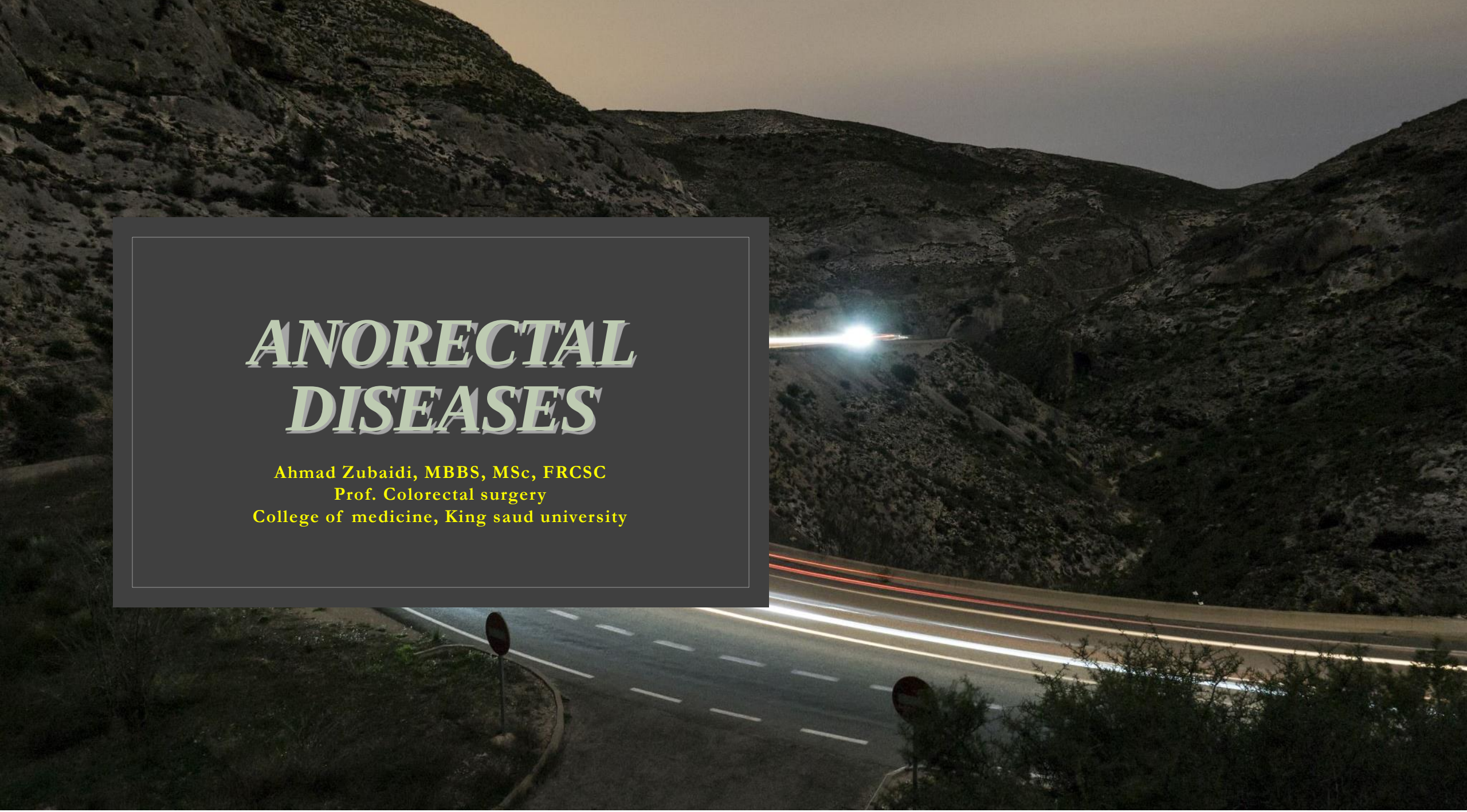


ANORECTAL DISEASES

Ahmad Zubaidi, MBBS, MSc, FRCSC
Prof. Colorectal surgery
College of medicine, King saud university

Introduction

- Anal and perianal disorders makeup ~ 20% of all outpatient Surgical referrals.
- These conditions are
  - Extremely distressing
  - Embarrassing to the patient
  - Often put up with symptoms for long time before seeking medical care.

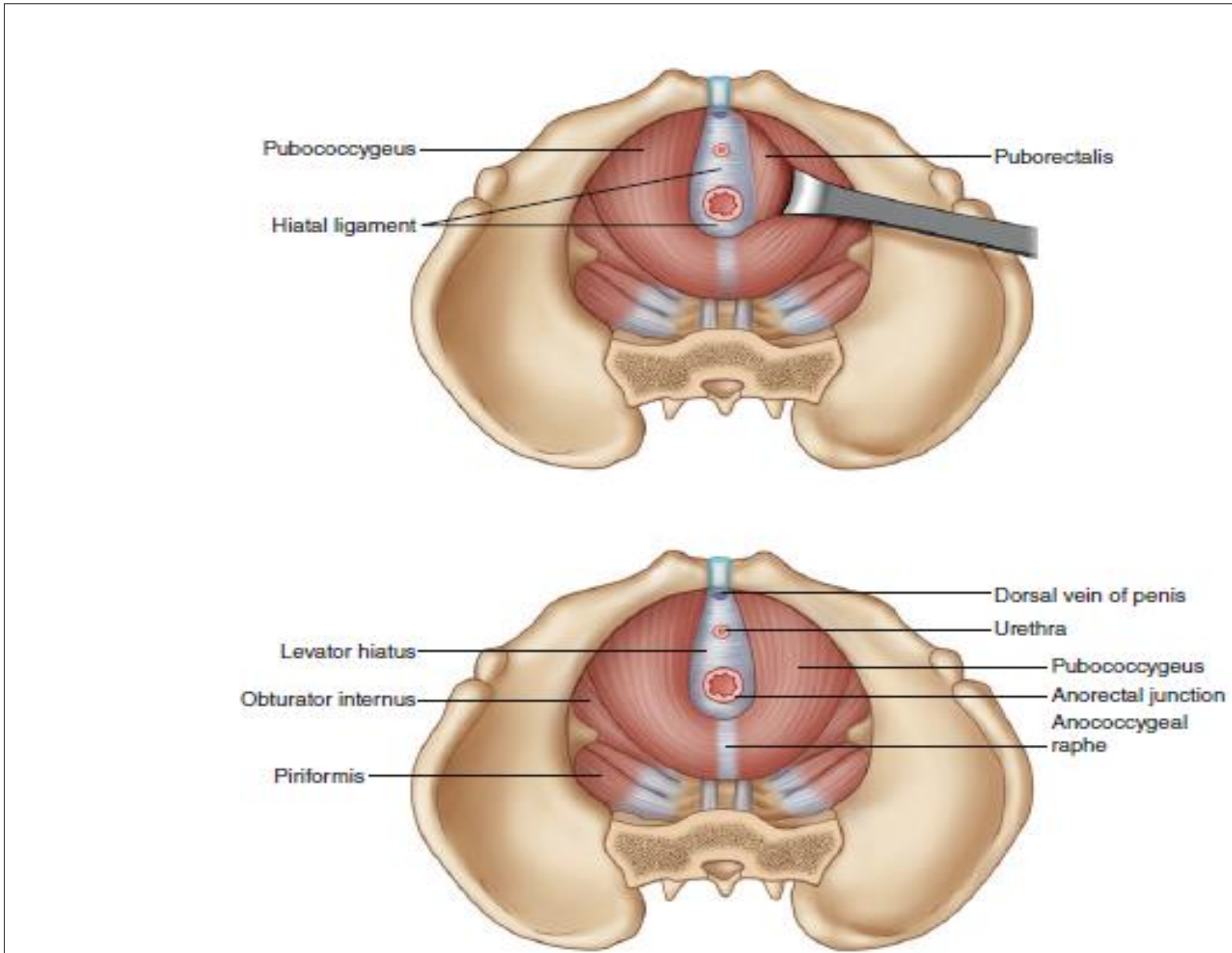


FIGURE 1-4. Pelvic floor anatomy, abdominal view.

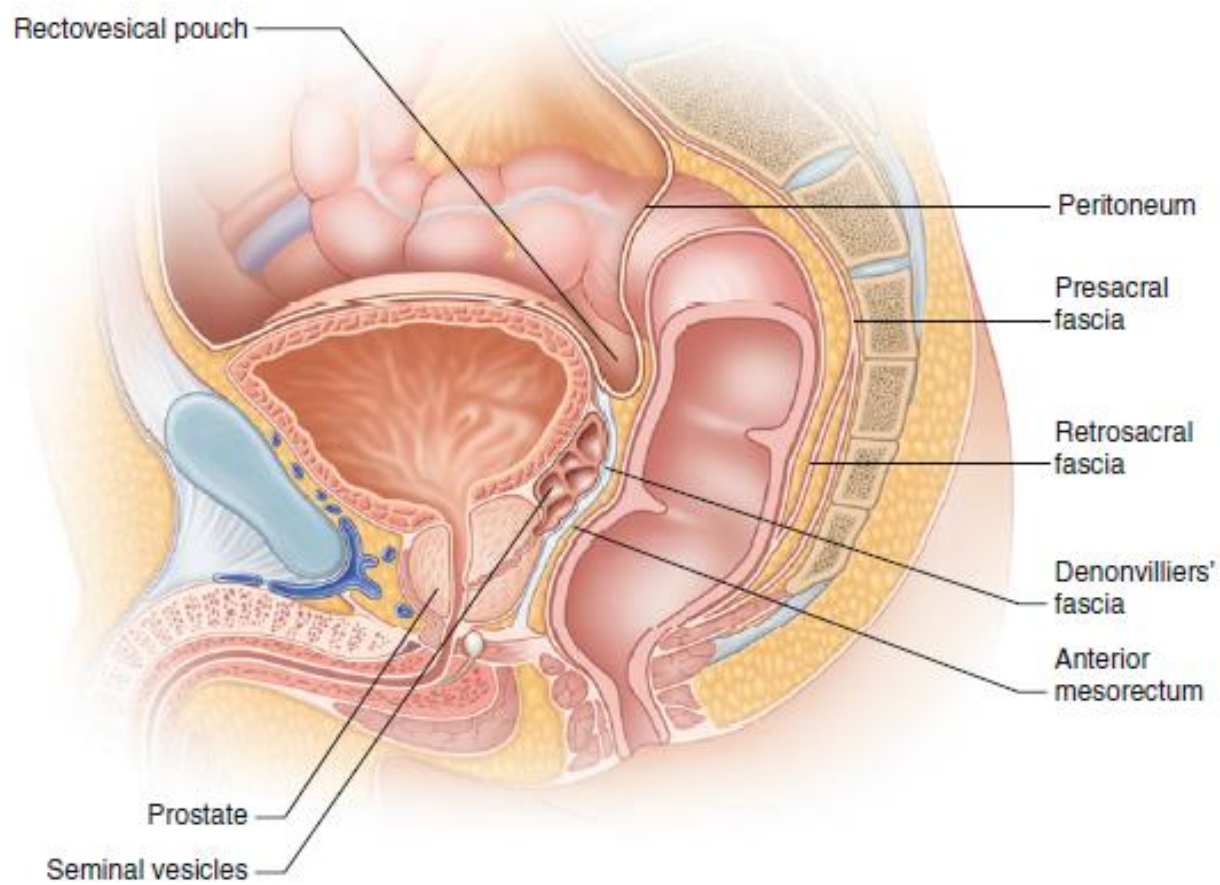
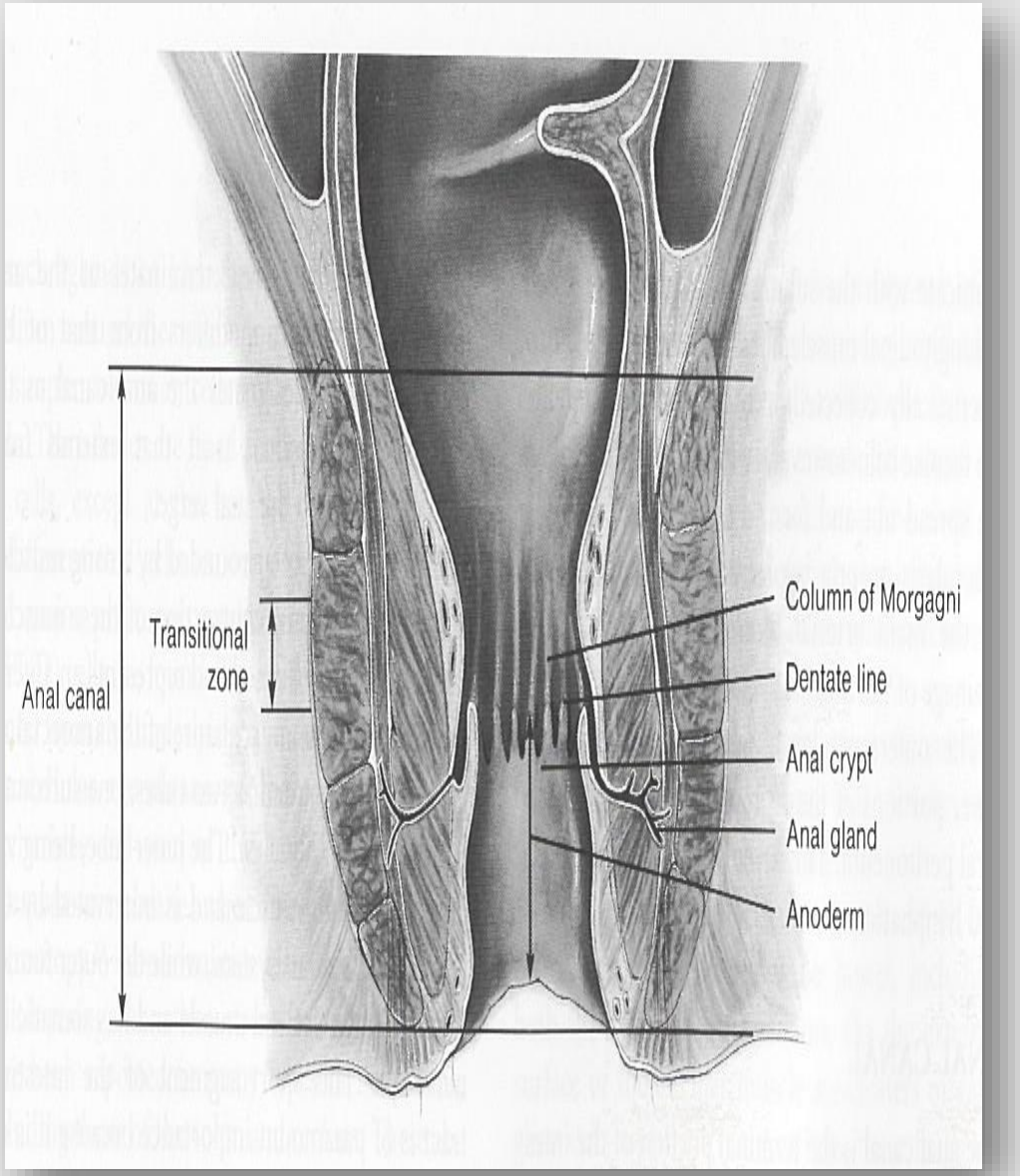


FIGURE 1-5. Fascial relationships of the rectum.

