

Anorectal Conditions

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● Important

● Doctor's Notes

● Extra

● Davidson's

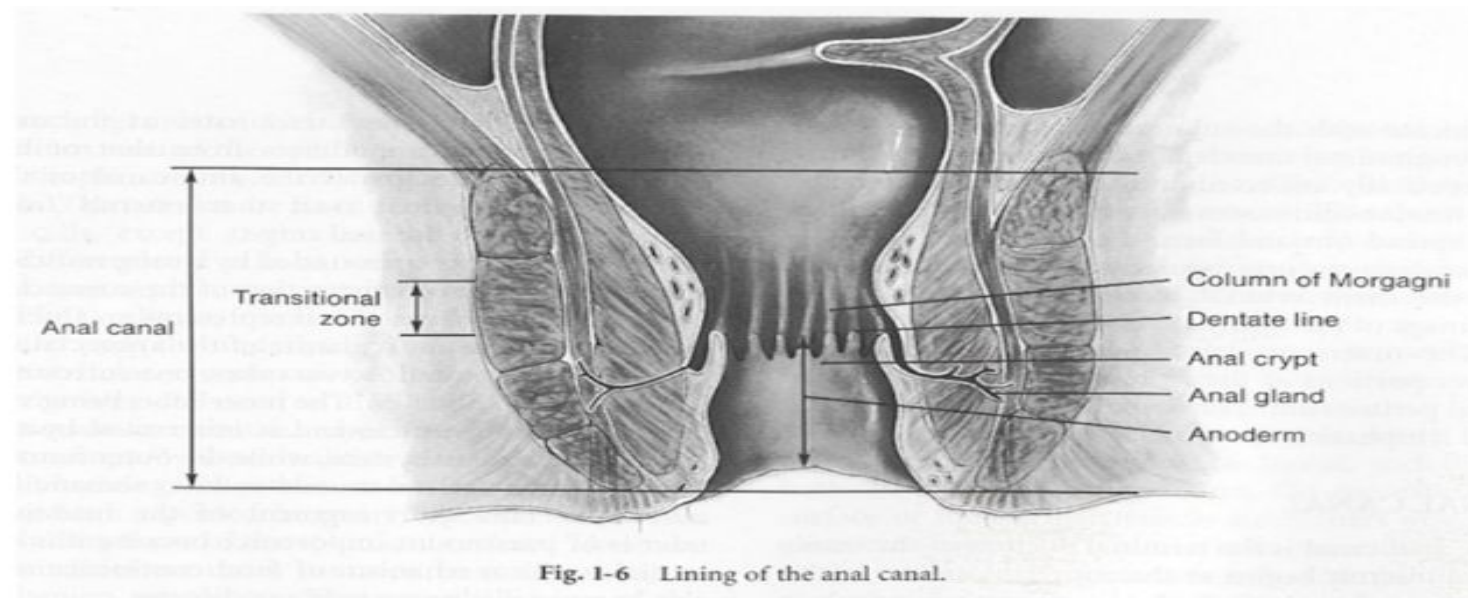
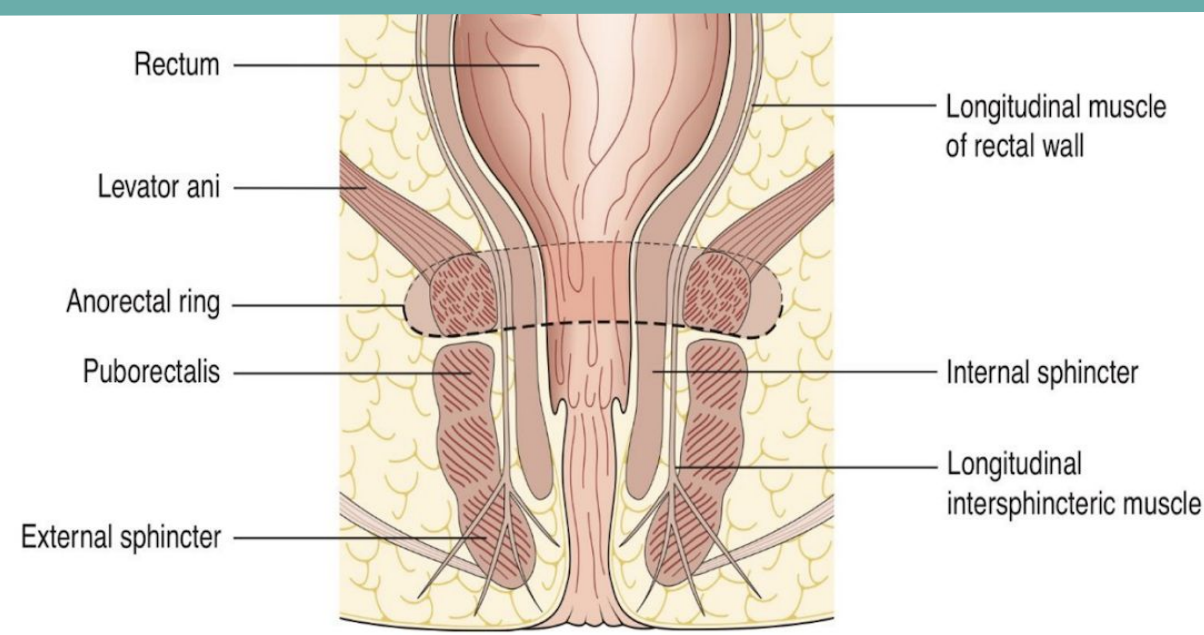
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Objectives:
Not Given



Anatomy of the Anal Canal



- The anal canal is about 3-4 cm long.
- **The "Anatomical" anal canal: From the dentate line to the anal verge. (MCQs)**
- **The "Surgical" anal canal: From the anorectal ring(junction) to the anal verge.(MCQs):**
 - It's formed by the **internal anal sphincter, external anal sphincter, and puborectalis.**
 - It's longer in males than in females.
- The dentate (pectinate) line represents the line of fusion between the endoderm + ectoderm. It divides the upper two thirds and lower third of the anal canal.
- There are glands within the crypts of dentate line. Which secrete mucus, lubricating and protecting the delicate epithelium of the anal transition zone.

Internal Sphincter	External Sphincter
Is a condensation of the inner circular smooth muscles of the rectum and is a continuation of the circular muscles of the GI tract	is a cylinder of striated muscle that extends downward from the levator ani muscle to the distal anoderm.
Visceral innervation , innervated by L5-S4 mixed autonomic function in crossed fashion so that unilateral injury still results in preserved function.	Somatic innervation , from branches of S2-3 via the inferior rectal branch of the pudendal nerve and the perineal branch of S4.
Columnar glandular epithelium	Non-keratinized squamous epithelium
chronically contracting and contributes approximately 50-75 % of the resting tone of the anus	when stimulated under voluntary control, it doubles the tone of the anus above the resting state.
<ul style="list-style-type: none"> ● Superior rectal (hemorrhoidal) artery (branch of the inferior mesenteric artery) ● Superior rectal vein → portal circulation. ● Lymphatic drainage to inferior mesenteric nodes 	<ul style="list-style-type: none"> ● Inferior rectal artery (branch of the internal pudendal artery) ● Inferior rectal vein → systemic circulation. ● Lymphatic drainage to the inguinal nodes.

Levator Ani Muscle

- The Levator ani muscle is also striated muscle and composed of pubococcygeus, puborectalis and iliococcygeus
- It essentially gives main pelvic floor support and is also instrumental for fecal continence

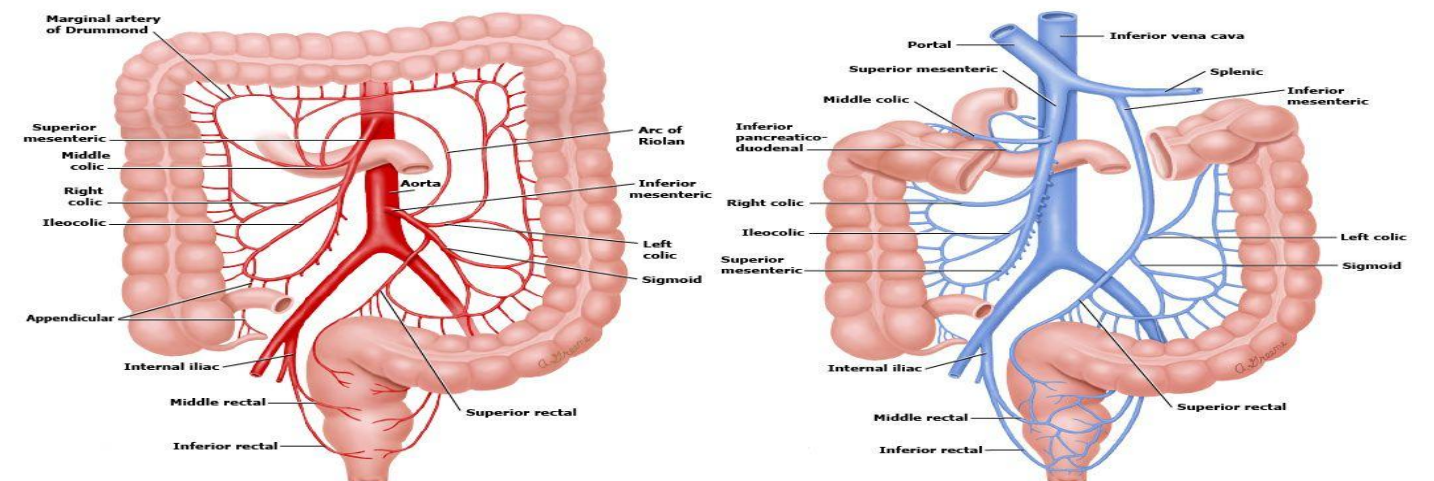
- The parasympathetic fibers to the rectum and anal canal emerge from the sacral foramina at the S2, 3, 4 levels.
- The parasympathetic join the sympathetic hypogastric nerves in the pelvic plexus
- The upper anal canal contains a high density of free and organized sensory nerve endings. Organized nerve endings include Meissner's corpuscles (touch), Krause's bulbs (cold), Golgi-Mazzoni bodies (pressure), and genital corpuscles (friction).

