Pelvic Organ Prolapse

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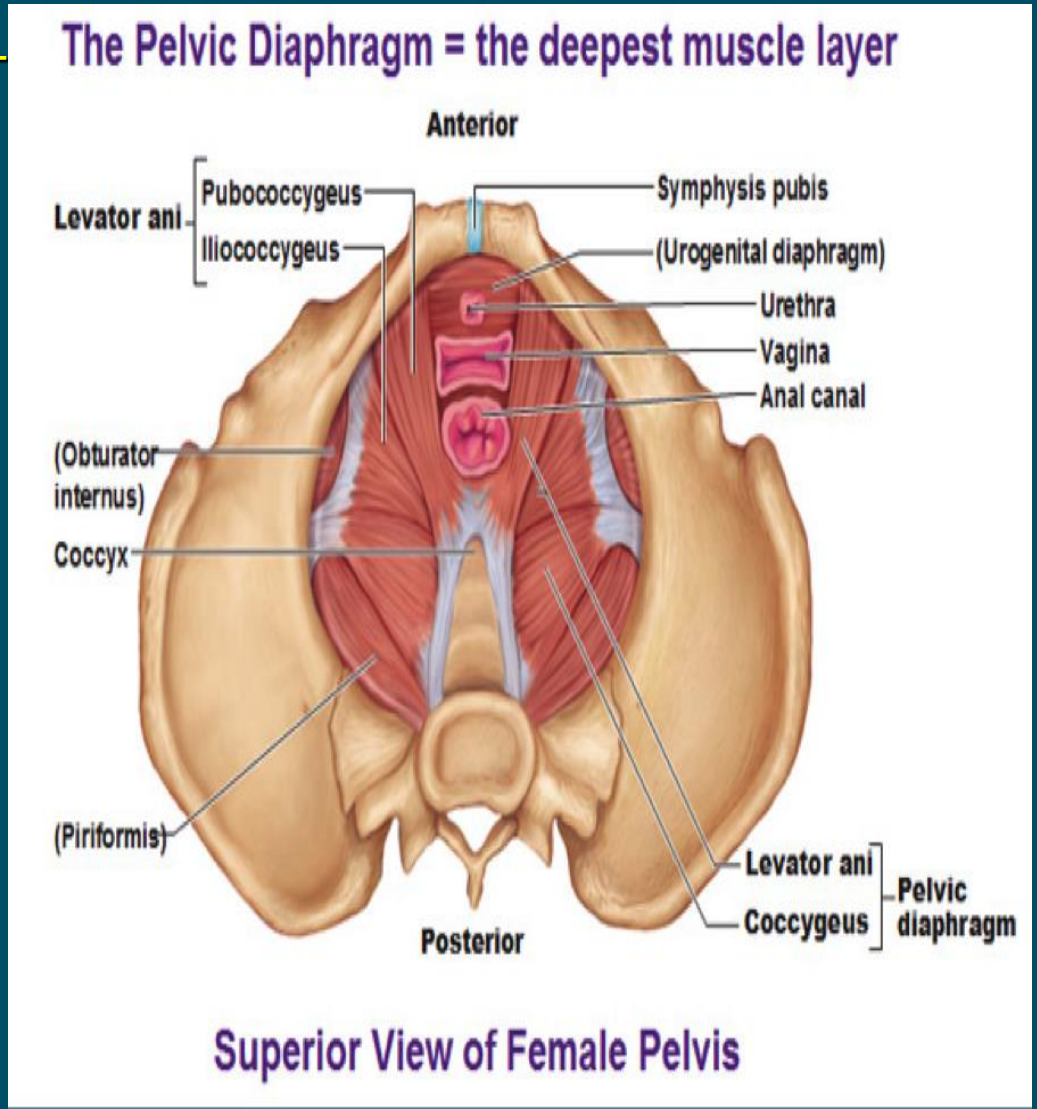
Pelvic diaphragm

Pelvic diaghragm/ levator ani muscle------

- 3 striated muscle-
  - Ileococcygeus.
  - Pubococcygeus.
  - Puborectalis.

Levator hiatus- btw 2 pubococcygeus-

  - Lower rectum.
  - Urethrae.
  - Dorsal v. of penis.
  - Vagina.



Perineum

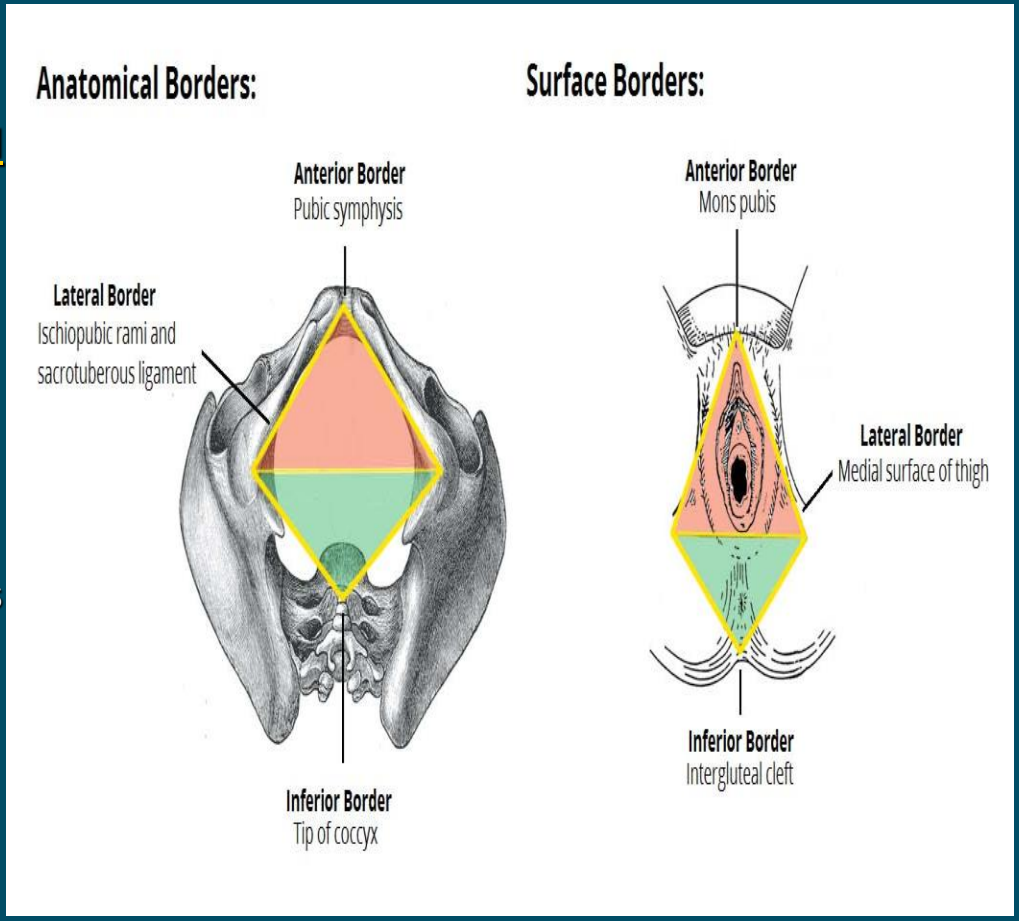
Region between the thighs inferior to the pelvic diaphragm.

- In front: pubic arch & arcuate ligament.
- Behind: tip of the coccyx
- Side: inferior rami of pubis and ischial tuberosity, & sacrotuberous ligament
- superiorly: pelvic floor.
- inferiorly: skin and fascia.

Part:

Line connecting ischial tuberosities divides perineum into 2 triangles:

- Urogenital triangle -- penis or vagina.
- Anal triangle containing the anus.



The *perineal body* (or central tendon of *perineum*)

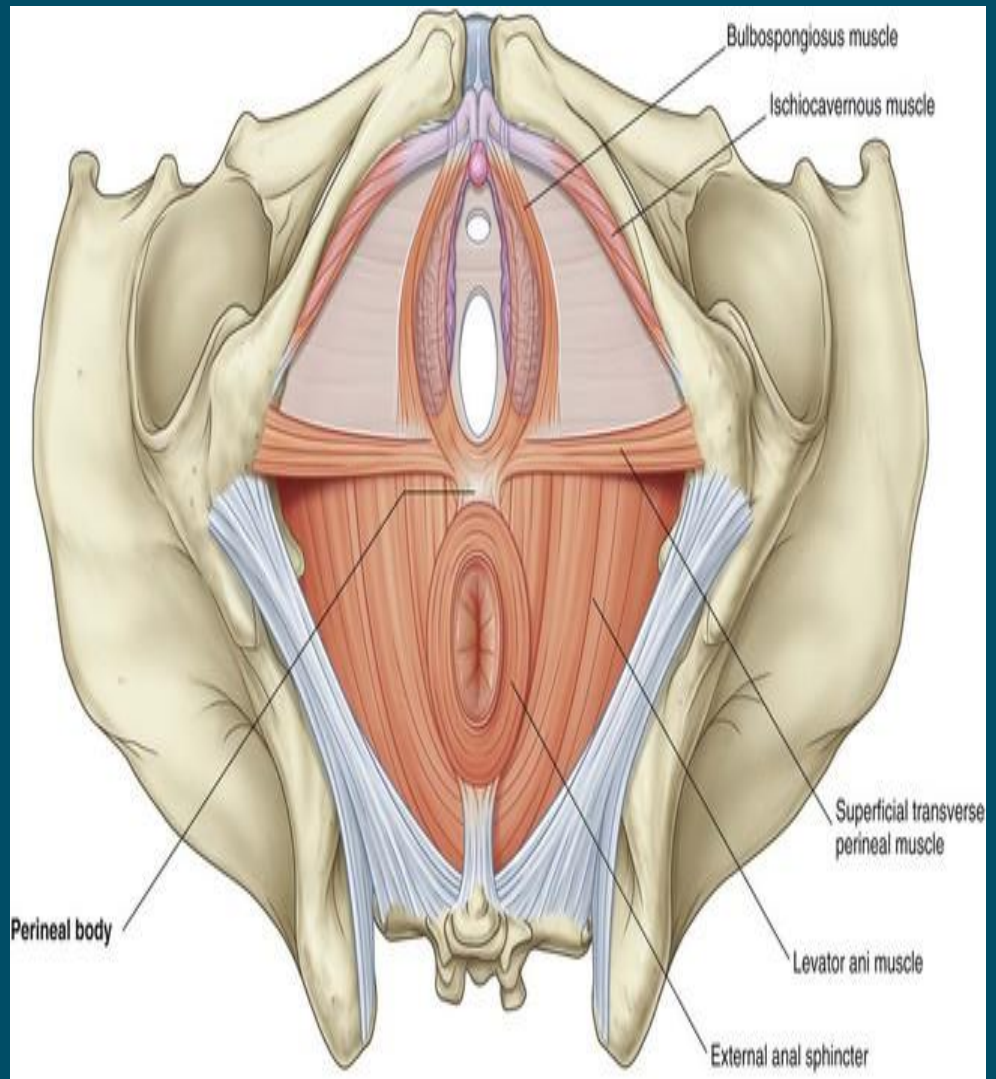
Pyramidal fibromuscular mass at the junction between the urogenital triangle and the anal triangle.

Location:

- In males--between the bulb of penis and the anus;
- In females--between the vagina and anus, & about 1.25 cm in front of anus.

Following muscles are attached:

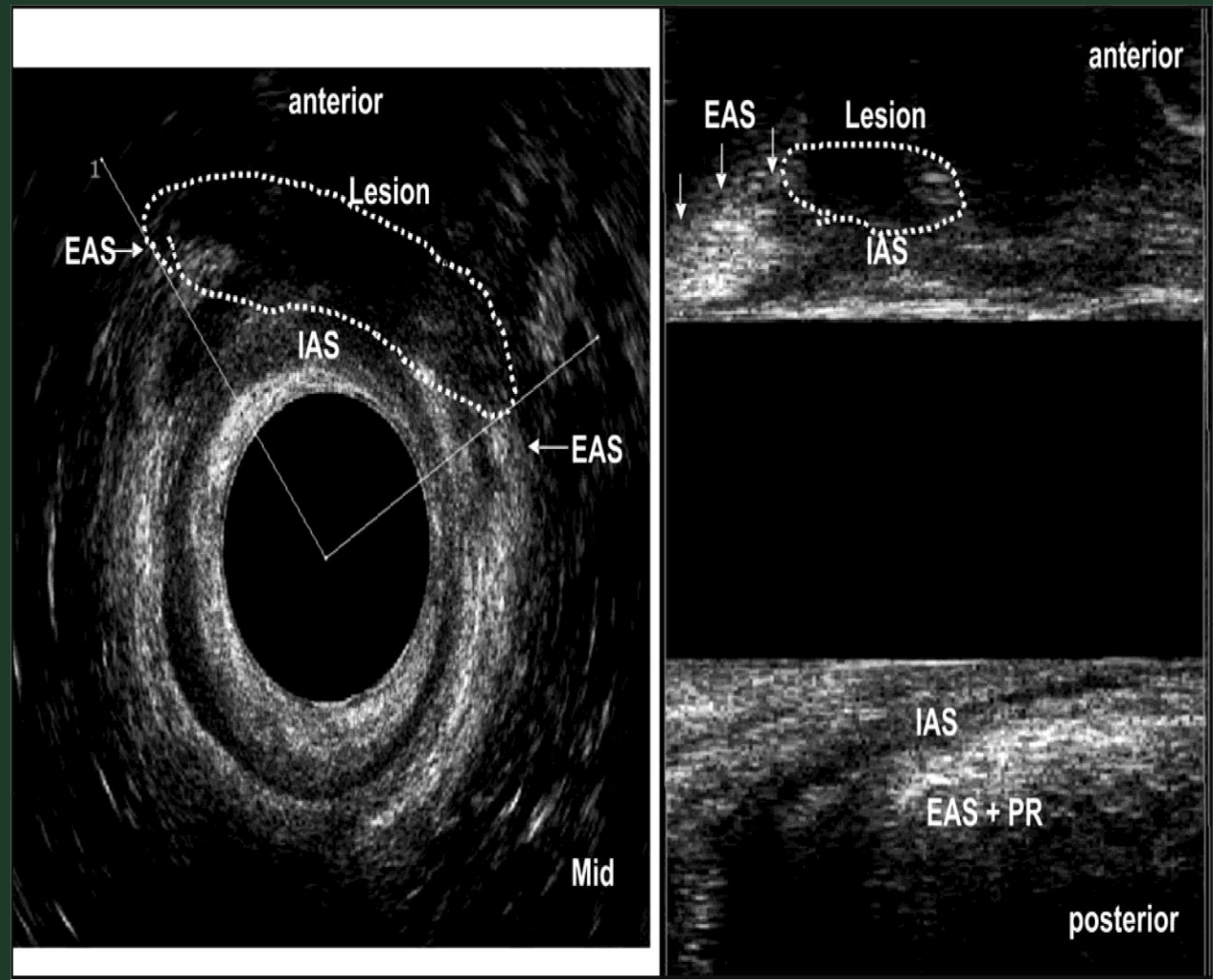
- EAS.
- Bulbospongiosus muscle.
- Superficial transverse perineal muscle.
- Anterior fibers of the levator ani.
- Fibers from external urinary sphincter.
- Deep transverse perineal muscle.