Anal canal

- **The "<u>ANATOMIC</u>" anal canal as beginning at the dentate line and extending to the anal verge. The "<u>SURGICAL</u>" anal canal, as first defined by Milligan and Morgan, extends from the anorectal ring to the anal verge.**

- **The surgical anal canal is formed by the internal anal sphincter, external anal sphincter, and puborectalis**
- **the surgical anal canal is longer in males than in females.**



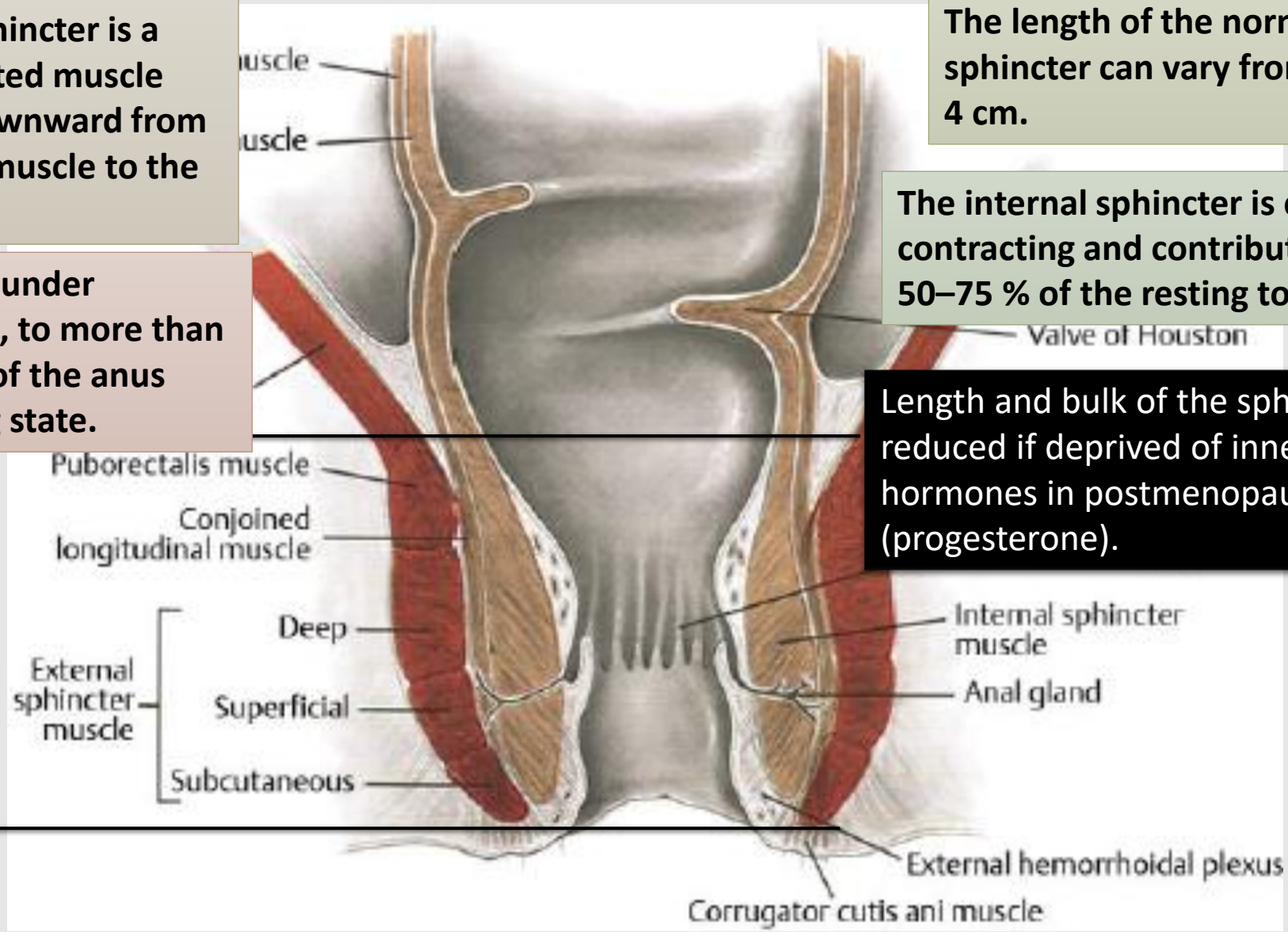
The external sphincter is a cylinder of striated muscle that extends downward from the levator ani muscle to the distal anoderm.

when stimulated under voluntary control, to more than double the tone of the anus above the resting state.

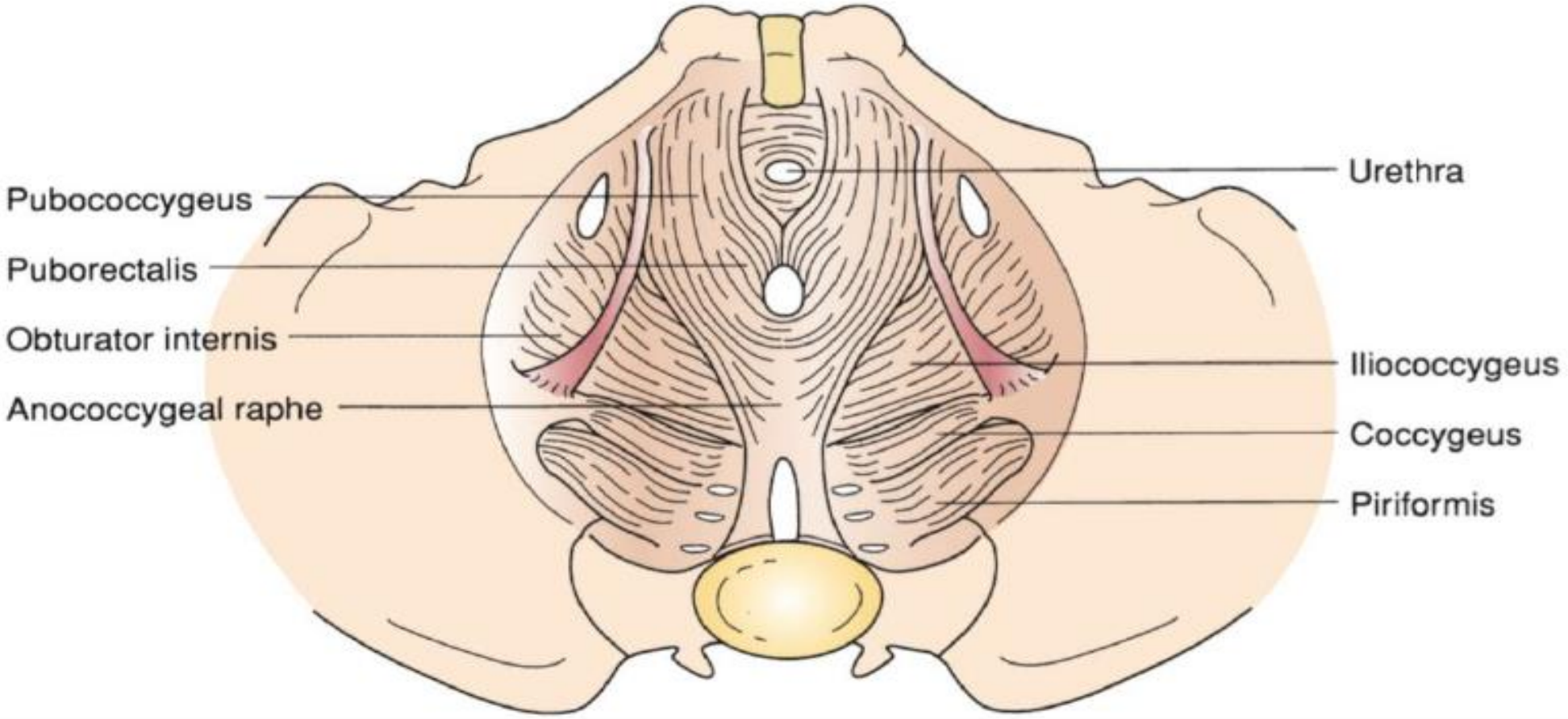
The length of the normal internal sphincter can vary from under 2 to over 4 cm.

The internal sphincter is chronically contracting and contributes approximately 50–75 % of the resting tone of the anus

Length and bulk of the sphincter can be reduced if deprived of innervation or hormones in postmenopausal women (progesterone).

