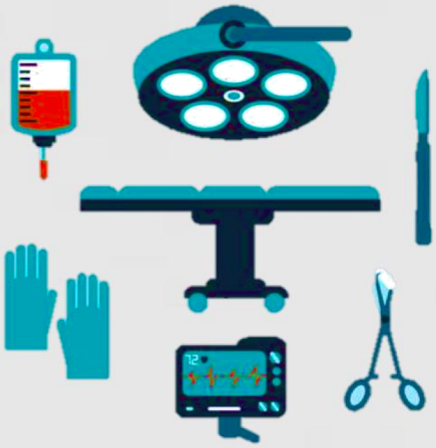


Anorectal Conditions

Objectives:

Not Given.

Resources:

- Davidson's (Chapter 17 pg 283).
- 436 doctors slides.
- Surgical Recall.
- 435's teamwork.
- Raslan's notes.

Done by: Yara Aldigi, Khalid Aleedan, Abdulmohsen Alkhalaf
Leaders: Heba Alnasser, Jawaher Abanumy, Mohammed Habib, Mohammad Al-Mutlaq
Revised by: Maha AlGhamdi

Color index:

Notes , Important , Extra , Davidson's

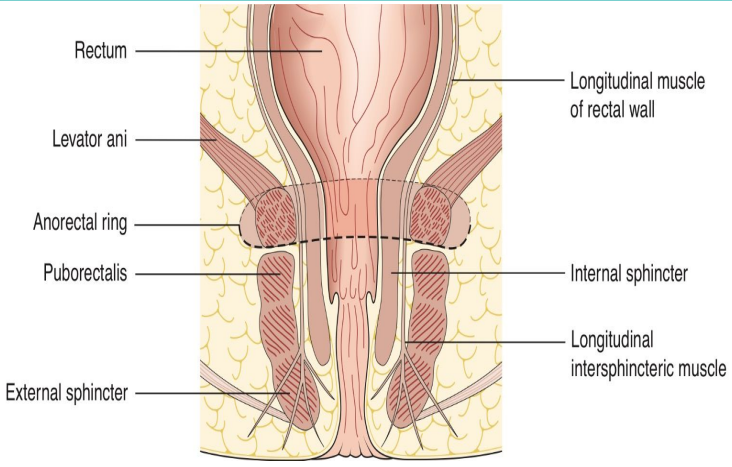
Editing file

Feedback

Note: We mentioned the diseases in the same order as Davidson's not the slides.

Anatomy of the Anal Canal

(you have to know the anatomy to understand the diseases)



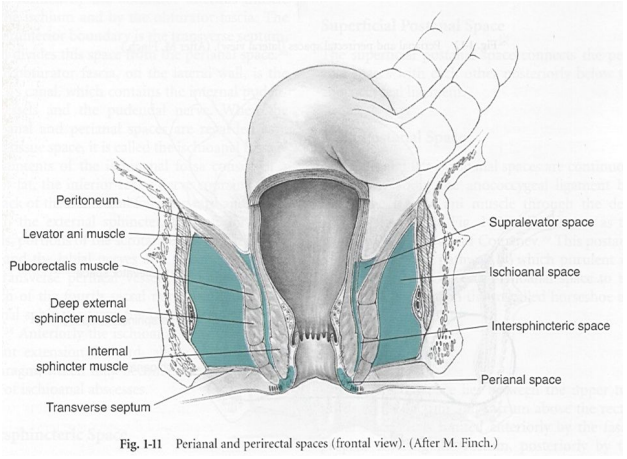


Fig. 1-11 Perianal and perirectal spaces (frontal view). (After M. Finch.)

The anal canal is about 3-4 cm long. It consists of 2 concentric **muscle layers** known as: internal and external sphincters.

Internal Sphincter	External Sphincter
Smooth muscle (involuntary control) Continuation of circular muscle of GI tract (bowel).	Skeletal muscle (voluntary control) Blends with lower part of levator ani (puborectalis sling)
Mainly for gas continence.	Mainly for solid and liquid stool continence.
Visceral innervation sensitive to stretch and ischemia	Somatic (sensory) innervation sensitive to touch & pain
Columnar glandular epithelium	Non-keratinized squamous epithelium
Derived from endoderm (hindgut)	Derived from ectoderm
• Superior rectal (hemorrhoidal) artery (branch of the inferior mesenteric artery) • Superior rectal vein → portal circulation. • Lymphatic drainage to inferior mesenteric nodes	• Inferior rectal artery (branch of the internal pudendal artery) • Inferior rectal vein → systemic circulation. • Lymphatic drainage to the inguinal nodes.

