Hemorrhoids

Key Concepts

- Hemorrhoids represent a sizeable source of patient morbidity, with a broad array of associated symptoms.
- Knowledge of anorectal and hemorrhoid anatomy is critical to selecting the appropriate treatment.
- **Minimizing straining, improving hydration, and increasing fiber intake** are the first step for patients with symptomatic hemorrhoids.
- Most office procedures are best suited for symptomatic grade I–III internal hemorrhoids **or** thrombosed external hemorrhoids.
- One's armamentarium should include a variety of techniques for symptomatic hemorrhoids to optimize outcomes and provide individualized therapy.
- Complications of hemorrhoid surgery include **urinary retention, bleeding, infection, stenosis, incontinence, and recurrence.**
- Special considerations include pregnant patients, as well as those with Crohn's disease, immunocompromise, or portal hypertension.

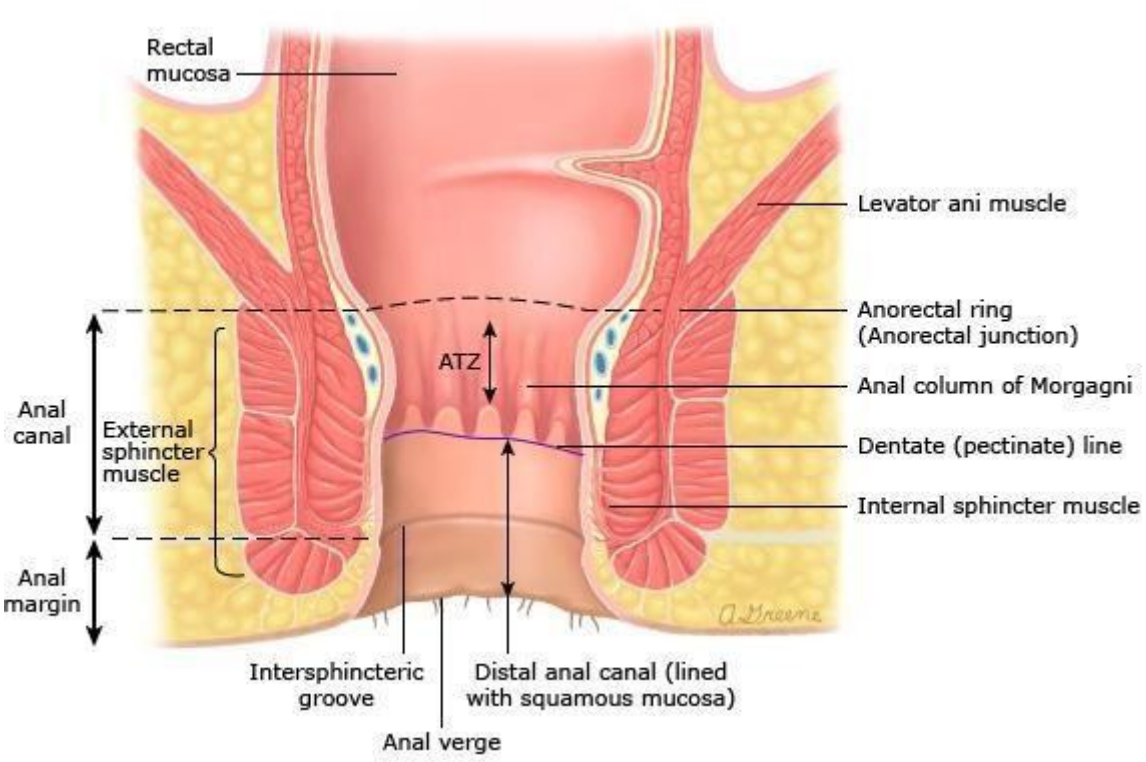
Introduction

Hemorrhoids: blood to ooze (Haem: blood Rhoos: flowing)
Piles: a ball or mass

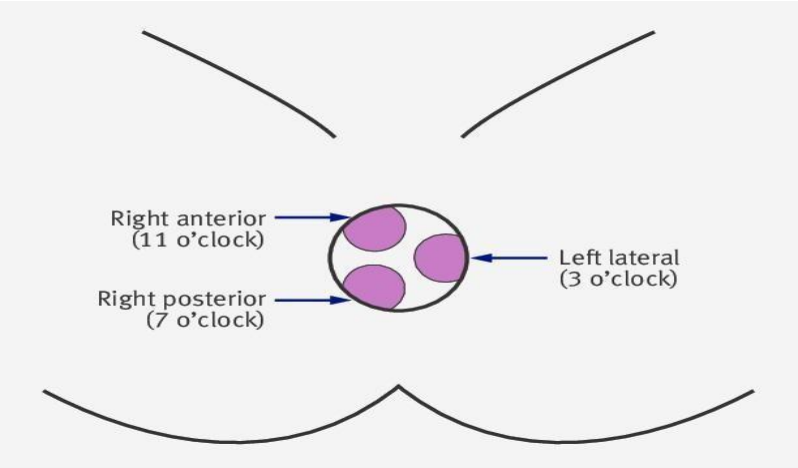
- Hemorrhoidal disease estimated to affect **4%** of the US population, usually underestimated due to limitations in diagnosis and under-reporting of symptoms to health care providers.
- It accounts for over **three million outpatient office visits** per year, at an estimated cost of over 770 million dollars.
- Hemorrhoids symptoms affect men and women with **equal** frequency, with the highest incidence **between age 45 and 65**.

Anatomy

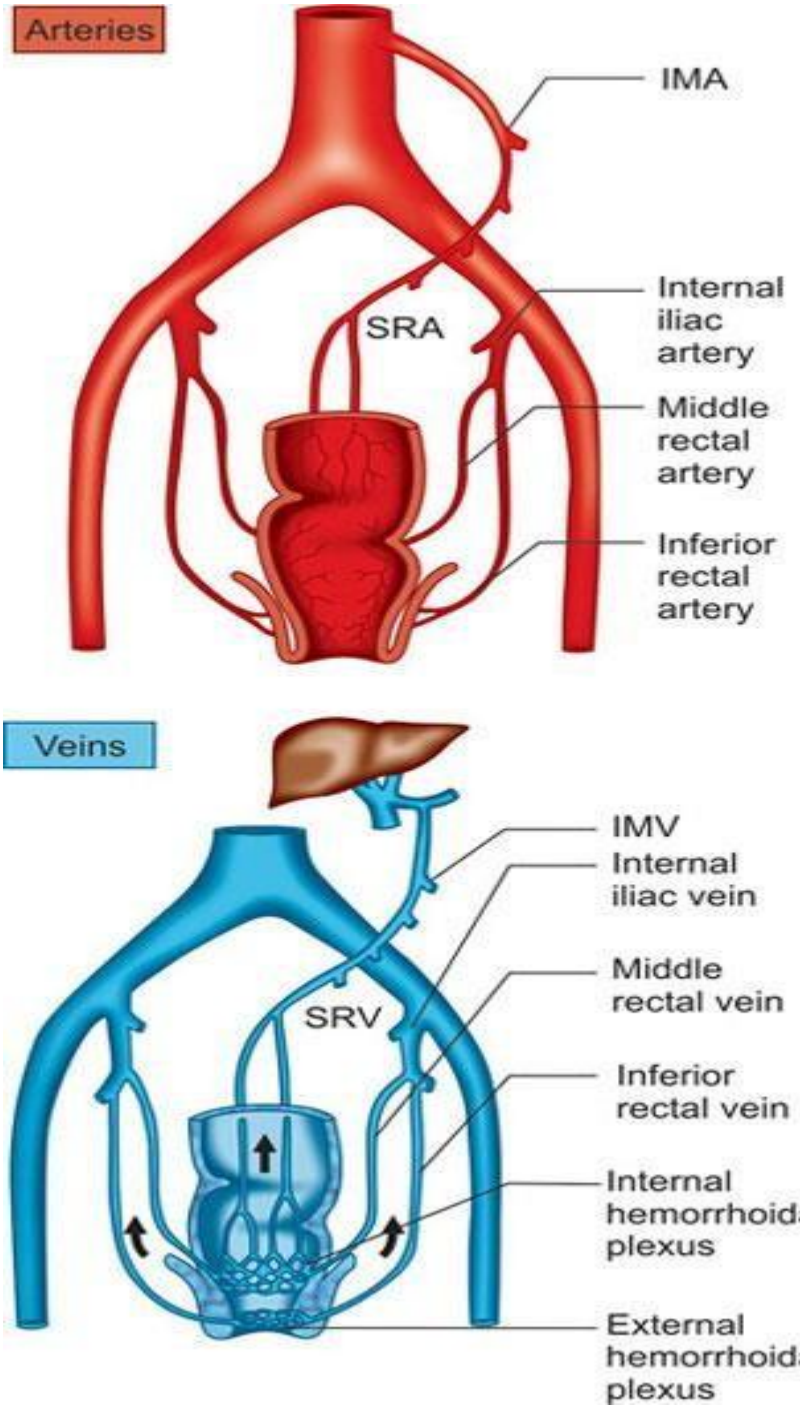
- **Anal canal:** proximal to dentate.
- **Anal margin:** between dentate line and anal verge.
- **Dentate line:** transition from columnar to stratified squamous epithelium.
- **Arterial supply**: inferior rectal artery.
- **Venous drainage:**
    - **Above dentate:** internal haemarroidal plexus
    - **Below:** external haemarroidal plexus



- Hemorrhoids are part of normal human anatomy. They are arteriovenous structures that lie in the submucosal layer within the anal canal. It can be **mucosal (elderly)** or **vascular (young)** type.
- Their three **primary locations (left lateral, right anterior, right posterior)**



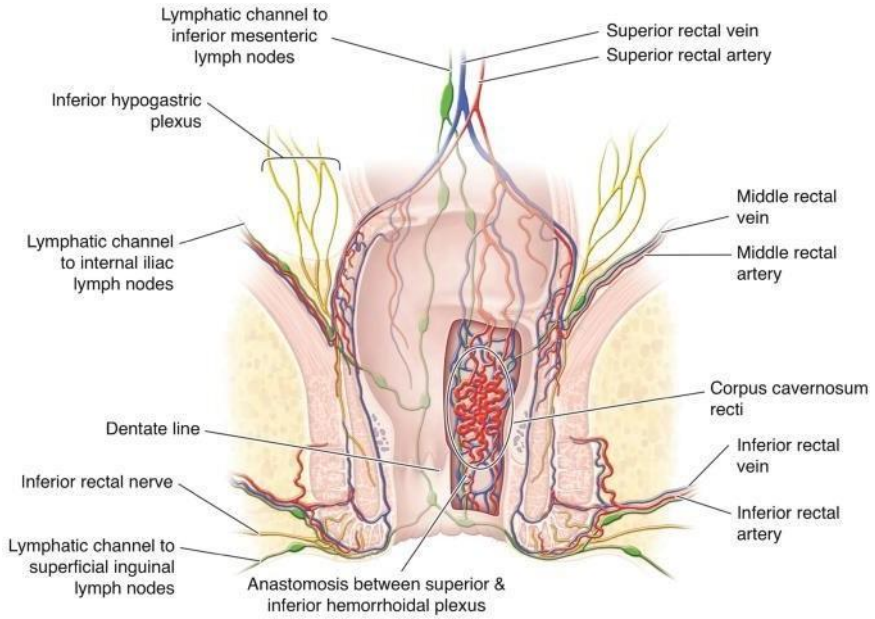
- Arterial inflow from the terminal branches of the **superior** hemorrhoidal and **middle** hemorrhoidal arteries.
- Venous outflow is from the **superior, middle, and inferior** hemorrhoidal veins, which drain into the internal pudendal vein and then the inferior vena cava.


Arteries
IMA
Internal iliac artery
SRA
Middle rectal artery
Inferior rectal artery
Veins
IMV
Internal iliac vein
Middle rectal vein
SRV
Inferior rectal vein
Internal hemorrhoidal plexus
External hemorrhoidal plexus

- Hemorrhoids are found above and below the dentate line and have **three** important components:

1. The lining (mucosa or anoderm).
2. The stroma (blood vessels surrounded by connective tissue).
3. anchoring connective tissue that secures the hemorrhoids to the internal sphincter and conjoined longitudinal muscle.

- (Anal cushions are **aggregation** of blood vessels (arterioles, venules) smooth muscle and elastic connective tissue in the **submucosa**).
- While it has been previously stated that the terminal branches of the superior hemorrhoidal artery end in the right anterior, right posterior, and left lateral positions of the anal canal. **This has been disputed**.
- At the level of the hemorrhoidal cushion, arteriovenous anastomosis (A-V shunts) exists in a complex vascular network termed the "**corpus cavernosum recti**." This vascular network with an arterial blood supply is why pulsatile bleeding can be seen at the time of hemorrhoidectomy.



