Treatment Approach

Prolapse Identified

Symptomatic

Factors to Consider:
1. Type and severity
2. Age
3. Medical comorbidities
4. Desire for future sexual function
5. Risk factors for recurrence

Non-surgical
Pessary

Asymptomatic or Mildly Symptomatic

Expectant Management

Surgery

Obliterative
Reconstructive
Are effective nonsurgical treatments available for women with pelvic organ prolapse?

For women with asymptomatic prolapse, education and reassurance are appropriate.

Women may not realize that symptoms of voiding or defecatory dysfunction are related to prolapse, so education about how prolapse symptoms manifest can be helpful.
Are effective nonsurgical treatments available for women with pelvic organ prolapse?

Some symptoms related to pelvic organ prolapse may be managed with lifestyle modifications.

For example, defecatory dysfunction may improve with fiber supplementation and use of an osmotic laxative. Sitting with feet elevated may decrease bulge symptoms. Pelvic muscle exercises, performed either independently or under professional supervision (PT) may improve symptoms or slow the progression of POP.
Vaginal estrogen

There is limited evidence for the treatment or prevention of POP with local or systemic estrogen. However, some clinicians believe that local estrogen may help with the vaginal irritation associated with POP.
Women considering treatment of POP should be offered a vaginal pessary as an alternative to surgery.

A pessary should be considered for a woman with symptomatic POP who wishes to become pregnant in the future.

A vaginal pessary is an effective nonsurgical treatment for women with POP, and up to 92% of women can be fitted successfully with a pessary.
In one study protocol, a ring pessary was inserted first, followed by a Gellhorn pessary if the ring did not stay in place.

Ring pessaries were used more successfully with stage II (100%) and stage III (71%) prolapse, and stage IV prolapse more frequently required Gellhorn pessaries (64%)
If possible, women should be taught to change their pessary independently.

If a woman is unable to remove and replace her pessary, regular follow-up (such as every 3–4 months) is necessary.

Annual follow-up is recommended for patients who are able to maintain pessary hygiene on their own.
Pessary management

Pressure on the vaginal wall from the pessary may result in local devascularization or erosion in 2–9% of patients.

Therapy should consist of removing the pessary for 2–4 weeks and local estrogen therapy.

Resolution may occur without local estrogen therapy.
Pessary management

If the problems persist, more frequent pessary changes or a different pessary may be required.

Caregivers to patients with dementia should be made aware of the regular pessary changes needed to avoid complications.

Although rare complications such as fistula can occur, pessary use is a low-risk intervention that can be offered to all women who are considering treatment of POP.
When is surgery indicated for the management of pelvic organ prolapse, and what are the primary approaches?

Surgery is indicated for the treatment of POP in women who are bothered by their POP and have failed or declined nonsurgical treatments.

Important considerations for deciding the type and route of surgery include:
- location and severity of prolapse
- nature of the symptoms (eg, presence of urinary, bowel, or sexual dysfunction)
- patient’s general health
- patient preference, and the
- surgeon’s expertise
<table>
<thead>
<tr>
<th>Surgical Technique</th>
<th>Aim</th>
<th>Indication</th>
</tr>
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<tbody>
<tr>
<td>Abdominal sacral colpopexy</td>
<td>To correct upper vaginal prolapse</td>
<td>Most commonly used in women with recurrent cystocele, vault, or enterocele</td>
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<tr>
<td>Uterosacral ligament suspension</td>
<td>To correct upper vaginal prolapse</td>
<td>Performed at the time of hysterectomy or in patients with posthysterectomy vaginal vault prolapse</td>
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<tr>
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<tr>
<td>Anterior vaginal repair</td>
<td>To correct anterior wall prolapse</td>
<td>May be used for the treatment of prolapse of the bladder or urethra (bladder, urethra, or both herniate downward into the vagina)</td>
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<td>(anterior colporrhaphy)</td>
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<tr>
<td>Posterior vaginal repair</td>
<td>To correct posterior wall prolapse</td>
<td>May be used for the treatment of rectocele (rectum bulges or herniates forward into the vagina), defects of the perineum, or both</td>
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<td>(posterior colporrhaphy) and perineorrhaphy</td>
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<tr>
<td>Vaginal repair with synthetic mesh or biologic graft augmentation</td>
<td>To correct anterior wall prolapse, apical vaginal prolapse, or both</td>
<td>Depending on the specific defect, the mesh augmentation can either be anterior, apical, or both. This repair is not routinely recommended.</td>
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Are vaginal surgical approaches effective for the management of pelvic organ prolapse?

Vaginal hysterectomy and vaginal apex suspension with vaginal repair of anterior and posterior vaginal wall prolapse as needed are effective treatments for most women with uterovaginal and anterior and posterior vaginal wall prolapse.

Vaginal native tissue repairs are performed without the use of synthetic mesh or graft materials.

These are relatively low-risk surgeries that may be considered as surgical options for most women with primary POP.
If a patient has uterine prolapse, vaginal hysterectomy alone is not adequate treatment.

Vaginal apex suspension should be performed at the time of hysterectomy for uterine prolapse to reduce the risk of recurrent POP.

Vaginal apex suspension involves attachment of the vaginal apex to the uterosacral ligaments or sacrospinous ligaments.

Uterosacral and sacrospinous ligament suspension for apical POP with native tissue are equally effective surgical treatments of POP, with comparable anatomic, functional, and adverse outcomes.