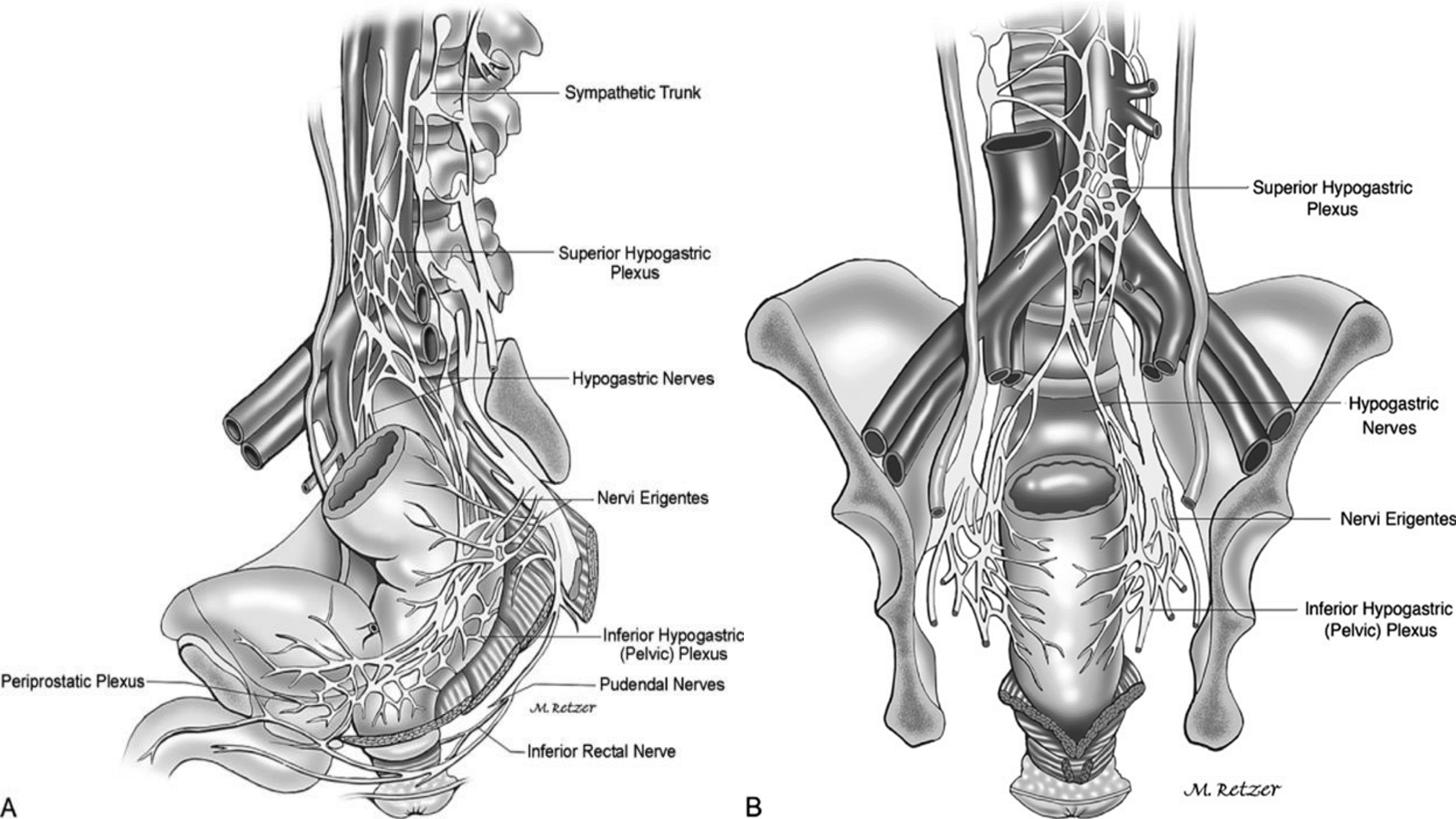


Diagnostic Studies

Endoanal Ultrasound-

- Anatomical assessment----in incontinence, fistulous disease, and anal pain.
  - IAS--- hypoechoic.
  - EAS---hyperechoic and
  - Scar---mixed echogenecity.
- Perineal body thickness (PBT)
  - <10 mm---- abnormal, and
  - >12 mm---- unlikely to have a sphincter defect.




Sympathetic Trunk
Superior Hypogastric Plexus
Hypogastric Nerves
Nervi Erigentes
Inferior Hypogastric (Pelvic) Plexus
Periprostatic Plexus
Pudendal Nerves
M. Retzer
Inferior Rectal Nerve
A
Superior Hypogastric Plexus
Hypogastric Nerves
Nervi Erigentes
Inferior Hypogastric (Pelvic) Plexus
M. Retzer
B

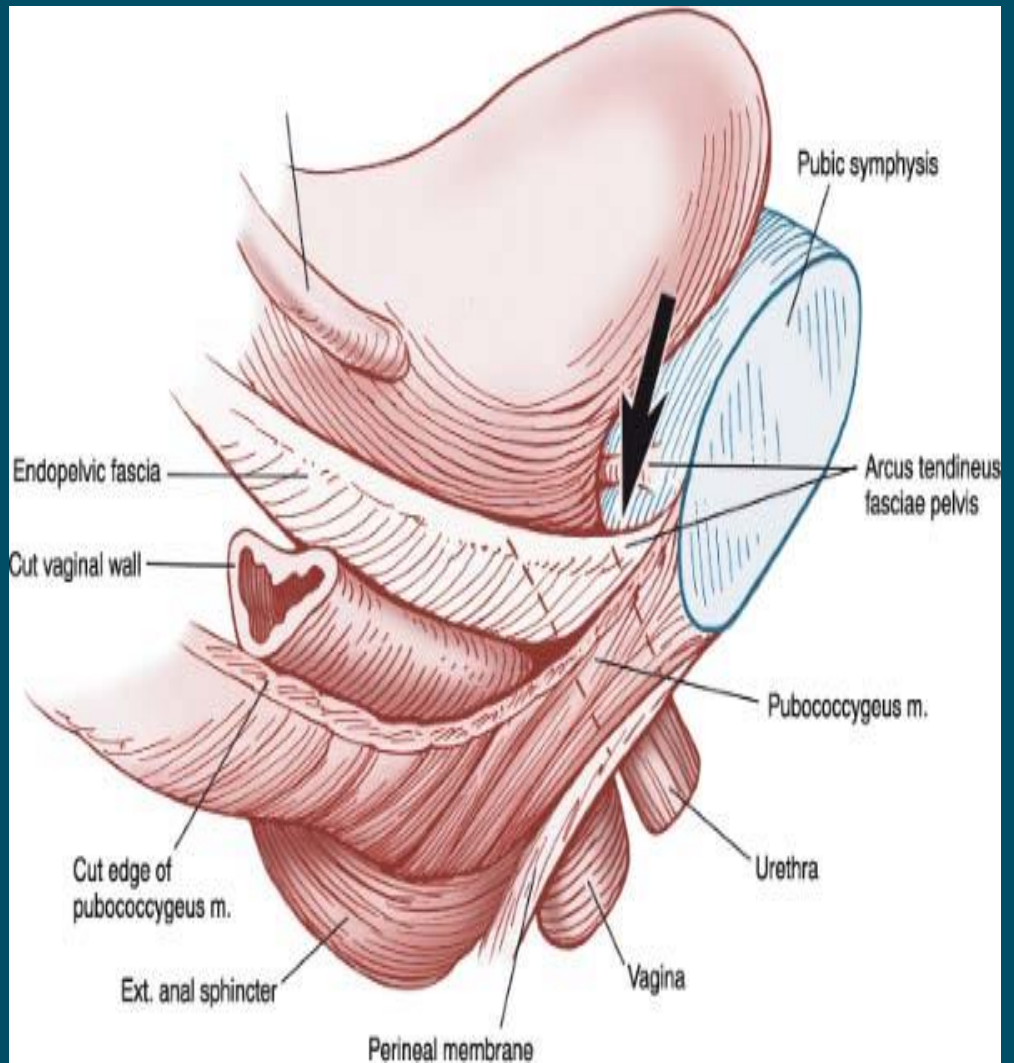
Fascial Relationships of the Rectum

Endopelvic or endovisceral fascia:

- More complex and controversial structure.
- Between visceral peritoneum and parietal fascia of the levator ani.
- Fibroareolar tissue containing neurovascular bundles, smooth muscles, collagen, and elastin.

Layers:

- Parietal endopelvic fascia lines the walls and floor of the pelvis and
- Continues as a visceral pelvic fascia.



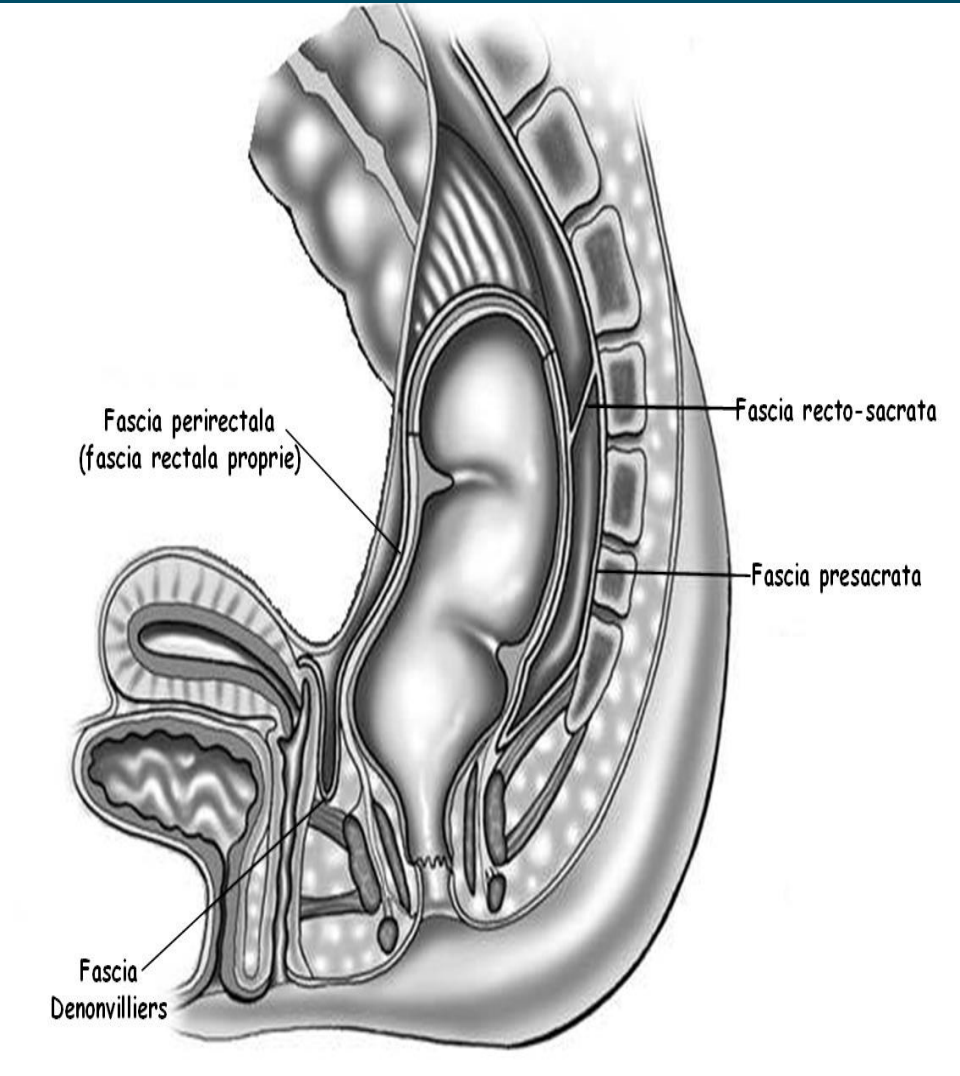
The presacral fascia

Thickened parietal endopelvic fascia.

- Covers the concavity of the sacrum and coccyx, nerves, the middle sacral artery, and presacral veins.

Extension:

- Postero-inferiorly it fuses with the mesorectal fascia, above the levator ani muscle, at the level of the anorectal junction.

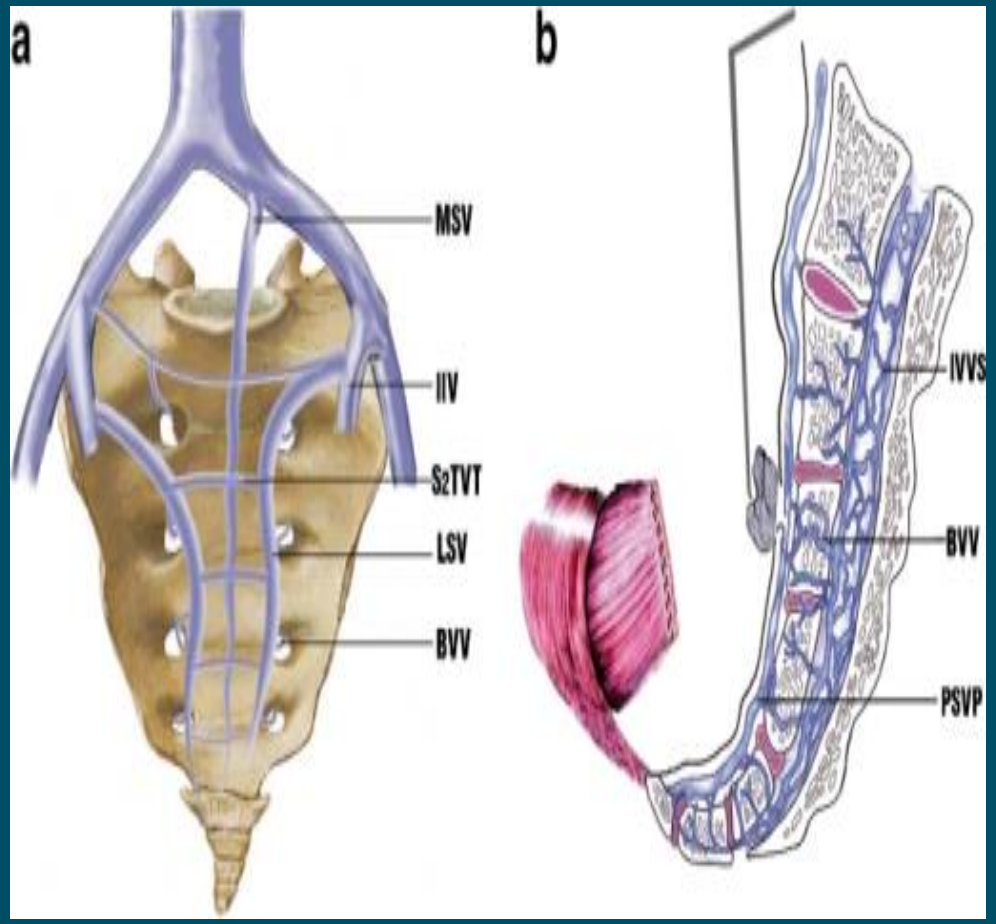


The presacral fascia

Inter fascial plane -- “Holy plane“- Heald RJ.

Dissection deep to presacral fascia-

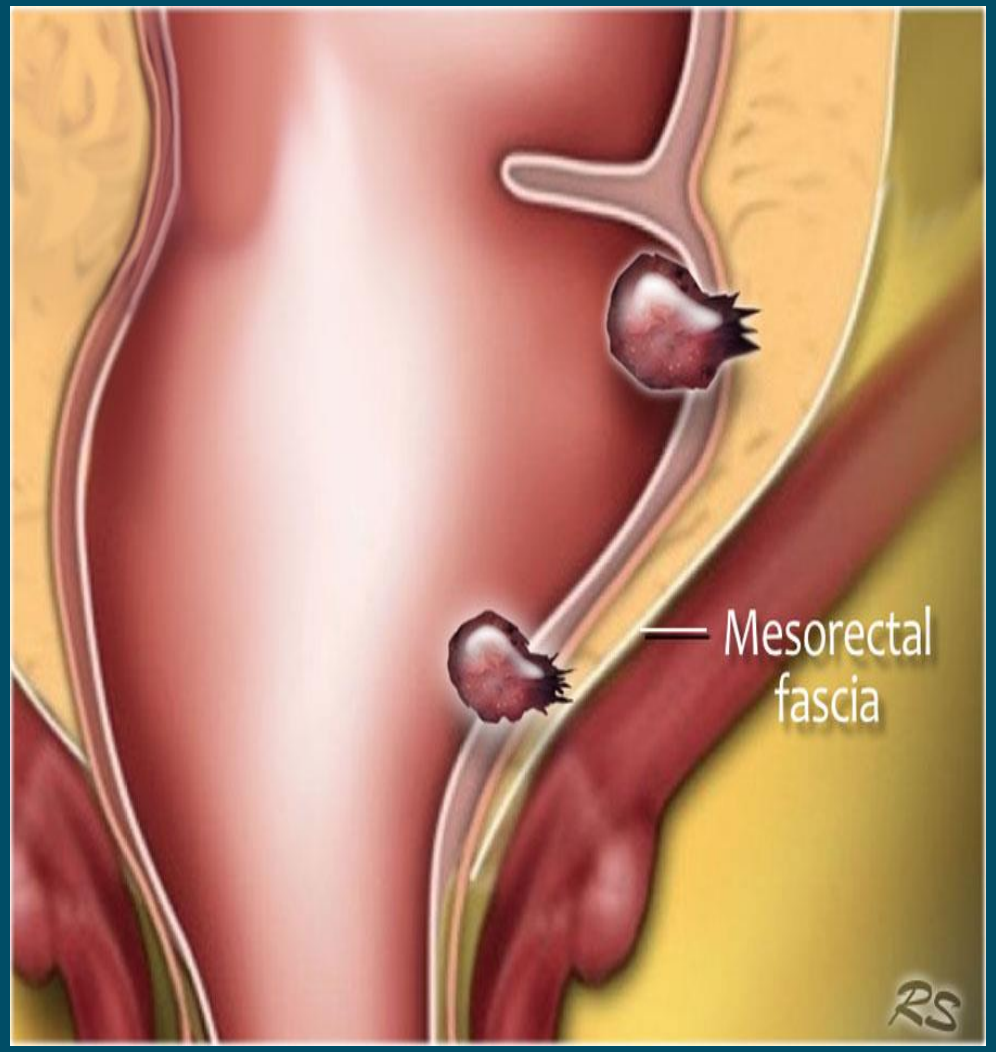
- Presacral hemorrhage--4.6–7.0%.
  - Difficulty in control as
    - Retraction.
    - High hydrostatic pressure--17–23 cm H2O, 2 -3 times the pressure of IVC.
  - Valveless veins communicate via basivertebral veins with the internal vertebral venous system.