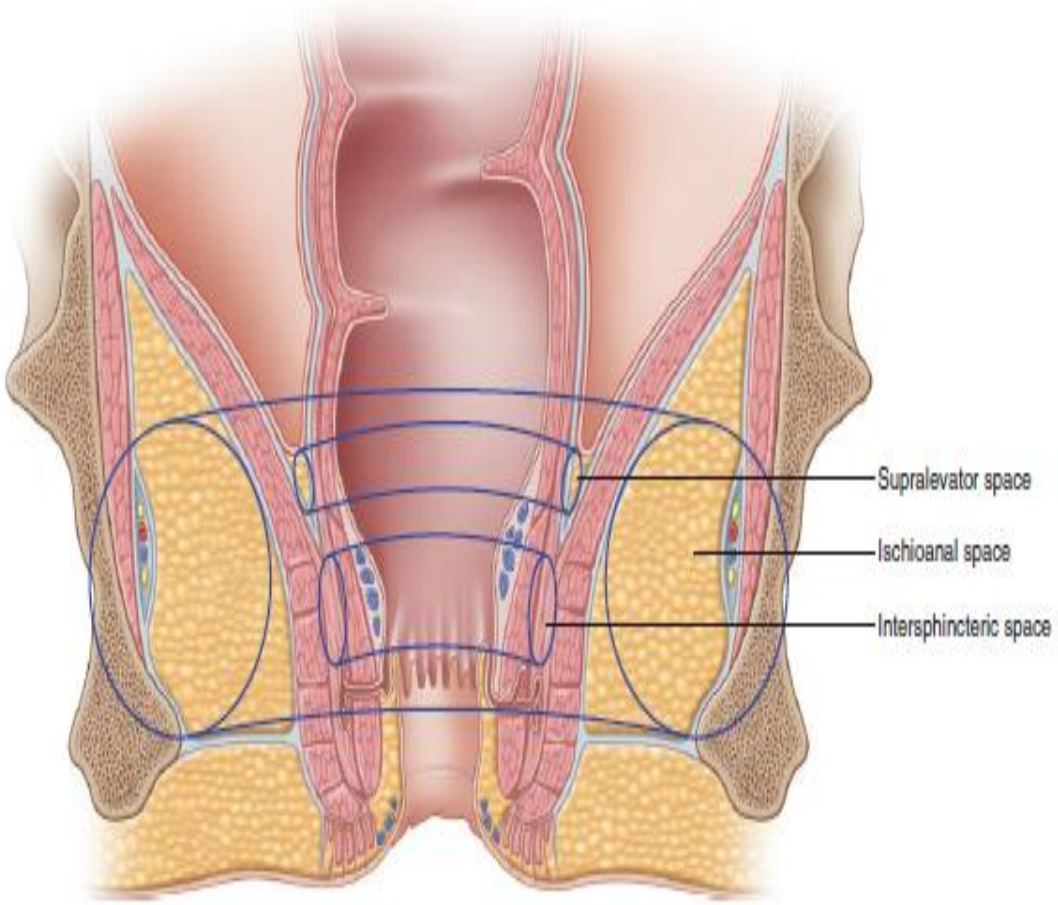


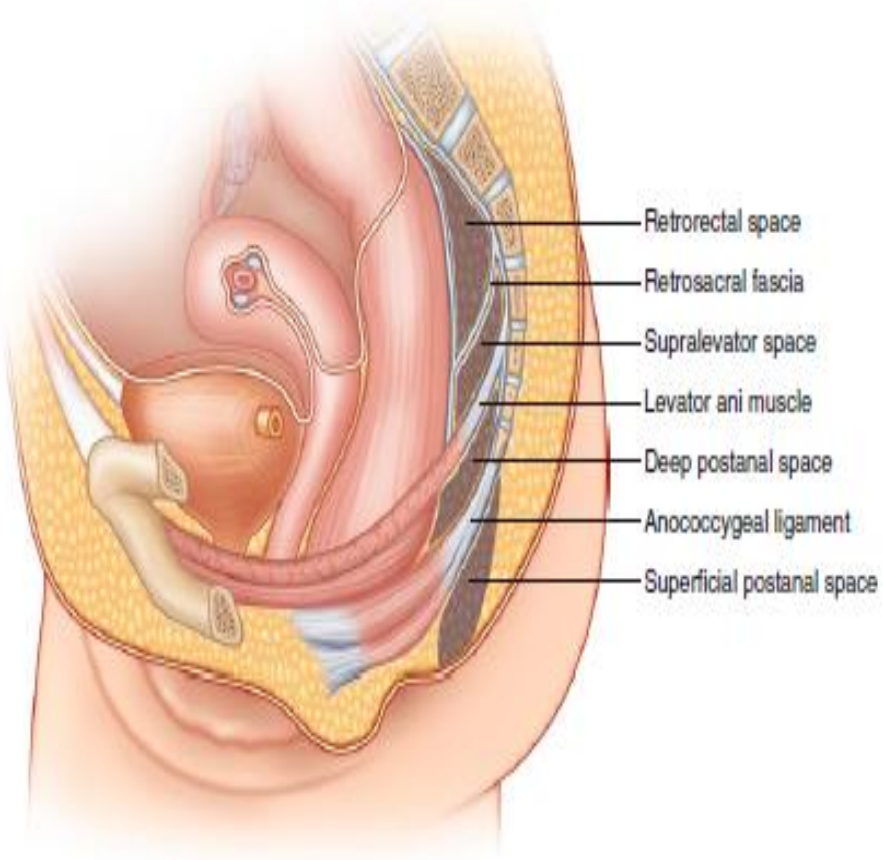
The levator ani muscle



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

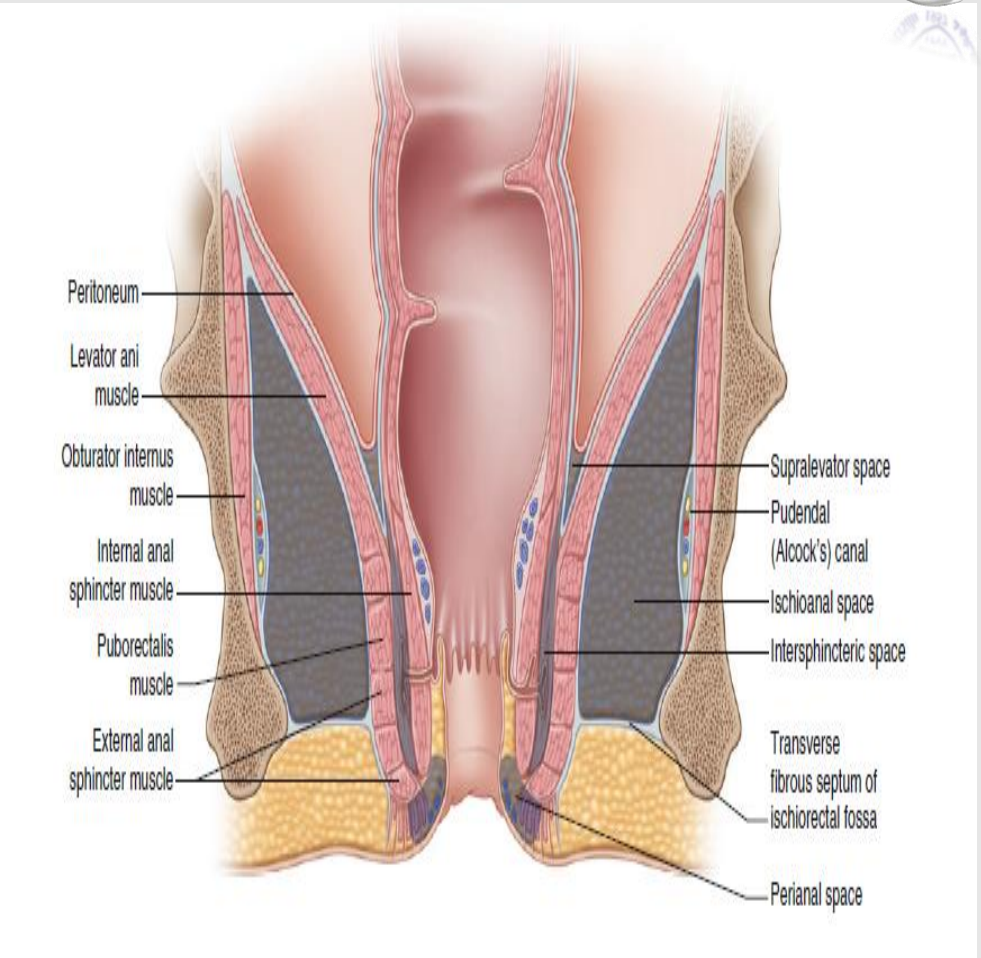
Anorectal Spaces





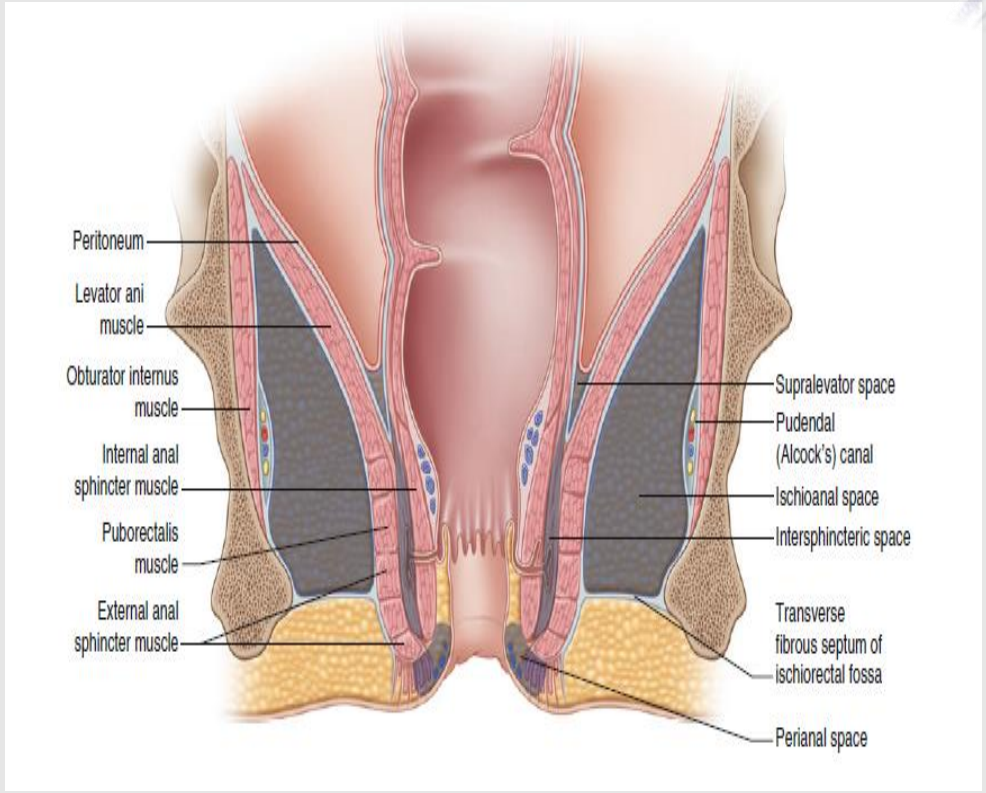
The perianal space

- **Boundries:**
  - **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**
- **The perianal space contains:**
  - **External hemorrhoid cushions**
  - **The subcutaneous external anal sphincter**
  - **The distal internal anal sphincter**
- **The perianal space is in communication with the inter-sphincteric space.**



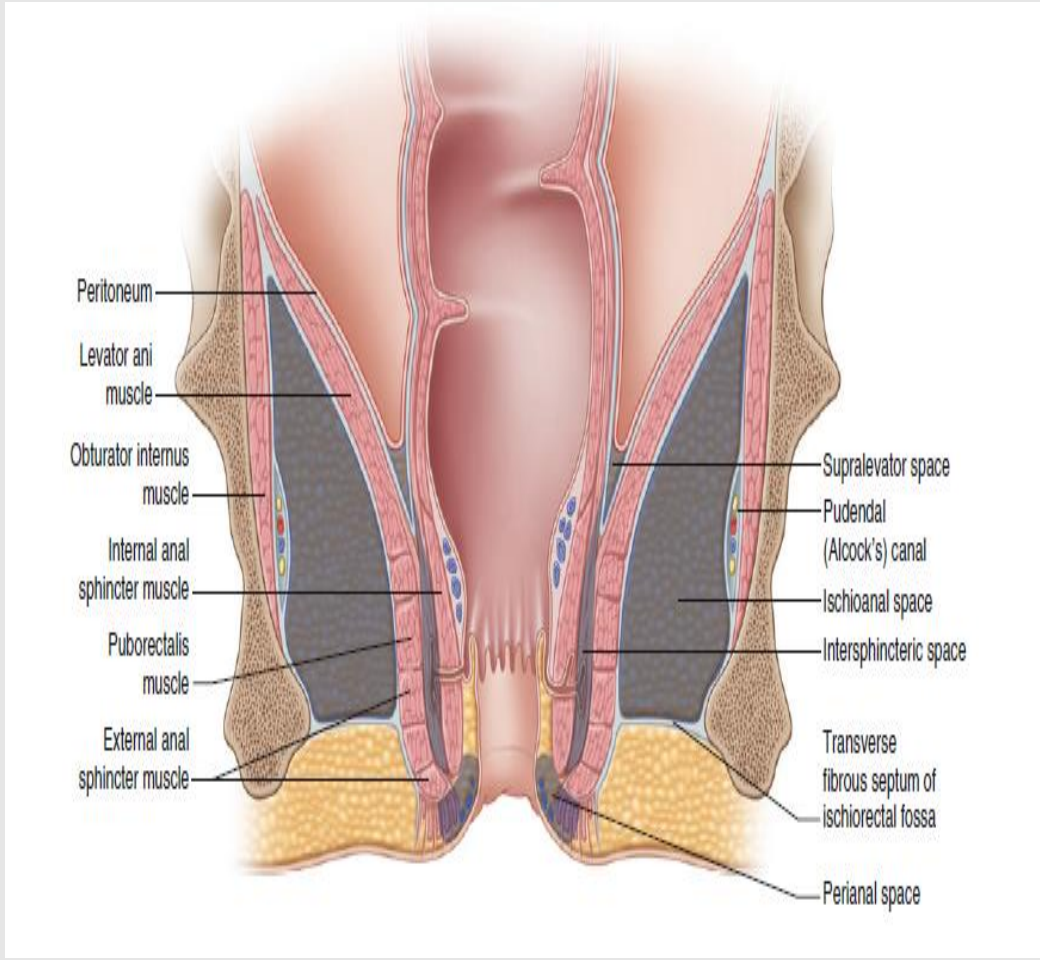
Intersphincteric space

- It lies between the internal and external anal sphincter
- It is continuous with the perianal space.
- It is of clinical importance as cryptoglandular infections tend to begin in this area and expand elsewhere to create anal fistula.



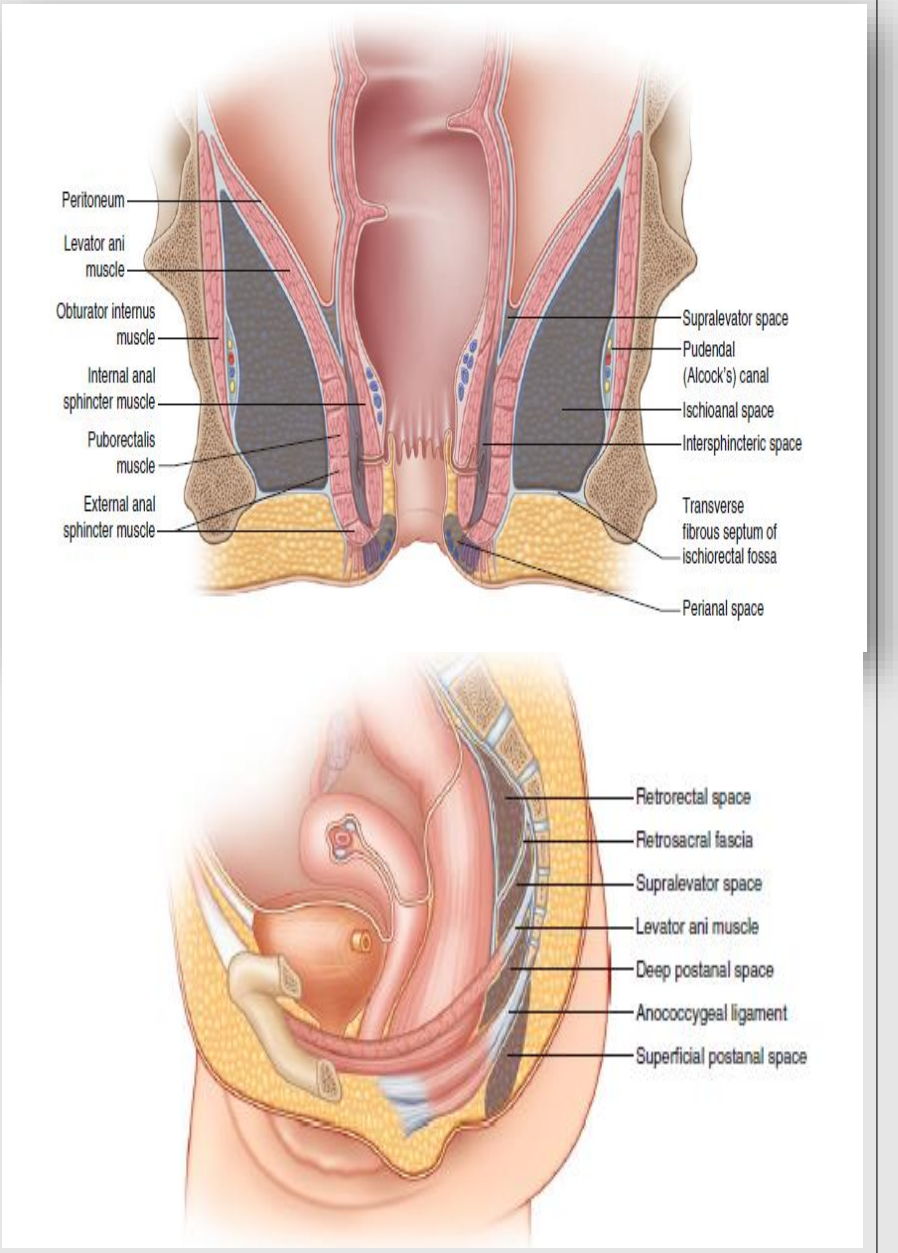
Submucous Space

- This space lies between the medial boarder of the internal anal sphincter and the anal mucosa proximal to the dentateline.
- It is continuous with the submucosa of the rectum.
- This area contains internal hemorrhoid vascular cushions.