ACOG PB 176
Sacrosinous Ligament Suspension

- Vaginal vault suspension using native tissue
- Posterior repair incision is used and the upper aspect of the right posterior vaginal wall is attached to the ligament
- Rates of recurrence after SSLS varied between 4% and 40%

Michigan Four Wall Sacrospinous Ligament Suspension (M4SSLS)

M4 SSLS is a variation of traditional SSLS. Uses apical incision and attaches all four walls of the vaginal apex directly to the ligament.

Michigan Four Wall Sacrospinous Ligament Suspension (M4SSLSS)

Entry into pararectal space

0-PDS placement on ligament

Source: Chapter 43, Surgeries for Pelvic Floor Disorders. Williams Gynecology 2e, 2012
Michigan Four Wall Sacrospinous Ligament Suspension (M4SSLs)

Michigan Modification with sutures passing through all four walls

Vaginal apex suspend to SSL by all four walls

Source: Chapter 43. Surgeries for Pelvic Floor Disorders. Williams Gynecology, 2e. 2012.
Long term Satisfaction with M4SSLs

- Retrospective review of subjective outcomes in patients undergoing M4SSLs from 1998-2003
- The proportion of patients who were "very" or "completely" satisfied was 75.3% (n=183)

Surgical Techniques of USLS

• 1927: Miller - “lifting sutures... passed through the peritoneum and underlying fascial and muscular structures at the base of the sacro-uterine ligament.”

• 2000: Shull - modification “composite” of those of the “master surgeons”
Anatomy of the Uterosacral Ligament

• First described in the early 1900’s in the English literature

• Originating from the posterolateral aspect of the cervix at the level of the internal cervical os and from the lateral vaginal fornix

  (Campbell)

• Insertion: Fibers which attached to the fascia covering the levator ani, coccygeus, and obturator muscles, as well as the presacral fascia (Blaisdell)

• Study of plastinated cross sections could not find a direct attachment to the sacrum (Fritsch et al.)
Anatomy and histology of apical support: a literature review concerning cardinal and uterosacral ligaments
Rajeev Ramanah & Mitchell B. Berger & Bernard M. Parratte & John O. L. DeLancey


• USL extends from S2 to S4 vertebra region to the dorsal margin of the uterine cervix and/or to the upper third of the posterior vaginal wall

• It has a superficial and deep component.

• Autonomous nerve fibers are a major constituent of the deep USL.

• Both the deep USL and the caudal CL are closely related to the inferior hypogastric plexus.

• USL and CL are visceral ligaments, with mesentery-like structures containing vessels, nerves, connective tissue, and adipose tissue.
Histology of USL:
- Attenuated, poorly organized connective tissue
- Sparse collagen fibers
- Muscle fibers
- Scattered elastin beneath peritoneum
- Few fibroblasts
- Adipose tissue

Cole et al.

Fig. 3 Histology after trichrome staining of biopsy specimen of the deep uterosacral ligament (USL) (a) showing mainly nerve fibers (n), adipose tissue (ad), and a few vessels (v), and of the cardinal ligament (CL) (b) showing mainly vessels (v)

Ramanah et al. 2012
Fig. 4  Magnetic resonance (MR) scan, axial view, showing the dorsal to ventral direction of the uterosacral ligament (USL) (red arrow) with its insertion to the cervix (Cx), Bladder (B), and rectum (Rec)

Ramanah et al. 2012
Attached broadly to 1st, 2nd, and 3rd sacral vertebrae, variably to 4th vertebrae

Distance from ureter:
- 0.9 cm at cervical portion
- 2.3 cm at intermediate portion
- 4.1 cm at sacral portion

Cervical and intermediate portions supported 17 kg before failure.
MRI of uterosacral ligament origin and insertion

• **Origin**
  - Cervix - 33%
  - Cervix and Vagina – 63%
  - Vagina - 4%

• **Insertion**
  - Sacrospinous ligament/coccygeus muscle complex – 82%
  - Sacrum – 7%
  - Piriformis muscle, sciatic foramen or ischial spine – 11%

MRI of uterosacral ligament origin and insertion

In healthy women, the uterosacral ligament origin and insertion points exhibited greater anatomic variation than their name would imply.

© 2004
Uterosacral Ligament Suspension restores Level 1 vaginal support

The USLS suspends the vaginal apex to the proximal remnants of the uterosacral ligaments usually using an intraperitoneal surgical approach

Restores the vagina to its normal axis, avoiding the retroflexion associated with SSLS
USLS

- Meta-analysis of 11 studies
- Anatomical success (POPQ stage 0–1)
  - 81.2 % (95%CI 67.5–94.5 %) for the anterior segment
  - 98.3 % (95 % CI 95.7–100 %) for the apical segment
  - 87.4 % (95 % CI, 67.5–94.5 %) for the posterior segment

- Postoperative prolapse symptoms reported in 5 of the 11 studies in this review and were relieved in 82–100 % of patients

• A Transvaginal Approach to Repair of Apical and Other Associated Sites of Pelvic Organ Prolapse with Uterosacral Ligaments


• Results:
  • All patients (n= 289) had preoperative or intraoperative evidence of grade 1 or greater apical loss of support of and at least one other site of pelvic organ prolapse.