Anorectal Spaces:

The perianal space	Intersphincteric space	Submucous Space	Ischioanal/ Ischiorectal Space
<p>→ Boundaries:</p> <ul style="list-style-type: none"> ◆ Cephalad: dentate line. ◆ Laterally: the subcutaneous fat of the buttocks, contained by fibers extending from the conjoined longitudinal muscle often referred to as corrugator cutis ani muscle fibers. ◆ The perianal space is contained by anoderm. <p>→ The perianal space contains:</p> <ul style="list-style-type: none"> ◆ External hemorrhoid cushions ◆ The subcutaneous external anal sphincter. ◆ The distal internal anal sphincter <p>→ The perianal space is in communication with the intersphincteric space.</p>	<p>→ It lies between the internal and external anal sphincter.</p> <p>→ It is continuous with the perianal space.</p> <p>→ It is of clinical importance as cryptoglandular infections tend to begin in this area and expand elsewhere to create anal fistula.</p> <p>The composition of the epithelium of the anorectum determines the type of tumour that affects the region. Thus, squamous cell carcinoma of the anal canal arises from the epithelium below the dentate line or in the transitional zone of non keratinised squamous epithelium. Because the canal above the anal transition zone contains columnar glandular epithelium, tumours of the upper anal canal are adenocarcinoma;</p>	<p>→ This space lies between the medial border of the internal anal sphincter and the anal mucosa proximal to the dentate line.</p> <p>→ It is continuous with the submucosa of the rectum.</p> <p>→ This area contains internal hemorrhoid vascular cushions.</p>	<p>→ Largest anorectal space. It is a pyramid shape with its apex at the levator muscle insertion into the obturator fascia.</p> <p>→ Boundaries:</p> <ul style="list-style-type: none"> ◆ Medially: levator ani muscle and external anal sphincter. ◆ Laterally: obturator internus muscle and obturator fascia. ◆ Posteriorly: lower border of the gluteus maximus muscle and the sacrotuberous ligament. ◆ The space is has an anterior boundary formed by the superficial and deep transverse perineal muscles. ◆ The caudal boundary is skin of the perineum <p>→ The ischioanal fossa contains:</p> <ul style="list-style-type: none"> ◆ adipose tissue ◆ pudendal nerve branches ◆ superficial branches of the internal pudendal vessels. <p>→ The right and left ischioanal space communicate posteriorly through the deep postanal space between the levator ani muscle and anococcygeal ligament.</p>

Vascular Supply:

- ★ Arterial supply: By middle and inferior rectal artery
- ★ Venous supply: Middle and inferior rectal veins



Common Anal Symptoms:

- ★ Anal bleeding, pain and discomfort
- ★ Perianal itching and irritation
- ★ Something coming down
- ★ Perianal discharge

Common Anorectal Diseases:

- ★ Anal Abscess
- ★ Anal Fistula
- ★ Anal fissure
- ★ Anal Cancer
- ★ Cancer of the rectum
- ★ Cryptitis
- ★ Enlarged papillae
- ★ Fecal Incontinence
- ★ Hemorrhoids
- ★ Levator Syndrome
- ★ Pilonidal cyst
- ★ Polyps
- ★ Proctalgia Fugax
- ★ Proctitis
- ★ Pruritus Ani
- ★ Rectal Prolapse
- ★ Rectocele
- ★ Venereal Warts (Condyloma)

Examination & Investigation:

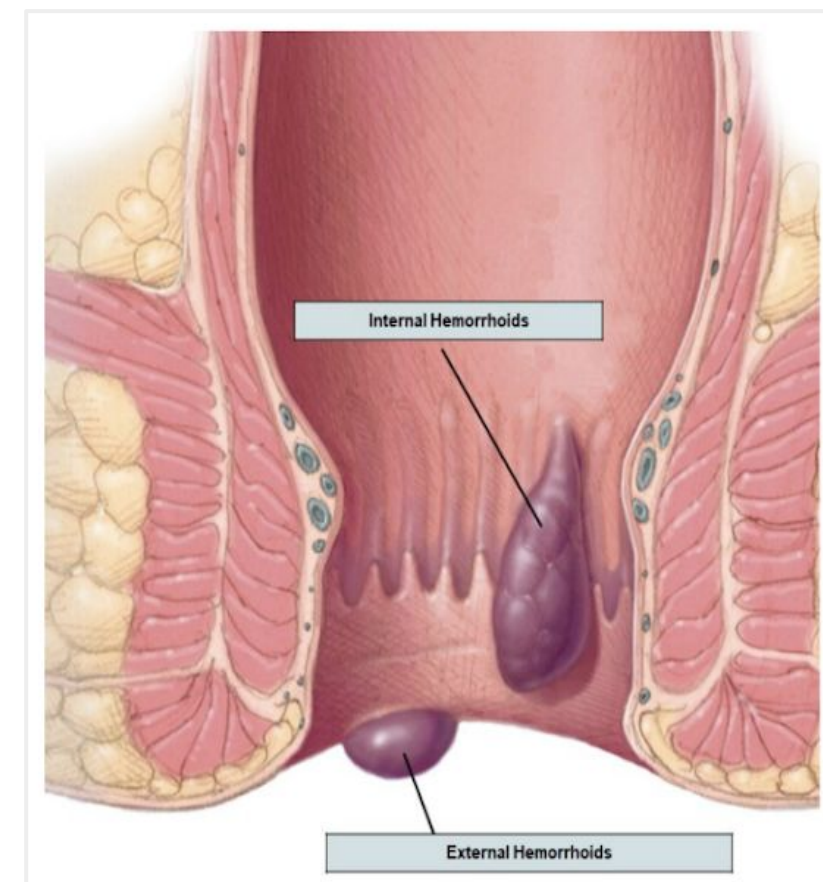
- ★ Clinical examination:
 - Anoscopy (will tell you what happens in anal canal)
 - Rectosigmoidoscopy (will tell you what happens in from rectum to sigmoid colon)
- ★ Investigation:
 - Endosonography
 - MRI (used for rectal cancer and its the most commonly used modality for anatomical problems)
 - Manometry (Measure pressure in the rectum and Sphincters)
 - MR Defecography (measure motility = Function and anatomy at rectum)

Hemorrhoids بواسير

- They are normal vascular structures in the anal canal that are like cushions which help in continence. When it gets symptomatic it becomes diseased hemorrhoid.
- Hemorrhoids are dilated veins occurring in relation to the anus
- Internal or External.
- Anything that increases the intra-abdominal (Ex:Constipation) or intrapelvic pressure can cause enlargement of the normal fibrovascular cushions lining the anal canal.

Etiology:

- Hereditary
- aging
- Anatomical (absence of valves in hemorrhoidal veins/ pelvic floor defect).
- Exacerbating factors (**straining**/obesity/chronic cough).
- ↑ intra abdominal pressure (ascites/intra-abdominal mass/ pregnancy).



Pathophysiology:

1. Engorgement of normal fibrovascular lining of anal canal
2. Prolapse of internal hemorrhoids tissue through anal canal
3. Thinning of the friable overlying mucosa
4. Subsequent bleeding occurs

(*Internal hemorrhoids course along terminal branches of Superior rectal artery & are located at the 2-, 5-, and 9-o'clock positions when the patient is viewed prone)

Internal hemorrhoids Originating above the dentate line*	External Hemorrhoids Originating below the dentate line
Painless with bleeding (may cause pain if very severe)	Painful
Embryonic endoderm & lined with columnar epithelium of anal mucosa	Ectoderm & covered by squamous epithelium of anal mucosa
Drain through the superior rectal vein → portal system.	Drain through the inferior rectal vein →IVC
Are not supplied by somatic sensory nerves and hence cannot cause pain	Are innervated by cutaneous nerves that supply the perianal area

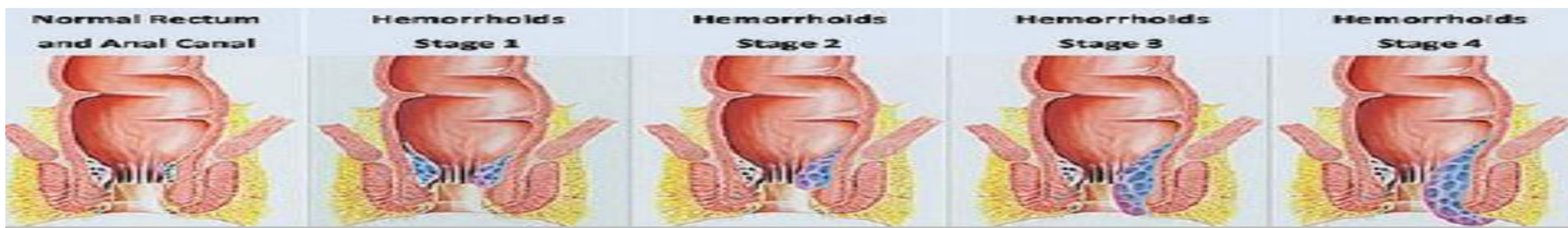
*Internal and External Hemorrhoids are divided by Dentate Line "pectinate line"