Mesorectal fascia / fascia propria or the pelvic visceral fascia-

Extension of pelvic fascia, enclosing --

- The rectum.
- Fat, nerves, the blood, and lymphatic vessels.
- More evident in the posterior and lateral extraperitoneal aspects of the rectum.



Waldeyer's Fascia / Rectosacral fascia

Thick fascial reflection----

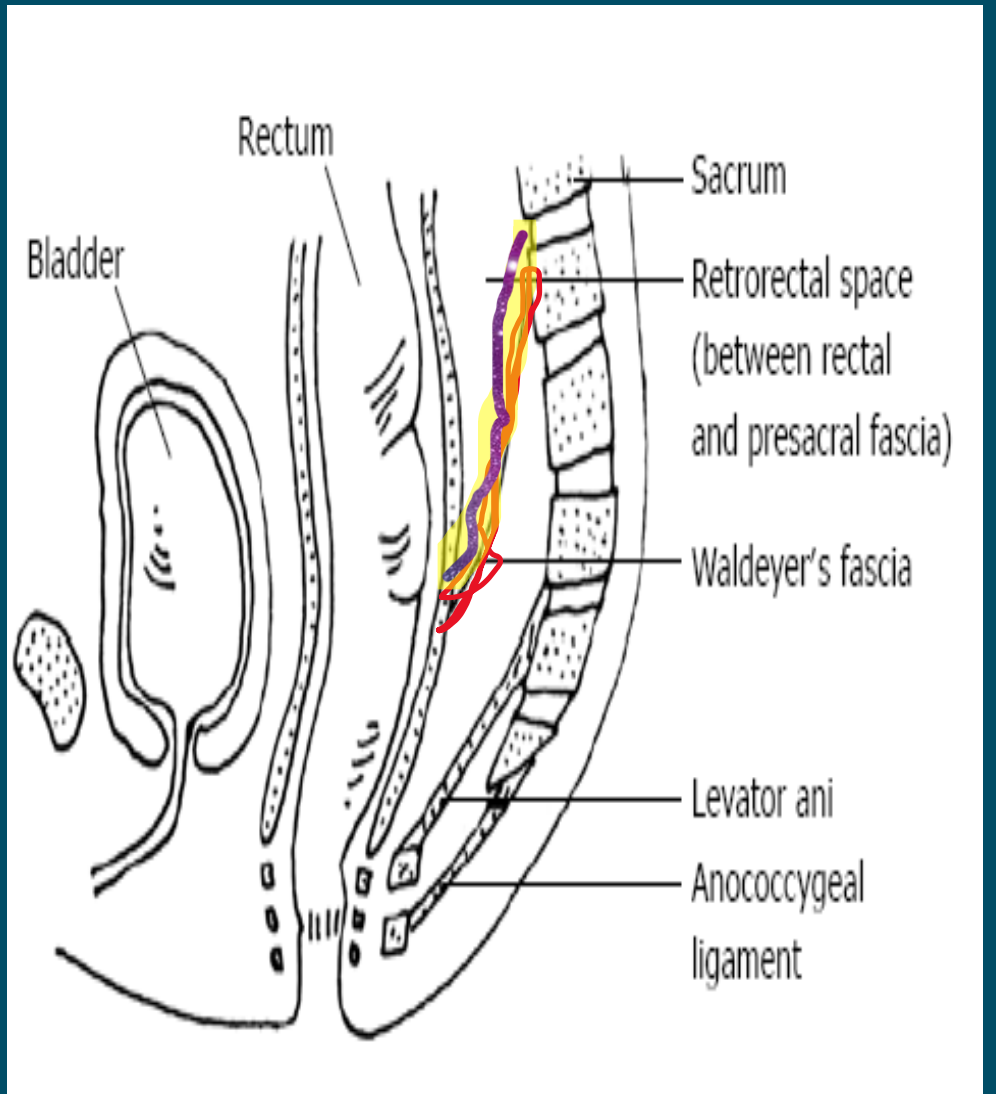
- From presacral fascia at S-4 level to fascia propria of the rectum just above the anorectal ring.
- Important landmark of posterior dissection.
- In 97% of cadaver dissections.

Contains-

- Branches of sacral splanchnic nerves arise directly from the sacral sympathetic ganglion.
- May contain branches of the lateral and median sacral vessels.

Importance:

- Sharply divided for full mobilization of the rectum.



Denonvilliers' Fascia

Anterior to the fascia propria----delicate layer of connective tissue.

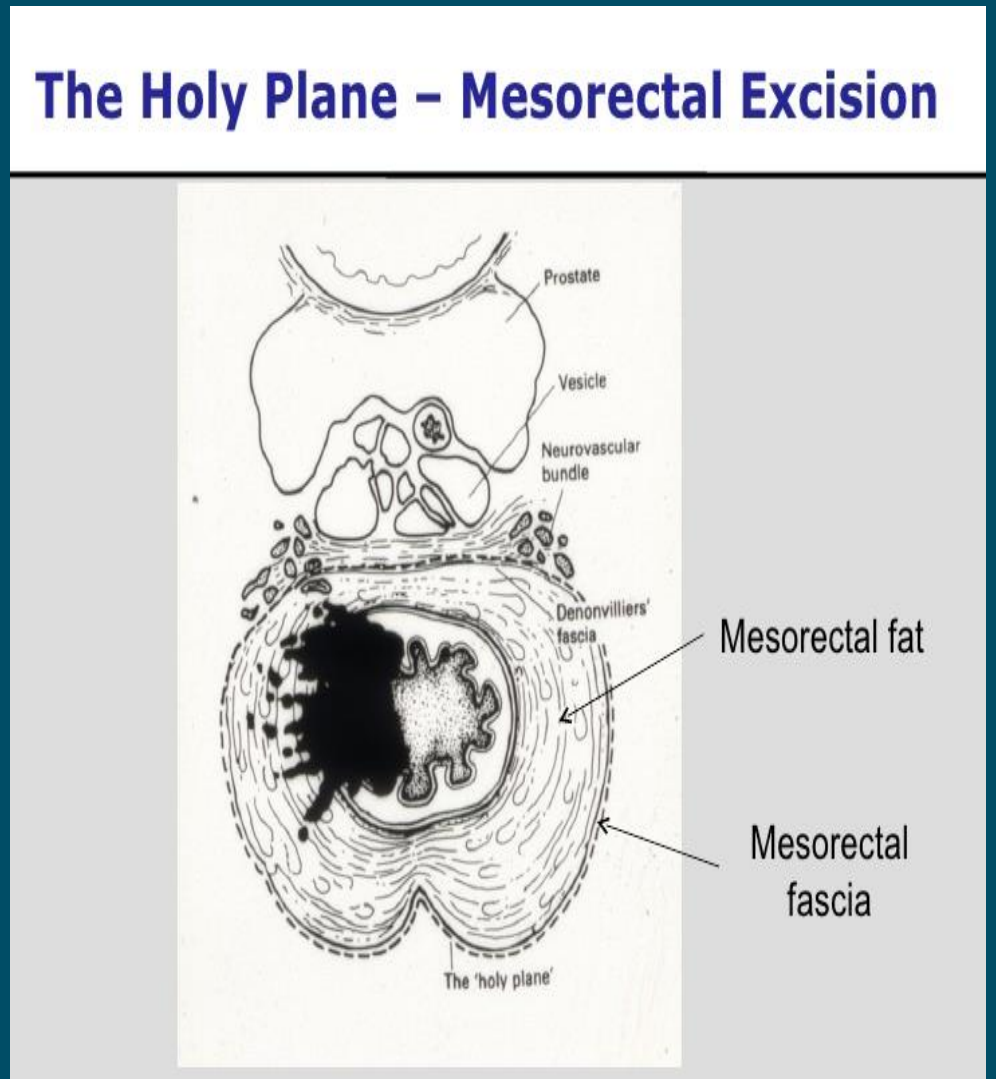
- It separates the rectum from the seminal vesicles and the prostate or vagina.

Morphology:

- No macroscopically discernible layers.

Histologically, composed of—

- Dense collagen,
- Smooth muscle fibers.
- Coarse elastic fibers.



Denonvilliers' fascia.

Its attachments have been surrounded by confusion and debates.

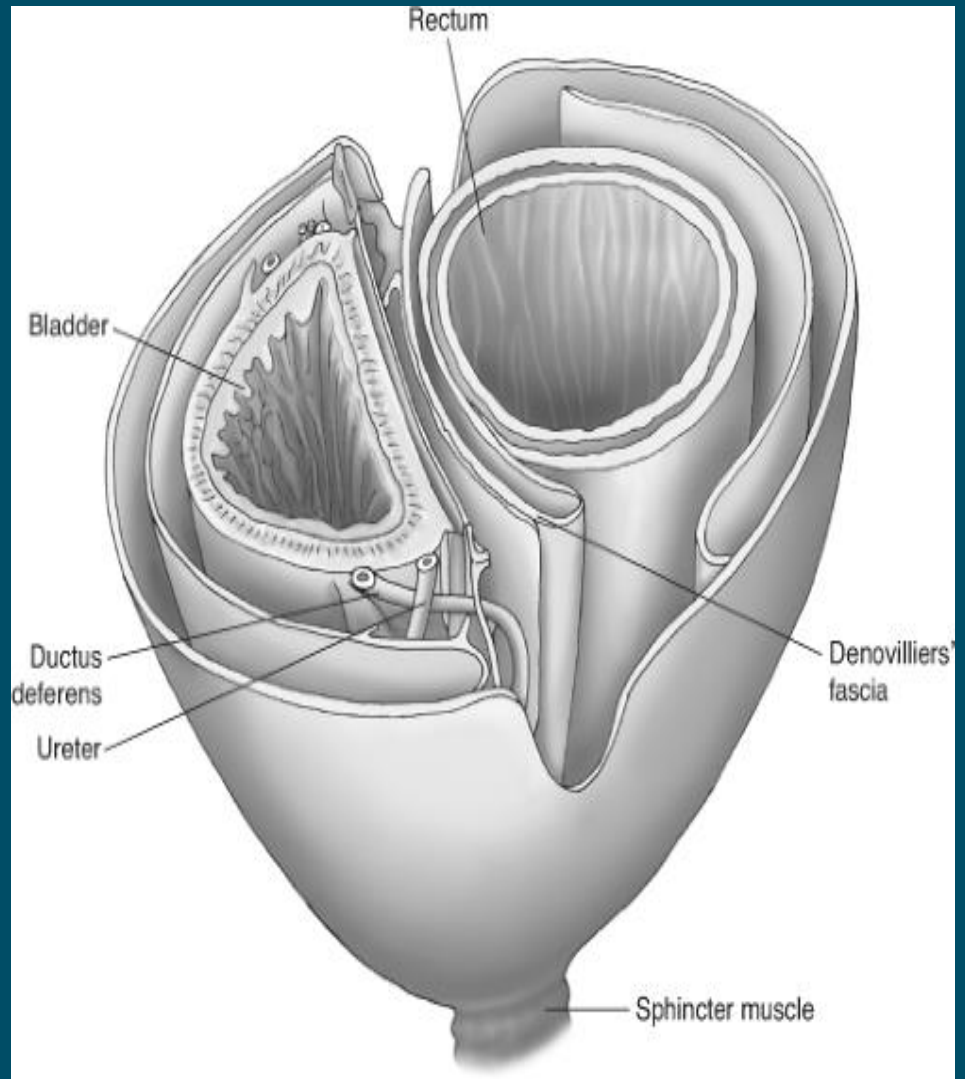
- Some believes it is adherent to the rectum,
- others note that it is applied to the seminal vesicles and prostate.

3 structures lie in front of rectal wall---

- Mesorectum
- Fascia propria and
- Denonvilliers' fascia.

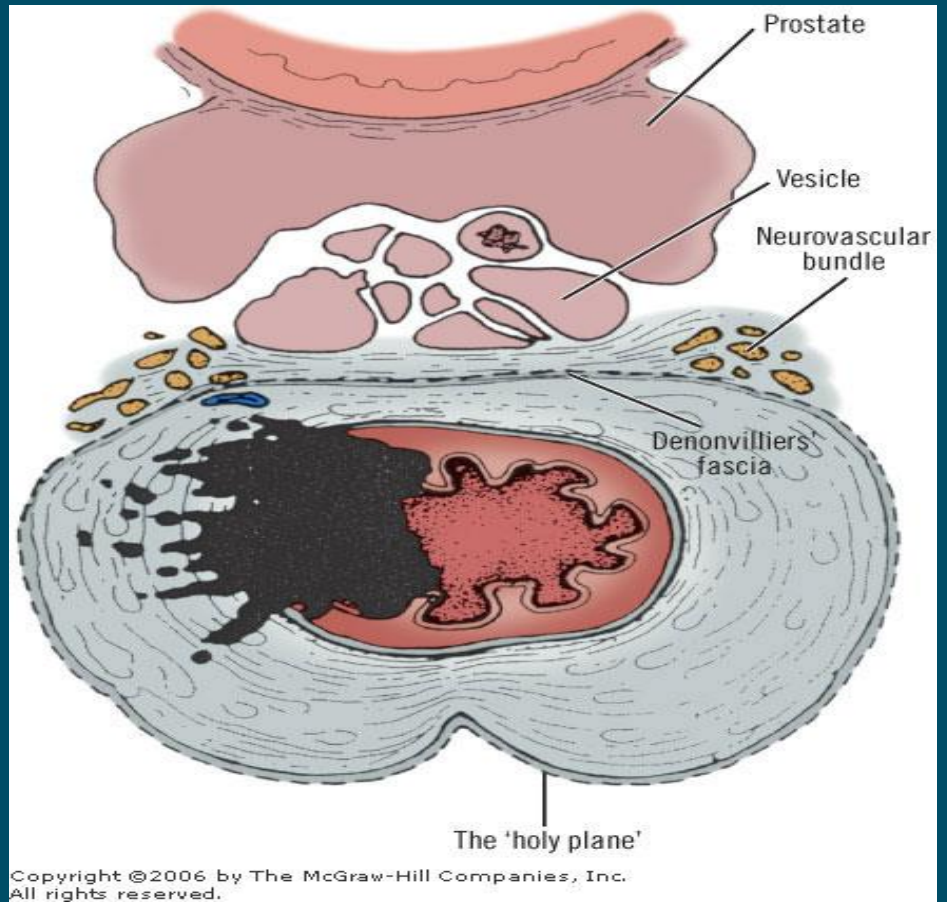
Importance:

- Plane of anterior dissection is more controversial.
- Not necessarily follow the same plane of posterior and lateral dissection



Anterior plane of dissection–

- Close rectal.
- Mesorectal.
- Extramesorectal.

