# LATEST 2024 MARROW NEET-SS NOTES

# UPDATED OBSGYNE RESIDENCY NOTES

# UROGYNAECOLOGY

# SURGICAL ANATOMY : BONY PELVIS, PELVIC FLOOR & PELVIC ORGANS

**Importance of pelvis and pelvic floor anatomy :**

- Symptoms of lower urinary tract pathology and gynaecological conditions are often overlapping and confusing.
- Coexistant urinary issues in female patients with vaginitis and recurrent urinary tract infections.
- Coexistant pelvic organ prolapse contributing to female urinary issues and voiding dysfunction.
- Pelvic floor dysfunction can be a cause as well as result of a pelvic organ condition and can lead to secondary sexual issues :
- Endometriosis of urinary bladder, untreated pelvic inflammatory disease can cause lower urinary tract symptoms (LUTS).
- Bladder pain syndrome/interstitial cystitis can cause pelvic floor spasms leading to painful intercourse (Dyspareunia and secondary vaginismus).
- Fecal and urinary incontinence often coexist and may have underlying neurogenic causes and may cause failure of surgery if not evaluated correctly.

## Bony pelvis

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**Structure :**

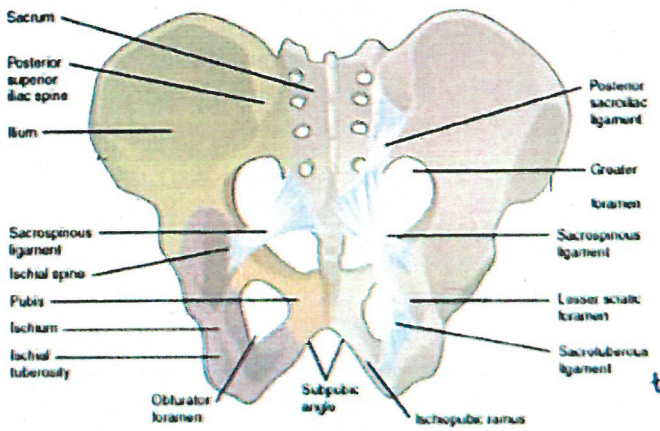
2 hip bones :

- Ilium.
- Ischium
- Pubis.

1 sacrum.

1 coccyx.

4 bones held at 4 joints maintain balance and stability.



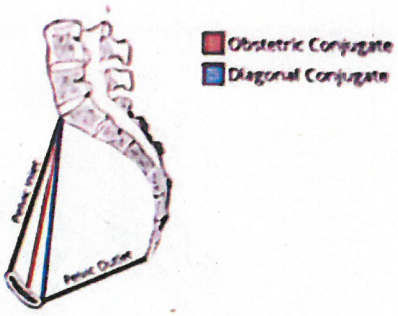

Bony pelvis.

**Joints :**

- 2 Sacroiliac joints.
- 1 Pubic symphysis.
- 1 Sacrococcygeal joint.

Axis inclination of inlet & outlet :

- Helps to maintain abdominal and pelvic organs in place.
- Maintained by spinous ligaments.
- Importance : Baby descends down during labor and head of baby undergoes internal rotation to exit through the outlet.



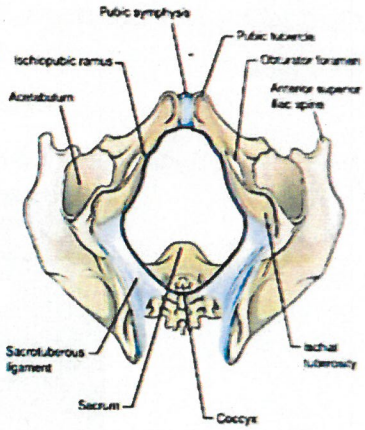

Axis of inclination.

Basal tone of pelvic floor :

Along with coordination of core muscles with respiration in standing and gravity dependant positions prevents organs to fall out of pelvis.

