% lidocaine shows a therapeutic effect on the treatment of hemorrhoids with improved symptoms of bleeding and prolapse.	Hemorrhoids	Unknown	Phase 2/3	[139]
NCT05788497	Faes Farma, S.A.	Patients With Uncomplicated Haemorrhoids: Benefit and Risk of Hemorrane Plus Versus edsmorrane and Versus Blank	N-195, Randomized, Quadruple	Hemorrane Plus with Hemorrane shows a significant effect on the patient who suffers from uncomplicated hemorrhoids diseases as compared to Placebo.	Hemorrhoids without complication	Not yet requiring	Phase 3	[140]
NCT05348200	Citius Pharmaceuticals, Inc.	CITI-002 in Adult Individuals with High-Grade Haemorrhoid	N-300, Randomized, Triple	After applying the CITI-002 drug to the patient in 5 different groups	Hemorrhoids	Recruiting	Phase 2	[141]

		s: Safety and Success		which show significant efficacy and therapeutic effect safely on hemorrhoid diseases.				
NCT03740321	Eskisehir Osmangazi University	SRAE With Embospheres for Hemorrhoids.	N-50, Randomized, Triple	When security and relapse emerged in coil embolisation, tri-acryl collagen microspheres in sizes 500–700 and 700–900 were used.	Embolizatio, Hemorrhoids	Unknown	Not applicable	[142]
NCT05268575	Fangyu Wang	A Study on the Endoscopic Treatments of Hemorrhoids	N/285, Randomized, None	Endoscopic hemorrhoid treatment is a safe, effective and rapid rehabilitation treatment	Hemorrhoids	Not yet recruiting	Not Applicable	[143]
NCT01306877	Medtronic – MITG	Hemostasis Parallel Study of Surgical Staple for Haemorrhoid Treatment	N- 149, Randomized, Single	The Covidien EEATM Haemorrhoid and Progression Stapling Set has a positive effect on the treatment of haemorrhoids and is comparable to the competing device based on the primary outcome measure.	Piles	Completed	Not Applicable	[144]
NCT01041911	Panacea Biotec Limited	To find out how patients with first- and second-degree hemorrhoids react to three	N-102, Randomized, Double-blind	Patients got intrasphincteric injections of either 0–6 ml of saline or 0–6 ml of	Hemorrhoids	completed	Phase 2	[145]

		infusions of euphorbia prostrata.		a material containing 30 units of botulinum toxin; however, the outcomes were noticeably worse in the botulinum toxin group.				
NCT02654249	Hospital Universitari de Bellvitge	This procedure for Grade III and IV HAEMORRHOIDS: A Prospective Randomised Trial Between THD via Ligasure	N-80, Randomized, none (open-label)	To reduce post-operative discomfort and morbidity in these patients, the THD technique is conducted without any incisions or removal of hemorrhoid tissue.	Hemorrhoids	Completed	Not Applicable	[146]
NCT03729414	Societa Italiana di Chirurgia ColoRettale	Arterial Doppler-guided or non-Doppler-guided The Problem (HAMLeT) is The Ligature and Mucopexy for Third Degree Haemorrhoids.	N-100, Randomized, Single	To cure prolapsing grade III hemorrhoids, mucopexy care is good if anal shields are suture-fixed without the use of a Doppler tool.	Hemorrhoids Prolapse	Unknown	Not applicable	[147]
NCT03805087	Humanitas Clinical and Research Center	Stage II haemorrhoids are managed with trans arterial coil embolisation of the high rectal arteries.	N-50, None (Open Label)	The efficiency of Prevention of hemorrhoidal health with trans arterial coil embolisation of the superior rectal arteries has an enormous effect.	Hemorrhoids	unknown	Not Applicable	[148]

NCT00717782	University of Palermo	Pain Relief for Thrombosed External Haemorrhoids	N-30, Randomized, Single	Patients received an intrasphincteric injection of either 0–6 ml of saline or 0–6 ml of substance containing 30 units of botulinum toxin; however, the botulinum toxin group's prognosis was noticeably worse.	Thrombosed external hemorrhoids	Completed	Phase 4	[149]
NCT01413867	Societa Italiana di Chirurgia ColoRettale	EEA Versus PPH Stapler for III Degree Hemorrhoids: Safety and Short-Term Accuracy (EEA/PPH2011)	N-120, Randomized, None (Open Label)	A novel stapler device was created by changing the stapled sutures and expanding the area available for mucosal excision in the stapler casing.	III-degree hemorrhoids	Completed	Phase 4	[150]
NCT00487045	Stetrix, Inc.	Using the HEM-AVERT Perianal Stabiliser Instrument to Prevent and/or Treat External Blood clots and/or Thrombosed External Haemorrhoids	N-176, Randomized, None (Open Label)	Reduced frequency and severity of thrombosed external hemorrhoids (TEH), which appear after vaginal delivery, thanks to the HEM-AVERTTM device.	Piles	Complete	Stage 1	[151]
NCT02358181	University of Catanzaro	Hemorrhoids and Metalloproteinases, Observational	N-187, Randomized, None	The extra protein structures and tissue remodeling are impacted	Hemorrhoids	Not applicable	Phase 1	[152]

		Study (HeMe)		by the MMPs, and NGAL is involved in regulating MMP activity at different stages of hemorrhoids.				
NCT0522854	State Scientific Centre of Coloproctology, Russian Federation	Treatment of Hemorrhoid With 1940nm Laser Procedure	N-200, Randomized, Single	Laser therapy at 1940 nm or sclerotomy with aethoxysklerol is used to treat patients who suffer from the 2-3 grade of hemorrhoids.	Hemorrhoids	Not applicable	Recruiting	[153]
NCT05750563	Giellepi S.p.A	The food supplement Microsmin® Plus's safety and effectiveness were determined in a randomised, double-blind, placebo-controlled study.	N-80, Randomized, Double	A new vitamin called Microsmin ® Plus has a new diosmin formulation that is micronized and proven to be useful for curing haemorrhoids.	Hemorrhoid	Not yet recruiting	Not applicable	[154]
NCT01383577	Federal University of Amazonas	Comparison of Double Rubber Band Binding and Dual Rubber Band Ligation for the Treatment of Haemorrhoids	N-76, Randomized, Double	The treatment of hemorrhoids is done with the After three months, individual and triple rubber band ties created a visible effect.	2nd-degree hemorrhoids	unknown	Not applicable	[155]
NCT04119401	Russian Society of Colorectal Surgeons	Hemorrhoid Artery LigatioN Without	N-200, Randomized, Double	When curing grade II to III haemorrhoids, electronic evaluation	Hemorrhoids	Unknown	Not applicable	[156]

		Doppler Trial (HAND)		of the pulse of the hemorrhoidal veins obtained through suture closure and mucopexy has a similar therapeutic benefit as a doppler guide.				
NCT02061176	Holbaek Sygehus	THD Versus Open Haemorrhoidectomy	N-90, Randomized, None	The treatment of prolapsing haemorrhoids shows significant effects with Transanal Haemorrhoidal Dearterialization and Open Haemorrhoidectomy.	Hemorrhoid	Unknown	Not applicable	[157]
NCT05770141	Assiut University	Laser Hemorrhoidoplasty Versus Open Surgical Hemorrhoidectomy in Second and Third-Degree Piles	N-40, Randomized, Single	The pain, urinary retention or bleeding associated with the surgical hemorrhoidectomy is higher than the laser hemorroidoplasty in second and third-degree piles.	Hemorrhoid	Not yet recruiting	Not applicable	[158]
NCT01647763	Cantonal Hospital of St. Gallen	Hemorrhoidal Artery Ligation and Rectoanal Repair Versus Stapled Hemorrhoidopexy	N-84, Randomized, Single	To reduce the rate of recurrence without increasing postoperative discomfort, hemorrhoidal artery ligation and recto anal	Hemorrhoid	Recruiting	Not applicable	[159]