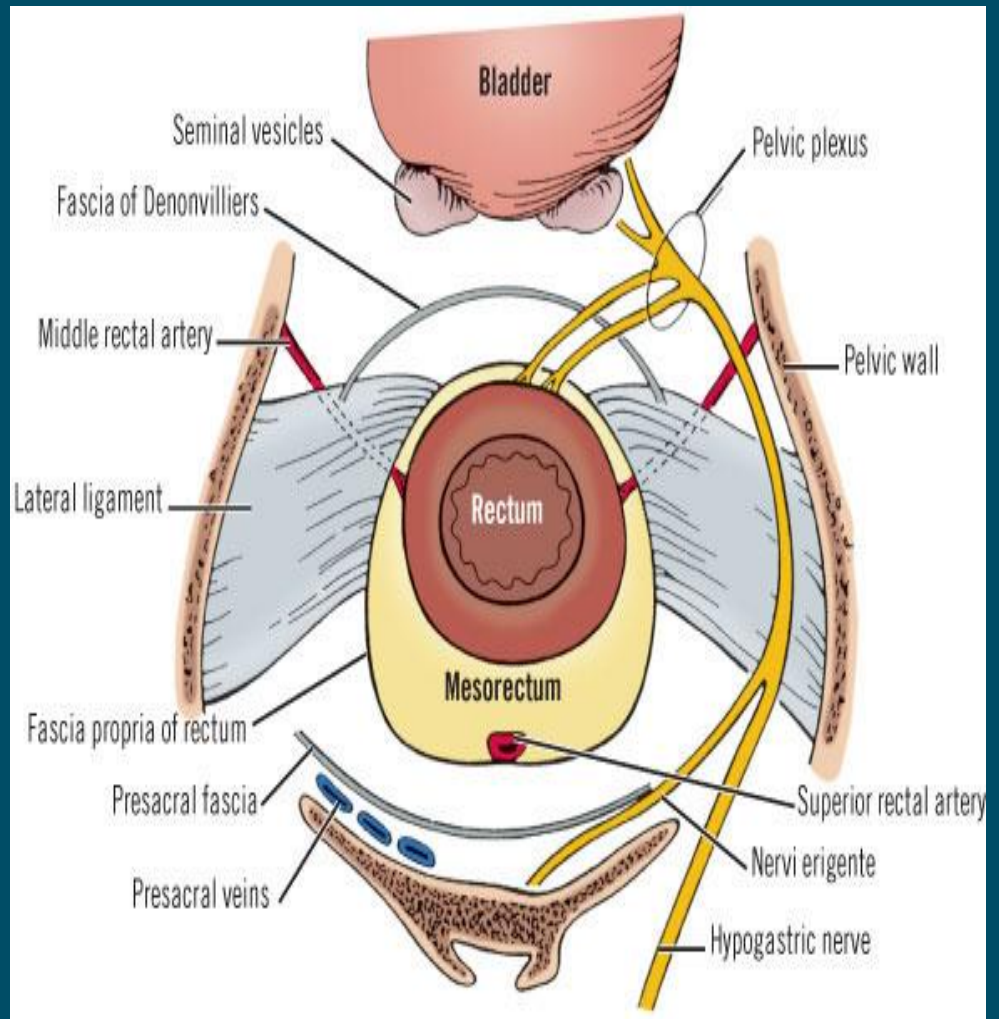


The lateral ligaments or stalks of the rectum—

- Distal condensations of the pelvic fascia.
- Roughly triangular .
- Base on the lateral pelvic wall and an apex to the lateral aspect of the rectum.

Importance:

- Do not contain important structures.
- MRA & pelvic plexus---closely related.
- Division --- 25% risk of bleeding.



Pelvic floor disorder

Anterior compartment (urinary)----

- Cystocele.
- Hypermobile bladder neck.

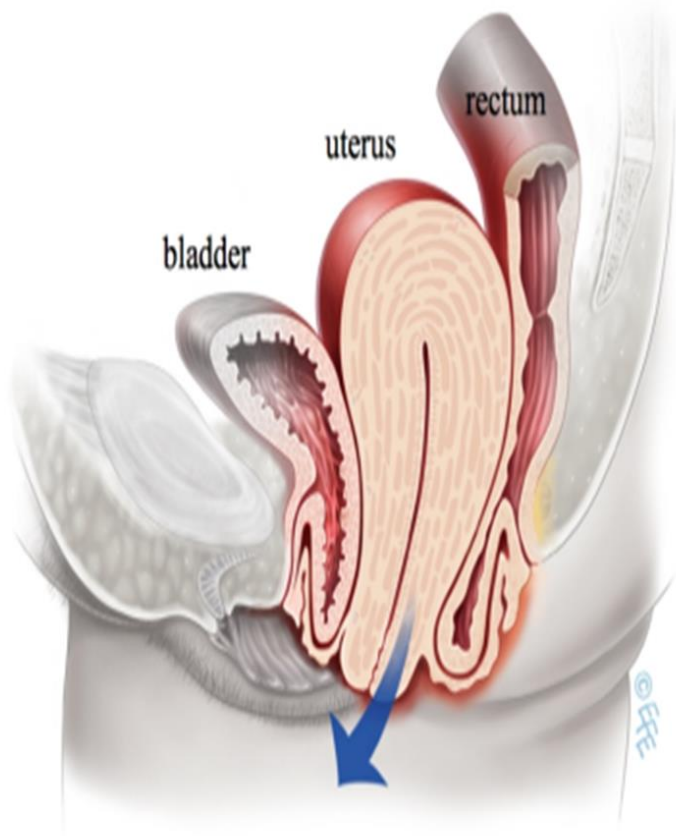
Middle compartment(genital)-----

- Vaginal vault prolapse.
- Uterine prolapse.

Posterior compartment (anorectal)---

- Rectocele.
- Enterocele.
- Rectal Intussusception.

- 95% of the women with pelvic floor dysfunction had abnormalities of all 3 compartments.

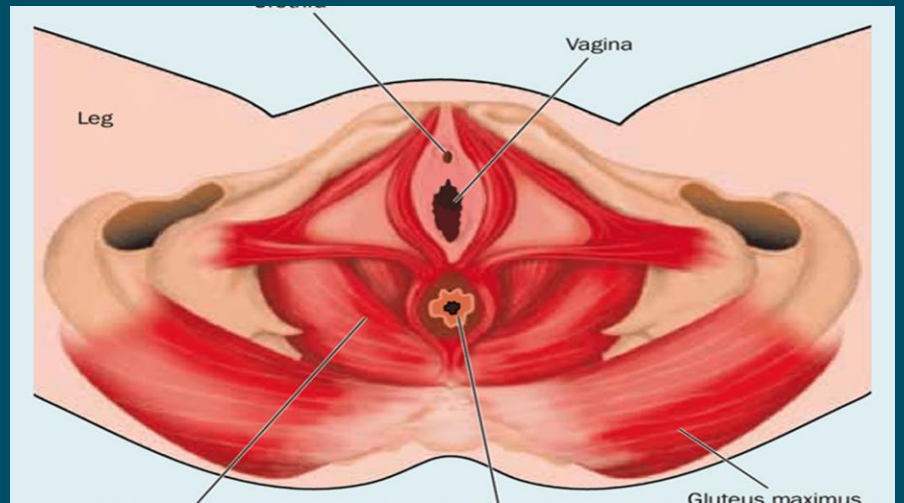


Pelvic floor disorder

- Commonly women.
  - Due to variation in size of the genital hiatus.
- More in aged person.

The exact etiology: unclear.

- Chronic stretching of the pelvic muscles leads to myopathic injury.



4 contrast study to outline—

- SI ,
- bladder
- vagina,
- Rectum.

Defecography

Radiological visualization of the act of defecation.

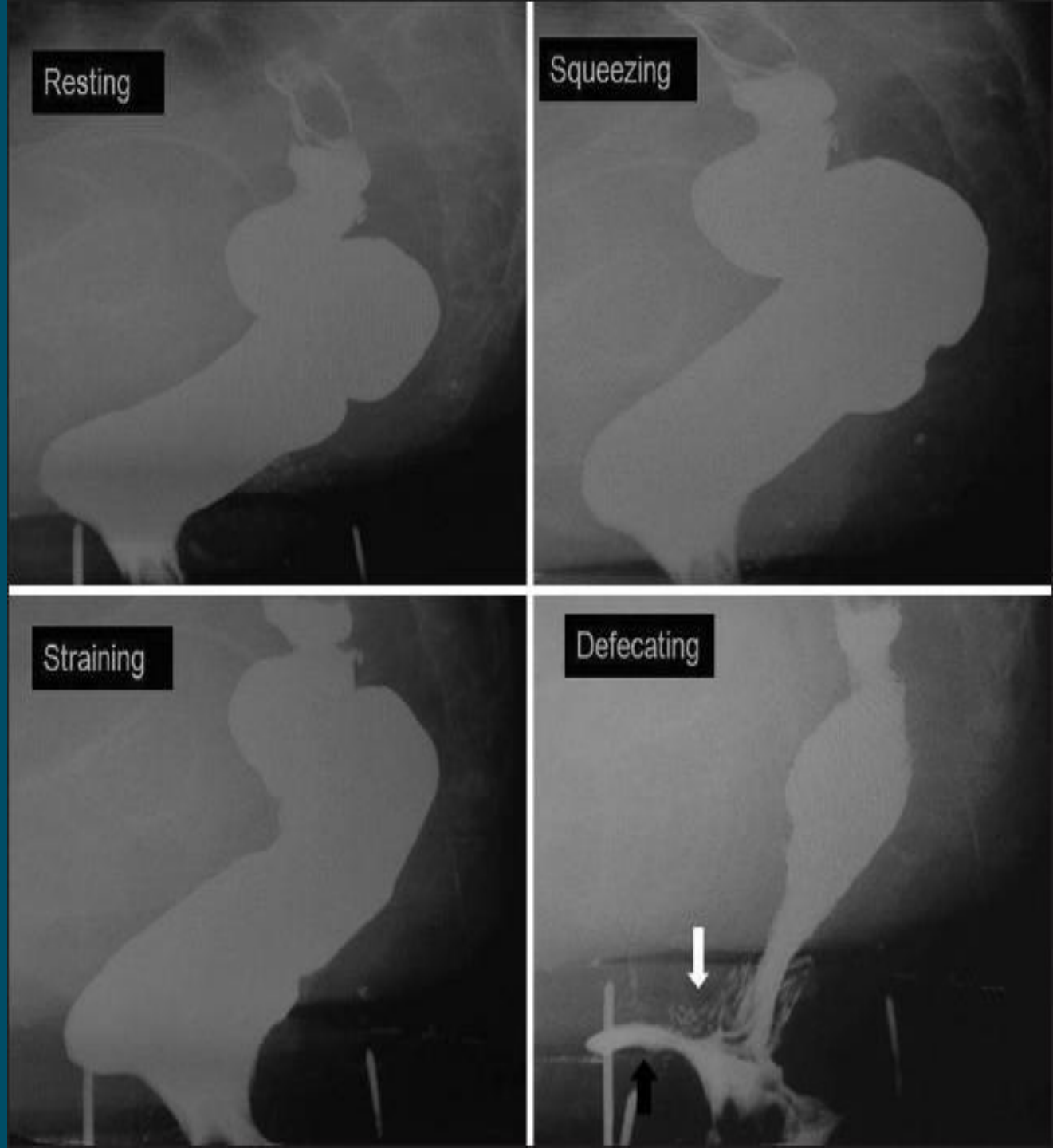
Procedure:

- Contrast is inserted into the rectum and vagina.
- Fluoroscopy is performed during defecation.

Defecography

Value in constipation–(indication)

- Paradoxical contraction of the pelvic floor-PFD
- Internal intussusception,
- Full thickness rectal prolapse,
- Rectocele, or enterocele.



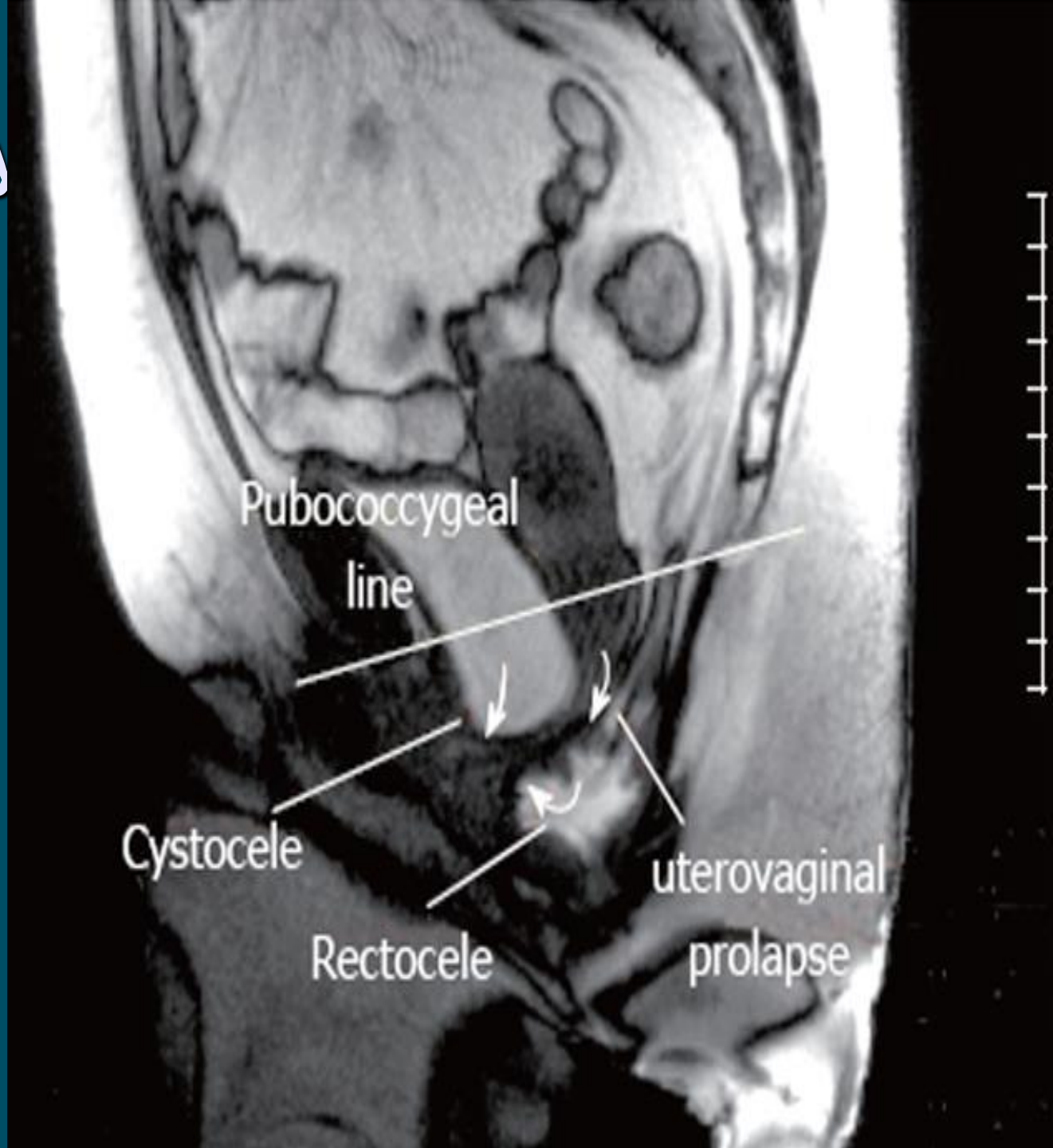
Dynamic MR defecography

Dynamic evaluation of the pelvic floor.

Contrast: (usually sonographic gel).