- The **dentate (pectinate) line** represents the line of fusion between the endoderm + ectoderm. It separates the anal canal from the anal verge.
- There are almost 15 to 20 glands within the crypts of dentate line. They have ducts that drain their content/debris into the anal canal.
- These glands are involved in the aetiology of perianal **abscess** and fistula.
- The function of the anal glands is to secrete mucus, lubricating and protecting the delicate epithelium of the anal transition zone.

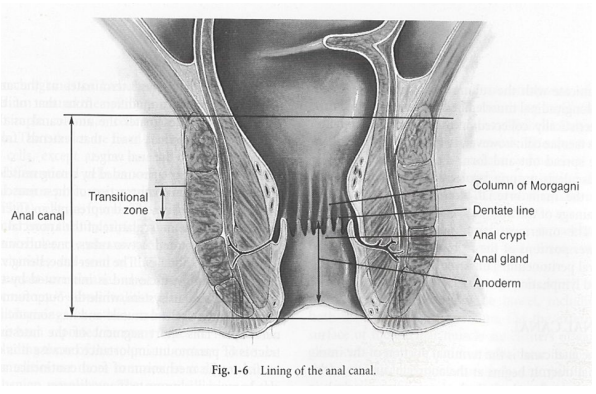


Fig. 1-6 Lining of the anal canal.

- **Anorectal spaces** (these spaces are important in abscess because we name them according to location):
  1. Perianal space **2.** Ischioanal Space **3.** Intersphincteric Space
  4. Supralevator Space **5.** Submucous space **6.** Superficial Postanal space
  7. Deep postanal space **8.** Retrorectal space

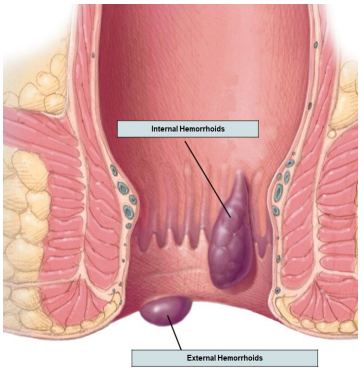
Don't understand? Watch this **video(11:50)** or click **this link**(TeachMeAnatomy).

Hemorrhoids بواسير

Video(07:56)

- Hemorrhoids are not a disease, they are normal vascular structures (شوية فزلز عليها شوية ابثيليم) in the anal canal that are like cushions which help in continence.
- When it gets symptomatic it becomes diseased hemorrhoid[1]. How does it become symptomatic?

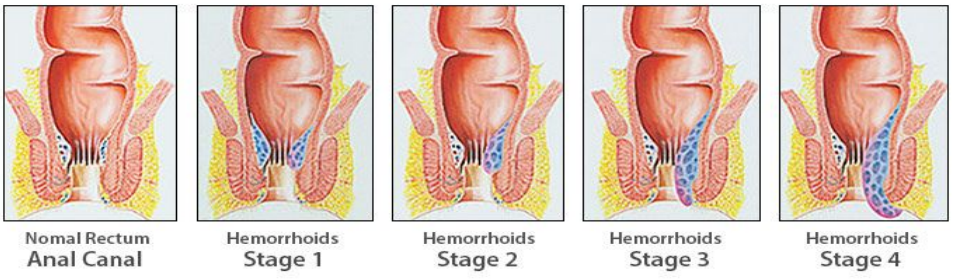
Pathophysiology:



Anything that **increases** the intra-abdominal or intrapelvic **pressure** (Chronic straining secondary to **constipation** or occasionally diarrhea[2]) can cause engorgement or enlargement of the normal fibrovascular cushions lining the anal canal → Fibrovascular cushions lose their attachment to the underlying rectal wall, which will cause:

- **Prolapse** (bulging) of internal hemorrhoidal tissue through the anal canal.
- The overlying mucosa becomes more friable and the vascularity increases → subsequent **rectal bleeding** occurs.

Internal Hemorrhoids	External Hemorrhoids
Originating **above** the dentate line	Originating **below** the dentate line.
Painless* with **bleeding** (***may** cause pain if very severe = grade 4 with incarceration)	Thrombosis* → **painful**, mostly without bleeding. *تتضغط تتضغط الين يصير لها. Due to straining it will become engorged
Classified into 4 grades based on the history[3]: • **Grade I** - bleeding **without** prolapse. • **Grade II** - prolapse with **spontaneous** reduction. • **Grade III** - prolapse with **manual** reduction (You have to push it). • **Grade IV** - incarcerated, **irreducible** prolapse.	



