

Pelvic Organ Prolapse (POP)



Osama M Warda MD
Prof. of obstetrics & gynecology
Mansoura University

DEFINITION

- Pelvic organ prolapse (POP) can be defined as descent of the pelvic organ(s) ; bladder, rectum, vagina, uterus; below their normal anatomical position due to distortion of their **dynamic** and **integrated** support.

Symptoms from POP

- POP can cause symptoms directly due to the prolapsed organ or indirectly due to organ dysfunction secondary to displacement from the anatomical position.
- **Direct POP symptoms include:**
 - (1) a sensation of vaginal **bulge**,
 - (2) **heaviness** or a visible protrusion at or beyond the introitus.
 - (3) lower abdominal or back **pain**, or a dragging discomfort relieved by lying or sitting.

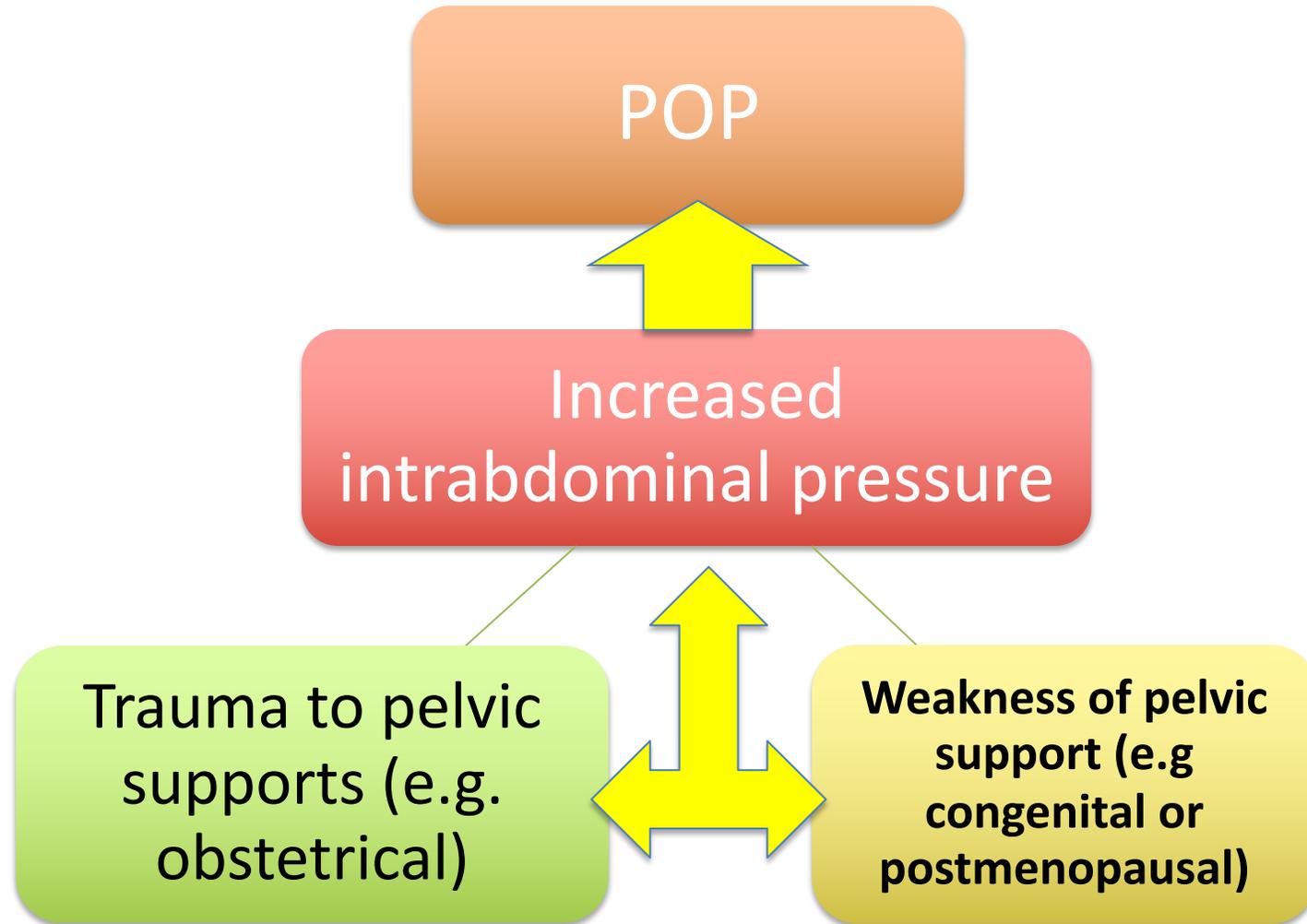
Symptoms from POP

- **Indirect symptoms:** will depend on which other organs are involved in the prolapse. They include:
 - (1) difficulty in *urination* or *defecation* (obstructive defecation)
 - (2) sensations of *incomplete emptying* of bladder or rectum.
 - (3) Patients *may have to support or reduce the prolapse* with their fingers to be able to void or evacuate stool completely (i.e. digitation)
 - (4) Urinary or fecal *incontinence* may also be present
 - (5) Sexual *dysfunction* due to introital laxity
 - (6) **Bleeding** from abrasion of the prolapsed part

ETIOLOGY OF POP

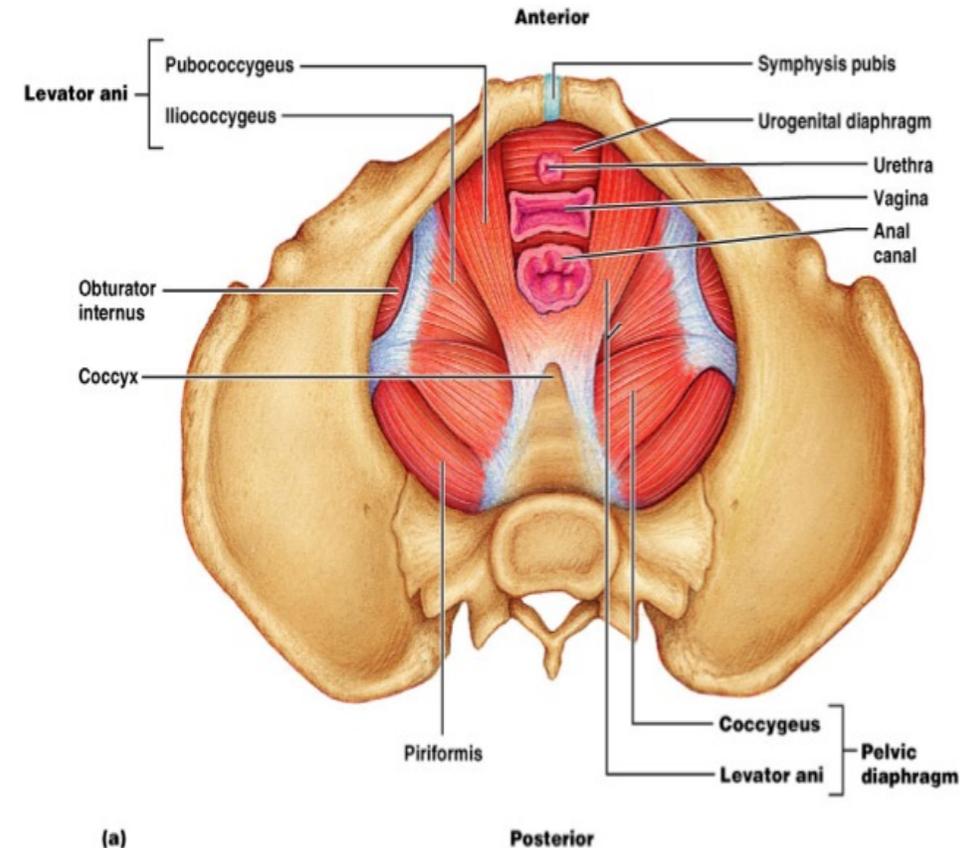
- **Risk factors** predisposing to prolapse either **congenital** weakness of the mesenchyme or due to obstetric **trauma**.
- **Obstetric trauma** causes:
 - 1- **Pudendal nerves damaged** , with increased nerve conduction times
 - 2- Thinning or avulsion of the **puborectalis muscle** from its insertion on the pubic ramus on one or both sides.

ETIOLOGY OF POP



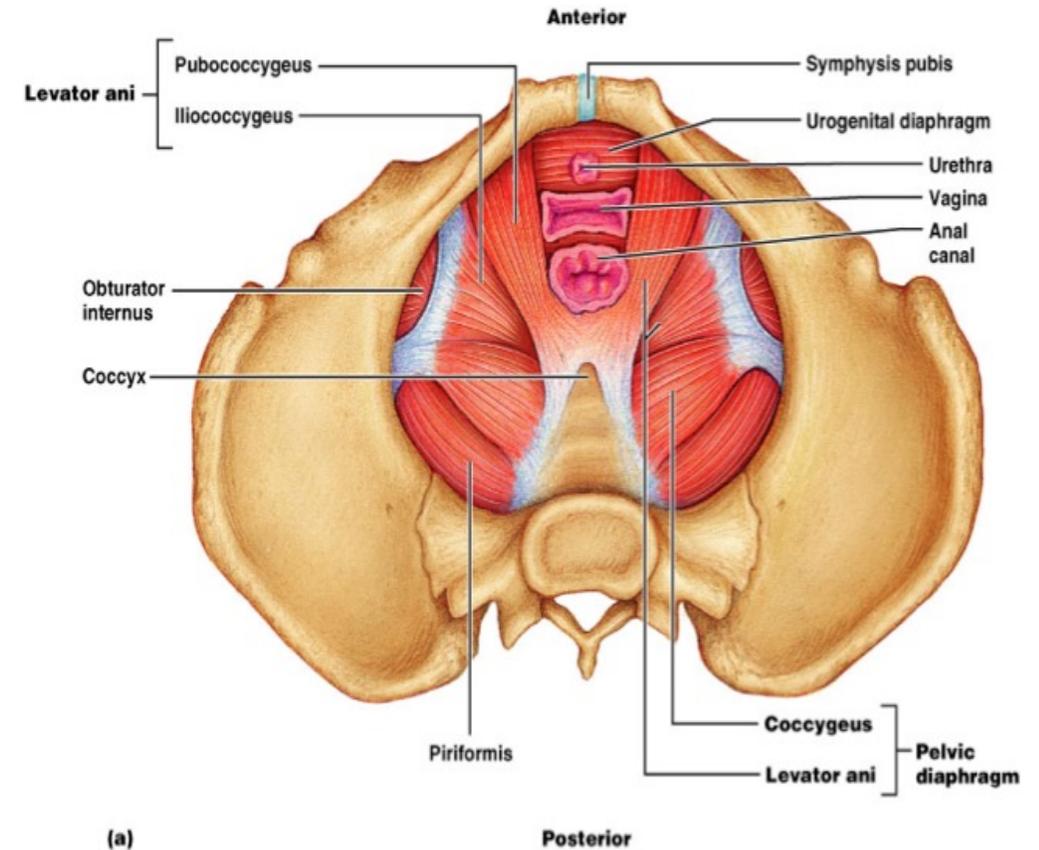
Relevant Anatomy

- Uterovaginal prolapse is caused by *failure of the interaction between the levator ani muscles and the ligaments and fascia that support the pelvic organs.*
- The levator ani muscles are *puborectalis, pubococcygeus and iliococcygeus.*
- They are attached on each side of the pelvic side wall from the pubic ramus anteriorly (pubococcygeus), over the obturator internus fascia to the ischial spine to form a bowl-shaped muscle filling the pelvic outlet and supporting the pelvic organs