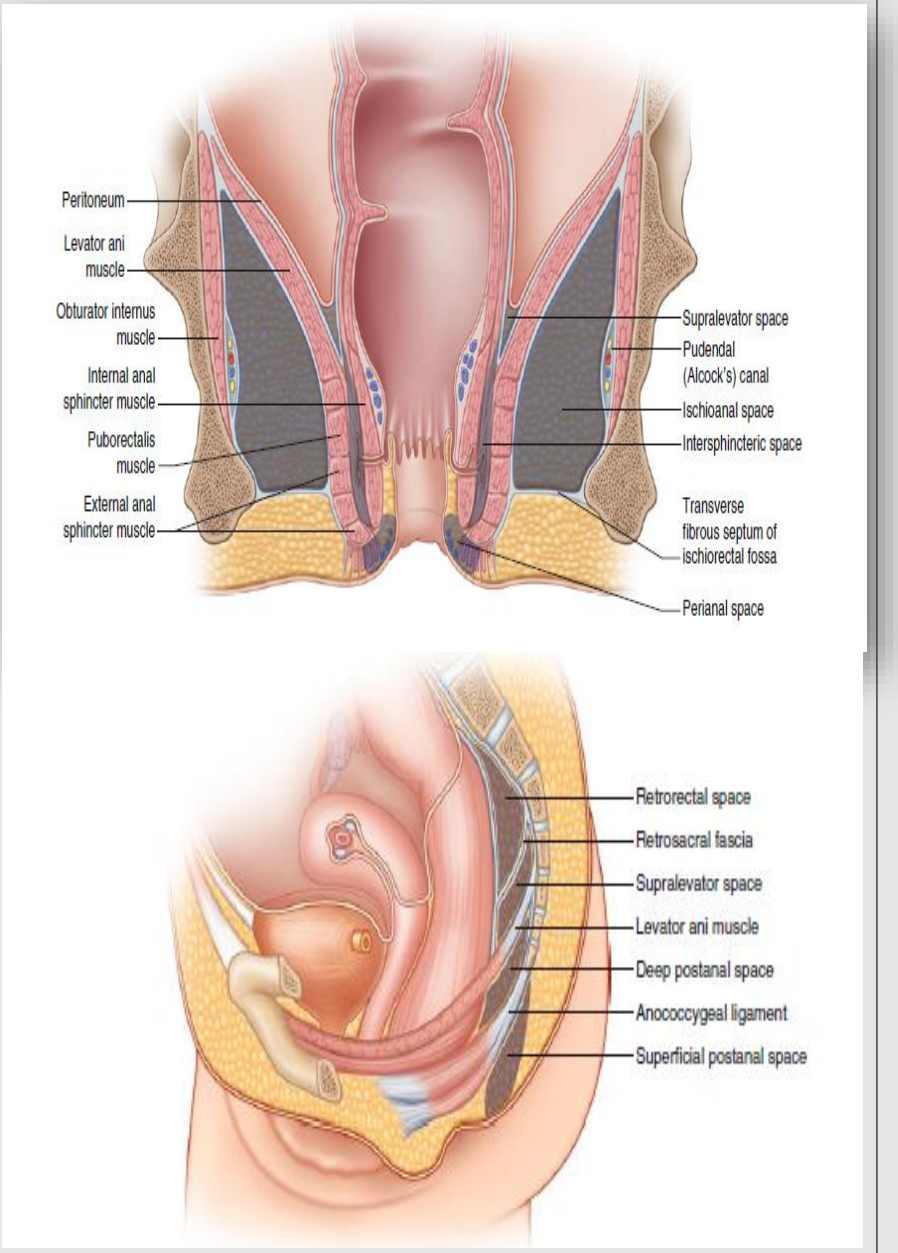
Ischioanal/ Ischiorectal Space

- The ischioanal /(ischiorectal) space is the largest anorectal space.
- It is a pyramid shape with its apex at the levator muscle insertion into the obturator fascia.
- Boundaries:
  - 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.

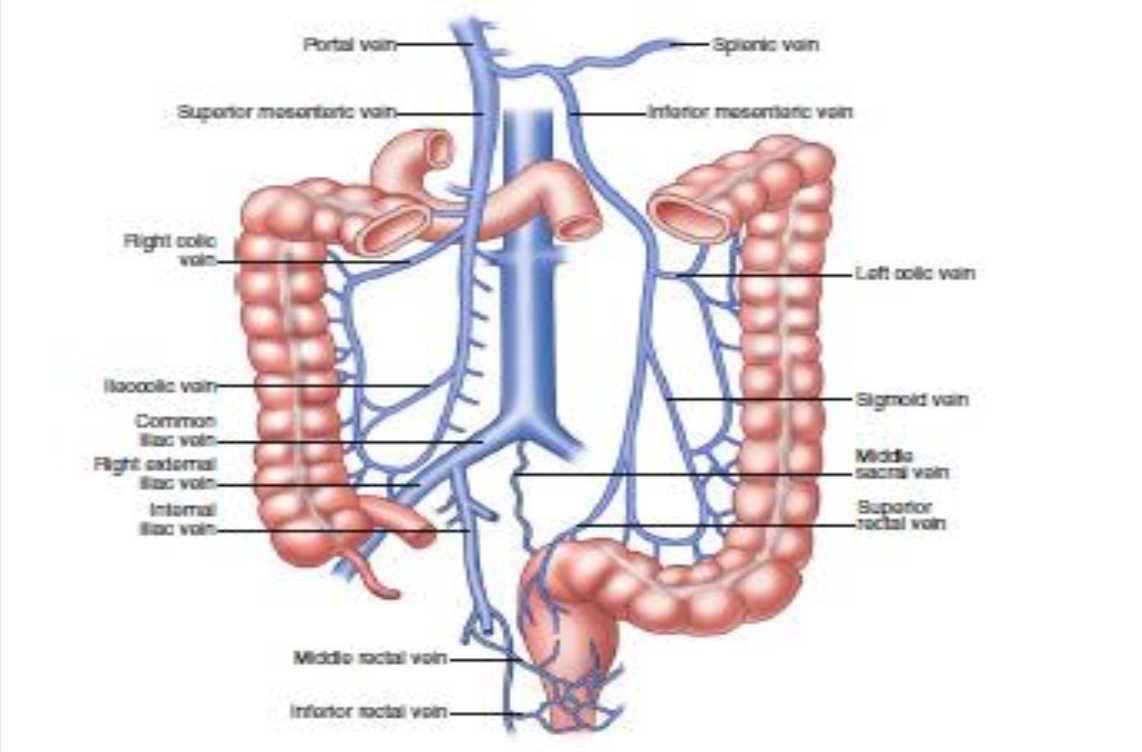


Ischioanal/ Ischiorectal Space

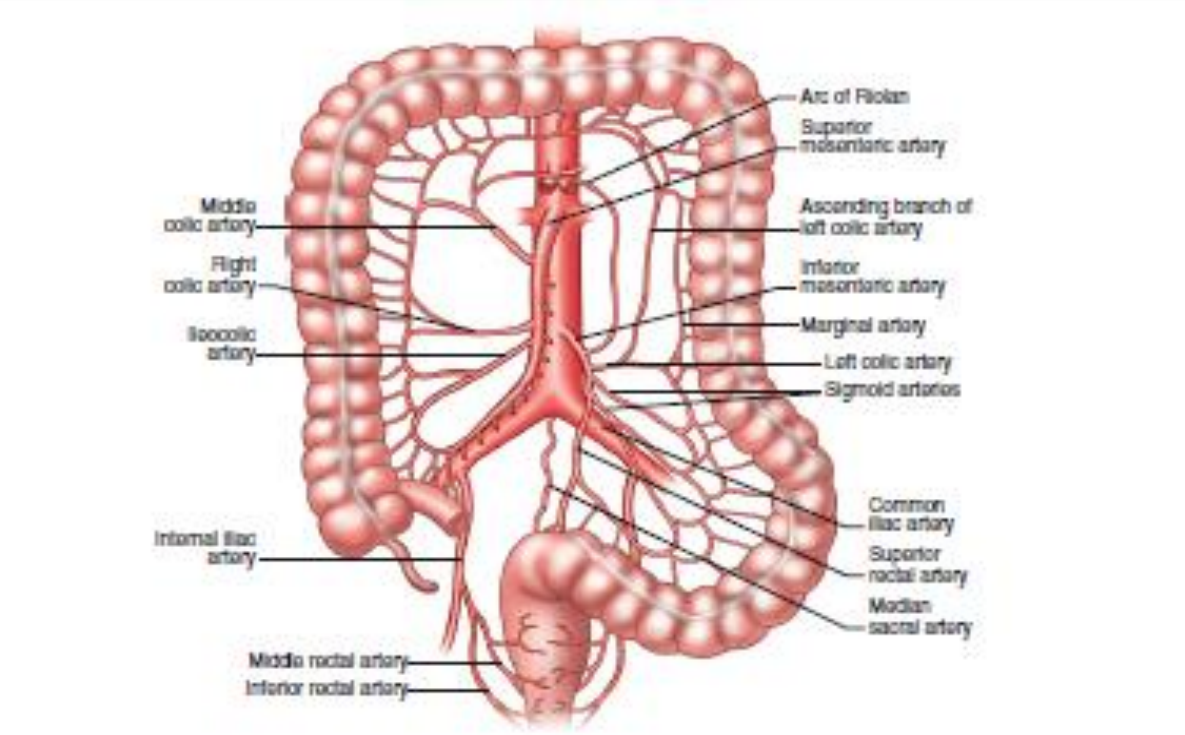
- The ischioanal fossa contains:
  - adipose tissue
  - pudendal nerve branches
  - superficial branches of the internal pudendal vessels.
- The right and left ischioanal space communicate posteriorly through the deep postanal space between the levator ani muscle and anococcygeal ligament



Vascular supply



Venous anatomy of the colon and rectum.

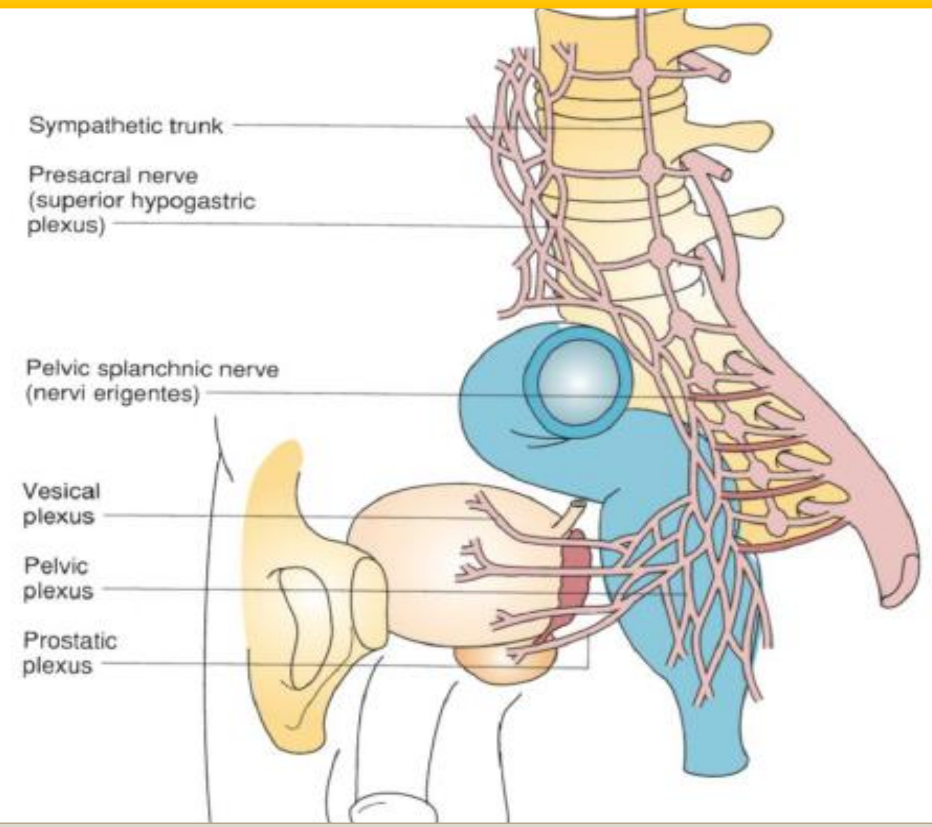


Arterial anatomy of the colon and rectum.

The internal sphincter is innervated by L5–S4 mixed autonomic function in crossed fashion so that unilateral injury still results in preserved function.

The external sphincter is similarly innervated from branches of S2–3 via the inferior rectal branch of the pudendal nerve and the perineal branch of S4.

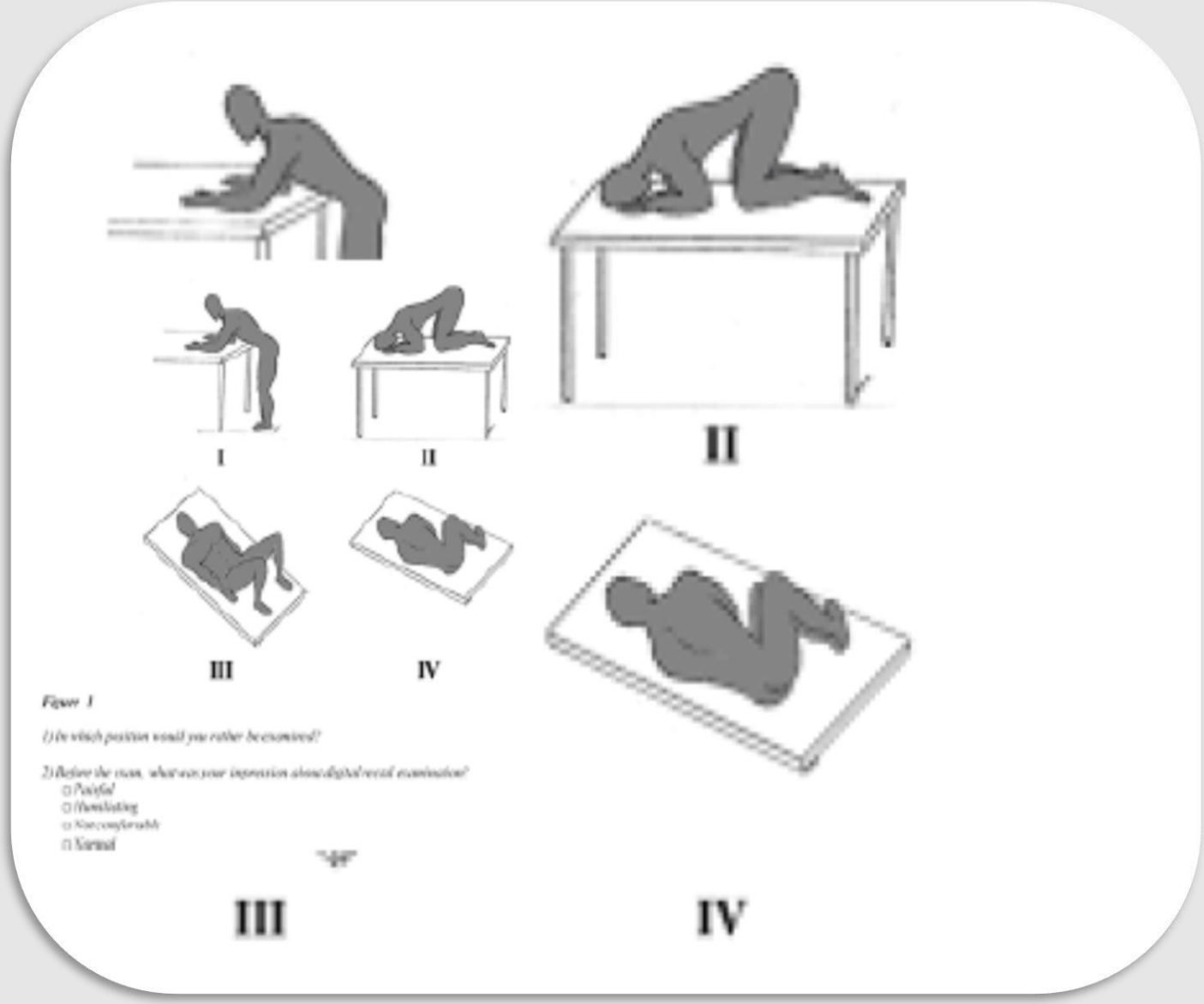
It receives its innervation from the inferior hemorrhoidal nerve and, therefore, is quite sensitive to trauma and stretch.