Internal Hemorrhoids بواسير

- ★ More common than external hemorrhoids
- ★ **Dilatation of the internal venous plexus with an enlarged displaced anal cushion**
- ★ From superior hemorrhoidal plexus
- ★ **Diagnosis and treatment are based on symptoms rather than appearance**
- ★ Therapy should be guided by two principles:
- ★ Colonic or rectal disease must be excluded
- ★ Asymptomatic hemorrhoids should not be treated

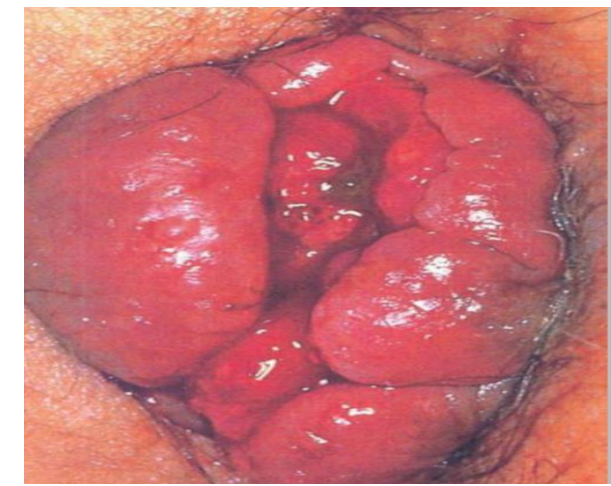
Grading:

GRADE	SYMPTOMS & SIGNS
First degree	Bleeding; no prolapse (only conservative treatment)
Second degree	Prolapse with spontaneous reduction , bleeding, seepage
Third degree	Prolapse requiring digital reduction , Bleeding, seepage
Fourth degree	Prolapsed, can not be reduced , strangulated (here the internal hemorrhoids become external and its treated only by surgery not By band ligation)



Clinical Features:

- ★ **Painless bright-red rectal bleeding with defecation**
- ★ With ↑ in size, hemorrhoids may **prolapse**
- ★ Mucoid discharge
- ★ Pruritus ani
- ★ Pain: if complications supervene (strangulation (which happens in stage 4), abscess)

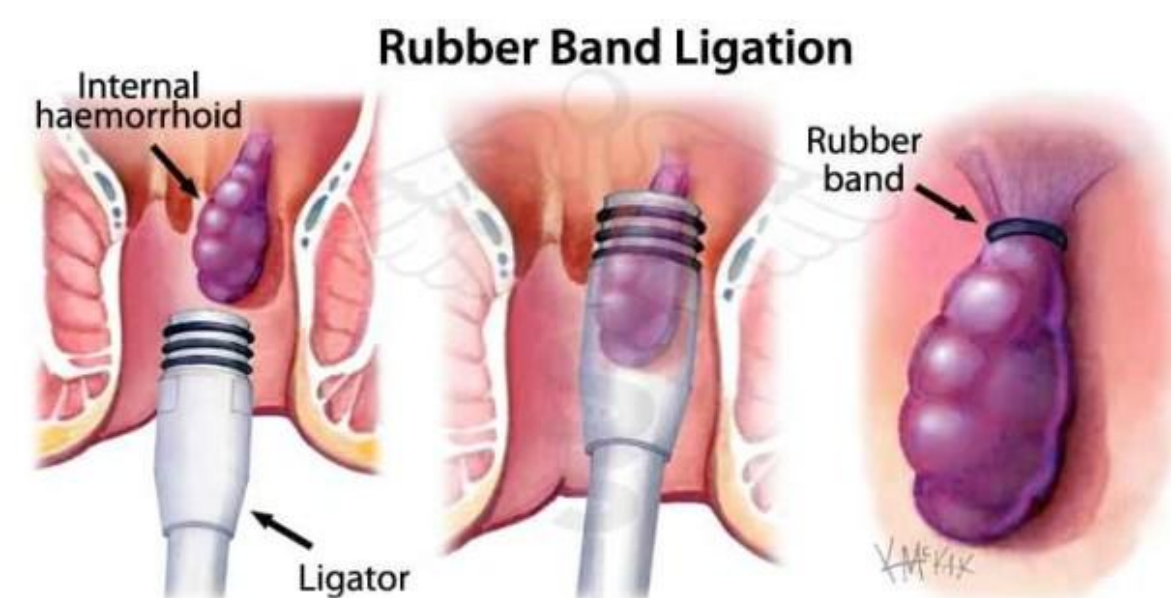


Differentials:

- Anorectal fissures ◦ Anorectal fistula ◦ Rectal abscess ◦ **Colorectal Ca**
- Rectal varices (Portal HTN) ◦ IBD ◦ Diverticular disease ◦ Angiodysplasia ◦ Anal warts ◦ Anal skin tags ◦ **Rectal prolapse** ◦ Rectal polyps ◦ Enlarged anal papillae

Treatment:

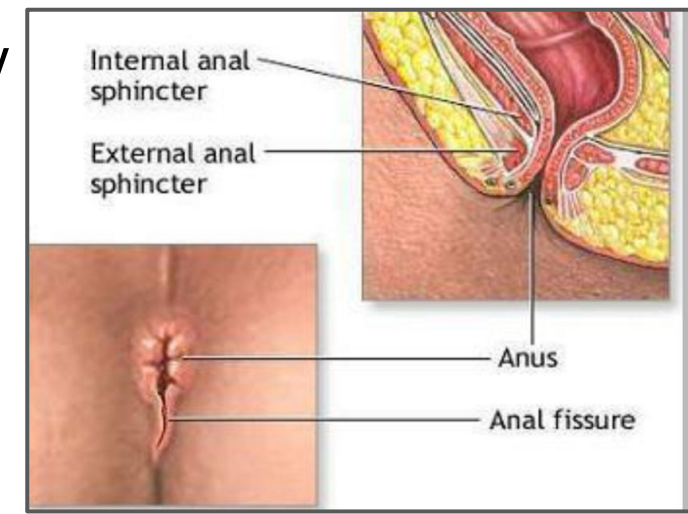
- ★ Non surgical procedures
- ★ Scope
- ★ Treat underlying problem
- ★ Banding
- ★ Surgical (For stage 4 hemorrhoidectomy)



1. **Dietary and lifestyle modifications:** (for all grades) increasing fluid and fiber in the diet, and recommending exercise.
2. **Rubber band ligation:** (internal hemorrhoid) (grade 2- 3)
 - a. Banding of mucosa → cut off supply → 7-10 days and it will fall.
 - b. **DON'T PUT BAND ON EXTERNAL HEMORRHOID IT IS SENSORY!**
3. **Hemorrhoidectomy** (grade 3 if banding didn't work-grade 4)
4. Lord's anal stretch (rarely done)
5. Infrared coagulation (for grade I and II)
6. Bipolar electrocautery (for lower-grade hemorrhoids)
7. Sclero Rx & Cryo Rx (S/E - abscess, urinary retention)
8. Laser therapy and Radio-wave ablation (for prolapsing hemorrhoids)

Anal Fissure بِسْوَة سِرَجِيَّة

- A fissure is a linear ulcer of the lower half of the anal canal, usually located in the posterior commissure in the midline. Fissures may be:
 1. Acute-mostly heal spontaneously
 2. Chronic-persist beyond 6 weeks, morphologically-presence of visible transverse internal anal sphincter fibers at the base of the fissure.



- **Associated signs in chronic fissures (MCQs):**

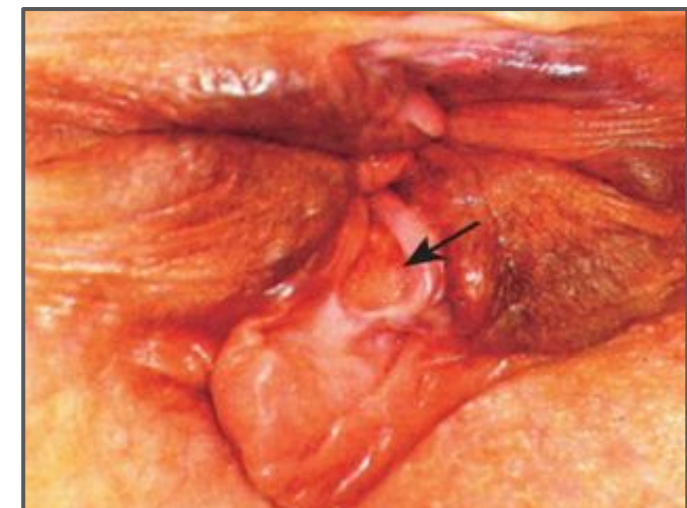
1. indurated edges
2. a sentinel pile (skin tag)
3. hypertrophied anal papilla
4. exposed internal sphincter fibres appears white, (while in acute they are red).

Pathogenesis

- Repeated straining → hypertrophy of muscle → decreased blood supply → ischemia → the least area of blood supply is the posterior midline → so a wound occurs.
- Successive bowel motions provoke further trauma, pain and anal spasm resulting in a vicious cycle.
- **90 - 99% of anal fissures are located in the posterior midline because (MCQs):**
 1. It has the least blood supply
 2. Lack of tissue support
 3. Maximal stretching at this site.

