Vault Prolapse

***Definition**
***Incidence**
***Classifications**
***Etiology**
***Diagnosis:**
  Clinical
  Investigations
***Treatment:**
  Conservative (non-surgical)
  Surgical:
    Prophylactic procedures (methods of vault suspension during 1ry hysterectomy)
    Active (therapeutic) procedures.

Definition:

It is the inversion of the vaginal apex with or without the cervix i.e. before or after hysterectomy.
Many definitions were applied to the term ’vault prolapse’ ; some defined it as vaginal vault prolapse following hysterectomy, others defined it as hernia of Douglas pouch including enterocele, others defined it as uterovaginal prolapse including cystocele. However most gynecologists tend to use this term in association with post-hysterectomy patients.

Enterocele is a hernia of peritoneum through a defect in normal endopelvic fascia resulting in peritoneum (usually containing small bowel) being in direct contact with vaginal epithelium. Therefore, post-hysterectomy enterocele can occur in the absence of vault prolapse if the uterosacral ligaments are intact & the fascial defect is between the rectovaginal & pubocervical fascia.

Incidence:

Vault prolapse ranges between 0.3% and 43% , and up to 30% of operations for prolapse or incontinence are repeat operatios (Toozs- Hobson, 1998).

The reported incidence of *enterocele* following hysterectomy (commonly vaginal hysterectomy for prolapse) ranges between 2% and 6% of cases operated upon (Howkins & Hudson,1977).

Classifications:

(A).Malpas classification (1962):

1-Primary vault prolapse; hernia of cul-de-sac, in presence of the uterus i.e. uterovaginal prolapse.

2-Secondary vault prolapse; post-hysterectomy vault prolapse.

(B).Beecham classification (1980):

[1].Enterocele:

I° = The sac is visible in the vagina when the perineum is depressed.
II° = The sac extends just through the introitus.
III° =The sac extends out the introitus & generally contains small and / or large bowel.

[2]. Post-hysterectomy vault prolapse:

I ° = The vaginal apex is visible when the perineum is depressed.

II ° = The vaginal apex extends just through the introitus.

III ° = The upper 2/3 of the vagina is outside the introitus .The sac will contain bladder, urethra, ureters, and small or large bowel. The evagination is **cranial** to the urogenital diaphragm. Hypermobility of the urethra is *not* significant.

IV ° = The entire vagina is outside the introitus. The sac includes the tissues **caudal** to the urogenital diaphragm. Hypermobility of the urethra is *present* with more than a 90 ° change in the urethral axis.

Etiology : [of enterocele & post-hysterectomy vault prolapse]

(A).General causes of prolapse:
1-Old age; menopausal atrophy.
2-High parity.
3-Chronic increase in intr-abdominal pressure.
4-Pelvic neuropathy; in women with prolapse & incontinence.

(B). Iatrogenic surgical causes: (failed previous repair)
1-Ill-chosen operation.
2-Unrecognized enterocele.
3- Poor surgical technique; especially the shelf closing the space between the bladder and the rectum.
4-Excessive shortening of the vagina; because the vaginal vault becomes exposed to direct intra-abdominal pressure.
5-Post-operative sepsis, or hematoma leads to disruption of the wound.
6-Colposuspension for stress incontinence predispose to vault prolapse & enterocele.

Diagnosis:

(A). Clinical:

I-*Symptoms*: The patient presents with one or more of the following;
1-Mass protruding from the vulva.
2-Difficulties related to defecation(large rectocele).
3-Backache.
4-Urinary symptoms are infrequent with pure enterocele or vault prolapse.

II-*Signs:* (best in standing position).
1-Mass bulging at the vulva on bearing down.
2-Enterocele is demonstrated by asking the patient to strain while speculum is withdrawn from the vagina when the enterocele is found to bulge posterior to the vaginal cuff.
3-Combined rectovaginal examination (Malpas' test) :
The index is introduced through the vagina while the middle finger in the rectum, both fingers are approximated while the patient is bearing down. If the mass hits the tip of the vaginal finger, the mass is *enterocele*. If the mass bulge between the two fingers(via the rectovaginal septum), the mass is *rectocele*.
4-Combined rectal & speculum exam:

The diagnosis of enterocele(or vault prolapse) can be confirmed & differentiated from rectocele by simultaneous PR while the speculum is being withdrawn; the enterocele falls between the speculum blades while the rectal wall maintains contact with the rectal finger.

(B). Investigations:

1-*Plain X-ray* : Evaluation in erect posture of the lower abdomen may demonstrate small & large bowel in the hernia sac(air = radiolucent).

2-*Renal assessment*: Although unusual, upper urinary tract conditions, such as hydronephrosis & even renal failure, have been described with complete prolapse & hence, renal assessment by biochemistry & ultrasound will need to be considered in such patients.

3-*Post-micturition residual urine measurement* by catheterization or ultrasound.

4-*Cystometry*: to discover occult stress incontinence. Also we may use urethro-cystometery & urethral pressure profile, after prolapse reduction.

5-*Dynamic fluoroscopy or ultrasound* can demonstrate the presence or absence of enterocele, which can save tedious dissection during operating on post-hysterectomy vault prolapse.

Treatment:

(A). Conservative (non-surgical) measures:

1-Pelvic floor exercises, electrical stimulation, or weighted cones may still be useful, although after previous failed surgery these are less likely to succeed.
2-Vaginal pessaries: are useful in the frail or infirm, but *no treatment* may be another option for this group also.

(B). Surgical treatment:

[I].Prophylactic surgical procedures:

There are many procedures to be done during *primary hysterectomy* (commonly vaginal) to prevent post-hysterectomy vault prolapse. Some of these are listed in the following table; (for more details see ‘vaginal hysterectomy’).