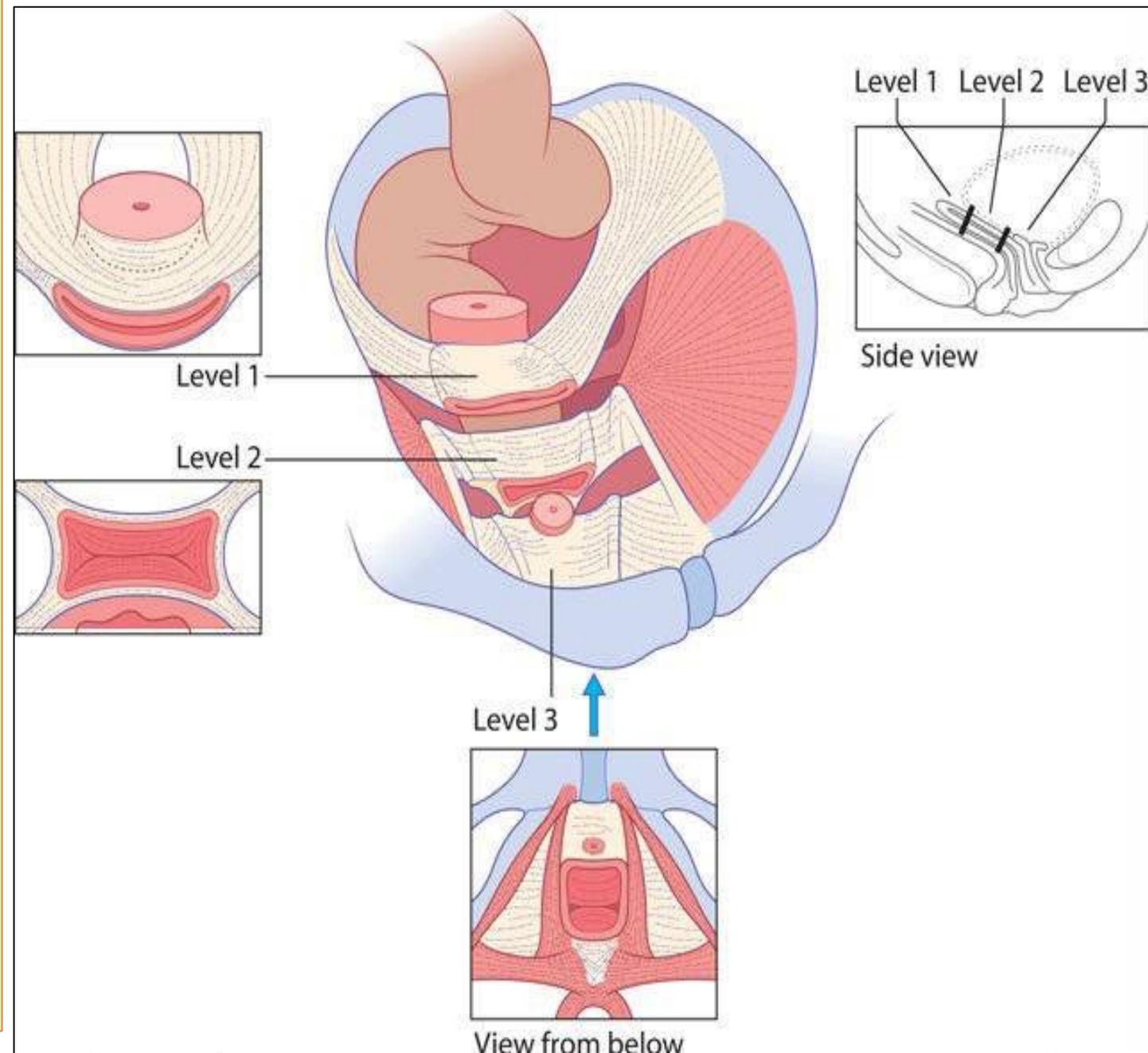


Relevant Anatomy

- There is a gap between the fibers of the puborectalis on each side to allow passage of *the urethra, vagina and rectum, called the urogenital hiatus.*
- The levator muscles support the pelvic organs and prevent excessive loading of the ligaments and fascia.



Fascial supports of the pelvic organs. Level 1 support is provided by the **uterosacral ligaments**, suspending the uterus and attached vaginal vault. Level 2 (midvagina) support is provided by the **fascia** lying between the **vagina and the bladder or rectum** that fuses laterally and runs to attach on the pelvic side wall. Level 3 support is provided by the **perineal body**, which has the posterior vaginal fascia fused to its upper surface.

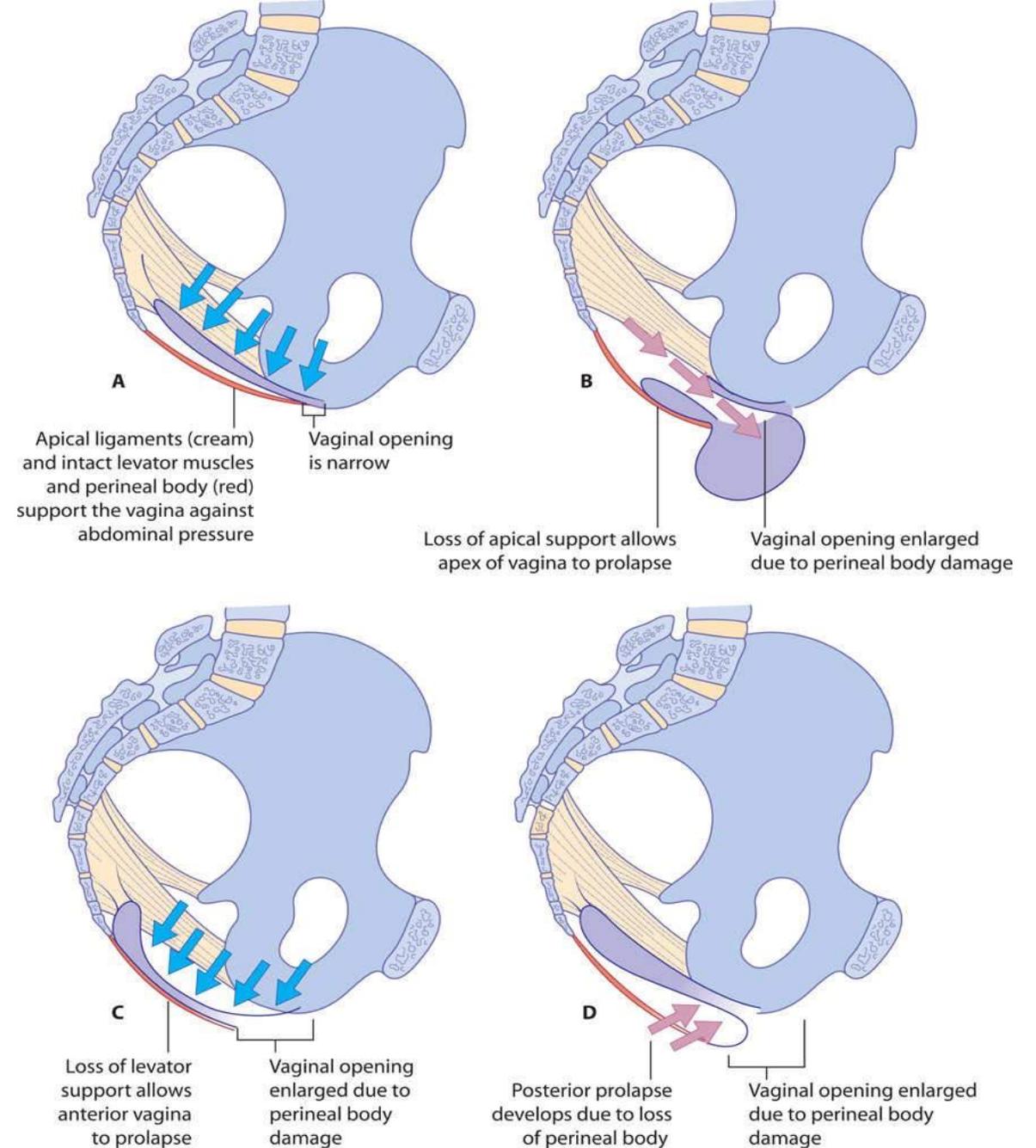


Development of prolapse.

The pelvic floor and ligaments work together to provide support against increases in abdominal pressure (A).

Prolapse is almost invariably associated with perineal body damage causing an enlarged vaginal opening.

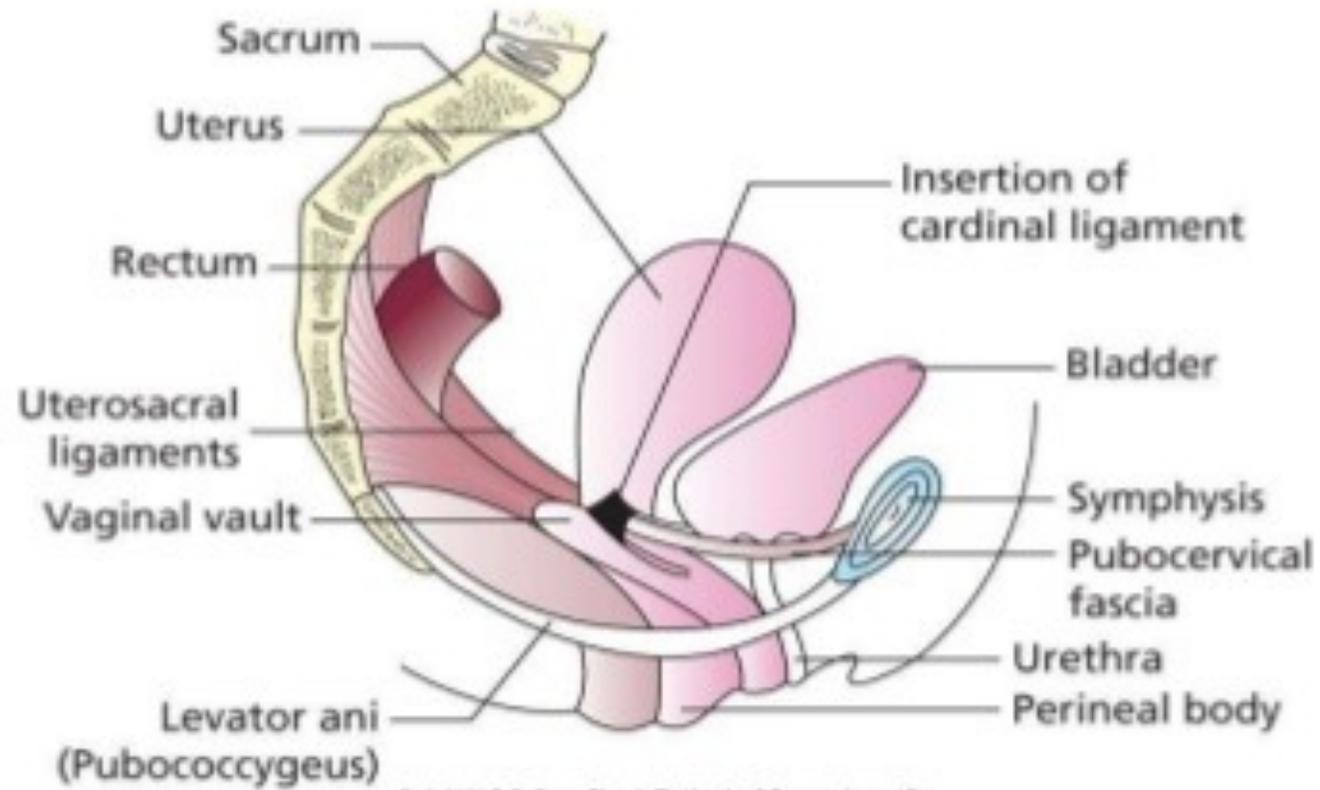
Prolapse can then occur if the apical (level 1) support is lost (B), or if the pelvic floor muscles are ineffective (C) or directly as a result of perineal body deficiency (D). Often, a combination of factors is at work.