				repair are combined.				
NCT04667169	University of Malaya	Bleeding in Laser Haemorrhoidoplasty	N-76, Randomized, Double	It has not been formally examined how well adding LHP with HAL helps with reducing the incidence of postoperative bleeding.	Hemorrhoid	Completed	Not applicable	[160]
DNCT00853853	Steven Schechter, M.	EnSeal Device Versus Ferguson Technique in Hemorrhoidectomy	N-100, Randomized, None	The sutureless device is less painful for the patient and easier for the surgeon to perform.	Hemorrhoids	Unknown	Not applicable	[161]
NCT02353156	Seoul National University Hospital	Posthemorrhoidectomy Using a digital shower or sitz bath in pain management	N-76, Randomized, Single	Pain management and wound healing after hemorrhoidectomy warm sitz bath show better results than an electronic bidet.	Hemorrhoid	Unknown	Phase 2	[162]
NCT03729414	Societa Italiana di Chirurgia ColoRettale	Artery ligation and mucopexy for third-degree haemorrhoids: doppler-guided or non-doppler-guided? HAMLeT)	N-100, Randomized, Single	Simple muco pexy methods which fix the anal cushion with sutures instead of using a Doppler device have an important effect on how prolapsing grade III haemorrhoids are handled by DGHAL and mucopexy.	Hemorrhoid prolapse	unknown	Not applicable	[163]
NCT02689856	Citius Pharmace	The steroid hydro and	N-211, Rando	A minimum of 147	Hemorrhoid	Completed	Phase 2	[164]

	uticals, Inc.	Lidocaine, or Therapy of Grade I and II Hemorrhoids: Toxicity and Efficiency (Hydro/Lido)	mized, Quadruple	participants will be enrolled to receive topical cream formulations for the treatment of Grade I or II hemorrhoids that contain either cortisone acetate or lidocaine chloride, either alone or in combination				
NCT03917056	The Nanjing Medical University's Second Hospital	Internal Cap-assisted Endoscopic Sclerotherapy Hemorrhoids and Rectal Prolapse	N-1000, Randomized, Single	When healing internal hemorrhoids and rectal prolapse by CAES, all long and short pins yield better outcomes.	Internal hemorrhoid rectal prolapsed	Unknown	Not applicable	[165]
NCT05519189	Centre Hospitalier Departemental Vendee	Evaluation of the Impact of Perianal Infiltration During Radiofrequency Thermo destruction of Haemorrhoidal Disease (RAFAELOCAL)	N-134, Randomized, Single	Its low postoperative pain and promising results make it an intriguing choice for managing hemorrhoidal illness.	Hemorrhoids	Recruiting	Phase 4	[166]
NCT04229784	Ramsay Générale de Santé	The procedures Surgical Therapy of Homorrhoidal Disease Multicenter Future Evaluation (RF-GREP)	N-150, None (Open Label)	A new technique has been built for killing hemorrhoidal vascular tissue: ablation.	Hemorrhoid	Unknown	Not applicable	[167]
NCT01099605	United States Naval Medical	Following a hemorrhoidectomy, continuous	N-42, Randomized, Triple	The use of these pumps shows significant	Hemorrhoid	Unknown	Phase 4	[168]

	Center, Portsmouth	local anaesthetic infusion is essential for the best postoperative pain management.		benefits in pain relief.				
NCT03757728	Vilnius University	Hemorrhoidal Pedicle Ligation, Laser, vs. Open This procedure in a Randomised Trial	N-121, Randomized, Triple	The treatments for 2 to 3-degree hemorrhoids are done by open hemorrhoidectomy, intrahaemorrhoidal laser therapy, and hemorrhoidal pedicle ligation is useful.	Grade 2, grade 3 hemorrhoids.	Unknown	Not applicable	[169]
NCT04362384	Hospital General Universitario Elche	Applying Topical Vitamin E Ovules to Treat Haemorrhoids	N-120, Randomized, Single	After 14 days of treatment with prednisolone or corticoid ointment as compared to the vitamin E ovules the bleeding, pain and stinging are evaluated	Bleeding strain pain	unknown	Phase 3	[170]
NCT04251884	Francesco Mongelli	Pudendal Nerve Block for Hemorrhoidectomy	N-49, Randomized, double	Patients undergoing Milligan-Morgan hemorrhoidectomy will be randomized to receive or not the pudendal nerve block after the spinal anesthesia.	Hemorrhoids Post-operative Pain	Complete	Not applicable	[171]
NCT05807425	Universidade do Porto	Polidocanol Foam in Hemorrhoidal	N-40, None	It shows the more efficient and	Blood vessels	Recruiting	Phase 2,	[172]

		Disease in Patients with Liver Cirrhosis	(Open Label)	safe use of polidocanol foam in healing cirrhotic people who have grade I, II, and III internal hemorrhoidal disease.	Hepatic cirrhosis		Phase 3	
NCT01867944	University of California, Los Angeles	Perineal Self-Acupressure	N-100, Randomized, None (Open Label)	With a questionnaire, people may assess their quality of life as a result of their constipation-related health.	Chronic Constipation Constipco-mpation Hemorrhoids	Completed	Not applicable	[173]
NCT02579330	Daniel Steinemann, MD	Coloshield in Transanal and Anatomical Surgery: A Trial	N-22, Randomized, Single	The Boston Bowel Preparation Score is used to compare the gross infection of the rectum when using and without Coloshield.	Fistula-in-ano Rectal Polyp Rectal Adenoma Hemorrhoids Anal Fissure	Unknown	Not applicable	[174]
NCT03907306	State Scientific Centre of Coloproctology, Russian Federation	Use of Cool Alpha Pulsed (CAP) for Wound Healing Upon Open Hemorrhoidectomy	N-100, Randomized, None (Open Label)	When having an open technique, patients who have hemorrhoids in stages from three to four hemorrhoidectomy then the post-operation wound is healed with the treatment with cold argon plasma.	Cold Argon Plasma	Unknown	Not applicable	[175]

NCT04288349	Russian Society of Colorectal Surgeons	IntraopeRativE Use of periNeal Block for Hemorrhoidectomy (IREN)	N-100, Randomized, Double	The intraoperative use of perineal block with spinal anesthesia is used to lower the quantity of painkillers needed and the discomfort after surgery.	Hemorrhoidectomy Pudendal Nerve	Unknown	Not applicable	[176]
NCT00935948	Hospital de Clinicas de Porto Alegre	Toxicity and Durability the Imescard Compound Water Smartweed Ointment was thoroughly examined.	N-60, Randomized, Quadruple	In the treatment of adult hemorrhoidal disease, the medication Imescard, which contains water smartweed, adrenalin, and hamamelis ointment, has excellent results and is safe to use.	Hemorrhoids Disease	Unknown	Phase 3	[177]
NCT03264430	Esam Eldin Mohamed Abdalla	For apical surgery, low-dose bupivacaine is combined with ketamine in a saddle wedge.	N-60, Randomized	Ketamine in a targeted saddle block using intrathecal a drug called for perianal resection. The evaluation of the anaesthetic quality and analgesic efficacy has better effect on Perianal surgery.	Perianal Fistula Hemorrhoids	unknown	Early phase 1	[178]
NCT05782010	Developeration AB	SCI-Pex Study - Safety and Performance of	N-35, None (Open Label)	SCI-Pex results demonstrate a significant effect.	Hemorrhoids	Not yet recruiting	Not applicable	[179]

		PexyEazy®, a Device for Treatment of Hemorrhoids (SCI-Pex)						

7. Future Perspectives

The fact that medicine is still developing is encouraging for future haemorrhoid treatment options. Researchers might develop novel non-surgical techniques that are less invasive, more effective, and less likely to have negative side effects than present practices. These could be cutting-edge methods like cryotherapy, laser therapy, or innovative procedures. New medications or topical treatments may be developed to target specific haemorrhoid symptoms or treat their underlying causes. These could provide more effective relief from pain, itching, and inflammation. Medical technology improvements may lead to the creation of improved minimally invasive therapies for haemorrhoids. These procedures might lead to shorter recovery times, less discomfort, and better long-term results than more traditional surgical procedures. Strategies used in regenerative medicine, such as stem cell therapy or tissue engineering, may be able to mend damaged blood vessels and hasten the healing of hemorrhoidal tissues. The most important thing to keep in mind is that these possibilities are just those possibilities. Additional research and clinical trials would be needed to validate their efficacy and safety. It is always preferable to seek medical advice if you have haemorrhoid symptoms or any other concerns. They can point you in the direction of the most recent knowledge and the best treatments.

