Review Article

Current updates on human hemorrhoid disease and its treatment options

ABSTRACT

Human hemorrhoid disease is characterized by aberrant vascular channel dilatation and distortion, as well as damaging changes in the supportive connective tissue within the anal cushion. The global prevalence of hemorrhoids is higher in Australia (38.93%) than in Israel (16%) and Korea (14.4%). The percentage of Egyptian patients who have colonoscopies for hemorrhoids has increased to 18%. Internal hemorrhoids were the third most common (7.5%) colonoscopic finding at Ayder Referral Hospital, Ethiopia. A study carried out at the University of Gondar Comprehensive Specialized Hospital discovered that 13.1% of adult patients who visited the surgical outpatient department had hemorrhoids. Various factors contribute to the development of hemorrhoids, including straining during bowel movements, and genetic predisposition. Regarding the pathophysiology of hemorrhoids, four theories have been developed. Human Hemorrhoids are categorized into two primary categories according to where they occur relative to the dentate line, which is an anatomical demarcation in the anal canal.

Keywords: Hemorrhoidal disease, Bleeding, medicinal plants, topical agent

INTRODUCTION

Hemorrhoidal diseases are relatively frequent anorectal disorders characterized by the symptomatic expansion and distal displacement of the natural anal cushions [1]. 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 [2]. 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 [3]. After the healing of external hemorrhoids, Hemorrhoidal issues usually get better in a couple of days of persistent skin tags [4].

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[5] With 3.3 million ambulatory-care visits, hemorrhoid illness is the fourth most prevalent gastrointestinal disorder in US outpatient clinics[6]. 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% [7]. Internal hemorrhoids were the third most typical colonoscopic result at Ayder Referral Hospital (7.5%)[8]. 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 [2].

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[9]. Internal hemorrhoids are further classified in Golligher's categorization according to the prolapse severity. Hemorrhoids in Grade I are those that 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 [10]. 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 [11,12,3]. Depending on the severity and degree of the symptoms, you can cure hemorrhoids

withdietary and lifestyle changes, pharmaceutical treatment, and surgical treatment. Conservative treatment approaches are recommended to relieve symptoms and prevent progression to higher degrees and consequences [13].

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

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 genesisof human hemorrhoids, including straining during bowel movements, and genetic predisposition.

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 [14]. 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 [15].

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 [16].

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 [17].

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 [18]. 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.

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[19]. 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 [20]

CLASSIFICATION AND CLINICAL PRESENTATION OF HUMAN HEMORRHOIDS

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 [21]. 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 [22].

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 incurableand 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[23]. 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 of hemorrhoids depends on four basic features of the illness: the level of hemorrhoidal prolapse (P), the number of principal hemorrhoidal columns implicated (N), the hemorrhoidal tissue's relation (R) to the dentate line, and the hemorrhoidal tissue's bleed (B). This classification system's four elements are given scores ranging from 1 to 5. rating 1 represents standard anal cushions, whereas Grade 5 represents the lowest rating in a certain attribute [24].

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 [24]. 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. Acuteexternal 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.

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 [25]Rectal Bleeding: In 71% of cases, the most common hemorrhoid presentation was painless rectal bleeding during feces, with or without prolapsing anal tissue [26]. 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 [21].**Itching and Discomfort**: Due to mucous secretion or fecal soiling, prolapsing hemorrhoids may produce anal itching or perineal irritation [16].

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 [27].

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 [28]. 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 early stages of the condition. Common advice includes taking sitz baths multiple times a day to soothe discomfort, avoiding straining when defecating, and decreasing the amount of 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 [29].

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 [30].

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 [31]. 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 [32].

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 [21]. 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 [33].

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 [13].