Relevant Anatomy

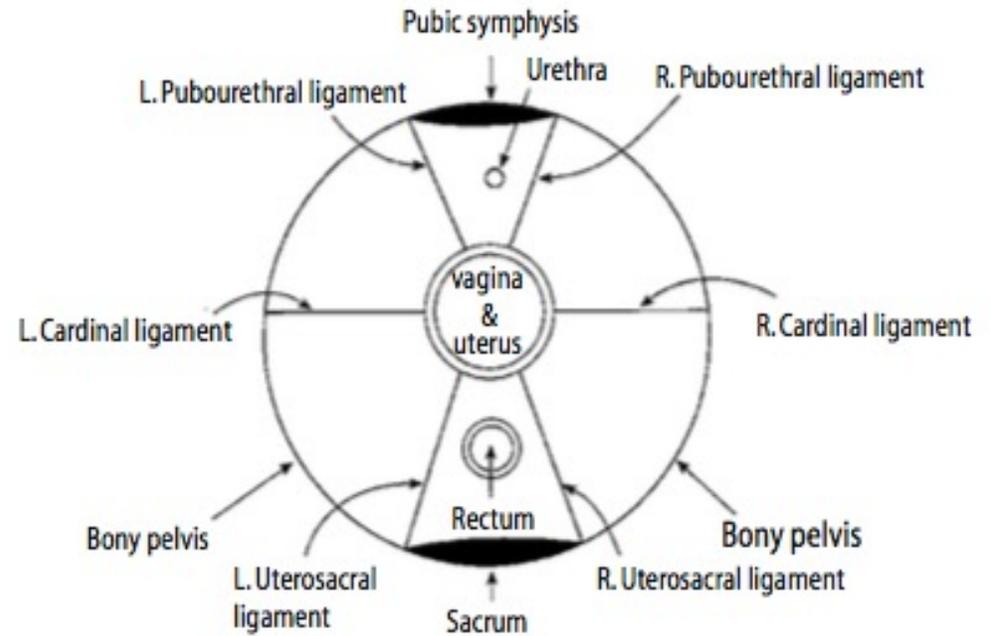
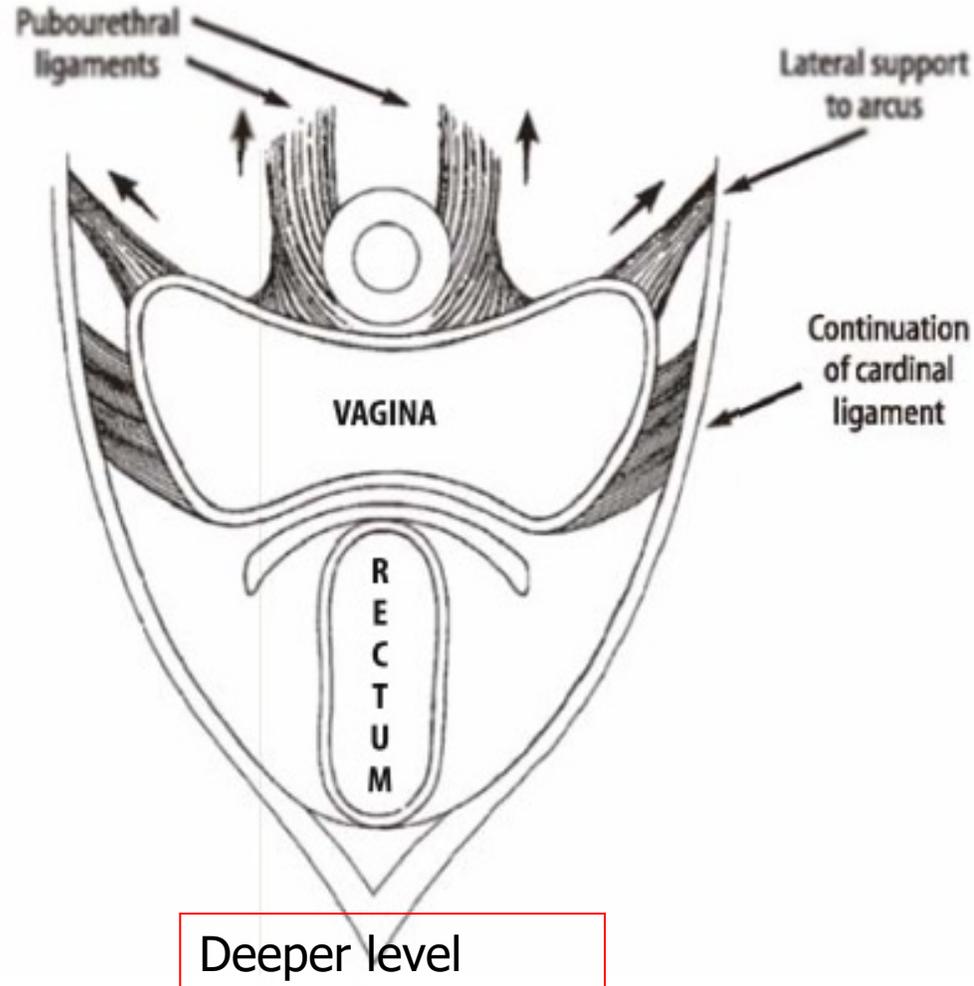
Key Learning Points:

- **The levator ani muscles** (puborectalis, pubococcygeus and iliococcygeus) support the pelvic organs and relieve excessive pressure from the ligaments and fascia.
- **The uterosacral ligaments** provide essential apical support (*level 1 support*).
- **Vaginal fascia** supports the vagina (*level 2 support*).
- **The perineal body** is very important in supporting the lower vagina (*level 3 support*).
- All the structures provide a **dynamic** and **integrated** support to the pelvic organs.