8. Conclusion

The anus and the rectum both have bulging, swelling veins that are known as haemorrhoids or piles. Haemorrhoids frequently exhibit other symptoms in addition to pain, itchiness, swelling, anal discomfort, and rectal bleeding. As technology has advanced throughout time, a variety of effective treatments for haemorrhoids have been developed. Because of our improved knowledge of the architecture and pathophysiology of the anal canal, we are now able to treat haemorrhoids more effectively. However, developing a more potent, efficient, and risky treatment regimen remains a difficult problem for medicinal chemists to treat and minimise the indications and symptoms of haemorrhoid disease. This article synthesizes existing literature and clinical data to provide a comprehensive overview of conventional medical interventions alongside emerging herbal approaches. By juxtaposing the clinical data associated with these strategies, it offers clinicians, researchers, and patients a comprehensive resource for making informed decisions regarding hemorrhoid management.

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Conflict of interest

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References

1. Xu L, Chen H, Gu Y. Stapled hemorrhoidectomy versus transanal hemorrhoidal dearterialization in the treatment of hemorrhoids: an updated meta-analysis. Surg Laparosc Endosc Percutan Tech, 2019;29(2):75-81.
2. Guindic LC. Treatment of uncomplicated hemorrhoids with a Hemor-Rite® cryotherapy device: a randomized, prospective, comparative study. J Pain Res, 2014;16:57-63.
3. Sandler RS, Peery AF. Rethinking what we know about hemorrhoids. Clin Gastroenterol Hepatol, 2019;17(1):8-15.

4. Shanmugam V, Hakeem A, Campbell KL, Rabindranath KS, Steele RJ, Thaha MA, et al. Rubber band ligation versus excisional haemorrhoidectomy for haemorrhoids. Cochrane Database Syst Rev, 2005;1:CD005034.
5. Aggrawal K, Satija N, Dasgupta G, Dasgupta P, Nain P, Sahu AR. Efficacy of a standardized herbal preparation (Roidosanal®) in the treatment of hemorrhoids: a randomized, controlled, open-label multicentre study. J Ayurveda Integr Med, 2014;5(2):117.
6. Lohsiriwat V. Treatment of hemorrhoids: a coloproctologist's view. World J Gastroenterol, 2015;21(31):9245-52.
7. Sun Z, Migaly J. Review of hemorrhoid disease: presentation and management. Clin Colon Rectal Surg, 2016;29(1):22-9.
8. Serra R, Gallelli L, Grande R, Amato B, De Caridi G, Sammarco G, et al. Hemorrhoids and matrix metalloproteinases: a multicenter study on the predictive role of biomarkers. Surgery, 2016;159(2):487-94.
9. Jacobs DO. Hemorrhoids: what are the options in 2018? Curr Opin Gastroenterol, 2018;34(1):46-9.
10. Guttenplan M. The evaluation and office management of hemorrhoids for the gastroenterologist. Curr Gastroenterol Rep, 2017;19(1):1-8.
11. Gallo G, Martellucci J, Sturiale AE, Clerico G, Milito G, Marino F, et al. Consensus statement of the Italian society of colorectal surgery (SICCR): management and treatment of hemorrhoidal disease. Tech Coloproctol, 2020;24:145-64.
12. Ray-Offor E, Amadi S. Hemorrhoidal disease: predilection sites, pattern of presentation, and treatment. Ann Afr Med, 2019;18(1):12-6.
13. Singal R, Gupta S, Dalal AK, Dalal U, Attri AK. An optimal painless treatment for early hemorrhoids; our experience in Government Medical College and Hospital. J Med Life, 2013;6(3):302.
14. Kandilarov N, Dimitrova V. Hemorrhoidal disease—contemporary aspects of the pathogenesis, clinical course, diagnosis and treatment. Khirurgiia (Sofiia), 2015;81(1):38-56.
15. Jacobs D. Clinical practice. Hemorrhoids. N Engl J Med, 2014;371(10):944-51.
16. Wu EB, Sung FC, Lin CL, Wu KL, Chen KB. Colorectal cancer risk in patients with hemorrhoids: a 10-year population-based retrospective cohort study. Int J Environ Res Public Health, 2021;18(16):8655.
17. Chivate SD, Killedar MM, Ladukar LD, Vardhani GS, Kavathe SK, Kanekar SR. Transanal suture mucopexy for hemorrhoids. Dis Colon Rectum, 2022;65(5):742-9.
18. Yang HK. Anal anatomy. Hemorrhoids, 2014:5-13.
19. Şişik A, Başak F, Hasbahçeci M, Acar A, Kılıç A, Özel Y, et al. Recovery from hemorrhoids and anal fissure without surgery. Turk J Gastroenterol, 2020;31(4):289.
20. Kirkil C, Aygen E, Dogru O, İlhan YS, Ayten R, Camci C, et al. The efficiency of various doses of topical isosorbide dinitrate in the treatment of chronic anal fissure and the long-term results: a prospective, randomized and controlled clinical trial. Turk J Gastroenterol, 2012;23(1):28-32.
21. Iida Y, Saito H, Takashima Y, Saitou K, Munemoto Y. Procedure for prolapse and hemorrhoids (PPH) with low rectal anastomosis using a PPH 03 stapler: low rate of recurrence and postoperative complications. Int J Colorectal Dis, 2017;32:1687-92.
22. Gachabayov M, Angelos G, George G, Kajmolli A, McGuirk M, Bergamaschi R. A multicenter prospective non-randomized study comparing Ferguson hemorrhoidectomy and transanal hemorrhoidal dearterialization for prolapsed, nonincarcerated, reducible hemorrhoids: a study protocol. Surg Technol Int, 2020;37:109-12.
23. Godeberge P, Sheikh P, Lohsiriwat V, Jalife A, Shelygin Y. Micronized purified flavonoid fraction in the treatment of hemorrhoidal disease. J Comp Eff Res, 2021;10(10):801-13.
24. Chang SS, Sung FC, Lin CL, Hu WS. Association between hemorrhoid and risk of coronary heart disease: a nationwide population-based cohort study. Medicine (Baltimore), 2017;96(31):e7662.
25. Gao H, Cheng X, Liu R, Wang X, Wang W, Gong F, Pan R, Hu J. Clinical study of herbal mixture "Diding Oral Medicine" as an alternative to preventative antibiotics in perioperative hemorrhoids: a CARE-compliant article. Medicine (Baltimore), 2021;100(18):e25661.
26. Elbetti C, Giani I, Novelli E, Fucini C, Martellucci J. The single pile classification: a new tool for the classification of haemorrhoidal disease and the comparison of treatment results. Updates Surg, 2015;67:421-6.
27. Cocorullo G, Tutino R, Falco N, Licari L, Orlando G, Fontana T, Raspanti C, Salamone G, Scerrino G, Gallo G, Trompetto M. The non-surgical management for hemorrhoidal disease: a systematic review. G Chir, 2017;38(1):5-14.