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.

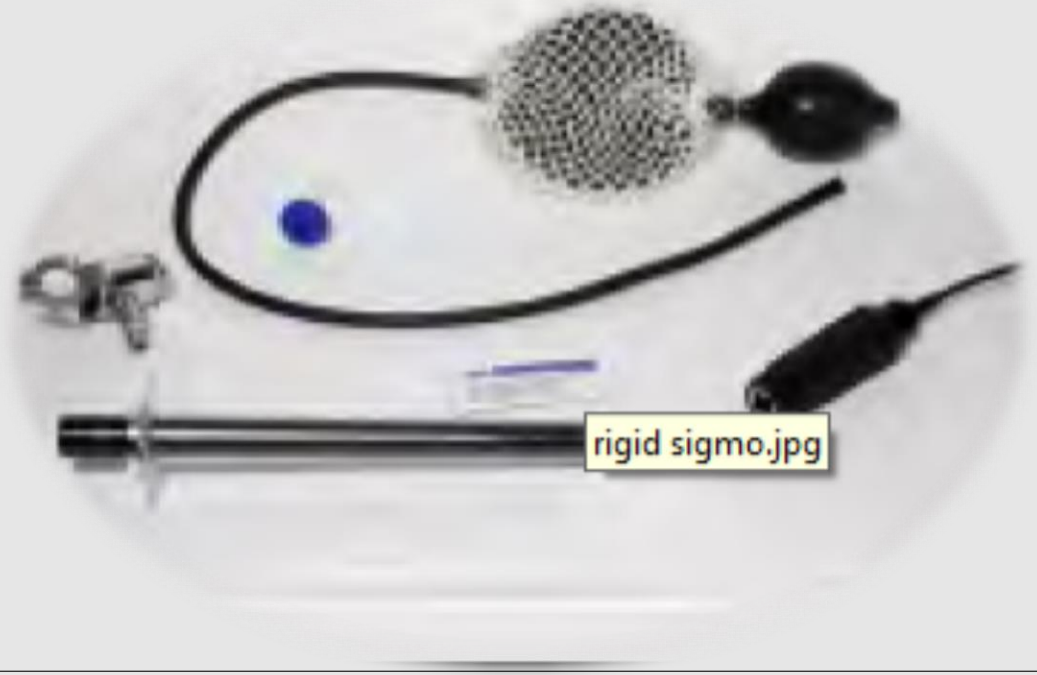
The upper anal canal contains a high density of free and organized sensory nerve endings. Organized nerve endings include Meisner's corpuscles (touch), Krause's bulbs (cold), Golgi-Mazzoni bodies (pressure), and genital corpuscles (friction).



Proctological examination

Examination and investigation

- Clinical exam
  - Anoscopy
  - Rectosigmoidoscopy
- Investigation
  - Endosonography
  - MRI
  - Manometry
  - MR Defecography



The Common Anal Symptoms

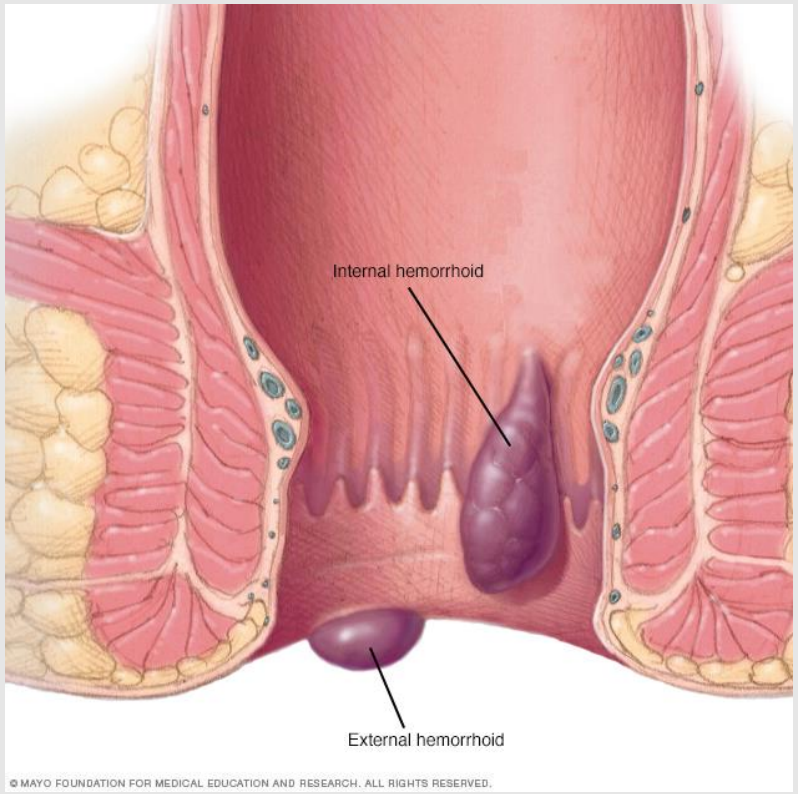
- Anal bleeding
- Anal pain and discomfort
- Perianal itching and irritation
- Something coming down
- Perianal discharge

Common Ano Rectal 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
- RectoceleVenereal Warts(Condyloma)

HEMORRHOIDS

- **Hemorrhoids (Greek: haima = blood, rhoos = flowing) syn. piles (Latin: pila= a ball)**
- **Hemorrhoids are dilated veins occurring in relation to the anus**



Hemorrhoids

- Diseased anal cushions in the anal canal
- Helps in the continence
- Internal or External

HEMORRHOIDS

- External hemorrhoids → ectoderm & covered by squamous epithelium of anal mucosa
- Internal hemorrhoids → embryonic endoderm & lined with columnar epithelium of anal mucosa
- Internal & external hemorrhoids are divided by "Dentate Line" (Pectinate line)
- Internal hemorrhoids drain through the superior rectal vein → portal system.
- External hemorrhoids drain through the inferior rectal vein →IVC
- Internal hemorrhoids are not supplied by somatic sensory nerves and hence cannot cause pain
- external hemorrhoids are innervated by cutaneous nerves that supply the perianal area

INTERNAL HEMORRHOIDS

- 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

HEMORRHOIDS : 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)

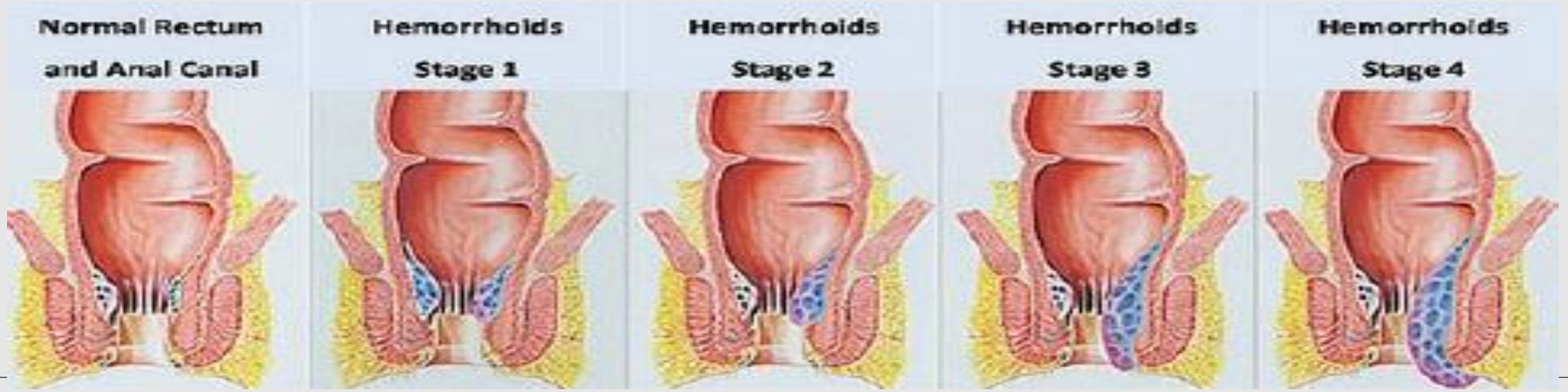
HEMORRHOIDS: PATHOPHYSIOLOGY

- Engorgement of normal fibrovascular lining of anal canal
  ↓
- Prolapse of internal hemorrhoids tissuethrough anal canal
  ↓
- Thinning of the friable overlying mucosa
  ↓
- 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)

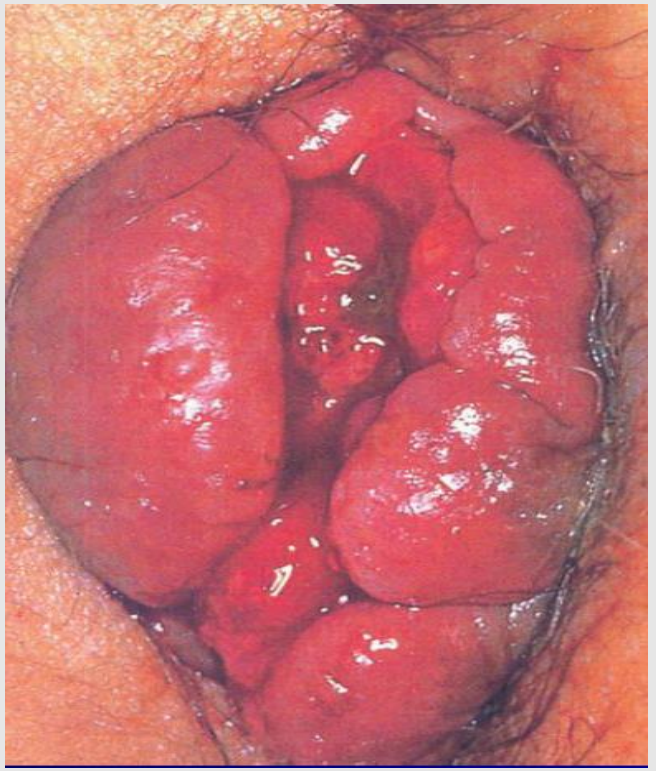
HEMORRHOIDS: GRADING

GRADE	SYMPTOMS & SIGNS
First degree	Bleeding; no prolapse
Second degree	Prolapse with spontaneous reduction, bleeding, seepage
Third degree	Prolapse requiring digital reduction, Bleeding, seepage
Fourth degree	Prolapsed, can not be reduced, strangulated



HEMORRHOIDS: CLINICAL FEATURES

- Painless bright-red rectal bleeding with defecation
- With ↑ in size, hemorrhoids may prolapse
- Mucoid discharge
- Pruritus ani
- Pain – if complications supervene (strangulation, abscess etc)



HEMORRHOIDS: DIFFERENTIALS

- Anorectal fissures
- Anorectal fistulae
- Rectal abscess
- Colorectal Ca
- Rectal varices (Portal HTN)
- Inflammatory bowel disease
- Diverticular disease
- Angiodysplasia
- Anal warts
- Anal skin tags
- Rectal prolapse
- Rectal polyps
- Enlarged anal papillae