Types:

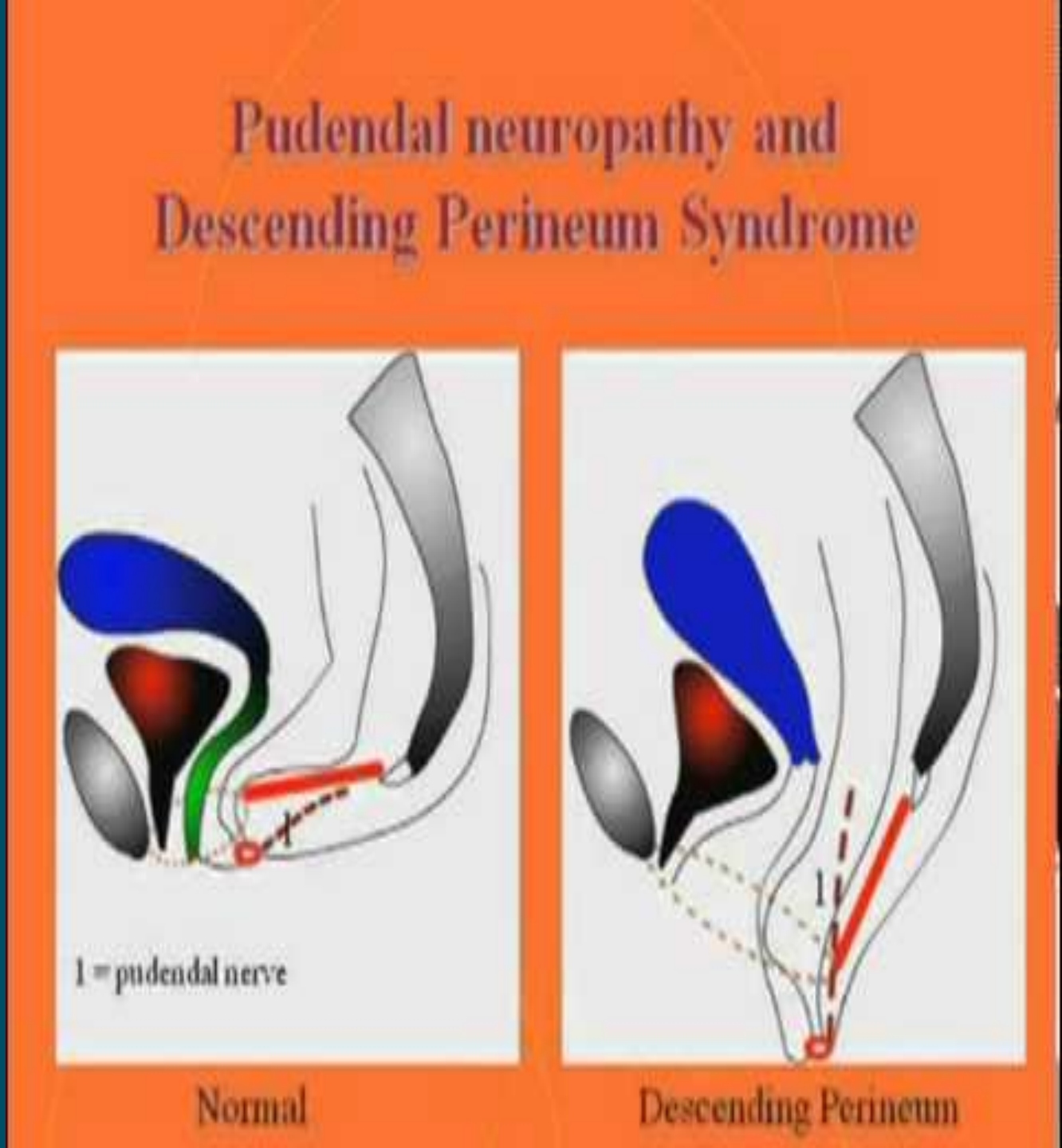
- open configuration MRI unit-
  - sitting during investigation,
  - superior
- closed-configuration units.

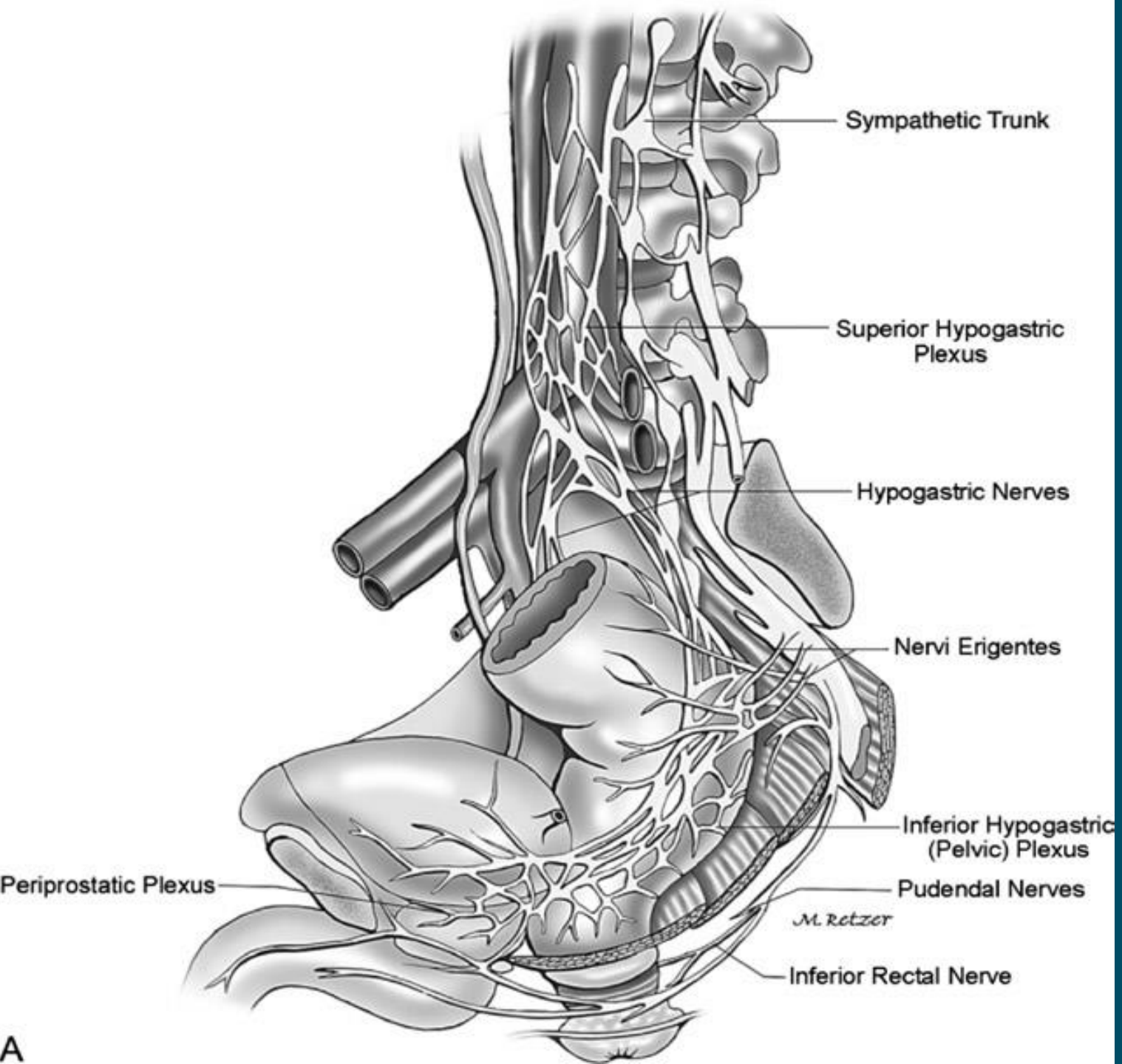


Pelvic Floor Descent/ Failure

Excessive perineal descent -

- FI,
- Severe constipation,
- SRUS,
- anterior mucosal and full-thickness rectal prolapse.
- Urinary voiding problem.





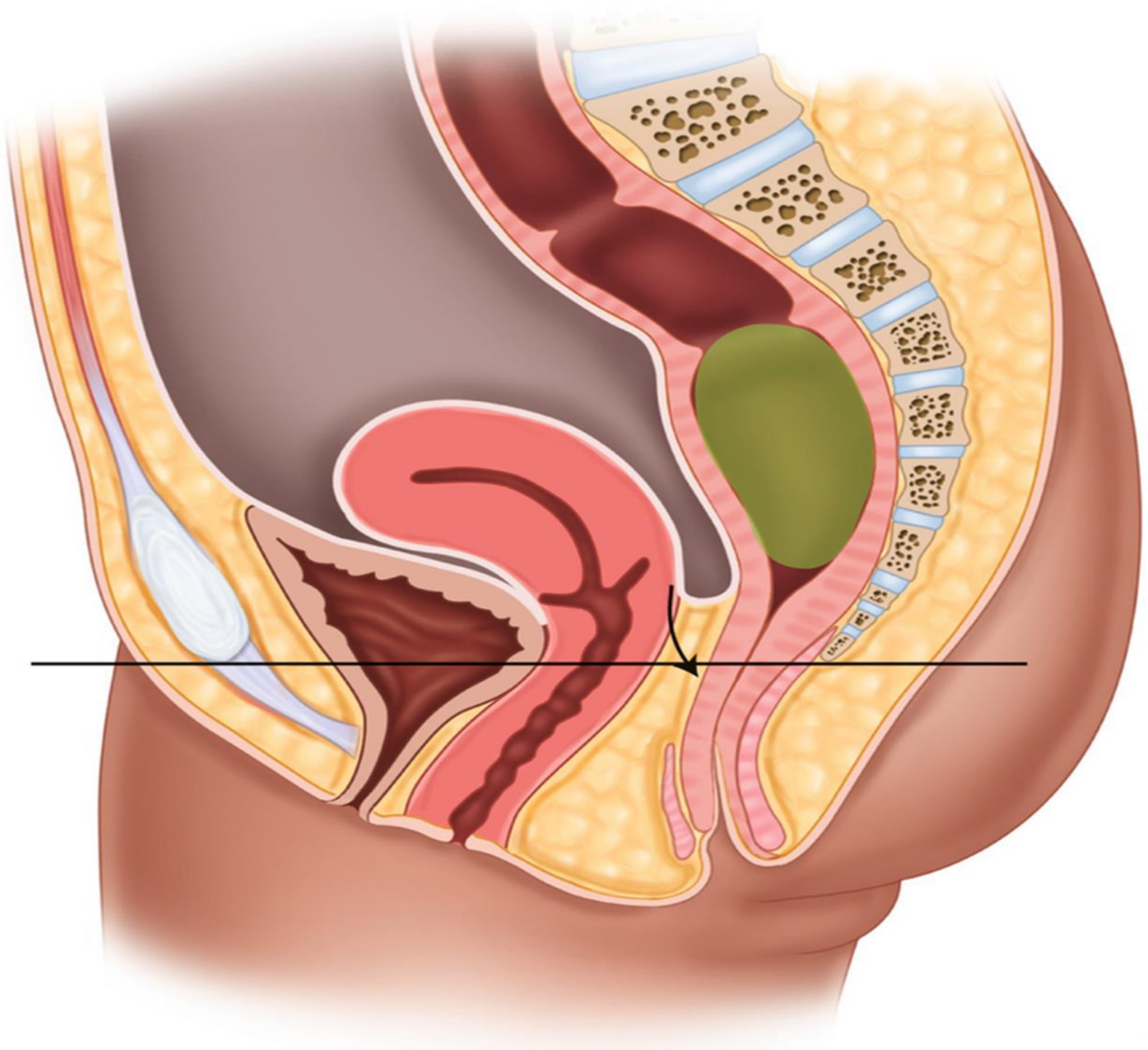
Pathophysiology:

Abnormal perineal descent, during straining, ----traction and damage to the pudendal & pelvic floor nerves----neuropathy & muscular atrophy.

- Irreversible pudendal nerve damage occurs after a stretch of 12% of its length.
- Descent of perineum of 2 cm, estimated to cause pudendal nerve stretching of 20%.

O/E-

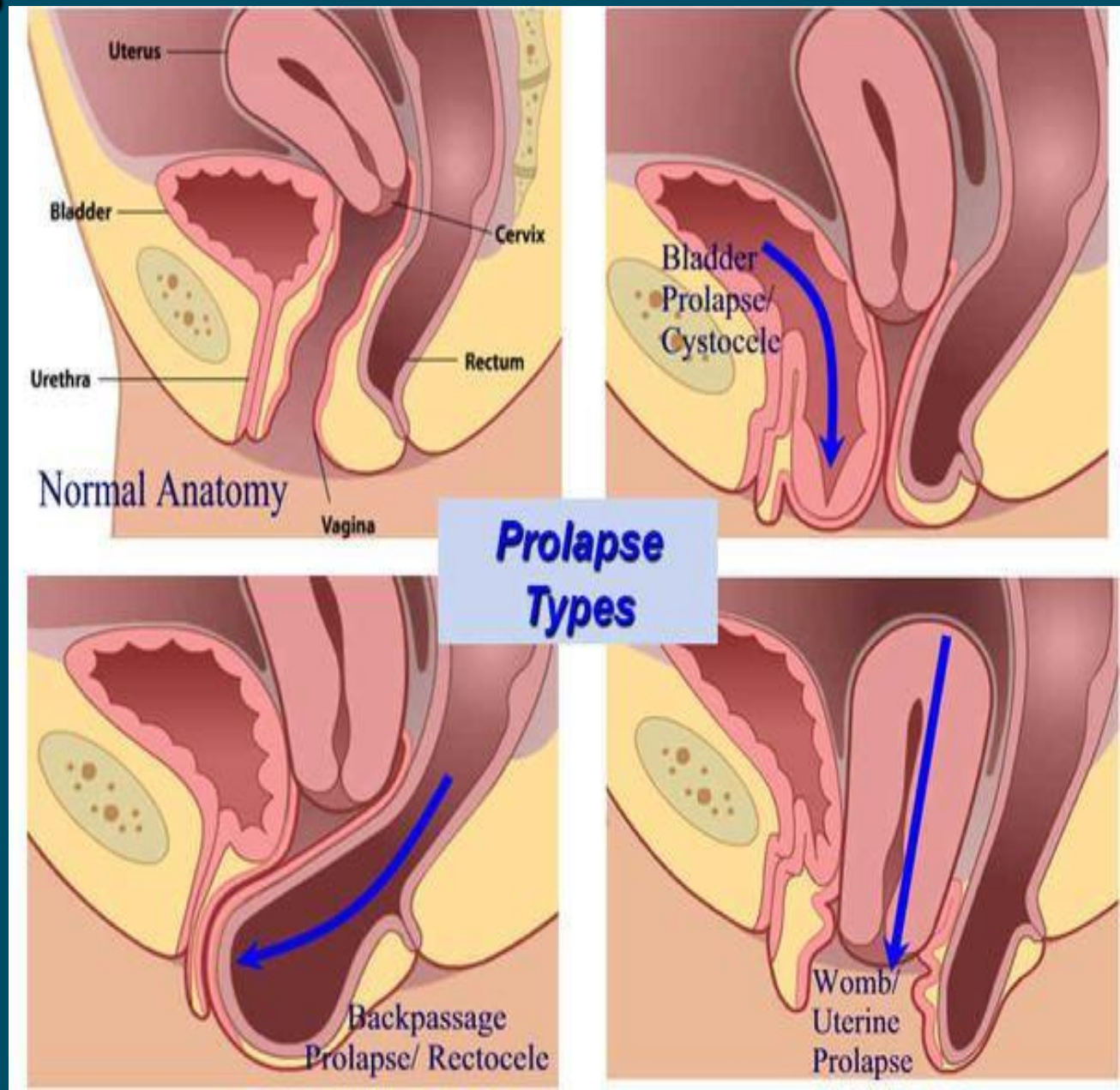
- Obliteration of perineal concavity.
- outward ballooning of perineum.
- Genital or rectal prolapse.



Diagnosis:

Precipitating factor :

- Chronic straining- 75% of subjects.
- Increased age
- Female.
- Neuropathy.
- **Chronic illness**
- **Malnutrition**
- **Internal prolapse**
- **Genitourinary & rectal prolapse.**



Investigation:

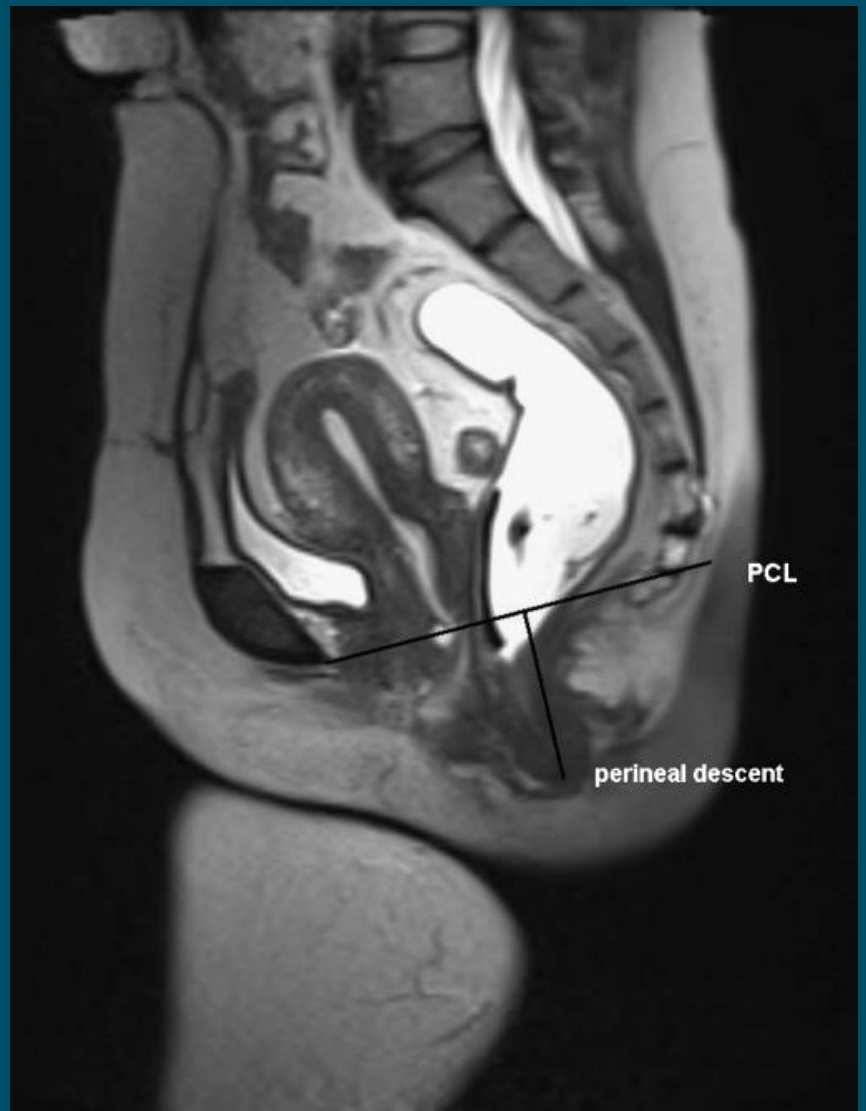
St Mark's perineometer placed on the ischial tuberosities---movable latex cylinder on the perineal skin----The distance between the level of the perineum and the ischial tuberosities is measured at rest & straining.