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

Number	Plant name	Part of plant	References
1	*Dolichandrone falcata*	Leaves	[12]
2	*Blumealacera* (Burm.f.) DC.	Leaves	[34]
3	*Pluchea indica*	Leaves	[35]
4	*Elephantopusscaber*	Leaves	[36]
5	*Ficus benghalensis*	Prop root	[37]
6	*Capsella bursa-pastoris* L.	Aerial whole part	[38]
7	*Anogeissusleiocarpus, Khaya senegalensis, Euphorbia hirta, and Parkia biglobosa*	Not mentioned	[1]
8	*Annona muricata* L.	Leaves	[39]

9	*Malva sylvetris*	Leaves	[40]
10	*Phlomis grandiflora*	Flowering part	[41]
11	*Graptophyllumpictum* (L.) Griff.	Leaves	[42]
12	*Cistus laurifolius*L.	Leaves	[43]
13	*Amorphophallus paeoniifolius*	Tuber	[44]

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 policresulene), 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. Localized edema and inflammation can be effectively treated with topical corticosteroid medications [32].

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 [45]. 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 [45].

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 [46]. 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.

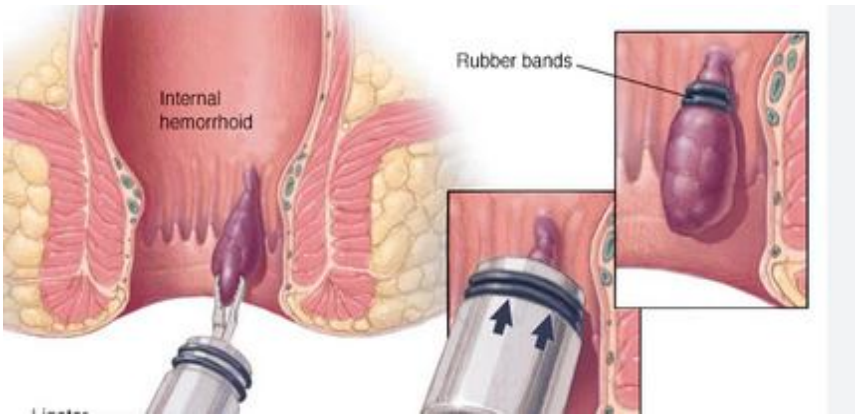

Figure 1: Rubber Band Ligation

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 [47].

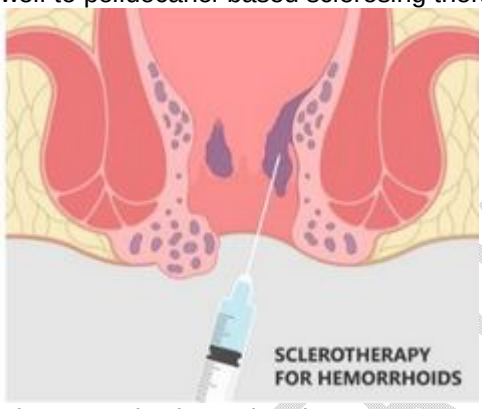

Figure 2: Injection Sclerotherapy

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 [30]. 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 [48].

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 [49].

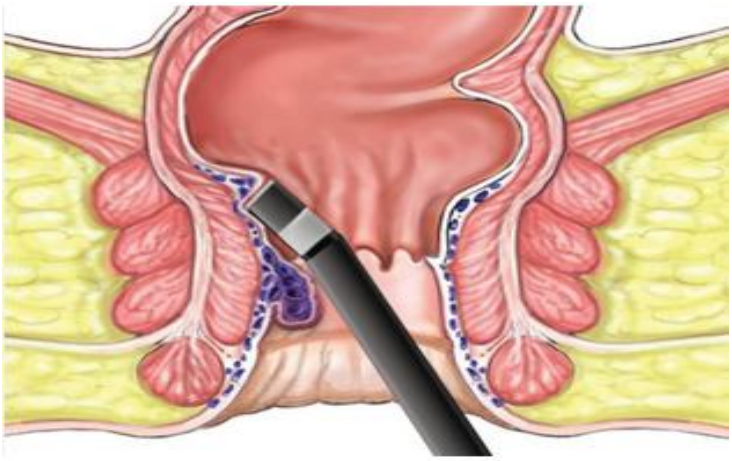

Figure 3: Infrared coagulation

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 [50]. 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_2) 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 [51].

