# PELVIC ORGAN PROLAPSE

Herzog

# Definition

- The International Urogynecological Association/International Continence Society (IUGA/ICS) joint report on the terminology of female pelvic floor dysfunction defines pelvic organ prolapse (POP) as "**the descent of one or more of the anterior vaginal wall, posterior vaginal wall, or the apex of the vagina (vaginal vault or cuff scar after hysterectomy)**".
- POP is a condition that occurs when the normal support of the pelvic floor has weakened.
- The recommended terminology is anterior and posterior vaginal wall prolapse, rather than "cystocele" and "rectocele," since we cannot completely discern (on physical exam) the anatomy behind the "bulge".

# Risk Factors for POP

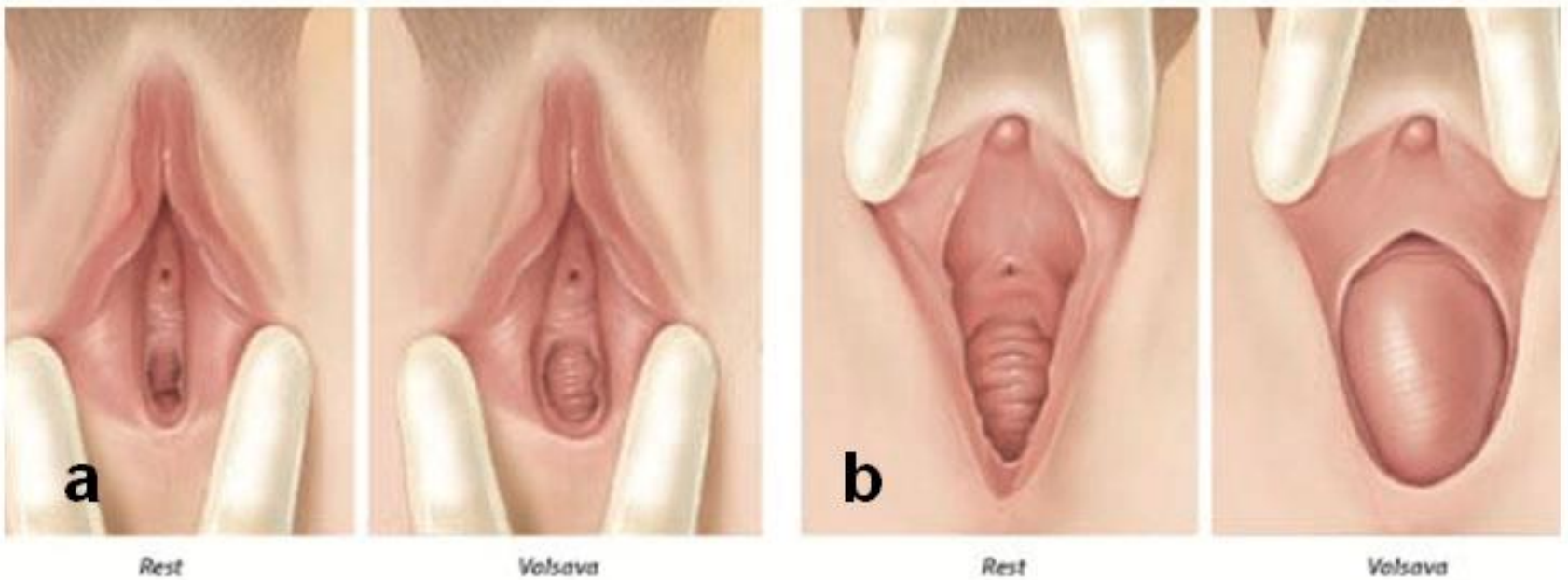
- Vaginal parity (cumulative)
- Advancing maternal age
- Infant size
- Race (Caucasian or Hispanic)
- Operative delivery (forceps, vacuum)
- Estrogen status (use of HRT might be protective)
- Pelvic surgery
- Increased abdominal straining (obesity, smoking, lung disease)

# Staging

| POPQ Staging of Pelvic Organ Prolapse | |
|---|---|
| Stage 0 | No prolapse |
| Stage I | Most distal portion of prolapse is 1 cm above the level of the hymen |
| Stage II | Most distal portion of prolapse is 1 cm distal or proximal to the hymenal plane |
| Stage III | Most distal portion is more than 1 cm below the hymen but protrudes no further than 2cm less the total vaginal length (TVL) |
| Stage IV | Complete vaginal eversion |

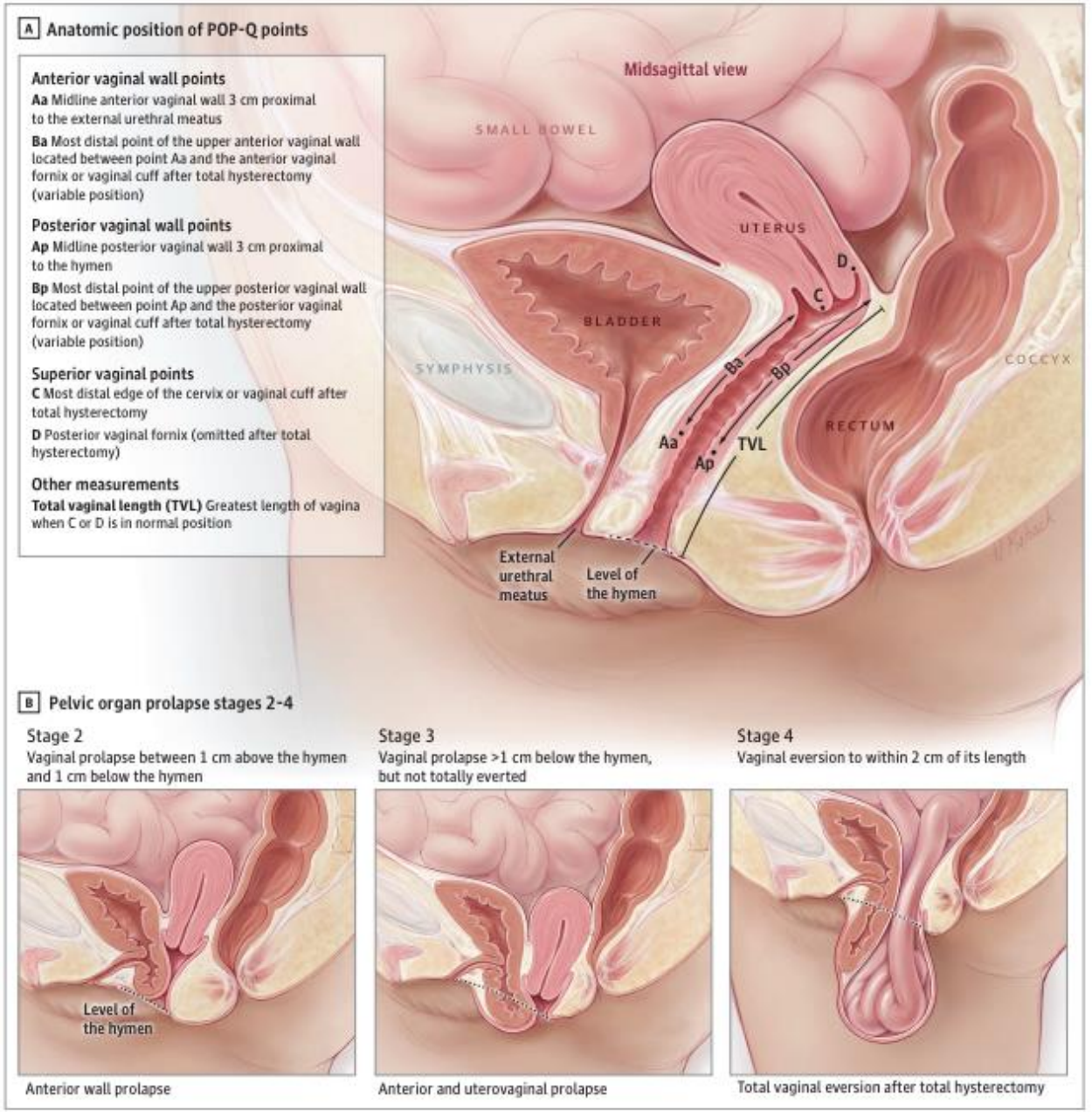
**Less than 7% of women have ideal support and at least 50% of women will have widening of the genital hiatus and visible movement of the anterior or posterior vaginal wall when the patient is straining on physical exam**

