



# Current Updates on Human Hemorrhoid Disease and its Treatment Options

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## Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

## Article Information

DOI: <https://doi.org/10.56557/jodagh/2024/v17i29027>

## Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://prh.ikpress.org/review-history/12640>

Review Article

Received: 24/10/2024  
Accepted: 28/12/2024  
Published: 29/12/2024

## ABSTRACT

Human Hemorrhoids are a common anorectal disorder characterized by the symptomatic expansion and distal displacement of the natural anal cushions. This condition is a significant global health concern, affecting millions of people, particularly those over 50 years old. Hemorrhoids are linked to several factors, including obesity, sedentary lifestyles, pregnancy, low-fiber diets, and constipation. The disease manifests as abnormal vascular dilatation, connective tissue changes in the anal cushion, and symptoms like rectal bleeding, pain, and itching. Hemorrhoids are classified as internal or external, with internal hemorrhoids further graded by the severity of prolapse. Treatment options range from conservative methods to more invasive surgical interventions.

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Cite as: Mekonnen, Rihana, and Tegenu Gelana. 2024. "Current Updates on Human Hemorrhoid Disease and Its Treatment Options". *Journal of Disease and Global Health* 17 (2):21-34. <https://doi.org/10.56557/jodagh/2024/v17i29027>.

Conservative approaches, recommended for mild to moderate cases, focus on dietary and lifestyle changes, including increased fiber intake, hydration, and sitz baths. Topical agents and medicinal plants are also used to alleviate symptoms.

Minimally invasive procedures like rubber band ligation, sclerotherapy, and infrared coagulation are effective for more severe cases. Surgical options, such as stapled hemorrhoidopexy and hemorrhoidal artery ligation, are reserved for advanced cases or when conservative treatments fail. Postoperative care is crucial for managing complications like pain, bleeding, and urinary retention.

*Keywords: Hemorrhoidal disease; bleeding; medicinal plants; topical agent.*

## 1. INTRODUCTION

Hemorrhoidal diseases are relatively frequent anorectal disorders characterized by the symptomatic expansion and distal displacement of the natural anal cushions (Cletus et al., 2017). It is a significant medical and economic issue affecting millions globally. Hemorrhoid development has allegedly been associated with several causes, such as obesity, sedentary lifestyles, pregnancy, low-fiber diets, and constipation (Kibret et al., 2021). Hemorrhoidal disease is characterized by aberrant vascular channel dilatation and distortion, as well as damaging changes in the supportive connective tissue within the anal cushion (Pawar et al., 2023). After the healing of external hemorrhoids, Hemorrhoidal issues usually get better in a couple of days of persistent skin tags (Chukwuemeka et al., 2023).

At fifty years of age, one-quarter of the African population has been reported to have hemorrhoids, whereas 50 to 85% of the world's population has been reported to have hemorrhoids eventually in their life (Alege et al., 2022). With 3.3 million ambulatory-care visits, hemorrhoid illness is the fourth most prevalent gastrointestinal disorder in US outpatient clinics (Kabir et al., 2021). The global prevalence of hemorrhoids is greater (38.93%) in Australia than in Korea (14.4%) and Israel (16%). The percentage of Egyptian patients who have colonoscopies for hemorrhoids has increased to 18% (Abdelrazik et al., 2023). Internal hemorrhoids were the third most typical colonoscopic result at Ayder Referral Hospital (7.5%) (Kebede et al., 2017). A study was carried out and hemorrhoids were seen in 13.1% of adult patients who visited the surgical outpatient department of the University of Gondar Comprehensive Specialized Hospital (Kibret et al., 2021).

Hemorrhoids can be internal or external. Internal hemorrhoids form inside the rectum or anus.

External hemorrhoids form beyond the anus. External hemorrhoids are the most common and problematic type (Erbay and Sarı, 2018). Internal hemorrhoids are further classified in Goligher's categorization according to the prolapse severity. Hemorrhoids in Grade I are bleeding but not prolapsing; in Grade II, they prolapse upon straining but spontaneously reduce; in Grade III, they prolapse but require manual reduction; and in Grade IV, they irreducibly prolapse (Alamri et al., 2021). Hemorrhoids typically form as a result of an increase in pressure on the pelvic and rectal veins, which leads to aberrant vascular channel dilatation and distortion, causing blood to leak out around the perianal, anal veins, resulting in rectal bleeding, itching, soiling, and pain with enlarged veins around the anus and lower rectum that resemble varicose veins (Azeemuddin et al., 2014, Dhaswadikar et al., 2022, Pawar et al., 2023). Depending on the severity and degree of the symptoms, you can cure hemorrhoids with dietary and lifestyle changes, pharmaceutical treatment, and surgical treatment. Conservative treatment approaches are recommended to relieve symptoms and prevent progression to higher degrees and consequences (Getachew et al., 2022).

Thus, this review paper aims to overview the current updates on human hemorrhoid disease and its treatment options.

### 1.1 Etiology and Pathophysiology of Human Hemorrhoids

Understanding the underlying causes and pathophysiology of human hemorrhoids is crucial for effective management. This section discusses the various elements that lead to the genesis of human hemorrhoids, including straining during bowel movements, and genetic predisposition.

#### 1.1.1 Etiology

The exact cause of human hemorrhoids is not fully understood, but several factors are thought to play a role:

**Hormonal Changes:** Progesterone tends to impede gastrointestinal transit, weaken venous wall muscle, and reduce the contractility of circular and longitudinal smooth muscles. Constipation is a result of this inhibition, and constipation indirectly increases the risk of developing Hemorrhoidal disease (Marco and Tiso, 2021) According to certain research, aberrant estrogen expressions in hemorrhoid tissues are linked to disease progression.

**Aging:** getting older may make someone more prone to experience hemorrhoids. The tissues and muscles in the rectal cavity that hold the veins in place may weaken with aging.

**Constipation and straining:** Constipation and prolonged straining are commonly considered risk factors for hemorrhoids. The straining needed to remove a solid fecal bolus may raise intra-abdominal pressure, which in turn may enhance blood flow to the internal hemorrhoidal plexus. This, in turn, may compromise venous outflow, which may cause the hemorrhoidal plexus to dilate (Zagriadskii et al., 2018).

**Genetic predisposition:** Genetics can have an impact on the strength and integrity of the muscles and cartilage. These systems are more prone to deteriorate over time in some families. It may indicate a genetic predisposition to poorer connective tissue and colorectal muscles if there is Hemorrhoidal history in the family (Ali et al., 2017).

**Sedentary lifestyle:** is characterized by long periods of sitting or lying down. drivers as a group, endure more occupational stress and are more prone to illnesses than the general working population. The bane of lorry drivers is the tendency to acquire hemorrhoids due to extended sitting and exposure to prolonged heat (Farid et al., 2022).

