

THE ROLE AND IMPORTANCE OF HEMORRHOIDS IN MODERN MEDICINE

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Abstract . Hemorrhoids are among the most common anorectal disorders, affecting millions of people worldwide. This paper explores their clinical presentation, pathophysiology, classification, diagnostic approaches, and both conservative and surgical management strategies. It also highlights the public health impact of hemorrhoids, their role in early detection of more serious gastrointestinal conditions, and the significance of recent technological advances such as Doppler-guided ligation and laser therapy. Emphasis is placed on preventive measures and patient education, reflecting the modern medical shift toward minimally invasive care. Overall, hemorrhoids represent not only a common clinical concern but also a multidisciplinary challenge in modern healthcare.

Keywords: Hemorrhoids, Diagnosis, Minimally Invasive Therapy, Public Health, Prevention, Modern Medicine

Introduction

Hemorrhoids, commonly referred to as piles, are dilated and inflamed venous structures located in the lower rectum and anal region. They are a frequently encountered health condition that, although generally benign, can lead to considerable discomfort and functional impairment. Hemorrhoids are divided into two categories: internal (arising above the pectinate line) and external (originating below it), and their presentation can vary from mild irritation to more serious complications like thrombosis or prolapse.

Epidemiological research indicates that hemorrhoids are highly prevalent among adults, particularly in individuals aged 45 to 65 years. According to some studies, nearly half of adults over the age of 50 will experience symptoms associated with hemorrhoids at some point. Despite being a widespread issue, hemorrhoids are often underreported due to embarrassment or stigma, which can delay diagnosis and treatment.

The reason hemorrhoids are medically significant today lies in their impact on patient well-being and healthcare systems. If left untreated, they can cause persistent discomfort, recurrent bleeding, and reduced quality of life. Moreover, since rectal bleeding is a symptom that can indicate more serious conditions such as colorectal cancer, hemorrhoids must be diagnosed with care. With the advent of new non-invasive treatments, managing hemorrhoids has become more effective and patient-friendly, underscoring their relevance in modern clinical practice.

The anal canal serves as the final segment of the gastrointestinal tract, typically measuring around 3 to 4 centimeters in length. It stretches from the rectum to the anal verge and is encased by two muscular structures: the **internal anal sphincter** and the **external anal sphincter**, which collectively control the passage of feces. A key anatomical feature is the **pectinate line**, which divides the upper and lower portions of the canal and has clinical relevance due to differences in blood supply, nerve innervation, and tissue type.

Above the pectinate line, venous blood is drained by the **superior rectal vein**, a component of the portal circulation. Below the line, drainage occurs via the **inferior rectal vein**, which connects to the systemic venous system. These vascular zones contain hemorrhoidal plexuses—clusters of veins prone to distension under increased pressure, eventually leading to the development of hemorrhoids.

Classification of Hemorrhoids

Hemorrhoids are categorized based on their anatomical location relative to the pectinate line:

- **Internal hemorrhoids** are located above the pectinate line and arise from the **superior hemorrhoidal plexus**. They are lined by mucosa and receive autonomic (visceral) innervation, making them generally painless. Internal hemorrhoids are graded based on the extent of prolapse:
 - *Grade I*: Remain within the anal canal without prolapse
 - *Grade II*: Prolapse during defecation but retract spontaneously
 - *Grade III*: Require manual reduction after prolapse
 - *Grade IV*: Irreducible and may be associated with thrombosis or strangulation
- **External hemorrhoids** develop below the pectinate line from the **inferior hemorrhoidal plexus**. Covered by squamous epithelium and innervated by somatic nerves, they are frequently **painful**, especially when thrombosed or inflamed

Hemorrhoids form due to **abnormally increased pressure** within the hemorrhoidal venous plexuses. This rise in pressure results in venous engorgement, stretching of vascular walls, and weakening of the connective tissue that supports the vascular cushions within the anal canal.

Several factors contribute to this pathological process, including:

- **Frequent straining** during bowel movements (commonly due to constipation)
- **Prolonged sitting**, especially during defecation
- **Pregnancy**, which elevates intra-abdominal pressure and causes venous congestion
- **Advancing age**, which is associated with weakening of supportive connective tissue
- **Obesity and sedentary behavior**, both of which impair venous return
- **Low dietary fiber intake**, leading to hard stools and increased defecation strain

Contemporary understanding also emphasizes that hemorrhoids are not merely swollen veins but result from **degeneration and displacement of normal anal cushions**, which are essential for continence. When these cushions become enlarged and prolapse, symptomatic hemorrhoids develop. The formation of hemorrhoids is closely linked to a variety of lifestyle, physiological, and anatomical contributors. These factors increase venous pressure or weaken the structural support of the anal cushions, thereby promoting hemorrhoid development.