# Exam

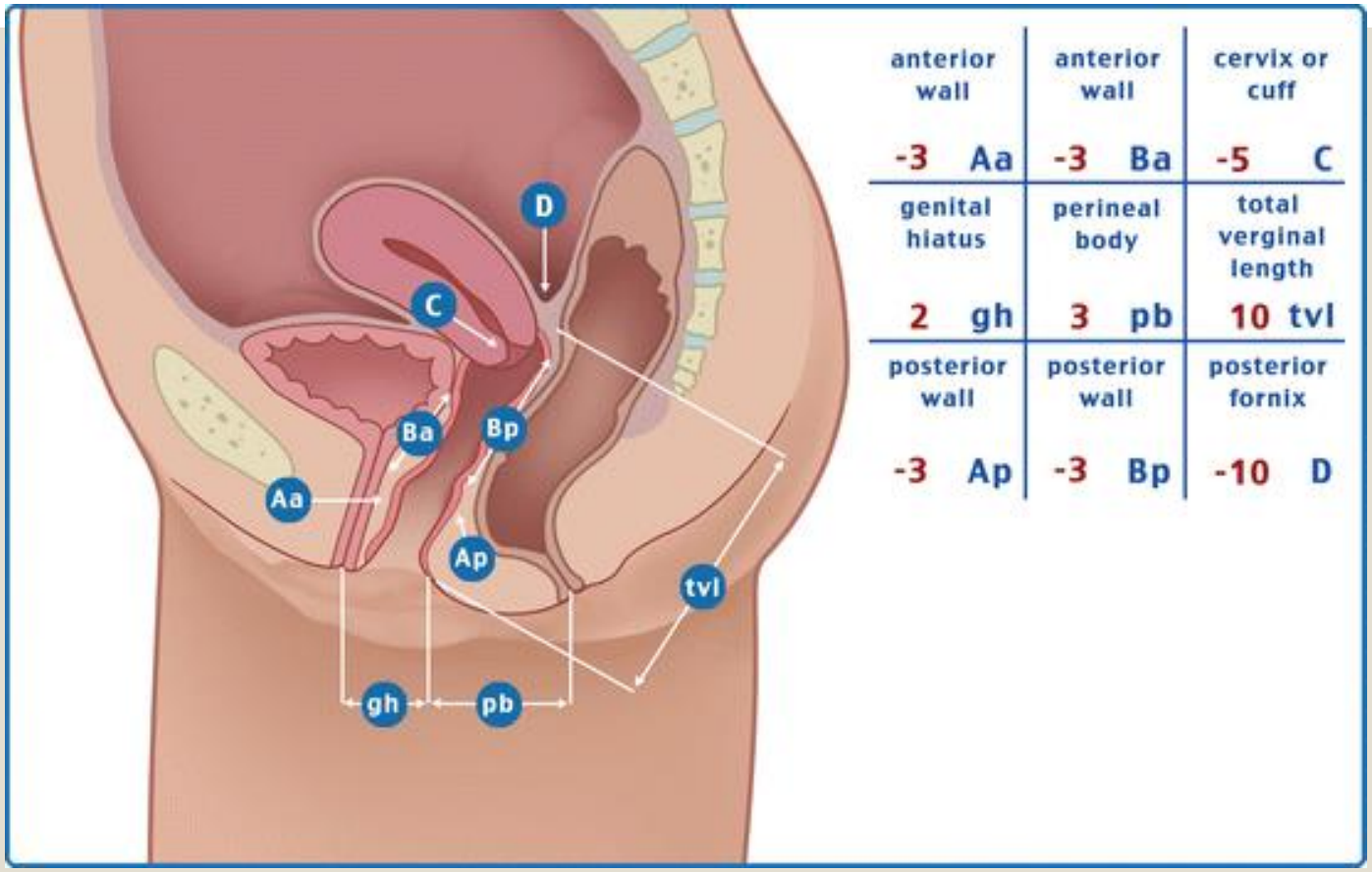



Visual examination of the pelvic floor at rest and with Valsalva in (a) nulliparous woman with no prolapse and (b) parous woman with apical and anterior vaginal wall descent.

Figure 1. Pelvic Organ Prolapse Quantification (POP-Q) Stages




The POP-Q points[13] are used to assess a woman's stage of pelvic organ prolapse on examination. The locations of these points are shown in panel A. This panel shows normal anatomy, most frequently seen in nulliparous women. In this trial, eligible patients included women planning vaginal surgery for stages 2 through 4 vaginal prolapse, illustrated in panel B. Descent of POP-Q point C with the Valsalva maneuver more than one-third of the total vaginal length and location of POP-Q points Aa, Ba, Ap, or Bp with the Valsalva maneuver beyond the hymen were among the criteria for surgical failure in this trial.




| anterior wall | anterior wall | cervix or cuff |
|---|---|---|
| -3 Aa | -3 Ba | -5 C |
| genital hiatus | perineal body | total verginal length |
| 2 gh | 3 pb | 10 tvl |
| posterior wall | posterior wall | posterior fornix |
| -3 Ap | -3 Bp | -10 D |

The patient is positioned where the utmost magnitude of the prolapse is shown and can be confirmed by the patient. Positions may include supine, standing or in a birthing chair at 45 degree angle. A Sim's speculum can be used if needed to draw back the anterior and posterior vaginal walls during the examination. All methods and positions utilised during the examination should be documented so that they can be reproduced

https://pop-q.netlify.app/

# Signs and symptoms of POP

- Voiding dysfunction/urinary incontinence (bulge extends beyond hymen)
- Pelvic pressure, back pain, pelvic pain, sensation of vaginal bulge
- Presence of vaginal bulge (most associated with objective POP)

- Numerous studies report either weak or absent association between posterior vaginal support and specific anorectal symptoms.
- The symptoms of a feeling of incomplete emptying, straining to defecate, splinting, and fecal urgency or incontinence often predate the finding of POP and may be secondary to **pelvic floor neuropathy**

# Conservative treatment of POP

- Prolapse is life altering, not life threatening
- Women who are not **bothered** by the symptoms or physical presence of a bulge can be followed with periodic exams
- **Exceptions** are women who develop signs or symptoms that they may not attribute to the POP such as **urinary retention resulting in overflow incontinence or recurrent symptomatic UTIs**
- Women **rarely** have **severe consequences due to voiding obstruction** caused by prolapse because at night, **a supine position often reduces the POP and the lower urinary tract obstruction is relieved**.

# Conservative treatment of POP

- While the condition of pelvic organ prolapse is not improved with the use of **vaginal estrogen**, **symptoms** such a **vaginal introital burning or dyspareunia** that are attributed to POP in post-menopausal women, can be alleviated
- A 2010 Cochrane review demonstrated that the use of transvaginal estrogen in conjunction with physical therapy may reduce the incidence of post-operative cystitis within the first four weeks after surgery.
- A typical regime consists of 200-400 micrograms of estradiol placed into the vagina before bed nightly for two weeks followed by a maintenance dose of 100 micrograms at night twice a week.
  - Each gram contains 0.625 mg conjugated estrogens, USP.
  - *Combination package:* Each contains a net wt. 1.06 oz (30 g) tube with plastic applicator(s) calibrated in 0.5 g increments to a maximum of 2 g.