28. Salehi B, Mishra AP, Nigam M, Karazhan N, Shukla I, Kiełtyka-Dadasiewicz A, Sawicka B, Głowacka A, Abu-Darwish MS, Hussein Tarawneh A, Gadetskaya AV. Ficus plants: state of the art from a phytochemical, pharmacological, and toxicological perspective. Phytother Res, 2021;35(3):1187-217.
29. Jakubauskas M, Poskus T. Evaluation and management of hemorrhoids. Dis Colon Rectum, 2020;63(4):420-4.
30. Jin L, Yang H, Qin K, Li Y, Cui C, Wu R, Wang Z, Wu J. Efficacy of modified rubber band ligation in the treatment of grade III internal hemorrhoids. Ann Palliat Med, 2021;10(2):1191-7.
31. Mott T, Latimer K, Edwards C. Hemorrhoids: diagnosis and treatment options. Am Fam Physician, 2018;97(3):172-9.
32. Albuquerque A. Rubber band ligation of hemorrhoids: a guide for complications. World J Gastrointest Surg, 2016;8(9):614-20.
33. Hollingshead JR, Phillips RK. Haemorrhoids: modern diagnosis and treatment. Postgrad Med J, 2016;92(1083):4-8.
34. Stavrou G, Tzikos G, Malliou P, Panidis S, Kotzampassi K. Rubber band ligation of hemorrhoids: is the procedure effective for the immunocompromised, hemophiliacs and pregnant women? Ann Gastroenterol, 2022;35(5):509.
35. Ding Z, Xuan J, Tang G, Shi S, Liang X, An Q, Wang F. Rubber band ligation versus coagulation for the treatment of haemorrhoids: a meta-analysis of randomised controlled trials. Postgrad Med J, 2023;99(1175):946-53.
36. Kumar M, Roy V, Prasad S, Jaiswal P, Arun N, Gopal K, Roy VK. Outcomes of rubber band ligation in haemorrhoids among outdoor patients. Cureus, 2022;14(9):e29767.
37. Akinmoladun O, Oh W. Management of hemorrhoids and anal fissures. Surg Clin North Am, 2024;104(3):473-90.
38. Ricci MP, Matos D, Saad SS. Rubber band ligation and infrared photocoagulation for the outpatient treatment of hemorrhoidal disease. Acta Cir Bras, 2008;23:102-6.
39. Yu J, Zhong J, Peng T, Jin L, Shen L, Yang M. Modified rubber band ligation for treatment of grade II/III hemorrhoids: clinical efficacy and safety evaluation—a retrospective study. BMC Surg, 2022;22(1):238.
40. Bek B, Fayaz Y, Ahmadi SU, Bek R, Fahimi R. Demography of haemorrhoids in Jamhuriat Hospital, Kabul. Int J Gen Med, 2024;17:3193-20041.
41. Xie YT, Yuan Y, Zhou HM, Liu T, Wu LH, He XX. Long-term efficacy and safety of cap-assisted endoscopic sclerotherapy with long injection needle for internal hemorrhoids. World J Gastrointest Surg, 2022;14(10):1120.
42. Patel S, Shahzad G, Rizvon K, Subramani K, Viswanathan P, Mustacchia P. Rectal ulcers and massive bleeding after hemorrhoidal band ligation while on aspirin. World J Clin Cases, 2014;2(4):86.
43. Jin L, Qin K, Wu R, Yang H, Cui C, Wang Z, Wu J. Laser hemorrhoidoplasty vs. rubber band ligation: a randomized trial comparing 2 mini-invasive treatment for grade II hemorrhoids. BMC Surg, 2024;24(1):164.
44. Russo E, Festa BM, Costantino A, Bernardocchi A, Spriano G, De Virgilio A. Postoperative morbidity of different tonsillectomy techniques: a systematic review and network meta-analysis. Laryngoscope, 2024;134(4):1696-704.
45. Albazee E, Alenezi A, Alenezi M, Alabdulhadi R, Alhubail RJ, Al Sadder KA, AlDabbous F, Almutairi AN, Almutairi SN, Almutairi AN, Alenezi MS. Efficacy of Harmonic Scalpel versus bipolar diathermy in hemorrhoidectomy: a systematic review and meta-analysis of nine randomized controlled trials. Cureus, 2023;15(2):e34734.
46. Aibuedefe B, Kling SM, Philp MM, Ross HM, Poggio JL. An update on surgical treatment of hemorrhoidal disease: a systematic review and meta-analysis. Int J Colorectal Dis, 2021;36(9):2041-9.
47. Tsunoda A, Sada H, Sugimoto T, Kano N, Kawana M, Sasaki T, Hashimoto H. Randomized controlled trial of bipolar diathermy vs ultrasonic scalpel for closed hemorrhoidectomy. World J Gastrointest Surg, 2011;3(10):147.
48. Lohsiriwat V. Hemorrhoids: from basic pathophysiology to clinical management. World J Gastroenterol, 2012;18(17):2009-17.
49. Ng KS, Holzgang M, Young C. Still a case of “no pain, no gain”? An updated and critical review of the pathogenesis, diagnosis, and management options for hemorrhoids in 2020. Ann Coloproctol, 2020;36(3):133-47.
50. Milito G, Lisi G, Aronadio E, Campanelli M, Venditti D, Grande S, Grande M. May radiofrequency be the best choice for III-IV degree hemorrhoids? Minerva Gastroenterol Dietol, 2016;63(1):38-43.

51. Zufry H, Hariyanto TI. Comparative efficacy and safety of radiofrequency ablation and microwave ablation in the treatment of benign thyroid nodules: a systematic review and meta-analysis. Korean J Radiol, 2024;25(3):301-13.
52. Mishra S, Sahoo AK, Elamurugan TP, Jagdish S. Polidocanol versus phenol in oil injection sclerotherapy in treatment of internal hemorrhoids: a randomized controlled trial. Turk J Gastroenterol, 2020;31(5):378.
53. Van Tol RR, Kleijnen J, Watson AJ, Jongen J, Altomare DF, Qvist N, Higuero T, Muris JW, Breukink SO, Henquet CJ. European Society of ColoProctology: guideline for haemorrhoidal disease. Colorectal Dis, 2020;22(6):650-62.
54. Yano T, Yano K. Comparison of injection sclerotherapy between 5% phenol in almond oil and aluminum potassium sulfate and tannic acid for grade 3 hemorrhoids. Ann Coloproctol, 2015;31(3):103.
55. Gallo G, Laforgia R, Goglia M, Lobascio P. Sclerotherapy with 3% polidocanol foam for the treatment of mucocutaneous bridges and/or residual piles after open excisional hemorrhoidectomy. Updates Surg, 2024;76(5):2087-90.
56. He A, Chen M. Sclerotherapy in hemorrhoids. Indian J Surg, 2023;85(2):228-32.
57. Zhang T, Xu LJ, Xiang J, He Z, Peng ZY, Huang GM, Ji GZ, Zhang FM. Cap-assisted endoscopic sclerotherapy for hemorrhoids: methods, feasibility and efficacy. World J Gastrointest Endosc, 2015;7(19):1334-40.
58. Zhang T, Long C, Cui B, He Z, Peng Z, Huang G, Zhang F. Cap-assisted endoscopic sclerotherapy for hemorrhoids: a prospective study (with video). Chin J Dig Endosc, 2017;7(19):709-712.
59. Zhang FM, Wu KC, Li JN, Wang X, He XX, Wan R, Chen SY. Rationale, new anus positioning methods, and updated protocols: expert recommendations on cap-assisted endoscopic sclerotherapy for hemorrhoids from China Gut Conference. Chin Med J (Engl), 2021;134(22):2675-7.
60. Yoshikawa K, Kawashima R, Hirose Y, Shibata K, Akasu T, Hagiwara N, Yokota T, Imai N, Iwaku A, Kobayashi G, Kobayashi H. Liver injury after aluminum potassium sulfate and tannic acid treatment of hemorrhoids. World J Gastroenterol, 2017;23(27):5034.
61. Siatecka H, Al-Awami S, Siddiqi A, Diwan AH. A rare case of varicella zoster infection in hemorrhoids in a patient with inflammatory bowel disease. Am J Dermatopathol, 2024;46(3):159–161.
62. Morsi S, Linares Bolsegui M, Kobeissi H, Ghozy S, Kallmes DF, Kelley SR, et al. Common design and data elements on rectal artery embolization for treatment of symptomatic internal hemorrhoidal disease: an interactive systematic review of clinical trials. CVIR Endovasc, 2024;7(1):45.
63. Gupta N, Katoch A, Lal P, Hadke NS. Rectourethral fistula after injection sclerotherapy for haemorrhoids: a rare complication. Colorectal Dis, 2011;13(1):105–107.
64. Tanwar R, Singh SK, Pawar DS. Rectourethral fistula: a rare complication of injection sclerotherapy. Urol Ann, 2014;6(3):261–263.
65. Lobascio P, Laforgia R, Novelli E, Perrone F, Di Salvo M, Pezzolla A, et al. Short-term results of sclerotherapy with 3% polidocanol foam for symptomatic second- and third-degree hemorrhoidal disease. J Invest Surg, 2021;34(10):1059–1065.
66. Salgueiro P, Garrido M, Santos RG, Pedroto I, Castro-Poças FM. Polidocanol foam sclerotherapy versus rubber band ligation in hemorrhoidal disease grades I/II/III: randomized trial. Dis Colon Rectum, 2022;65(7):e718–e727.
67. Salgueiro P, Rei A, Garrido M, Rosa B, Oliveira AM, Pereira-Guedes T, et al. Polidocanol foam sclerotherapy in the treatment of hemorrhoidal disease in patients with bleeding disorders: a multicenter, prospective, cohort study. Tech Coloproctol, 2022;26(8):615–625.
68. Bi D, Alghamdi S, Gutierrez OI. Cryotherapy for the treatment of benign refractory rectal bleeding. Endoscopy, 2023;55(S 01):E368–E369.
69. Cristea C, Lewis CR. Hemorrhoidectomy. 2024 Feb 24. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025.
70. Siddiqui UD, Barth BA, Banerjee S, Bhat YM, Chauhan SS, Gottlieb KT, et al. Devices for the endoscopic treatment of hemorrhoids. Gastrointest Endosc, 2014;79(1):8–14.
71. Gupta PJ. Infrared coagulation versus rubber band ligation in early stage hemorrhoids. Braz J Med Biol Res, 2003;36:1433–1439.
72. Sudarmi K, Dudhamal TS. Comparative clinical study of Apamarga Kshara application, infrared coagulation and Arshohara Vati in the management of Arsha (1st and 2nd degree hemorrhoids). AYU, 2017;38(3–4):122–126.
73. Aronniemi J, Castren E, Lappalainen K, Vuola P, Salminen P, Pitkäranta A, et al. Sclerotherapy complications of peripheral venous malformations. Phlebology, 2016;31(10):712–722.