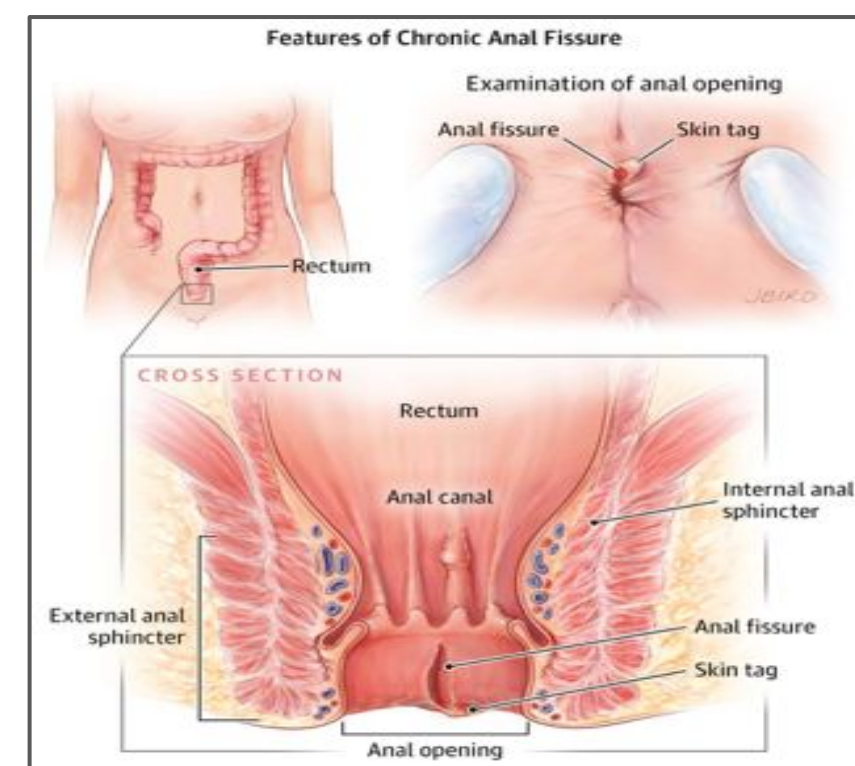
Etiology:

1. Trauma from passage of hard stools
2. Low-fiber diets
3. Prior anal surgery
4. Hypertonicity & hypertrophy of the internal anal sphincter
5. Posterior anal commissure is the most poorly perfused part of the anal canal.
 - In patients with hypertrophied internal anal sphincters, this delicate blood supply is further compromised



Salient Features:

- M/C location - posterior midline
- Other associated conditions:
 1. Sentinel pile or tag externally
 2. Enlarged anal papilla internally° Hidradenitis suppurativa
 3. STDs
 4. IBD
- With defecation, the ulcer is stretched causing severe pain & mild bleeding



Clinical Features: (from 436)

- **The cardinal symptom is severe pain** during and for minutes to hours following defecation.
- Sometimes bleeding in 10 - 20% (outlet-type rectal bleeding).

Types:

★ Typical:

1. Posterior midline 75%
2. Anterior midline 25%
3. Posterior and anterior 3%

★ Atypical or multiple (Not located anterior or posterior)

1. Crohn's Disease
2. Trauma
3. Tuberculosis
4. Syphilis
5. AIDS
6. Anal carcinoma

Anal Fissure **بِسْوَة سَرَجِيَّة**

Management:

- **Warm Sitz baths**
- Hydrocortisone & lidocaine L/A for acute fissures
- **Stool softeners & fiber supplements**
- **Vasodilators** (applied topically **as cream**):
 - -Topical Nitroglycerin 0.2% up to 8 weeks (local application → NO donor → resting anal pressure ↓ → anodermal blood flow ↑)
 - -Topical application of 2% Diltiazem [Calcium channel blockers -topical nifedipine] (fewer S/E) → heal between 48 and 75% of fissures that fail GTN
- Botulinum toxin (botox) (Injected into ext & int sphincters → striated muscle denervation → muscle paralysis & relaxation)
- Surgery: Lateral internal **Sphincterotomy** (Closed/Open technique) **done when the patient doesn't respond to the Conservative treatment (option seen above) like in chronic fissures**

Surgical 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?**

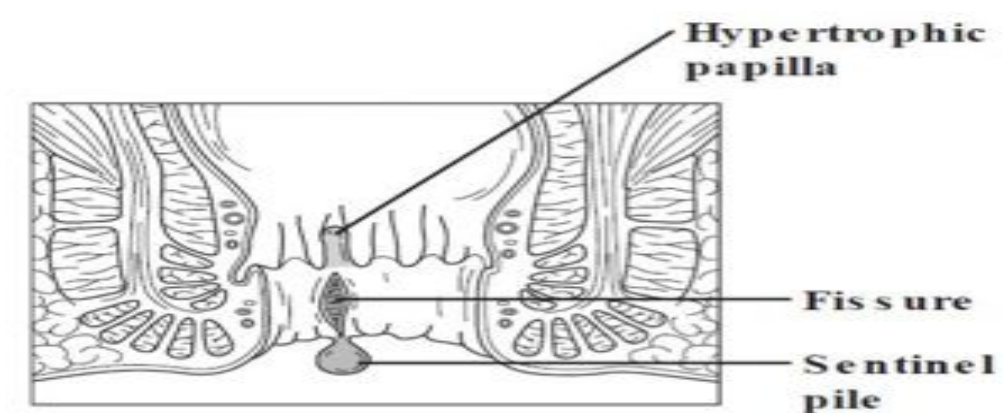
Chronic fissure refractory to conservative treatment

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

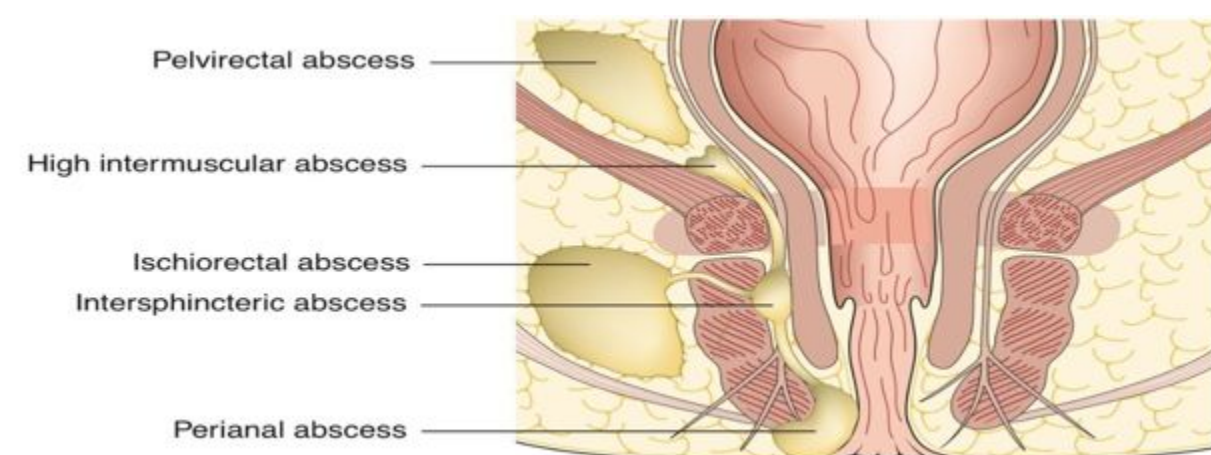


Perianal Abscess

- The abscess is an acute manifestation, and the fistula is a chronic condition.
- Anorectal abscesses frequently result in more or less complex and extensive fistulous tracts
- The two pathologies should be regarded as the same condition.
- Primary septic lesions have a cryptoglandular origin- 90% of fistulas.

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*.**
- 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
- The infection usually starts in one of the crypts of Morgagni and extends along the related anal gland to the intersphincteric plane where it forms as abscess.
- Soon it tracks in various directions to produce different types of abscesses which are classified as follows:
 - **Perianal abscess** (60%) **Most common**
 - **Ischiorectal abscess** (30%)
 - **Submucosal abscess** (5%)
 - **Pelvirectal or Supralevator abscess**

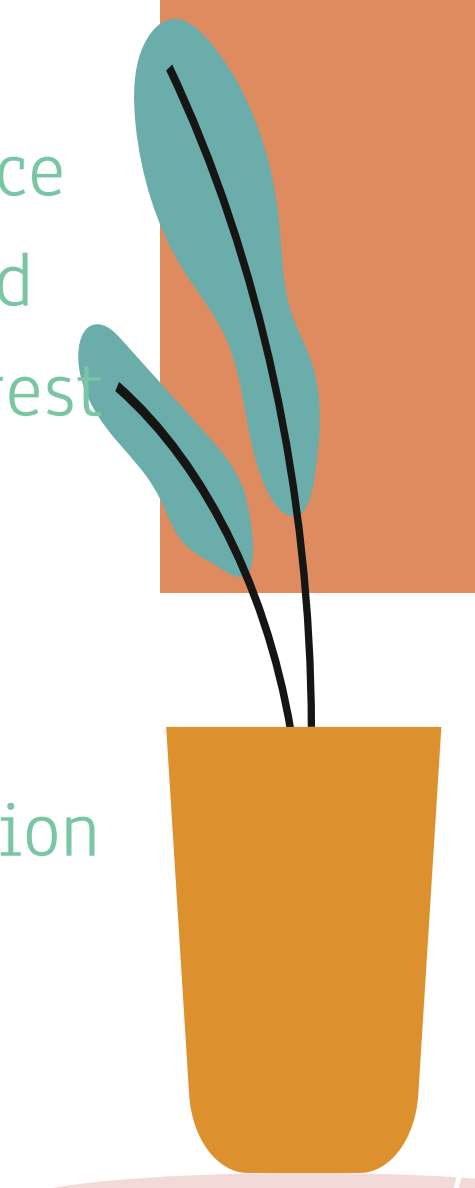


Clinical Features: (from 436)

- 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: (from 436)

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.
2. Give **Parenteral antibiotic** (metronidazole,cephalosporins) **only for some patients** (Immunocompromised, patients with valvular disease, Diabetics, cancer patients, extensive diseases with local manifestation (such as cellulitis) or Systemic manifestation (tachycardia, fever).