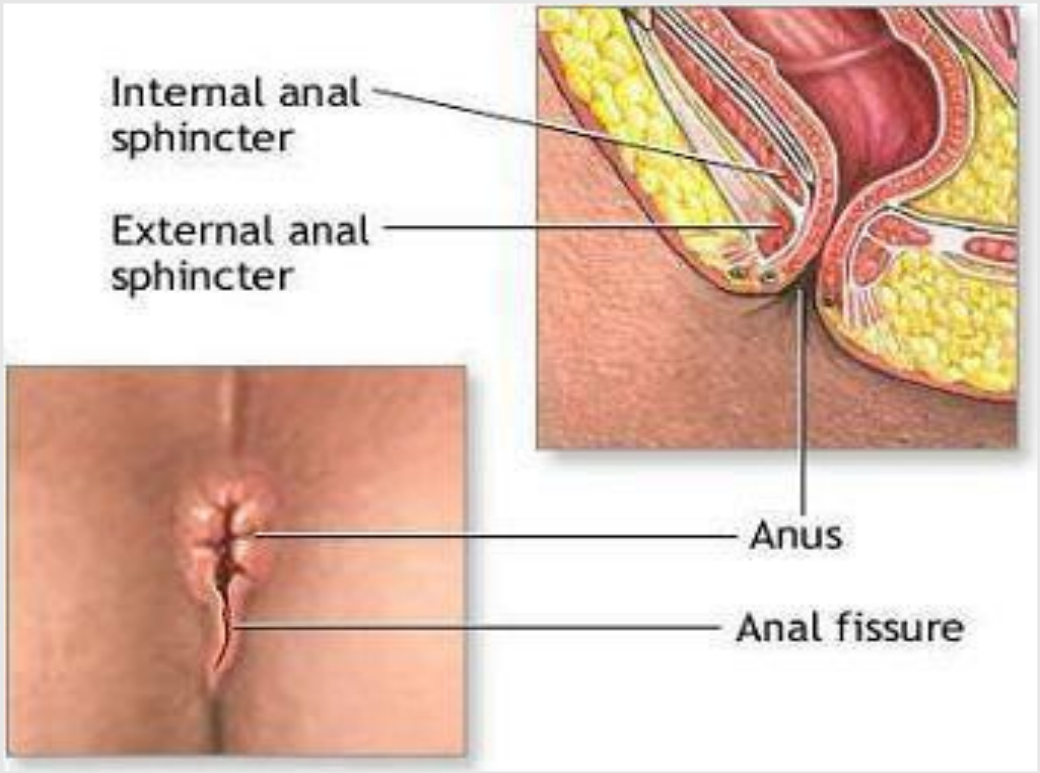
Treatment

- **Scope**
- **Treat underlying problem**
- **Banding**
- **Surgical**

HEMORRHOIDS: MANAGEMENT

- Non-surgical procedures
  - Lord's anal stretch (rarely done)
  - Rubber band ligation (grades II and grade III)
  - Infrared coagulation (for grade I and II)
  - Bipolar electrocautery (for lower-grade hemorrhoids)
  - Sclero Rx & Cryo Rx (S/E – abscess, urinary retention)
  - Laser therapy and Radio-wave ablation (for prolapsing hemorrhoids)

ANAL FISSURE



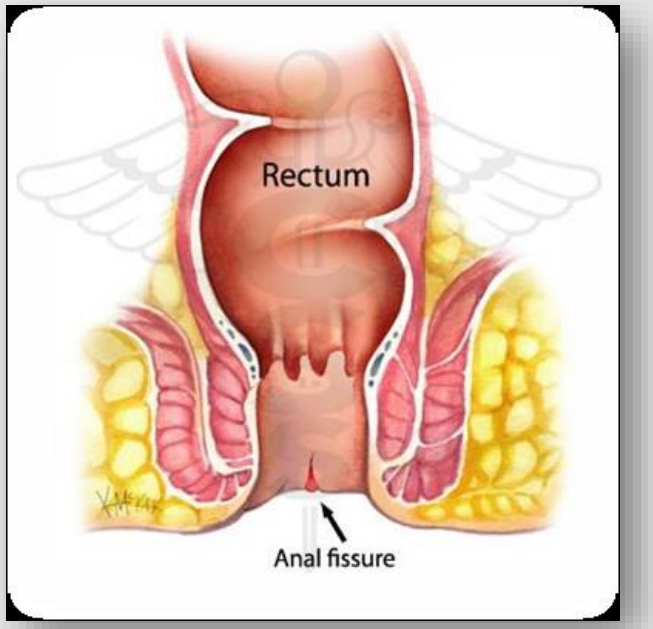
An anal fissure is a linear ulcer of the lower half of the anal canal, usually located in the posterior commissure in the midline

Anal fissures


Anal Fissure

- Acute-mostly heal spontaneously
- Chronic-persistence beyond 6 weeks, morphologically-presence of visible transverse internal anal sphincter fibers at the base of the fissure
- Associated signs in chronic fissures: indurated edges, a sentinel pile and a hypertrophied anal papilla

SALIENT FEATURES

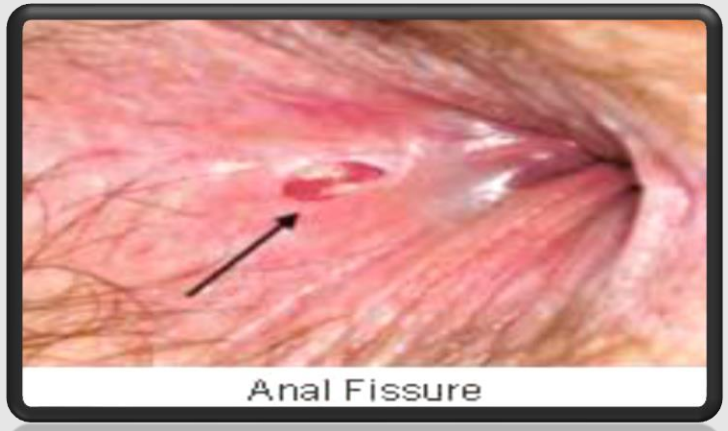


- M/C location – posterior midline
- Other associated conditions:
  - *Sentinel pile or tag externally*
  - *Enlarged anal papilla internally*
  - *Hidradenitis suppurativa*
  - *STDs*
  - *IBD*
- With defecation, the ulcer is stretched causing severe pain & mild bleeding

Anal fissures

Typical

- Posterior midline 75%
- Anterior midline 25%
- Posterior and anterior 3%



Atypical or multiple

- Crohn Disease
- Trauma
- Tuberculosis
- Syphilis
- AIDS
- Anal carcinoma

ETIOPATHOGENESIS

- Trauma from passage of hard stools
- Low-fiber diets
- Prior anal surgery
- Hypertonicity & hypertrophy of the internal anal sphincter
- 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

MANAGEMENT

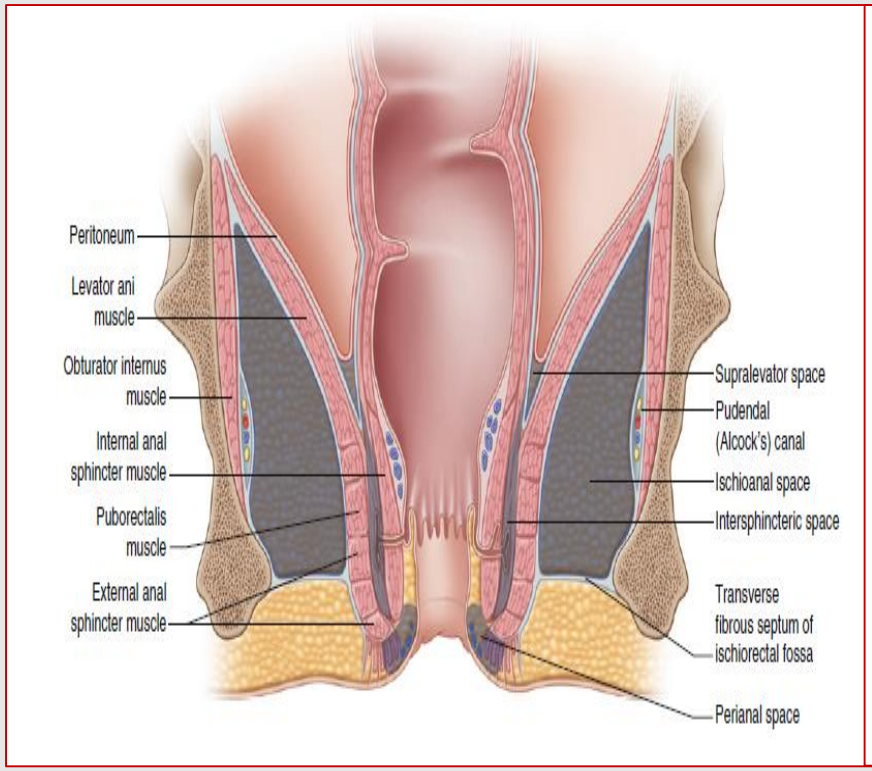
- Warm Sitz baths
- Hydrocortisone & lidocaine L/A for acute fissures
- Stool softeners & fiber supplements
- Topical Nitroglycerin **0.2% up to 8 weeks** (local application →NO donor→ resting anal pressure ↓ → anodermal blood flow ↑)
- Topical application of 2% Diltiazem **[Calcium channel blockers –topical nifedipine]** (fewer S/E) **→ heal between 48 and 75% of fissures that fail GTN**

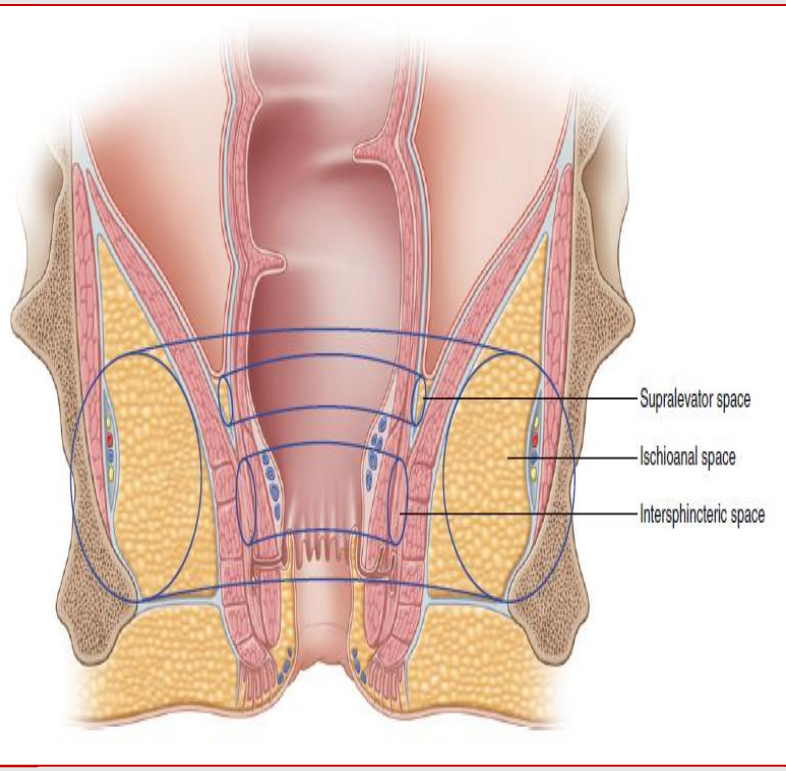
- Botulinum toxin (Injected into ext & int sphincters →striated muscle denervation →muscle paralysis & relaxation)
- Lateral internal Sphincterotomy (Closed/Open technique)

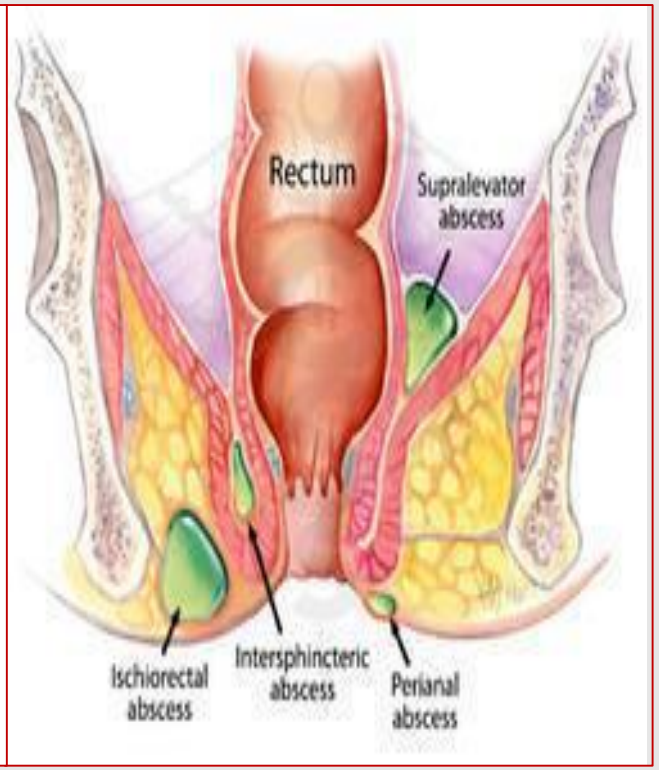
Abscesses and anal fistulas

- 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

Classification of anal abscesses

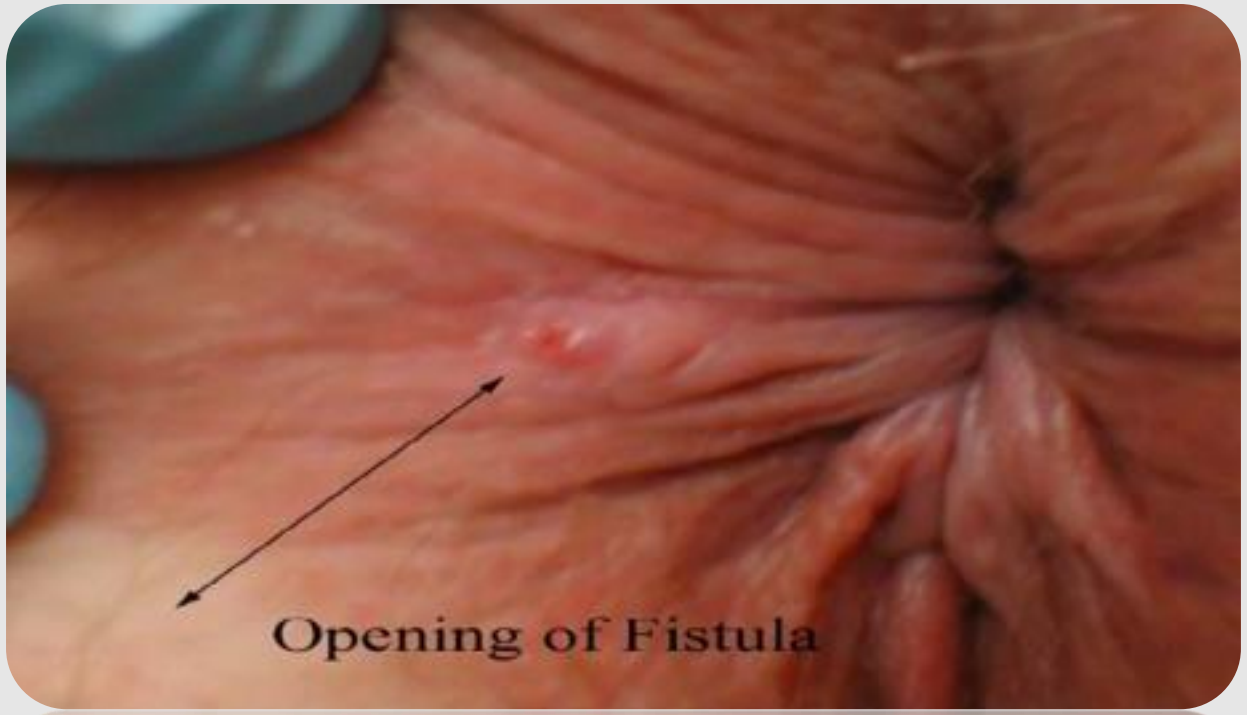






Classification of anal abscesses

- The infection usually starts in one of the crypts of Morgagni and extends along the related anal gland to the inter sphincteric 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%)
  - Ischiorectal abscess (30%)
  - Sub mucous abscess (5%)
  - Pelvirectal or Supralevator abscess