**Pregnancy:** Due to increased intra-abdominal pressure that constricts the anal cushion during pregnancy, hemorrhoids are more likely to occur, however, the patient is still able to recover following birth. Consuming alcohol may cause damage to the liver, raise blood pressure, and dehydrate a person. All of these may make hemorrhoids more likely to occur (Hong et al., 2022). Hemorrhoids can occur more frequently in those who are obese. The pelvic area, especially the rectal veins, is subjected to increased pressure when an individual is overweight, which increases the susceptibility to swelling and

inflammation. poor anal hygiene doesn't use harsh toilet paper: Avoid rough or scented toilet paper; opt for soft, unscented options or wet wipes to avoid irritation. Among these, straining and chronic constipation, are considered primary contributors towards the formation of hemorrhoids.

## 2. PATHOPHYSIOLOGY

Regarding the pathophysiology of human hemorrhoids, four theories have been developed. For years, the hypothesis that varicose veins and portal hypertension within the anal canal cause hemorrhoids have been put out, however, it is no longer accepted. The second theory which is a widely recognized hypothesis, known as the cushion theory or sliding anal canal theory, suggests that the primary pathologic event is the aberrant slide of cushions through the anal canal (Margetis, 2019) The third theory puts forth that hemorrhoids can arise from a decrease in venous return from the anal canal's sinusoids to the superior and middle rectal veins during feces. According to the fourth theory, hemorrhoids are caused by blood stagnation in a dilated plexus. Hemorrhoids are thought to be caused by typically clogged venous pathways within lowered anal cushions (Fiðere et al., 2021).

### 2.1 Classification and Clinical Presentation of Human Hemorrhoids

#### 2.1.1 Classification

Human Hemorrhoids are classified into two main types based on their location relative to the dentate line, which is an anatomical demarcation in the anal canal (Gupta et al., 2021). Internal Hemorrhoids are normal components of human anatomy and they are high-specialized vascular cushions located in the sub-muscular space of the anal canal above the dentate line (Pata et al., 2020).

Internal hemorrhoids are further classified into four grades. First-degree hemorrhoids enter the anal canal lumen via protrusion; they do not prolapse.; second-degree hemorrhoids prolapse beyond the anal canal but spontaneously reduce; third-degree hemorrhoids prolapse more easily and protrude during feces or straining, remaining prolapsed until digitally restored within the anus.; and Hemorrhoids in the fourth degree are incurable and constantly prolapse. As a result, this categorization is a clinical classification with implications for subsequent care. Other

hemorrhoid classification systems have been proposed, but none are as extensively used as Goligher's (Ng, 2020). Goligher's was classified human hemorrhoid solely according to the prolapse severity. This classification does not specify the number of hemorrhoidal columns involved, their size, or whether they are isolated or circumferential. It does not take into account the quantity of blood loss caused by hemorrhoidal illness.

The "PNR-Bleed" classification system for hemorrhoids is a detailed approach used to evaluate the severity of hemorrhoids based on four key features: **Prolapse (P)**, **Number (N)**, **Relation (R)**, and **Bleed (B)**. Each feature is assessed and given a score ranging from 1 to 5, allowing for a comprehensive understanding of the hemorrhoidal condition.

**Prolapse (P):** This refers to the degree to which the hemorrhoidal tissue extends outside the anus.

**Score 1:** No prolapse, with hemorrhoidal tissue remaining entirely inside.

**Score 2:** Prolapse occurs only during defecation but spontaneously retracts.

**Score 3:** Prolapse occurs during defecation and requires manual reduction.

**Score 4:** Prolapse occurs with any physical activity and requires manual reduction.

**Score 5:** Prolapse is permanent and cannot be manually reduced.

**Number of Principal Hemorrhoidal Columns (N):** This refers to how many of the primary hemorrhoidal columns (tissue clusters) are involved.

**Score 1:** One principal hemorrhoidal column is affected.

**Score 2:** Two principal hemorrhoidal columns are affected.

**Score 3:** Three principal hemorrhoidal columns are affected.

**Score 4:** All four columns (anterior, posterior, left lateral, and right lateral) are involved.

**Score 5:** Diffuse involvement of hemorrhoidal tissue beyond the principal columns.

**Relation to the Dentate Line (R):** This assesses how the hemorrhoidal tissue relates to the dentate line, which is an anatomical marker within the anal canal.

**Score 1:** The hemorrhoidal tissue is located entirely above the dentate line (internal hemorrhoids).

**Score 2:** The hemorrhoidal tissue is predominantly above the dentate line.

**Score 3:** The hemorrhoidal tissue is at the level of the dentate line.

**Score 4:** The hemorrhoidal tissue is predominantly below the dentate line (external hemorrhoids).

**Score 5:** The hemorrhoidal tissue is entirely below the dentate line.

**Bleed (B):** This feature evaluates the severity and frequency of bleeding associated with the hemorrhoids.

**Score 1:** No bleeding.

**Score 2:** Occasional bleeding during defecation.

**Score 3:** Frequent bleeding during defecation, with mild blood loss.

**Score 4:** Bleeding occurs with or without defecation, with moderate blood loss.

**Score 5:** Persistent bleeding, with significant blood loss and potential for anemia.

#### Interpretation of Scores:

**Score 1** in any category represents a condition close to normal or minimally symptomatic.

**Score 5** represents the most severe manifestation of that particular attribute (Khan et al., 2020).

**External Hemorrhoids:** These hemorrhoids develop below the dentate line and are covered by anoderm, which is specialized skin surrounding the anus. External hemorrhoids are often visible and can be felt as swollen lumps around the anus (Khan et al., 2020). External hemorrhoids are prone to thrombosis; a hemorrhoid becomes a thrombosed hemorrhoid if the vein bursts and/or a clot of blood forms.

There are two kinds of external hemorrhoids: acute and chronic. Acute external hemorrhoids. Acute external hemorrhoids: - The acute form is a hematoma and manifests as a circular, bluish swelling at the anal border. Prolonged external hemorrhoids. Also known as "skin tags," these are composed of a few blood vessels and connective tissue that appear as one or more skin folds. frequently an ongoing case of thrombosed external hemorrhoids.