Symptoms:

- **Bleeding and prolapse** (sometimes) are the cardinal symptoms and may occur isolated or together:
  - Bright fresh red blood per rectum.
    - Very commonly drips into the toilet water (separate from the bowel motion) .
    - Blood may also be seen while wiping after defecation.
  - Prolapsing anal mass.
    - prolapse usually occurs in association with a bowel movement, or may also prolapse during walking or heavy lifting as a result of increased intra-abdominal pressure.
- Extreme **pain** (especially with thrombosed external hemorrhoids).

[1] Liver diseases do not cause hemorrhoids. This is a common misconception. They cause varices above.
[2] Patients with diarrhea will strain in an attempt to fully empty their rectum so they don't have to go to the bathroom again
[3] They will all have bleeding but the difference is in the prolapse (if its present or not and if it can be reduced or not)

Evaluation of rectal bleeding:

● Rule-out rectal cancer **(VERY IMPORTANT)**. We divide patients with rectal bleeding into two groups:

Low risk for cancer	High risk for cancer
young individual with bleeding associated with hemorrhoidal disease and no other systemic symptoms, and no family history	>50 y/o, positive family history, anemic[4], weight loss, dark blood, recent change in bowel habits
Anoscopy and rigid sigmoidoscopy (you only see the first 20 cms)	Perform full endoscopy before treatment to rule out proximal neoplasia.

Treatment:

- Most of the time we just treat the underlying cause.
- Treatments are classified into three categories:
  1. Treat underlying cause by dietary and lifestyle modification.
  2. Non operative/office procedures (banding).
  3. Surgery (Operative hemorrhoidectomy).

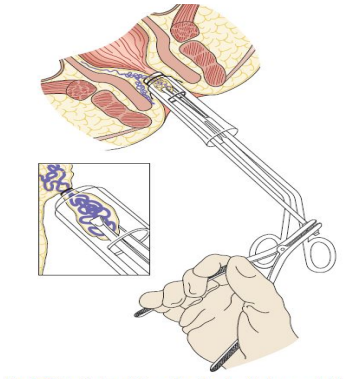
1. DIETARY AND LIFESTYLE MODIFICATIONS:

- The main goal of this treatment is to minimize straining at stool i.e, treat the underlying cause which is mostly constipation[5].
- Achieved by increasing **fluid** and **fiber** in the diet, and recommending exercise.
- Bulk forming stool softeners may be indicated (in acute phase of constipation we may give them laxatives but don't prescribe them forever).
- Most pts will respond to this and only 10 percent need surgery (usually grade 3 and 4).

2. OFFICE TREATMENT:

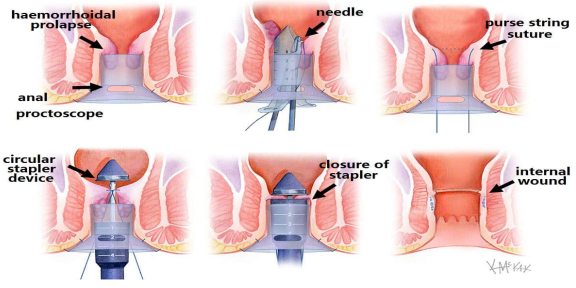
RUBBER BAND LIGATION Video(00:29)

- Banding of mucosa → cut off supply → 7-10 days and it will fall.
- **DON'T PUT BAND ON EXTERNAL HEMORRHOID IT IS SENSORY!**
- This procedure usually doesn't cause pain. If there is severe pain it means the band is either below the dentate line, or we banded the full thickness of the wall and caused ischemia → so we need to **remove it**.



3. HEMORRHOIDECTOMY

- The triangular shaped hemorrhoid is excised down to the underlying sphincter muscle.
- Wound can be closed or left open.
- Stapled hemorrhoidectomy has been developed as an alternative to standard hemorrhoidectomy



[4] Keep this in mind: **any iron deficiency anemia is GI source until proven otherwise.**
[5] Some patients will say they don't have constipation and when you ask about their bowel movements they will say: one bowel every 3 days OR sitting in the bathroom for a long time 45 mins to one hour → this is constipation. So we have to educate the patient (go in and go out quickly)

Recall: EXTRA

What are hemorrhoids?
Engorgement of the venous plexuses of the rectum, anus, or both; with protrusion of the mucosa, anal margin, or both
Why do we have "healthy" hemorrhoidal tissue?
It is thought to be involved with fluid/air continence
What are the signs/symptoms?
Anal mass/prolapse, bleeding, itching, pain
Which type, internal or external, is painful?
External, below the dentate line
If a patient has excruciating anal pain and history of hemorrhoids, what is the likely diagnosis?
Thrombosed external hemorrhoid (treat by excision)
What are the causes of hemorrhoids?
Constipation/straining, portal hypertension, pregnancy
What is an internal hemorrhoid?
Hemorrhoid above the (proximal) dentate line
What is an external hemorrhoid?
Hemorrhoid below the dentate line
What are the three "hemorrhoid quadrants"?