Classification and grading:

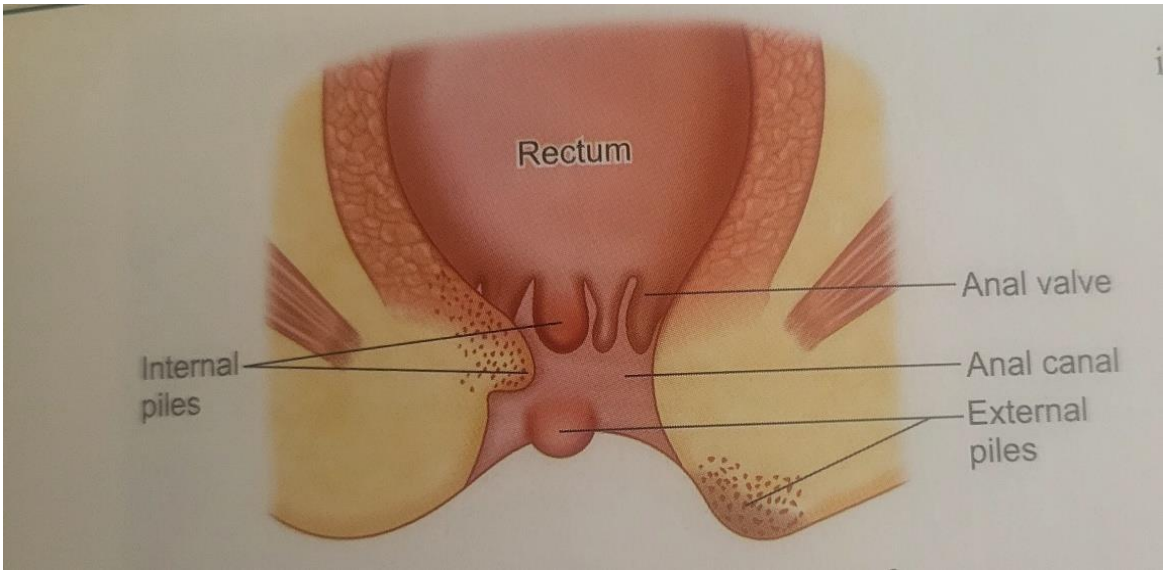
- Hemorrhoids classified as either **internal** or **external** based on their anatomic relationship to the dentate line. (mixed contains both)

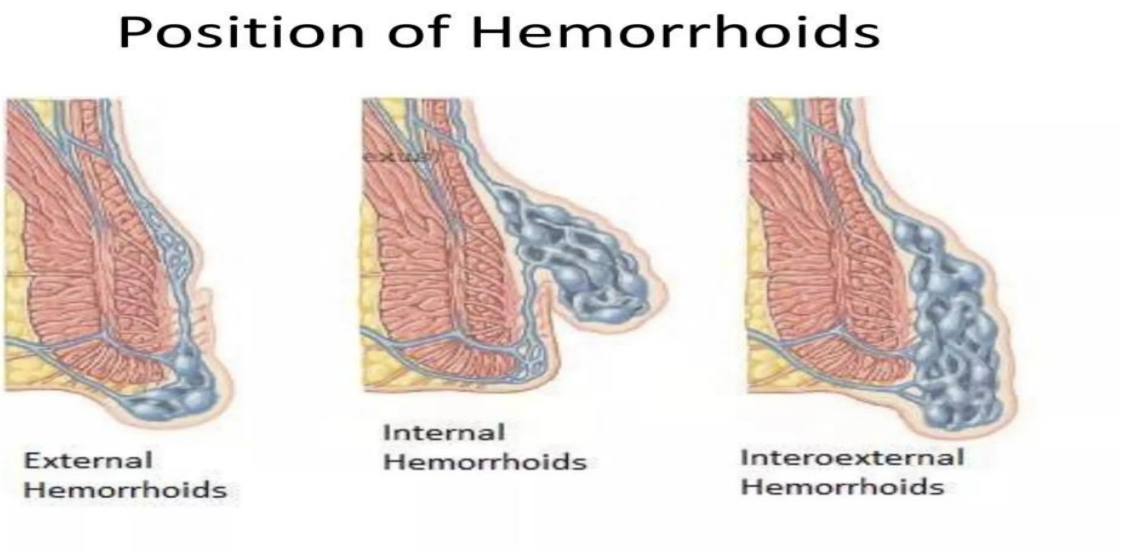
Internal hemorrhoids

- Proximal to the dentate line.
- have overlying columnar mucosa covered with mucus membrane.
- have visceral innervation and thus are sensitive to **pressure** but not **pain** or **temperature**.

External hemorrhoid

- “5-day painful, self-curing lesion”.
- Distal to dentate line.
- Have overlying modified squamous epithelium (anoderm).
  Covered with skin
    - Have somatic innervation and are exquisitely sensitive to pain and temperature.
    - They are not true hemorrhoids and usually recognized because of complications.

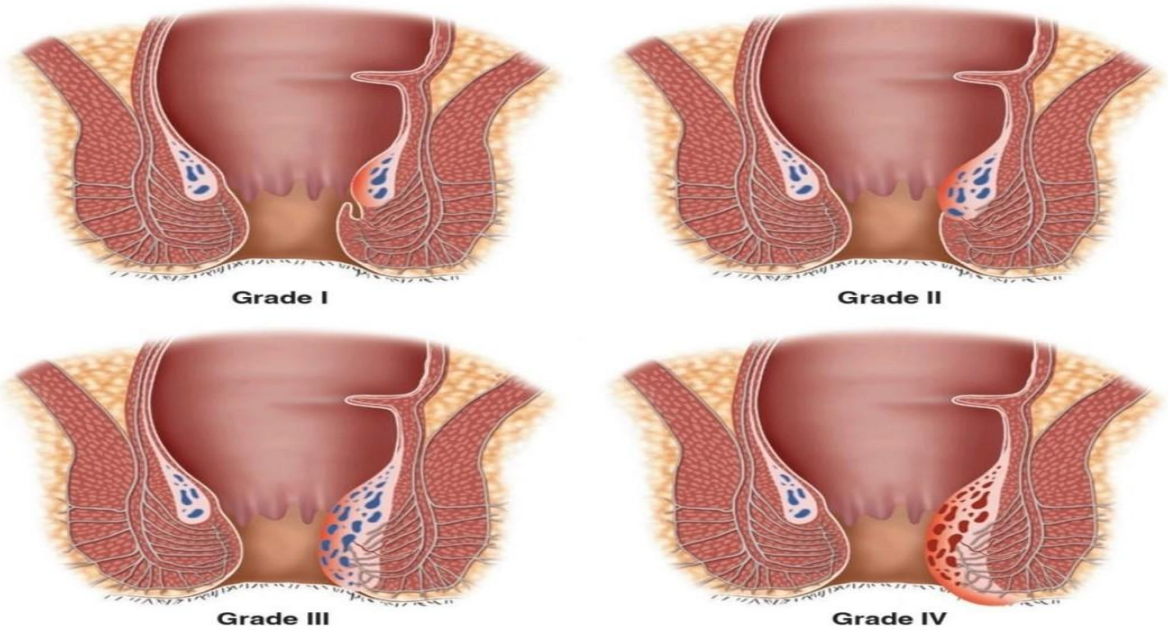




Primary vs secondary

- **Primarily:** 3,7,11 o'clock positions**.**
- **Secondary:**
  - One which occurs **between the primary sites.**
  - May be seen between the main bile masses in which case they are internal hemorrhoid at the secondary position.
  - As a result of specific conditions.
- **Local**: Anorectal deformity, Hypotonic anal sphincter
  Abdominal Ascites
- **Pelvic**: Gravid uterus, Uterine neoplasm, bladder carcinoma, ovarian neoplasm
- **Neurological**: Paraplegia, Multiple sclerosis

- **Internal hemorrhoids** are graded based on the degree of prominence and prolapse
- **Grade I hemorrhoids** are visibly engorged but do not prolapse below the dentate line.
- **Grade II hemorrhoids** prolapse below the dentate on Valsalva or defecation but spontaneously reduce.
- **Grade III hemorrhoids** prolapse but require manual reduction.
- **Grade IV hemorrhoids** are prolapsed and not reducible.

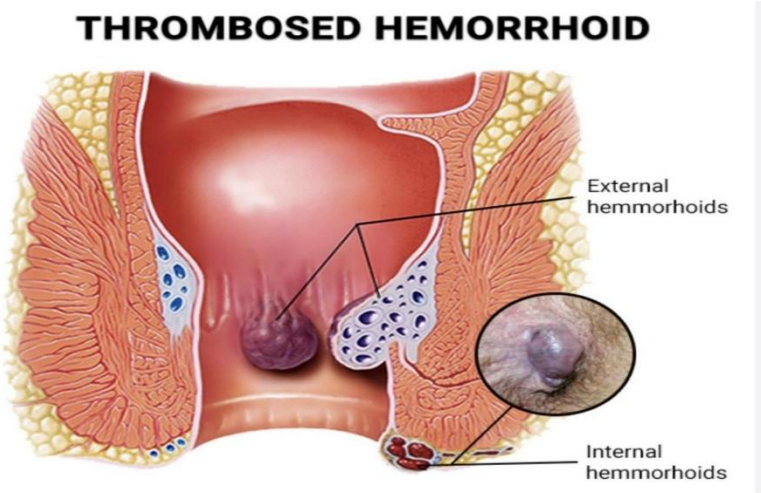


Strangulated hemorrhoids

- Hemorrhoids which are grade IV that have become edematous to the point of compromised blood supply, leading to necrosis or gangrene in extreme cases.

Thrombosed hemorrhoids

- They are typically **external** and **contain a clot** under pressure, causing them to have a rounded, bluish appearance.



Skin tags

- are somewhat **synonymous** with external hemorrhoids, they are typically considered those that are less engorged and bluish in color and are characterized by redundant anoderm.
- Often a skin tag will develop **after a thrombosed hemorrhoid** has fully resolved and the clot has been absorbed.

Etiology

- Only about 40% of those with enlarged hemorrhoids are symptomatic.
- Symptomatic hemorrhoids are more common in individuals from **higher** socioeconomic backgrounds and in **whites.**
- Hemorrhoids contribute to up to 20% of baseline continence, acting as a **passive buttress** to block seepage of stool, and they also engorge on Valsalva and thus potentiate their effect.
- This may have important implications on patients' bowel function after hemorrhoid procedures, particularly individuals who have marginal continence.

Multiple theories

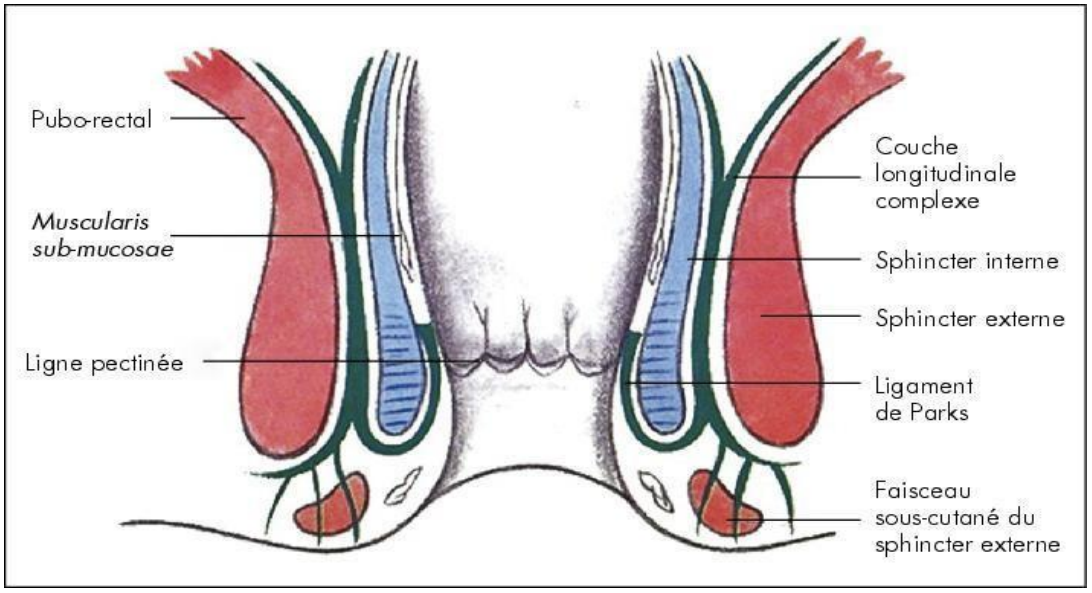
- **Straining** is felt to be a major contributor, most commonly straining with defecation as is typically met with **constipation**, due to either hard stools or pelvic outlet dysfunction.
- **Weightlifters, COPD or chronic cough**
- Compared to a more natural "squatting" position, the typical **Western commode** requires its users to strain in an unnatural fashion to defecate and may be a **contributor** to hemorrhoid pathology.
- **impaired venous return.**
- **pregnancy or pelvic outlet dysfunction.**

Morphology

- Veins in the lower rectum are in **loose submucosal** plane but above inter a stronger muscular layer.
- Superior rectal vein **has no valves** (tributaries of portal vein).

On a tissue level:

- Matrix **metalloproteinases**, vascular endothelial growth factor (**VEGF),** and **nitric oxide synthase** have all been shown to be associated with hemorrhoidal disease.
- In addition to vessel engorgement, neovascularization may also play a key role.
- Present concept is weakening of **Park's ligament** which is the lower end of the external sphincter.



Clinical Presentation
Internal hemorrhoids

- The most common symptoms are **bleeding, pain, and tissue protrusion.**
- Painless bleeding with bowel movements accompanied by intermittent protrusion of tissue from the anal canal are the classic symptoms of enlarged internal hemorrhoids.
- The bleeding is usually **bright red** and is commonly described as on the toilet tissue, dripping, or even squirting into the toilet water. (**streak on toilet paper** after wiping / **splash in pan).**
- Other common symptoms of internal hemorrhoids include **rectal pressure, mucus discharge, and soiling** of undergarments with stool seepage.
- Although it can appear significant to patients, bleeding from hemorrhoids is **rarely the cause of anemia**, although possible with chronic substantial blood loss.
- Pain is **not typically** associated with internal hemorrhoids unless they are **prolapsed and strangulated**, which is not a subtle finding.
- The presence of pain should prompt the clinician to question the diagnosis of other **perianal processes**, such as thrombosed external hemorrhoids, anal fissure, or abscess.