Outlet of pelvis :

- marked by lower border of pubic symphysis in front, coccyx behind, and laterally by sacrotuberous ligament.
- Diamond shaped.



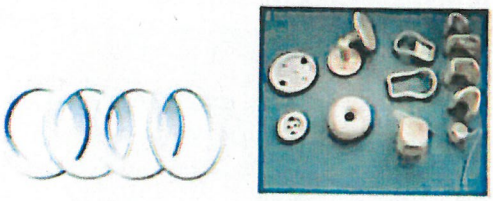

Pelvic outlet.

Importance :

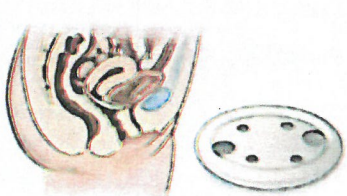
Urogynaecological procedures.

use of ring pessary for prolapse :

- In patients not fit for surgery.
- Sizes : 1.5 inches to 4 inches.
- Size is based on severity of prolapse and size of pelvic outlet.
- Silicon rings, easily mouldable.
- Holds entire pelvic organ within pelvis.
- Inserted at the level of pubic symphysis and posteriorly bony pelvis bay in the posterior fornix.

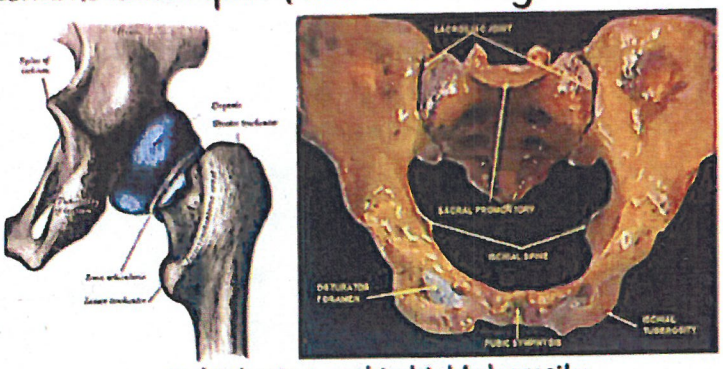


Pessaries.




Ring pessary with support

## Surgical landmarks ischial spine & ischial tuberosity :



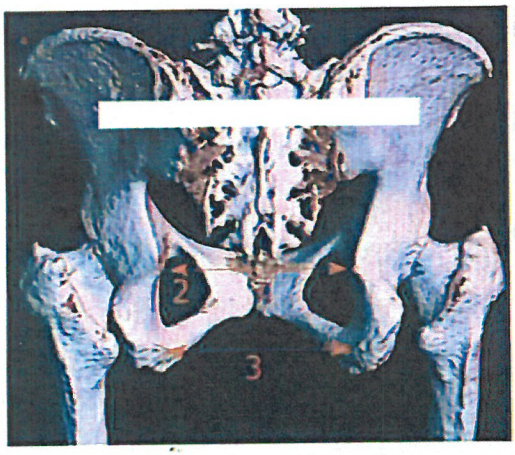

Ischial spine and ischial tuberosity.

Ischial spine : Gives rise to sacrospinous ligament.

Ischial tuberosity : Gives rise to sacrotuberous ligament.

Surgical importance : mark the boundaries of greater and lesser sciatic foramen.

Interspinous & intertuberous diameters : Dimensions of pelvic outlet.

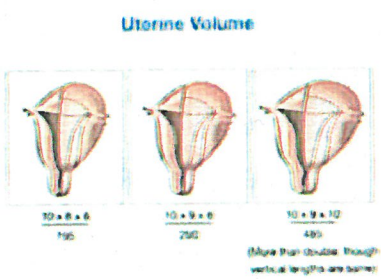



2 : Interspinous diameter.

3 : Intertuberous diameter.