• 87% had optimal anatomic outcomes, with no persistent or recurrent support defects at any site

• 5% had grade 2 or greater persistent or recurrent support defects
  • The anterior segment (bladder) was the site with the most persistent or recurrent support defects, which means that it was the site of the least durable repair.
  • The urethra and cuff had the most durable repairs

• Morbidity included a 1% transfusion rate, a 1% ureteral injury or ureteral kinking rate, and a 0.3% postoperative death rate.
Uterosacral ligament vault suspension: five-year outcomes

- N=72
- Mean follow-up period was 5.1 years (range 3.5-7.5 years)
- Concurrent procedures:
  - Vaginal hysterectomy (37.5%)
  - anterior colporrhaphy (58.3%)
  - posterior colporrhaphy (87.5%)
  - suburethral slings (31.9%)

- Surgical failure (symptomatic recurrent prolapse of stage 2 or greater in any compartment)
  - 15.3%

- Two patients (2.8%) had recurrence of apical prolapse of stage 2 or greater

Uterosacral Ligament Suspension (57283)
**FIGURE 2** Step by step: High uterosacral vaginal vault suspension

A The most prominent portion of the prolapsed vaginal vault is grasped with two Allis clamps. B The vaginal wall is opened up and the enterocoele sac is identified and entered. C The bowel is packed high into the pelvis using large laparotomy sponges. The retractor lifts the sponges out of the lower pelvis, thus completely exposing the cul-de-sac. When appropriate traction is placed downward on the uterosacral ligaments with an Allis clamp, the uterosacral ligaments are easily palpated bilaterally. D Delayed absorbable sutures have been passed through the uppermost portion of the uterosacral ligaments on each side, and have been individually tagged.

E Each end of the previously passed sutures is brought out through the posterior peritoneum and the posterior vaginal wall. (A free needle is used to pass both ends of these delayed absorbable sutures through the full thickness of the vaginal wall.) F Anterior colporrhaphy is begun by initiating dissection between the prolapsed bladder and the anterior vaginal wall. G Anterior colporrhaphy is complete. H The vagina has been appropriately trimmed and closed with interrupted or continuous delayed absorbable sutures. Delayed absorbable sutures that were previously brought out through the full thickness of the posterior vaginal wall are then tied; doing so elevates the prolapsed vaginal vault high up into the hollow of the sacrum.
A View of a posterior vaginal wall defect secondary to an enterocoele and rectocele. B After entry into the enterocoele sac, intraperitoneal suspension sutures are brought out through the full thickness of the vaginal wall at the level of the apex. C Tying these sutures after the vaginal incision is closed at the apex not only results in greater vaginal length but also contributes to overall support of the entire posterior vaginal wall.
5 surgical pearls for high uterosacral vaginal vault suspension

- Be prepared to convert to a sacrospinous fixation if you cannot enter the enterocoele sac or if the posterior cul-de-sac is obliterated with adhesions
- Pass the sutures through durable tissue so that, when traction is placed on the sutures, there is minimal movement of the peritoneum. Doing so might avoid kinking of the ureter.
- Pass the sutures through the full thickness of the posterior vaginal wall, including the peritoneum. Doing so not only suspends the apex but tremendously facilitates support for the posterior vaginal wall (FIGURE 4, page 40).
- When prolapse is very large, excise redundant portions of the upper part of the posterior vaginal wall and peritoneum—making sure, however, that you keep all layers together for performing the suspension. (See VIDEO #4, showing high uterosacral suspension in a patient who has complete uterine procidentia.)
- Do not try to pass a ureteral stent if you do not see indigo carmine dye spill from the ureteral orifices; to do so can be difficult after repair of prolapse, even in the hands of a skilled urologist. It is best instead to:
  1. identify the offending suture
  2. cut it
  3. visualize the spill of dye-colored urine
  4. proceed with either replacing the cut suture or maintaining the suspension with other, remaining sutures.

In our experience, when we have also performed an anterior repair, the ureter is kinked in at least 50% of cases because of one of the sutures that was used to correct the cystocele.
Abdominal USLS

- Retrospective review of 107 women
- 75 completed 1 year follow up
- 12% reported recurrent or persistent prolapse symptoms

- 7% had anatomic failure of Stage 2 or greater prolapse
- 9% erosion rate of apical Gortex sutures
  - Average time to erosion 56 mo (3-75 mos)

Lowenstein et al, 2009
Laparoscopic USLS

- Retrospective comparison
- 96 vaginal USLS vs 22 laparoscopic USLS
- No significant differences in perioperative morbidity or anatomical or subjective outcomes
- Failure at the Apex
  - Vaginal - 6.3%
  - Laparoscopic – 0%
- Ureteral compromise in 4.2% of vaginal group
- None in laparoscopic group

Rardin et al 2009
Abdominal approach USLS
Complications of Uterosacral Ligament Suspension

• Ureteral kinking/injury rate of 1–11 %
  • Ureteral reimplantation rate in this series was only 0.6 %
  • Blood transfusions were reported in 1.3 %
  • Cystotomy in 0.1 %
  • Bowel injury in 0.2 %

• A review of 700 consecutive vaginal prolapse surgeries found intraoperative ureteral kinking/injury of 5.9% directly attributable to the USLS
  • 87% were identified at cystoscopy before the completion of the index surgery and were relieved by removing suspension sutures intraoperatively with no long-term consequences for the patient.

• Marguiles et al 2010, Guistilo-Ashby et al. 2006
Ureter 1.4 cm from uterosacral ligament at cervix

Elkins et al.

Distance from ureter:
0.9 cm at cervical portion
2.3 cm at intermediate portion
4.1 cm at sacral portion

Buller, 2001
Recognition and management of nerve entrapment pain after uterosacral ligament suspension

Chung CP, Kuehl TJ, Larsen WI, Yandell PM, Shull BL.