### 2.1.2 Clinical presentation

The clinical presentation of human hemorrhoids can vary depending on the type and severity of the condition. Symptoms such as blood in the stool, pain around the anus, rectal swelling, itching, or soiling are common in individuals seeking treatment for hemorrhoidal illness. According to a sub-group analysis conducted in India, the most prevalent symptoms experienced by individuals with hemorrhoidal disease were bleeding from the anus and pain, which was followed by anal swelling and itching (Sheikh et al., 2021). Rectal Bleeding: In 71% of cases, the most common hemorrhoid presentation was painless rectal bleeding during feces, with or without prolapsing anal tissue (Ray-Offor and Amadi, 2019). Generally, Patients frequently complain of bleeding with or without stools, puffiness, mild distress, or itching. Various manifestations may include spoilage or mucous leakage, pruritis, hygienic issues, and a sense of inadequate evacuation (Gupta et al., 2020). **Itching and Discomfort:** Due to mucous secretion or fecal soiling, prolapsing hemorrhoids may produce anal itching or perineal irritation (Ali and Shoeb, 2017).

## 3. TREATMENT OPTION FOR HUMAN HEMORRHOIDAL DISEASES

Treatment options for HD range from conservative methods (e.g., dietary and lifestyle modifications), medicinal plants, and medical management (topical agent) to non-invasive procedures such as sclerotherapy, rubber band ligation, infrared coagulation, or invasive surgery procedures (Lohsiriwat et al., 2023).

### 3.1 Conservative Treatment Options

Conservative treatment options are often the first line of management for hemorrhoids, especially in mild to moderate cases. Hemorrhoids can be treated conservatively in the first instance with a high-fiber diet (25 to 35 g daily), fiber

supplements, increased water intake, warm water baths (sitz baths), and stool softeners (Mott et al., 2018). One of the primary lines of treatment for most anorectal problems, including hemorrhoids, is usually dietary and behavioral changes. According to current international guidelines, conservative treatment is suggested for first and second-degree hemorrhoids. This includes changing one's diet and lifestyle, consuming enough fiber and fluids, and using oral phlebotonics to control the condition's early stages. Common advice includes taking sitz baths multiple times daily to soothe discomfort, avoiding straining when defecating, and decreasing the time spent on the toilet. The following are common conservative treatment options for hemorrhoids. Modulating fluid intake, diet, stool softeners, sitz baths, local hygiene, preventing diarrhea and constipation, and oral and topical medications are common treatment options (Yildiz et al., 2019).

#### 3.1.1 Dietary modifications

First-line therapy for patients with symptomatic hemorrhoid illness usually consists of dietary modification, including proper intake of fluids and fiber and counseling regarding defecation practices (Davis et al., 2018).

#### 3.1.2 Sitz baths

Warm Water Baths: Soaking the anal area in a warm water bath (sitz bath) several times a day can help alleviate pain, itching, and inflammation associated with hemorrhoids. For several anal illnesses, including HD, a classic and often advised treatment is a sitz bath with warm water (not exceeding 40–42 °C) for three minutes (Gallo et al., 2020). The related anal sphincter spasm can be relieved with warm sitz baths. Reduced spasm, promoted blood flow, and aid in healing can be achieved with nitroglycerin 0.125%, nifedipine 0.5%, or diltiazem 2%, occasionally combined with lidocaine 5% compounded ointment applied three times a day for 1-4 weeks, and then twice a day for 1 week (Rao et al., 2022).

#### 3.1.3 Lifestyle modifications

The main focus of traditional hemorrhoid treatment is lifestyle modification to help the patient avoid delayed straining by reducing the formation of hard stool, which can be achieved by increasing the intake of oral liquids and dietary fiber (Gupta et al., 2021). Patients with

any level of hemorrhoids should even be urged to modify their lifestyle as a preventative measure and a means of treatment. These adjustments include consuming more oral fluids and dietary fiber, consuming less fat, exercising frequently, maintaining good dental hygiene, refraining from reading and straining in the restroom, and avoiding drugs that induce diarrhea or constipation (Sinha and Pratap, 2020).

### 3.1.4 Medical Interventions (Topical Agents)

Topical agents typically contain low-dose anaesthetics, steroids, protectants, antiseptics, and astringents. These topical medications such as corticosteroids, antiseptics, astringents (like poliresulene), and local anesthetics (like lidocaine) are available for the symptomatic treatment of hemorrhoids. Topical treatments are advised as an initial treatment for several anal and perianal disorders, including hemorrhoids, due to the efficacy of these treatments in reducing symptoms, as demonstrated by several clinical trials. International recommendations advise against using them (Rao et al., 2022).

## 3.2 Medicinal Plants

Because of their potential therapeutic benefits, traditional medicines which mostly use medicinal plants and their bioactive molecules are resurfacing as an alternate source of therapy for a variety of diseases including hemorrhoids. Fifty medicinal plants belonging to 33 families were compiled as anti-hemorrhoidal agents that were used by locals and traditional healers in different parts of Ethiopia (Getachew et al., 2022).

### 3.2.1 Minimally invasive procedures

Advancements in technology have led to the development of various minimally invasive procedures for hemorrhoid management.

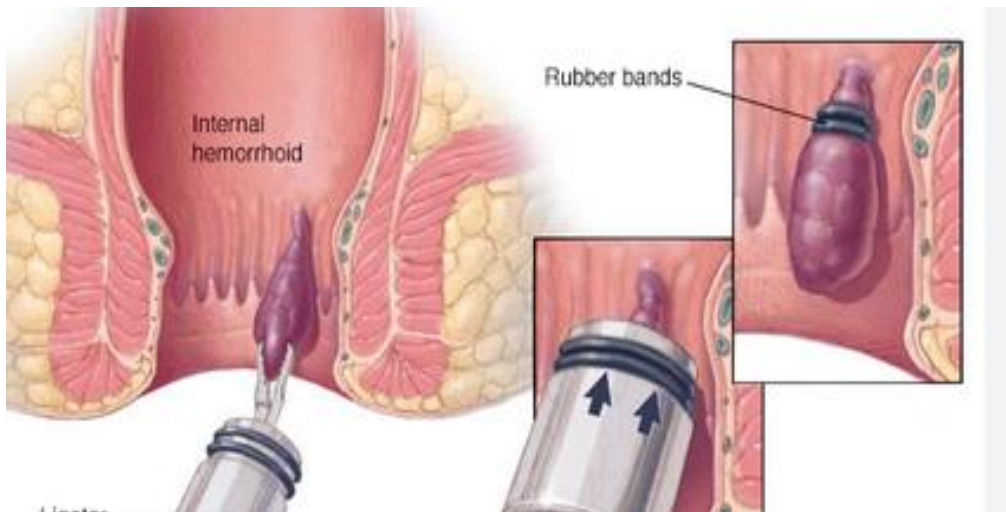
According to the European Society of Coloproctology, the recommended course of treatment for Grade I and II hemorrhoids is Rubber Band Ligation (RBL) since individuals who receive RBL exhibit a much better response than those who receive SCL and/or IRC (Van et al., 2020) When conservative measures fail to provide sufficient relief or in cases of more severe hemorrhoids, minimally invasive procedures may be considered. The two main office-based methods for treating internal hemorrhoids ranging from grade I to III are infrared photocoagulation and banding. In rubber band ligation, the hemorrhoid of interest is grasped or suctioned with a ligation instrument inserted through a speculum. This makes it easier to lay a rubber band across the hemorrhoid and down to its pedicle (Van et al., 2020).