External hemorrhoids

- Common symptoms include **itching, irritation, perianal moisture, and difficulty with hygiene.**
- External hemorrhoids **do not cause pain unless thrombosis is present.**
- **Thrombosis:** a **firm** nodule that has a **blue** or purple tinge is visible and palpable at the anal orifice.
- These may be **nontender or painful**, and the contained clot can erode through the overlying stretched skin.
- **Spontaneous resolution** of thrombosed external hemorrhoids often **leaves** a skin tag.

- These may reduce in size over time but typically **do not regress completely** and may be associated with symptoms such as itching and difficulty cleansing the region.

Diagnosis

- **History and physical exam** are essential in correctly identifying hemorrhoidal disease and excluding the many other benign and malignant conditions that must be considered.

History

- The diagnosis of hemorrhoidal disease is almost always a clinical one and should start with a medical history, with great care taken to identify associated symptoms and risk factors.
- Focus should be on the extent, **severity**, and **duration** of symptoms such as bleeding and extent of prolapse, issues of perineal hygiene, and presence or absence of pain.
- A careful review of fiber intake and bowel habits, including **frequency, consistency, and ease of evacuation**, should also be performed.
- Additionally, acute changes in bowel habits associated with bleeding may signify a more ominous cause, such as **inflammatory bowel disease or neoplasm**.

Causes for bleeding per anum	
Piles	Carcinoma rectum
Fissure-in-ano	Carcinoma colon
Polyps	Diverticulitis
Ulcerative colitis	Intussusception
Amoebic colitis	Vascular anomaly of the colorectum
Fistula-in-ano	Mesenteric ischaemia

- All patients should be asked about other factors that are related to development of hemorrhoidal disease such as **chronic heavy lifting or chronic cough from asthma or chronic obstructive pulmonary disease**, or unusual toileting behavior such as withholding or limited access to bathroom facilities.
- Specific note should be made of **anticoagulant use, fecal incontinence symptoms, previous anorectal surgery, obstetric history, and history of radiation to the pelvis**, because these may affect management decisions.

Physical examination

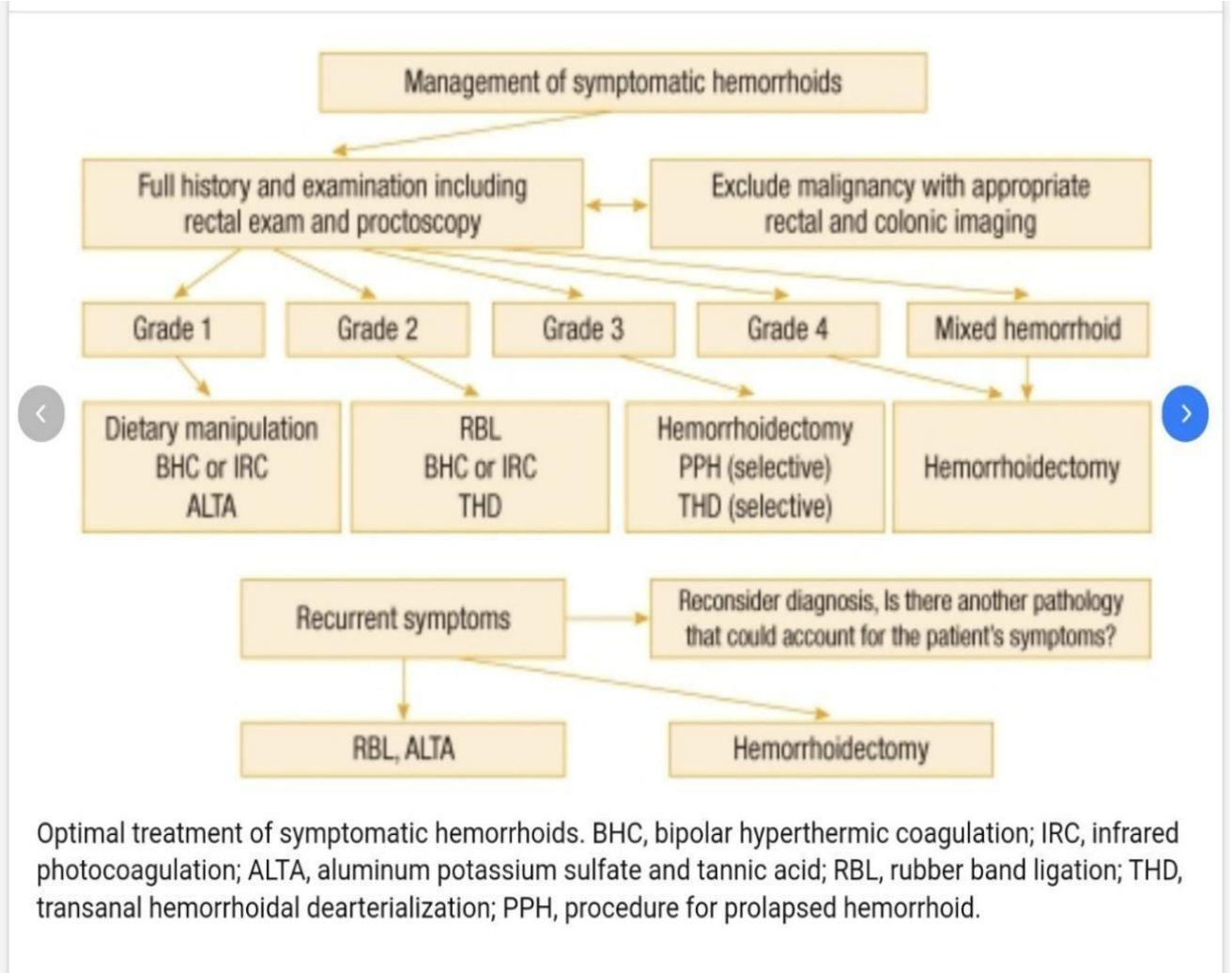
- can be done in the **prone or lateral decubitus position.**
- Findings should be noted in **anteroposterior and right–left terms** and documented as such.
- The examination begins with inspection of the **gluteal cleft** and then, with gentle retraction of the buttocks, inspection of the **perianal area and perineum**.
- Prolapsed hemorrhoids can be noted by inspection.
- The skin is inspected for findings such as external hemorrhoids, skin tags, condyloma, skin breakdown, fistulous.
- Openings, fissures, erythema, scars, masses, and any gape of the anus at rest.
- Digital rectal examination should evaluate for other anal pathology and sphincter integrity.
- Can't be palpated, only thrombosed pile can be felt.
- **Anoscopy** should be performed to assess the anatomy.
- **Internal hemorrhoids**, located above the dentate line, should be assigned a grade, which will help guide therapy.
- In addition, an evaluation of the patient while straining on the commode will assist in the diagnosis of hemorrhoid prolapse, as well as exclude full-thickness rectal prolapse.
- What should be **documented**:

Number, degree, size, appearance, surface, chronicity

Laboratory or radiographic studies

- **Are not typically required** for diagnostic purposes.
- Although **hemorrhoids are the most common reason for hematochezia**, other disease processes, such as colorectal cancer or polyps, inflammatory bowel disease, other colitis, diverticular disease, and angiodysplasia, can also precipitate bleeding.
- While the majority of patients with hematochezia will not have colorectal cancer, **rectal bleeding attributed to hemorrhoids represents the most common missed opportunity to show a cancer diagnosis.**
- Any patient **with age greater than 45**, or with a **change in bowel habits, anemia, weight loss**, or those with a **family history of colorectal cancer** or suggestive of **hereditary nonpolyposis colorectal cancer or Lynch syndrome, should be further examined with colonoscopy.**

Treatment



Optimal treatment of symptomatic hemorrhoids. BHC, bipolar hyperthermic coagulation; IRC, infrared photocoagulation; ALTA, aluminum potassium sulfate and tannic acid; RBL, rubber band ligation; THD, transanal hemorrhoidal dearterialization; PPH, procedure for prolapsed hemorrhoid.

Treatment

-preventive: diet, laxative-

-Therapy :

Medical: Diet, sitz bath, local, oral drugs

Parasurgical: Sclerotherapy, banding, cryotherapy, IRC, Laser surgery, DGHAL

Surgery: open, closed, Semi open, stapled, stretching,

- Patients generally seek treatment for hemorrhoids once they **experience symptoms**.
- Simple non-procedural strategies are the first-line approach Unless patients are presented in an acute fashion with heavy bleeding, thrombosis, or strangulation.

- A first trial of conservative management is typically employed for a period **of 6–8 weeks**.
- at which point in-office reassessment is warranted, to determine response to treatment and decide whether further interventions are needed

Medical Management

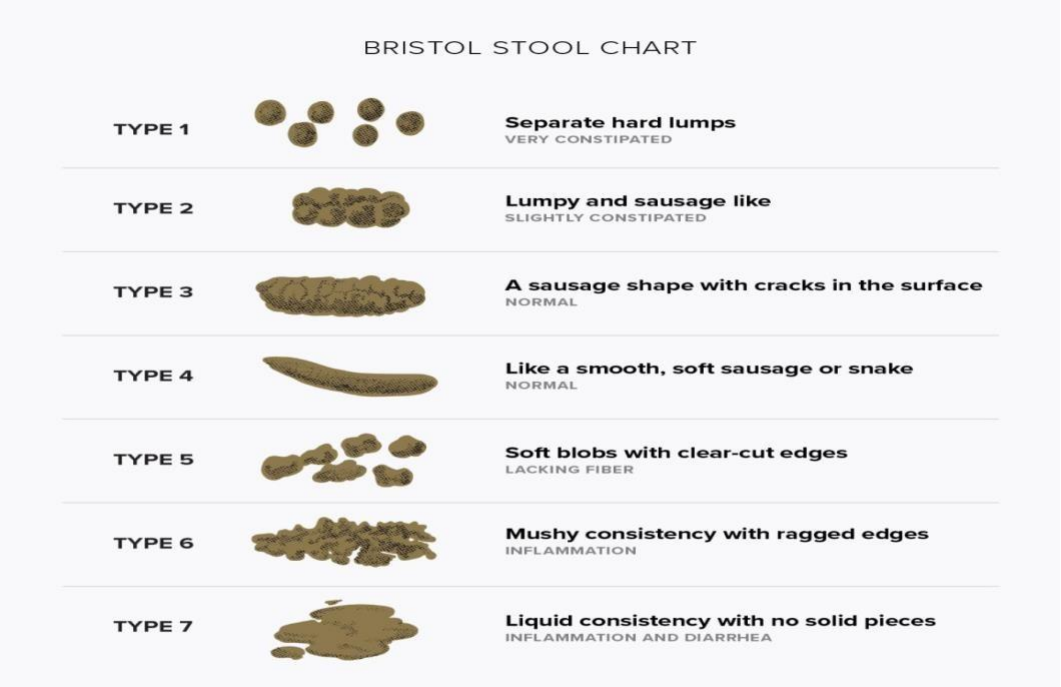
Stool Habits

- Patients should be encouraged to maintain stooling habits that promote a healthy anal canal by minimizing pressure and strain on the hemorrhoids.
- patients should be educated to avoid sitting on the toilet for prolonged periods of time (**discourage reading on the toilet!**).
  The act of defecation should not take more than just a few minutes; if an attempt is unproductive, the patient should get up and try again later when the urge returns.

  "**You don't defecate in the library so You shouldn't read in the Bathroom."**
- A **foot stool** will promote a more natural "squatting" position and may help those who endorse straining, or those with a component of pelvic outlet dysfunction constipation.

Stool Texture

- Critical to alleviating hemorrhoid symptoms is improving the texture of the stool, with the goal of having **soft, yet formed stools with adequate bulk.**

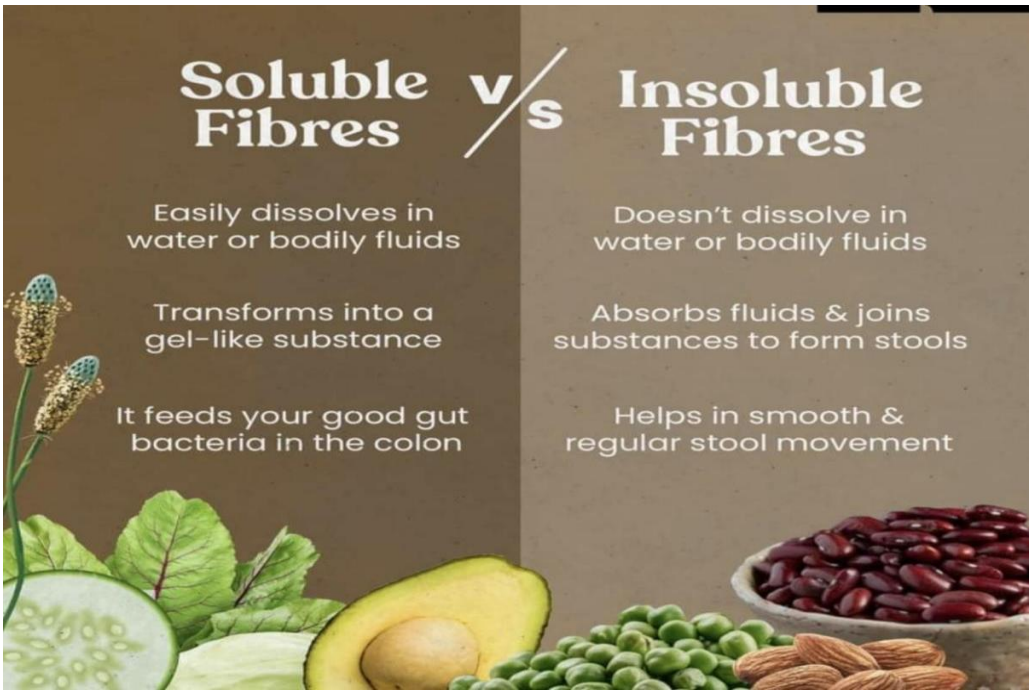


- Fiber acts as a "**sponge**" and prevents stool from becoming overly hard or loose depending on dietary variation or occasional indiscretions.
- This can be accomplished by supplementing the diet with **soluble** fiber, with a goal of **25–50** grams daily.
- Commercially available fiber supplements include psyllium, methylcellulose, and calcium polycarbophil.