1. Left lateral
2. Right posterior
3. Right anterior

Classification by Degrees, Define the following terms for internal hemorrhoids:

- **1st-degree hemorrhoid:** Hemorrhoid that does not prolapse
- **2nd-degree hemorrhoid:** Prolapses with defecation, but returns on its own
- **3rd-degree hemorrhoid:** Prolapses with defecation or any type of Valsalva maneuver and requires active manual reduction (eat fiber!)
- **4th-degree hemorrhoid:** Prolapsed hemorrhoid that cannot be reduced

What is the treatment?

- High-fiber diet, anal hygiene, topical steroids, sitz baths
- Rubber band ligation (in most cases anesthetic is not necessary for internal hemorrhoids)
- Surgical resection for large refractory hemorrhoids, infrared coagulation, harmonic scalpel

What is a "closed" vs. an "open" hemorrhoidectomy?

- **Closed** (Ferguson) "closes" the mucosa with sutures after hemorrhoid tissue removal
- **Open** (Milligan-Morgan) leaves mucosa "open"

What are the dreaded complications of hemorrhoidectomy?

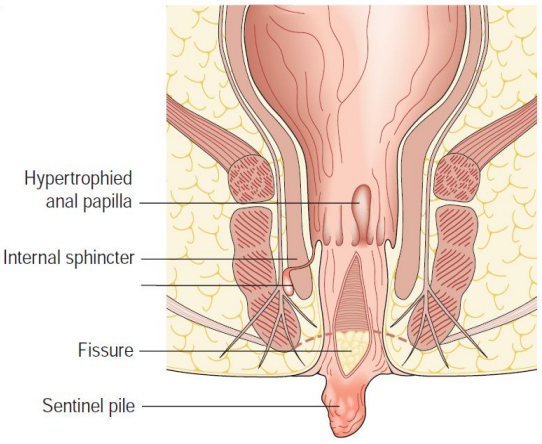
- Exsanguination (bleeding may pool proximally in lumen of colon without any signs of external bleeding)
- Pelvic infection (may be extensive and potentially fatal)
- Incontinence (injury to sphincter complex)
- Anal stricture

What condition is a contraindication for hemorrhoidectomy?
Crohn's disease
Classically, what must be ruled out with lower GI bleeding believed to be caused by hemorrhoids?
Colon cancer (colonoscopy)

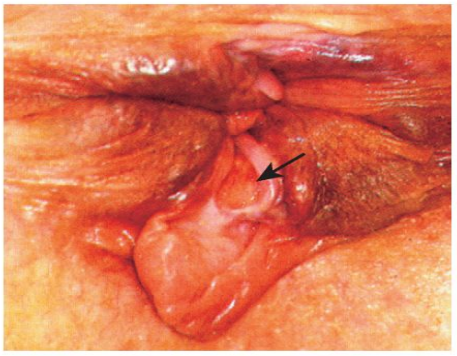
Anal Fissure شق شرجي

- A fissure is a tear جرح (or linear ulcer) in the anal canal (in the anoderm) extending from just below the dentate line (anal transition zone) to the anal verge.
- It is common and usually affects younger age groups (18-30 years).

Pathogenesis:

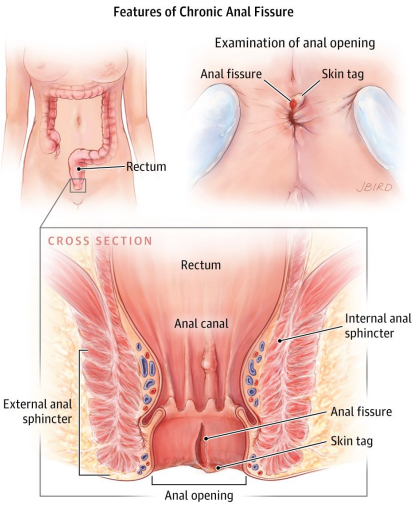


- Repeated straining → hypertrophy of muscle → decreased blood supply → ischemia → the least area of blood supply is the posterior midline → so a wound occurs.
- In summary: **Ischemia** due to low blood supply due to high pressure.
- Successive bowel motions provoke further trauma, pain and anal spasm resulting in a vicious **cycle**.
- Patients are reluctant to go to the bathroom because of pain, so they hold it in. Then the longer the feces stays in the bowel, the more fluid is reabsorbed and the harder stool gets. Then this stool will cause more injury during defecation.
- 90 - 99% of anal fissures are located in the posterior midline because:
  - It has the least blood supply (which further decreases when pushing to defecate) result of arterial anatomy and internal anal sphincter hypertonicity
  - Lack of tissue support
  - Maximal stretching at this site.
- Almost all the rest located in the anterior midline.