74. McLemore EC, Rai R, Siddiqui J, Patrick Basu P, Tabbaa M, Epstein MS. Novel endoscopic delivery modality of infrared coagulation therapy for internal hemorrhoids. Surg Endosc, 2012;26:3082–3087.
75. Devi V, Deswal G, Dass R, Chopra B, Kriplani P, Grewal AS, et al. Hemorrhoid disease: a review on treatment, clinical research and patent data. Infect Disord Drug Targets, 2023;23(6):15–35.
76. Kicel A. An overview of the genus Cotoneaster (Rosaceae): phytochemistry, biological activity, and toxicology. Antioxidants, 2020;9(10):1002.
77. Soundararajan P, Won SY, Kim JS. Insight on Rosaceae family with genome sequencing and functional genomics perspective. Biomed Res Int, 2019;2019:1–17.
78. Hennia A, Miguel MG, Nemmiche S. Antioxidant activity of Myrtus communis L. and Myrtus nivellei Batt. & Trab. extracts: a brief review. Medicines, 2018;5(3):89.
79. Wolde B, Abay SM, Nigussie D, Legesse B, Makonnen E, Mengie Ayele T. Evaluation of wound healing and antibacterial activities of solvent fractions of 80% methanol leaf extract of Brucea antidysenterica JF Mill (Simaroubaceae). Infect Drug Resist, 2022;15:1517–1531.
80. Eshwarappa RS, Ramachandra YL, Subaramaihha SR, Subbaiah SG, Austin RS, Dhananjaya BL. Anti-lipoxygenase activity of leaf gall extracts of Terminalia chebula (Gaertn.) Retz. (Combretaceae). Pharmacogn Res, 2016;8(1):78–81.
81. Saini V, Deswal G, Dhingra AK, Singh J, Kumar J, Saini A. Exploring pharmacological mechanisms, clinical trials and patent landscapes of berberine: a review. Nat Prod J, 2026;16(1):e22103155324599.
82. Li W, Zhang X, Chen R, Li Y, Miao J, Liu G, Lan Y, Chen Y, Cao Y. HPLC fingerprint analysis of Phyllanthus emblica ethanol extract and their antioxidant and anti-inflammatory properties. J Ethnopharmacol, 2020;254:112740.
83. Dhananjaya BL, Shivalingaiah S. The anti-inflammatory activity of standard aqueous stem bark extract of Mangifera indica L. as evident in inhibition of Group IA sPLA$_2$. An Acad Bras Cienc, 2016;88:197-209.
84. Aumeeruddy MZ, Zengin G, Mahomoodally MF. A review of the traditional and modern uses of Salvadora persica L. (Miswak): toothbrush tree of Prophet Muhammad. J Ethnopharmacol, 2018;213:409-44.
85. Hashempur MH, Khademi F, Rahmanifard M, Zarshenas MM. An evidence-based study on medicinal plants for hemorrhoids in Medieval Persia. J Evid Based Complementary Altern Med, 2017;22(4):969-81.
86. Niroumand MC, Heydarpour F, Farzaei MH. Pharmacological and therapeutic effects of Vitex agnus-castus L.: a review. Pharmacogn Rev, 2018;12(23):103-114.
87. Amer RI, El-Osaily GH, Bakr RO, El Dine RS, Fayez AM. Characterization and pharmacological evaluation of anti-cellulite herbal product(s) encapsulated in 3D-fabricated polymeric microneedles. Sci Rep, 2020;10(1):6316.
88. Miraj S, Alesaeidi S. A systematic review study of therapeutic effects of Matricaria recutita chamomile (chamomile). Electron Physician, 2016;8(9):3024.
89. Umamageswari MS, Maniyar YA. Evaluation of anti-inflammatory activity of aqueous extract of leaves of Solanum melongena Linn. in experimental animals. J Clin Diagn Res, 2015;9(1):FF01.
90. Liu F, Cui X, Duan Y, Guo S, Liu J, Ying X. A new alkaloid from Portulaca oleracea L. and its anti-inflammatory activity. Nat Prod Res, 2021;36(18):4703-7.
91. Tadesse A, Kagnew B, Kebede F, Kebede M. Ethnobotanical study of medicinal plants used to treat human ailment in Guduru District of Oromia Regional State, Ethiopia. J Pharmacogn Phytother, 2018;10(3):64-75.
92. Jima TT, Megersa M. Ethnobotanical study of medicinal plants used to treat human diseases in Berbere District, Bale Zone of Oromia Regional State, South East Ethiopia. Evid Based Complement Alternat Med, 2018;2018:1-16.
93. Tomovic MT, Cupara SM, Popovic-Milenkovic MT, Ljujic BT, Kostic MJ, Jankovic SM. Antioxidant and anti-inflammatory activity of Potentilla reptans L. Acta Pol Pharm, 2015;72(1):137-45.
94. Kashkooe A, Sardari FA, Mehrabadi MM, Zarshenas MM. A review of pharmacological properties and toxicological effects of Adiantum capillus-veneris L. Curr Drug Discov Technol, 2021;18(2):186-93.
95. Marques I, Fernandes I, Paulo OS, Batista D, Lidon FC, Rodrigues AP, Partelli FL, DaMatta FM, Ribeiro-Barros AI, Ramalho JC. Transcriptomic analyses reveal that Coffea arabica and Coffea canephora have more complex responses under combined heat and drought than under individual stressors. Int J Mol Sci, 2024;25(14):7995.
96. Koch W, Zagórska J, Marzec Z, Kukula-Koch W. Applications of tea (Camellia sinensis) and its active constituents in cosmetics. Molecules, 2019;24(23):4277.