- **Hard stool** causes straining and puts pressure on the hemorrhoids, whereas **loose stool** can be highly irritating, and frequent defecation can cause symptoms to escalate.
- **Fiber works best** when water intake is increased to at least 64 ounces (**~2L)**, with more being needed for warmer climates or significant physical activity.
- For some patients, **prebiotics and probiotics** are an adjunct to maintain colon health and stool texture.

***Probiotics** are foods or supplements that contain live **microorganisms** intended to **maintain or improve** the "good" bacteria (normal microflora) in the body.

***Prebiotics** are foods (typically **high-fiber foods**) that act as **food** for human microflora.



- Those with severe chronic constipation may require stool softeners or laxatives to correct their stool texture, and those with chronic loose stools despite fiber supplementation may require antidiarrheals; however, these medications should not be first line in most circumstances.

Hygiene

- soaking in the **bathtub**, or in a **sitz bath**, is soothing to the hemorrhoids, allows for **relaxation of the pelvic floor**, can facilitate reduction of tissue prolapse, and **decrease edema**.
- Soaks can be performed at **15-minute intervals** in warm water for symptomatic relief, without the need for salts or emollients, which may cause irritation.

Topical Therapies

- **Generally**, patients present for in-office evaluation for hemorrhoids because over-the-counter remedies have already failed.
- There are **no quality data** to support the use of commercially available topical therapies (creams, wipes) and suppositories; however, if the patient reports a perceived benefit, it is generally acceptable to continue their use, given the overall low side-effect profile of these preparations.
- Most common topical products contain topical anesthetics such as **lidocaine**, **steroids** such as hydrocortisone, and/or pramoxine, which is an anti-inflammatory.
- Daily use of topicals **beyond 7 days** may lead to dermatitis and exacerbate symptoms.
- Formulations containing steroids also should not be used for more **than 7** days as they can lead to thinning of the delicate anoderm.
- **Warm or cold packs** can also provide symptomatic relief.

Oral Therapies

- NSAIDs may help relieve discomfort and reduce inflammation.
- **Phlebotonics** represent a class of **oral plant-derived flavonoids** and synthetic drugs that were originally intended for chronic venous disease and are currently used for hemorrhoidal disease predominantly in Europe and Asia, as they are not approved by the Federal Drug Administration for use in the United States.
- Phlebotonics have been shown to **decrease hemorrhoid** symptoms through multiple effects, including reducing inflammation and increasing vascular tone.
- Multiple studies and meta-analyses have demonstrated modest benefit its in reducing symptoms of pruritis and bleeding and also may be used in the post-operative setting.

Office-Based Procedures

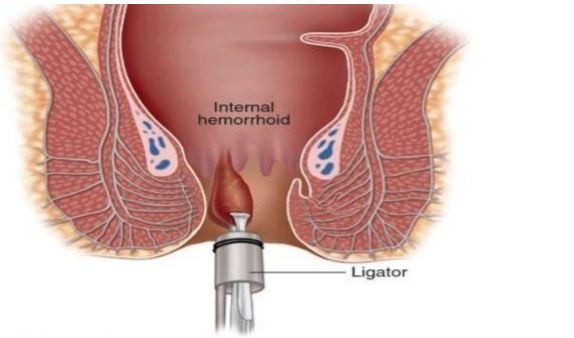
- With proper patient selection, office-based procedures for hemorrhoids can be fast, economical, effective, and low risk.
- Outcomes are optimized when patients also utilize the conservative strategies mentioned above.
- It is important to take a thorough history, paying particular note to use of anticoagulants and bleeding disorders.

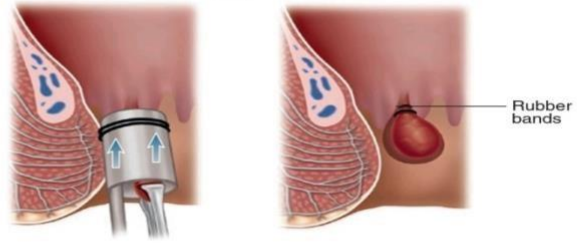
Internal Hemorrhoids

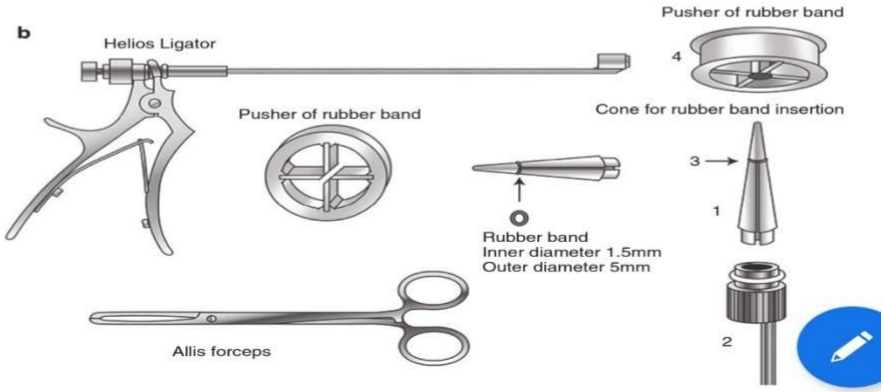
- Multiple techniques exist for safe in-office treatment of symptomatic internal hemorrhoids, including:
  - **Rubber band ligation (RBL)**
  - **Infrared photocoagulation (IRC)**
  - **Bipolar diathermy**
  - **Sclerotherapy**
- Patients with grade I–II and some grade III hemorrhoids with symptoms of bleeding are ideal **candidates** for office procedures.
- Those with large prolapsing grade III hemorrhoids primarily with associated symptoms of tissue prolapse may need a **surgical approach, or an attempt at conservative measures to downgrade** them before attempting an office procedure.
- The techniques described below can all be done in either left lateral decubitus or prone position, based on surgeon preference, and involve instrumentation through an anoscope.
- Patients who **cannot tolerate** anoscopy in the office are therefore **not** suitable candidates for these procedures.

Rubber band ligation

- involves placement of a rubber band on the redundant mucosa of the hemorrhoid column **above** the dentate line (2cm upove).

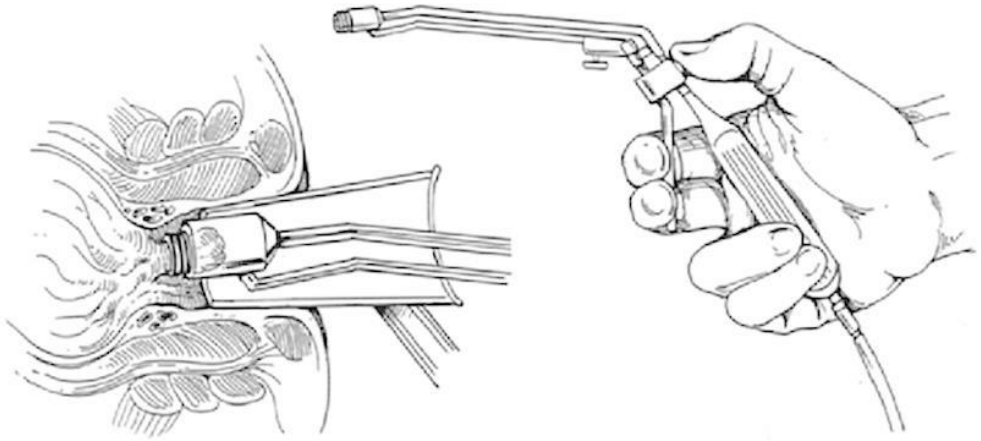

Internal hemorrhoid
Ligator


Rubber bands


b
Helios Ligator
Pusher of rubber band
Pusher of rubber band
4
Cone for rubber band insertion
3
1
Rubber band
Inner diameter 1.5mm
Outer diameter 5mm
Allis forceps
2

- The strangulated hemorrhoid tissue captured within the band necroses after 5–7 days, leaving a small ulcer that eventually will scar in.

- There are several varieties of hemorrhoid banding devices that exist, including the McGown suction ligator, which applies suction (instead of a separate grasper) to bring the tissue into the device, with a trigger to deploy the band.
- While it does require purchase of a suction machine, it enables the surgeon to perform the procedure without a hand from an assistant.



- The device is used through the anoscope to secure the band onto the mucosa of the selected hemorrhoid.
- While more than one column may be banded safely in a single office visit, studies demonstrate a higher rate of symptoms including pain and urinary retention. (**only 2 piles repeat after 3 weeks)** (2 bands for pile).
- With proper technique, the patients may feel **mild rectal pressure** during the procedure (which may last up to 1– 2 days), but **should** not experience pain, which is most likely from band placement too distal within the anal canal.

- While patients on anticoagulation (other than 80 mg aspirin) are conventionally recommended to hold anticoagulation prior to rubber band ligation
    - A recent retrospective case-control study of 82 patients demonstrated no difference in bleeding risk for patients on clopidogrel compared to the control group, 3.75% versus 2.78%, p = 0.74.
    - Risk of bleeding peaks at post-procedure day 5–7, when the tissue necroses and the band falls off, and in rare instances requires operative management.
    - Risk of **pelvic sepsis**, characterized by fever, urinary retention, swelling, and pain, is rare but can be rapidly progressing and fatal if not immediately recognized.

Scenario:

Male with poorly controlled DM, presented to clinic with anal bulge and bleeding.

Anoscopy: II Degree internal hemorrhoids

RBL >1 DAY LATER > fever, pain, urinary retention

What to do? Urgent EUA, this is sepsis

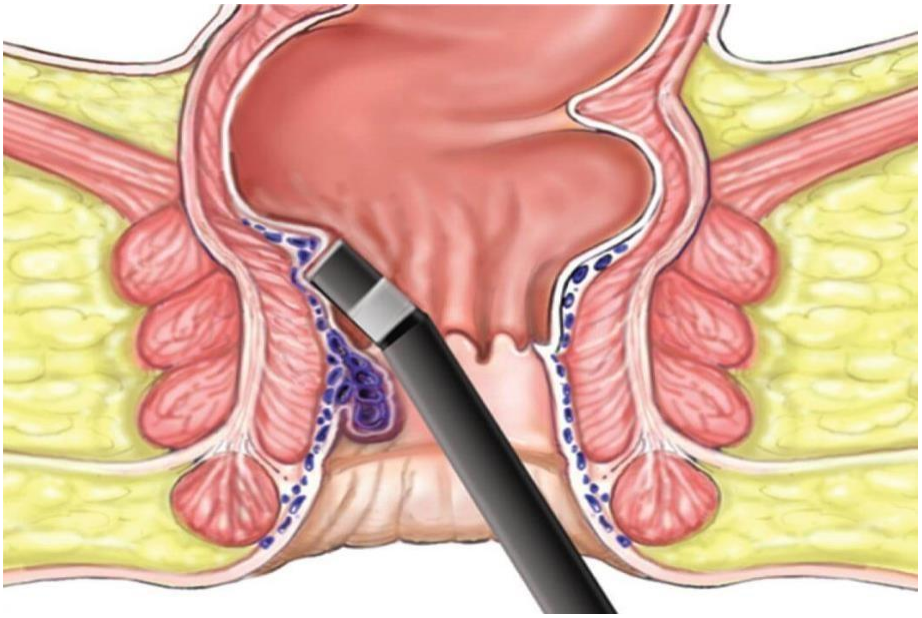
Energy ablation techniques

Infrared photocoagulation.

Bipolar diathermy.

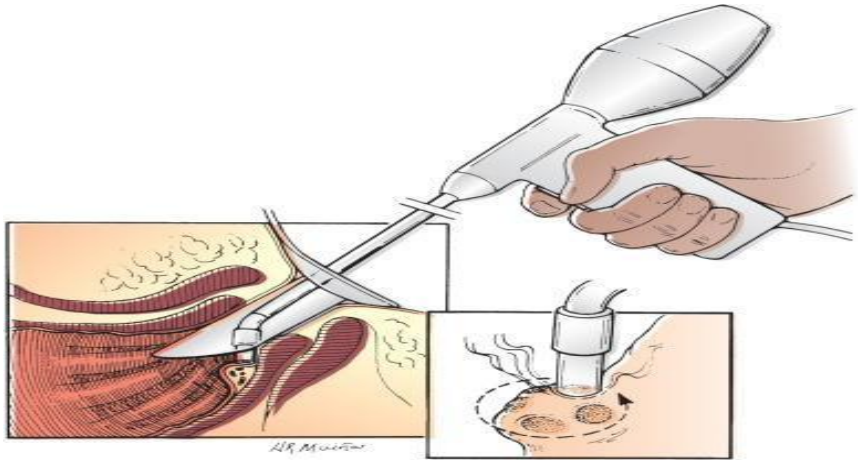
Infrared photocoagulation (IPC).