# Conservative treatment of POP

- <u>Physical therapy (PT)</u>
  - If physical symptoms (pelvic heaviness, pressure or the sensation of "something falling out of the vagina") are **greater than objective evidence** of POP, PT can be beneficial
  - Will not change POPQ, but may improve symptoms (pelvic pressure, associated urinary incontninence)
  - **Myofascial release and core strengthening including the hips, back and abdomen.**

# Conservative treatment of POP

- Pessaries
  - Can be used as single treatment for POP and urinary incontinence
  - Most women who are sexually active tend to prefer surgery to conservative treatments however, reduced POP-related bother, symptoms, and improvement in perception of body image
  - **Since pessaries can also be used for stress urinary incontinence can be employed as a single treatment for both stress incontinence and POP and are useful also in short-term situations until a woman can undergo surgery.**

# Pessaries

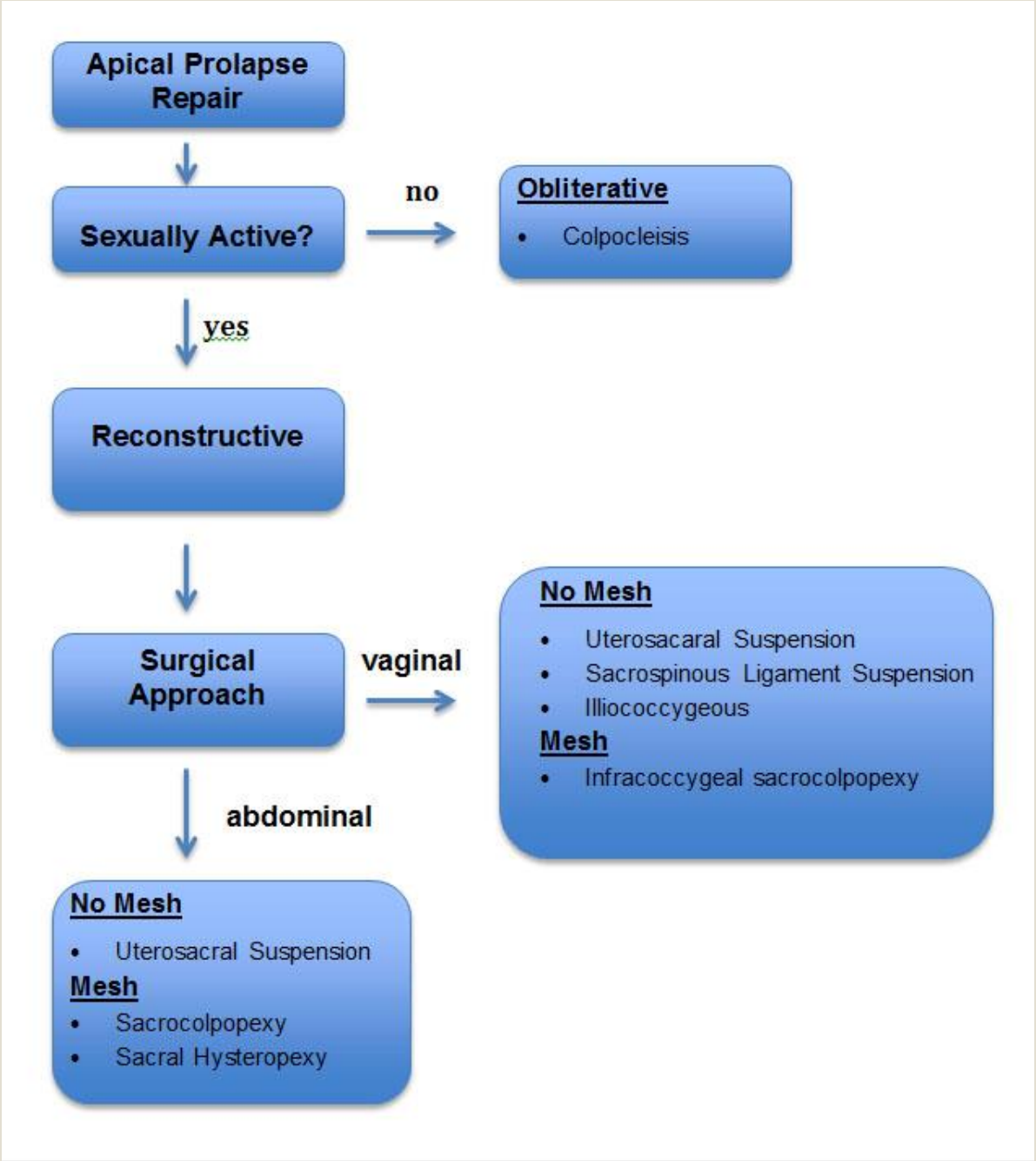
- Pessary trials can assist with guiding surgical therapy by revealing occult incontinence allowing counseling regarding concomitant treatment of stress incontinence.
- Women can learn to remove, clean and place pessaries unless they have physical limitations.
- **Pessaries should be taken out and left out overnight 2-3 times a week.**
- **Women who cannot remove their pessaries themselves, can leave a pessary in continuously but require office exams every 3-6 months to assess the vaginal walls for erosion**.

- **Consider starting intravaginal estrogen to prevent erosion**

# Surgical treatment for POP

- A recent study of > 2,500 women who underwent POP repair and were followed for 2 years found that 84% were satisfied with the outcome and 90% reported an improvement compared to their pre-operative state.
- Multiple support defects often co-exist
- Ensure adequate apical suspension ("cornerstone of a successful POP repair")
- Procedures:
  - Obliterative (no longer desire sexual intercourse due to advanced age, medical comorbidities, or lack of partner who has functional erections)
  - Reconstructive