#### 3.2.1.1 Rubber Band Ligation (RBL)

RBL is a frequently employed non-surgical technique for hemorrhoids of types I, II, and III. An endoscope is introduced in the anal area in the RBL procedure. The affected area is then wrapped with a rubber band to stop the blood flow and lessen the hemorrhoids (Dhiman et al., 2023). One of the most popular techniques in the world for treating symptomatic hemorrhoids is the excision of hemorrhoidal tissue followed by mucosal fixation and prolapse correction.

**Table 1. List of experimentally proven medicinal plants used for the treatment of hemorrhoids**

Number	Plant name	Part of plant	References
1	<i>Dolichandrone falcate</i>	Leaves	(Dhaswadikar et al., 2022)
2	<i>Blumea lacera</i> (Burm.f.) DC.	Leaves	(Dubey et al., 2023)
3	<i>Pluchea indica</i>	Leaves	(Senvorasinh et al., 2019)
4	<i>Elephantopus scaber</i>	Leaves	(Sulistiarini et al., 2023)
5	<i>Ficus benghalensis</i>	Prop root	(Chatterjee et al., 2020)
6	<i>Capsella bursa-pastoris</i> L.	Aerial whole part	(Apaydin et al., 2020)
7	<i>Anogeissus leiocarpus</i> , <i>Khaya senegalensis</i> , <i>Euphorbia hirta</i> , and <i>Parkia biglobosa</i>	Not mentioned	(Cletus et al., 2017)
8	<i>Annona muricata</i> L.	Leaves	(Ayun et al., 2020)
9	<i>Malva sylvestris</i>	Leaves	(Aka-Dönmez et al., 2019)
10	<i>Phlomis grandiflora</i>	Flowering part	(Donmez and Koca-Caliskan, 2019)
11	<i>Graptophyllum pictum</i> (L.) Griff.	Leaves	(Kusumawati et al., 2022)
12	<i>Cistus laurifolius</i> L.	Leaves	(Pekacar et al., 2024)
13	<i>Amorphophallus paeoniifolius</i>	Tuber	(Dey et al., 2016)



**Fig. 1. Rubber band ligation**

### 3.2.1.2 Sclerotherapy

The first surgeon to inject carbolic acid for hemorrhoids was Mitchell. There are several sclerosants available for injecting hemorrhoids; the most widely used one has a reduced rate of mucosal necrosis and contains 5% phenol in almond oil. While quick and straightforward to use, injection is less successful than RBL. For injection sclerotherapy, phenol in almond oil is less beneficial than aluminum potassium sulfate, and tannic acid. The amount of polidocanol needed by patients with grade III hemorrhoids was noticeably higher than that of patients with grade II hemorrhoids. Children with symptomatic hemorrhoids responded well to polidocanol-

based sclerosing therapy (He and Chen, 2023).

### 3.2.1.3 Infrared Coagulation (IRC)

IRC could be used as the first option in bleeding Grade I hemorrhoids. IRC induces hemorrhoid tissue necrosis with the direct administration of infrared rays. For grade I and II hemorrhoids, this is most frequently utilized (Davis et al., 2018). The percentages of improvement for hemorrhoidal degrees I, II, and III were 78%, 51%, and 22%, respectively, according to the given data. with 81-93% cumulative subjective improvement for grades I–II (Tutino et al., 2020).



**Fig. 2. Injection Sclerotherapy**



When dealing with large or prolapsing hemorrhoids, IRC is not appropriate. IRC works similarly to RBL in terms of effectiveness, and because there is less tissue necrosis, there are less discomfort problems (Soeseno et al., 2021).

#### 3.2.1.4 Laser treatment

The abbreviation for "light amplification by stimulated emission of radiation," as defined by Albert Einstein in 1917, is LASER. In the field of proctology in particular, minimally invasive laser therapy may be quite beneficial for treating delicate areas (Trigui et al., 2022). The

hemorrhoidal laser procedure is carried out in two ways as a minimally invasive technique: 1. Laser therapy using low-power Infrared coagulation (IRC); 2. Hemorrhoidectomy using a high-powered carbon dioxide (CO<sub>2</sub>) laser. Every study used a similar method for laser hemorrhoidoplasty, which involved accessing submucosal space above the dentate line and sequentially delivering laser energy to reduce the hemorrhoidal mass. When it came to grade II and III hemorrhoids, laser treatment produced satisfactory long-term results and lower rates of postoperative discomfort and bleeding than the open method (Lakmal et al., 2021).