Feasibilty of Non Descent Vaginal Hysterectomy (NDVH) :

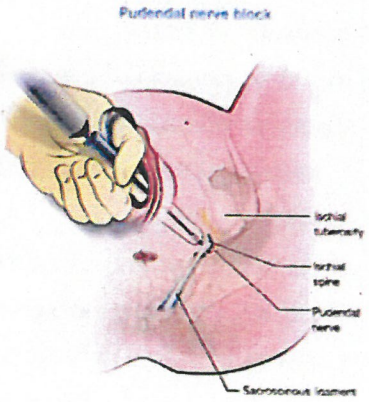
- Can be assessed by interspinous and intertuberous space.
- Availabilty of vaginal space.




Availability of vaginal space.

Urogynaecological significance of ischial spine :

- Shortest pelvic diameter : Helps to assess whether uterus can be delivered via vaginal route in NDVH.
- Attachment of sacrospinous ligament : Sacrospinous fixation suture.
- Landmark between greater sciatic notch & lesser sciatic notch.
- Level of external os of uterine cervix.
- Level of ureter crossing below uterine artery.
- Attachment of levator ani muscle.
- Ring pessary for prolapse should stay at this level for accurate support.
- Level of pudendal block/pudendal nerve (S2,3,4) landmark.
- Axis of inlet to outlet changes at this level (Obstetrical significance).

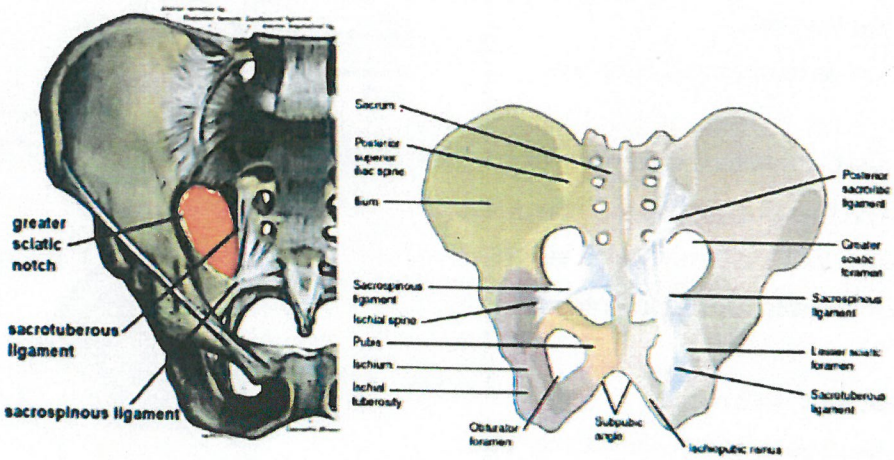



## Ligaments of pelvis :

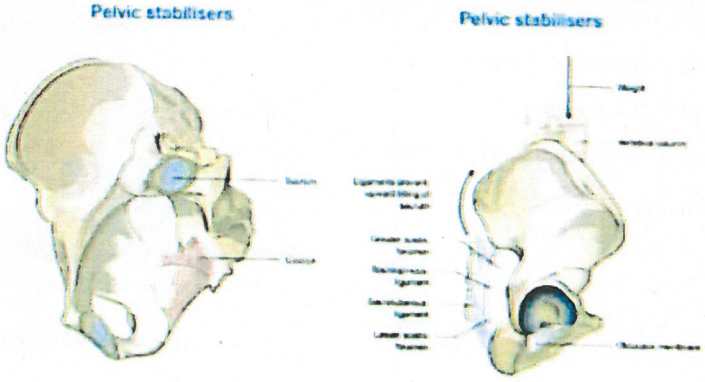
Sacrospinous ligament & sacrotuberous ligament.

Tough ligaments : Pelvic stablisers.

mark the boundaries of greater & lesser sciatic foramen.




Sacrotuberous and sacrospinous ligaments.



**Sciatic foramina :**

Exit gate of true pelvis.