# Algorithm for Surgical Repair of Apical Prolapse



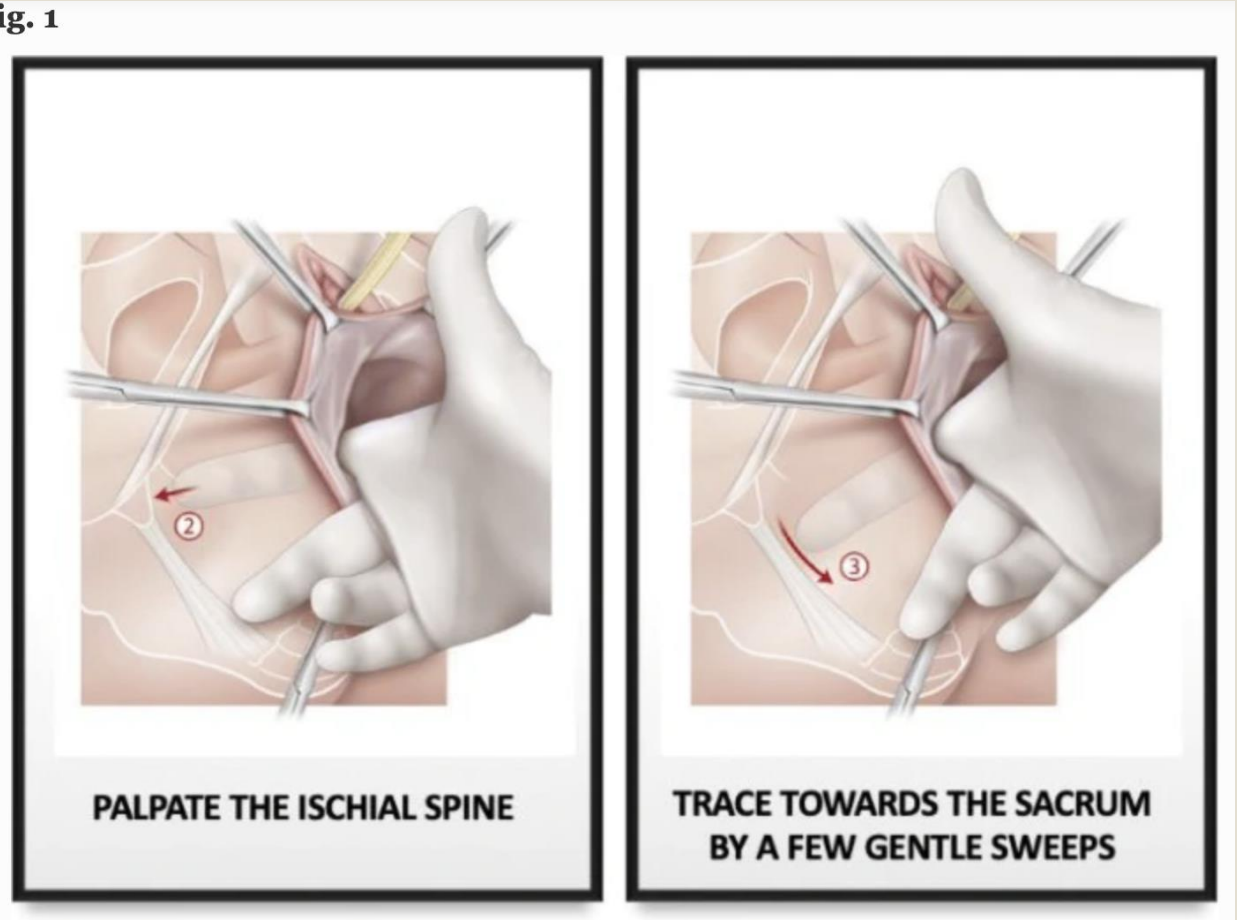
# OBLITERATIVE PROCEDURE

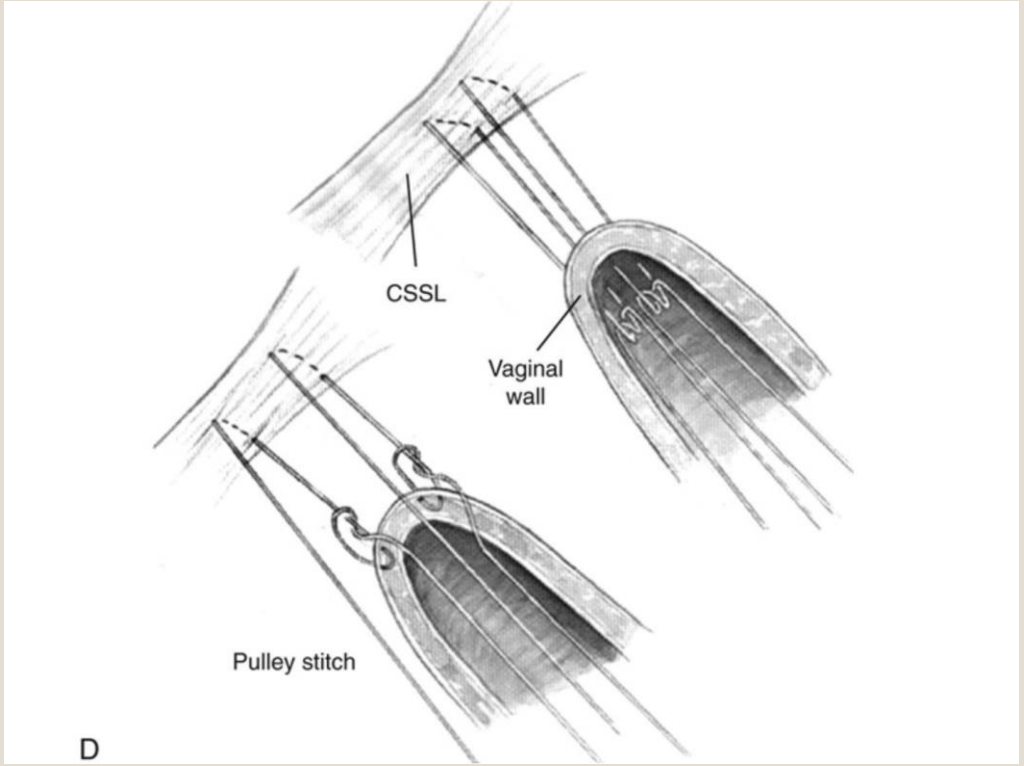
- Elderly women
- No longer desire sexual intercourse
- Shorter operative time
- Decrease peri-operative morbidity
- Low risk of POP recurrence
  - **Reoperation rates at 1 year are 1%, and 95% of patients report being satisfied with the outcome of surgery.**
- Total colpocleisis versus LeFort partial colpocleisis (if uterus in situ)
- A total colpocleisis includes removal of the vaginal epithelium, whereas a partial colpocleisis refers to leaving some portion of the lateral vaginal epithelium to provide drainage tracts in a woman with a uterus.
- Some surgeons **advise Pap smear testing and endometrial evaluation (e.g. transvaginal sonogram, endometrial biopsy) prior to performing a colpocleisi**s as the vaginal tract will be obliterated after the procedure thereby precluding future testing.

# RECONSTRUCTIVE PROCEDURES

- Vaginal
  - Sacrospinous ligament suspension (SSLS)
    - The suspension is often performed with a concomitant hysterectomy
    - Transvaginal suspension of vaginal apex to sacrospinous ligament (SSL), unilateral (usually) or bilateral, **extraperitoneal**
    - Ensure sufficient vaginal length to reach SSL
    - Cure rates 63-97%
    - Complications: dyspareunia, gluteal pain, anterior vaginal wall recurrence

**Fig. 1**


PALPATE THE ISCHIAL SPINE
TRACE TOWARDS THE SACRUM
BY A FEW GENTLE SWEEPS


CSSL
Vaginal
wall
Pulley stitch
D

# RECONSTRUCTIVE PROCEDURES

- Vaginal
  - Uterosacral ligament suspension
    - Vaginal apex attached to bilateral uterosacral ligaments, intraperitoneal
    - At 4 years follow-up, 5% recurrence of grade 2 or higher POP
    - Complications: ureteral obstruction (11%), nerve injury, suture erosion
    - Intraoperative cystoscopy essential
    - Similar anatomic, functional, and adverse event outcomes to SSLS

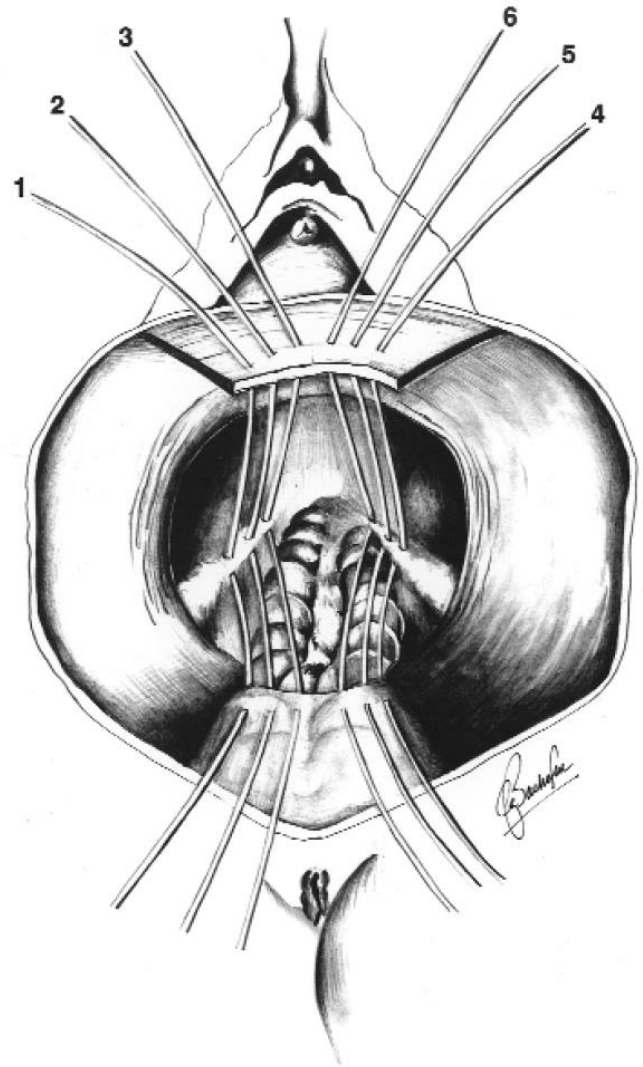



**Fig 1.** Three sutures are placed in uterosacral ligament pedicles on each side. One arm of each suture is placed in transverse portion of pubocervical and rectovaginal fascia.