- causes **coagulation** and results in vascular sclerosis and fixation of the tissue.
- Best used for **grade I–II** hemorrhoids.
- it uses a tungsten-halogen lamp as an energy source, converting the light to heat with a polymer probe tip.
- Similar to bipolar diathermy, the probe tip is applied 3–4 times to the apex of the internal hemorrhoid to deliver 0.5– 2 second pulses of heat at a 2.5–3 mm depth of penetration.
- One advantage of this technique is that it **can be used on multiple hemorrhoid columns at one time**.
- It produces a discrete area of necrosis (coagulates tissue proteins and evaporates water from the cells) which heals to form a scar.
- **Often 3 or 4 sittings** are needed At Month intervals.
- It does **not cause noncontact coagulation**; does **not cause interference with electromagnetic devices such as pacemakers**.
- It is **Contraindicated** in external pile, proctitis.
- Long-term results are Not good.
- Equipment is expensive; multiple sessions are needed.



Bipolar diathermy

- It is another similar office technique for grade I–III hemorrhoids that involves the use of 20 watts of pulsed electrocautery at a depth of **2.2** mm focused on the apex of the hemorrhoid, causing tissue coagulation.
- If applied too distally, these techniques can cause pain and can potentially lead to ulceration or fissure formation.



- In terms of outcomes, a prospective randomized trial of 122 patients comparing bipolar diathermy to IPC demonstrated *similar outcomes.*

Sclerotherapy

- It is the **oldest technique for grade I–III hemorrhoids.**
- The procedure involves the injection of 1–1.5 mL of a sclerosing agent into the **submucosal** layer of the base of the engorged hemorrhoid, using a 21-gauge spinal needle. The sclerosant causes fibrosis and fixation of the hemorrhoid.
- Critical to the technical success of this procedure is avoiding injecting either too superficially, resulting in damage to the mucosa, or too deep, which can cause pain, infection, and abscess.
- The most common sclerosing agents are **hypertonic saline** and 5% **phenol in oil**.

(ALUMINUM POTASSIUM SULFATE AND TANNIC ACID (ALTA))

- One of the advantages of sclerotherapy is that it is safe for patients on anticoagulation.

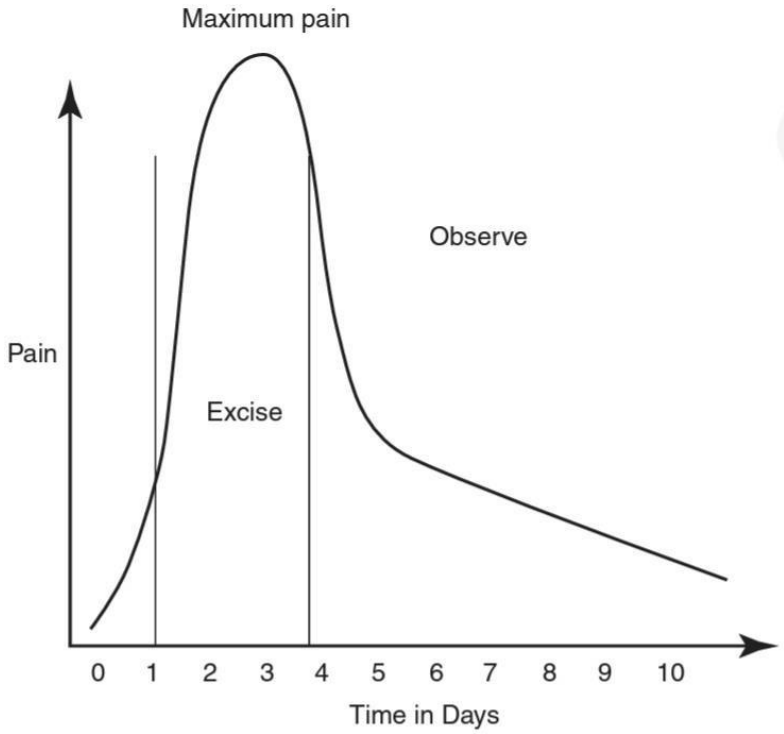
Gabriel syringe

- Multiple small trials compare rubber band ligation to sclerotherapy, with differing results but overall favorable outcomes with both, leading one to conclude that they are comparable and at the discretion and *preference of the surgeon*

Thrombosed Hemorrhoid Excision

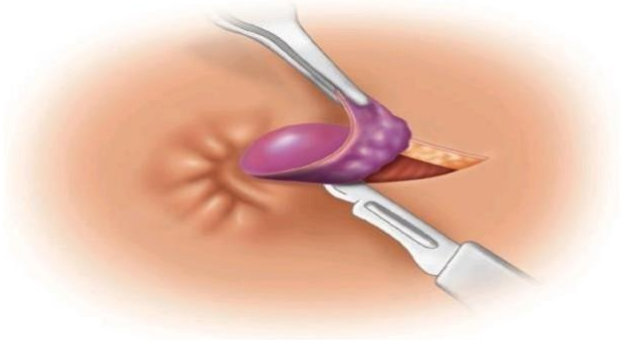
It depends on patient's symptoms

- In the first **24 – 72** hours after onset, pain increase, and Excision is warranted.
- After 72 hours, pain generally diminishes.
- <72 hours of symptoms surgery withe **elliptical excision.**
- 72 hours of symptoms – **lance open only** (pain of surgery worse than hemorrhoid.
- Some of the most grateful patients are those who undergo excision of a thrombosed hemorrhoids in the office setting.
- Optimal timing of the procedure is critical, and thus knowledge of the natural history of thrombosed hemorrhoids is important.



- As most patients should start to experience spontaneous improvement within 72 hours of the onset of symptoms, **excision beyond this time point may only serve to increase the intensity and duration of pain.**
- For those not meeting criteria for excision, **topical nifedipine** has been shown to **improve** pain scores by decreasing associated sphincter spasm.
- A small subset of patients will present with **persistent pain** and a palpable lump for several days to weeks, with no improvement in symptoms, and may also be **good candidates for excision.**

- Compared to **incision and clot evacuation**, excision of the thrombosed hemorrhoid is associated with improved outcomes, specifically decreased rate of recurrence and less pain.
- To excise a thrombosed hemorrhoid
    - The perianal skin is **cleansed** with a betadine solution and allowed to dry.
    - **Local anesthetic** (1% lidocaine with or without epinephrine 1:200,000) is injected using a 27-gauge needle into the base of the hemorrhoid.
    - Toothed forceps are used to grasp the most **lateral or radial** aspect of the hemorrhoid, while a fine Metzenbaum scissor (or an office cautery device) is used to meticulously dissect around the hemorrhoid and associated clot in an **ellipse shap**e, **superficial to the sphincter muscle.**
    - **Dissection** in the proper tissue plane results in minimal blood loss.
    - Care is used to prevent going unnecessarily wide on the anoderm, creating a larger wound than necessary.
    - Pressure is held on the excision site, and **silver nitrate** can be used for hemostasis.



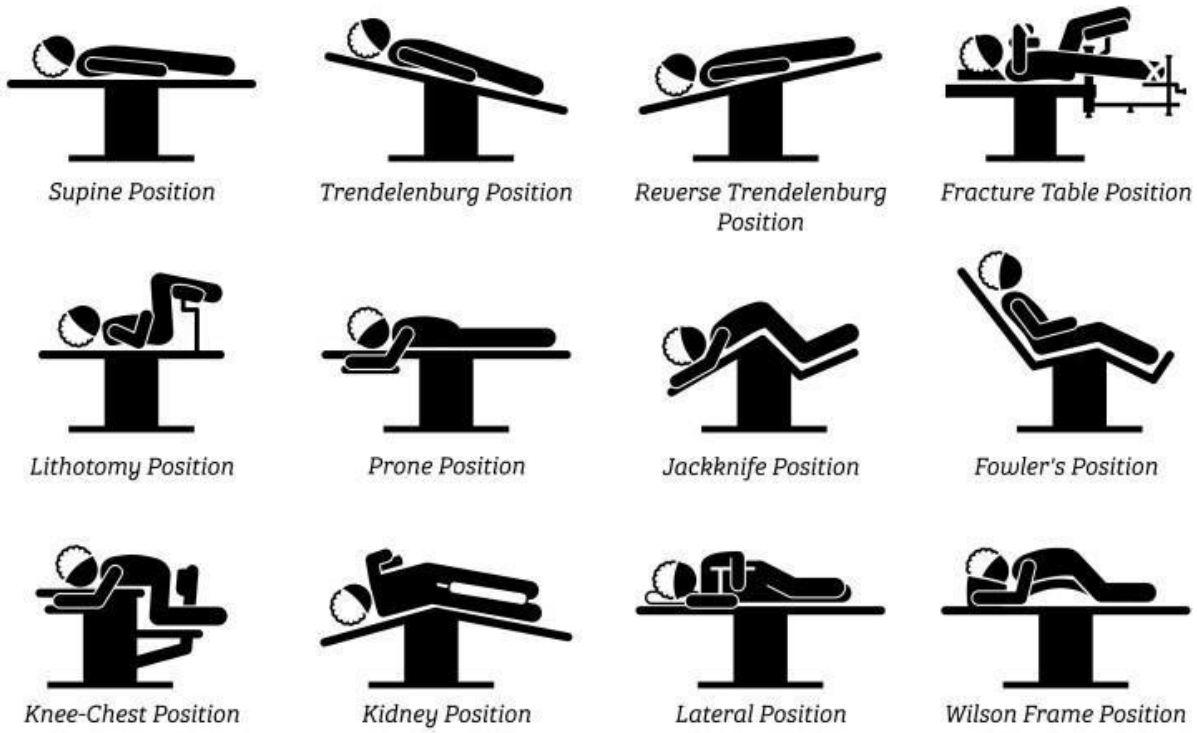
Operative Management of Hemorrhoids

- Operative management of hemorrhoids is usually reserved for those patients who have **failed** medical management or have **recurrent**, persistent disease despite medical therapy or office-based procedures.
- Typically, **only 5–10%** of patients with hemorrhoid-related complaints require operative hemorrhoidectomy.
- Operative approaches are most effective for **grade III and IV** internal hemorrhoids, those with a large external component, and may be the only realistic option for extensive hemorrhoidal disease or incarcerated, strangulated, or gangrenous hemorrhoids.
- Excisional hemorrhoidectomy has **excellent** results, **minimal** recurrence rates, **few** complications and remains the gold standard in the surgical management of hemorrhoids.
- Excisional hemorrhoidectomies can be classified as:
    - Closed (Ferguson technique)
    - Open (Milligan- Morgan technique)

  Others:

    - Whitehead Hemorrhoidectomy
    - Semi-open pedicular hemorrhoidectomy of Parks

- **Because both excisional techniques are associated with significant postoperative pain**, other surgical techniques have been devised with the goal of achieving the excellent results of excisional haemorrhoidectomy while reducing postoperative discomfort.
- More specifically, these other primary operative management techniques include use of:
  - **Ultrasonic energy devices.**
  - **Stapled hemorrhoidopexy.**
  - **Transanal hemorrhoid dearterialization.**
  - **Cryotherapy.**
  - **Laser therapy.**
- In **all** operative interventions, bowel preparation and preoperative antibiotics are not required.
- A preoperative enema can be given at the surgeon's discretion to clear out the distal rectum of stool.
- The anesthetic technique can be tailored to the patient and can range from local with sedation to full general anesthetic.
- Positioning in lithotomy, prone, jackknife, or left lateral positioning is per surgeon preference.

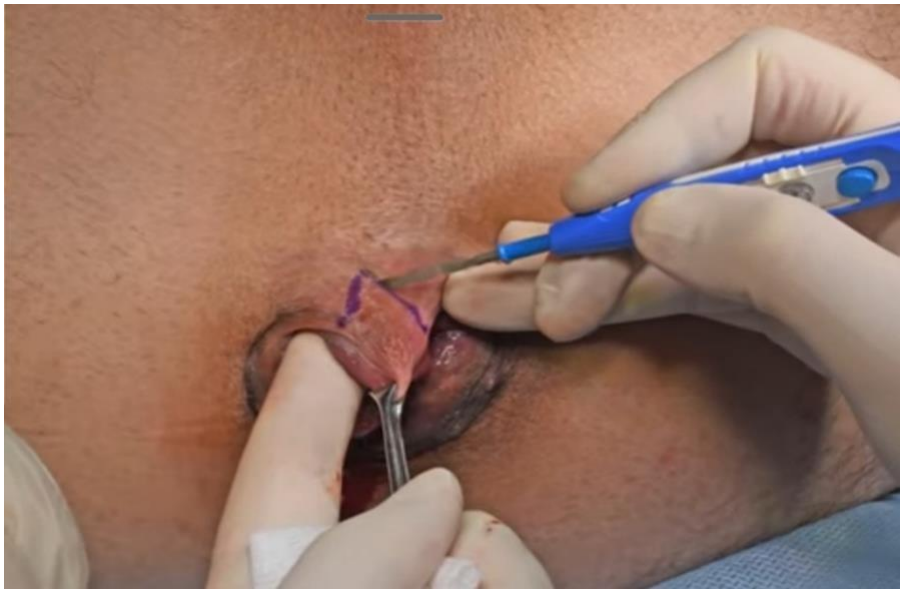


- All operations begin with a thorough visual inspection of the perianal skin, followed by digital rectal exam and anoscopy to determine which hemorrhoid columns require intervention and to rule out other pathology not identified during the office examination.