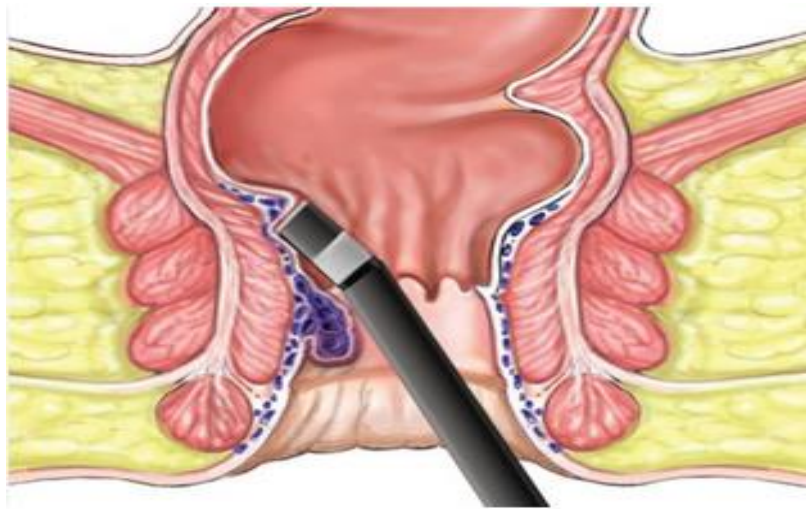


Fig. 3. Infrared coagulation

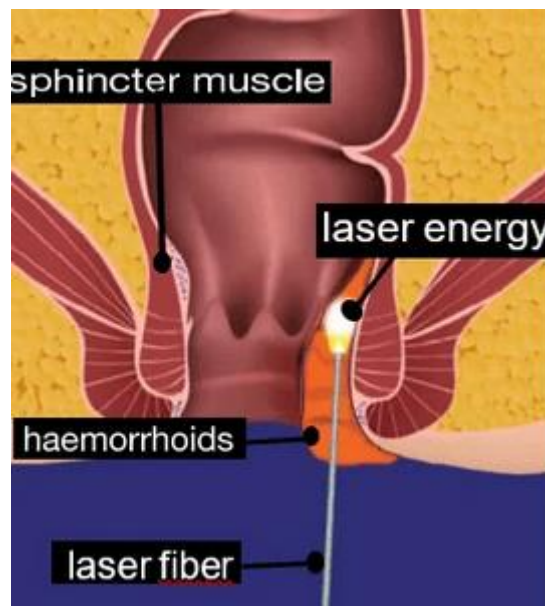


Fig. 4. Laser treatment



### 3.2.2 Surgical interventions

Surgery is only indicated for patients who are unable to respond to nonoperative treatment or who have grade III or IV hemorrhoids, per the 2018 American Society of Colon and Rectal Surgeons Clinical Practice Guidelines for the Management of Hemorrhoids (ASCRS 2018) (Davis et al., 2018). Conventionally, the most frequently performed surgical procedures involve excisional haemorrhoidectomy, which can be either closed (Ferguson method) or open (Milligan-Morgan operation). Postoperative problems, including discomfort and urine retention, are thought to be the main drawback of haemorrhoidectomy. To mitigate this drawback, novel surgical techniques such as stapled hemorrhoidopexy and HAL have been developed to reduce the rate of problems following surgery (Chen et al., 2020). Staples were first used to cure hemorrhoids using linear devices. After modifying the circular stapler, Antonio Longo created an entire suite of tools. He referred to the method as the "Procedure for Prolapse and Hemorrhoids." In addition to the term PPH, the procedure is sometimes referred to as Longo-operation or stapled hemorrhoidopexy (Puia et al., 2021). Since more than 20 years ago, it has been utilized as a therapeutic option for third- and fourth-degree HD. Compared to traditional hemorrhoidectomy, it has a shorter recovery period, less pain following surgery, and an earlier return to normal

activities (Sobrado et al., 2022). According to reports, SH is a safe substitute for surgical hemorrhoidectomy that offers the benefits of a shorter hospital stay, better patient satisfaction, and less postoperative pain (Emile et al., 2019).

### 3.2.3 Hemorrhoidal Artery Ligation (HAL)

Non-excisional surgical procedures have become more and more common in recent years due to their ability to lessen the majority of patients' discomforts, including post-operative pain and the recovery of working independence, while also maintaining a physiologically useful tissue for continence and bowel movements (Verre et al., 2022).

Hemorrhoidal artery ligation, also known as transanal hemorrhoidal dearterialization (THD). The THD process involves using a specialized proctoscope with a Doppler transducer to locate and ligate the terminal branches of the superior rectal arteries. When the superior hemorrhoidal artery's terminal branches get arterialized, the blood supply to the hemorrhoids gradually decreases, which leads to the hemorrhoidal cushions contracting and the symptoms improving as a result (Giarratano et al., 2018). Compared to stapled hemorrhoidectomy, transanal hemorrhoidal dearterialization is a safer procedure that results in much less bleeding after surgery (Song et al., 2018).

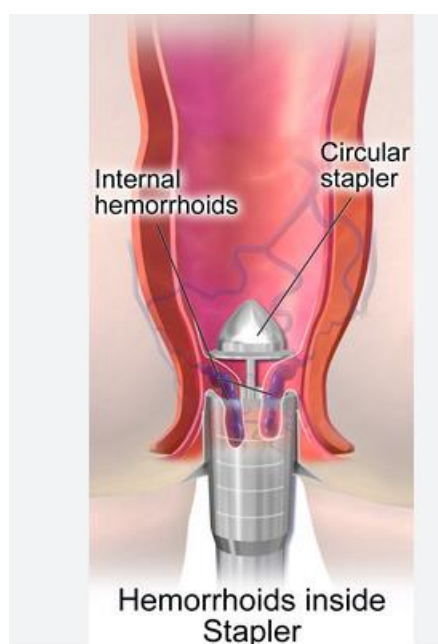


Fig. 5. Stapled hemorrhoidopexy

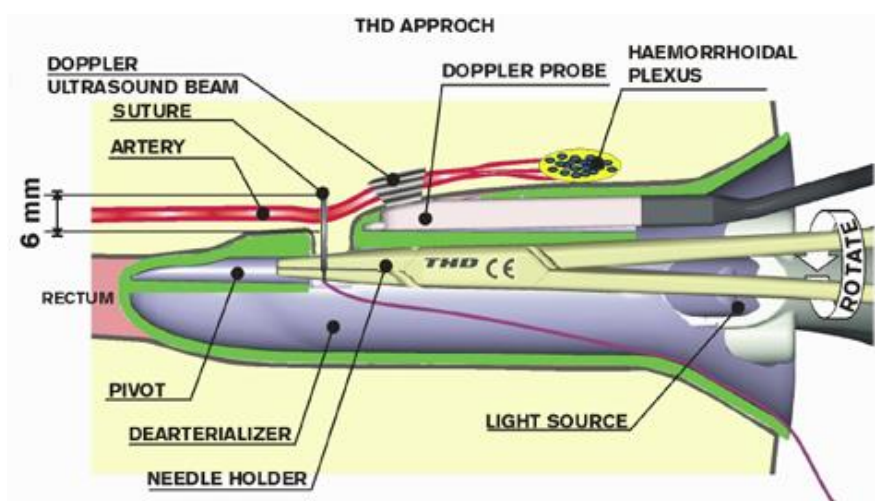


Fig. 6. Hemorrhoidal Artery Ligation /Transanal Hemorrhoidal dearterialization

#### 4. POSTOPERATIVE CARE AND COMPLICATIONS

High-Quality Nursing (HQN) is a widely used nursing intervention in clinical practice. There are two possible reasons why high-quality nursing can reduce hemorrhoid surgery postoperative pain. Physiological intervention is one of them. The patient's discomfort is essentially reduced by preoperative (warm salt baths and hot compresses) and postoperative (acupuncture) techniques. Psychological help is the alternative. Patients experience less discomfort when there is preoperative communication and postoperative attention transfer (Huang et al., 2020).

The most common complications are pain, urinary retention, bleeding, and stricture. Urinary retention in cases of spinal anesthesia (20.1%), secondary or reactionary bleeding (2.4–6%), and subcutaneous abscess (0.5%) are possible complications following hemorrhoidal surgery. Complications following surgery range from 20% to 25% and include anal stenosis, bleeding, incontinence, infection, and postoperative discomfort (Brusciano et al., 2020).