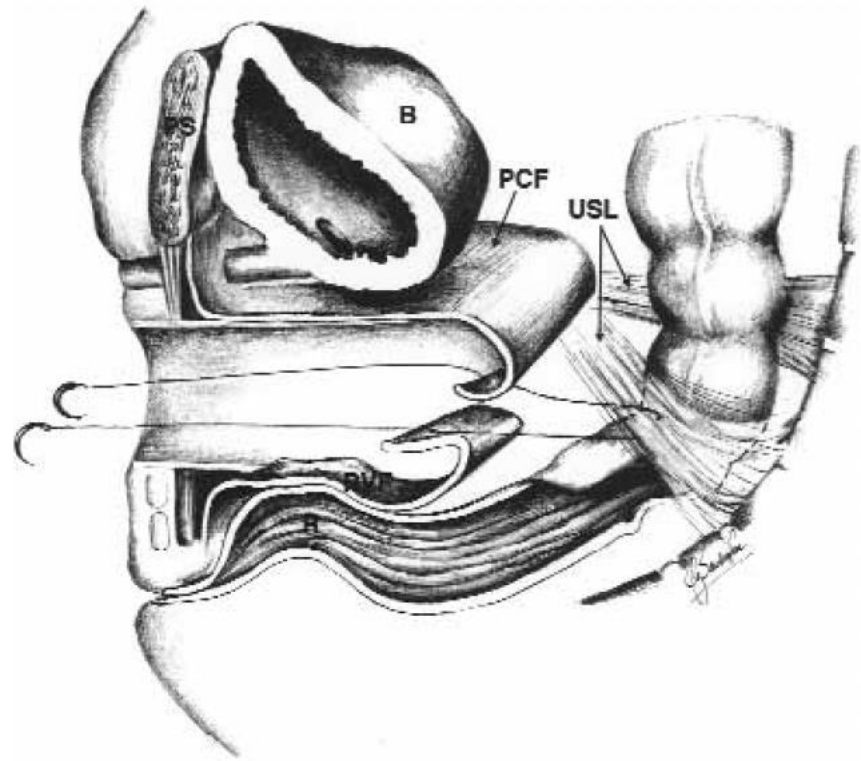



**Fig 2.** Sagittal view of suspensory suture in left uterosacral ligament *(USL)* with one arm through pubocervical fascia *(PCF)* and one arm through rectovaginal fascia *(RVF)*. *PS*, Pubic symphysis; *B*, bladder.

JAMA | Original Investigation

# Effect of Uterosacral Ligament Suspension vs Sacrospinous Ligament Fixation With or Without Perioperative Behavioral Therapy for Pelvic Organ Vaginal Prolapse on Surgical Outcomes and Prolapse Symptoms at 5 Years in the OPTIMAL Randomized Clinical Trial

J. Eric Jelovsek, MD, MMEd; Matthew D. Barber, MD, MHS; Linda Brubaker, MD, MS; Peggy Norton, MD; Marie Gantz, PhD; Holly E. Richter, PhD, MD; Alison Weidner, MD; Shawn Menefee, MD; Joseph Schaffer, MD; Norma Pugh, MS; Susan Meikle, MD, MSPH; for the NICHD Pelvic Floor Disorders Network

**Objective** To compare outcomes in women randomized to (1) ULS or SSLF and (2) usual care or perioperative behavioral therapy and pelvic floor muscle training (BPMT) for vaginal apical prolapse.

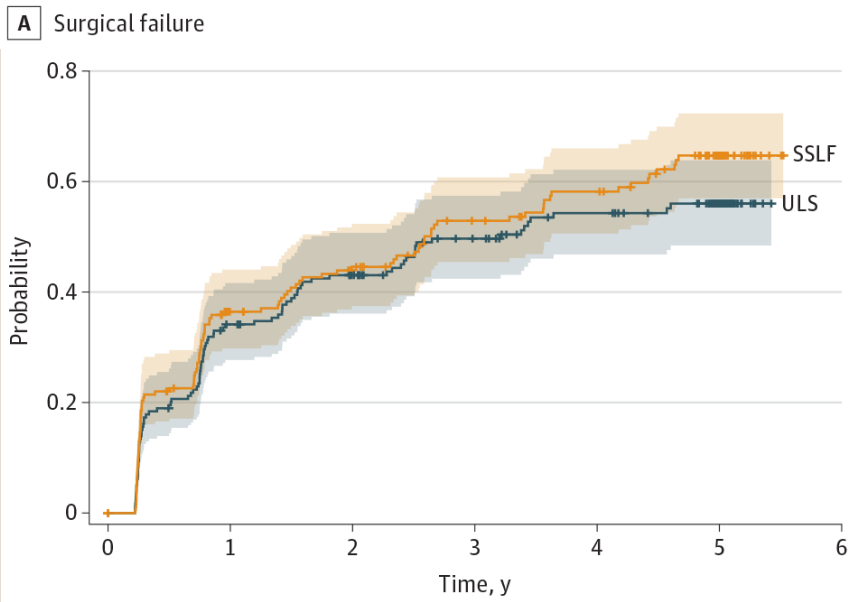
**Design, Setting, and Participants** This 2 × 2 factorial randomized clinical trial was conducted at 9 US medical centers. Eligible participants who completed the Operations and Pelvic Muscle Training in the Management of Apical Support Loss Trial enrolled between January 2008 and March 2011 and were followed up 5 years after their index surgery from April 2011 through June 2016.

**Interventions** Two randomizations: (1) BPMT (n = 186) or usual care (n = 188) and (2) surgical intervention (ULS: n = 188 or SSLF: n = 186).

**Main Outcomes and Measures** The primary surgical outcome was time to surgical failure. Surgical failure was defined as (1**) apical descent greater than one-third of total vaginal length or anterior or posterior vaginal wall beyond the hymen or retreatment for prolapse (anatomic failure), or (2) bothersome bulge symptoms.** The primary behavioral outcomes were time to anatomic failure and Pelvic Organ Prolapse Distress Inventory scores (range, 0-300).

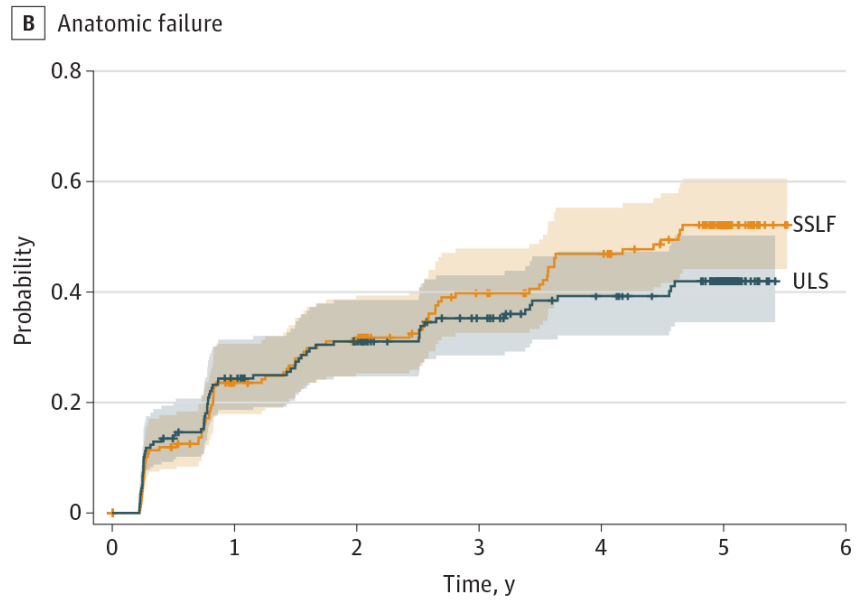
**Results** The original study randomized 374 patients, of whom 309 were eligible for this extended trial. For this study, 285 enrolled (mean age, 57.2 years), of whom 244 (86%) completed the extended trial. **By year 5, the estimated surgical failure rate was 61.5% in the ULS group and 70.3% in the SSLF group (adjusted difference, −8.8% [95% CI, −24.2 to 6.6]). The estimated anatomic failure rate was 45.6% in the BPMT group and 47.2% in the usual care group (adjusted difference, −1.6% [95% CI, −21.2 to 17.9]).** Improvements in Pelvic Organ Prolapse Distress Inventory scores were −59.4 in the BPMT group and −61.8 in the usual care group (adjusted mean difference, 2.4 [95% CI, −13.7 to 18.4]).

**Conclusions and Relevance** Among women who had undergone vaginal surgery for apical pelvic organ vaginal prolapse, there was **no significant difference between ULS and SSLF in rates of surgical failure and no significant difference between perioperative behavioral muscle training and usual care on rates of anatomic success and symptom scores at 5 years. Compared with outcomes at 2 years, rates of surgical failure increased during the follow-up period, although prolapse symptom scores remained improved**.