Results:

- Eight (1.6%) of 515 patients had neuropathic pain requiring suture removal from the affected side
- Operative pain was recognized after discontinuation of intravenous narcotics on postoperative day 1
- Patients reported their pain improved after removal of all sutures on the affected side
- Patients with neuropathic pain did not differ from those without regard to age, BMI, and preoperative prolapse stage, or in the number of sutures placed
- None of the eight had recurrent pelvic organ prolapse (POP), with a median follow-up of 5 months

Chung CP, Kuehl TJ, Larsen WI, Yandell PM, Shull BL. Recognition and Management of Nerve Entrapment Pain After Uterosacral Ligament Suspension. Obstet& Gynecol Vol120; No 2, Part 1, August 2012 pp292-295
Suture entrapment of S2/S3 sacral nerves.

Image of right hemipelvis with peritoneum reflected off of underlying structures (*).
The S2, S3, and S4 sacral nerve roots are marked. The blue suture (Allis) traverses the peritoneum only, whereas the green (deep UR-6) and white (deep CT-1) sutures are visualized encircling S2 and S3 nerves. SP, sacral promontory.

Schematic of pelvis with sacral nerves. The circular zone denotes locations where nerve entrapment was identified in cadaveric specimens. IS, ischial spine; LS, lumbosacral trunk; S2-S5, sacral nerve roots; R, rectum; V, vagina; U, urethra.

Neural Entrapment During Uterosacral Ligament Suspension

- Bilateral Uterosacral ligament suspension was performed in 10 unembalmed female cadavers using different techniques described in literature
- Median location of sutures relative to the ischial spine did not differ significantly by suture technique
- Portions of sacral nerve roots were encircled by uterosacral ligament suspension sutures in 7 cadavers
- There were no instances of nerve entrapment when sutures were placed while tenting the ligament with an Allis clamp, although these sutures contained a less substantial purchase of connective tissue.
- In six cadavers, sacral nerves were encircled by sutures placed using a dorsal and posterior arc, regardless of the needle size.
- Entrapment was more likely with sutures placed into the right hemipelvis compared with the left (43% compared with 13%; $P<0.001$).

CONCLUSION: Sacral nerve roots are the most vulnerable neural structures during uterosacral ligament suspension. Suture placement directly into the uterosacral ligament with a dorsal and posterior needle arc results in a higher risk of nerve entrapment compared with ventral tenting of the ligament.

In the Operations and Pelvic Muscle Training in the Management of Apical Support Loss (OPTIMAL) trial (2014)

2-year follow-up surgical success rate

64.5% (n=186) for uterosacral ligament suspension compared with

63.1% (n=188) for sacrospinous ligament fixation (adjusted odds ratio [OR], 1.1; 95% confidence interval [CI], 0.7–1.7)

The serious adverse event rate at 2-year follow-up was 16.5% for uterosacral ligament suspension compared with 16.7% for sacrospinous ligament fixation (adjusted OR, 0.9; 95% CI, 0.5–1.6)

Barber JAMA 2014
Vaginal surgery has been the defining characteristic of the gynecologic surgeon since the successful repair of urinary fistulas >100 years ago.

The majority of cases of prolapse of the vagina can be successfully operated upon via the vagina. The cure is not infrequently difficult, and a great deal of surgical ingenuity is required.

Richard W. TeLinde, 1966
Authors' conclusions:

Sacral colpopexy has superior outcomes to a variety of vaginal procedures including sacrospinous colpopexy, uterosacral colpopexy and transvaginal mesh. These benefits must be balanced against a longer operating time, longer time to return to activities of daily living, and increased cost of the abdominal approach.

The use of mesh or graft inlays at the time of anterior vaginal wall repair reduces the risk of recurrent anterior wall prolapse on examination. Anterior vaginal polypropylene mesh also reduces awareness of prolapse, however these benefits must be weighted against increased operating time, blood loss, rate of apical or posterior compartment prolapse, de novo stress urinary incontinence, and reoperation rate for mesh exposures associated with the use of polypropylene mesh.

Posterior vaginal wall repair may be better than transanal repair in the management of rectocele in terms of recurrence of prolapse. The evidence is not supportive of any grafts at the time of posterior vaginal repair. Adequately powered randomised, controlled clinical trials with blinding of assessors are urgently needed on a wide variety of issues, and they particularly need to include women's perceptions of prolapse symptoms. Following the withdrawal of some commercial transvaginal mesh kits from the market, the generalisability of the findings, especially relating to anterior compartment transvaginal mesh, should be interpreted with caution.
Surgical management of pelvic organ prolapse in women. Maher C1, Feiner B, Baessler K, Schmid C.

• Conclusions:

• Sacral colpopexy has superior outcomes to a variety of vaginal procedures including sacrospinous colpopexy, uterosacral colpopexy and transvaginal mesh.

• These benefits must be balanced against a longer operating time, longer time to return to activities of daily living, and increased cost of the abdominal approach.
Anterior vaginal wall repair

Anterior colporrhaphy is an effective treatment for most anterior vaginal wall prolapse

Many women with anterior vaginal wall prolapse also have an apical prolapse

In these women, surgery should correct the apical prolapse and the anterior vaginal wall prolapse

Resupport of the vaginal apex concurrently with repair of the anterior vaginal wall defect reduces the risk of recurrent POP surgery
Anterior vaginal wall repair

Paravaginal defects are lateral detachments of the vaginal wall from the fascial condensations over the levator ani muscles.