Interpretation:

- **Negative- plane** of the perineum is above the tuberosities.
- Positive- descent below this level.
- The plane of the perineum at rest should be −2.5±0.6 cm, descending to +0.9±1.0 cm on straining.

Dynamic proctography- The anorectal angle normally lies on a PCL & descends by 2±0.3 cm on straining.

- In DPS----descends 5-6 cm from PCL.

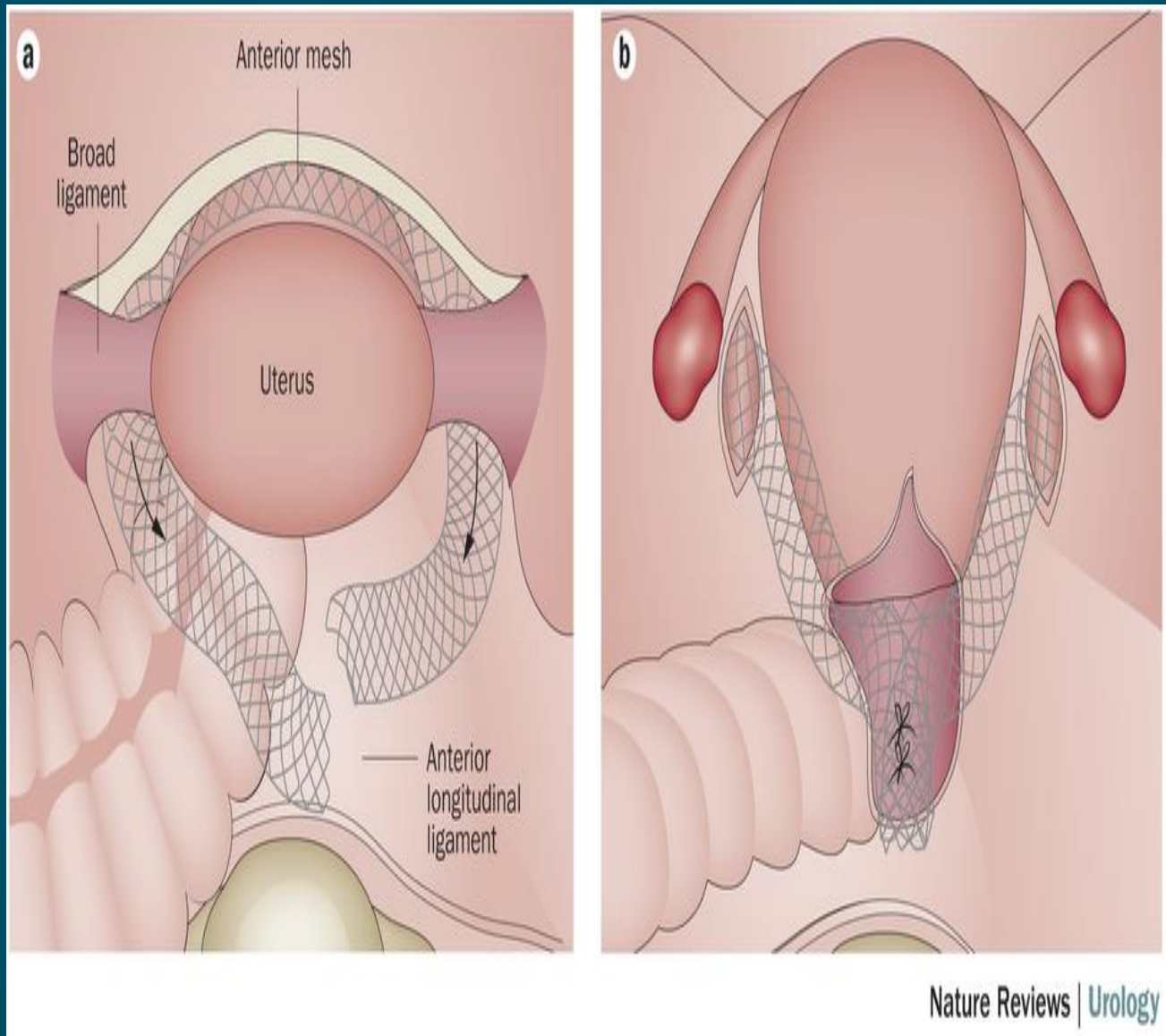


Management:

- Dietary fibre
- Laxative.
- Bowel training----avoid straining.

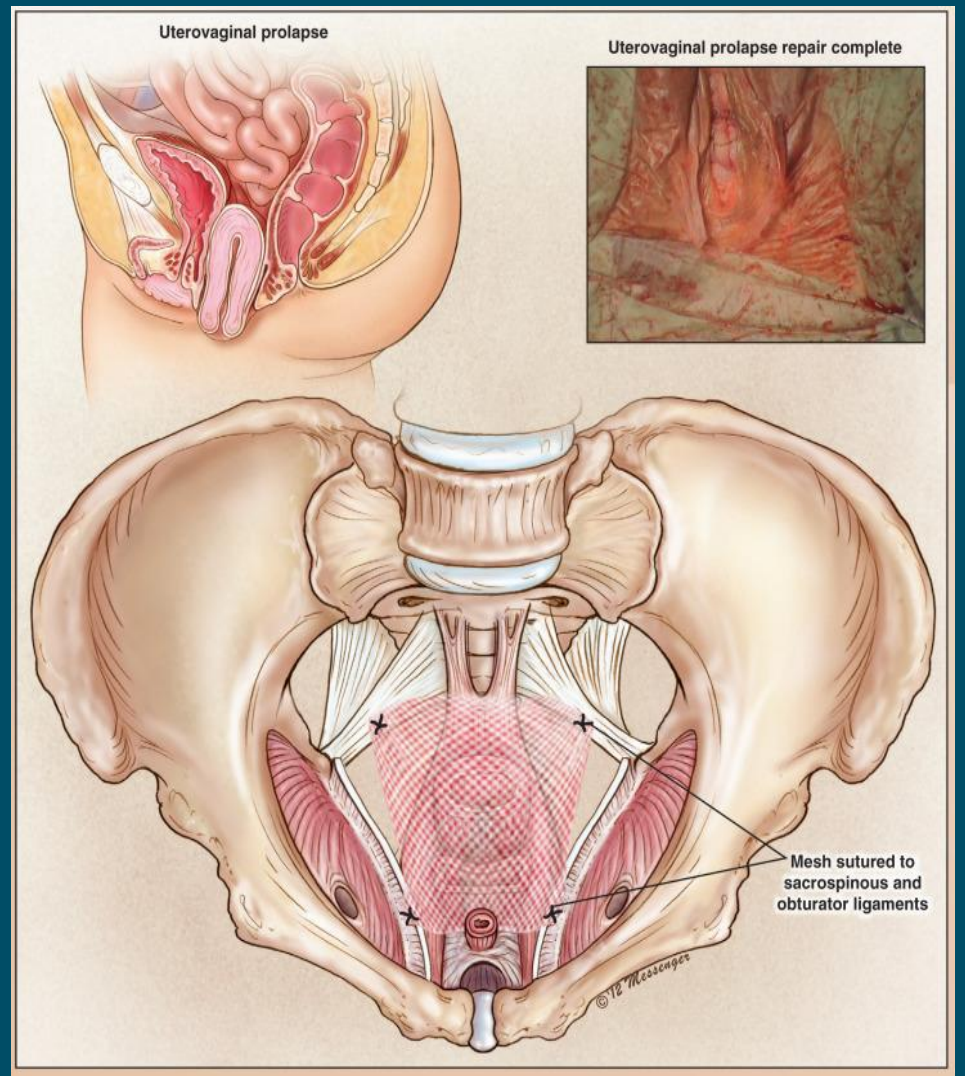
Surgery:

- Restoration of pelvic floor by
  - mesh &
  - suspension or
  - resection of rectum.
- Combined- abd. Colporectopexy with obliteration of Cul De sac.
- Combined abdominoperineal approach -colporectopexy with plication of levator & ant. Perineorrhaphy.



In pelvic floor laxity- cystocele rectocele enterocele-----

- Total pelvic Marlex mesh repair.

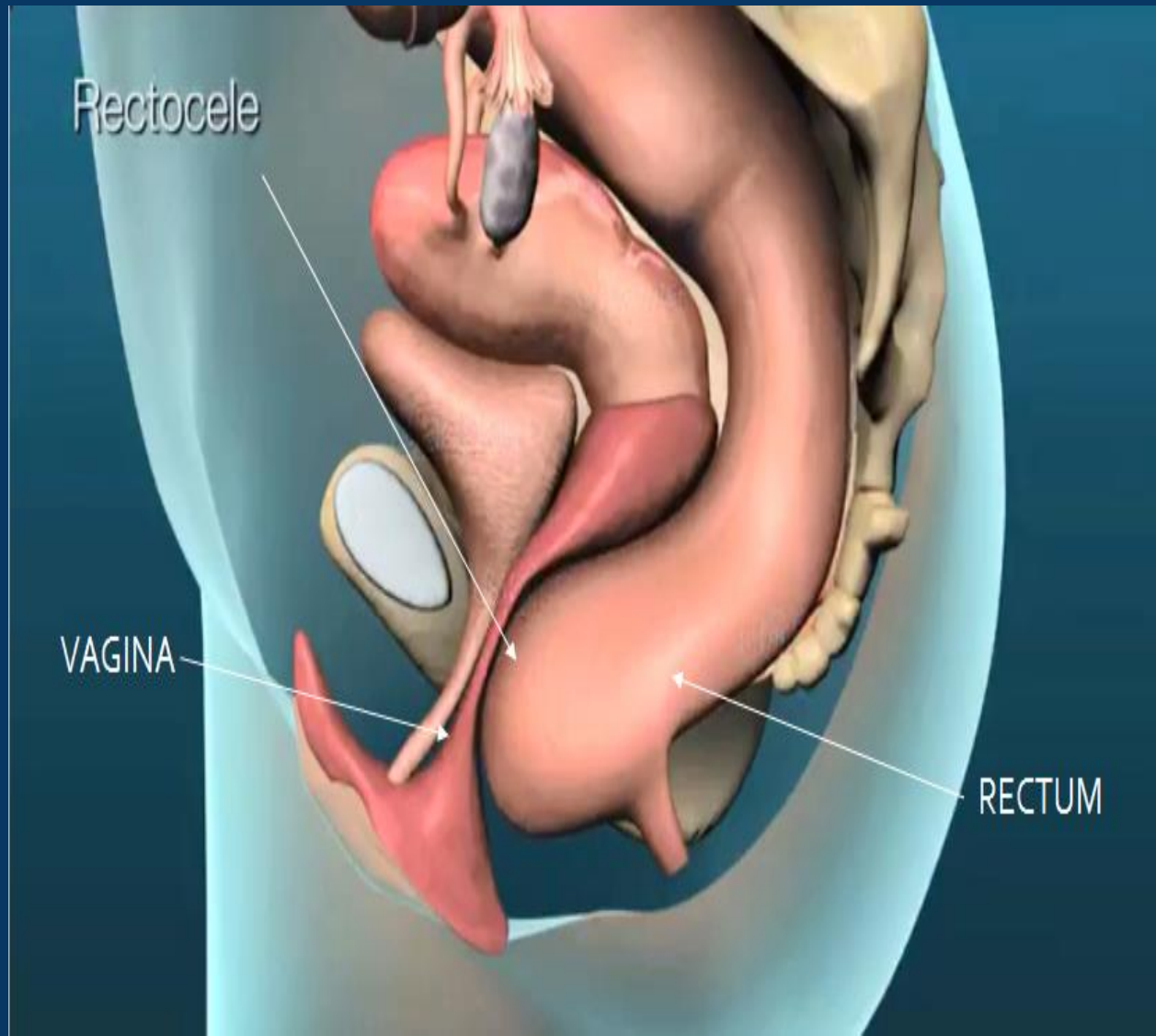


Rectocele

Herniation of the anterior rectal wall into the lumen of the vagina.

Pathogenesis:

- Chronic straining on a weakened rectovaginal septum both by-
  - obstetric trauma and
  - Progressive pelvic floor deficiency, as part of the aging process.



4th or 5th decade of life.

- 5 most common presenting symptoms---
  - excessive straining,
  - incomplete evacuation,
  - manual assistance required,
  - sense of fullness,
  - Bowel movement <3/week.

Diagnosis:

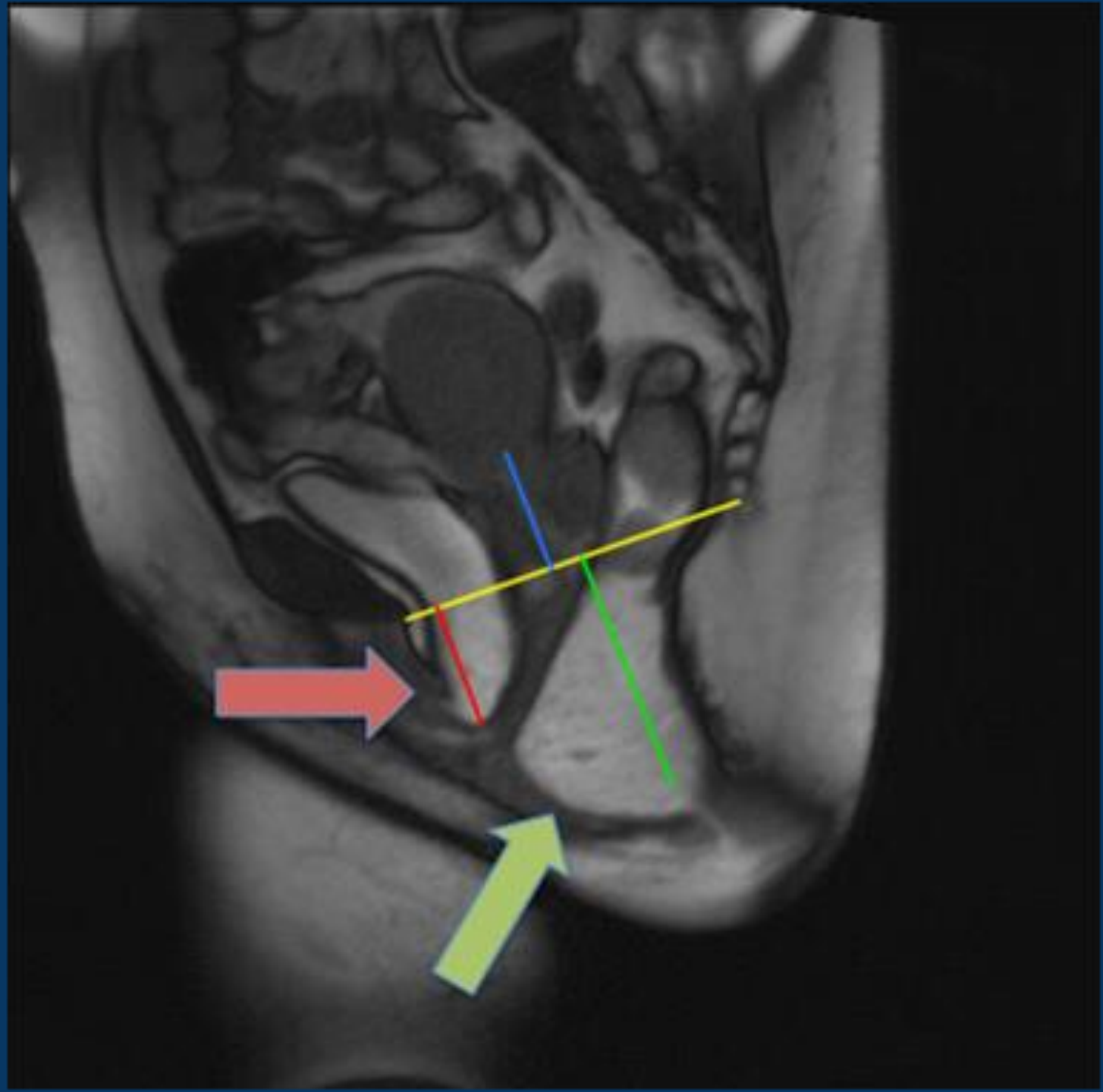
- Adequate history.