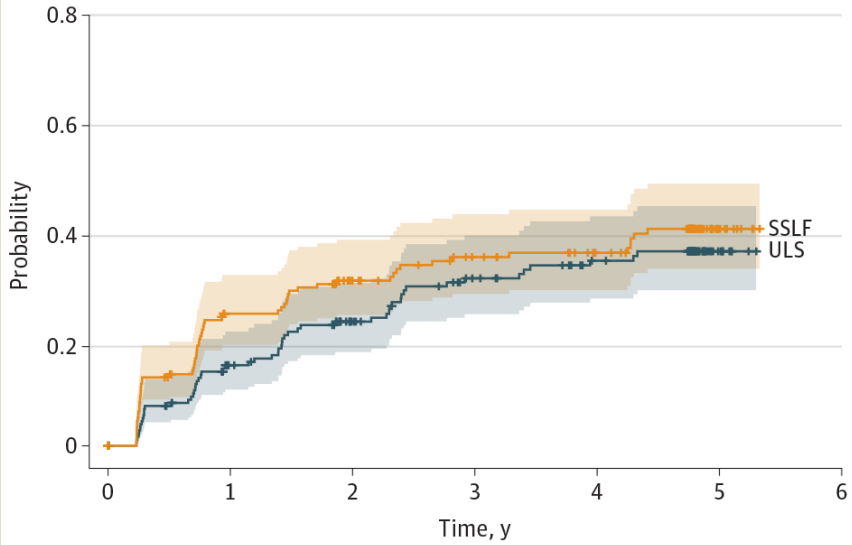

No. at risk

| | | | | | | |
|---|---|---|---|---|---|---|
| ULS | 188 | 115 | 93 | 72 | 58 | 33 |
| SSLF | 186 | 104 | 86 | 65 | 55 | 26 |



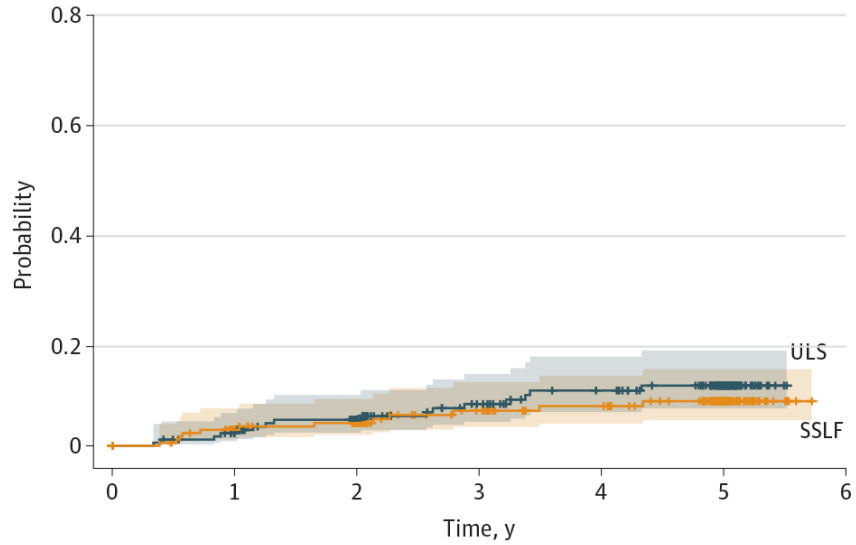

No. at risk

| | | | | | | |
|---|---|---|---|---|---|---|
| ULS | 188 | 130 | 110 | 88 | 73 | 42 |
| SSLF | 186 | 124 | 105 | 80 | 67 | 35 |




No. at risk

| | | | | | | |
|---|---|---|---|---|---|---|
| ULS | 188 | 143 | 113 | 92 | 79 | 9 |
| SSLF | 186 | 128 | 104 | 88 | 78 | 9 |




No. at risk

| | | | | | | |
|---|---|---|---|---|---|---|
| ULS | 188 | 167 | 146 | 122 | 108 | 62 |
| SSLF | 186 | 159 | 146 | 120 | 110 | 63 |

Table 2. Estimated Adjusted Probability of Pelvic Organ Prolapse Failure After Vaginal Prolapse Surgery

| Outcome | No. With Outcome/Total No. (%)[a] | | Adjusted Probability of Prolapse (95% CI)[b] | | Adjusted Treatment Difference[b] | *P* Value |
|---|---|---|---|---|---|---|
| | ULS | SSLF | ULS | SSLF | | |
| **Primary** | | | | | | |
| Surgical failure[c] | | | | | | |
| 6 mo | 34/177 (19.2) | 39/177 (22) | 0.237 (0.157 to 0.318) | 0.248 (0.154 to 0.343) | −0.011 (−0.135 to 0.113) | .86 |
| 1 y | 59/177 (33.3) | 63/172 (36.6) | 0.34 (0.25 to 0.43) | 0.376 (0.269 to 0.483) | −0.036 (−0.175 to 0.103) | .60 |
| 2 y | 76/172 (44.2) | 76/166 (45.8) | 0.457 (0.358 to 0.555) | 0.52 (0.406 to 0.633) | −0.063 (−0.213 to 0.087) | .40 |
| 3 y | 87/158 (55.1) | 89/154 (57.8) | 0.527 (0.425 to 0.63) | 0.604 (0.489 to 0.718) | −0.076 (−0.23 to 0.078) | .32 |
| 4 y | 92/150 (61.3) | 96/148 (64.9) | 0.577 (0.472 to 0.682) | 0.661 (0.547 to 0.774) | −0.084 (−0.238 to 0.071) | .28 |
| 5 y | 94/145 (64.8) | 104/146 (71.2) | 0.615 (0.508 to 0.722) | 0.703 (0.591 to 0.814) | −0.088 (−0.242 to 0.066) | .25 |
| **Secondary** | | | | | | |
| Anatomic failure[d] | | | | | | |
| 6 mo | 24/176 (13.6) | 22/176 (12.5) | 0.17 (0.094 to 0.246) | 0.149 (0.07 to 0.228) | 0.021 (−0.088 to 0.131) | .69 |
| 1 y | 44/175 (25.1) | 41/169 (24.3) | 0.247 (0.158 to 0.335) | 0.262 (0.161 to 0.363) | −0.015 (−0.15 to 0.119) | .82 |
| 2 y | 54/167 (32.3) | 54/163 (33.1) | 0.338 (0.236 to 0.441) | 0.408 (0.288 to 0.527) | −0.069 (−0.226 to 0.088) | .37 |
| 3 y | 62/149 (41.6) | 66/145 (45.5) | 0.397 (0.286 to 0.508) | 0.501 (0.374 to 0.628) | −0.104 (−0.272 to 0.065) | .22 |
| 4 y | 65/139 (46.8) | 73/138 (52.9) | 0.441 (0.324 to 0.558) | 0.568 (0.437 to 0.698) | −0.127 (−0.301 to 0.048) | .15 |
| 5 y | 68/133 (51.1) | 80/134 (59.7) | 0.475 (0.354 to 0.597) | 0.618 (0.487 to 0.749) | −0.143 (−0.321 to 0.035) | .11 |
| Bothersome bulge symptoms[e] | | | | | | |
| 6 mo | 13/177 (7.3) | 22/175 (12.6) | 0.08 (0.033 to 0.128) | 0.127 (0.053 to 0.201) | −0.046 (−0.135 to 0.042) | .29 |
| 1 y | 24/172 (14) | 40/172 (23.3) | 0.141 (0.081 to 0.2) | 0.195 (0.103 to 0.286) | −0.054 (−0.164 to 0.056) | .32 |
| 2 y | 38/165 (23) | 51/168 (30.4) | 0.226 (0.153 to 0.3) | 0.281 (0.172 to 0.39) | −0.055 (−0.188 to 0.078) | .40 |
| 3 y | 48/146 (32.9) | 56/148 (37.8) | 0.287 (0.203 to 0.372) | 0.339 (0.22 to 0.459) | −0.052 (−0.2 to 0.096) | .48 |
| 4 y | 53/138 (38.4) | 59/144 (41) | 0.335 (0.242 to 0.429) | 0.383 (0.256 to 0.51) | −0.048 (−0.208 to 0.112) | .54 |
| 5 y | 56/133 (42.1) | 64/134 (47.8) | 0.374 (0.273 to 0.476) | 0.418 (0.286 to 0.55) | −0.044 (−0.213 to 0.125) | .60 |

Abbreviations: SSLF, sacrospinous ligament fixation; ULS uterosacral ligament suspension.

[a] Numerator is the number of participants classified at the time point or a prior point as a failure; denominator includes all participants in the numerator plus participants evaluated at the point or a later point as a success who had not previously been classified as a failure.