Diagnosis of paravaginal defects by physical examination is unreliable.

If a paravaginal defect is suspected, there usually is apical loss of support.

Apical support procedures may address most anterior vaginal wall defects, including paravaginal defects.
Anterior vaginal wall repair

Williams Gyn 3rd ed
Paravaginal defect repair
Posterior vaginal wall repair

Posterior vaginal wall repair traditionally has been performed through a midline plication of the posterior vaginal wall fibromuscular connective tissue.

The repair should be performed without placing tension on the levator ani muscles because this may lead to dyspareunia.

Perineorrhaphy that results in reattachment of the perineal muscles to the rectovaginal septum can be performed as needed if a perineal defect is present.
An alternative technique for performing posterior vaginal wall repair is site-specific repair, which involves dissection of the vaginal epithelium off the underlying fibromuscular connective tissue and repair of localized tissue defects with sutures.

Although a retrospective comparison of site-specific repair and midline colporrhaphy found that site-specific repair was associated with a higher rate of recurrence of a symptomatic bulge (11% versus 4%, \( P=0.02 \))

a prospective study showed comparable outcomes for the two techniques.
Posterior vaginal wall repair
Posterior vaginal wall repair
Perineorrhaphy
When is abdominal sacrocolpopexy indicated for the management of pelvic organ prolapse?

Abdominal sacrocolpopexy is a proven and effective surgery for the treatment of POP.

This procedure involves placement of a synthetic mesh or biologic graft from the apex of the vagina to the anterior longitudinal ligament of the sacrum.
When is abdominal sacrocolpopexy indicated for the management of pelvic organ prolapse?

Women who may be candidates for abdominal sacrocolpopexy include those who have a shortened vaginal length, intra-abdominal pathology, or risk factors for recurrent POP (eg, age younger than 60 years, stage 3 or 4 prolapse, and body mass index greater than 26).

In women who are at increased risk of synthetic mesh-related complications (eg, chronic steroid use, current smoker), sacrocolpopexy with a biologic graft or alternatives to a sacrocolpopexy could be considered.
Abdominal sacrocolpopexy with biologic grafts show conflicting results.

Abdominal sacrocolpopexy with porcine dermis xenograft had efficacy similar to that of abdominal sacrocolpopexy with synthetic polypropylene mesh. However, the porcine dermal xenograft used in this study is no longer available.
In a study that evaluated the 5-year surgical outcomes of abdominal sacrocolpopexy among patients randomized to receive polypropylene mesh or cadaveric fascia lata, use of synthetic mesh resulted in better anatomic cure than use of cadaveric fascia lata grafts (93% [27 out of 29] versus 62% [18 out of 29], \(P=.02\)).

Abdominal sacrocolpopexy with synthetic mesh has a lower risk of recurrent POP but is associated with more complications than vaginal apex repair with native tissue.
Abdominal sacrocolpopexy

Data from randomized controlled trials also show a significantly greater likelihood of anatomic success with mesh abdominal sacrocolpopexy compared with vaginal apex repair with native tissue (pooled OR, 2.04; 95% CI, 1.12–3.72).

Surgical complications that are more common after abdominal sacrocolpopexy with mesh include ileus or small-bowel obstruction (2.7% versus 0.2%, \( P<.01 \)), thromboembolic phenomena (0.6% versus 0.1%, \( P=.03 \)), and mesh or suture complications (4.2% versus 0.04%, \( P<.01 \)).
Sacrocolpopexy with mesh is associated with a significant reoperation rate due to mesh-related complications.

Long-term (ie, 7-year) follow-up of participants of the Colpopexy and Urinary Reduction Efforts (CARE) trial found that the estimated rate of mesh complications (erosion into the vagina, visceral erosions, and sacral osteitis) was 10.5% (95% CI, 6.8–16.1), with a significant number of reoperations.
Many of the CARE trial sacrocolpopexies, however, were performed with non-type 1 mesh, which may have increased the mesh complication rate. Because of complications attributed to multifilament and small-pore-size synthetic mesh, type 1 synthetic meshes (monofilament with large pore size) currently are used in the United States.
Do patients benefit from a minimally invasive approach to pelvic organ prolapse surgery?

Sacrocolpopexy with or without supracervical hysterectomy or total hysterectomy can be performed laparoscopically with or without robotic assistance.

Although open abdominal sacrocolpopexy is associated with shorter operative times (222 minutes versus 296 minutes; $P<.02$)

minimally invasive sacrocolpopexy is associated with

less blood loss (122 ± 146 mL versus 187 ± 142 mL; $P<.01$)

shorter hospitalization (1.3 ± 1 days versus 2.9 ± 1.6 days; $P< .01$)
Do patients benefit from a minimally invasive approach to pelvic organ prolapse

Similar results were seen in RCT that compared open ASC with laparoscopic sacrocolpopexy

mean blood loss was significantly greater in the open arm (mean difference [MD] 184 mL; 95% CI, 96–272)

fewer inpatient days in the laparoscopic group (MD, 0.9 days; 95% CI, 0.1–1.7).
Although robotic assistance shortens the learning curve for performing laparoscopic sacrocolpopexy and improves surgeon ergonomics, it has not been shown to improve short-term outcomes for patients.

In two randomized controlled trials that compared robot-assisted sacrocolpopexy with laparoscopic sacrocolpopexy, operating time, postoperative pain, and cost were found to be significantly greater in the robot-assisted group.