Procedure	**Peritoneum**	**Ligaments**	**Vaginal skin suture**
1-Shaw’s (Mayo’s)	Purse-string	Criss-cross	Midline
2-Heany’s	Sutured to vagina	Included in peritoneal &vaginal suture.	Transversly.
3-TeLinde’s	Purse-string	Fixed to lateral vaginal wall.	Midline.
4-Thomson(Vienna) [1966]	-2 lateral angles separately plicated -Midline part transversely sutured.	Fixed to lateral vaginal wall (as above).	Not closed, but packed through, aiming that fibrosis will support.
5-Geary[1972]	Anterior & posterior angles are separately plicated.	Ligaments are brought together in midline.	Transversly
6-Mc Call’s[1957]	Sutured to the vagina (full thickness)	Uterosacral ligament included in vaginal & peritoneal sutures.	Transversly.

[II]. Active surgical procedures:

-Age per se is not a major risk factor under 80 years.

-The procedure depends on whether the uterus is present or previously removed.

(a).Uterus Present:[=Repair of hernia of Douglas' pouch, enterocele]

According to the approach, there may be vaginal or abdominal procedures;

(1). Vaginal method of repair:

-Should be the primary line of repair.

-Included as additional step in the chosen operation for repair of prolapse (e.g. Fothergill, classical repair, vaginal hysterectomy).

-It entails the following additional steps;

i-Dissection of the posterior vaginal wall up to the posterior fornix from the anterior rectal wall.

ii-Herniectomy; The sac is cleansed of intestine, transfixed at its neck(level of the uterosacral ligaments), then excised.

iii-Herniorrhaphy; (=Repair of the posterior defect);

- The uterosacrals sutured together in front of the rectum.
- Pre-rectal fascia fixed to uterosacrals.
- Rectal pillars are sutured from above downwards.
- Pre-rectal fascia may be used to fortify the 'keel' formed by rectal pillars supporting rectum & closing the gap between the rectosigmoid & uterosacrals.
- Finally, the levator ani are sutured with care taken to fix the upper stitch to the lower uterosacral stitch to obliterate the gap.

(2). Abdominal method of repair (Moschowitz's operation):

The pouch of Douglas is obliterated by inserting 2 or 3 ties of purse-string sutures.Care is taken not to include the ureter. Howkins & Hudson (1977) did not recommend this operation as a primary treatment for enterocele.

(b). Uterus previously removed: [= treatment of post-hysterectomy vault prolapse]

According to the approach, there may be vaginal or abdominal procedures;

(1). Vaginal procedures:

1- McCall's culdoplasty with uterosacral ligament suspension(1957):

The uterosacral ligament is identified posterior & medial to the ischial spine, close to the sacrum. It has been suggested that laparoscopy could be used to identify & tag the uterosacral ligaments. Separate sutures placed through the full thickness of the vaginal skin, peritoneum, and uterosacral ligaments so as to obliterate the cul-de-sac, and suspend the vault by the uterosacral ligaments. Originally, Mc Call used silk but in 20% of cases suture needed to be removed, so recently, delayed absorbable suture material such as polyglycolic acid may be preferable.

2- Sacrospinous fixation:

This procedure is indicated in total vaginal inversion when there is difficulty to identify the uterosacral ligament strength (Nichols, 1996). This procedure entails *unilateral* fixation(usually sufficient) of the vault to the *right* sacrospinous ligament.

3- Iliococcygeal fixation of the vault:

This procedure is an alternative to the sacrospinous fixation, but the vault is fixed to the iliococcygeus muscle instead of the sacrospinous ligament.

4- An operation similar to clssical repair with opening the peritoneal pouches & suturing any identifiable ligaments to the vaginal vault.

5- Partial vaginectomy:

This procedure is indicated in old, frail woman who is sexually inactive.

6- Le Fort partial colpocleisis:

This procedure may be done under local anesthesia in frail, old women who are sexually inactive.

(2). Abdominal procedures:

All these procedures can be done through laparotomy or laparoscopy.

1- Burch colposuspension (1968):

The vaginal vault is fixed to the *pectineal ligament* using non-absorbable suture. It was originally described in the management of stress urinary incontinence.

2- Beecham & Beecham colposuspension (1973):

The vaginal vault is fixed to the *anterior abdominal wall* using either autologous fascia lata strips or synthetic slings e.g. Dacron tape.

3- Yates sacrocolpopexy (1975):

The vaginal vault is fixed to the *3rd piece of the sacrum* using non-absorbable suture.

4-Toozs- Hobson sacrocolpopexy (1998):

It is a sacropexy *interposing mesh* between vagina & sacrum.

Comparison of different methods of vaginal vault prolapse

Method of repair	**Advantages**	**Disadvantages**
1-McCall culdoplasty	-Low risk -Good results	Difficulty in identifying uterosacrals in advanced cases.
2-High uterosacral suspension & fascial defect repair	Anatomically based	-Difficulty in identifying defect. -Minimal published data. Risk of ureteric occlusion.
3-Sacrospinous fixation	-Good published data -Easily learnt.	-Relies on small area of support. -Unilateral fixation leaves other side unsupported. -Risk of serious complications(bleeding from hypogastric plexus or inferior gluteal artery injury).
4-Open sacrocolpopexy	-Good published results -Can combine with colposuspension for stress incontinence.	-High risk of morbidity. -May need vaginal repair of other defects.
5-Laparoscopic sacro-colpopexy	-Low morbidity -Can combine with colposuspension for stress incontinence.	-Long learning curve -Expensive -Success data awaited.

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