Greater sciatic foramen :

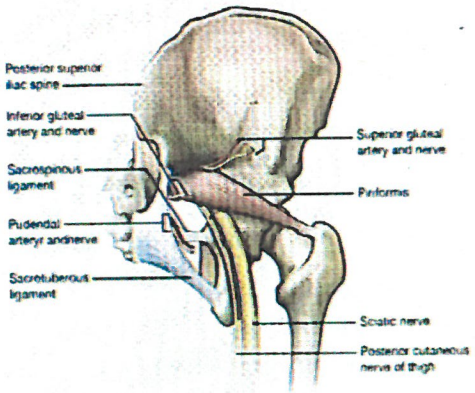
Piriformis muscle : From transverse process and spine and attaches to greater trochanter of femur.

Structures passing above piriformis : Superior gluteal nerves and vessels.

Structures passing below piriformis :

- Inferior gluteal nerves and vessels.
- Sciatic nerve.
- Pudendal nerve and internal pudendal vessels : Exit from greater sciatic foramen, hook around ischial spine and re-enters lesser sciatic foramen.
- Nerve to obturator internus : Exit from greater sciatic foramen and re-enters lesser sciatic foramen.
- Nerve to quadratus femoris.
- Posterior cutaneous nerve of thigh.

Structures passing through greater and lesser sciatic foramens




Lesser sciatic foramen :

- Pudendal nerve and internal pudendal vessels.
- Nerve to obturator internus.

Surgical importance : During sacrospinous fixation for vault prolapse, stitches are avoided in the neurovascular bundle within sacrospinous ligament.

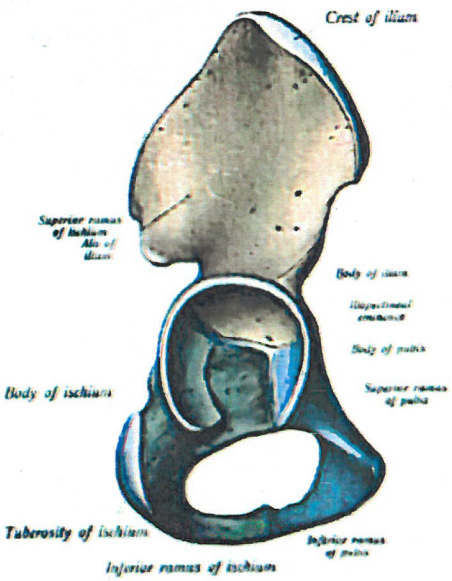
**Obturator foramen :**

Bounded by superior and inferior pubic rami, ischiopubic ramus.

Covered by obturator membrane, obturator externus and obturator internus.

Surgical importance :

In midurethral sling surgeries, obturator membrane is perforated.

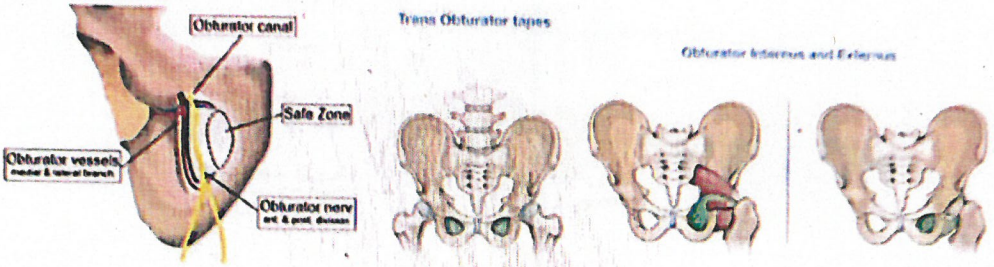



Obturator foramen

Midurethral slings :