- A hooked finger -
  - pocket-like defect.

Diagnosis:

Defecography –

- Conventional.
- Dynamic.
  - <2 cm- insignificant.
  - >3 cm in depth- abnormal.



Defecography

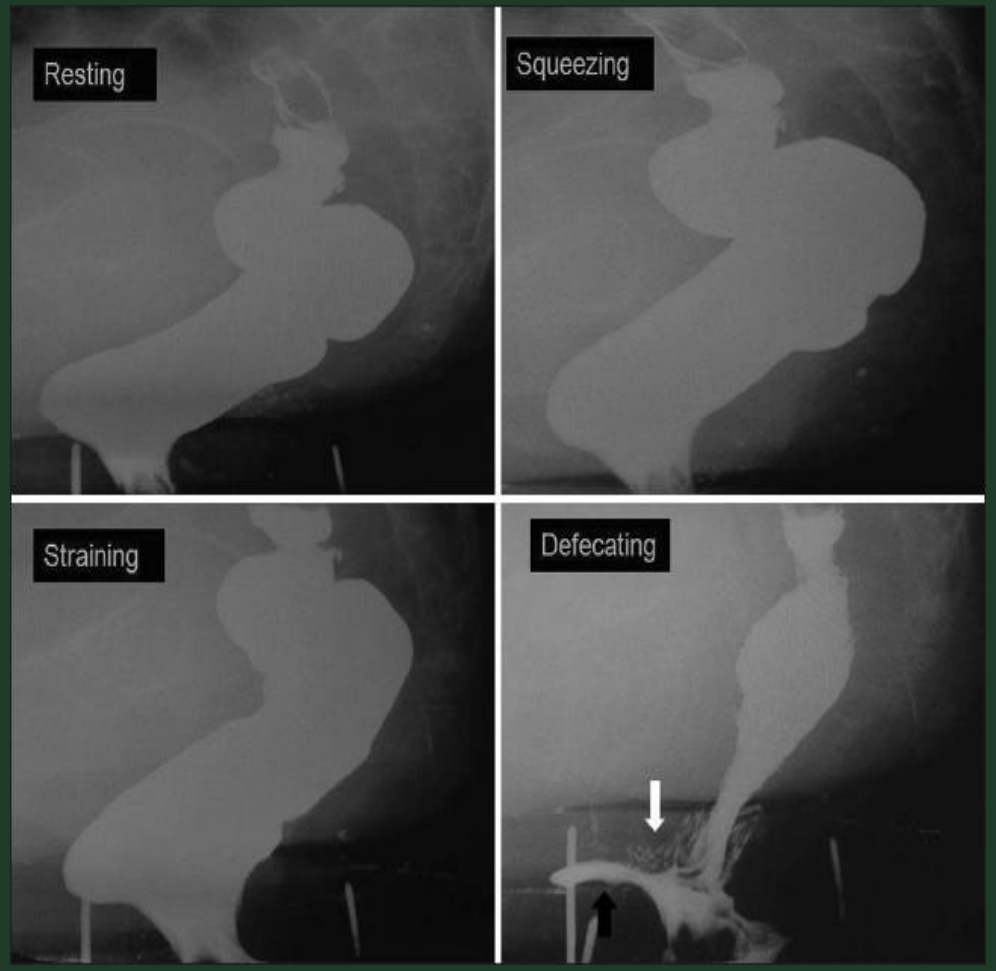
Radiological visualization of the act of defecation.

Provides a picture –

- Successive phases of defecation.
- Dynamic impression of pelvic floor.
- Changes in the rectal configuration and the anorectal angle.
- degree of evacuation.

Value in FI–-

- Demonstrate presence of incomplete evacuation---overflow incontinence.



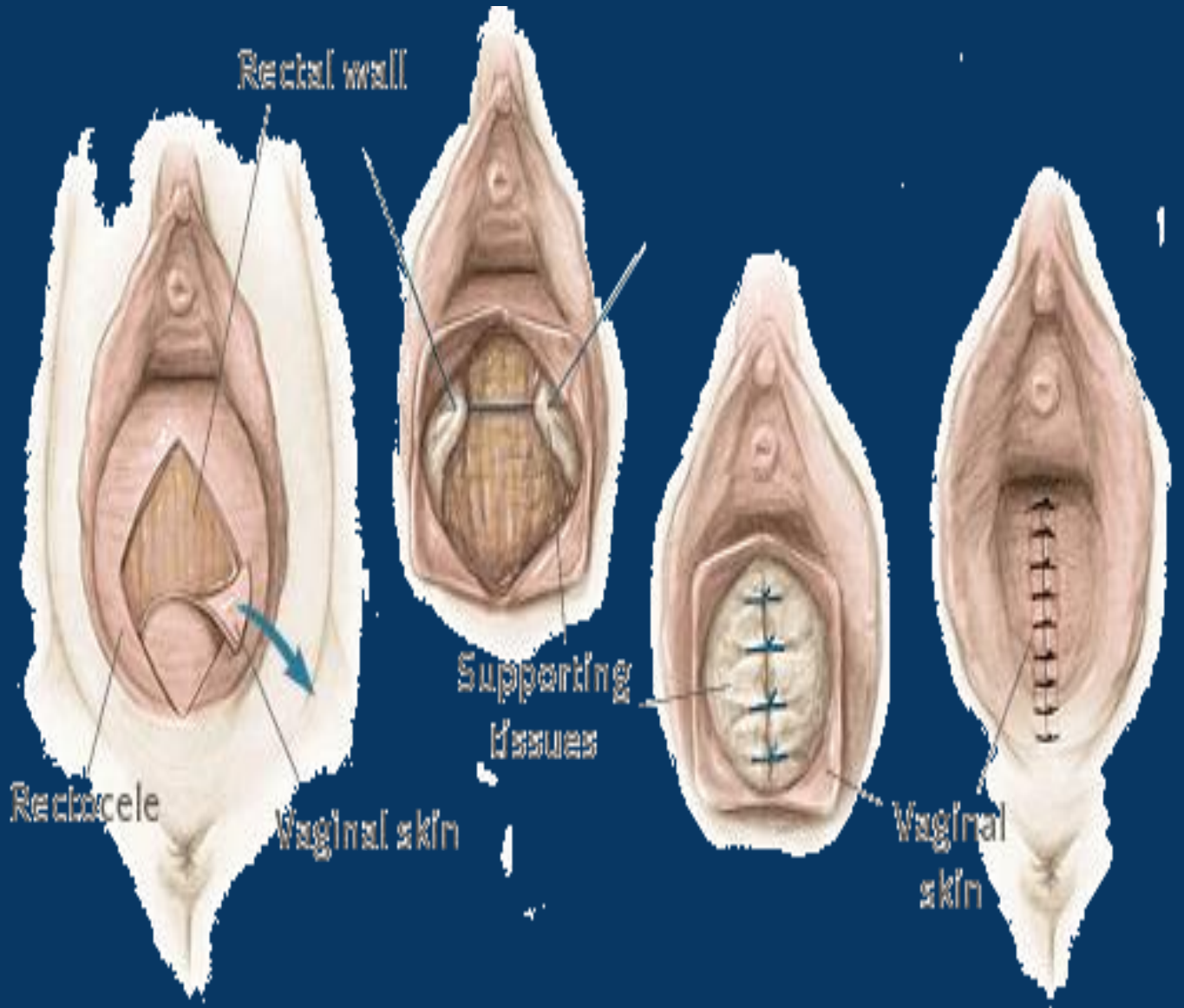
Rectocele

Treatment-

- Conservative-
- Surgical-

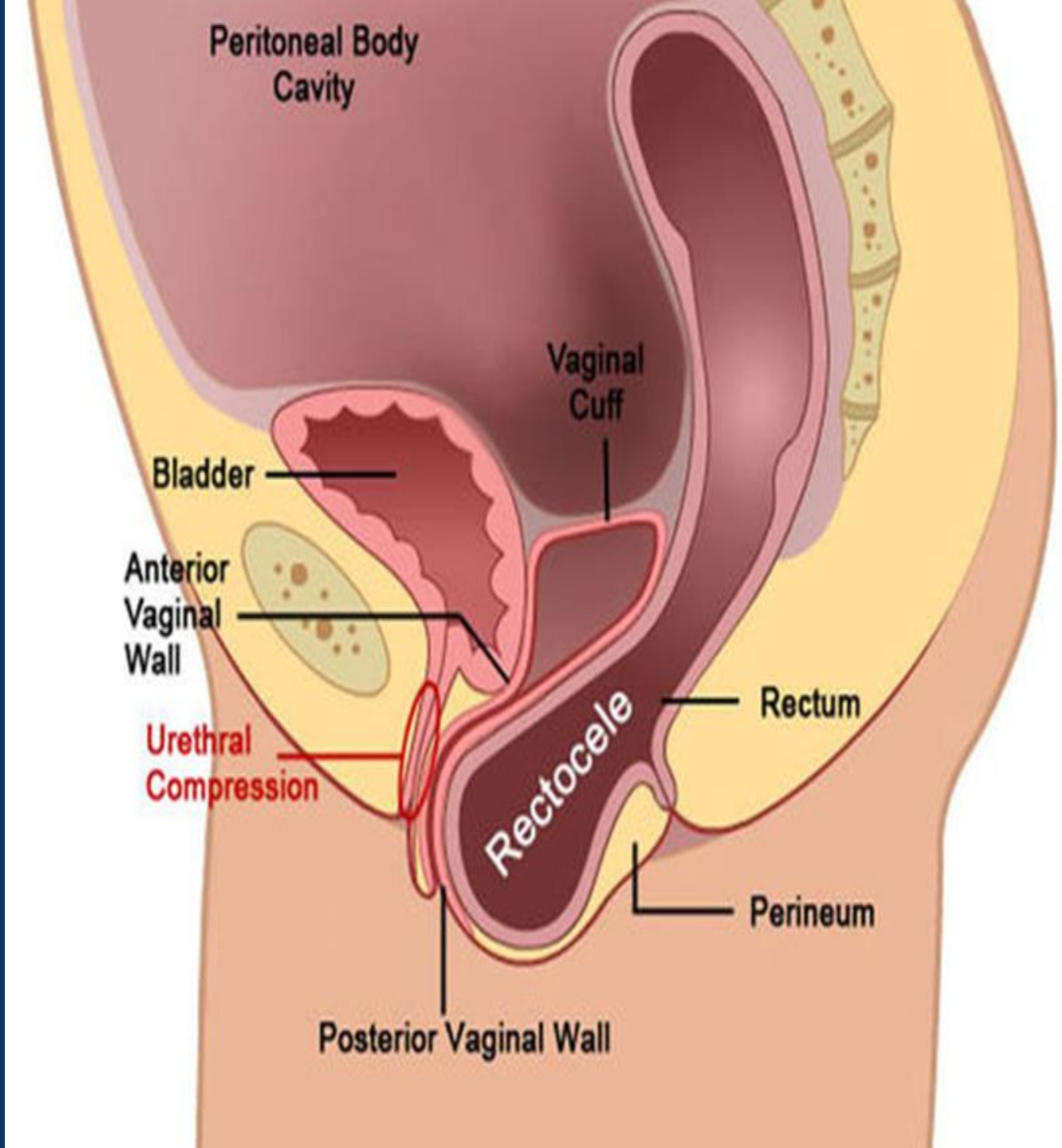
  - Transvaginal,
  - Transanal
  - Transperineal
  - Abdominal.

Till now it is not known which treatment is the most optimal one.



Poor Prognosis:

- Previous hysterectomy,
- Large rectocele on defecography,
- Preoperative use of enemas and laxatives related to a poor outcome.



Supports of bladder

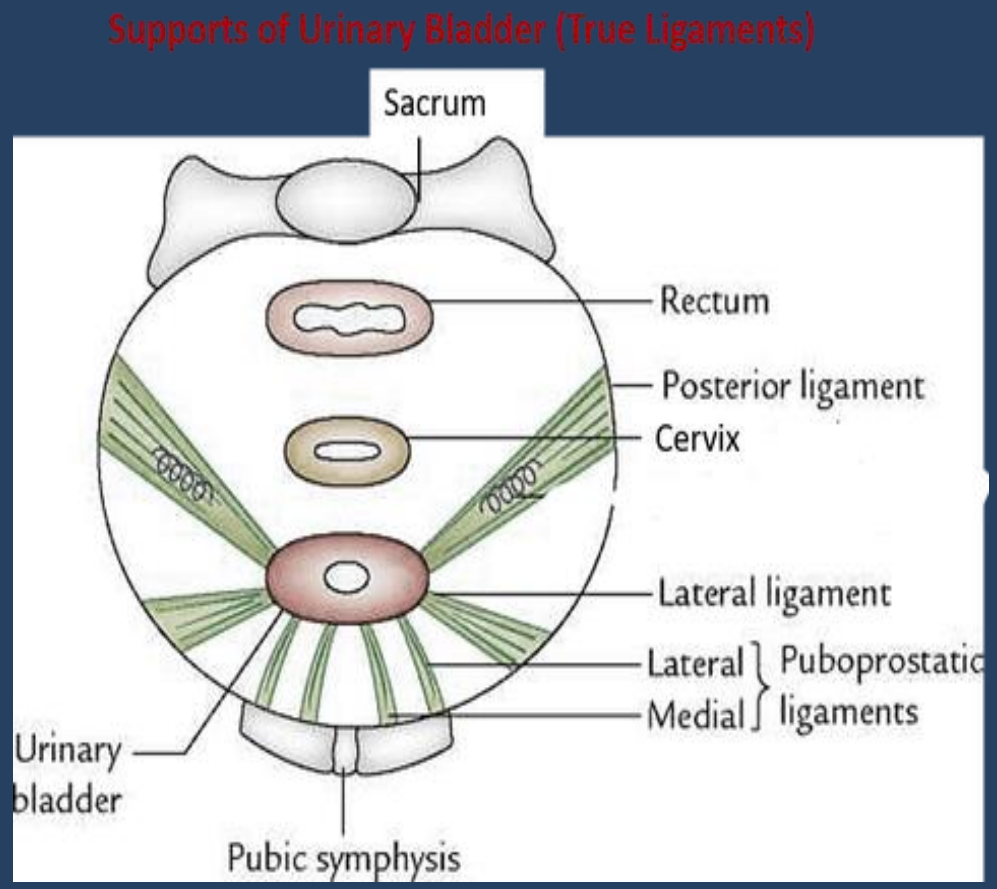
True ligaments- thickened pelvic fascia.

Lateral true ligament- side of the bladder to lateral pelvic ligament.

Posterior true ligament- lateral border of the base of the bladder to lateral wall.

Medial & lateral puboprostatic ligaments- body of the pubis to prostate. (pubovesical to prostate).