#### 5. CONCLUSION

A wide range of treatment options is available for hemorrhoids, ranging from conservative measures to medical and surgical interventions. By considering the severity of symptoms, patient preferences, and the expertise of healthcare professionals, individualized treatment plans can be formulated to provide effective relief.

In conclusion, this review provides an overview of the current treatment options for hemorrhoids, including conservative measures, medicinal plants, medical interventions, and surgical procedures.

#### DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

#### CONSENT AND ETHICAL APPROVAL

It is not applicable.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

#### REFERENCES

- Abdelrazik, M., Almazraqi, A., Alharbi, M., Alhumayri, K., Al Hadi, E., Al Hadi, A., et al. (2023). Assessment of knowledge and awareness about hemorrhoid causes and stages among the general public of Saudi Arabia. *Medical Science*, 27(135), 1–9. <https://doi.org/10.54905/disssi/v27i135/e208ms3004>
- Aka-Dönmez, C., Boyacıoğlu, Ö., Korkusuz, P., & Koca-Çalışkan, U. (2019). From a traditional remedy to modern therapy; *In vivo* antihemorrhoidal study of *Malva*

- sylvestris* L. *MESMAP-5 Proceedings Book*, 260.
- Alamri, F., Alshehri, A., Alfaifi, O., Alshehri, B., Alamri, F., Alshehri, A., & Al-amer, M. (2021). Knowledge, attitude, and practice of adults toward hemorrhoids in Aseer region, Southern Saudi Arabia. *International Journal of Medicine in Developing Countries*, 152–156. <https://doi.org/10.24911/ijmdc.51-1605716982>
- Alege, G. O., Atawodi, J. C., Williams, A. V., Adah, V., & Olowonibi, G. O. (2022). Evaluation of the phytochemical compositions and genotoxic potentials of some anti-hemorrhoid herbal preparations sold in Nigeria. *Ife Journal of Science*, 24(1). <https://doi.org/10.4314/ijfs.v24i1.10>
- Ali, S. A., & Shoeb, M. F. R. (2017). Study of risk factors and clinical features of hemorrhoids. *International Surgery Journal*, 4(6), 1936. <https://doi.org/10.18203/2349-2902.isj20172051>
- Apaydin Yildirim, B., Aydin, T., Kordali, S., Yildirim, S., Cakir, A., & Yildirim, F. (2020). Antihemorrhoidal activity of organic acids of *Capsella bursa-pastoris* on Croton oil-induced hemorrhoid in rats. *Journal of Food Biochemistry*, 44(9). <https://doi.org/10.1111/jfbc.13343>
- Ayun, N. Q., Kusmardi, Nurhuda, & Elya, B. (2020). Anti-inflammation of soursop leaves (*Annona muricata* L.) against hemorrhoids in mice induced by croton oil. *Pharmacognosy Journal*, 12(4), 784–792. <https://doi.org/10.5530/pj.2020.12.112>
- Azeemuddin, M., Viswanatha, G. L., Rafiq, M., Thippeswamy, A. H., Baig, M. R., Kavya, K. J., Patki, P. S., & Shyam, R. (2014). An improved experimental model of hemorrhoids in rats: Evaluation of antihemorrhoidal activity of a herbal formulation. *ISRN Pharmacology*, 2014, 1–7. <https://doi.org/10.1155/2014/530931>
- Brusciano, L., Gambardella, C., Terracciano, G., Gualtieri, G., Schiano di Visconte, M., Tolone, S., del Genio, G., & Docimo, L. (2020). Postoperative discomfort and pain in the management of hemorrhoidal disease: Laser hemorrhoidoplasty, a minimally invasive treatment of symptomatic hemorrhoids. *Updates in Surgery*, 72(3), 851–857. <https://doi.org/10.1007/s13304-019-00694-5>
- Chatterjee, R., Patil, S., & Sahu, A. N. (2020). Phytochemical estimation and anti-hemorrhoidal activity of *Ficus benghalensis* Linn. prop root extract. *Research Journal of Pharmacy and Life Sciences*, 1(1), 10–21.
- Chen, M., Tang, T. C., He, T. H., Du, Y. J., Qin, D., & Zheng, H. (2020). Management of hemorrhoids: Protocol of an umbrella review of systematic reviews and meta-analyses. *BMJ Open*, 10(3). <https://doi.org/10.1136/bmjopen-2019-035287>
- Chukwuemeka Okafor, H., Nkechinyere Okafor, J., & Ifeyinwa Okafor, R. (2023). Hemorrhoids among people of Sifawa community in Sokoto State. *Journal of Family Medicine and Health Care*, 9(2), 28–33. <https://doi.org/10.11648/j.jfmhc.20230902.11>
- Cletus, A., Dibal, M., Malgwi, T., Hadiza, I., Adama, A., & Abubakar, U. (2017). Anti-hemorrhoid evaluation of selected medicinal plants used in Bali North-East Nigeria for the treatment of hemorrhoids (pile). *Journal of Pharmaceutical Research International*, 18(3), 1–6. <https://doi.org/10.9734/jpri/2017/25433>
- Davis, B. R., Lee-Kong, S. A., Migaly, J., Feingold, D. L., & Steele, S. R. (2018). The American Society of Colon and Rectal Surgeons clinical practice guidelines for the management of hemorrhoids. *Diseases of the Colon & Rectum*, 61(3), 284–292. <https://doi.org/10.1097/DCR.0000000000001030>
- De Marco, S., & Tiso, D. (2021). Lifestyle and risk factors in hemorrhoidal disease. *Frontiers in Surgery*, 8. <https://doi.org/10.3389/fsurg.2021.729166>
- Dey, Y. N., Wanjari, M. M., Kumar, D., Lomash, V., & Jadhav, A. D. (2016). Curative effect of *Amorphophallus paeoniifolius* tuber on experimental hemorrhoids in rats. *Journal of Ethnopharmacology*, 192, 183–191.
- Dhaswadikar, S. R., Parmar, K. M., Kamble, S. K., Kathuria, I., Dhobi, M., Birajdar, A., Prasad, S. K., & Itankar, P. R. (2022). Anti-hemorrhoidal potential of standardized leaf extract of *Dolichandrone falcata*. *Phytomedicine Plus*, 2(1). <https://doi.org/10.1016/j.phyplu.2021.100172>
- Dhiman, S., Nadda, R. K., & Bhardwaj, P. (2023). Medicinal herbs from Western Himalayas for hemorrhoids treatment: A review correlating traditional knowledge with modern therapeutics. *Pharmacological Research – Modern Chinese Medicine*, 9, 100334.