Constipation and Excessive Straining

Chronic constipation is a leading cause of hemorrhoids. When individuals strain to pass hard stools, intra-abdominal and rectal pressures rise sharply, which distends the hemorrhoidal veins. This

repeated strain can damage the surrounding connective tissue, making hemorrhoids more likely to prolapse or thrombose.

Extended Toilet Sitting

Spending excessive time seated on the toilet can increase gravitational pressure on the anal vessels. This position contributes to venous pooling, further enlarging the hemorrhoidal plexuses and leading to symptomatic hemorrhoids.

Diet Low in Fiber

A diet lacking in adequate fiber leads to small, hard, and dry stools. This often results in straining and prolonged defecation, which aggravates the venous structures in the anal region. In contrast, fiber-rich diets promote regular, softer bowel movements that help prevent hemorrhoidal pressure buildup.

Pregnancy and Delivery

Pregnant individuals are at higher risk due to increased abdominal pressure from the growing uterus and hormonal changes that relax vascular walls. Additionally, the physical strain of childbirth—especially vaginal delivery—can trigger or worsen hemorrhoids.

Obesity

Excess body weight, particularly around the abdomen, increases pressure on pelvic and rectal veins. Obesity is also associated with poor bowel habits and a sedentary lifestyle, which further amplifies the risk.

Genetic Tendency

Although less commonly emphasized, some individuals may inherit a predisposition to weaker vascular or connective tissues in the anal region, making them more susceptible to hemorrhoids.

The way hemorrhoids present clinically depends on their type—internal or external—as well as their severity. Symptoms may range from mild discomfort to more severe issues such as pain, bleeding, and swelling, which can interfere with daily life.

Signs of Internal Hemorrhoids

Internal hemorrhoids develop within the rectum and usually do not cause pain because the area is innervated by visceral nerves. However, certain symptoms often occur:

- **Bright red rectal bleeding**, usually noticed on toilet paper or in the toilet bowl after defecation.
- **Mucus discharge**, sometimes leading to skin irritation around the anus.
- **Sensation of incomplete bowel movement**, caused by prolapsed tissue.

- **Prolapse**, where the hemorrhoid pushes through the anus during defecation. In early stages, it may go back on its own, while more advanced cases may require manual repositioning or remain constantly prolapsed.

Signs of External Hemorrhoids

External hemorrhoids form under the skin around the anus and tend to cause more discomfort due to rich sensory nerve supply in this area. Typical symptoms include:

- **Pain**, especially if a blood clot (thrombosis) develops inside the hemorrhoid.
- **Swelling**, often seen or felt as a lump near the anus.
- **Itching or irritation**, caused by stretched skin or hygiene challenges.
- **Bleeding**, though less frequent than with internal types, may still occur if the area becomes irritated.

Possible Complications

When hemorrhoids are not managed properly, they may lead to further problems such as:

- **Thrombosis**, in which a clot forms inside an external hemorrhoid, causing intense pain and swelling.
- **Strangulation**, a condition where a prolapsed hemorrhoid loses blood supply, leading to tissue death if untreated.
- **Chronic blood loss**, which can occasionally result in **anemia** if bleeding continues over time.
- **Secondary infections** or hygiene difficulties due to prolapse or constant moisture.

Impact on Daily Life

Though hemorrhoids are not usually dangerous, their symptoms can be embarrassing, distressing, and disruptive. Pain, discomfort, and bleeding often discourage people from seeking early care, and the social stigma may contribute to delayed diagnosis and worsened outcomes.

Diagnosing hemorrhoids involves a combination of **patient history**, **physical examination**, and sometimes **instrument-based evaluations**. The goal is not only to confirm the presence of hemorrhoids but also to **rule out more serious conditions** such as colorectal cancer or inflammatory bowel disease, especially when rectal bleeding is involved.

The diagnosis of hemorrhoids typically involves gathering the patient's complaints, conducting a physical examination, and, if needed, using instrument-based evaluations. An important aspect is not only identifying hemorrhoids themselves, but also **ruling out more serious conditions**, such as colorectal cancer or inflammatory bowel disease. This is especially crucial when **rectal bleeding** is present.

The first step is for the physician to obtain a detailed medical history (anamnesis). This includes asking about the nature of the bleeding (for example, whether it is bright red and appears on toilet paper or in the toilet bowl), the location and duration of pain, the presence of discharge (mucus),

itching, or swelling, and bowel habits, such as constipation and straining during defecation. The doctor will also ask about any personal or family history of gastrointestinal diseases, particularly colorectal cancer or inflammatory bowel diseases. If the patient has unexplained weight loss, changes in stool appearance, or persistent bleeding, further in-depth investigations are required.