Etiology:

- Most fissures are idiopathic.
- Recurrent or multiple fissures affecting areas other than the midline should raise the suspicion of Crohn's disease, or TB or ulcerative colitis.
- Can be a complication of hemorrhoidectomy (although uncommon).



Clinical Features:

- **The cardinal symptom is severe pain** during and for minutes to hours following defecation.
- Sometimes bleeding in 10 - 20% (outlet-type rectal bleeding).
- Fissures may be **acute** and settle **spontaneously**.
- **Chronic**[6] anal fissure is defined as an ulcer that has been present for **at least 6 weeks**.
- **Features of chronicity (>6 weeks) 4 signs:**
  1. Distal sentinel/skin tag, **2.** a proximal hypertrophied anal papilla, **3.** fibrotic and raised edges, and **4.** exposed internal sphincter fibres appears white[7] (while in acute they are red).

[6] A picture of a chronic fissure came as an **OSCE** station for the 4th years and they were asked what it is and how treat it, etc. (it MIGHT come for us)

[7] The sphincter is white in color and if the fissure is chronic the sphincter becomes exposed.

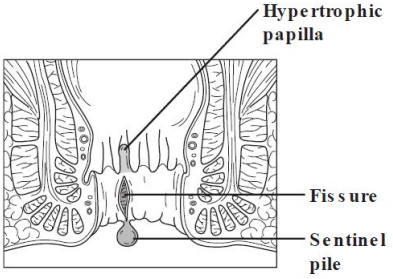
Treatment: (The main goal is to increase the blood supply to the tissue).

- Note: once the fissure becomes chronic it's hard to treat and needs surgery, but if it is acute you can still manage them medically.
- Treat the constipation (underlying cause → avoid straining!):
  - Warm baths (sitz bath) and a diet sufficiently high in fibers to achieve soft bulky stools allows approximately 50% of acute anal fissures to heal within three weeks.
  - Recurrence is common, in the range of 30-70%, but can be reduced to 15-20% by maintaining a high fibre diet
- **Vasodilators** (applied topically as cream):
  - Calcium Channel Blockers ex: nifedipine
  - Nitrates → Nitroglycerin
- Botox (to paralyze internal sphincter and relieve pressure)
- Surgery:
  - Lateral internal **sphincterotomy** (LIS): commonest operation for anal fissure → involves cutting a small portion of the internal sphincter, relaxing the muscle and increasing blood supply to allow the fissure to heal, 5% risk of incontinence.

Recall: EXTRA

What is anal fissure?
Tear or fissure in the anal epithelium
What is the most common site?
Posterior midline (comparatively low blood flow)
What is the cause?
Hard stool passage (constipation),hyperactive sphincter, disease process (e.g., Crohn's disease)
What are the signs/symptoms?
Pain in the anus, painful (can be excruciating) bowel movement, rectal bleeding, blood on toilet tissue after bowel movement, sentinel tag, tear in the anal skin, extremely painful rectal exam, sentinel pile, hypertrophic papilla
What is a sentinel pile?
Thickened mucosa/skin at the distal end of an anal fissure that is often confused with a small hemorrhoid
What is the anal fissure triad for a chronic fissure?

1. Fissure
2. Sentinel pile
3. Hypertrophied anal papilla



What is the conservative treatment?
Sitz baths, stool softeners, high fiber diet, excellent anal hygiene, topical nifedipine, Botox
What disease processes must be considered with a chronic anal fissure?
Crohn's disease, anal cancer, sexually transmitted disease, ulcerative colitis, AIDS
What are the indications for surgery?
Chronic fissure refractory to conservative treatment
What is one surgical option?
Lateral internal sphincterotomy (LIS)—cut the internal sphincter to release it from spasm
What is the "rule of 90%" for anal fissures?