The groups had similar anatomic and functional outcomes 6 months to 1 year after surgery, although the robotic experience of the surgeons was low at the start of the study, which may have affected the results.
Minimally invasive Sacrocolpopexy

Overall, the current literature is too scant to adequately indicate which minimally invasive approach should be recommended.

Further comparative studies that assess long-term anatomic and functional outcomes and patient safety and that identify subgroups of patients who would benefit from a robotic approach are warranted.
**Is posterior vaginal wall prolapse repair more effective with a transanal or transvaginal incision?**

Posterior vaginal wall prolapse repair is more effective when performed through a transvaginal incision than a transanal incision.

Systematic review findings show that, compared with transanal incision, posterior vaginal repair results in fewer recurrent prolapse symptoms (relative risk [RR], 0.4; 95% CI, 0.2–1.0), lower recurrence on clinical examination (RR, 0.2; 95% CI, 0.1–0.6), and a smaller mean depth of rectocele on postoperative defecography (MD, –1.2 cm; 95% CI, –2.0 to –0.3).
Are surgical approaches available to treat pelvic organ prolapse in women with medical comorbidities?

Obliterative procedures—which narrow, shorten, or completely close the vagina—are effective for the treatment of POP and should be considered a first-line surgical treatment for women with significant medical comorbidities who do not desire future vaginal intercourse or vaginal preservation.

Obliterative procedures have high reported rates of objective and subjective improvement of POP (98% and 90%, respectively) and are associated with a low risk of recurrent POP.

ACOG PB 176
Are surgical approaches available to treat pelvic organ prolapse in women with medical comorbidities?

Because obliterative surgical procedures can be performed under local or regional anesthesia, these procedures may be especially beneficial for the treatment of POP in women with significant medical comorbidities that preclude general anesthesia or prolonged surgery, such as cardiac disease, chronic obstructive pulmonary disease, or thromboembolic disease.

Le Fort-style partial colpocleisis
Total colpectomy
Le Fort-style partial colpocleisis
Le Fort-style partial colpocleisis
Colpocleisis - Complete colpectomy

Williams Gyn 3rd ed
Colpocleisis

Are surgical approaches available to treat pelvic organ prolapse in women with medical comorbidities?

Obliterative procedures are associated with low rates of:
Complications - 6.8%,
intensive care unit admissions, - 2.8%,
Mortality – 0.15%
Colpocleisis

Patients undergoing obliterate procedures must be committed to no longer having vaginal sexual intercourse.

In a multisite prospective study of older women (mean age 79 years) who underwent obliterate repair of POP, 95% of patients (125 out of 132) reported being satisfied or very satisfied with the results of the procedure 1 year after surgery.

Patient regret also has been reported to be low. Among women interviewed more than 1 year after obliterate prolapse repair, only 9% (3 out of 32) reported they regretted having the procedure.
What can be recommended regarding currently available synthetic mesh and biologic graft materials for use in vaginal pelvic organ prolapse surgery?

The use of synthetic mesh or biologic grafts in POP surgery is associated with unique complications not seen in POP repair with native tissue.

A systematic review of seven randomized controlled trials that compared native tissue repair with synthetic mesh vaginal prolapse repair found that more women in the mesh group required repeat surgery for the combined outcome of prolapse, stress incontinence, or mesh exposure (RR, 2.40; 95% CI, 1.51–3.81).

The rate of mesh exposure was 12%, and 8% of women required repeat surgery for mesh exposure up to 3 years after the initial surgery.
What can be recommended regarding currently available synthetic mesh and biologic graft materials for use in vaginal pelvic organ prolapse surgery?

Systematic review findings show that vaginal repair of prolapse with biologic grafts (tissue from human cadaver or other species) results in similar rates of “awareness of prolapse” and reoperation for prolapse compared with repairs using native tissue.

However, it is difficult to make an overall recommendation about the use of biologic grafts for vaginal prolapse repair because the available evidence is of low quality, and most of the biologic grafts that were used in studies to date are no longer available.
Synthetic mesh placed through a transvaginal incision to correct POP has been studied extensively although there are few long-term (greater than 3 years) studies regarding the effectiveness of procedures currently being performed. Many transvaginal mesh products were removed from the market following the 2011 U.S. Food and Drug Administration (FDA) announcement that identified serious safety and effectiveness concerns over the use of transvaginal mesh to treat POP.
In January 2016, the FDA issued two final orders regarding surgical mesh that is used to repair POP transvaginally:

1. The FDA reclassified this surgical mesh—from class II, which generally includes moderate-risk devices, to class III, which generally includes high-risk devices.

2. The FDA required manufacturers to submit a premarket approval application to support the safety and effectiveness of surgical mesh for the transvaginal repair of POP.

Subsequently, in January 2017, the FDA reclassified all urogynecologic surgical mesh instrumentation (whether used for transvaginal POP repair or other urogynecologic surgical mesh procedures) from class I (low risk) exempt from premarket notification to class II (moderate risk) and subject to premarket notification.
**Posterior Vaginal Repair**

The use of synthetic mesh or biologic grafts in transvaginal repair of posterior vaginal wall prolapse **does not improve outcomes**.

In addition, there are increased complications (eg, mesh exposure) associated with placement of mesh through a posterior vaginal wall incision.