97. Wuletaw D. Ethnobotanical study of medicinal plants used to treat human and livestock aliments in Simada District, South Gondar Zone, Ethiopia [dissertation].
98. Zhang Y, Pan X, Ran S, Wang K. Purification, structural elucidation and anti-inflammatory activity in vitro of polysaccharides from Smilax china L. Int J Biol Macromol, 2019;139:233-43.
99. Mesfin F, Seta T, Assefa A. An ethnobotanical study of medicinal plants in Amaro Woreda, Ethiopia. Ethnobot Res Appl, 2014;12:341-54.
100. Ielciu I, Frédérich M, Hanganu D, Angenot L, Olah NK, Ledoux A, Crișan G, Păltinean R. Flavonoid analysis and antioxidant activities of the Bryonia alba L. aerial parts. Antioxidants, 2019;8(4):108.
101. Hmidani A, Bourkhis B, Khouya T, Ramchoun M, Filali-Zegzouti Y, Alem C. Phenolic profile and anti-inflammatory activity of four Moroccan date (Phoenix dactylifera L.) seed varieties. Heliyon, 2020;6(2):e03436.
102. Chakou FZ, Boual Z, Hadj MD, Belkhalfa H, Bachari K, El Alaoui-Talibi Z, El Modafar C, Hadjkacem F, Fendri I, Abdelkafi S, Traïkia M. Pharmacological investigations in traditional utilization of Alhagi maurorum Medik. in Saharan Algeria: In vitro study of anti-inflammatory and antihyperglycemic activities of water-soluble polysaccharides extracted from the seeds. Plants (Basel), 2021;10(12):2658.
103. Marashdah MS, Farraj AI. Pharmacological activity of 2% aqueous acetic acid extract of Alhagi maurorum roots. J Saudi Chem Soc, 2010;14(3):247-50.
104. Zhu LH, Bao TH, Deng Y, Li H, Chen LX. Constituents from Apium graveolens and their anti-inflammatory effects. J Asian Nat Prod Res, 2017;19(11):1079-86.
105. Alqahtani FY, Aleanizy FS, Mahmoud AZ, Farshori NN, Alfaraj R, Al-Sheddi ES, Alsarra IA. Chemical composition and antimicrobial, antioxidant, and anti-inflammatory activities of Lepidium sativum seed oil. Saudi J Biol Sci, 2019;26(5):1089-92.
106. Zhang L, Li D, Yu S. Pharmacological effects of harmine and its derivatives: a review. Arch Pharm Res, 2020;43:1259-75.
107. Galeotti N. Hypericum perforatum (St John's wort) beyond depression: A therapeutic perspective for pain conditions. J Ethnopharmacol, 2017;200:136-46.
108. Schepetkin IA, Özek G, Özek T, Kirpotina LN, Khlebnikov AI, Quinn MT. Chemical composition and immunomodulatory activity of Hypericum perforatum essential oils. Biomolecules, 2020;10(6):916.
109. Yousefsani BS, Boozari M, Shirani K, Jamshidi A, Dadmehr M. A review on phytochemical and therapeutic potential of Iris germanica. J Pharm Pharmacol, 2021;73(5):611-25.
110. Shivalingu BR, Vivek HK, Priya BS, Soujanya KN, Swamy SN. Purification and characterization of novel fibrin(ogen)olytic protease from Curcuma aromatica Salisb.: role in hemostasis. Phytomedicine, 2016;23(13):1691-8.
111. Houston DM, Bugert J, Denyer SP, Heard CM. Anti-inflammatory activity of Punica granatum L. (Pomegranate) rind extracts applied topically to ex vivo skin. Eur J Pharm Biopharm, 2017;112:30-7.
112. Fizeșan I, Rusu ME, Georgiu C, Pop A, Ștefan MG, Muntean DM, Mirel S, Vostinaru O, Kiss B, Popa DS. Antitussive, antioxidant, and anti-inflammatory effects of a walnut (Juglans regia L.) septum extract rich in bioactive compounds. Antioxidants (Basel), 2021;10(1):119.
113. Rauf A, Imran M, Butt MS, Nadeem M, Peters DG, Mubarak MS. Resveratrol as an anti-cancer agent: a review. Crit Rev Food Sci Nutr, 2018;58(9):1428-47.
114. Morikawa T, Matsuda H, Yoshikawa M. A review of anti-inflammatory terpenoids from the incense gum resins frankincense and myrrh. J Oleo Sci, 2017;66(8):805-14.
115. Sina B, Degu HD. Knowledge and use of wild edible plants in the Hula District of the Sidama Zone. Int J Bioresour Stress Manag, 2015;6(3):352-65.
116. Nallal VU, Prabha K, VethaPotheher I, Ravindran B, Baazeem A, Chang SW, Otunola GA, Razia M. Sunlight-driven rapid and facile synthesis of silver nanoparticles using Allium ampeloprasum extract with enhanced antioxidant and antifungal activity. Saudi J Biol Sci, 2021;28(7):3660-8.
117. Kumar S, Saharan R, Saini V, Saini A. Gallic acid: a wonderful remedy in medicinal field.
118. Zubair M, Widén C, Renvert S, Rumpunen K. Water and ethanol extracts of Plantago major leaves show anti-inflammatory activity on oral epithelial cells. J Tradit Complement Med, 2019;9(3):169-71.
119. Huang XY, Shao ZX, An LJ, Xue JJ, Li DH, Li ZL, Hua HM. New lignanamides and alkaloids from Chelidonium majus and their anti-inflammation activity. Fitoterapia, 2019;139:104359.
120. Chhikara N, Kour R, Jaglan S, Gupta P, Gat Y, Panghal A. Citrus medica: nutritional, phytochemical composition and health benefits—a review. Food Funct, 2018;9(4):1978-92.
121. Henriques Monteiro EM, Chibli LA, Yamamoto CH, Santana Pereira MC, Pinto Vilela FM, Rodarte MP, Oliveira Pinto MA, Henriques do Amaral MD, Silva Silvério M, Matos Araújo AL, Andre de Araujo AD.