anal fistulas

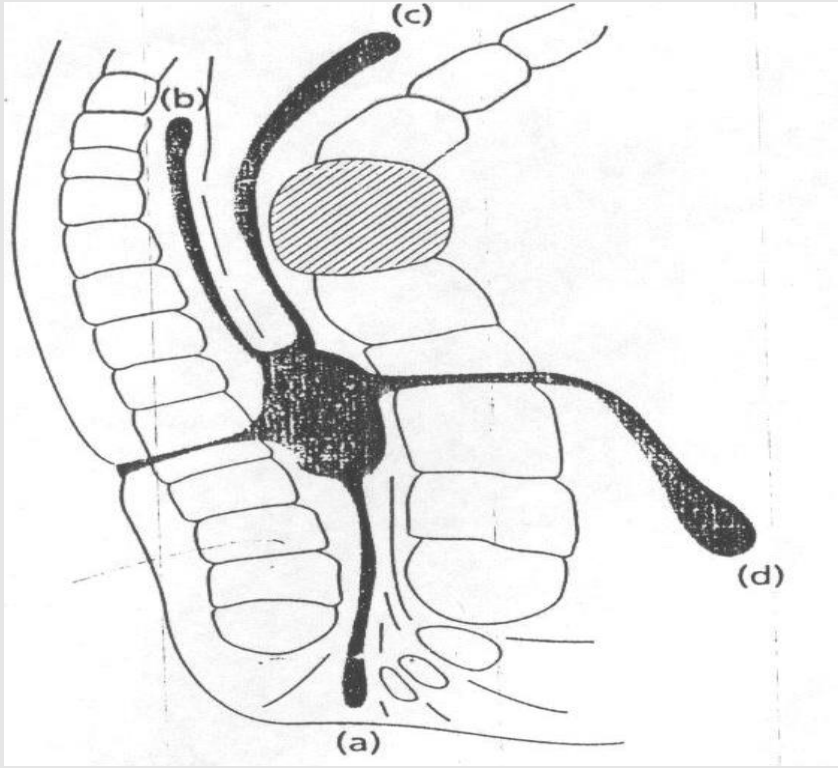
DEFINITION: IT IS A TRACT LINED UP BY GRANULATION TISSUE CONNECTING BETWEEN PERIANAL SKIN AND THE CAVITY OF THE ANAL CANAL OR RECTUM.

Fistula in ano: 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

anal fistulas: pathogenesis

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

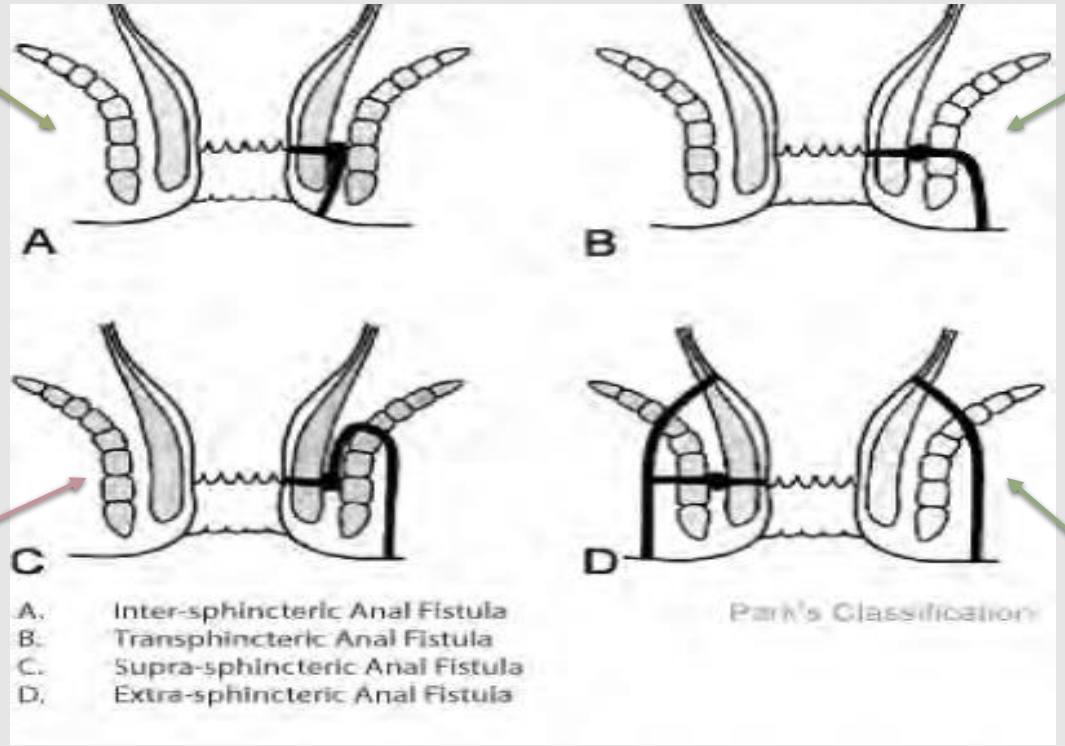


Classification of anal fistulas

- According to the site of their internal opening they can be classified into:
  - **Low level fistula**, the internal opening open into the anal canal below the anorectal ring.
  - **High level fistula**, the internal opening open into the anal canal at or above the anorectal ring .

anal fistulas: Parks classification

Inter sphincteric (70%) low level anal fistula



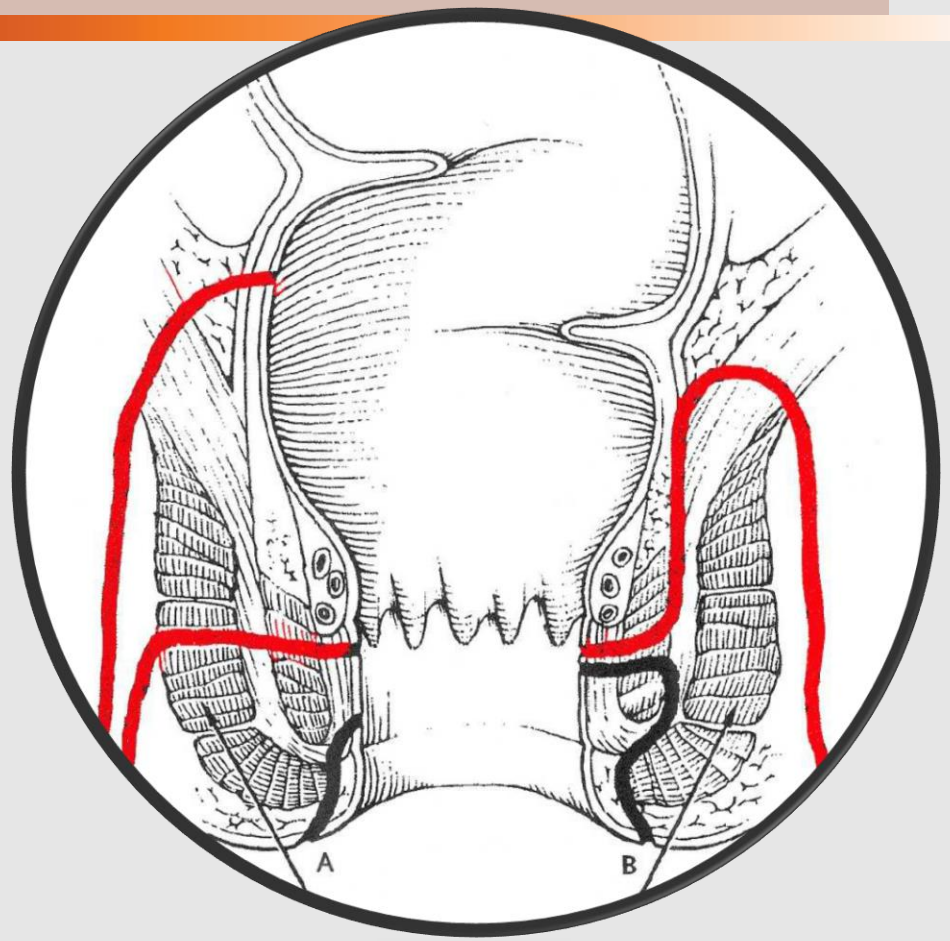
Trans-sphincteric (25%) high level anal fistula

Extra sphincteric (1%) rare type include the tract passes outside all sphincter muscles to open in the rectum.

PERIANAL DISEASE: GUIDLINES

PARK'S Classification

Suprasphincteric
extrasphincteric,
trans-sphincteric



- Drain the sepsis
- Try to identify fistulous tracts

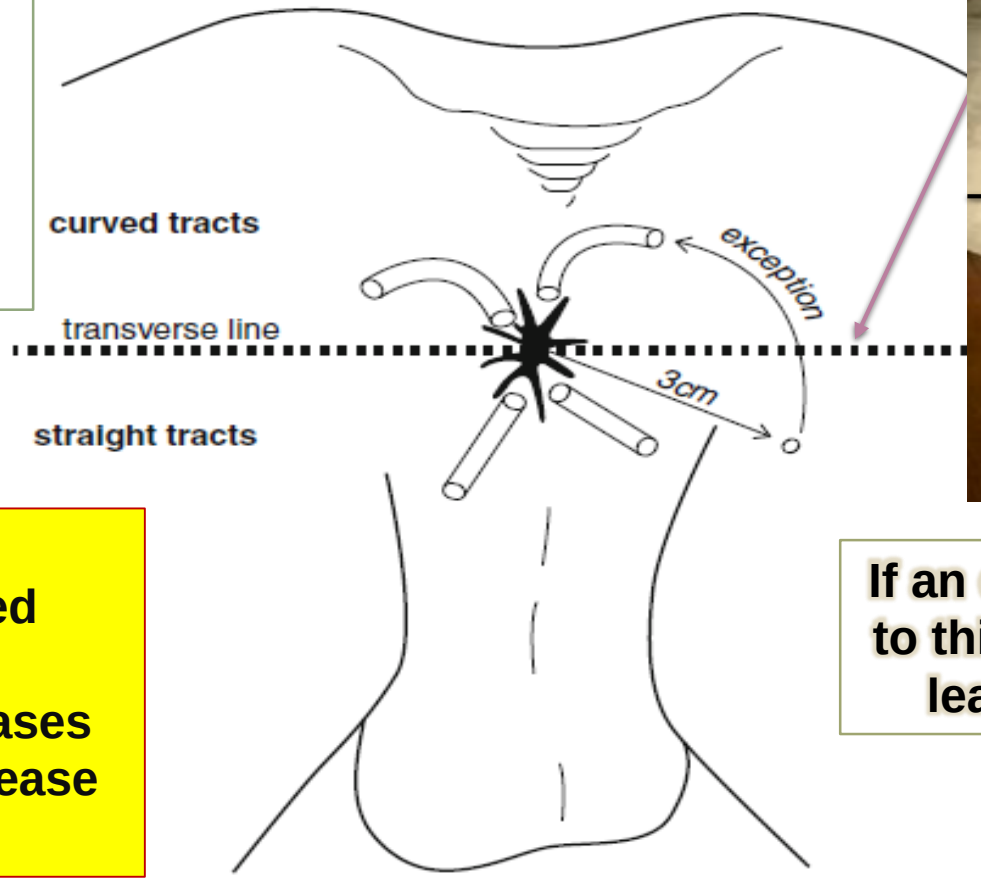
Abscesses and anal fistulas: Symptoms

- **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.

A imaginary line is drawn transversely across the anus

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.**

If an external opening is Anterior to this line (not far than 3cm) will lead to a straight radial tract