[b] Based on accelerated failure time, frailty models controlling for behavioral therapy and pelvic floor muscle training group and concomitant or prior hysterectomy as independent variables and surgeon as a random frailty effect.

[c] Surgical failure was defined as Pelvic Organ Prolapse Quantification (POP-Q) point C descended more than one-third of total vaginal length; POPQ points Aa, Ba, Ap, or Bp were beyond the hymen; bothersome vaginal bulge symptoms were reported by the participant; or the participant received retreatment. The apex is point C (cervix), and posteriorly is point D (pouch of Douglas). In women after hysterectomy, point C is the vaginal cuff and point D is omitted.

[d] Anatomic failure was defined as POPQ system point C descended more than one-third of total vaginal length; POPQ points Aa, Ba, Ap, or Bp were beyond the hymen; or the participant received retreatment during follow-up.

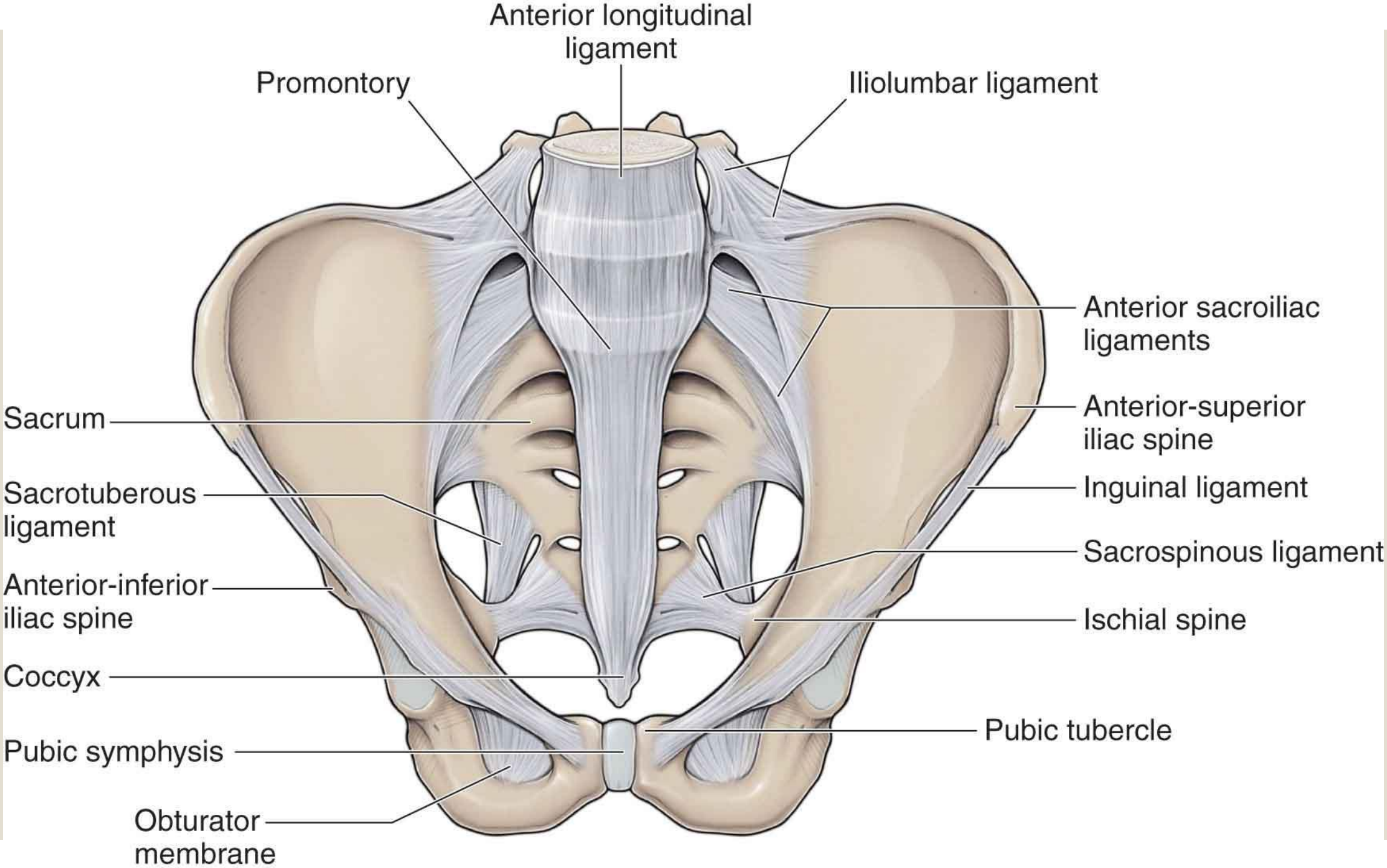
[e] Bothersome bulge symptoms were reported by the participant in response to the questions, "Do you usually have a sensation of bulging or protrusion from the vaginal area?" or "Do you usually have a bulge or something falling out that you can see or feel in the vaginal area?" on the Pelvic Floor Disorders Inventory.

Table 3. Secondary Outcomes of Cumulative Rates of Granulation Tissue, Suture Exposure, Mesh Erosion or Exposure, and Repeat Surgery

| Outcome | No./Total No. (%) | | Adjusted Risk Difference, % (95% CI) for ULS vs SSLF at 5 y[a] |
|---|---|---|---|
| | ULS | SSLF | |
| Granulation tissue | | | |
| 2 y | 32/147 (21.8) | 20/138 (14.5) | |
| 3 y | 32/136 (23.5) | 20/128 (15.6) | |
| 4 y | 34/127 (26.8) | 20/118 (16.9) | |
| 5 y | 35/121 (28.9) | 21/112 (18.8) | 10.5 (−0.2 to 21.2) |
| Suture exposure | | | |
| 2 y | 27/147 (18.4) | 26/138 (18.8) | |
| 3 y | 28/137 (20.4) | 27/130 (20.8) | |
| 4 y | 30/127 (23.6) | 29/122 (23.8) | |
| 5 y | 31/120 (25.8) | 29/113 (25.7) | 0.3 (−10.8 to 11.4) |
| Midurethral sling erosion or exposure | | | |
| 2 y | 1/147 (0.7) | 1/137 (0.7) | |
| 3 y | 1/134 (0.7) | 3/127 (2.4) | |
| 4 y | 1/122 (0.8) | 4/117 (3.4) | |
| 5 y | 2/113 (1.8) | 4/108 (3.7) | −1.9 (−6.2 to 2.4) |
| Pelvic organ prolapse surgery | | | |
| 2 y | 4/147 (2.7) | 2/138 (1.4) | |
| 3 y | 7/133 (5.3) | 3/126 (2.4) | |
| 4 y | 9/117 (7.7) | 4/110 (3.6) | |
| 5 y | 10/118 (8.5) | 5/110 (4.5) | 3.9 (−2.5 to 10.3) |

# RECONSTRUCTIVE PROCEDURES

- Abdominal sacrocolpopexy (ASC)
  - Synthetic **mesh placed on anterior and posterior vagina and suspended to anterior longitudinal ligament at S1-S2 (open approaches) or the sacral promontory (minimally invasive approach).**
  - **Lower rate of recurrent prolapse and less post-operative dyspareunia compared to SSLS, but higher costs and longer operative times**
  - Open or minimally invasive approaches
    - Similar operative times and 1-year anatomic outcomes, minimally invasive approach with less post-operative pain
  - The 2016 Cochrane review of surgery for women with apical POP included 20 RCT's (3414 women) and concludes that sacrocolpopexy is associated with a lower risk of awareness of prolapse, recurrent prolapse on examination, repeat surgery for prolapse, post-operative SUI and dyspareunia than a variety of vaginal intervention


Anterior longitudinal ligament
Promontory
Iliolumbar ligament
Anterior sacroiliac ligaments
Sacrum
Anterior-superior iliac spine
Sacrotuberous ligament
Inguinal ligament
Sacrospinous ligament
Anterior-inferior iliac spine
Ischial spine
Coccyx
Pubic tubercle
Pubic symphysis
Obturator membrane