In two randomized trials that compared native tissue with biologic graft material for the repair of posterior prolapse, the objective failure rate was significantly lower at the 1-year follow up in the native tissue group (10% [10 out of 98]) as compared with the biologic graft group (21% [20 out of 93]) (RR, 0.47; 95% CI, 0.24–0.94), and the subjective failure rate was similar between the groups (RR, 1.09; 95% CI, 0.45–2.62) (58, 75, 87).

There was no difference in the rate of postoperative dyspareunia between the groups (RR, 1.26; 95% CI, 0.59–2.68).
**Posterior Vaginal Repair**

Another trial that compared posterior biologic graft repair with traditional repair noted worse anatomic outcomes with posterior biologic graft repair than with traditional repair (46% versus 14%; *P*=0.02) (19, 58).

Thus, synthetic mesh or biologic grafts should not be placed routinely through posterior vaginal wall incisions to correct POP for primary repair of posterior vaginal wall prolapse.
Anterior Vaginal Repair

Polypropylene mesh improves anatomic and some subjective outcomes but does not affect reoperation rates for recurrent prolapse and is associated with a higher rate of complications compared with native tissue vaginal prolapse repair.
Pelvic organ prolapse vaginal mesh repair should be limited to high-risk individuals in whom the benefit of mesh placement may justify the risk, such as individuals with recurrent prolapse (particularly of the anterior or apical compartments) or with medical comorbidities that preclude more invasive and lengthier open and endoscopic procedures.

Before placement of synthetic mesh grafts in the anterior vaginal wall, patients should provide their informed consent after reviewing the benefits and risks of the procedure and discussing alternative repairs.
Is special training required to perform pelvic organ prolapse procedures that use mesh or biologic grafts?

Surgeons who perform POP surgery with biologic grafts or synthetic mesh grafts should have training specifically for these procedures and should be able to counsel patients regarding the risk–benefit ratio for the use of mesh compared with native tissue repair.

There are unique risks and complications associated with the use of mesh in surgeries to treat POP.
Is special training required to perform pelvic organ prolapse procedures that use mesh or biologic grafts?

Special training regarding patient selection, anatomy, surgical technique, postoperative care, and management of complications is necessary for physicians who perform POP surgery using mesh or biologic grafts.

The American Urogynecologic Society has published guidelines for training and privileging for the performance of abdominal sacrocolpopexy and vaginal mesh prolapse surgery.

ACOG PB 176
Are there effective pelvic organ prolapse surgical treatment methods available for women who prefer to avoid hysterectomy?

Women who desire surgical treatment of POP may choose to avoid hysterectomy for a variety of reasons, including preservation of fertility, maintenance of body image, and beliefs about adverse effects on sexual function.

Alternatives to hysterectomy for the surgical treatment of POP include hysteropexy (ie, uterine suspension) and Le Fort colpocleisis.
Hysteropexy

Hysteropexy is a viable alternative to hysterectomy in women with uterine prolapse, although there is less available evidence on safety and efficacy compared with hysterectomy.

Hysteropexy may be performed through a vaginal incision by attaching the cervix to the sacrospinous ligament with sutures or mesh. Hysteropexy also may be performed abdominally or laparoscopically by placing a mesh or biologic graft from the cervix to the anterior longitudinal ligament.
Hysteropexy

Shortening the uterosacral ligaments laparoscopically with or without robotic assistance or by an abdominal incision also can be performed.

A 2016 cohort study that compared laparoscopic sacral hysteropexy with vaginal mesh hysteropexy found that, at 1-year follow-up, the two procedures had similar efficacy and no significant differences in the rate of complications, blood loss, or length of hospitalization.
Benefits of hysteropexy compared with total hysterectomy include shorter operative time and a lower incidence of mesh erosion if mesh augmentation is used.

In comparison, women with uterine prolapse who choose hysterectomy will have a lower risk of uterine and cervical cancer or any procedures that involve abnormalities of the cervix or uterus (eg, endometrial biopsy). They will not become pregnant and will not have uterine bleeding or pain.
Can the occurrence of stress urinary incontinence after surgery for pelvic organ prolapse be anticipated and avoided?

All women with significant apical prolapse, anterior prolapse, or both should have a preoperative evaluation for occult stress urinary incontinence, with cough stress testing or urodynamic testing with the prolapse reduced.

ACOG PB 176
Summary of Recommendations and Conclusions

The following recommendations and conclusions are based on good and consistent scientific evidence (Level A):

Uterosacral and sacrospinous ligament suspension for apical POP with native tissue are equally effective surgical treatments of POP, with comparable anatomic, functional, and adverse outcomes.

ACOG PB 176
The following recommendations and conclusions are based on good and consistent scientific evidence (Level A):

The use of synthetic mesh or biologic grafts in transvaginal repair of posterior vaginal wall prolapse does not improve outcomes.

ACOG PB 176
The following recommendations and conclusions are based on good and consistent scientific evidence (Level A):

Polypropylene mesh augmentation of anterior vaginal wall prolapse repair improves anatomic and some subjective outcomes but does not affect reoperation rates for recurrent prolapse and is associated with a higher rate of complications compared with native tissue vaginal prolapse repair.

ACOG PB 176
The following recommendations and conclusions are based on limited or inconsistent scientific evidence (Level B):

Many women with POP on physical examination do not report symptoms of POP. Treatment is indicated only if prolapse is causing bothersome bulge and pressure symptoms, sexual dysfunction, lower urinary tract dysfunction, or defecatory dysfunction.

Women considering treatment of POP should be offered a vaginal pessary as an alternative to surgery.