- <https://doi.org/10.1016/j.prmcm.2023.100334>
- Donmez, C., & Koca-Caliskan, U. (2019). Ethnopharmacological survey on *Phlomis grandiflora*: In vivo antihemorrhoidal model. *Current Perspectives in Medicinal & Aromatic Plants (MAPs)*, 2.
- Dubey, T., Bhanukiran, K., Prasad, S. K., & Hemalatha, S. (2023). Optimization of extraction process and anti-hemorrhoidal activity of *Blumea lacera* (Burm.f.) DC. leaves in Croton oil-induced hemorrhoid model. *Pharmacognosy Magazine*, 19(3), 709–719. <https://doi.org/10.1177/09731296231170936>
- Emile, S. H., Elfeki, H., Sakr, A., & Shalaby, M. (2019). Transanal hemorrhoidal dearterialization (THD) versus stapled hemorrhoidopexy (SH) in treatment of internal hemorrhoids: A systematic review and meta-analysis of randomized clinical trials. *International Journal of Colorectal Disease*, 34(1), 1–12. <https://doi.org/10.1007/s00384-018-3187-3>
- Erbay, M. Ş., & Sari, A. (2018). Plants used in traditional treatment against hemorrhoids in Turkey. *Marmara Pharmaceutical Journal*, 22(2), 110–132. <https://doi.org/10.12991/mpj.2018.49>
- Farid, M. I. N. A., Azhar, A. N. H., Iskandar, H. R., Abdiweli, H., & Selamat, H. A. (2022). A cross-sectional study on the prevalence of hemorrhoids among lorry drivers in Klang Valley, Malaysia. *International Journal of Health Sciences*, 6(S7), 5153–61. <https://doi.org/10.53730/ijhs.v6nS7.13102>
- Fiðere, I., Groma, V., Goldiðð, N. R., Gardovskis, A., & Gardovskis, J. (2021). Worldwide disease—Haemorrhoids. How much do we know? *Proceedings of the Latvian Academy of Sciences. Section B. Natural, Exact, and Applied Sciences*, 75(1), 1–10. <https://doi.org/10.2478/prolas-2021-0001>
- Gallo, G., Martellucci, J., Sturiale, A., Clerico, G., Milito, G., & Marino, F., et al. (2020). Consensus statement of the Italian Society of Colorectal Surgery (SICCR): Management and treatment of hemorrhoidal disease. *Techniques in Coloproctology*, 24(2), 145–164. <https://doi.org/10.1007/s10151-020-02149-1>
- Getachew, M., Belayneh, A., Kebede, B., Alimaw, Y., Biyazin, Y., Abebaw, A., & Abebe, D. (2022). Medicinal plants used for management of hemorrhoids in Ethiopia: A systematic review. *Heliyon*, 8(8). <https://doi.org/10.1016/j.heliyon.2022.e10211>
- Giarratano, G., Toscana, E., Toscana, C., Petrella, G., Shalaby, M., & Sileri, P. (2018). Transanal hemorrhoidal dearterialization versus stapled hemorrhoidopexy: Long-term follow-up of a prospective randomized study. *Surgical Innovation*, 25(3), 236–241. <https://doi.org/10.1177/1553350618761757>
- Gupta, S., Singh, T. G., Baishnab, S., Garg, N., Kaur, K., & Satija, S. (2020). Recent management of hemorrhoids: A pharmacological & surgical perspective. *Review Article*, 20.
- He, A., & Chen, M. (2023). Sclerotherapy in hemorrhoids. *Indian Journal of Surgery*, 85(2), 228–232.
- Hong, Y. S., Jung, K. U., Rampal, S., Zhao, D., Guallar, E., & Ryu, S., et al. (2022). Risk factors for hemorrhoidal disease among healthy young and middle-aged Korean adults. *Scientific Reports*, 12(1), 129.
- Huang, G., Liang, D., Hu, Y., Yang, H., Li, H., Chu, D., & Jia, J. (2020). High-quality nursing promotes postoperative recovery and complication reduction in patients undergoing anorectal surgery for hemorrhoids. *International Journal of Clinical and Experimental Medicine*, 13(6), 3841–3847.
- Kabir, S. F., Das, D., Alam, K. Z., Murshed, M., & Mohammad, D. (2021). Frequency of hemorrhoidal complaints in a real-life population and possible concomitance between hemorrhoidal disease and chronic venous disease: Going further in our understanding of hemorrhoidal disease. *Surgical Science*, 12(9), 319–331.
- Kebede, Y., Tsegay, B., & Abreha, H. (2017). Endoscopic and histopathological correlation of gastrointestinal diseases in Ayder referral hospital, Mekelle University, northern Ethiopia. *Ethiopian Medical Journal*, 55(4).
- Khan, M. A., Chowdri, N. A., Parray, F. Q., Wani, R. A., Mehraj, A., & Baba, A., et al. (2020). “PNR-Bleed” classification and Hemorrhoid Severity Score—A novel attempt at classifying the hemorrhoids. *Journal of Coloproctology*, 40(4), 398–403. <https://doi.org/10.1016/j.jcol.2020.05.012>
- Kibret, A. A., Oumer, M., & Moges, A. M. (2021). Prevalence and associated factors of hemorrhoids among adult patients visiting