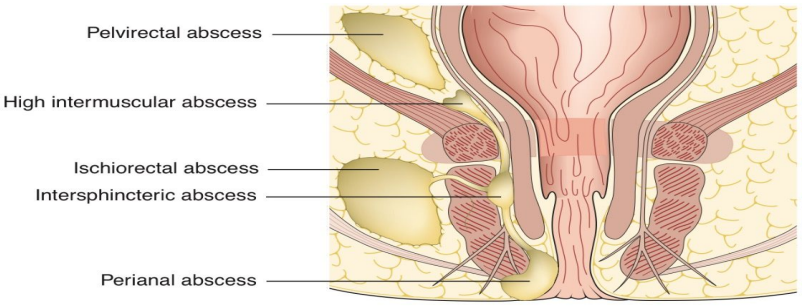
- 90% occur posteriorly
- 90% heal with medical treatment alone
- 90% of patients who undergo an LIS heal successfully

Perianal Abscess Video(08:14)

- The abscess is an acute manifestation, and the fistula is a chronic condition.

Pathophysiology:

- Most abscesses (**90%**) are due to cryptoglandular hypothesis, initiated by blockage of the anal gland ducts followed by secondary infection with colonic organisms such as *Bacteroides, streptococcus faecalis* and *coliforms*.
- Infection at the glands in crypts of dentate line → swollen → close lumen → collection and accumulation of debris → dirty area with bacteria → abscess.
- **Other specific causes for anal abscess (10%):**
  - Crohn's → inflammation → abscess.
  - Ulcerative colitis (rarely)
  - TB
  - Cancer (Carcinoma)
  - Trauma or Radiation
  - Foreign body
  - Lymphoma & Leukemia
  - Pelvic inflammation



Types	Explanation
Perianal abscess	**Most common** type.
Intersphincteric abscess	• Abscess remains localised **between** the internal sphincter and the external sphincter. • Difficult to diagnose (by examination). • Main differential diagnosis is **acute anal fissure**.
Ischiorectal or ischioanal abscess	• Relatively uncommon but a serious problem. • As the ischiorectal space is horseshoe-shaped and there are no fascial barriers within it, infection can track extensively and affect the contralateral space. • Patient presents with swelling in both buttocks associated with difficulty in sitting.
Supralevator space Above levator ani.	Has different mechanism from those above relating to abdominal pathology. Rare, difficult to diagnosis.

Clinical features:

- The patient presents with acute anal **pain** and tenderness +/- systemic manifestations (fever) if it becomes infected .
- There is usually no evidence of suppuration on inspection of the perianal region. Pain often prevents digital examination.

Treatment:

1. Almost always surgical → **Incision and drainage**: When we drain the abscess, we produce a small channel between the end of the bowel and the skin near the anus, this is called fistula. 60% percent of the fistulas after drainage will close spontaneously while the rest will remain[8].
2. Give **Parenteral antibiotic** (metronidazole,cephalosporins) **only for some patient** (Immunocompromised, patients with valvular disease, Diabetics, cancer patients, extensive diseases with local manifestation (such as cellulitis) or Systemic manifestation (tachycardia, fever).

[8] We don't know who will close and who will not, they did studies which showed that if the bacteria in the pus came from the skin it will be a fistula, but if it came from the GI it won't be a fistula.

Perianal Fistula ناسور

Video(09:47)

- Fistula is a communication between 2 epithelialized structures.
- The abscess is an acute manifestation, and the fistula is a chronic condition.
- Anal gland duct obstruction results in stasis and infection of the anal gland (cryptoglandular infection). **Abscess precedes all such cases of fistula**, although the sepsis is often subclinical.
- Inappropriate surgical drainage of perianal abscess is responsible for a proportion of fistula.
- Perianal fistula follows the abscess. 40% of drained abscesses end with fistula

Clinical features:

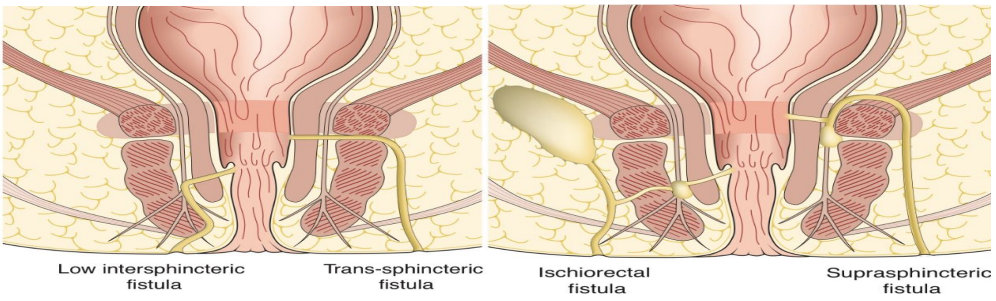
In most cases, the patient presents with a chronically discharging opening in the perianal skin, associated with pruritus and perianal discomfort.