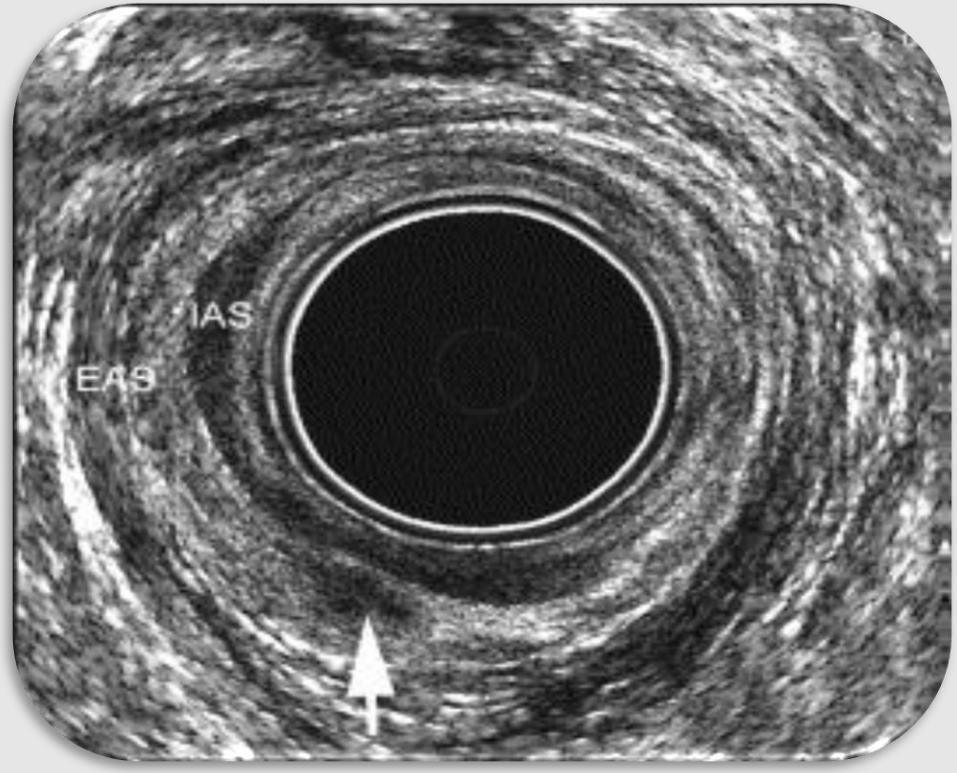
Abscesses and anal fistulas: Diagnosis

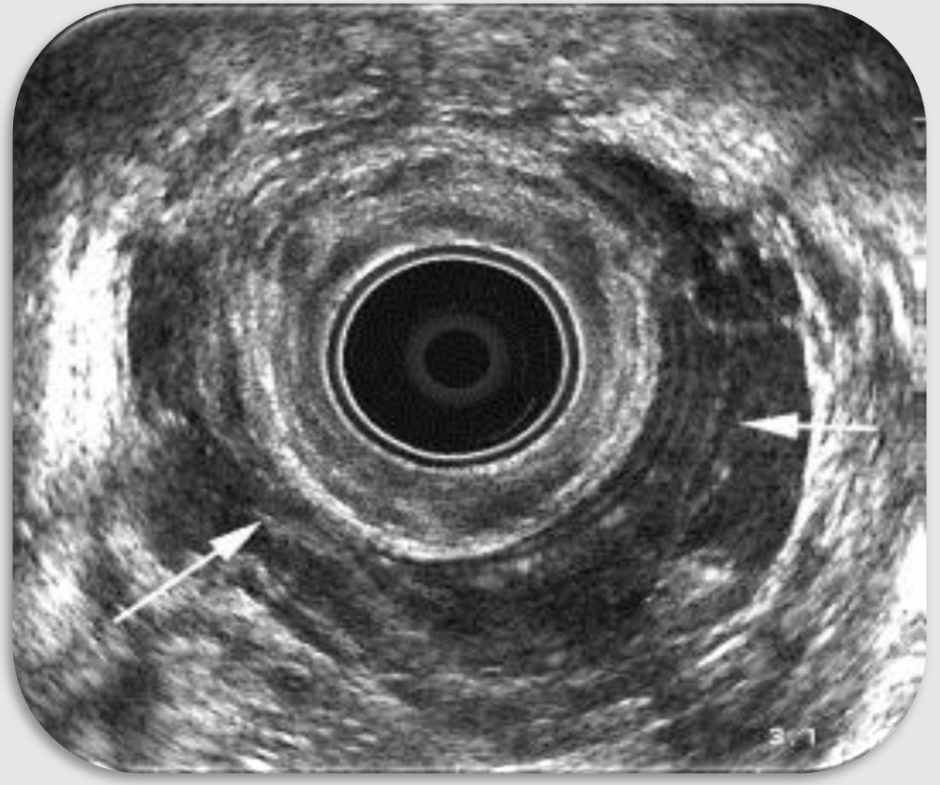
- Clinical exam
- Endosonography
- MRI
- Sometimes anorectal examination with a rigid instrument
  - To identify the anal crypt responsible for the infection
  - To determine the prsence of underlying septic or inflammatiry proctitis
  - To look for a perforated anorectal cancer

anal fistulas: investigations: Fistulogram

- Anterio-posterior view fistulography
  - Showing fistulas tract non branching opening in the anal canal below the inter-trochantric line.

anal fistulas: investigations: EUS





anal fistulas: investigations: Mri

Coronal view (STIR) left transsphincteric active track is seen start from the ischiorectal fossa traversing the external and then the internal sphincter.

(A)Puborectales muscle

(B)Active transsphincteric track

(C)Ischiorectal fossa abscess cavity

Complex anal fistula: SURGICAL TX

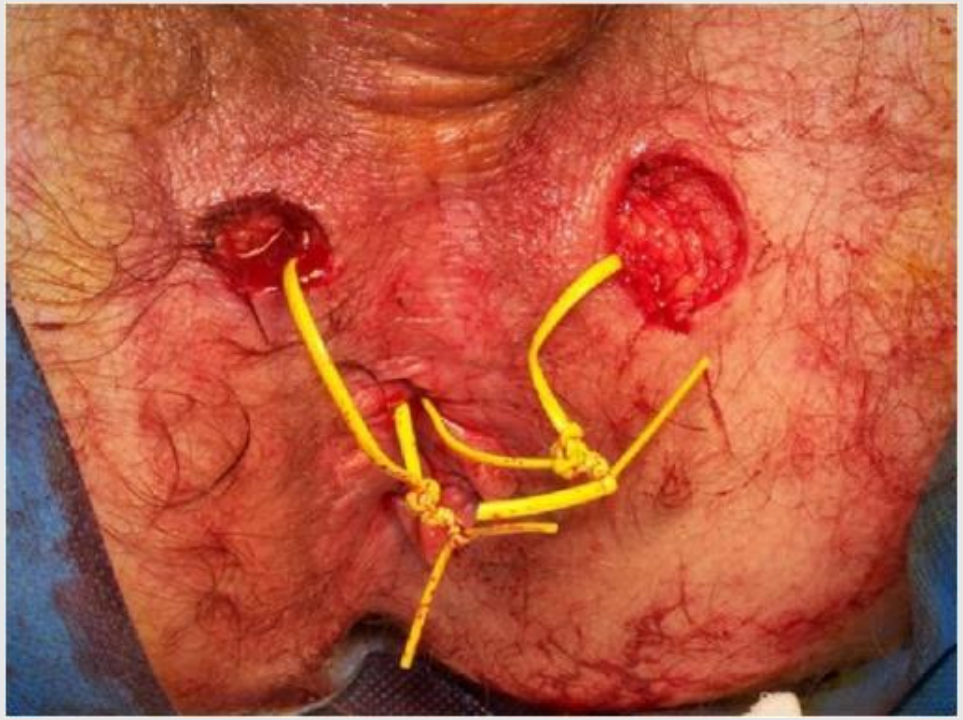
Definitive Therapy

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

anal abcesses and fistulas: 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 tracks are probably best treated by this method.**
    - **High healing rate 62 -100%**
    - **Long healing time up to 6 months**
    - **Minor incontinence 0-12%**

anal abcesses and fistulas: Treatment



Seton

- Can be placed alone, combined with fistulotomy, or in a staged fashion.
- Indications:
  1. Complex fistulas (ie, 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%

anal abcesses and fistulas: treatment complication

- **Early postoperative complications :**
  1. **Urinary retention**
  2. **Bleeding**
  3. **Fecal impaction**
  4. **Thrombosed hemorrhoids**

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

PILONIDAL SINUS

- 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.

Pilonidal sinus is a chronic subcutaneous abscess in the natal cleft, which spontaneously drains through the openings.

PILONIDAL SINUS: Patholgy

- 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.

PILONIDAL SINUS: Treatment

- **One of several ways:**
  - **Nonoperative treatment,**
  - **Lateral incision and excision of midline pits, incision and marsupialization.**
  - **Wide local excision with or without primary closure, excision and**
    1. **Z- plasty,or**
    2. **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 rectosogmoid 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.

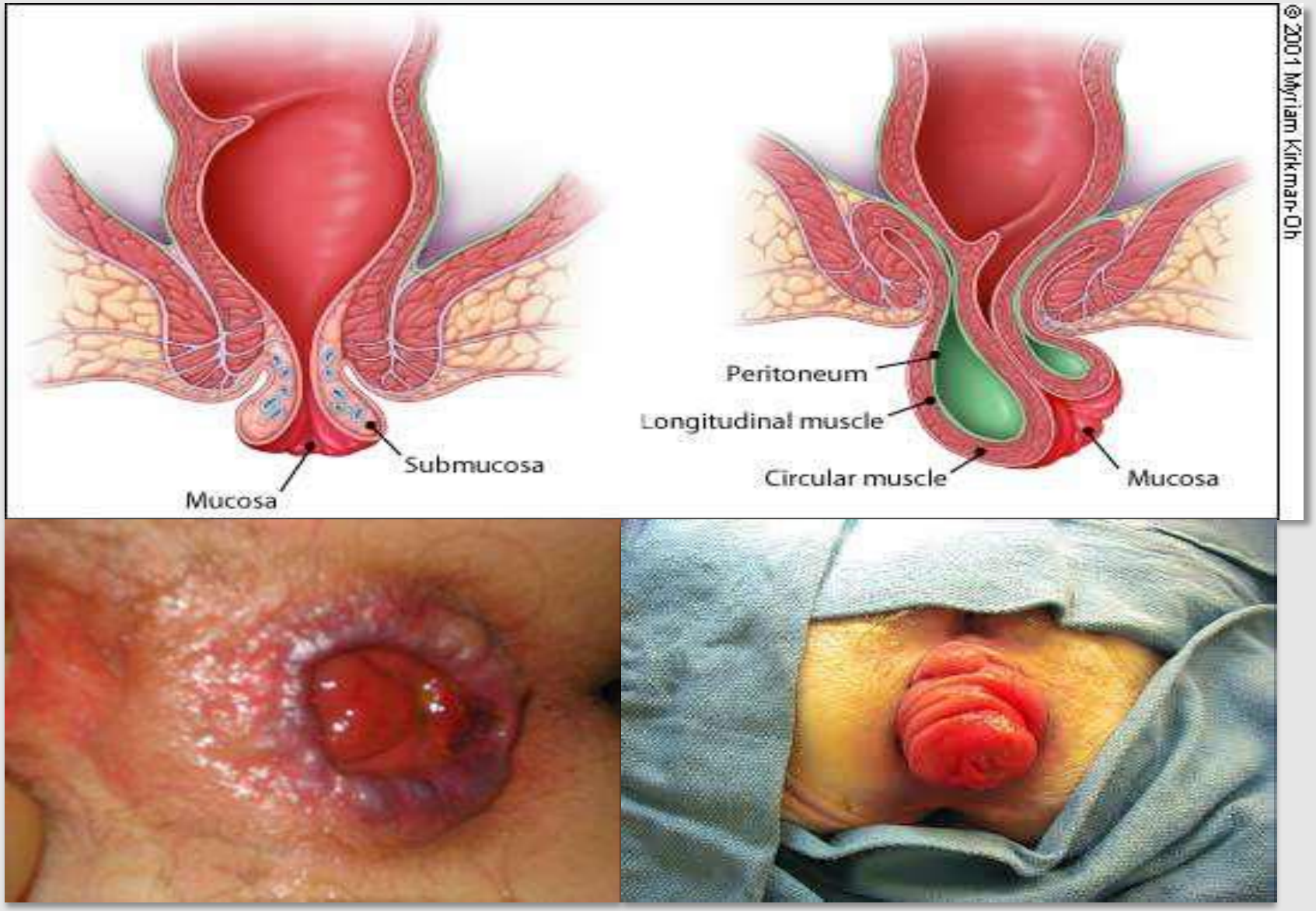
Rectal Prolapse : Factors preventing Prolapse

- Curvature of sacrum (under developed sacral curve)
- Tilt of pelvis
- Serpentine course of rectum
- Levator ani muscles-fixes rectum
- Puborectalis sling-Tilt and elevate lower end of rectum

Rectal Prolapse : Types of Prolapse

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

Mucosal vs Full Rectal Prolapse



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)

Rectal Prolapse : 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

Rectal Prolapse : Clinical Features

- Something coming out of anal canal during straining, coughing, lifting weights
- Constipation (58%)
- Mucus discharge
- Feeling of incomplete evacuation
- Itching

Rectal Prolapse : Clinical Features

- **Fecal incontinence:**
  a. **More common in long standing complete prolapse**
  b. **Due to stretching of pudendal and perineal nerves**
  c. **Dilatation of anal canal and relaxation of anal sphincters.**
  d. **Bleeding (rare)-of massive or irreducible**

Rectal Prolapse : Differential Diagnosis

- Prolapsed haemorrhoid
- Large polypoidal lesion protruding through anus

Rectal Prolapse : 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%)

Rectal Prolapse

Difference Between Rectal Prolapse & Hemorrhoids

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

Rectal Prolapse : 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

Rectal Prolapse : 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 (1.8-2.2msec)

Rectal Prolapse : Non operative 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

- Due to HPV infection
- Some serotypes /high potential of malignancy HPV 16 and 18!!!
- Perianal and/or intra-anal examination of anal canal!

Anal wart: Condyloma acuminate

- 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

Anal wart: Condyloma acuminate

HPV Infection risk for 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

Anal wart: Condyloma acuminate

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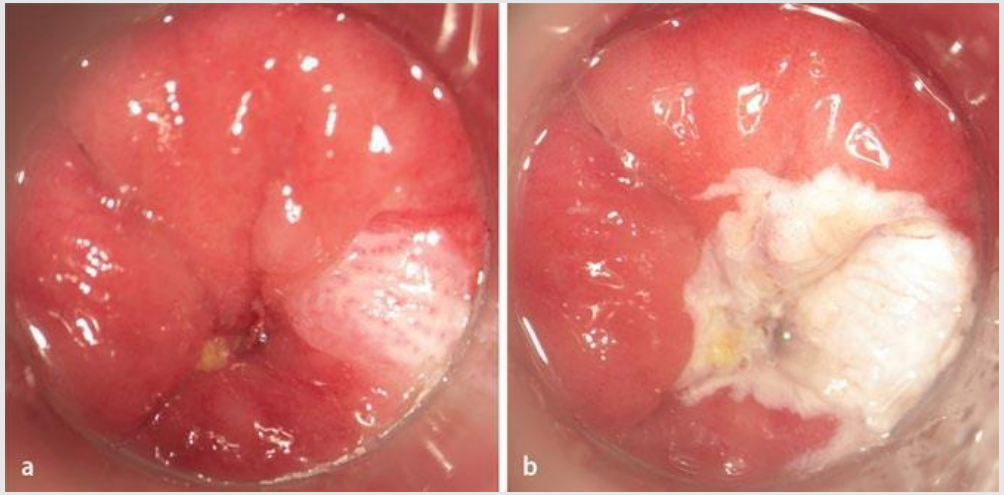
Condyloma acuminata –high resolution anoscopy



- high resolution anoscopy
  - Aceto whitening
  - Treatment with trichlor acetic acid 85%

Condyloma acuminata –treatment

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 recipients.

Condyloma acuminate : treatment

- 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


THANK YOU :)