Excisional Haemorrhoidectomy
Closed Technique (Ferguson Technique)

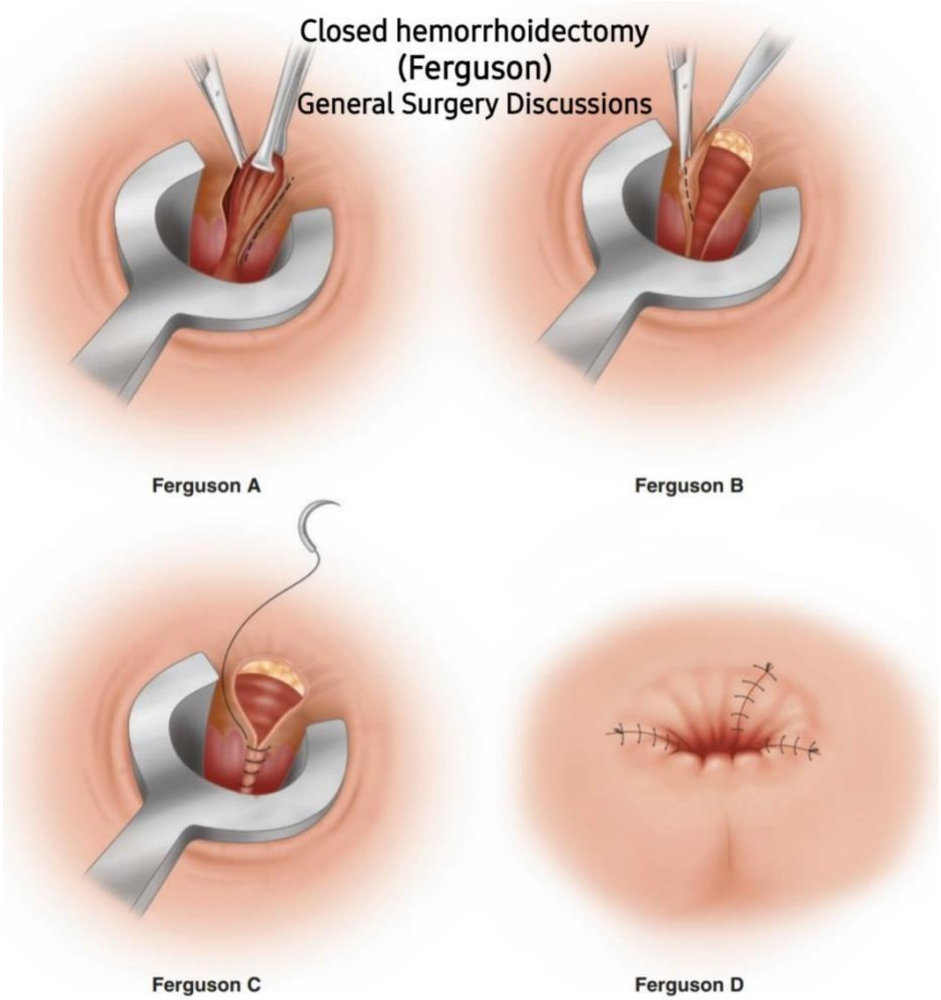
- The closed haemorrhoidectomy technique remains **the most common operation** for hemorrhoids in the **United States**.

- An elliptical incision is made, starting at the perianal skin and continuing to the anorectal ring, **dissecting the hemorrhoid tissue away from the sphincter complex.**
- **Dissection** can be completed with a scissors, scalpel, or Bovie electrocautery.



- Dissection is carried out beyond the enlarged internal component at which point the pedicle is suture **ligated** with absorbable suture and the hemorrhoid **tissue amputated**.
- The wound is then closed in a running fashion with the same absorbable suture used to ligate the hemorrhoid pedicle.
- The suture may be run in locking fashion to improve hemostasis, and small bites of the underlying sphincter complex may be taken to close the dead space.
- A few millimeters of the anal margin wound may be left open for drainage.

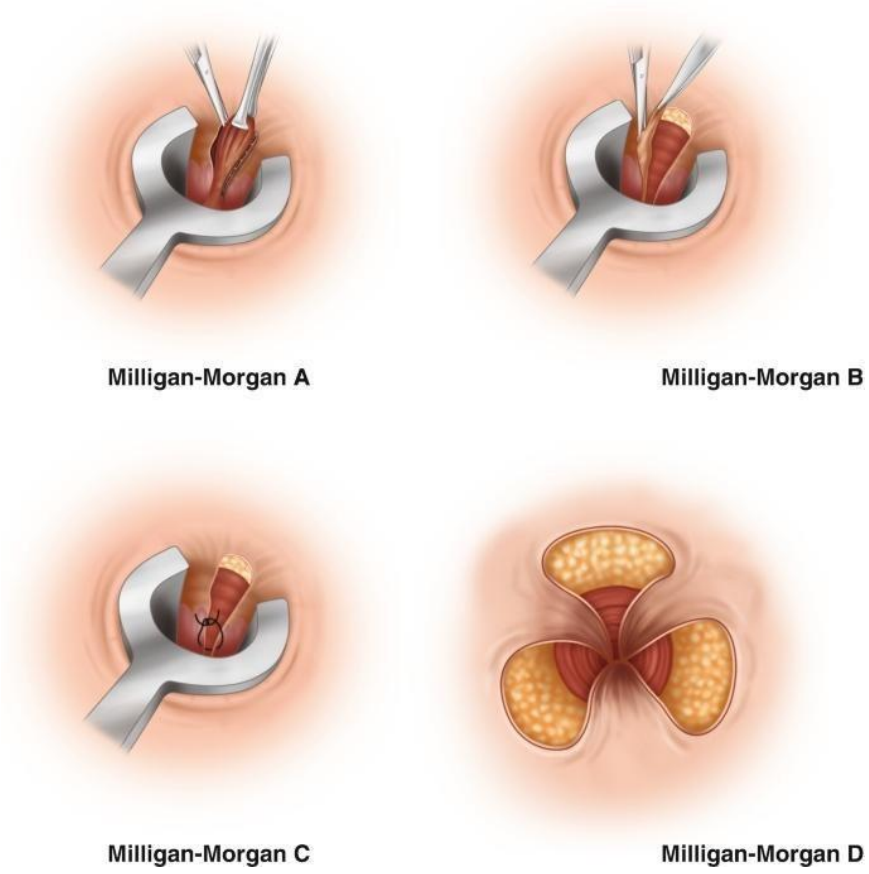
- One to three columns may be excised using this technique. Care should be taken to **preserve bridges** of viable skin and mucosa between excision sites to prevent stenosis.

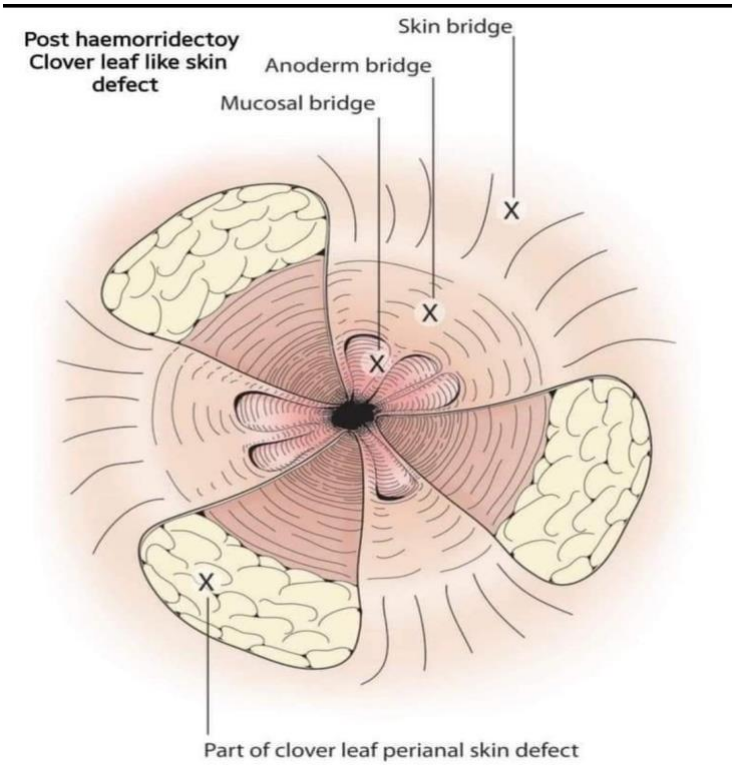


- Hemorrhoids may be sent as individual specimens, so that any incidental finding on final pathology can be attributed to a specific quadrant, although the likelihood of incidental findings is only about 1% in the literature.

Open Technique (Milligan- Morgan)

- The open technique of hemorrhoidectomy is **commonly** used in the **United Kingdom**.
- Perioperative considerations are the same as for the Ferguson technique.
- The excision is also very similar, however, following suture ligation of the pedicle and amputation of the hemorrhoids bundle the wounds are left open to heal by secondary intent.
- Again, one to three columns can be excised, with the same caveat regarding preservation of viable bridges of skin and mucosa.





- A recent meta-analysis of 11 RCTs comparing open versus closed hemorrhoidectomy demonstrated that the **closed** approach was associated with *decreased postoperative* ***pain***, ***faster wound healing***, *and* ***lesser risk of postoperative bleeding***.
- ***CLOSED: BLEEDING, PAIN, HEALING BETTER***
- *Postoperative complications,* ***hemorrhoid recurrence, and infectious complications were similar.***

Use of Energy Devices in Excisional Hemorrhoidectomy

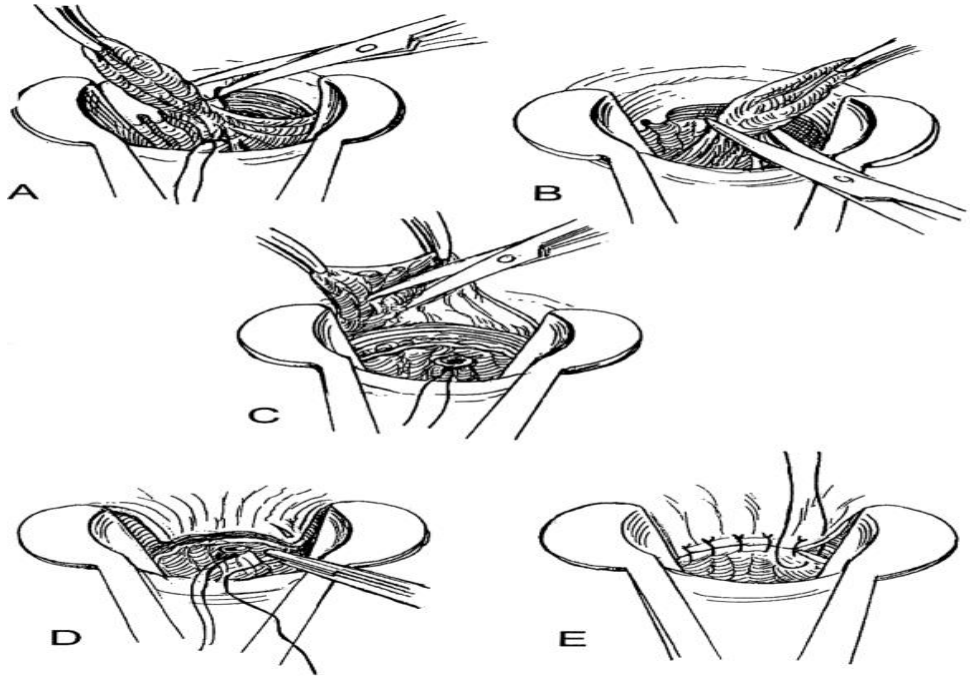
- Both the open and closed techniques have been modified to include the use of alternative energy sources, such as the bipolar diathermy and ultrasonic shears.
- A Cochrane review was completed to compare bipolar energy hemorrhoidectomy to standard excisional hemorrhoidectomy. The authors concluded that early

postoperative *pain was less* when the bipolar device was used; however, the *difference was no longer noted at day 14.*

- Hemorrhoidectomy completed with a bipolar energy device was also found to be faster. **(ENERGY: FASTER, PAIN LESS)**
- Use of ultrasonic shears seems to produce similar results. When these two devices were evaluated head-to-head in a randomized controlled trial of patients undergoing closed hemorrhoidectomy, *postoperative pain scores were similar, with no differences in clinical outcomes*.
- Other approaches including diathermy and the use of laser technology have not demonstrated improvements in pain and may be associated with higher cost.