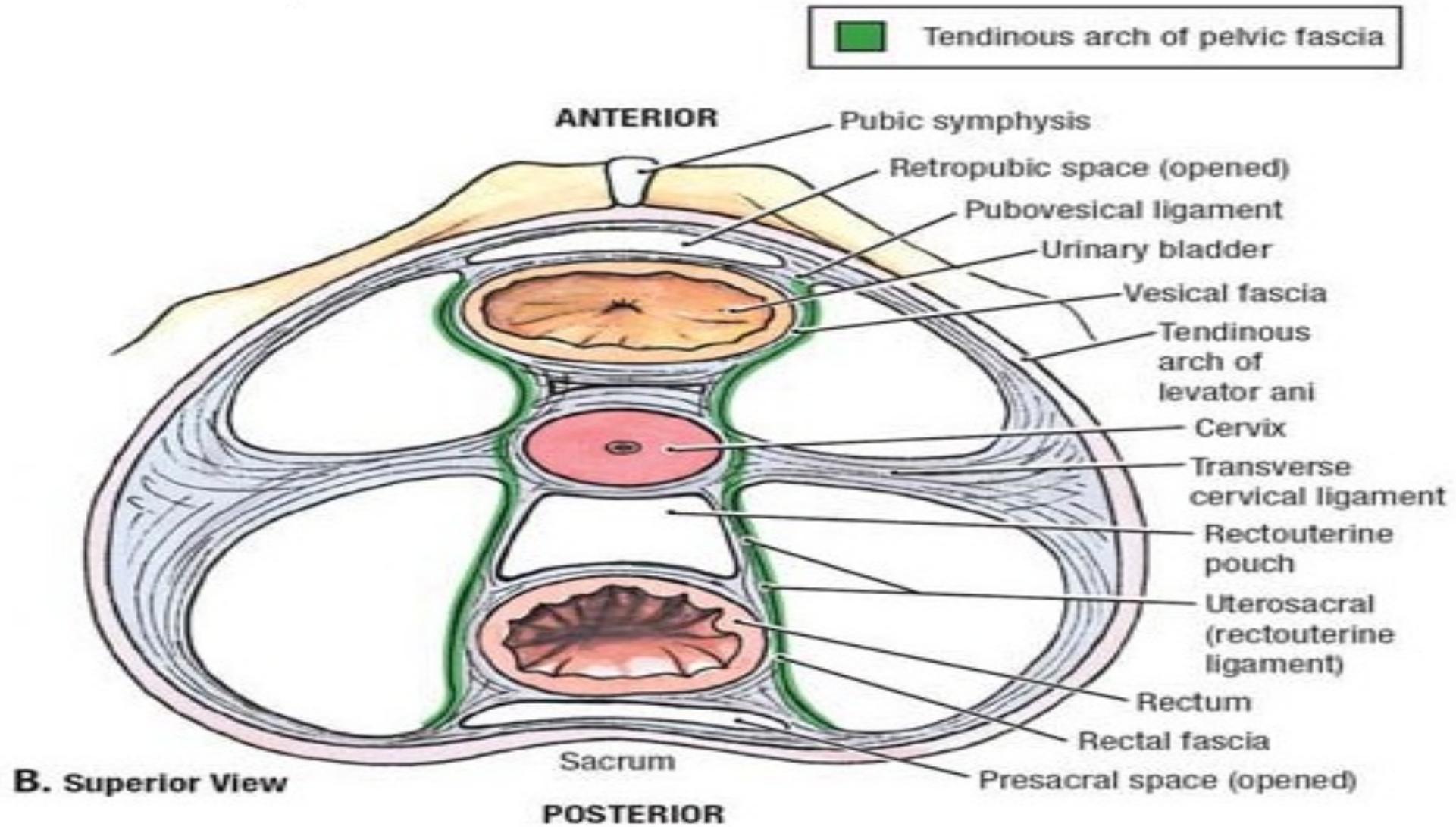


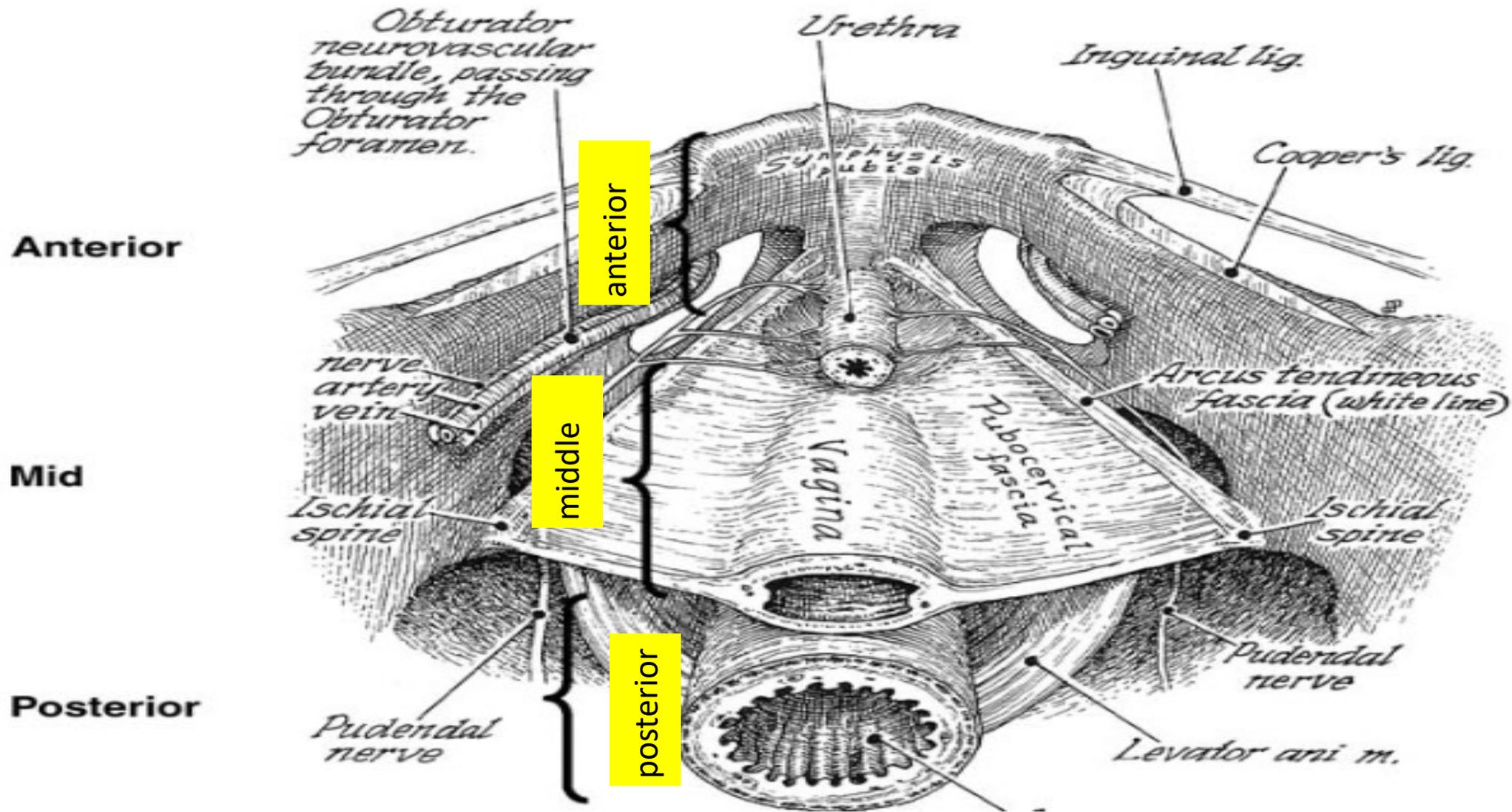
Padalini & Datta: Shaw's Textbook of Gynaecology, 15e
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Fascial ligaments



Figurative illustration of pelvic supports based on the analogy of a bicycle wheel with a hub (vagina and uterus), spokes (pelvic support structures), and rim (bony pelvis). Scotti RJ et al. In: Rosenthal RA, Zenilman ME, Kathick MK, editors. *Principles and Practice of Geriatric Surgery*. New York: Springer, 2001; 824. [8]





The anatomy of three compartment of the pelvis viewed from above

De Lancey's three levels of vaginal support

- **Apical suspension (LEVEL 1)**
 - ✓ Upper para-colpium suspends apex to pelvic walls and sacrum
 - Damage results in prolapse of vaginal apex (vault prolapse)
- **Mid-vaginal lateral attachment (LEVEL 2)**
 - ✓ Vaginal attachment to arcus tendineus fascia and levator ani muscle fascia
 - ✓ Pubo-cervical and recto-vaginal fasciae support bladder and anterior rectum
 - Avulsion results in cystocele or rectocele
- **Distal perineal fusion (LEVEL 3)**
 - ✓ Fusion of vaginal fascia to perineal membrane, perineal body and levators
 - Damage results in deficient perineal body or urethrocele

Clinical assessment of prolapse

THE HISTORY:

- You should elicit the presenting symptom(s) and severity, and include questions to ascertain if the patient has any coexisting urinary, fecal or sexual symptoms .
- One should be sensitive to the emotional aspect of the problem, but specific questions should be asked about sexual discomfort and difficulty achieving orgasm.

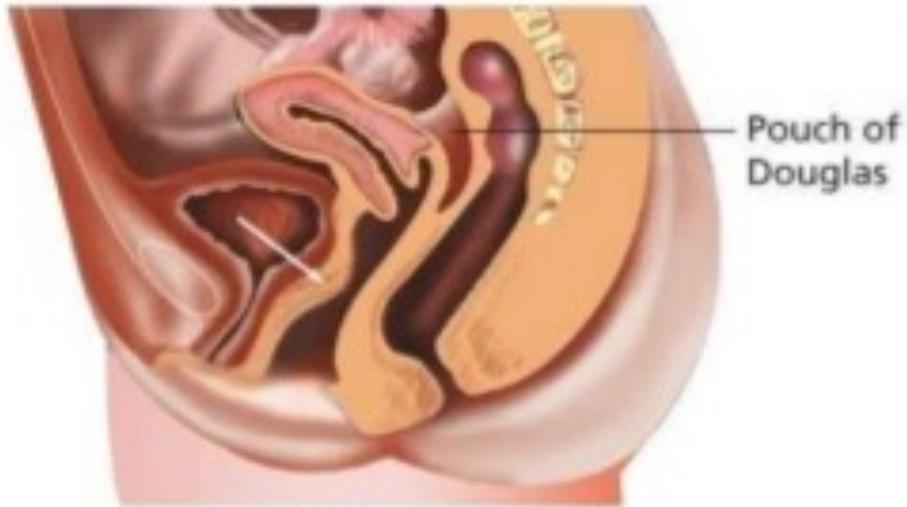
Clinical assessment of prolapse

CLINICAL EXAM

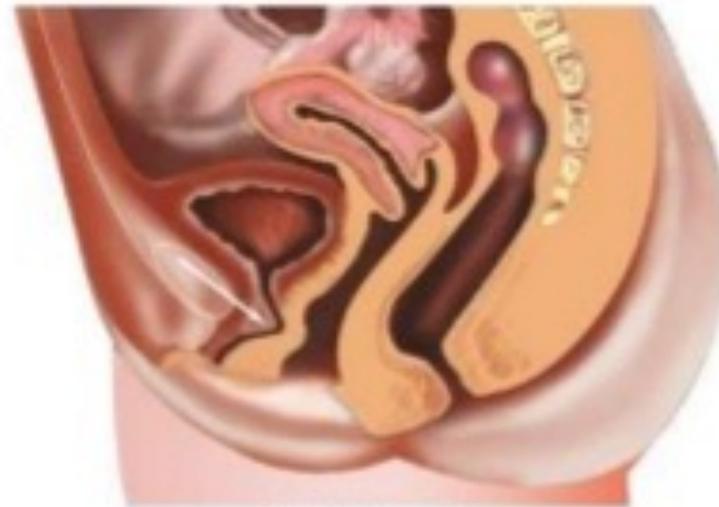
- should ideally be done in the **lithotomy** position with a Sims speculum . This allows retraction of the anterior and posterior vaginal wall in turn, to allow full assessment of the degree of prolapse and to assess how much descent of the cervix and uterus is present.
- Prolapse is classically described in three stages of descent, and note should be made of whether it occurs at patient straining or at rest and whether traction has been applied:



I **A:** Sim's speculum; **B:** Sim's speculum inserted with the patient in the left lateral position. The speculum is being used to hold back the posterior vaginal walls to allow inspection of the anterior wall and vault. The speculum can be rotated 180° or withdrawn slowly to visualize the posterior wall.