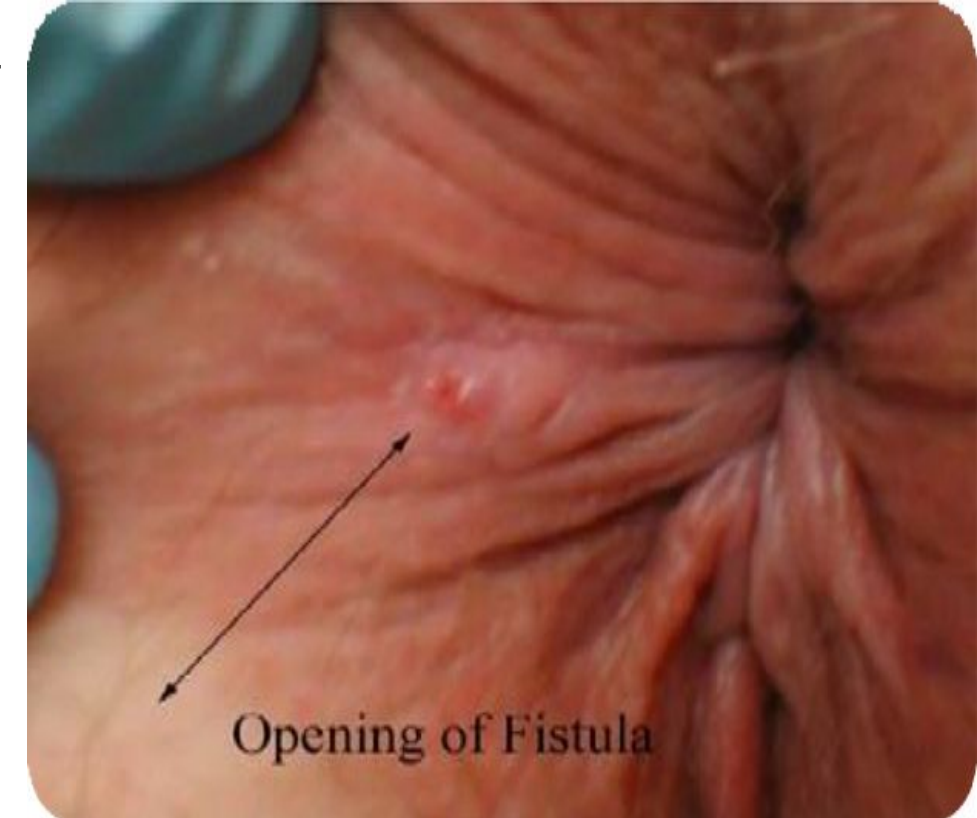


Perianal Fistula الباسور

- Fistula is a communication between 2 epithelialized structures.
- Definition: It is a tract lined by granulation tissue connecting between perianal skin and the cavity of the anal canal or rectum
- 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.

Epidemiology:

- ★ The incidence of a fistula in ano developing from an anal abscess ranges from 26% to 38%
- ★ The prevalence of fistula in ano is 8.6 cases per 100,000 population.
- ★ In men, it is 12.3 cases per 100,000 population
- ★ In women, it is 5.6 cases per 100,000 population.
- ★ The male to female ratio is 1.8:1.
- ★ The mean patient age is 38.3 years



Pathogenesis:

- ★ Different theories were reported about persistence of fistula-in-ano include:
 - **Cryptoglandular theory commonest**
 - Epithelialization
 - Presence of foreign body
 - Specific infections: (IBD, TB, colloid anal carcinoma, rectal carcinoma, lymphogranuloma venereum)

Classification:

According to the site of their internal opening they can be classified into:

1. Low level fistula: Internal opening open into the anal canal below the anorectal ring.
2. High level fistula: Internal opening open into the anal canal at/above the anorectal ring.

Evaluation: (from 436)

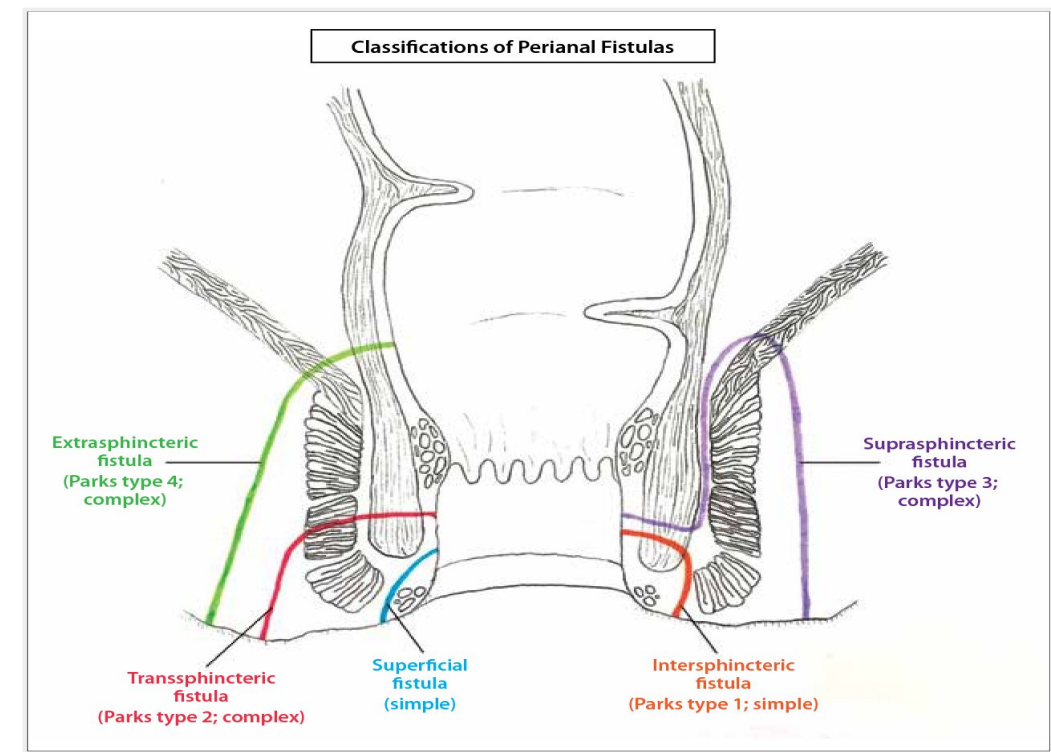
- ★ An accurate **preoperative assessment** of the anatomy of an anal fistula is very important* to know how much muscle is involved and choose correct management.
- ★ **Five essential points of a physical examination of an anal fistula:**
 1. location of the internal opening.
 2. location of the external 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.

*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**

الباسور Perianal Fistula

Park's Classification:

- Intersphincteric** (70%) low level anal fistula
- Trans-sphincteric** (25%) high level anal fistula
- Suprasphincteric** anal fistula
- Extrasphincteric** (1%) rare type include the tract passes outside all sphincter muscles to open in the rectum.



Guidelines:

- ★ **Parks classification:** suprasphincteric, extrasphincteric & transsphincteric
- ★ Drain the sepsis
- ★ Try to identify fistulous tracts

Symptoms of Abscesses & Anal Fistulas:

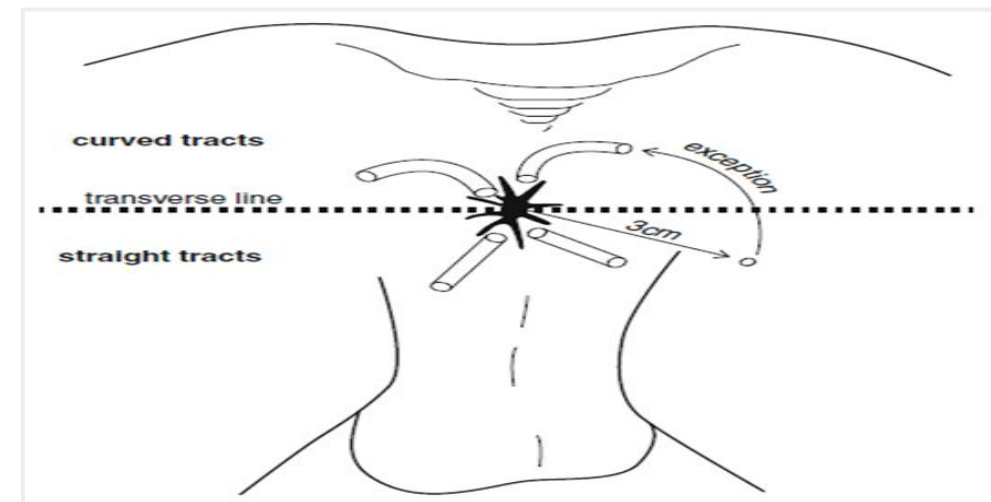
- ★ Discomfort, perianal pain and swelling aggravating by sitting, walking and defecation
- ★ Sometimes minor anal bleeding and discharge **if small amount of pus**
- ★ Superficial cellulitis
- ★ **Fever**, chills, malaise

Goodsall's Rule:

- ★ An imaginary line is drawn transversely across the anus.
 - If an external opening is Anterior to this line (**not far than 3cm**) will lead to a straight radial tract.
 - Whereas an external opening that lies posterior to the line will lead to a curved tract and an internal opening in the posterior commissure.