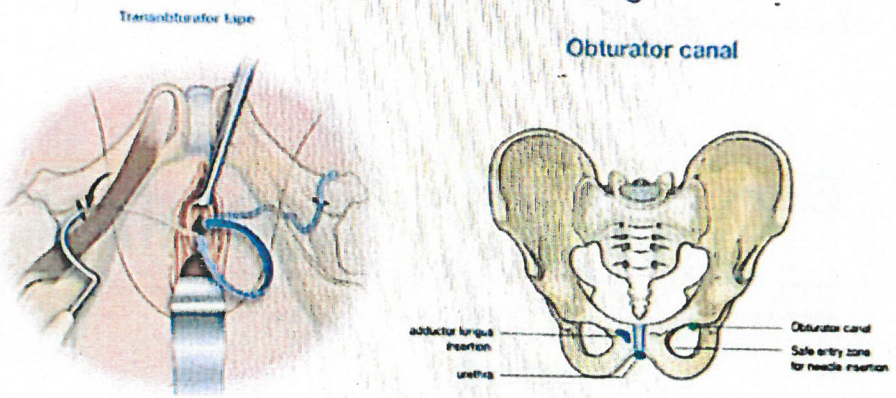
Trans obturator tapes (Synthetic tapes) along with implant placing devices (Transobturator/retropubic needles).

Act as a sling below urethra.




Safe zone of obturator membrane :

- Obturator vessels run in the obturator canal laterally in obturator foramen.
- Avoid unstoppable bleeding, nerve injuries.
- Needle should be kept medially to avoid lateral injury.




## Pelvic floor

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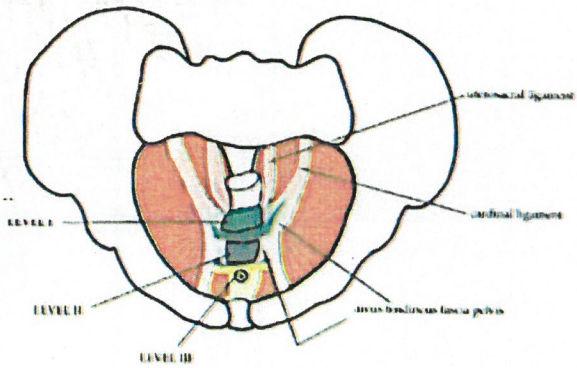
Levator ani muscle :

Skeletal muscle.

3 parts :

- Pubococcygeus.
- Iliococcygeus.
- Ischiococcygeus.

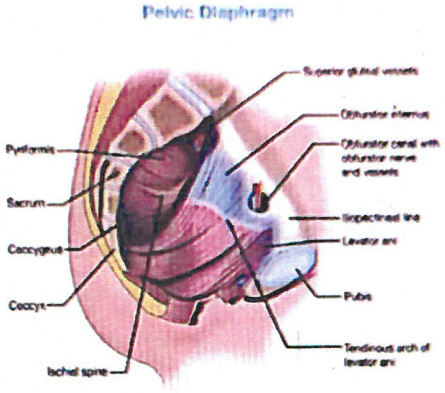
Fan shaped muscle holding entire pelvic organs in place.




Levator ani

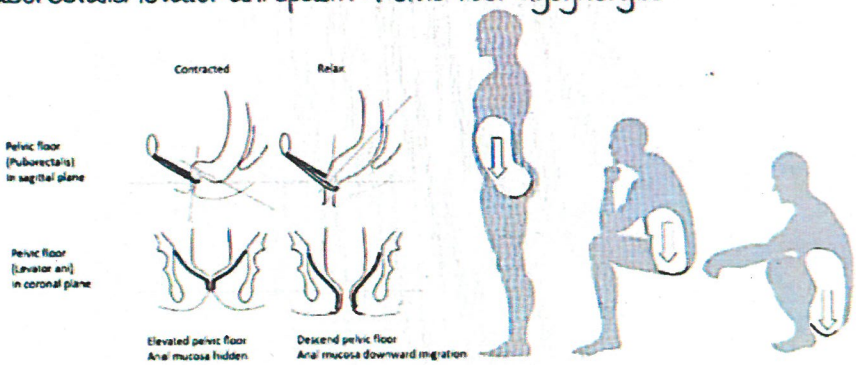
Arcus tendineous fasciae pelvis :

- White line.
- Attachment of levator ani lies over obturator membrane above obturator internus.