Next, a **physical examination** is performed. The initial step is visual inspection of the external anal area — this can reveal **external hemorrhoids**, skin tags, signs of **thrombosis**, or **prolapsed internal hemorrhoids**. After that, a **digital rectal examination** is conducted by inserting a lubricated, gloved finger into the rectum. This helps assess internal swelling, tenderness, masses, or muscle tone. If necessary, **anoscopy** is used — a small plastic or metal instrument that allows direct visualization of the inner anal canal to assess and grade **internal hemorrhoids**.

If the patient's symptoms are unusual, persistent, or the patient is over 50 years old, **advanced diagnostic tools** may be employed. **Proctoscopy** allows for a deeper examination of the rectum, while **sigmoidoscopy** or **colonoscopy** enables full evaluation of the large intestine. These procedures are essential in cases of suspicious bleeding, tumors, or inflammatory diseases.

Additionally, the physician must distinguish hemorrhoids from other conditions such as **anal fissures** (which typically cause sharp pain and bleeding during defecation), **anal abscesses or fistulas** (which present with fever and purulent discharge), **rectal polyps or tumors**, and inflammatory bowel diseases such as **Crohn's disease** or **ulcerative colitis**. Conditions like **proctitis** or **rectal prolapse** must also be considered during differential diagnosis.

A correct and thorough diagnosis is essential for prescribing appropriate treatment and, more importantly, for early detection of potentially serious diseases. In the case of hemorrhoids, diagnosis not only facilitates treatment but also plays a key role in preventive healthcare.

Management Strategies

The treatment of hemorrhoids depends on their type, severity, and how much they affect the patient's quality of life. In most cases, good results can be achieved with conservative methods, but sometimes outpatient procedures or surgical intervention may be necessary. The most effective approach is often a step-by-step and individualized treatment plan.

In the early stages, especially for **Grade I and II internal hemorrhoids** or small external hemorrhoids, **conservative (non-surgical) methods** are recommended. This type of treatment begins with lifestyle and dietary changes. Including fiber-rich foods in the diet (such as fruits, vegetables, and whole grains) helps soften stools and facilitate easier bowel movements. Drinking enough water each day (at least 6–8 glasses) supports healthy bowel function. Avoiding prolonged sitting on the toilet and straining during defecation reduces pressure on the rectal veins. Maintaining regular physical activity is also beneficial. Losing excess weight can reduce pressure on the pelvic veins.

In addition, various medications and topical treatments are used to relieve symptoms. Local anesthetic creams such as lidocaine help reduce pain, while steroid-based suppositories and ointments reduce inflammation. Barrier creams, such as zinc oxide or petroleum jelly, help relieve itching and irritation.

Soaking the perianal area in warm water for 10–15 minutes several times a day (sitz baths) can also reduce pain and swelling.

If symptoms persist despite conservative measures, **minimally invasive outpatient procedures** may be used. One of the most common of these is **rubber band ligation**, where a small elastic band is placed around the base of an internal hemorrhoid to cut off blood flow. Within a few days, the hemorrhoid shrinks and falls off. This method is effective for **Grade II–III internal hemorrhoids**.

Sclerotherapy involves injecting a chemical solution into the hemorrhoid, which causes it to shrink and scar. This is a painless and simple procedure. In **infrared coagulation**, thermal energy is applied to the hemorrhoid to cause tissue death — suitable for smaller internal hemorrhoids. **Electrotherapy** or **bipolar cauterization** uses electrical current to burn and shrink the hemorrhoidal tissue. These procedures are done in clinics and do not require hospital admission.

If the above methods are ineffective, or if the hemorrhoid is large, painful, or prolapsed, **surgical treatment** may be necessary. The most common surgical procedure is **hemorrhoidectomy**, where the hemorrhoidal tissue is surgically removed. While highly effective, this method can involve longer recovery and more postoperative discomfort. Another technique is **stapled hemorrhoidopexy (PPH)**, in which a special stapling device is used to lift and fix the prolapsed internal hemorrhoids back into the rectum. This method causes less pain and allows faster recovery than traditional surgery. Additionally, in cases of **thrombosed external hemorrhoids**, a minor incision can be made under local anesthesia to remove the clot (thrombectomy) — this is most effective if performed within 72 hours of onset.

Every patient's treatment plan should be tailored based on the **grade of hemorrhoids**, **severity of symptoms**, and **individual preferences**. Collaboration among family physicians, gastroenterologists, and colorectal surgeons ensures comprehensive and effective care.

Importance in Modern Medicine

Although hemorrhoids may appear to be a minor health issue, they hold significant importance in modern medical practice due to their high prevalence, their impact on patients' quality of life, and their role in identifying more serious diseases. As the field of medicine increasingly emphasizes prevention and minimally invasive treatments, the management of hemorrhoids reflects many of the core priorities of contemporary healthcare systems.