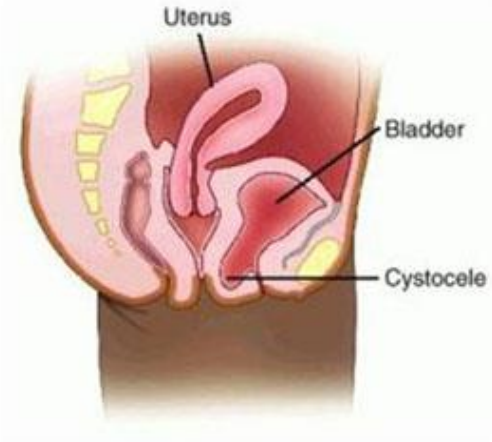
Median umbilical ligament.

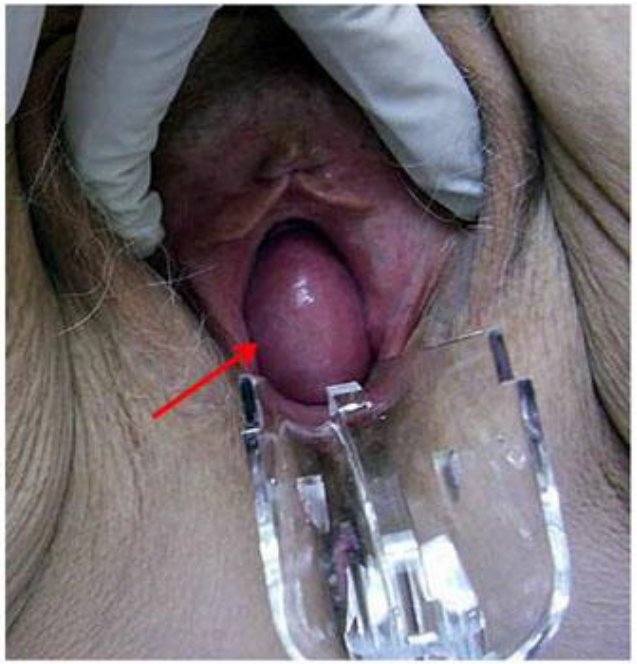


Cystocele

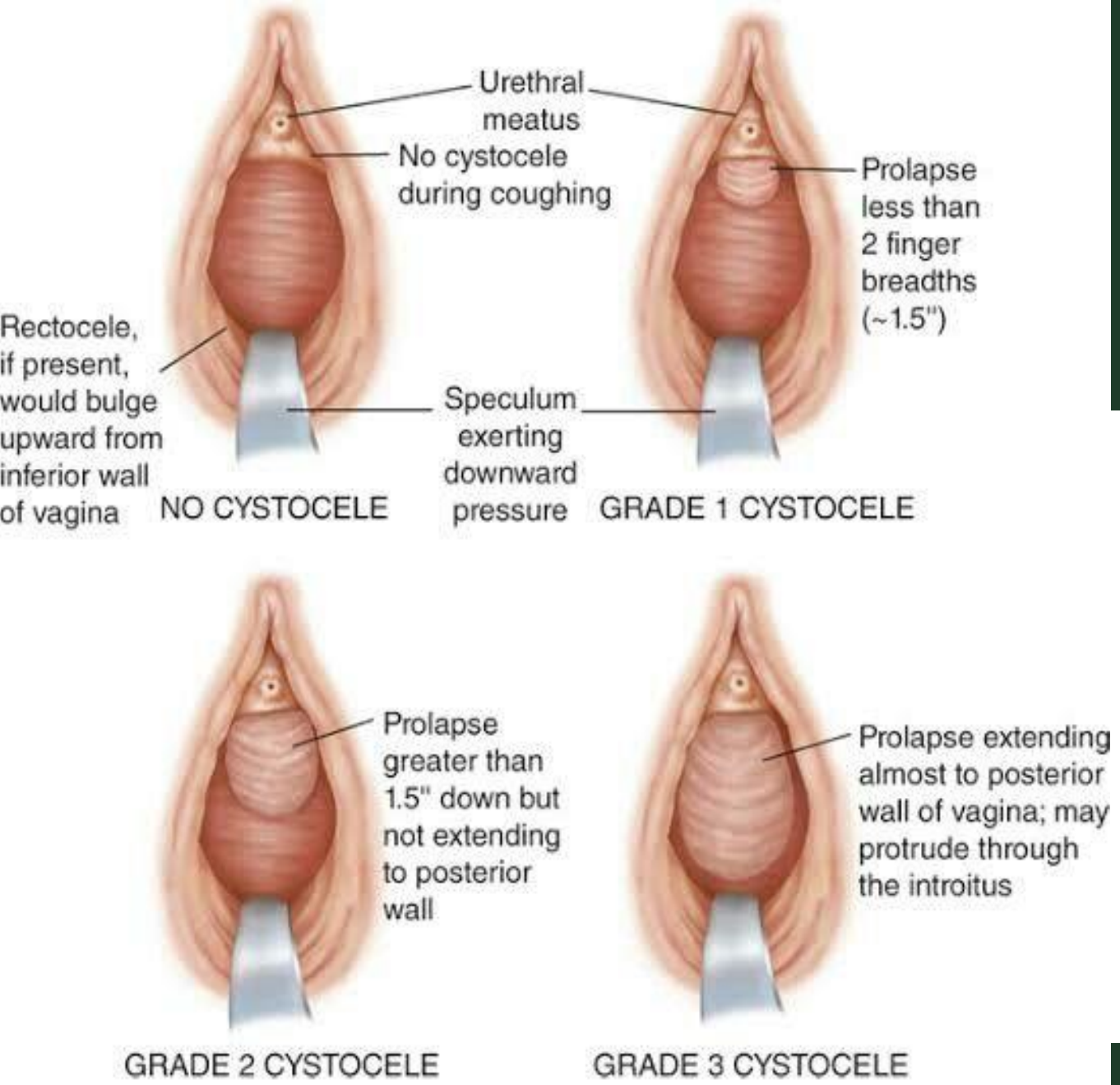
Aetiology-

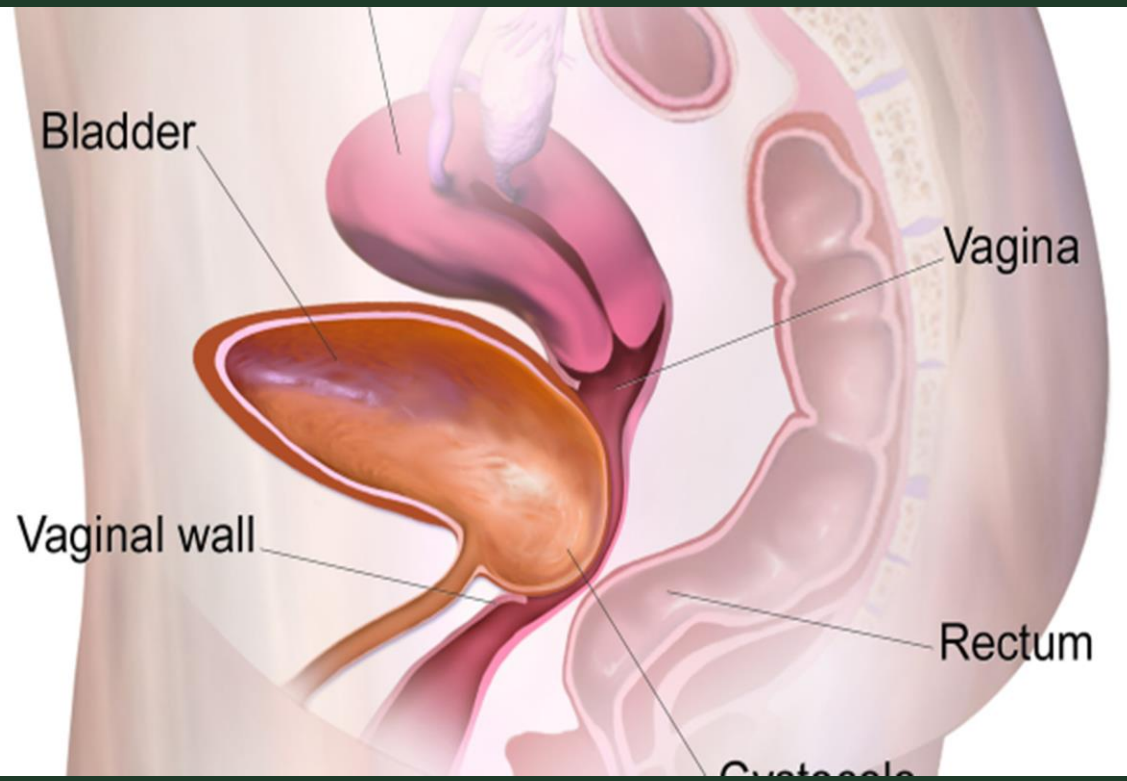
- Obstetric trauma.
- Appears later when genital atrophy.
- Aging.
- Congenital defects.
- After hysterectomy.





Vaginal exam revealing protrusion of a cystocele (arrow)



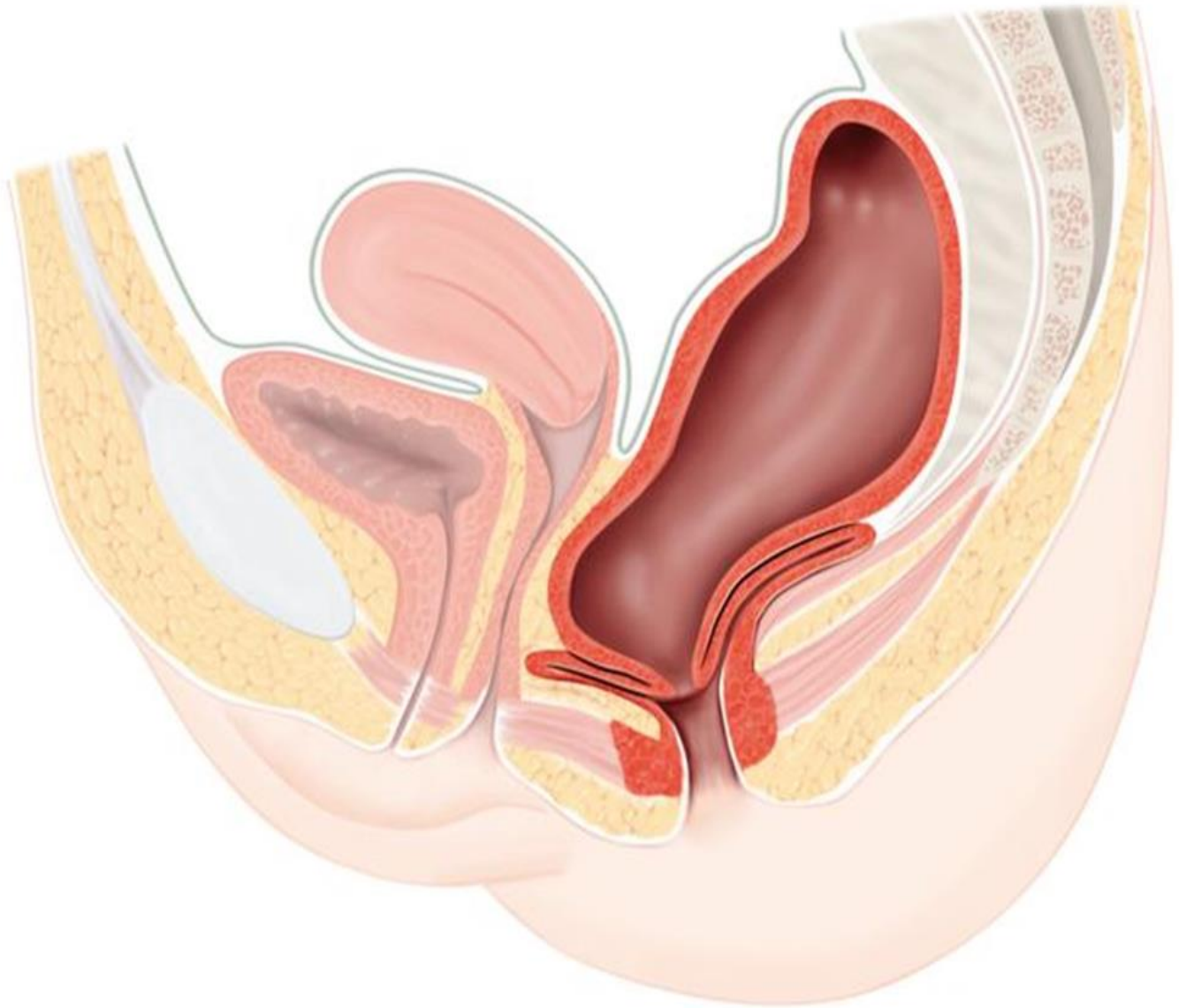


Many theories-

- Sliding hernia through a defect within the pelvic fascia.
- Other suggests- an intussusception of the rectum.

More in women—

- Childbirth.
- prolonged straining at stool,
- Anatomical- wider pelvis.



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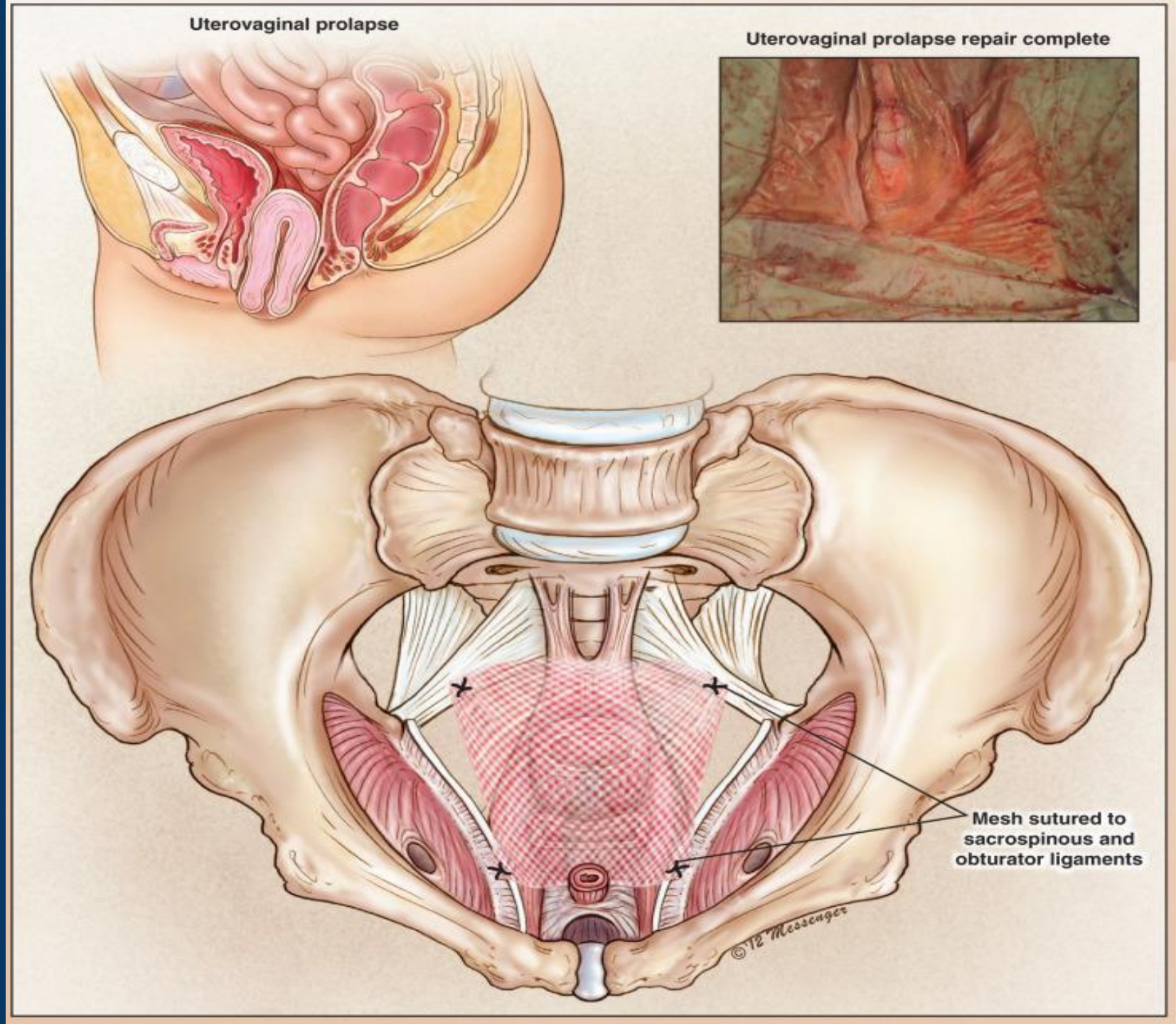

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