Evaluation:

- An accurate **preoperative assessment** of the anatomy of an anal fistula is very important[9] to know how much muscle is involved and choose correct management.
- **Five essential points of a physical examination of an anal fistula:**
    1. location of the internal opening.
    2. location of the external opening.
    3. location of the primary tract (the duct between the openings).
    4. location of any secondary tract.
    5. determination of the presence or absence of underlying disease.

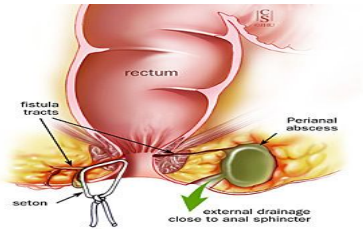
- Clinical exam is key: you touch around the external opening to feel a cord-like structure, this is a canal, and in 80 - 90% of patients we should also feel the internal opening.
- If you think it's a **complicated** fistula (deep or branching) do **MRI** or examination under anaesthetic (EUA) inject a liquid or gas bubbles (hydrogen peroxide) into the external opening then follow it until it comes out from the internal opening.

Classifications:



Management: (treatment of the fistula depends on the depth)

- Almost always surgical **fistulotomy (treatment of choice):** افتحها من اولها الى اخرها وأنظفها
    - The laying-open (نخليها مفتوحه تقفل براحتها) technique is useful for 85-95% of primary fistulae .
    - But we can't do fistulotomy to all fistulas, it depends on how much muscle is involved (because we may cut too much and cause incontinence) and our evaluation.



[9] When I'm evaluating the tract I have to go exactly from the external opening to the internal, because if I go anywhere else I'll make a second tract and it will become a **complicated fistula**

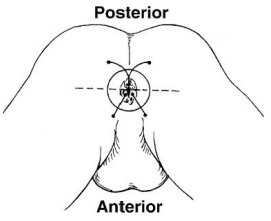
- High complex fistulae should be repaired by **seton:**

Cutting Seton	أدخّل سلك مع الفتحه من برا واطلعه من الفتحه اللي جوى وأربطه على الفيستيولا وأقول للمريض كل ما دخل الحمام يسحب على الخيط الين يحس بألم ويوقّف (المريض بهذي الطريقة قاعد يقص العضلات -فقط خلية او خليتين- بهذي الطريقة المريض قاعد يسمح للعضلة تلتئم وتتقصّ حبة حبة مب مثل لما نقص احنا العضلة كلها مرة وحدة بالعمليه. So it allows for gradual healing with fibrosis (cell by cell cutting)
Draining Seton	A length of suture material looped through the fistula which keeps it open and allows pus to drain out. It only relieves symptoms and can be used in patient with crohn's disease

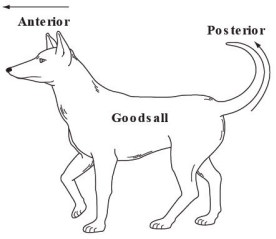
- Treating the internal opening
- Treatment of underlying pathology.

Recall: EXTRA

What is anal fistula?
Fistula from rectum to perianal skin
What are the causes?
Usually anal crypt/gland infection (usually perianal abscess)
What are the signs/symptoms?
Perianal drainage, perirectal abscess, recurrent perirectal abscess, "diaper rash," itching
What disease should be considered with fistula in ano?
Crohn's disease
How is the diagnosis made?
Exam, proctoscope

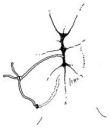


What is Goodsall's rule?
Fistulas originating anterior to a transverse line through the anus will course straight ahead and exit anteriorly, whereas those exiting posteriorly have a curved tract
How can Goodsall's rule be remembered?
Think of a dog with a straight nose (anterior) and curved tail (posterior)

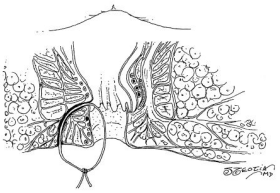


What is the management of anorectal fistulas?