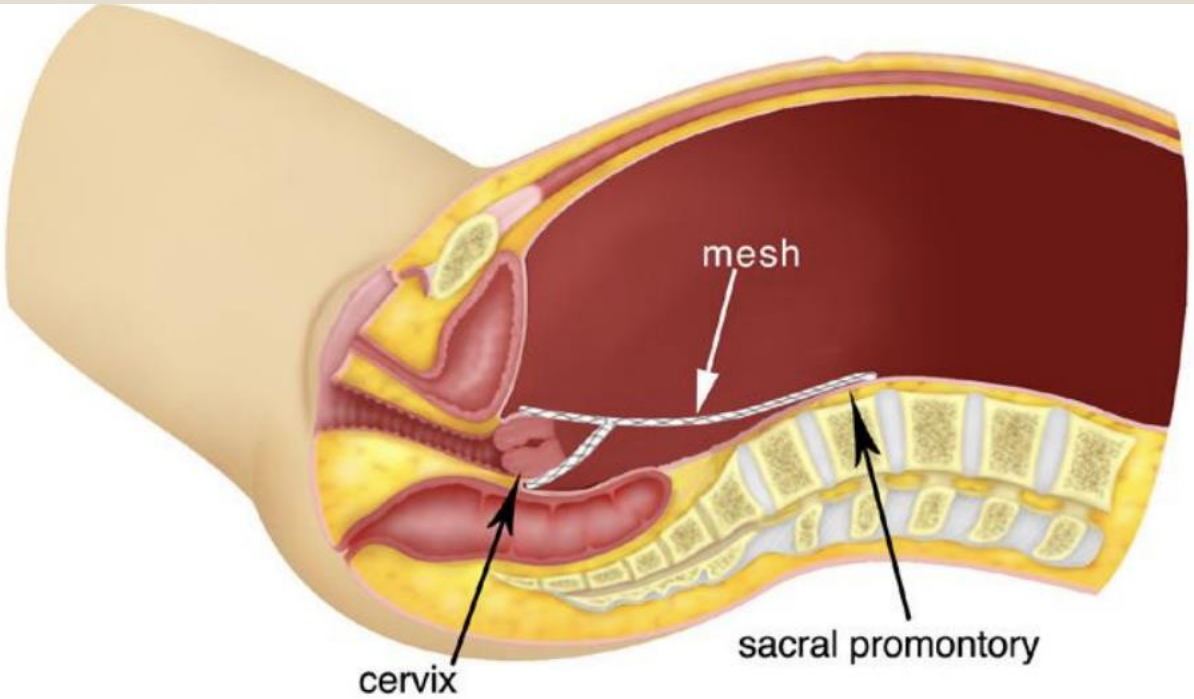
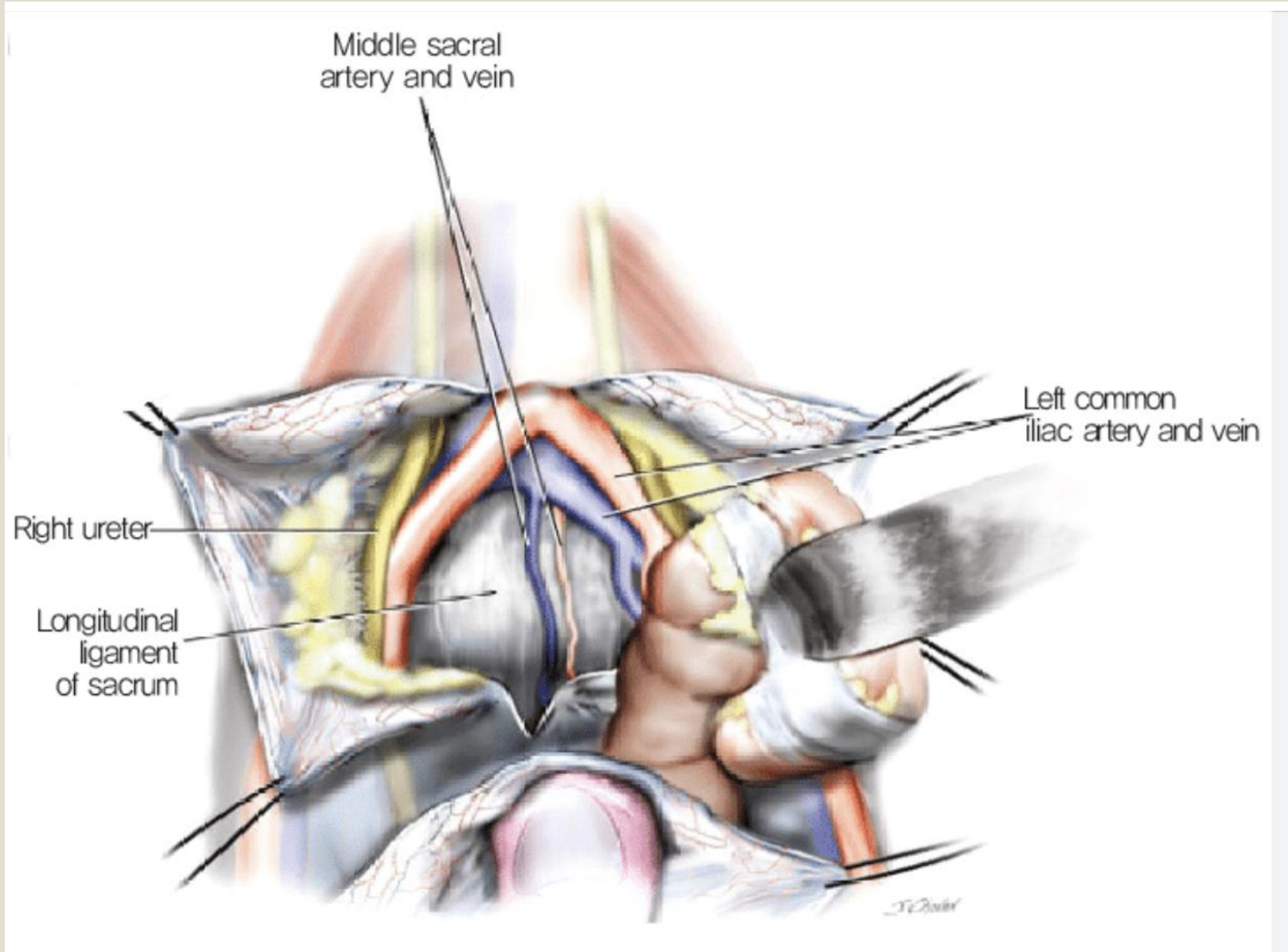



Figure 32.2 subtotal hysterectomy and sacrocolpopexy


Middle sacral
artery and vein
Left common
iliac artery and vein
Right ureter
Longitudinal
ligament
of sacrum

# RECONSTRUCTIVE PROCEDURES

- Abdominal sacrocolpopexy (ASC)
  - Complications
    - Intraoperative: cystotomy (3%), enterotomy or proctotomy (2%), ureteral injury (1%)
    - Post-operative: urinary tract infection (11%), wound problems (5%), hemorrhage or transfusion (4%), ileus (4%), deep vein thrombosis or pulmonary embolism (3%), operation for small bowel obstruction (1%), incisional hernia repair (5%)
  - Overall mesh erosion rate of 3%

  - https://ars.els-cdn.com/content/image/1-s2.0-S0002937817328107-mmc1.mp4

# RECONSTRUCTIVE PROCEDURES

## ◦UTERINE PRESERVATION

- Many women prefer to keep the uterus
  - 36-60% of survey respondents said "yes" if surgical outcomes the same
  - 21% of survey respondents said 'yes' even if outcomes worse
- Contraindications
  - History of cervical pathology, abnormal uterine bleeding, future pregnancy
- Little data exists to guide care and counseling
  - Systematic review in 2019 concludes "surgeons should counsel on outcomes and risks to the specific hysteropexy planned"

# RECONSTRUCTIVE PROCEDURES

- CONCIMITTANT TREATMENT OF SUI

- Women undergoing prolapse surgery may experience stress urinary incontinence after prolapse reduction (i.e. “unmasking” stress urinary incontinence due to unkinking the urethra).
- **Large randomized trials have demonstrated improved stress urinary incontinence outcomes after prolapse surgery when a concomitant stress urinary incontinence procedure is performed.**
- However, performing concomitant stress urinary incontinence surgery presents additional surgical risk and is not necessary in all patients.
- Thus, many surgeons proceed on a case by case basis when it comes to performing a concomitant stress urinary incontinence procedure at the time of prolapse repair.