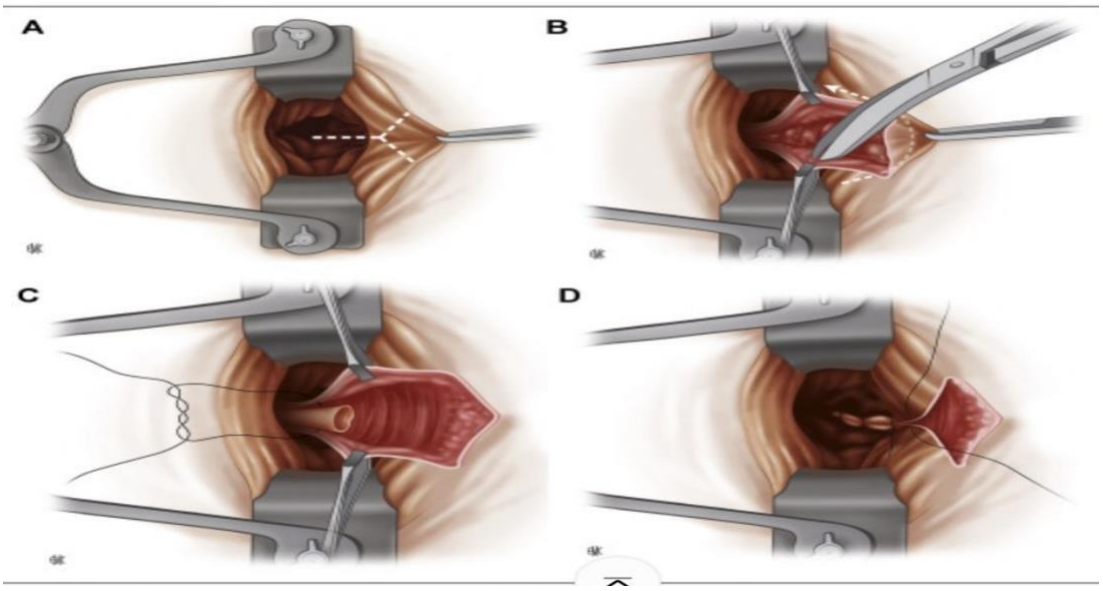
Whitehead Hemorrhoidectomy

- Involves a circumferential excision of internal hemorrhoidal tissue and redundant anoderm just proximal to the dentate line.
- This procedure **never** gained wide acceptance in the United States, in part owing to a high incidence of postoperative complications including anal stenosis, mucosal ectropion (the “Whitehead deformity”), and disturbed continence. Most centers have abandoned this approach.



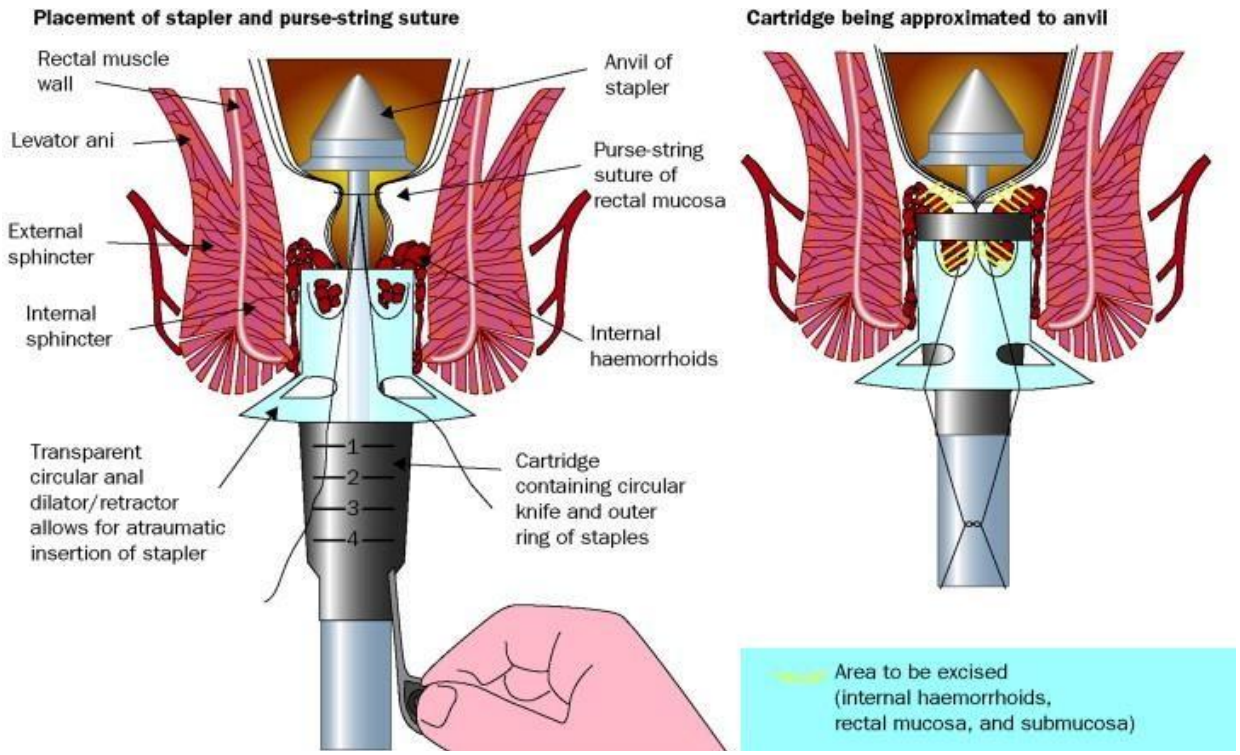
Semi-open pedicular hemorrhoidectomy of Parks

1. Placement of the retractor.
2. intracanular Incision.
3. Submucosal hemorrhoidectomy.
4. Ligation of the pedicle.
5. Suture Closure of the mucosa of the anal canal



Stapled Hemorrhoidopexy

- Procedure for Prolapse and Hemorrhoids
- First developed in Italy, uses a circular stapling device to address circumferential internal hemorrhoids and create a **mucosa-to-mucosa anastomosis.**
- Although effective for **internal** prolapsing disease, it does not address external hemorrhoids.
- To perform the procedure, a **translucent** anoscope, provided with the circular stapler, is introduced transanally.
- After placing the anoscope, a purse-string suture is placed in a circumferential manner into the submucosa, approximately **2 cm above the dentate line.**
- The head of the stapler is then placed through the anoscope and into the rectum.
- The purse string is tied down around the shaft of the stapler.
- The stapler is slowly closed while providing traction on the purse-string.
- Once closed, the stapler is fired and then advantages of the stapled technique.



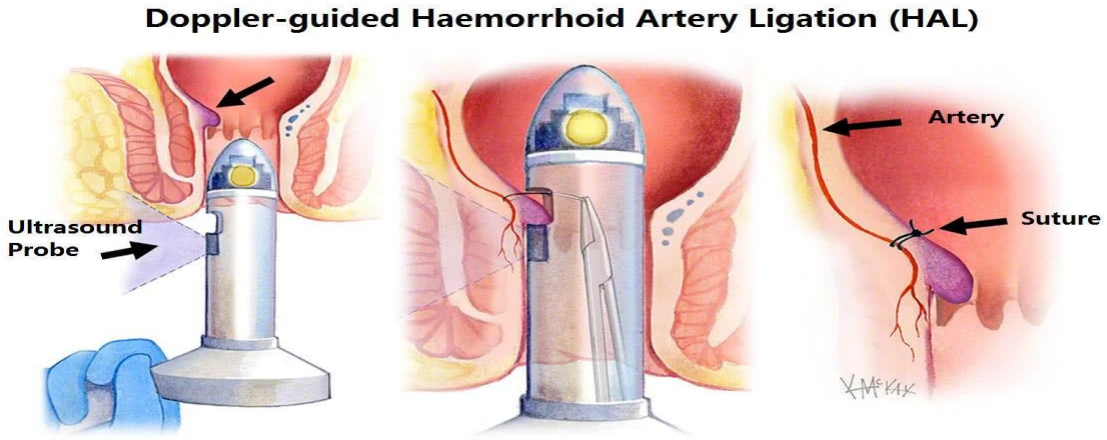
- The excisional hemorrhoidectomy group had significantly better quality-of-life scores than the hemorrhoidopexy group.
- Further, in the stapled hemorrhoidopexy group, 32% of patients reported that their symptoms had *recurred* compared with only 14% in the excisional hemorrhoidectomy group, and this difference was maintained at 24 months.
- Patients undergoing hemorrhoidopexy were **more** likely to require an **additional** operative procedure.
- Patients undergoing excisional hemorrhoidectomy surgery were more likely than those undergoing stapled hemorrhoidopexy to be **asymptomatic** following surgery.

- Stapled hemorrhoidopexy has been associated with several unique complications, including **rectovaginal fistula, staple line bleeding, and stricture at the staple line.**
- The severity of possible complications associated with stapled hemorrhoidopexy have deterred many from its use and reflect the importance of proper training and surgical technique.

Doppler-Guided Hemorrhoidectomy

Doppler- guided/assisted hemorrhoid artery ligation (HAL)

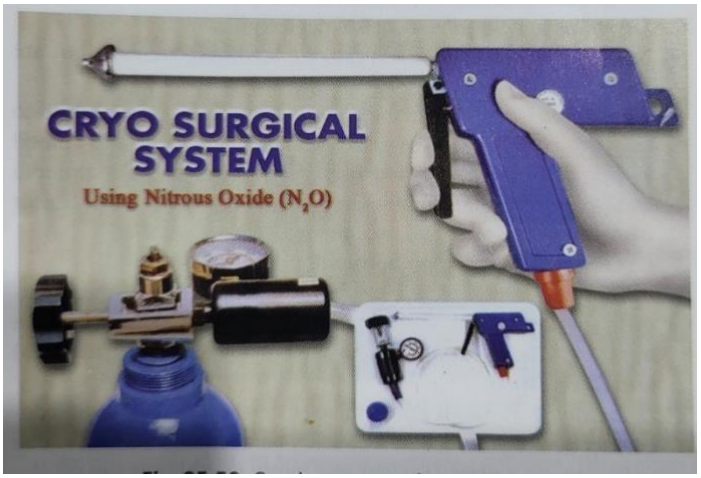
- Use an anoscope fashioned with a Doppler probe to identify each hemorrhoid artery.
- The artery is subsequently ligated and, although not initially described, is often followed by a suture **mucopexy** for patients with symptomatic prolapse.
- Potential benefits are the **lack of tissue excision and less pain.**
- Patient preparation and setup is identical to any excisional technique. A specialized anoscope with Doppler ultrasound is introduced into the anal canal. The Doppler and anoscope are rotated until a feeding artery is identified. With the aid of a guide to ensure proper depth and location, the artery is suture ligated.
- The Doppler can be used to confirm loss of signal, indicating ablation of arterial inflow.
- The process is repeated until the **four to six hemorrhoidal** arteries have been ligated. Depending on the degree of prolapse, a **suture mucopexy** may be included using the same stich as the ligation.



- This is completed by running a **continuous suture** from the ligation point toward the distal anal canal, just **proximal** to the dentate line.
- The free end of the stich is then tied to the tail of the suture, pulling the hemorrhoid column into the proximal anal canal toward the ligation.
- Prospective studies using HAL have demonstrated favorable short-term results, **Recurrence rate of 17.5%,** with the **highest** rates for **grade IV hemorrhoids.**
- Overall **postoperative complication** rates were **low**, with an overall **bleeding rate of 5%** and an overall **reintervention rate of 6**%.
- Quality-of-life assessment, and continence score were similar between RBL AND HAL. Patients had more pain in the early postoperative period after HAL.HAL was also **more expensive** and **was not found to be cost-effective compared with RBL in terms of incremental cost per quality-adjusted life-year.**
- In respect to long-term outcomes, a recently completed meta-analysis of comparing stapled hemorrhoidectomy to HAL demonstrated a statistically significant difference in recurrence (OR 0.55; 95% CI, 0.340.90 P = 0.02) with increased recurrence in the HAL group.
- A similar meta-analysis demonstrated that recurrence was highest in those with grade IV hemorrhoids.
- When comparing HAL to excisional hemorrhoidectomy, one meta-analysis, which included 286 patients in the evaluation of recurrence, found no difference.
- In conclusion, HAL demonstrates favorable short-term results but may be associated with increased recurrence, especially in those with grade IV hemorrhoids.

Cryotherapy

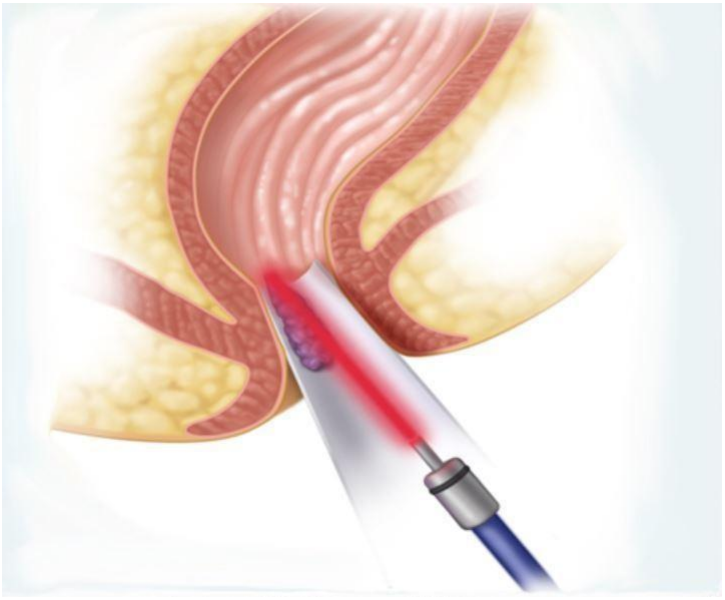
- Using nitrous oxide **(-98 c**) or liquid nitrogen **(-196c**), extreme Cold Temperature is used to Coagulate and cause necrosis of piles which gets separated and falls off subsequently.
- It is relatively painless and can be done on OP basis and all masses can be tackled at one sitting.