Antinociceptive and anti-inflammatory activities of the sesame oil and sesamin. Nutrients, 2014;6(5):1931-44.
122. Bałan BJ, Niemcewicz M, Kocik J, Jung L, Skopińska-Różewska E, Skopiński P. Oral administration of Aloe vera gel, anti-microbial and anti-inflammatory herbal remedy, stimulates cell-mediated immunity and antibody production in a mouse model. Cent Eur J Immunol, 2014;39(2):125-9.
123. Razia S, Park H, Shin E, Shim KS, Cho E, Kang MC, Kim SY. Synergistic effect of Aloe vera flower and Aloe gel on cutaneous wound healing targeting MFAP4 and its associated signaling pathway: In-vitro study. J Ethnopharmacol, 2022;290:115096.
124. Ghasemi M, Golmakani E, Kamali H, Akaberi A, Bibak B. Study of methanol extract of Cyprus Longus on visceral pain by writhing test in mice. J North Khorasan Univ Med Sci, 2014;6(1):133-8.
125. Elsewedy HS, Younis NS, Shehata TM, Mohamed ME, Soliman WE. Enhancement of anti-inflammatory activity of optimized niosomal colchicine loaded into jojoba oil-based emulgel using response surface methodology. Gels, 2021;8(1):16.
126. Amsalu N, Bezie Y, Fentahun M, Alemayehu A, Amsalu G. Use and conservation of medicinal plants by indigenous people of Gozamin Wereda, East Gojjam Zone of Amhara region, Ethiopia: an ethnobotanical approach. Evid Based Complement Alternat Med, 2018;2018:2973513.
127. Mazengia E, Beyene T, Tsegay B. Diversity of medicinal plants used to treat human ailments in rural Bahir Dar, Ethiopia. Asian J Forestry, 2019;3(2):77-87.
128. Dalle M. Ethnobotanical study of medicinal plants in Nagelle Arsi district, West Arsi zone of Oromia, Ethiopia. J Nat Res, 2019;9:58-70.
129. Birhanu A, Ayalew S. Indigenous knowledge on medicinal plants used in and around Robe Town, Bale Zone, Oromia region, Southeast Ethiopia. J Med Plants Res, 2018;12(16):194-202.
130. Kassa Z, Asfaw Z, Demissew S. Ethnobotanical study of medicinal plants used by the local people in Tulu Korma and its surrounding areas of Ejere district, Western Shewa Zone of Oromia regional state, Ethiopia. J Med Plants Stud, 2016;4:24-47.
131. Tripathi RK, Bolegave SS, Shetty PA, Uchil DA, Rege NN, Chawda MB, Rege SA. Efficacy and safety of a polyherbal formulation in hemorrhoids. J Ayurveda Integr Med, 2015;6(4):225-32.
132. Kestřánek J. Hemorrhoid management in women: the role of tribenoside+ lidocaine. Drugs Context, 2019;8:212594.
133. Bartels DA, Johnson R, Bayor MT, Ainooson GK, Ossei PP, Etuaful RK, Buamah R. Formulation of suppositories of alum produced from bauxite waste in Ghana for the treatment of hemorrhoid. ScientificWorldJournal, 2021;2021:6642342.
134. Porwal A, Kundu GC, Bhagwat G, Butti R. Polyherbal formulation Anoac-H suppresses the expression of RANTES and VEGF for the management of bleeding hemorrhoids and fistula. Mol Med Rep, 2021;24(4):722.
135. Pietroletti R, Giuliani A, Buonanno A, Mattei A, Fiasca F, Gallo G. Efficacy and tolerability of a new formulation in rectal ointment based on Zn-L-Carnosine (Proctilor®) in the treatment of haemorrhoidal disease. Front Surg, 2022;9:818887.
136. Mehdi Z, Fatemeh P, Roja R, Fatemeh H, Reza H. Efficacy and safety of Hemoheal cream in patients with hemorrhoids: a randomized double-blind placebo-controlled clinical trial. J Tradit Chin Med, 2021;41(2):301-7.
137. Lin S, Zang M. Effectiveness of Mayinglong Musk Hemorrhoid Ointment on wound healing and complications after internal hemorrhoid ligation and external hemorrhoidectomy. Evid Based Complement Alternat Med, 2022;2022:1-7.
138. Huang YJ, Chen CY, Chen RJ, Kang YN, Wei PL. Topical diltiazem ointment in post-hemorrhoidectomy pain relief: A meta-analysis of randomized controlled trials. Asian J Surg, 2018;41(5):431-7.
139. University Hospital Dubrava. Topical 2% Lidocaine for the treatment of symptomatic hemorrhoids [Internet]. Bethesda (MD): ClinicalTrials.gov; 2013 Oct 10 [cited 2023 Apr 11]. Available from: https://clinicaltrials.gov/ct2/show/NCT01961739.
140. Faes Farma, S.A. Efficacy and safety of Hemorrane Plus versus Hemmerone and versus placebo in patients with uncomplicated haemorrhoids [Internet]. Bethesda (MD): ClinicalTrials.gov; 2023 Mar 27 [cited 2023 Apr 11]. Available from: https://clinicaltrials.gov/ct2/show/NCT05788497
141. Citius Pharmaceutical, Inc. Safety and efficacy of CITI-002 in adult patients with moderate grade hemorrhoids. ClinicalTrials.gov [Internet]. 2022 [cited 2023 Apr 11]. Available from: https://clinicaltrials.gov/ct2/show/NCT05348200?Cond=hemorrhoids&draw=2&rank=8
142. Eskisehir Osmangazi University. SRAE with Embospheres for hemorrhoids. ClinicalTrials.gov [Internet]. 2018 [cited 2023 Apr 11]. Available from:

https://clinicaltrials.gov/ct2/show/NCT03740321?cond=Embolization%20hemorrhoids&draw=2&rank=44
143. Wang F. A study on the endoscopic treatments of hemorrhoids. ClinicalTrials.gov [Internet]. 2022 [cited 2023 Apr 11]. Available from: https://clinicaltrials.gov/ct2/show/NCT05268575?Cond=hemorrhoids&draw=2&rank=7
144. Medtronic-MITG. Comparison study of surgical staplers for the treatment of hemorrhoids (HEMOSTASIS). ClinicalTrials.gov [Internet]. 2011 [cited 2023 Apr 11]. Available from: https://clinicaltrials.gov/ct2/show/NCT01306877?Cond=hemorrhoids&draw=2&rank=9
145. Panacea Biotec Ltd. To evaluate the dose response of 3 doses of Euphorbia prostrata in patients with first and second degree hemorrhoids. ClinicalTrials.gov [Internet]. 2009 [cited 2023 Apr 11]. Available from: https://clinicaltrials.gov/ct2/show/NCT01041911?Cond=hemorrhoids&draw=2&rank=11
146. Hospital Universitari de Bellvitge. Prospective randomized trial about THD versus Ligasure hemorrhoidectomy for grade III and IV hemorrhoids (THD-LIGA). ClinicalTrials.gov [Internet]. 2016 [cited 2023 Apr 11]. Available from: https://clinicaltrials.gov/ct2/show/NCT02654249?cond=hemorrhoid&draw=2&rank=13
147. Societa Italiana di Chirurgia Colo Rettale. Doppler-guided arterial ligation and mucopexy for third degree hemorrhoids: That is the question (HAMLet). ClinicalTrials.gov [Internet]. 2018 [cited 2023 Apr 11]. Available from: https://clinicaltrials.gov/ct2/show/NCT03729414?cond=hemorrhoids&draw=2&rank=20
148. Humanitas Clinical and Research Center. Transarterial coil embolization of superior rectal arteries for treatment of stage II hemorrhoids. ClinicalTrials.gov [Internet]. 2019 [cited 2023 Apr 12]. Available from: https://clinicaltrials.gov/ct2/show/NCT03805087?Cond=hemorrhoids&draw=2&rank=34
149. University of Palermo. Pain relief for thrombosed external hemorrhoids. ClinicalTrials.gov [Internet]. 2008 [cited 2023 Apr 12]. Available from: https://clinicaltrials.gov/ct2/show/NCT00717782?Cond=Thrombosed%20External%20Hemorrhoid&draw=2&rank=47
150. Societa Italiana di Chirurgia Colo Rettale. Safety and short-term effectiveness of EEA versus PPH stapler for III degree hemorrhoids (EEA/PPH2011). ClinicalTrials.gov [Internet]. 2011 [cited 2023 Apr 12]. Available from: https://clinicaltrials.gov/ct2/show/NCT01413867?Cond=III%20degree%20hemorrhoids&draw=2&rank=39
151. Stetrix, Inc. Prevention and/or reduction of hemorrhoids and/or thrombosed external hemorrhoids using the HEM-AVERT perianal stabilizer instrument (HEM-AVERT). ClinicalTrials.gov [Internet]. 2007 [cited 2023 Apr 12]. Available from: https://clinicaltrials.gov/ct2/show/NCT00487095?cond=hemorrhoids&draw=2&rank=36
152. University of Catanzaro. Hemorrhoids and metalloproteinases, observational study (HeMe). ClinicalTrials.gov [Internet]. 2015 [cited 2023 Apr 12]. Available from: https://clinicaltrials.gov/ct2/show/NCT02358174?cond=Hemorrhoids&draw=2&rank=42
153. State Scientific Centre of Coloproctology, Russian Federation. Treatment of hemorrhoid with 1940nm laser procedure. ClinicalTrials.gov [Internet]. 2022 [cited 2023 Apr 12]. Available from: https://clinicaltrials.gov/ct2/show/NCT05228054?Cond=hemorrhoids&draw=2&rank=40
154. Giellepi S.p.A. Randomised, double-blind, placebo-controlled to assess the efficacy and safety of the food supplement Microsmin® Plus. ClinicalTrials.gov [Internet]. 2023 [cited 2023 Apr 12]. Available from: https://clinicaltrials.gov/ct2/show/NCT05750563?cond=hemerroids&draw=2&rank=37
155. Federal University of Amazonas. Comparison between single and triple rubber band ligation for the treatment of hemorrhoids. ClinicalTrials.gov [Internet]. 2011 [cited 2023 Apr 12]. Available from: https://clinicaltrials.gov/ct2/show/NCT01383577?Cond=II%20Degree%20hemerroids&draw=2&rank=43
156. Russian Society of Colorectal Surgeons. Hemorrhoid artery ligation without Doppler trial (HAND). ClinicalTrials.gov [Internet]. 2019 [cited 2023 Apr 13]. Available from: https://clinicaltrials.gov/ct2/show/NCT04119401?Cond=hemorrhoids&draw=2&rank=46
157. Holbaek Sygehus. THD versus open haemorrhoidectomy. ClinicalTrials.gov [Internet]. 2014 [cited 2023 Apr 13]. Available from: https://clinicaltrials.gov/ct2/show/NCT02061176?Cond=hemorrhoids&draw=2&rank=59
158. Assiut University. Laser hemorrhoidoplasty versus open surgical hemorrhoidectomy in second and third degree piles. ClinicalTrials.gov [Internet]. 2023 [cited 2023 Apr 13]. Available from: https://clinicaltrials.gov/ct2/show/NCT05770141?Cond=Hemorrhoids&draw=2&rank=60