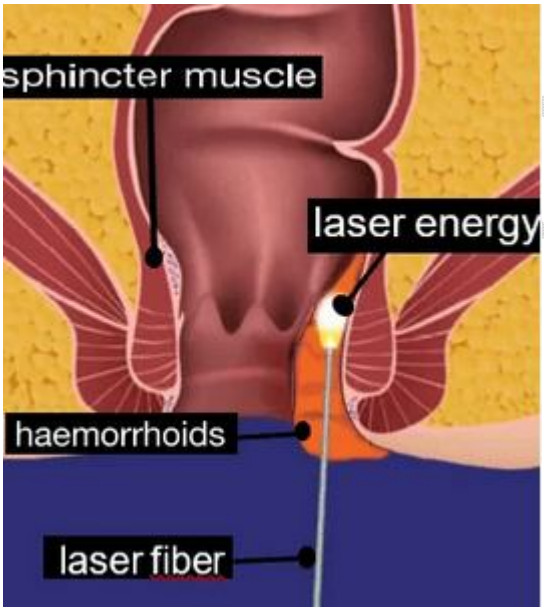

Figure 4: Laser treatment

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) [30]. 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 [52]. 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 Long-operation orstapled hemorrhoidopexy[53]. 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 [54]. 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 [55].

Figure 5: Stapled hemorrhoidopexy

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 [56].

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 [57]. Compared to stapled hemorrhoidectomy, transanal hemorrhoidal dearterialization is a safer procedure that results in much less bleeding after surgery [58].

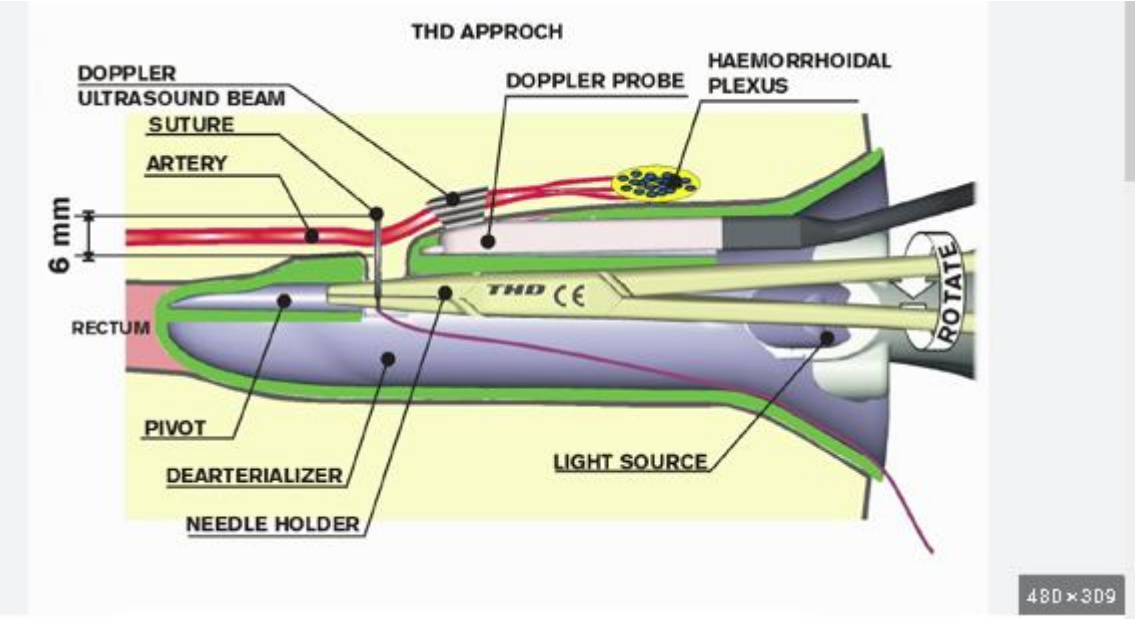

Figure 6 : Hemorrhoidal Artery Ligation /Transanal Hemorrhoidal dearterialization

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 [59].

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 [60].

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.

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