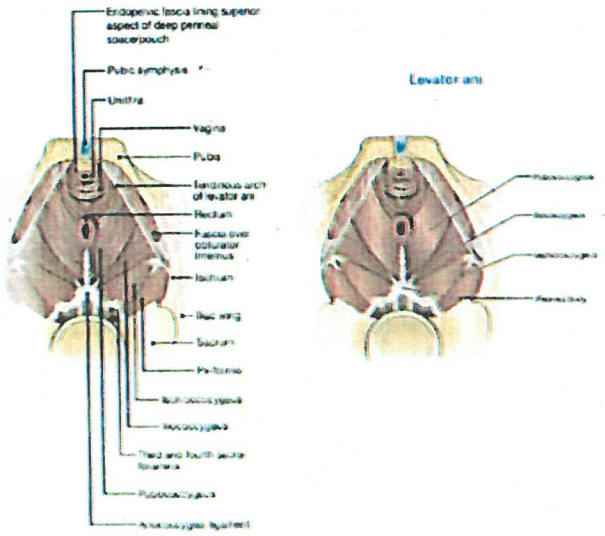

Puborectalis :

- Lowest part of levator ani muscle.
- Puborectalis sling at anorectal junction.
- maintains anorectal angle for continence.
- Puborectalis relaxes during defaecation to straighten the anorectal angle.
- Puborectalis/levator ani spasm : Pelvic floor dysynergia.




Pubprectalis sling at anorectal junction.

Levator ani – Perineal view :

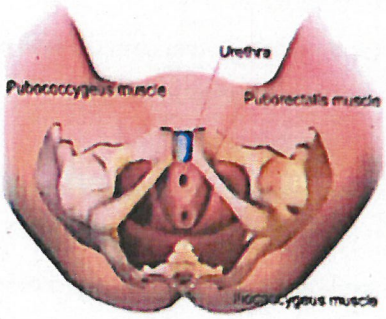



Levator ani : Pernieal view.

----- Active space -----

Sutures are not placed in levator ani : Can lead to painful perineal spasms.
Nerve supply : S2, 3, 4 (Pudendal nerve).

Kegel exercises :
For stress urinary incontinence in females.



Female Pelvic Muscles

## Pelvic organs & their supports

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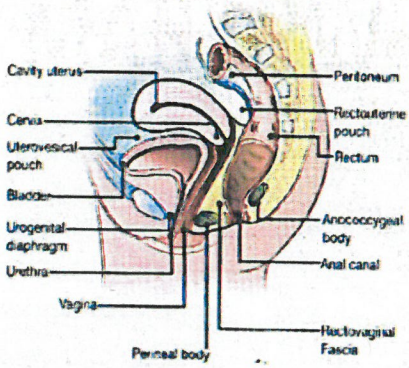
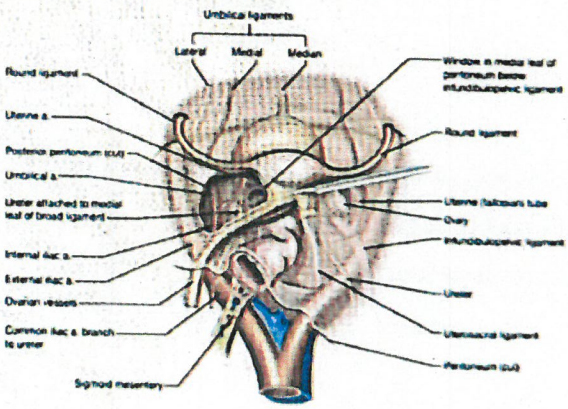
Pelvic organ supports :

1. Connective tissue (Fascial) support : Endopelvic fascia (Sheet of fascia covering all the organs, provides planes for neurovascular bundles.
2. Muscular supports : Levator ani.
3. Ligaments : Delancey's 3 levels of pelvic floor supports.