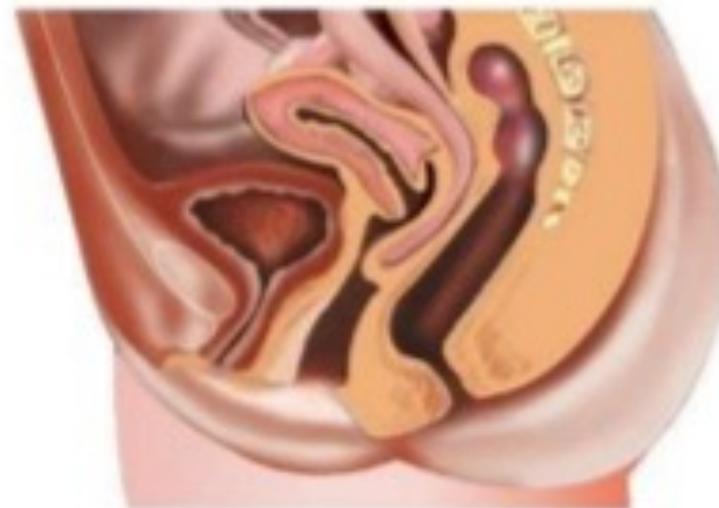
Cystocele



Urethrocele



Rectocele

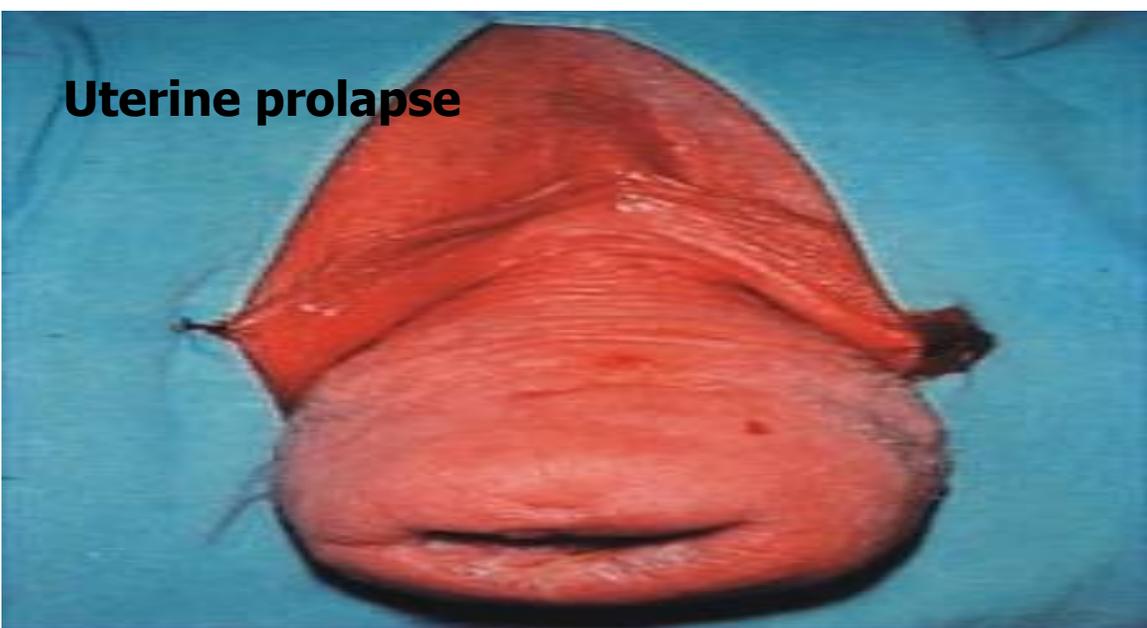


Enterocele

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Cystocele



Uterine prolapse

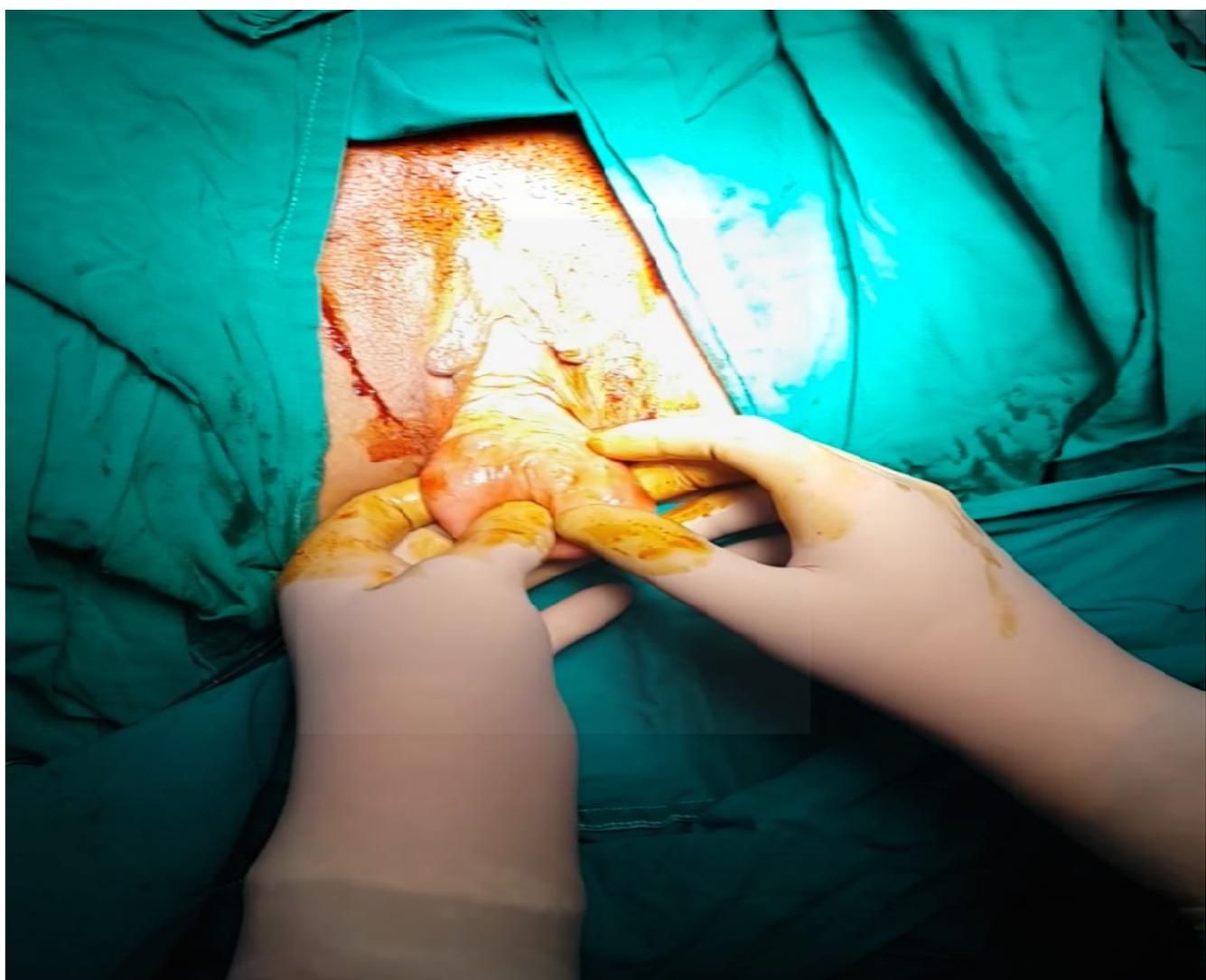


Rectocele (high= intact peineal body)



Rectocele (low=peineal tear)

FIGURE 14. Mid-vaginal posterior prolapse that protrudes through the introitus despite a normally supported perineal body. (© DeLancey 2004)



Post-hysterectomy vaginal vault prolapse

Clinical assessment of prolapse

- In view of the complex relationship between prolapse and *bladder* or *bowel* functions, if women have additional indirect symptoms, then it is prudent to arrange *urodynamic assessment or functional tests of the lower bowel*, which may include
 - 1- *Endo-anal ultrasound to check for anal sphincter defects,*
 - 2- *Rectal manometry,*
 - 3- *Flexible sigmoidoscopy ,*
 - 4- *defaecating proctogram.*
- Ideally, such patients should be reviewed with the completed investigations in a MDT meeting including a *gynecologist*, colorectal *surgeon*, *continence nurse* and *physiotherapist*.

Stages of POP

Vaginal prolapse is formally staged using different methods, but the most important assessment is whether the vaginal prolapse reaches to, or beyond, the hymen. Finally, it is important to assess whether the perineal body is intact or has become attenuated, resulting in an enlarged vaginal opening.

Stages of POP

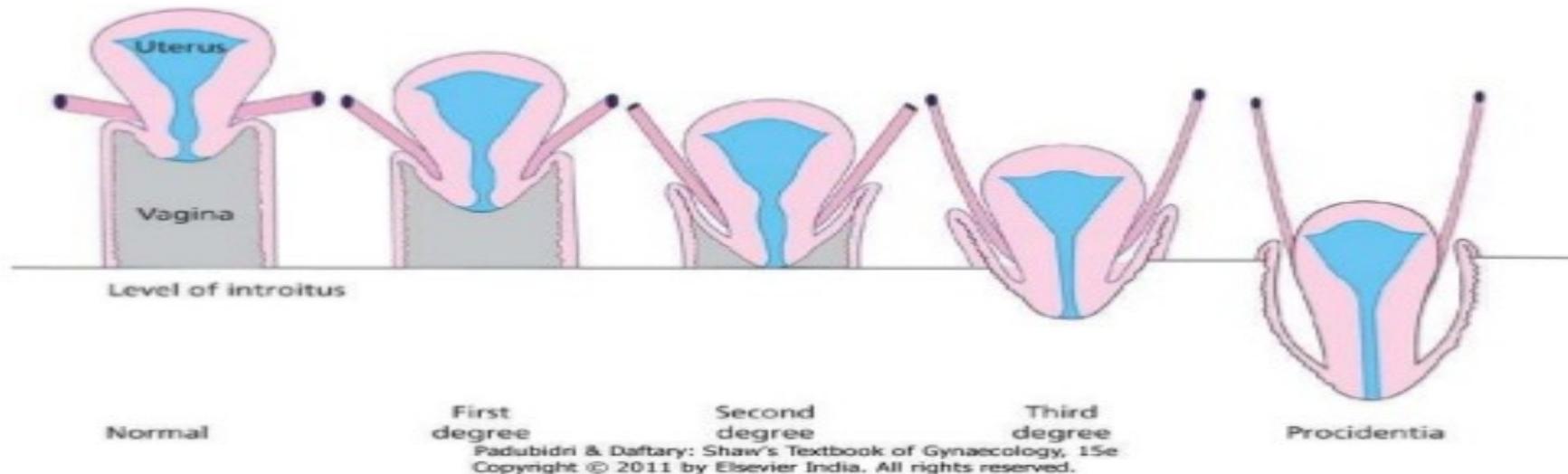
Many systems have been used in staging of POP, however, the basis are

- **Stage I:** where the prolapse does not reach the hymen.
- **Stage II:** where the prolapse reaches the hymen.
- **Stage III :** when the prolapse is mostly or wholly outside the hymen.
- When the uterus prolapses wholly outside this is termed **procidentia**.

Stages of POP

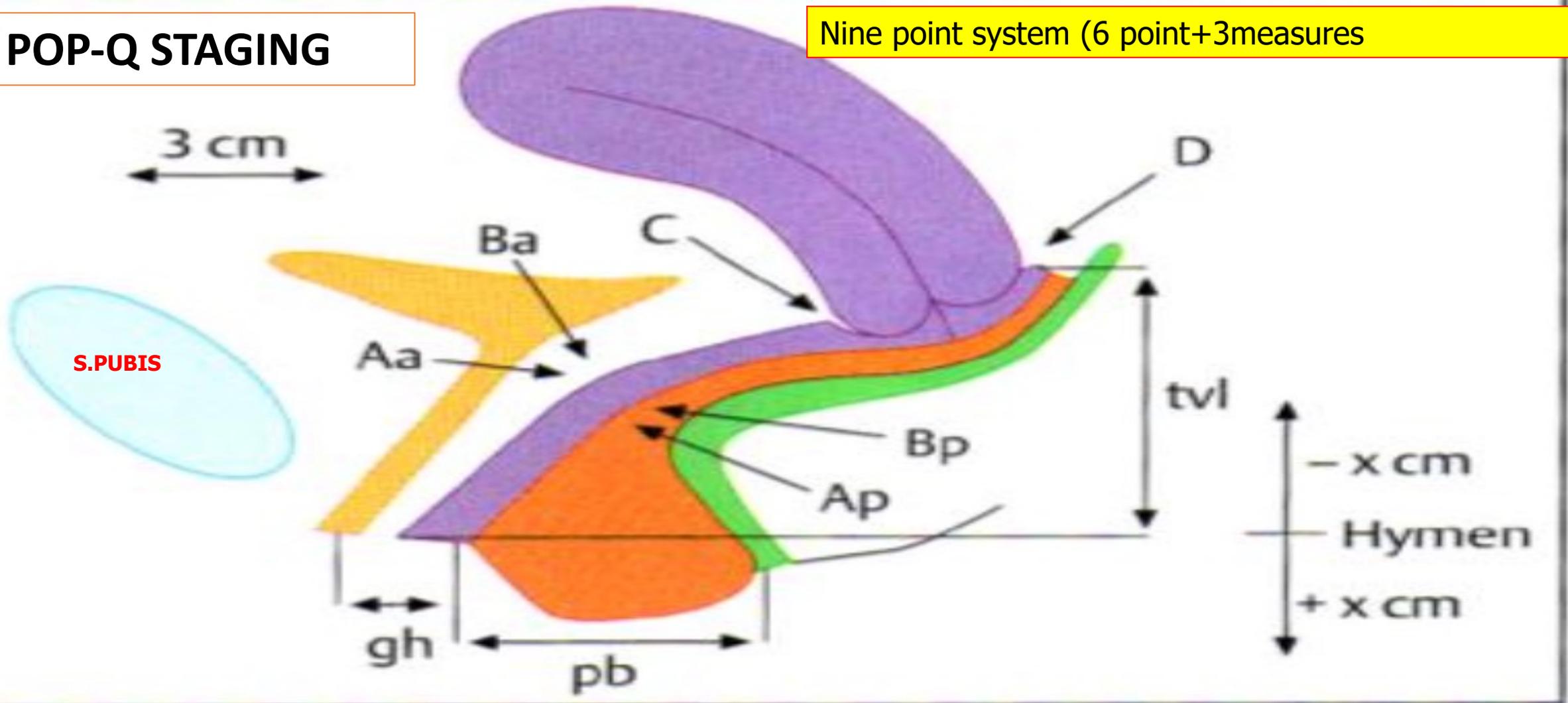
- **Old systems:** not objective, not validated for describing the spectrum of pelvic support in individual patients and in study populations:

a). Uterine prolapse:



POP-Q STAGING

Nine point system (6 point+3measures)



Points and landmarks for POP-Q system examination. **Aa**, point A anterior, **Ap**, point A posterior, **Ba**, point B anterior; **Bp**, point B posterior; **C**, cervix or vaginal cuff; **D**, posterior fornix (if cervix is present); **gh**, genital hiatus; **pb**, perineal body; **tv**, total vaginal length.

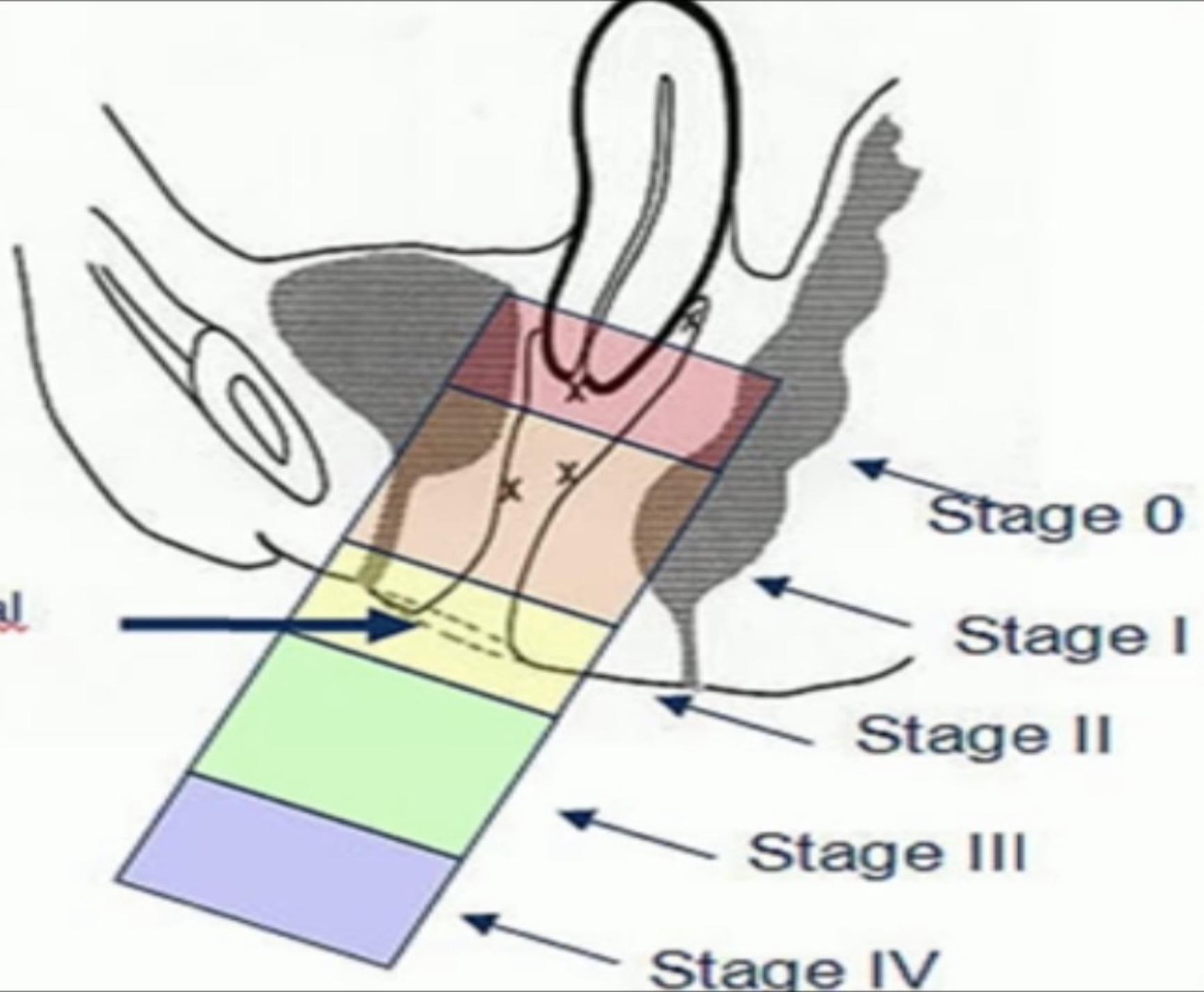
POP-Q: The grid

Aa Anterior wall -3cm	Ba Anterior wall -3cm	C Cervix (cuff) -6cm
gh genital hiatus 2cm	pb Perineal body 3cm	Tvl Total vag length 10cm
Ap Posterior wall -3	Bp Posterior wall -3	D Posterior fornix -10

POP-Q Stages of POP

- Once the measurements are taken, the patients are assigned to the corresponding stage:
- **Stage 0** = no prolapse during straining.
- **stage I** = most distal portion of prolapse is > 1cm above level of hymen
- **Stage II**= the most distal part of prolapse is <1cm **proximal** to or **distal** to the plane of hymen
- **Stage III**=the most distal portion of the prolapse protrudes more than 1 cm **below** the hymen but **not** all of the vagina has prolapsed.
- **Stage IV**=complete vaginal eversion is essential.

Hymenal



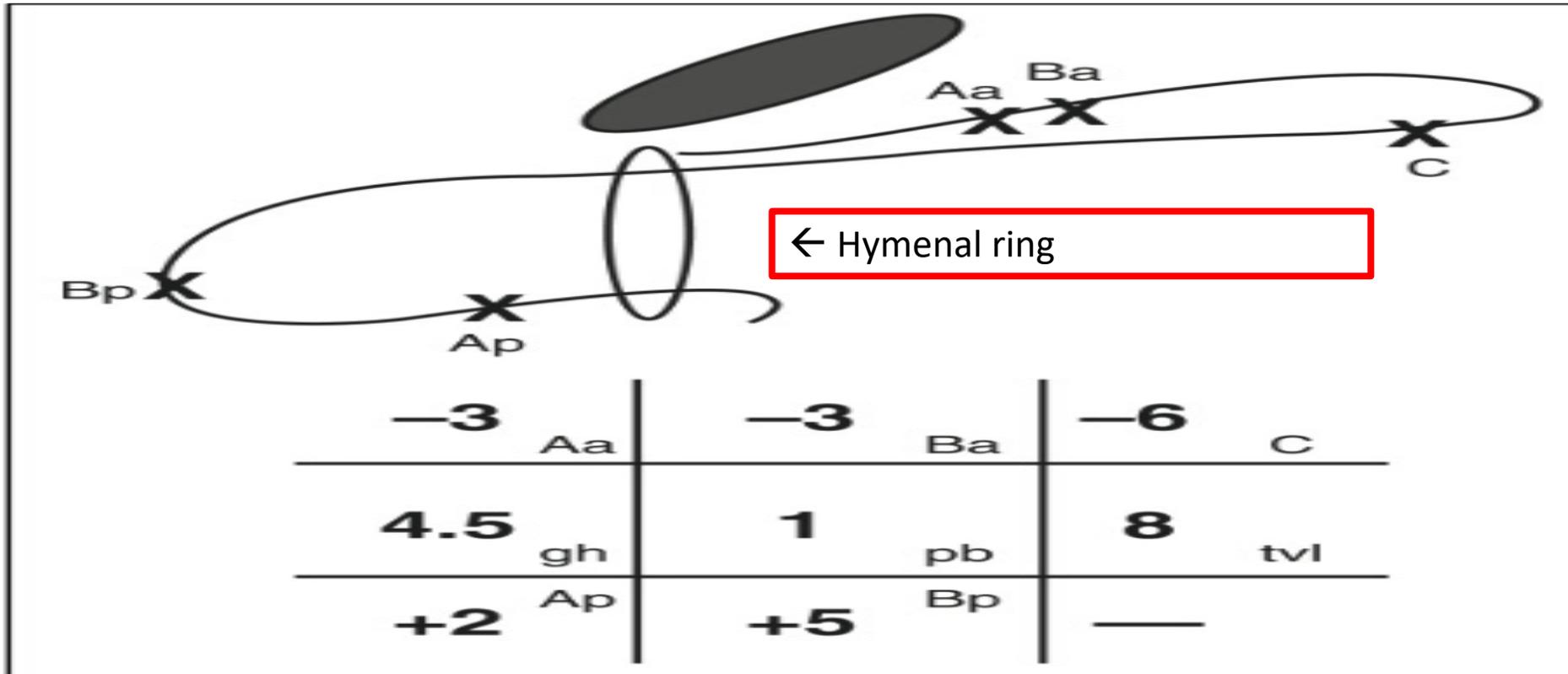


Fig. 4 An example of measurements using the POP-Q system.

Grid and line diagrams of predominantly posterior support defect. Leading point of prolapse is upper posterior vaginal wall, point Bp (+5). Point Ap is 2 cm distal to hymen (+2) and vaginal cuff scar is 6 cm above hymen (-6). Cuff has undergone only 2 cm of descent because it would be at -8 (total vaginal length) if it were properly supported. This represents stage III Bp prolapse. (From Bump RC, Mattiasson A, Bo K, et al: The standardization of terminology of female pelvic organ prolapse and pelvic floor dysfunction. Am J Obstet Gynecol 1996;175:10-17.)

Stage III Bp prolapse

Aa -3	Ba -3	C -8
Gh 2	Pb 3	Tvl 10
Ap -3	Bp -3	D -10

Points Aa and Ba and points Ap and Bp are all -3 indicating no anterior or posterior wall descent.

Lowest point of the cervix is 8 cm above hymen (-8) and posterior fornix is 2 cm above this (-10).