- the surgical outpatient department in the University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia. *PLoS ONE*, 16(4).  
<https://doi.org/10.1371/journal.pone.0249736>
- Kusumawati, I., Rullyansyah, S., Rohmania, Rizka, A. F., Hestianah, E. P., & Matsunami, K. (2022). Histomorphometric study of ethanolic extract of *Graptophyllum pictum* (L.) Griff. leaves on croton oil-induced hemorrhoid mice: A Javanese traditional anti-hemorrhoid herb. *Journal of Ethnopharmacology*, 284, 114765. <https://doi.org/10.1016/j.jep.2021.114765>
- Lakmal, K., Basnayake, O., Jayarajah, U., & Samarasekera, D. N. (2021). Clinical outcomes and effectiveness of laser treatment for hemorrhoids: A systematic review. *World Journal of Surgery*, 45(4), 1222–1236. <https://doi.org/10.1007/s00268-020-05923-2>
- Lohsiriwat, V., Sheikh, P., Bandolon, R., Ren, D. L., Roslani, A. C., & Schaible, K., et al. (2023). Recurrence rates and pharmacological treatment for hemorrhoidal disease: A systematic review. *Advances in Therapy*, 40(1), 117–132. <https://doi.org/10.1007/s12325-022-02351-7>
- Margetis, N. (2019). Pathophysiology of internal hemorrhoids. *Annals of Gastroenterology*, 32(3), 264–272. <https://doi.org/10.20524/aog.2019.0355>
- Mott, T., Latimer, K., & Edwards, C. (2018). Hemorrhoids: Diagnosis and treatment options. *American Family Physician*, 97(3), 172–179.
- Ng, K. S., Holzgang, M., & Young, C. (2020). Still a case of “no pain, no gain”? An updated and critical review of the pathogenesis, diagnosis, and management options for hemorrhoids. *Annals of Coloproctology*, 36(3), 133–147. <https://doi.org/10.3393/ac.2020.05.04>
- Pata, F., Sgró, A., Ferrara, F., Vigorita, V., Gallo, G., & Pellino, G. (2020). Anatomy, physiology, and pathophysiology of haemorrhoids. *Reviews on Recent Clinical Trials*, 16(1), 75–80. <https://doi.org/10.2174/1574887115666200406115150>
- Pawar, A. T., Deshmukh, C. D., Jadhav, D. K., & Kulkarni, R. R. (2023). Anti-hemorrhoidal activity of Ayurvedic cream in rats. *Indian Drugs*, 60(1), 84–88. <https://doi.org/10.53879/id.60.01.10882>
- Pekacar, S., Özüpek, B., Akkol, E. K., Taştan, H., Ersan, H., & Orhan, D. D. (2024). Identification of bioactive components on antihemorrhoidal activity of *Cistus laurifolius* L. using RP-HPLC and LC-QTOF-MS. *Journal of Ethnopharmacology*, 319, 117122.
- Puia, I. C., Puia, A., Florea, M. L., Cristea, P. G., Stanca, M., Fetti, A., & Moia, E. (2021). Stapled hemorrhoidopexy: Technique and long-term results. *Chirurgia (Bucur)*, 116(1), 102–108. <https://doi.org/10.21614/CHIRURGIA.116.1.102>
- Rao, S. S. C., Qureshi, W. A., Yan, Y., & Johnson, D. A. (2022). Constipation, hemorrhoids, and anorectal disorders in pregnancy. *American Journal of Gastroenterology*, 117(10S), 16–25. <https://doi.org/10.14309/ajg.0000000000001962>
- Ray-Offor, E., & Amadi, S. (2019). Hemorrhoidal disease: Predilection sites, pattern of presentation, and treatment. *Annals of African Medicine*, 18(1), 12–16. [https://doi.org/10.4103/aam.aam\\_4\\_18](https://doi.org/10.4103/aam.aam_4_18)
- Senvorasinh, K., Phunikhom, K., & Sattayasai, J. (2019). Anti-hemorrhoidal activity of *Pluchea indica* leaves aqueous extract in Croton oil-induced hemorrhoids in experimental animals. *Srinagarind Medical Journal*, 34(6), 590–594.
- Sheikh, P., Mital, K., Maheshwari, U., Prabakaran, J., Sharda, P., & Dumbre, R. (2021). Clinical presentation of hemorrhoids and its correlation with chronic venous disease in India: A subgroup analysis of the International CHORUS Survey. *Indian Journal of Surgery*, 83(2), 513–521. <https://doi.org/10.1007/s12262-020-02426-1>
- Sinha, P., Pratap Singh, M., & Kumar Rajpoot, B. (2020). Review article on guda arsha (hemorrhoids): Causes, signs and symptoms, prevention & treatment. *World Journal of Pharmaceutical Research*, 9. <https://doi.org/10.20959/wjpr20208-18056>
- Sobrado, C. W., Sobrado, L. F., Oregon, C. A., Villela, H. M., & Hora, J. A. B. (2022). Stapled hemorrhoidopexy: Results, late complications, and degree of satisfaction after 16 years of follow-up. *Arquivos Brasileiros de Cirurgia Digestiva*, 35. <https://doi.org/10.1590/0102-672020220002e1689>
- Soeseno, S. W., Wahyudi, P. A. E., & Febyan, F. (2021). Diagnosis and management of

- internal hemorrhoids: A brief review. *European Journal of Medical and Health Sciences*, 3(5), 1–5.  
<https://doi.org/10.24018/ejmed.2021.3.5.1014>
- Song, Y., Chen, H., Yang, F., Zeng, Y., He, Y., & Huang, H. (2018). Transanal hemorrhoidal dearterialization versus stapled hemorrhoidectomy in the treatment of hemorrhoids: A PRISMA-compliant updated meta-analysis of randomized control trials. *Medicine (Baltimore)*, 97(29).  
<https://doi.org/10.1097/MD.0000000000001502>
- Sulistiarini, R., Puranti, A., & Prabowo, W. C. (2023). Phytochemicals and anti-hemorrhoidal activities of *Elephantopus scaber* leaves. *Journal of Advanced Biotechnology and Experimental Therapeutics*, 6(2), 436–444.  
<https://doi.org/10.5455/jabet.2023.d139>
- Trigui, A., Rejab, H., Akrouf, A., Trabelsi, J., Zouari, A., Majdoub, Y., Amar, M. B., & Mzali, R. (2022). Laser utility in the treatment of hemorrhoidal pathology: A review of the literature. *Lasers in Medical Science*, 37(2), 693–699.  
<https://doi.org/10.1007/s10103-021-03333-x>
- Tutino, R., Salamone, G., De Marco, P., Cocorullo, G., & Gulotta, G. (2020). Outpatient treatment of hemorrhoidal disease: The alternative way to treat hemorrhoidal disease in a simple, safe, and effective manner. *Reviews on Recent Clinical Trials*, 16(1), 5–9.  
<https://doi.org/10.2174/1574887115666200305150029>
- van Tol, R. R., Kleijnen, J., Watson, A. J. M., Jongen, J., Altomare, D. F., Qvist, N., Higuero, T., Muris, J. W. M., & Breukink, S. O. (2020). European Society of ColoProctology: Guideline for haemorrhoidal disease. *Colorectal Disease*, 22(6), 650–662.  
<https://doi.org/10.1111/codi.14975>
- Verre, L., Gallo, G., Grassi, G., Bussolin, E., Carbone, L., Poto, G. E., Carpineto Samorani, O., Marano, L., Marrelli, D., & Roviello, F. (2022). Transanal hemorrhoidal dearterialization (THD) for hemorrhoidal disease: An Italian single-institution 5-year experience analysis and updated literature review. *Frontiers in Surgery*, 9, 1088546.  
<https://doi.org/10.3389/fsurg.2022.1088546>
- Yildiz, T., Aydin, D. B., Ilce, Z., Yucak, A., & Karaaslan, E. (2019). External hemorrhoidal disease in child and teenage: Clinical presentations and risk factors. *Pakistan Journal of Medical Sciences*, 35(3), 696–700.  
<https://doi.org/10.12669/pjms.35.3.442>
- Zagriadskii, E. A., Bogomazov, A. M., & Golovko, E. B. (2018). Conservative treatment of hemorrhoids: Results of an observational multicenter study. *Advances in Therapy*, 35(11), 1979–1992.  
<https://doi.org/10.1007/s12325-018-0794-x>

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