Laser therapy

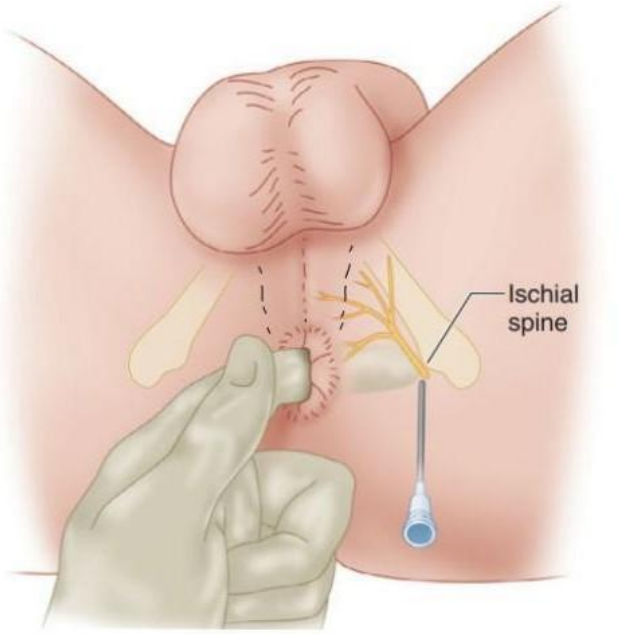
- Laser therapy for piles- for **3rd** degree piles
- Nd-YAG, diode and carbon dioxide lasers can be used but are Expensive and tedious.
- The intense beam of light interacts with tissue and can be used to cut, coagulate or ablate the tissue, sealing off nerves and tiny blood vessels can be done by laser beam.
- By sealing superficial nerve endings patients have minimum postoperative discomfort.
- It is done for **internal** hemorrhoids.

Advantages	Disadvantages
Less operative time	Need skill
Less intraoperative and post-Operative bleed and pain	Sphincter should be taken care of, no contact (burning can occur)
Quick recovery	
Done under LA/SA	
less complications (minimal pain, constipation, and urinary retention)	



Pain Management and Postoperative Care

- Pain management after hemorrhoidectomy starts with adequate patient counseling in the preoperative setting.
- Recovery time is variable and depends on the type of procedure, anticipated extent of surgery, as well as the patient's intrinsic tolerance and if they are on preoperative narcotics.
- For patients under conscious sedation, a **pudendal nerve block** consisting of a **1:1 mix of 1% lidocaine, and 0.25% bupivacaine** is most commonly used, for a total volume of **40–60** mL depending on patient weight.



- The addition of 1:200,000 epinephrine to one of the local analgesics will increase the maximum dose and duration of action.

- As for oral medications, non-narcotic medications should be used as a mainstay, with narcotic pain medication for breakthrough pain.
- Recommended effective Ibuprofen dose is 600 mg TID.
- Acetaminophen can be used either simultaneously or alternating, at doses not to exceed **4 g/day**.
- **Diazepam** is a very helpful adjunct in reducing sphincter spasm.
- **Oral metronidazole** has been given in the postoperative setting, although studies are mixed regarding its efficacy in terms of decreasing pain.

Topicals After Hemorrhoidectomy

- Various topical preparations can be considered in the postoperative setting as data suggest a modest benefit.
- 5**% topical baclofen** (**significant reduction** in pain and analgesic consumption in the treatment arm at 1 and 2 weeks postop).
- **Topical glyceryl trinitrate** (**GTN) ointment** (**significant reduction in pain** on postoperative days 3 and 7, but not on day 1).
- Modest benefits of topical **lidocaine** in the postoperative setting, when combined with **diclofenac or nifedipine**.

Routine Postoperative Care Following hemorrhoidectomy

- Pain control.
- patients are instructed to **avoid constipation**. Patients who have corrected their stool texture prior to undergoing surgery will have the best outcomes.
- It is essential to educate patients on the constipating side effects of narcotics, and to counteract this with **water intake and fiber, stool softeners, laxatives, and other adjuncts such as prune juice and probiotics**. (Fecal impaction in the postoperative period can be devastatingly painful).
- avoid diarrhea.
- Sitz baths and warm or cool packs will also provide relief from pain

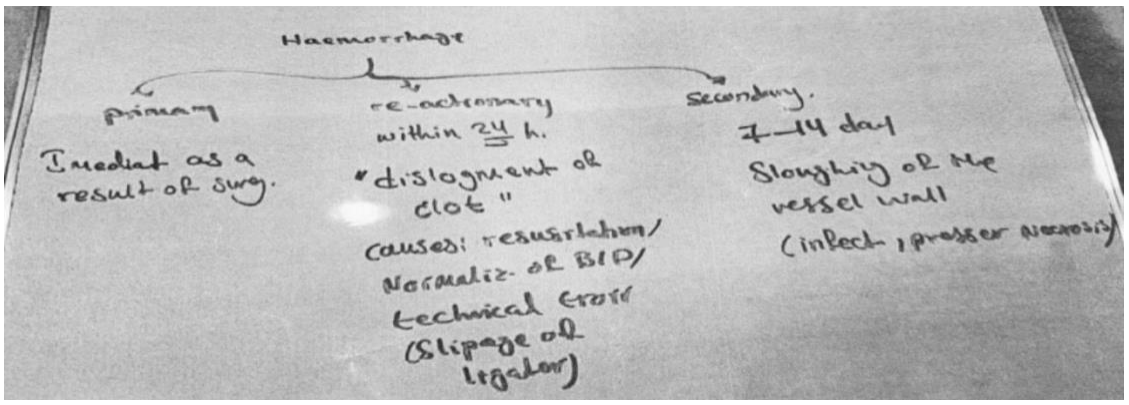
Complications

Complications of Hemorrhoidectomy	
Early complications	**Late complications**
• **Pain (MC)**^{Q} • **Acute retention of urine (2nd MC)**^{Q} • Reactionary hemorrhage	• Secondary hemorrhage • Anal stricture • Anal fissure • Incontinence

Urinary Retention

- One of the most common complications (1–15%).
- The most common reason for failure of surgical patients to be discharged.
- The incidence is higher after **spinal anesthesia** and after **HAL** procedures. The risk may be decreased with decreasing volume of intravenous fluids to less than **500 c**c and using local anesthesia.

Postoperative Hemorrhage



- Delayed post-hemorrhoidectomy bleeding is a **rare** but serious complication after hemorrhoidectomy (0.9–10%).
- While some minor bleeding is expected to be after hemorrhoidectomy, patients who describe passage of an entire bowel movement of blood clots are **likely to requir**e an exam under anesthesia.
- The culprit vessel may **not always** be found, but if it is, it can usually be managed with an interrupted figure of eight absorbable suture.
- It is also reasonable to **evacuate** any residual clot from the rectum and distal sigmoid via rigid proctoscopy to **reduce the chances** of clouding the postoperative clinical picture with ongoing hematochezia.
- Some data suggest that delayed bleeding is **linked** to risk factors such as the surgical procedure, infection, defecation with excessive straining, and number of piles.
- Interestingly, a study that evaluated 45 patients with delayed bleeding reported that **male gender and individual surgeons** were independent risk factors.
- There was **no significant difference** in the occurrence of hemorrhage between patients who underwent a closed or open hemorrhoidectomy or between conventional hemorrhoidectomy and using a bipolar energy device.

Fecal Incontinence

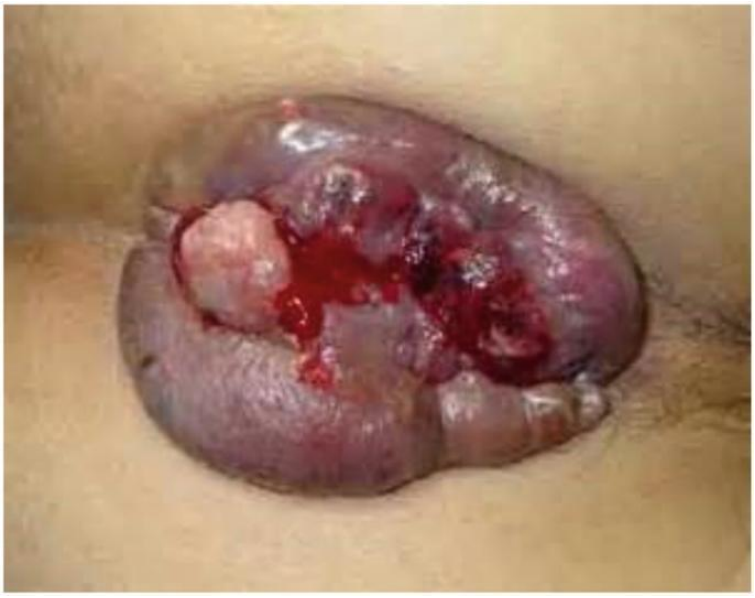
- can occur but rare.
- There may be **undue stretch placed on the anal sphincter** at the time of surgery, **direct sphincter injury**, or **loss** of the bulk of the hemorrhoid cushions.
- Proper technique which avoids the sphincter muscles should have no impact on sphincter integrity or function.

Anal Stenosis

- Anal stenosis can occur following hemorrhoidectomy if excessive anoderm is removed.
- It is **most encountered** following emergency hemorrhoidectomy and is usually secondary to inadequate remaining skin bridges.
- **Treatment** can involve **bulk laxatives, dilation, and anoplasty.**

Special Patient Populations

Strangulated Hemorrhoids



- Strangulated hemorrhoids are internal hemorrhoids that have prolapsed and become incarcerated and irreducible.
- Edema and **thrombosis** of external hemorrhoids often **accompany** this condition.
- The incarcerated internal hemorrhoids may be beefy red, or ulcerated and necrotic, depending on the length of time of incarceration.
- If not necrotic, **circumferential injection of local anesthetic** and reduction of the strangulated hemorrhoids can be accomplished, followed by bed rest.
- Unless the patient has prohibitive operative risk, the best option for strangulated hemorrhoids is **expeditious excisional hemorrhoidectomy**; in the presence of **necrosis**, **excision** is a necessity.
- Either an open or a closed technique can be used. If tissues are very edematous, or if devitalized tissue is present, one may consider leaving the wounds open to prevent **abscess**.
- Postoperative care is as **usual** after excisional hemorrhoidectomy.

Hemorrhoids in Pregnancy

- Engorgement of the internal hemorrhoids and edema of the external hemorrhoid are common during pregnancy, possibly related to **impaired venous return, constipation, and pressure on the pelvic floor.**
- 14.4% in the third trimester, 14.6% prevalence of thrombosis in the postpartum period.
- Hemorrhoid symptoms **are almost always** resolve after delivery and rarely need urgent intervention.
- Surgical intervention in pregnancy is **reserved** for **strangulated hemorrhoids**, or occasionally a **very symptomatic** external thrombosis
- When necessary, operation should be performed using local **anesthesia** with the patient positioned in the **left lateral decubitus** position to avoid compression of the inferior vena cava.

Hemorrhoids, Varices, and Portal Hypertension

- Rectal varices and hemorrhoids are **distinct** and different.
- Rectal varices in patients with portal hypertension provide collateral circulation for the portal system into the systemic venous circulation.
- Incidence of hemorrhoid symptoms in patients with portal hypertension **is like that of the general population.**
- Rectal varices bleed much less commonly than esophageal varices.
- In the rare instance of bleeding from rectal varices, portal hypertension **should be addressed first**.
- Direct control methods such as sclerotherapy and suture ligation will have a **higher rate of success** if the portal system is decompressed and should be reserved for instances in which all other options have been exhausted.

Hemorrhoids in Crohn's Disease

- As many patients with Crohn's disease have loose stools, engorged hemorrhoids may occasionally be seen and require surgical intervention.
- These are specifically **distinguished** from Crohn-related perianal skin tags.

Patient selection is very important (high rate of poor wound healing). However, in **appropriately selected patients** who are well controlled medically and have no rectal inflammation or other anorectal disease, a **good outcome** can be attained.

Hemorrhoids in the Immunocompromised Patient

- Anorectal pathology is **increasingly seen** in immunocompromised patients, including those with **medically induced** immunosuppression, such as solid organ transplant recipients and patients receiving steroids or chemotherapy, as well as those with **disease-induced** immunosuppression, including human immunodeficiency virus (HIV).
- One must recall that this population is heterogeneous.
- For those in whom immunocompromise **can be expected to resolve**, conservative management should be **pursued** aggressively until immunity is normal or nearly so.
- For those with an ongoing degree of immunocompromise, **medical management should be the primary approach**, reserving direct intervention only after medical failure and with careful consideration of the implications of complications in this population.
- **RBL and excisional hemorrhoidectomy have been shown to be safe in HIV-positive patients** on **highly active antiretroviral therapy with acceptable CD4 counts.**

Conclusion

- Hemorrhoidal disease is **common** and **frequently misdiagnosed**.
- Knowledge of associated symptoms along with anorectal and hemorrhoid anatomy is critical in securing the diagnosis and selecting the proper treatment.
- **Minimizing straining and improving hydration and fiber intake are the first step** for patients with symptomatic hemorrhoids.
- Most office procedures are best suited for **symptomatic grade I–III** internal hemorrhoids or thrombosed external hemorrhoids.
- One's armamentarium should include a variety of techniques for symptomatic hemorrhoids to **optimize** outcomes and provide individualized therapy.
- **Excisional hemorrhoidectomy** continues to provide the **most consistent results**, while others, possibly less painful surgical interventions, are associated with higher recurrence rates.
- Complications of hemorrhoid surgery are **rare** and include urinary **retention, bleeding, infection, stenosis, incontinence, and recurrence**.
- Special considerations include **pregnant patients**, as well as those with **Crohn's disease, the immunocompromised, or those with portal hypertension**.

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