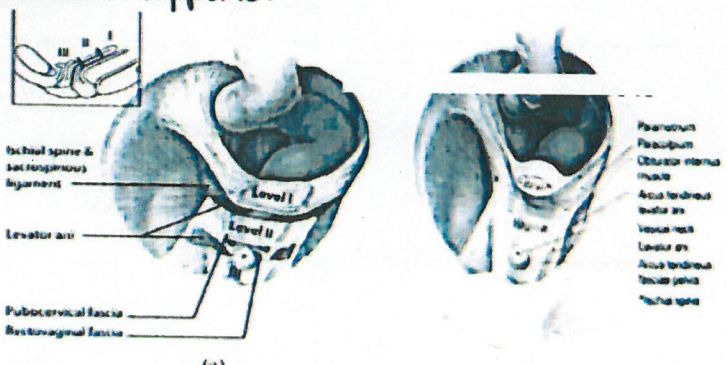
Anterior and posterior relations of vagina




Pelvic Spaces: Surgical View




Delancey 3 levels of supports :




Delancey 3 levels of supports.

delancey level I :

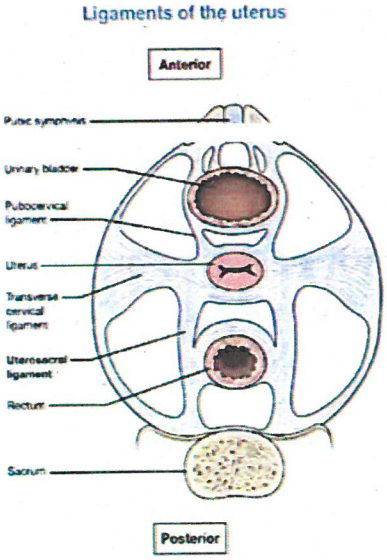
Pericervical ring.

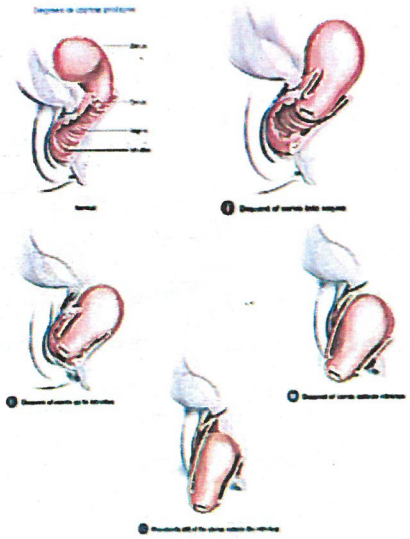
Ligaments joining uterus and cervix to lateral pelvic wall.

- Uterosacral ligament.
- Cardinal ligament.
- Pubocervical ligament.

Defect in level I : Uterine prolapse.

Point of reference : Ischial spine, externally hymen.

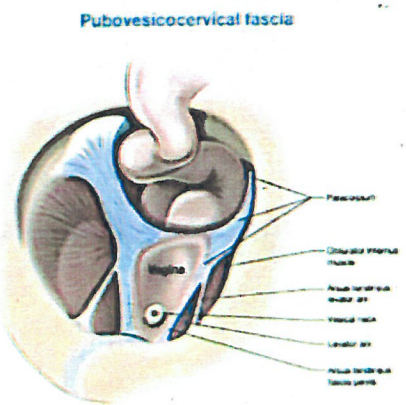


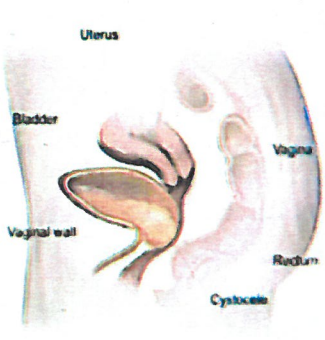



delancey level II :

Pubovesicocervical fascia.

Lateral defect : Cystocele.




Cystocele.

Sometimes level I and level 2 defects both are present.