★ Exception

- >3 cm anteriorly located opening
- Other associated diseases especially Crohn's disease and malignancy.
- Any fistula >3 cm or posterior =curved line
- Anterior fistula that is < 3 cm= straight line



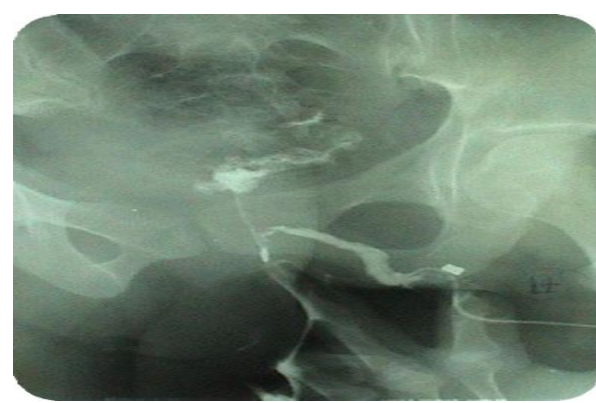
Diagnosis of Abscesses & Anal Fistulas:

- ★ Clinical exam
- ★ Endosonography
- ★ MRI
- ★ Sometimes anorectal examination with a rigid instrument:
 - To identify the anal crypt responsible for the infection
 - To determine the presence of underlying septic or inflammatory proctitis
 - To look for a perforated anorectal cancer

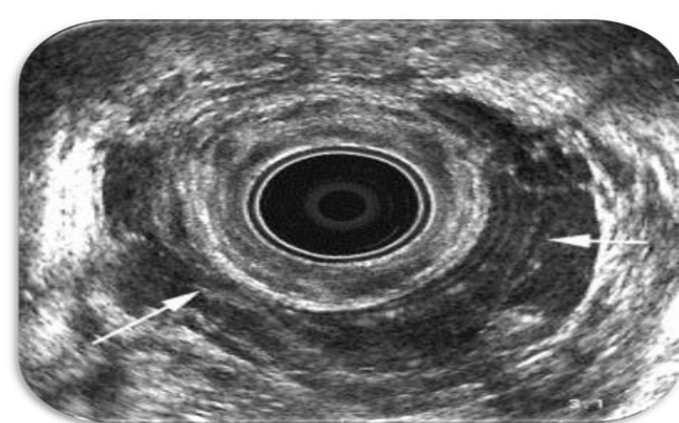
Investigation of Anal Fistulas:

- ★ Fistulogram: Anterio-posterior view fistulography, Showing fistulas tract non branching opening in the anal canal below the intetrochanteric line.
- ★ EUS
- ★ MRI: Coronal view (STIR) left transsphincteric active track is seen start from the ischiorectal fossa traversing the external and then the internal sphincter.
 - Puborectalis muscle
 - Active transsphincteric tract
 - Ischiorectal fossa abscess cavity

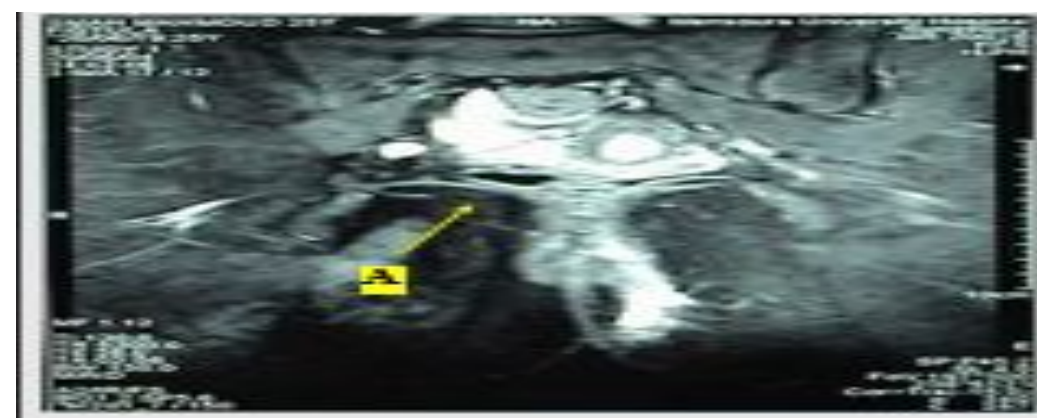
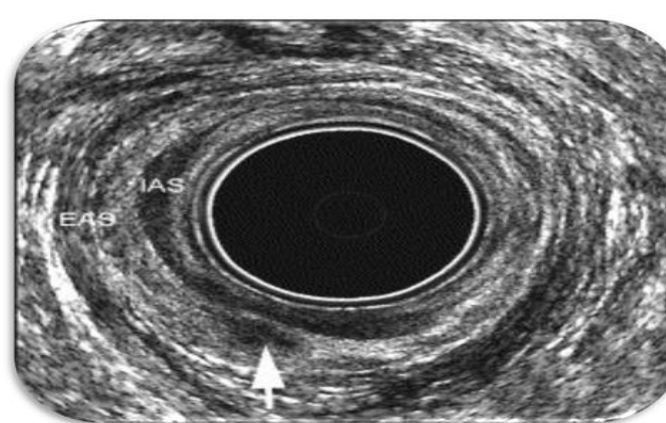
الباسور Perianal Fistula



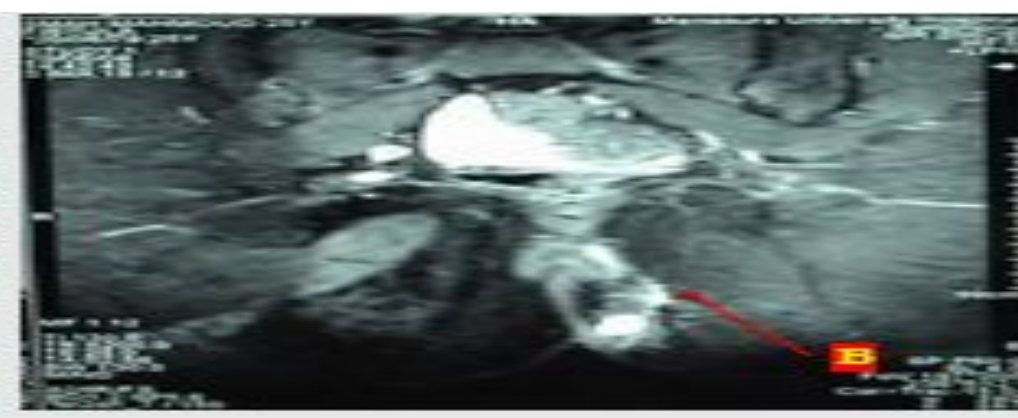
Fistulogram



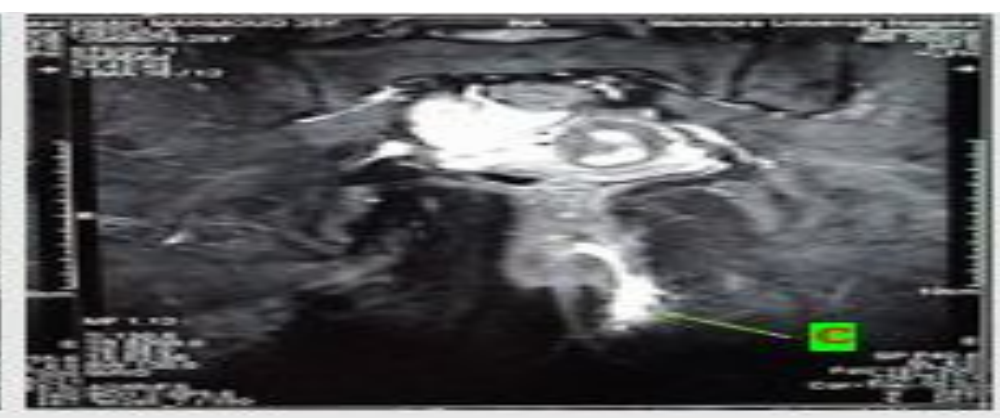
EUS



Puborectalis muscle



Active transsphincteric tract



ischiorectal fossa abscess cavity

Treatment:

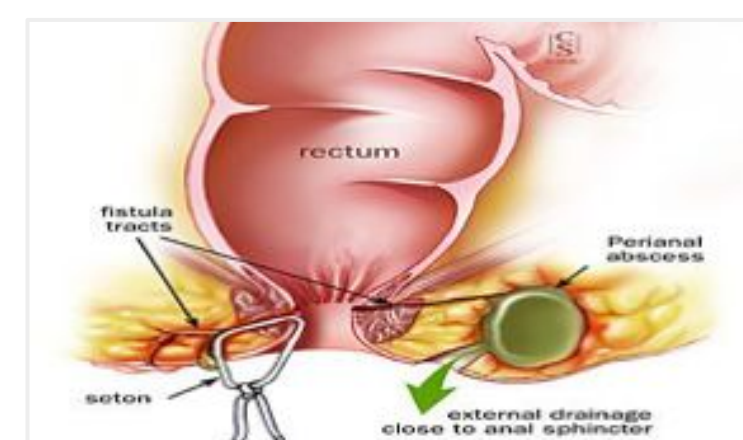
★ Principles of fistula surgery:

- Treatment of fistulas is aimed at draining sepsis, defining and eradicating fistulous tracts whilst preserving sphincter integrity and function (Gordon, 1999).

★ Fistulotomy and drainage:

- Fistulotomy means laying open and allowing to heal by secondary intention. It should be used only when a significant degree of incontinence would not result.
- Intersphincteric and low transsphincteric tracts are probably best treated by this method.

- High healing rate 62%-100 %
- Long healing time up to 6 months
- Minor incontinence 0%-12%
- **It's the treatment of choice for low level fistula not high**



★ Seton:

- Can be placed alone, combined with fistulotomy, or in a staged fashion.