159. Cantonal Hospital of St. Gallen. Hemorrhoidal artery ligation and rectoanal repair versus stapled hemorrhoidopexy. ClinicalTrials.gov [Internet]. 2012 [cited 2023 Apr 13]. Available from: https://clinicaltrials.gov/ct2/show/NCT01647763?cond=hemorrhoids&draw=2&rank=69
160. University of Malaya. Bleeding in laser haemorrhoidoplasty. ClinicalTrials.gov [Internet]. 2021 [cited 2023 Apr 13]. Available from: https://clinicaltrials.gov/ct2/show/NCT04667169?Cond=Hemorrhoids&draw=2&rank=71
161. Schechter S. EnSeal Device Versus Ferguson Technique in Hemorrhoidectomy. ClinicalTrials.gov [Internet]. 2009 [cited 2023 Apr 13]. Available from: https://clinicaltrials.gov/ct2/show/NCT00853853?cond=hemorrhoids&draw=2&rank=76
162. Seoul National University Hospital. Posthemorrhoidectomy Pain Management With Electronic Bidet or Sitz Bath. ClinicalTrials.gov [Internet]. 2014 [cited 2023 Apr 13]. Available from: https://clinicaltrials.gov/ct2/show/NCT02353156?cond=hemorrhoid&draw=2&rank=94
163. Società Italiana di Chirurgia ColoRettale. Doppler-guided or Non Doppler-guided Arterial Ligation and Mucopexy for Third Degree Hemorrhoids: That is the Question (HAMLeT). ClinicalTrials.gov [Internet]. 2018 [cited 2023 Apr 14]. Available from: https://clinicaltrials.gov/ct2/show/NCT03729414?cond=hemorrhoids%20prolapse&draw=2&rank=20
164. Citius Pharmaceuticals, Inc. Safety and Efficacy of Hydrocortisone and Lidocaine Treatment of Grade I and II Hemorrhoids (Hydro/Lido). ClinicalTrials.gov [Internet]. 2016 [cited 2023 Apr 14]. Available from: https://clinicaltrials.gov/ct2/show/NCT02689856?cond=hemorrhoids&draw=2&rank=23
165. The Second Hospital of Nanjing Medical University. Cap-assisted Endoscopic Sclerotherapy for Internal Hemorrhoids and Rectal Prolapse. ClinicalTrials.gov [Internet]. 2019 [cited 2023 Apr 14]. Available from: https://clinicaltrials.gov/ct2/show/NCT03917056?Cond=Internal%20Hemorrhoid%20rectal%20Prolapse&draw=2&rank=56
166. Centre Hospitalier Départemental Vendée. Evaluation of the Value of Perianal Infiltration During Thermodestruction of Haemorrhoidal Disease by Radiofrequency (RAFAELOCAL). ClinicalTrials.gov [Internet]. 2022 [cited 2023 Apr 14]. Available from: https://clinicaltrials.gov/ct2/show/NCT05519189?cond=hemorrhoids&draw=2&rank=80
167. Ramsay Générale de Santé. Multicentric Prospective Evaluation of Radiofrequency Surgical Treatment of Haemorrhoidal Disease (RF-GREP). ClinicalTrials.gov [Internet]. 2020 [cited 2023 Apr 14]. Available from: https://clinicaltrials.gov/ct2/show/NCT04229784?cond=hemorrhoids&draw=2&rank=108
168. United States Naval Medical Center, Portsmouth. Continuous Infusion of Local Anesthetic for Optimal Post Operative Pain Control Following Hemorrhoidectomy. ClinicalTrials.gov [Internet]. 2009 [cited 2023 Apr 14]. Available from: https://clinicaltrials.gov/ct2/show/NCT01099605?Cond=hemorrhoids&draw=2&rank=112
169. Vilnius University. Randomized Trial: Hemorrhoidal Pedicle Ligation vs Laser vs Open Hemorrhoidectomy. ClinicalTrials.gov [Internet]. 2018 [cited 2023 Apr 14]. Available from: https://clinicaltrials.gov/ct2/show/NCT03757728?cond=hemorrhoids%20II%2C%20III%20degree&draw=2&rank=113
170. Hospital General Universitario Elche. Topical Vitamin E Ovules for the Treatment of Hemorrhoids. ClinicalTrials.gov [Internet]. 2020 [cited 2023 Apr 14]. Available from: https://clinicaltrials.gov/ct2/show/NCT04362384?cond=hemorrhoid&draw=2&rank=117
171. Mongelli F. Pudendal Nerve Block for Hemorrhoidectomy. ClinicalTrials.gov [Internet]. 2020 [cited 2023 Apr 14]. Available from: https://clinicaltrials.gov/ct2/show/NCT04251884?Cond=hemorrhoids&draw=2&rank=122
172. Universidade do Porto. Polidocanol Foam in Hemorrhoidal Disease in Patients With Liver Cirrhosis. ClinicalTrials.gov [Internet]. 2023 [cited 2023 Apr 14]. Available from: https://clinicaltrials.gov/ct2/show/NCT05807425?Cond=Hemorrhoids%20Liver%20Cirrhosis&draw=2&rank=127
173. University of California, Los Angeles. Perineal Self-Acupressure. ClinicalTrials.gov [Internet]. 2013 [cited 2023 Apr 15]. Available from: https://clinicaltrials.gov/ct2/show/NCT01867944?Cond=hemorrhoids&draw=2&rank=134
174. Steinemann D. Trial on Use of Coloshield in Transanal and Anal Surgery. ClinicalTrials.gov [Internet]. 2015 [cited 2023 Apr 15]. Available from: https://clinicaltrials.gov/ct2/show/NCT02579330?Cond=Fistula-in-Ano-Rectal%20Polyp-Rectal%20Adenoma%20Hemorrhoids&draw=2&rank=150

175. State Scientific Centre of Coloproctology, Russian Federation. Cold Argon Plasma (CAP) Application in the Wound Treatment After Open Hemorrhoidectomy. ClinicalTrials.gov [Internet]. 2019 [cited 2023 Apr 15]. Available from: https://clinicaltrials.gov/ct2/show/NCT03907306?Cond=Cold%20Argon%20Plasma&draw=2&rank=157
176. Russian Society of Colorectal Surgeons. IntraopeRativE Use of periNeal Block for Hemorrhoidectomy (IREN). ClinicalTrials.gov [Internet]. 2020 [cited 2023 Apr 15]. Available from: https://clinicaltrials.gov/ct2/show/NCT04288349?Cond=HemorrhoidectomyPudendal%20Nerve&draw=2&rank=158
177. Hospital de Clínicas de Porto Alegre. Efficacy and Safety Evaluation of the Imescard Compound Water Smartweed Ointment. ClinicalTrials.gov [Internet]. 2009 [cited 2023 Apr 15]. Available from: https://clinicaltrials.gov/ct2/show/NCT00935948?Cond=hemorrhoidal%20disease&draw=2&rank=159
178. Abdalla EEM. Adding Ketamine to Low Dose Bupivacaine in Saddle Block for Perianal Surgery. ClinicalTrials.gov [Internet]. 2017 [cited 2023 Apr 15]. Available from: https://clinicaltrials.gov/ct2/show/NCT03264430?Cond=Perianal%20Fistula%20Hemorrhoids&draw=2&rank=118
179. Developeration AB. SCI-Pex Study - Safety and Performance of PexyEazy®, a Device for Treatment of Hemorrhoids (SCI-Pex). ClinicalTrials.gov [Internet]. 2023 [cited 2023 Apr 15]. Available from: https://clinicaltrials.gov/ct2/show/NCT05782010?cond=hemorrhoids&draw=2&rank=116

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