Hemorrhoids are one of the most frequently encountered anorectal disorders worldwide. Epidemiological studies indicate that a large proportion of adults—particularly those over the age of 50—experience hemorrhoidal symptoms at some point in their lives. These symptoms, which may include pain, bleeding, and discomfort, can lead to decreased work performance, absenteeism, and diminished overall well-being. Despite their common nature, many individuals delay seeking treatment due to social stigma or embarrassment, which may lead to worsening of the condition and increased pressure on healthcare services.

In addition to their impact on comfort and daily function, hemorrhoids are clinically significant because they can mimic symptoms of more serious diseases. Rectal bleeding, one of the main

symptoms of hemorrhoids, is also a potential sign of conditions such as colorectal cancer or inflammatory bowel disease. For this reason, every case of rectal bleeding must be carefully evaluated by healthcare providers. A thorough assessment of hemorrhoidal complaints not only aids in appropriate treatment but also plays a crucial role in the early diagnosis and prevention of life-threatening conditions.

Advancements in medical technology have transformed the treatment landscape for hemorrhoids. Minimally invasive methods such as rubber band ligation, infrared coagulation, and laser therapy have become widely available. These procedures are generally safe, quick, and require minimal recovery time, making them ideal for outpatient care. The shift from invasive surgeries to simpler techniques demonstrates how hemorrhoid management is adapting to modern standards of patient-centered and efficient care.

Moreover, hemorrhoids underscore the importance of preventive medicine. A majority of cases can be avoided by adopting healthier lifestyle habits, including increasing dietary fiber intake, maintaining proper hydration, exercising regularly, and avoiding prolonged straining during defecation. Patient education in these areas supports broader public health goals aimed at reducing the burden of preventable diseases.

Lastly, the diagnosis and management of hemorrhoids involve various healthcare professionals — from general practitioners and gastroenterologists to colorectal surgeons and pharmacists. This multidisciplinary involvement highlights how, despite their seeming simplicity, hemorrhoids represent a common concern across the medical spectrum and demand coordinated, effective care.

Recent Advances

In recent years, the treatment of hemorrhoids has significantly improved due to advances in medical technology and a growing emphasis on minimally invasive care. These innovations have made hemorrhoid management more effective, less painful, and more compatible with outpatient treatment environments. Patients now benefit from faster recovery times, reduced complications, and procedures that do not require hospitalization.

One of the notable techniques is **Doppler-Guided Hemorrhoidal Artery Ligation (DGHAL)**. This method involves the use of a Doppler ultrasound probe to identify the arteries supplying blood to internal hemorrhoids. Once located, these arteries are tied off, which decreases blood flow and leads to natural shrinkage of the hemorrhoids. This approach is associated with minimal pain and a rapid recovery period, making it a suitable option for moderate hemorrhoid cases.

Another modern innovation is **laser therapy**, where focused laser energy is applied to hemorrhoidal tissue to shrink and seal it without significant bleeding. Compared to traditional surgical methods, laser therapy causes less postoperative discomfort and allows patients to return to their normal routines much sooner. This procedure is particularly effective for patients who wish to avoid the longer recovery times associated with conventional surgery.

Stapled Hemorrhoidopexy (also known as Procedure for Prolapse and Hemorrhoids or PPH) is a surgical technique designed to address prolapsed internal hemorrhoids. A circular stapling device is

used to reposition the hemorrhoidal tissue back into the rectum and secure it in place. By avoiding incisions in the sensitive perianal area, this procedure reduces pain significantly and is becoming increasingly popular for managing advanced internal hemorrhoids.

In addition to these surgical innovations, there has also been a widespread expansion in the use of **minimally invasive outpatient procedures**. Clinics now frequently offer treatments such as **rubber band ligation**, **infrared coagulation**, and **sclerotherapy**. These procedures are quick, low-risk, and typically require no anesthesia or hospital stay. Their availability has greatly reduced the need for surgical intervention in many cases, offering patients a more convenient and efficient treatment pathway.

These recent advances in hemorrhoid management represent a broader shift in medicine toward patient-friendly, efficient, and technology-driven care. They not only improve treatment outcomes but also enhance the patient experience by minimizing discomfort and disruption to daily life.

Conclusion

Hemorrhoids remain one of the most common and impactful anorectal conditions seen in healthcare today. While they are rarely life-threatening, their symptoms—ranging from discomfort to bleeding—can significantly affect a person's quality of life and require proper medical attention. A clear understanding of their **anatomy, risk factors, and symptoms** is essential for early detection and effective management. Thanks to advances in **minimally invasive procedures** and growing awareness about **preventive care**, treatment has become more accessible and patient-friendly than ever before. Beyond clinical management, hemorrhoids also highlight broader issues in modern medicine—such as the importance of **healthy lifestyle habits, early screening, and interdisciplinary care**. Whether through diet, education, or procedural innovation, the approach to hemorrhoids reflects the evolving goals of today's healthcare: prevention, precision, and improved quality of life for every patient.

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