Vaginal length is 10 cm,
Genital hiatus (gh) is 3 cm,
Perineal body(pb) is 3 cm.

Aa -1	Ba +5	C -6
Gh 4	Pb 1	Tvl 10
Ap -3	Bp -3	D -8

Points Aa and Ba are showing descent indicating anterior wall descent.

Lowest point of the cervix is 6 cm above hymen (-6) and posterior fornix is 2 cm above this (-8).

Vaginal length is 10 cm,
Genital hiatus (gh) is 4 cm,
Perineal body(pb) is 1 cm.

Aa -2	Ba -2	C -6
Gh 6	Pb 1	Tvl 10
Ap +2	Bp +5	D -8

Points Aa and Ba are showing mild descent.

Points Ap and Bp show marked descent

Lowest point of the cervix is 6 cm above hymen (-6) and posterior fornix is 2 cm above this (-8).

Vaginal length is 10 cm,
Genital hiatus (gh) is 6 cm,
Perineal body(pb) is 1 cm.

Aa +3	Ba +6	C -2
Gh 5	Pb 2	Tvl 6
Ap -3	Bp -2	D —

Leading edge of prolapse: upper anterior vaginal wall represented by Point Ba at +6 cm

Point Aa is maximally distal at +3 cm. The vaginal cuff is 2 cm above the hymen (Point C=-2)

The tvl is 6 cm. This means that if the vaginal apex or cuff was in its normal position, Point C would be -6. Since point C representing the apex or vaginal cuff is -2 cm, one can deduce that the apex or cuff has undergone 4 cm of descent.

Aa -3	Ba -3	C +2
Gh 4.5	Pb 2	Tvl 10
Ap -3	Bp -3	D -8

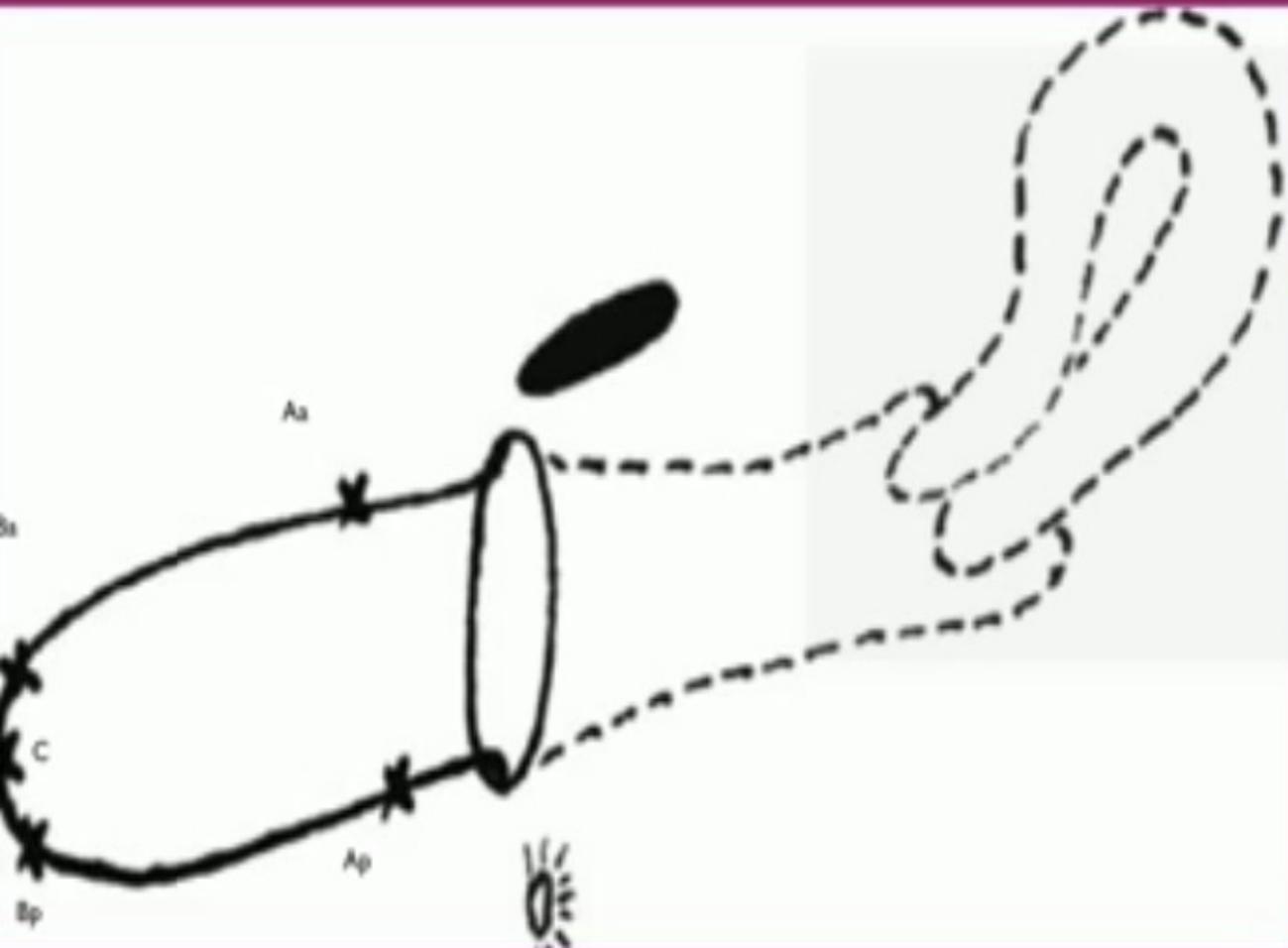
Points Aa and Ba and Points Ap and Bp show no descent

Lowest point of the cervix is 2 cm below hymen (+2) and posterior fornix is 2 cm above this (-8).

Vaginal length is 10 cm,

Genital hiatus (gh) is 4.5 cm,

Perineal body(pb) is 2 cm.



Aa +3	Ba +8	C +8
Gh 5	Pb 1.5	Tvl 8
Ap +3	Bp +8	D -

Treatment for prolapse

Conservative treatment: includes

1- **pelvic floor muscle exercises** and

2- **the use of supportive vaginal pessaries.** →

- For women with urinary or bowel symptoms

conservative treatment for these symptoms can be commenced at the same time as for the prolapse.



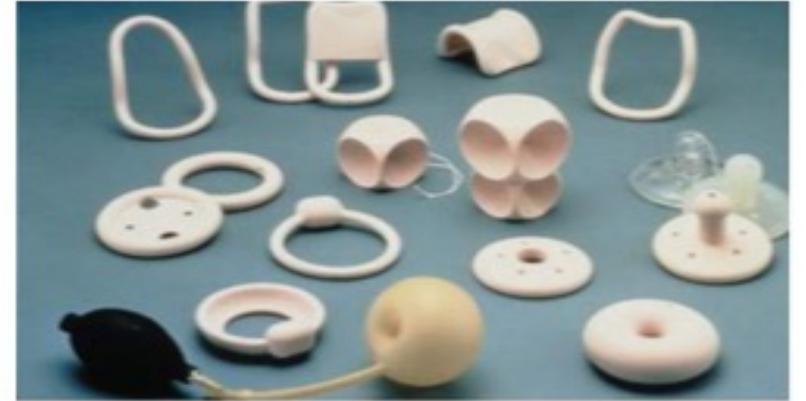
Treatment for prolapse

Conservative treatment: Pelvic floor exercises

- A course of supervised *pelvic floor exercises* will reduce the symptoms of prolapse and for women who are keen to **avoid** surgical treatment, this can be an **effective first step**, although there is *less evidence that pelvic floor exercise will reduce the anatomical extent of the prolapse and it is unlikely to be helpful for women whose prolapse is beyond the vaginal introitus.*

Treatment for prolapse

Conservative treatment: Pessary treatment:



- A ***vaginal support pessary*** is inserted to reduce the prolapse, which leads to resolution of many of the symptoms.
- Pessary use can be very effective at relieving symptoms and has the advantage of **avoiding surgery** and the associated risks, which can be extremely useful in the *medically unfit and elderly*.
- A range of shapes of pessary is available (see picture)

Conservative treatment: Pessary treatment: (cont.)

- *Ring pessaries* are usually tried first, but an **intact** perineal body is necessary for these to be retained.
- *Shelf pessaries*, **Gelhorn** pessaries and others are useful for women with **deficient** perineal bodies.
- It is usual practice to replace *a pessary every 6 months* and to examine the patient for signs of vaginal ulceration, although this frequency is **traditional** and not based on any evidence.

Conservative treatment: Pessary treatment: (cont.)

- Complications are uncommon and usually minor (*bleeding, discharge*), although rarely the pessary can become *incarcerated*, requiring general anesthesia to remove, and rare cases of *rectovaginal or vesicovaginal fistula formation* have been reported.
- *Sexual intercourse* remains theoretically possible with a well-placed **ring pessary**, but **not** with the others, *so would not generally be suitable for women who are sexually active.*
- Motivated patients can be taught to insert and remove their own pessaries if they do wish to remain sexually active.

SURGERY FOR POP

- Surgical treatment for prolapse is **common**, and can be offered if conservative treatments have failed or if the patient chooses surgery from the outset.
- There are a wide range of **specific procedures** .
- The procedure chosen depends on
 - (1).which compartment is affected,*
 - (2).whether the woman wishes to retain her uterus and*
 - (3).whether the vaginal or abdominal route of surgery is chosen.*
- The essential principles of prolapse surgery apply for all procedures.

SURGERY FOR POP

- Prolapse surgery is performed *through the vagina* to restore the ligamentous tissue supports to the apex, anterior and posterior vagina (anterior repair, posterior repair) and repair of the perineal body.
- The vaginal route can also be used for *pos-thysectomy vault prolapse*, *attaching the vaginal vault to the right sacrospinous ligament with non-absorbable or slowly absorbable sutures*, but here an abdominal approach to perform a ***sacrocolpopexy*** is an option that will provide excellent, durable long-term cure.

SURGERY FOR POP

- In the last 3–5 years, there has been an increasing number of women wishing to **avoid hysterectomy** during prolapse surgery, so both ***sacrospinous fixation and sacrocolpopexy*** can be performed by attaching a mesh or sutures to the cervix rather than the vaginal vault.
- Vaginal repair using mesh **improves** the *anatomical outcome and reduces the risk of recurrent prolapse*. **No difference** in symptom relief between standard repair and mesh repair. Mesh repair carries the risk of later **erosion** and **need for removal**, which is challenging surgery.