1. Define the anatomy
2. Marsupialization of fistula tract (i.e., llet tract open)
3. Wound care: routine Sitz baths and dressing changes
4. Seton placement if fistula is through the sphincter muscle

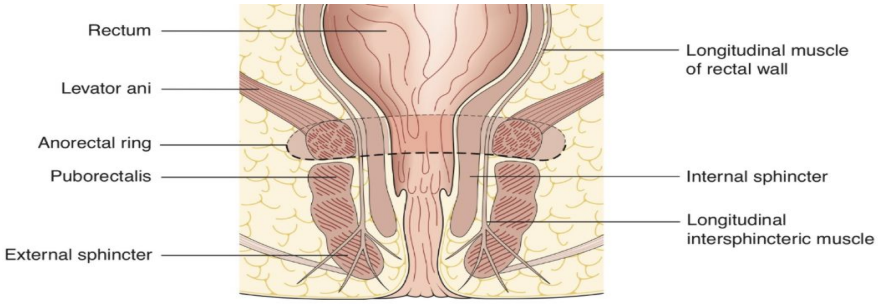


What is a seton?
Thick suture placed through fistula tract to allow slow transection of sphincter muscle; scar tissue formed will hold the sphincter muscle in place and allow for continence after transection
How do you find the internal rectal opening of an anorectal fistula in the O.R.?
Inject H_2O_2 (or methylene blue) in external opening—then look for bubbles (or blue dye) coming out of internal opening!



What is a sitz bath?
Sitting in a warm bath (usually done after bowel movement and TID)
What is perirectal abscess?
Abscess formation around the anus/rectum
What are the signs/symptoms?
Rectal pain, drainage of pus, fever, perianal mass
How is the diagnosis made?
Physical/digital exam reveals perianal/ rectal submucosal mass/ fluctuance
What is the indication for postoperative IV antibiotics for drainage?
Cellulitis, immunosuppression, diabetes, heart valve abnormality
What percentage of patients develops a fistula in ano during the 6 months after surgery?
50%

Summary

Anatomy of the Anal Canal:	 • Types of sphincters: internal (sensitive to stretch) and external (sensitive to pain) • Anorectal spaces (8) important in abscess
Hemorrhoids	Normal vasculature in the anal canal, when symptomatic it becomes diseased hemorrhoids. • Caused by anything that'll increase intra-abdominal pressure. • Types : A) Internal (4 grades) B) External • Symptoms: bleeding and prolapse **Treatments:** (**dietary and lifestyle** / rubber band ligation / hemorrhoidectomy)
Anal fissures	A tear in the anal canal. • Initiating factor is trauma and is related to ischemia • Cardinal **symptom** is pain • Over 90% are located in the posterior midline **Types**: A) acute B) chronic **Treatment** (treat constipation/ Vasodilators / Botox / Surgery)
Perianal abscess	**Cryptoglandular hypothesis:** infection of the anal glands associated with the anal crypts is the primary cause of anal fistula and abscess. **Other Causes:** (Crohns/ Ulcerative Colitis/ TB) **Types(4)** related to anorectal space space **Treatment:** Incision & Drainage +/- parenteral antibiotic (if patient is immunocompromised)
Anal fistula	Abscess precedes all cases of fistula **Essential points of a clinical examination of an anal fistula:** internal opening, tract, and external opening **Investigations:** Clinical exam Complicated fistula requires MRI **Management:** **Fistulotomy**

Quick recap by the doctor:

★ Patient presented with **severe pain**, **no** lump, pain more with bowel motion→ most likely **fissure**
★ Patient has **painful lump** → most likely **abscess** or **external** hemorrhoid.
★ If patient only presents with **blood,** no **pain** → most likely **internal hemorrhoid**.

Keep in mind that these anorectal conditions are very common (almost 90% of people will have them at some point) so you should know them no matter what your speciality is.

Questions

Q1: What is the most common pathophysiology of perianal abscess?
a) bacterial colonization
b) bacterial invasion
c) anal gland occlusion
d) bacteremia

Q2: How can we treat high complex fistula?
a) fistulotomy
b) seton
c) both

Q3: In which grade of hemorrhoids does prolapse occur that can be manually reduced?
a) grade 1
b) grade 2
c) grade 3
d) grade 4

Q4: What medical treatment can be given to patients with anal fissure?
a) beta blockers
b) topical calcium channel blockers
c) topical nitroglycerine
d) answers b and c

Q5: In the treatment of anal fissures, what is the mechanism of action of botox?
a) vasodilation
b) antiseptic
c) paralysis of internal sphincter

Q6: 22-year-old female with bright red blood from her rectum with history of extremely painful bowel movements. Name the most likely diagnosis.
a) anal fissure
b) hemorrhoid
c) perianal abscess
d) perianal fistula

Q7: A medically free 21-year-old presented with acute anal pain and was diagnosed to have perianal abscess. How would you treat this patient?
a) systemic antibiotic
b) fistulotomy
c) incision and drainage
d) seton

Answers : 1: C 2: B 3: C 4: D 5: C 6: A 7. C