○ Indications:

1. **Complex: High fistulas (high transsphincteric, suprasphincteric, extrasphincteric) or multiple fistulas.**
 2. **Recurrent fistulas after previous fistulotomy.**
 3. Anterior fistulas in female patients.
 4. Poor preoperative sphincter pressures.
 5. Patients with Crohn disease or patients who are Immunosuppressed.
- The success rates for cutting setons range from 82-100%
 - long-term incontinence rates : 12-25%



Surgical Treatment of Complex Anal Fistula

Definitive Therapy: 1. Combined/local medical treatment 2. Fistulotomy ectomy 3. Flap 4. VAAFT 5. LIFT 6. Plug 7. Glue 8. Cell based therapy

Treatment Complications:

1. Early Postoperative Complications:

- a. Urinary retention, Bleeding, Fecal impaction & **Thrombosed hemorrhoids**

2. Delayed Postoperative Complications:

- a. Recurrence & Incontinence (stool)
- b. Anal stenosis: The healing process causes fibrosis of the anal canal; bulking agents for stool help to prevent narrowing
- c. **Delayed wound healing:** Complete healing occurs by 12 weeks unless an underlying disease process is present (ie, recurrence, Crohn disease)

Pilonidal Sinus

- **Definition:** it is a chronic subcutaneous abscess in the natal cleft, which spontaneously drains through the openings.
- The term pilonidal sinus (pilus, meaning hair, and nidus, meaning nest **to describe the chronic sinus containing hair and found between the buttocks.**
- It is called jeep disease " because it is more frequent in military personnel who entered training & driving trucks, tanks, and jeeps.

Pathology:

- ★ It is subcutaneous fibrous tract that may be lined with squamous epithelium.
- ★ A small abscess cavity and branching tracts may come off the primary tract. As a rule, hair follicles are not identified.
- ★ Hairs, if seen, sticking out of the secondary opening are in the abscess cavity that the body tries to spit out.
- ★ Most sinus tracts (93 %) run cephalad; the rest 7 %) run caudad.



Treatment:

One of several ways:

1. Nonoperative treatment,
2. Lateral incision and excision of midline pits, incision and marsupialization.
3. Wide local excision with or without primary closure, excision and
 - Z plasty or Advancing flap operation (Karydakis procedure)

Rectal Prolapse

- Rectal Prolapse is circumferential descent of rectum (bowel) through the anal canal.
- Common in infants, children & elderly
- Common in females (6:1)

Rectum Anatomy:

- ★ Rectum is 18-20 cm long: from rectosigmoid junction to anorectal junction and follows curve of sacrum.
- ★ Three lateral curvatures:
 - Upper and lower are convex to right
 - While middle one is convex to left.
- ★ On mucosal side they correspond to semicircular folds (Houston's valve).
- ★ Part of rectum between middle and lower valve is widest ampulla of rectum.

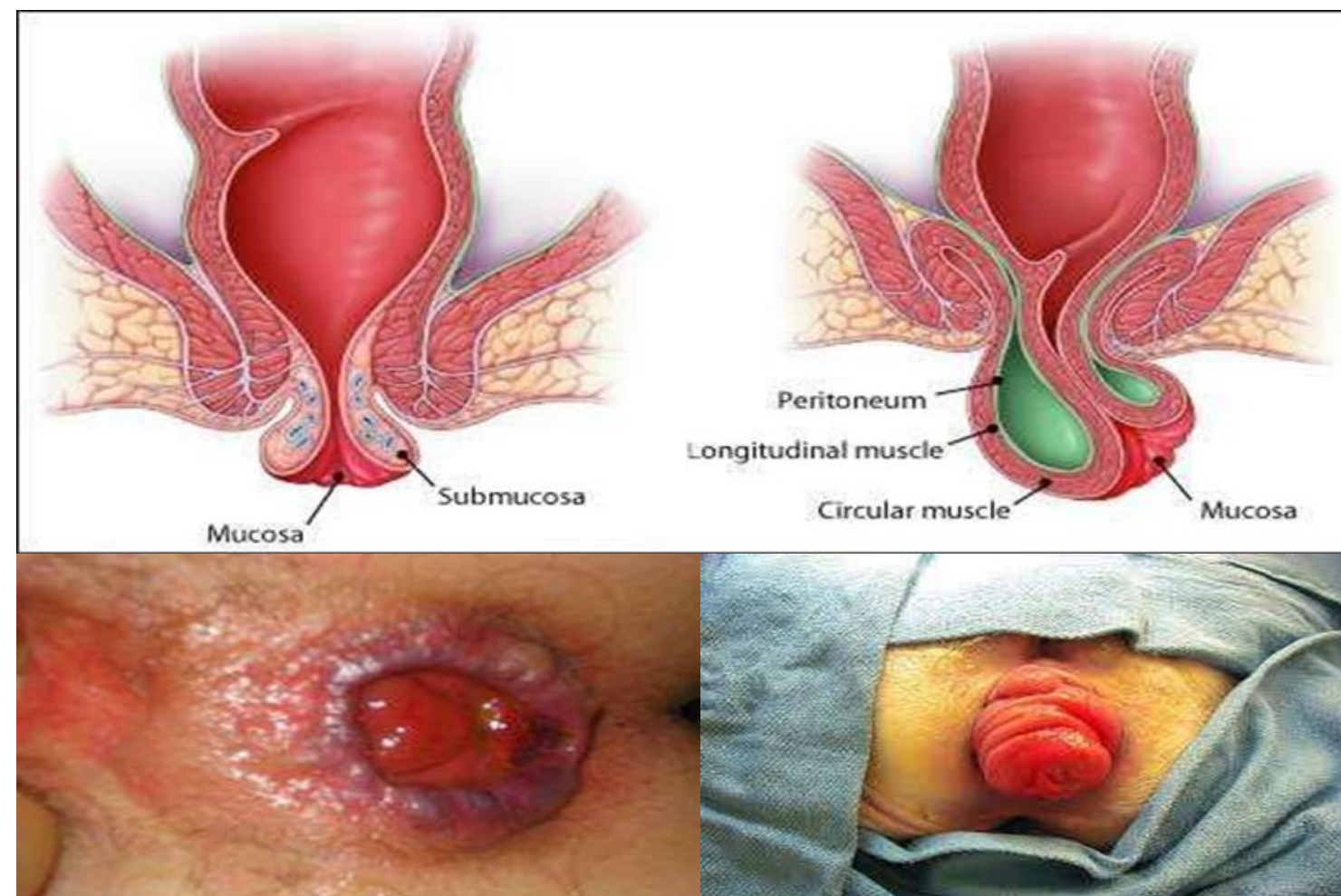
Factors Preventing Prolapse:

1. Curvature of sacrum (under developed sacral curve)
2. Tilt of pelvis
3. Serpentine course of rectum
4. Levator ani muscles fixes rectum
5. Puborectalis sling Tilt and elevate lower end of rectum

Rectal Prolapse

Types:

- Partial or Rectal mucosal Prolapse: Protrusion of the rectoanal mucosa & submucosa
- Complete prolapse or Procidentia: Include mucosa, submucosa & muscles
- Internal prolapse or intussusception:
 - Occult rectoanal intussusception
 - Prolapse does not protrude from the anus
 - Not always pathologic/symptomatic



Mucosal vs Full Rectal Prolapse

Etiology:

- ★ Extreme of age
- ★ Children: first three years (male=female)
- ★ Cystic fibrosis, malnutrition, diarrhea, severe cough, parasites
- ★ Constipation (component of colonic dysmotility)
- ★ Weakening/malfunctioning of pelvic floor/sphincters
- ★ Anismus spastic pelvic floor
- ★ Pudendal neuropathy (obstetric injuries, aging)
- ★ Sphincter dysfunction (trauma, aging)
- ★ Decreased sacral curvature, Multipara female, Diarrhea, cough, malnutrition
- ★ Decreased ischiorectal fossa fat
- ★ Mental illness (depression, autism)

Pathophysiology:

- ★ Rectum passes through opening in pelvic floor funnel
- ★ Lateral & rectosigmoid attachments relax
- ★ Mesorectum lengthens
- ★ Anal sphincters stretch
- ★ Rectal prolapse
- ★ Associated pelvic anatomic abnormalities
- ★ Deep anterior cul de sac
- ★ Redundant sigmoid colon
- ★ Patulous anal sphincter
- ★ Loss of posterior rectal fixation

Clinical Features:

- ★ Something coming out of anal canal during straining, coughing, lifting weights
- ★ Constipation (58%)
- ★ Mucus discharge
- ★ Feeling of incomplete evacuation
- ★ Itching
- ★ Fecal incontinence:
 - More common in long standing complete prolapse
 - Due to stretching of pudendal and perineal nerves
 - Dilatation of anal canal and relaxation of anal sphincters.
 - Bleeding (rare) of massive or irreducible

Rectal Prolapse

Differential Diagnosis:

- ★ Prolapsed haemorrhoid
- ★ Large polypoid lesion protruding through anus

Evaluation:

- ★ Ask patient to produce the prolapse
- ★ If not obvious:
 - Straining in sitting position (toilet)
 - phosphate enema or glycerine suppositories (children) to induce strain
 - Look for associate vaginal prolapse (15-30%)

Differences between Rectal Prolapse & Hemorrhoids:

	Rectal Prolapse	Hemorrhoids
Tissue Folds	Circumferential	Double Rectal Wall Decreased
Abnormality on Palpation	Double Rectal Wall	Radial
Resting & Squeeze Pressures	Decreased	Hemorrhoidal Plexus Normal



Examination:

- ★ Concentric rings and grooves
- ★ Perianal skin excoriation and maceration
- ★ Chronic prolapse: Inflamed, edematous and irregular surface & Biopsies to rule out neoplasia
- ★ Digital examination: Sphincter pressures

Investigations:

- ★ Colonoscopy or barium enema: Exclude tumor, biopsy of ulcers and mass lesions
- ★ Defecography:
 - Megarectum
 - Incontinence
 - Nonrelaxing puborectalis
 - Abnormal perineal descent
 - Rectocele
 - Mucosal prolapse
- ★ Anal manometry can help assess sphincters:
 - Long standing prolapse may damage internal sphincter.
 - Pudendal nerve latency study: Pudendal nerve terminal motor latency (1.8- 2.2 msec)

Nonoperative Management:

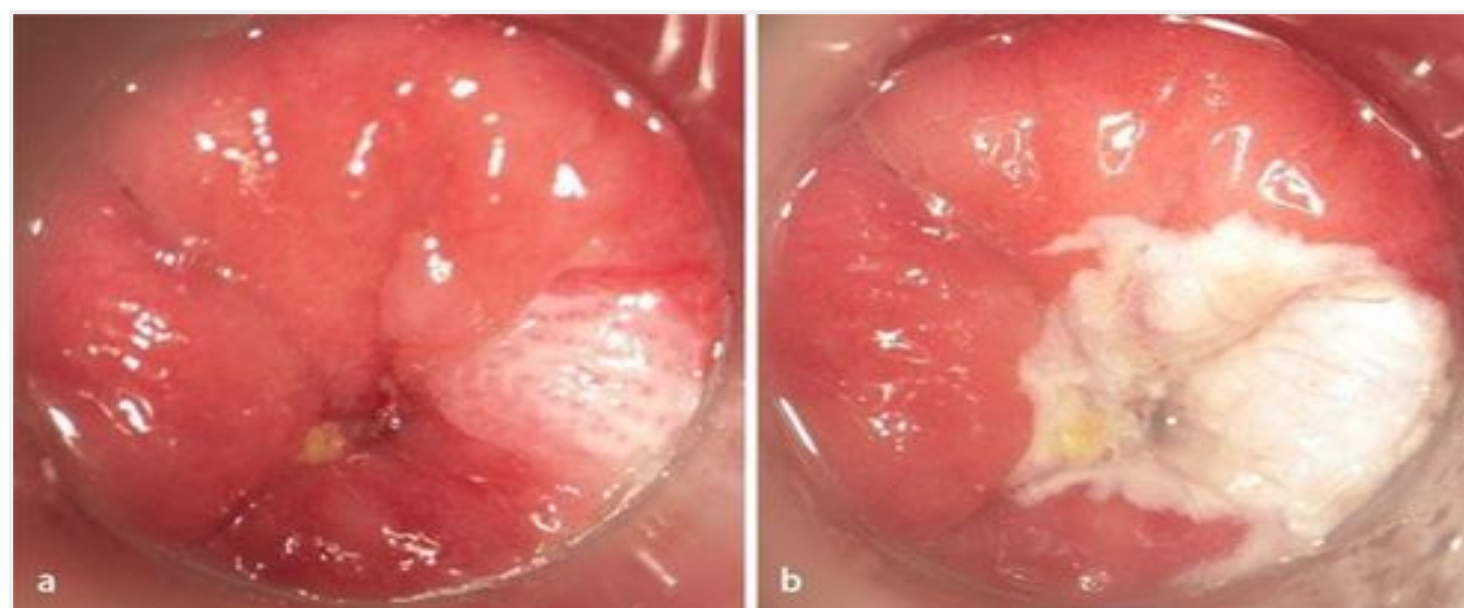
- ★ Treat constipation: Fiber supplements & Stool softeners
- ★ Reduce incarcerated rectal prolapse: Table sugar
- ★ Adhesive strapping of buttocks
- ★ Manual anal support during defecation
- ★ Correction of constipation
- ★ Perineal exercises (kegel's exercise)
- ★ Electrical stimulation
- ★ Submucosal injection of phenol in almond oil
- ★ Infrared coagulation

Condyloma Acuminata (Anal Wart)

- Due to **HPV** infection
- Some serotypes /high potential of malignancy **HPV 16 and 18!!!**
- Perianal and/or intra-anal examination of anal canal!
- First appear as tiny spots or growths
- May grow larger than the size of a pea
- **Asymptomatic vs itching, bleeding, mucous discharge or lumps in the anal area**
- HPV virus, sexually transmitted disease, anal intercourse +/-
- Strongly related to anal cancer

HPV Infection (risk of anal cancer):

1. HPV infection :
 - Previous cervical cancer or CIN III
 - Wife with cervical cancer
 - Numerous lifetime sexual partners
2. Immunosuppression :
 - Any solid organ transplant
 - HIV+
3. Anal intercourse : MSM



- High resolution anoscopy
- Acetowhitening
- Treatment with trichloroacetic acid 85%

Treatment:

- High resolution anoscopy :
 - Focal destruction with fulguration, infrared coagulation or bovie
- Serial exams
- Vaccines: most administer before infection, girls and women 9-26 years Many under investigation
- Not proven effective in men or immunosuppressed
- Prevention : aggressive screening and ablation (MSM, women with cervical Or vulvar lesions, all HIV, all transplant recipient
- Podophyllin diluted to 15 20% when the lesions are few and small
- Cryosurgery
- Electrosurgery
- Laser treatment
- Clinical trials with interferons(alpha, gamma)
- Local immunostimulation with imiquimod

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)

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 H₂O₂ (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?

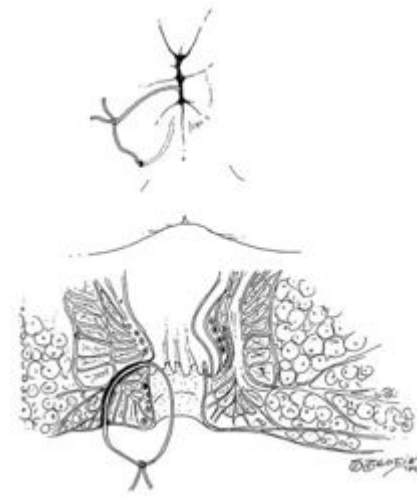
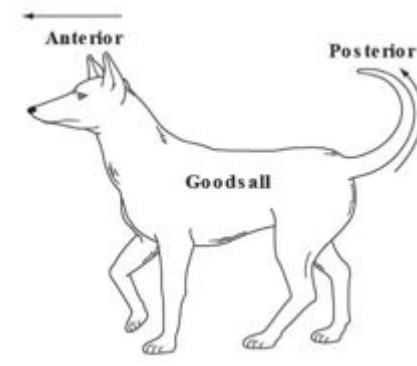
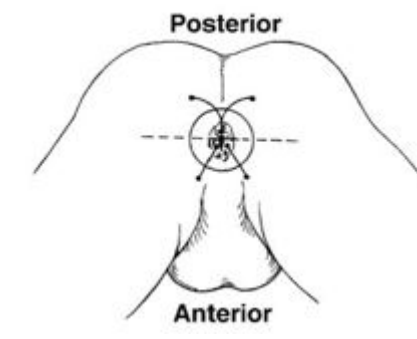
Physical/digital exam reveals perianal/ rectal submucosal mass/ fluctuance

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%



<p>Hemorrhoids</p>	<ul style="list-style-type: none"> -Types: 1- internal (painless with bleeding). 2-external (painful). -Internal is classified into four groups : Grade I: bleeding without prolapse. Grade II: prolapse with spontaneous reduction. Grade III: prolapse with manual reduction. Grade IV: incarcerated,irreducible prolapse -symptoms: bleeding and prolapse. -Treatments: dietary and lifestyle modifications, rubber band ligation, hemorrhoidectomy. -What are the three "hemorrhoid quadrants"? Left lateral, right posterior, right anterior.
<p>Anal fissures</p>	<ul style="list-style-type: none"> -Location: most common sight is posterior midline. -Symptoms : cardinal symptom is severe pain during defecation. -Treatment: treat the constipation, vasodilator, botox, surgery.
<p>Perianal abscess</p>	<ul style="list-style-type: none"> -Types: perianal abscess, intersphenctric abscess, ischioirectal abscess, supralevator abscess. -Symptoms: acute anal pain and tenderness. -Treatment: incision and drainage.
<p>Perianal fistula</p>	<ul style="list-style-type: none"> -abscess precedes all suchcases of fistula. -Symptoms: chronically discharging opening in the perianal skin. -Diagnosis: clinical examination is key, if you think it's a complicated fistula do MRI. -Treatment: fistulotomy .
<p>Pilonidal sinus</p>	<ul style="list-style-type: none"> - Space full of hair & bacteria . - More frequent in military personnel . - Treatment : excision .
<p>rectal prolapse</p>	<ul style="list-style-type: none"> - Common in infants, children & elderly, females (6:1). - Most important etiologies : extreme age, constipation, anismus spastic pelvic floor. - Clinical features : Something coming out of anal canal during straining, coughing., constipation, itching. - Treatment : perineal exercise (kegel's exercise), submucosal injection of phenol in almond oil.
<p>Condyloma acuminata (anal wart)</p>	<ul style="list-style-type: none"> - Due to HPV infection. - Serotypes HPV 16 & 18 carry high potential of malignancy. - Treatment : acitic acid, immunomodulators. - Treat partner & prevent exposure. - vaccination.

Quiz

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

Q8: All of the following can be a cause of rectal prolapse except ?

- a) constipation
- b) Increased ischiorectal fossa fat
- c) extreme age
- d) cystic fibrosis

Q9: condyloma acuminata is caused by which viral infection ?

- a) HIV
- b) HPV
- c) Hep b

Q10: which of the following HPV strains carry high potential for malignancy ?

- a) 16 & 18
- b) 6 & 8
- c) 17 & 19

Answers : 1: C 2: B 3: C 4: D 5: C 6: A 7. C. 8: B. 9: B. 10: A.