Procedure	Key point	Short description	Complications
Anterior vaginal repair (ant.colporrhaphy)	<ul style="list-style-type: none"> -For anterior vaginal prolapse. -NOT for stress incontinence 	Suture to reinforce fascia between vagina & bladder	<ul style="list-style-type: none"> - Bladder injury - High recurrence
Posterior vaginal repair Post. colporrhaphy	<ul style="list-style-type: none"> -For posterior vaginal prolapse - Can improve obstructed defecation - Risk of recurrence is low 	Suture to reinforce fascia between vagina & rectum	<ul style="list-style-type: none"> - Risk of rectal injury - Postoperative dyspareunia
Vaginal repair with polypropylene mesh	<ul style="list-style-type: none"> - Usually reserved for recurrent prolapse - Surgical repair reinforced with mesh - Very low recurrence rates - Excellent anatomical results 	Mesh can be inlay (not fixed), or fixed to the pelvic ligaments to mimic the native utrosacral ligaments and fascial attachments	<ul style="list-style-type: none"> -mesh erosion through the vagina (5%) - Mesh erosion through bladder or rectum (<5%) - Dypareunia - Chronic pelvic pain - Excision of mesh is difficult

Principles of POP surgery

- **Remove/reduce the vaginal bulge.**
- **Restore the ligament/tissue supports to the apex, anterior and posterior vagina.**
- **Replace associated organs in their correct positions.**
- **Retain sufficient vaginal length and width to allow intercourse.**
- **Restore the perineal body.**
- **Correct or prevent urinary incontinence.**
- **Correct or prevent fecal incontinence.**
- **Correct obstructed defecation.**

KEY LEARNING POINTS

• **ovaginal prolapse causes troublesome symptoms but is not life threatening.**

- **A course of pelvic floor exercises can reduce symptoms and may reduce prolapse progression in women with mild/moderate prolapse.**
- **Vaginal pessaries are a useful conservative treatment but do not suit all women.**
- **Surgery for prolapse is effective, but has a recurrence rate of about 5%.**
- **It is not essential to perform hysterectomy for prolapse.**
- **Mesh repairs for prolapse give a better anatomical cure, but there is no convincing evidence that symptom relief is different from standard surgery.**
- **Mesh complications are common and can be extremely difficult to manage.**



Management

Depends on: the stage of the prolapse, severity of symptoms, age, general health of the patient, and desire for future childbearing.



Non-surgical management

Expectant

- If asymptomatic or mildly symptomatic prolapse.
- Symptom-directed therapy**
- Weight loss if overweight.
 - Avoid standing for long periods of time.
 - Defaecatory problems – behavioural training, dietary modification (high-fibre diet), and laxatives to prevent constipation and straining.
- Hormone replacement therapy (HRT)**
- There is no evidence to support the use of oestrogen replacement to prevent or treat prolapse.

Pessaries

- Indicated in pregnant women, physically frail women, those unfit for surgery, or when surgery is declined.
- Change every 6–8 months to prevent ulceration of the vaginal vault. If left for a long period, there is a risk of calcium deposition, erosion, and fistula formation.
- Various shapes and sizes. Supportive (ring) or space-occupying (donut pessary).
- Shelf pessaries preclude sexual intercourse and are therefore suitable for women who are not sexually active.
- Ring pessaries tend to fail in women with deficient perineum, who may require shelf pessaries instead.
- Side effects – vaginal discharge, irritation, bleeding.
- Pessary can be fitted in most women with prolapse, regardless of prolapse stage or site. (ACOG)

Pelvic floor muscle training

PFMT may improve pelvic function and is recommended as an adjunct therapy for women with prolapse and associated symptoms.



Evidence round-up

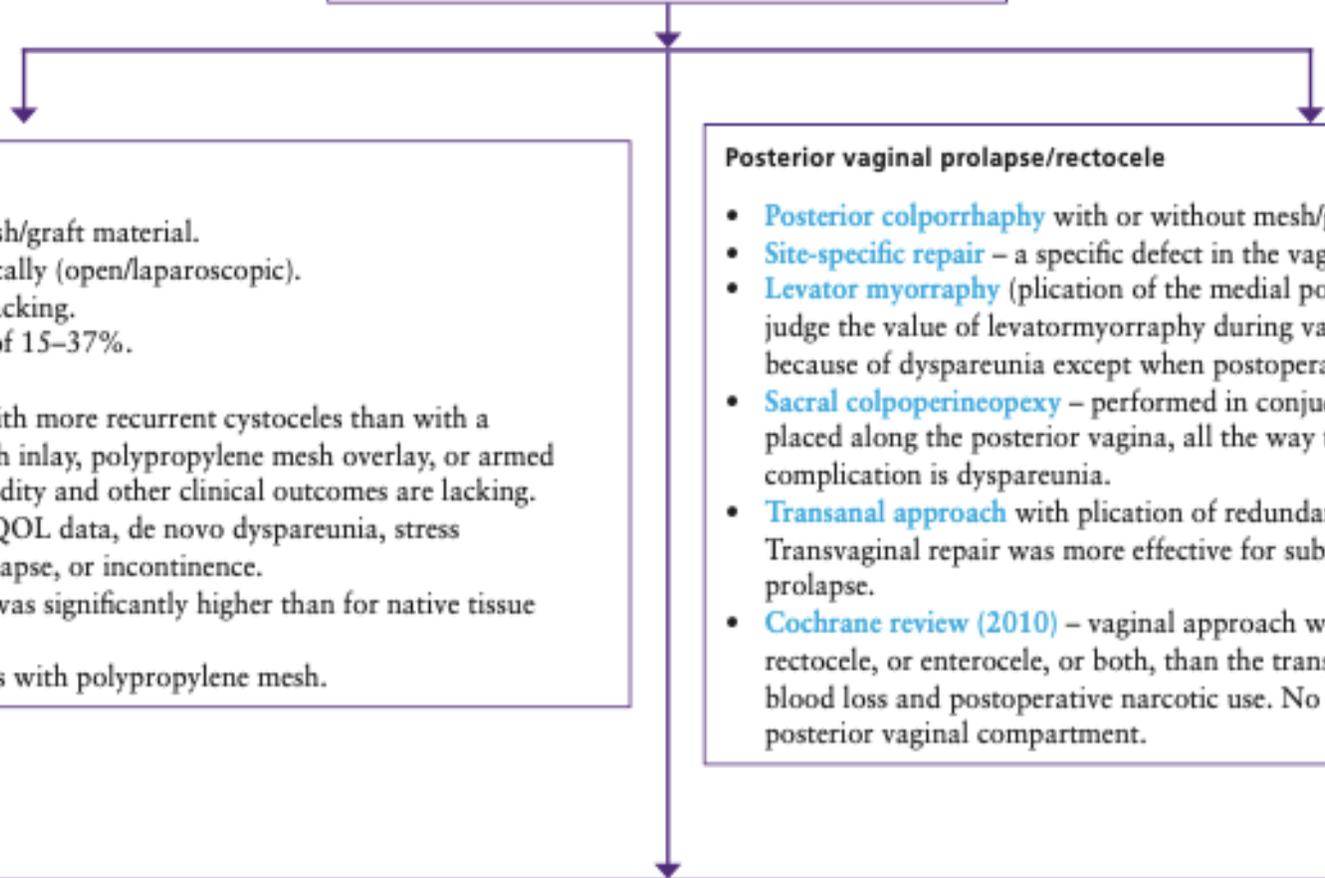
[Cochrane review \(2013\) – pessaries](#) (mechanical devices) for pelvic organ prolapse in women found only one RCT comparing ring and Gellhorn pessaries. Both pessaries are effective in 60% of women, with no differences between the two types of pessary.

[Cochrane review \(2011\) – PFMT](#) improves in prolapse stage by 17% compared to no PFMT. There is some evidence indicating a positive effect of PFMT for prolapse symptoms and severity; 6 months of supervised PFMT has anatomical and symptom improvement.

[Cochrane reviews \(2010\) – oestrogen](#) – use of local oestrogen in conjunction with PFMT before surgery may reduce the incidence of postoperative cystitis within 4 weeks after surgery.



Surgical management



Anterior vaginal prolapse/cystocele

- **Anterior colporrhaphy** with or without mesh/graft material.
 - **Paravaginal repair** – vaginally or retropubically (open/laparoscopic).
- Studies comparing the above approaches are lacking.
- Retrospective case series – recurrence rate of 15–37%.
 - **Cochrane review (2010):**
 - Standard anterior repair is associated with more recurrent cystoceles than with a polyglactin mesh or porcine dermis mesh inlay, polypropylene mesh overlay, or armed transobturator mesh; but data on morbidity and other clinical outcomes are lacking.
 - No differences in subjective outcomes, QOL data, de novo dyspareunia, stress incontinence, re-operation rates for prolapse, or incontinence.
 - Blood loss with transobturator meshes was significantly higher than for native tissue anterior repair.
 - Mesh erosions – 10% of anterior repairs with polypropylene mesh.

Posterior vaginal prolapse/rectocele

- **Posterior colporrhaphy** with or without mesh/graft material.
- **Site-specific repair** – a specific defect in the vaginal muscularis or adventitia is repaired.
- **Levator myorrhaphy** (plication of the medial portion of levator ani) – insufficient evidence to judge the value of levator myorrhaphy during vaginal repair. Its use has been largely abandoned because of dyspareunia except when postoperative sexual activity is not anticipated. (ACOG)
- **Sacral colpoperineopexy** – performed in conjunction with sacral colpopexy, where a mesh is placed along the posterior vagina, all the way to perineal body (open/laparoscopic). Main complication is dyspareunia.
- **Transanal approach** with plication of redundant rectal mucosa and anterior rectal muscle. Transvaginal repair was more effective for subjective symptom relief and recurrence of prolapse.
- **Cochrane review (2010)** – vaginal approach was associated with a lower rate of recurrent rectocele, or enterocele, or both, than the transanal approach, although there was a higher blood loss and postoperative narcotic use. No data on efficacy of polypropylene mesh in the posterior vaginal compartment.

Apical prolapse

- **Abdominal/laparoscopic sacrocolpopexy (ASC)**
- **Vaginal sacrospinous fixation/colpopexy (SSF)**
- **Vaginal uterosacral ligament suspension**
- **Iliococcygeus fixation**
- **Sling procedures/hysteropexy**
- **Colpocleisis**

Use of mesh in prolapse repair surgery

NICE

- Surgical repair of vaginal wall prolapse using mesh may be more efficacious than traditional surgical repair without mesh. Both efficacy and safety vary with different types of mesh, and the data on efficacy in the long term are limited. There is a risk of complications that can cause significant morbidity.
- Insertion of mesh uterine suspension sling (including sacrohysteropexy), infracoccygeal sacropexy using mesh – current evidence on the safety and efficacy is inadequate.
- Therefore, the above procedures should only be used with special arrangements for clinical governance, consent, and audit or research.

ACOG

- Based on currently available limited data, although many patients undergoing mesh augmented vaginal repairs heal well without problems, there seems to be a small but significant group of patients who experience permanent life altering sequelae including pain and dyspareunia.
- Range of mesh-related complications available from RCTs – mesh erosions 5–19%; buttock, groin, pelvic pain 0–10%; de novo dyspareunia 8–28%; re-operation (excluding operation of USI) 3–22%.
- Pelvic organ prolapse: mesh repair should be reserved for high-risk individuals in whom the benefit of mesh replacement may justify the risk, such as individuals with recurrent prolapse (particularly of anterior compartment) or with medical co-morbidities that preclude more invasive lengthier open and endoscopic procedures.

Thank you

<https://www.slideshare.net/OSAMAWARDA/pepvic-organ-prolapseprof-osama-warda>