ACOG PB 176
The following recommendations and conclusions are based on limited or inconsistent scientific evidence (Level B):

Vaginal apex suspension should be performed at the time of hysterectomy for uterine prolapse to reduce the risk of recurrent POP.

Abdominal sacrocolpopexy with synthetic mesh has a lower risk of recurrent POP but is associated with more complications than vaginal apex repair with native tissue.
The following recommendations and conclusions are based on limited or inconsistent scientific evidence (Level B):

Obliterative procedures—which narrow, shorten, or completely close the vagina—are effective for the treatment of POP and should be considered a firstline surgical treatment for women with significant medical comorbidities who do not desire future vaginal intercourse or vaginal preservation.
The following recommendations and conclusions are based on limited or inconsistent scientific evidence (Level B):

The use of synthetic mesh or biologic grafts in POP surgery is associated with unique complications not seen in POP repair with native tissue.

Hysteropexy is a viable alternative to hysterectomy in women with uterine prolapse, although there is less available evidence on safety and efficacy compared with hysterectomy.
The following recommendations are based primarily on consensus and expert opinion (Level C):

A POP-Q examination is recommended before treatment for the objective evaluation and documentation of the extent of prolapse.

A pessary should be considered for a woman with symptomatic POP who wishes to become pregnant in the future.
The following recommendations are based primarily on consensus and expert opinion (Level C):

Pelvic organ prolapse vaginal mesh repair should be limited to high-risk individuals in whom the benefit of mesh placement may justify the risk, such as individuals with recurrent prolapse (particularly of the anterior or apical compartments) or with medical comorbidities that preclude more invasive and lengthier open and endoscopic procedures.

Before placement of synthetic mesh grafts in the anterior vaginal wall, patients should provide their informed consent after reviewing the benefits and risks of the procedure and discussing alternative repairs.
The following recommendations are based primarily on consensus and expert opinion (Level C):

Surgeons who perform POP surgery with biologic grafts or synthetic mesh grafts should have training specifically for these procedures and should be able to counsel patients regarding the risk–benefit ratio for the use of mesh compared with native tissue repair.
The following recommendations are based primarily on consensus and expert opinion (Level C):

Routine intraoperative cystoscopy during POP surgery is recommended when the surgical procedure performed is associated with a significant risk of injury to the bladder or ureter.

These procedures include suspension of the vaginal apex to the uterosacral ligaments, sacrocolpopexy, and anterior colporrhapsy and the placement of mesh in the anterior and apical compartments.
The following recommendations are based primarily on consensus and expert opinion (Level C):

All women with significant apical prolapse, anterior prolapse, or both should have a preoperative evaluation for occult stress urinary incontinence, with cough stress testing or urodynamic testing with the prolapse reduced.
The following recommendations are based primarily on consensus and expert opinion (Level C):

Patients with POP but without stress urinary incontinence who are undergoing either abdominal or vaginal prolapse repair should be counseled that postoperative stress urinary incontinence is more likely without a concomitant continence procedure but that the risk of adverse effects is increased with an additional procedure.
ACOG video of prolapse

Pelvic Organ Prolapse Videos

PEV001

patient education video pelvic support problems or incontinence pelvic organ prolapse pelvic organ prolapse videos pelvic organ prolapse... and photocopying pev001 pelvic organ prolapse is a disorder... prolapse shown here pelvic organ prolapse also can... organ prolapse is a disorder in which one or more
Surgery for Pelvic Organ Prolapse

What is pelvic organ prolapse?

Pelvic organ prolapse is a condition in which one or more pelvic organs (uterus, cervix, vagina, bladder, or rectum) drop down into the vagina. The organs may bulge through the vaginal opening and cause discomfort, pressure, or difficulty with urination, bowel movements, or sexual intercourse.

What organs can be affected by pelvic organ prolapse?

The organs that can be affected include the following:

- Bladder
- Uterus (the organ that contains the body of the baby during pregnancy)
- Rectum

What are the symptoms of pelvic organ prolapse?

Symptoms may include:

- Feeling of heaviness or pressure in the vaginal area
- Difficulty urinating or feeling that you need to urinate frequently
- Difficulty or pain with sexual intercourse
- Feeling of fullness in the lower abdomen or pelvic area
- Rectal symptoms such as constipation or difficulty with bowel movements
- Pain in the lower back or abdomen
- Prolapse of organs into the vagina or rectum
- Difficulty with bladder or bowel control

What are the risks of pelvic organ prolapse?

Risks include:

- Infection
- Urinary tract infection
- Sacrococcygeal bursitis
- Rectal tear

What are the treatment options for pelvic organ prolapse?

Treatment options may include:

- Medical management
- Pelvic floor physical therapy
- Surgery

Frequently Asked Questions: Special Procedures

ACOG Patient handouts
Pelvic organ prolapse (POP): the herniation of the pelvic organs to or beyond the vaginal walls
Resources:
Utube video: Uterosacral Ligament Suspension, Walters and Schull – Cleveland Clinic

Uterosacral ligament Suspension, Karram Contemporary OBGYN

AUGS video: Anatomy of Sacrospinous ligament, Delancy

Resident membership to AUGS

References
• ACOG Practice Bulletin 176, April 2017
• Walters & Karram, Urogynecology and Reconstructive Surgery 4th ed
• Williams Gynecology 2nd ed
In the 2006 CARE Trial, sacrocolpopexies were done with and without Burch

- In women with POP having ASC who were continent before surgery, Burch decreased the rate of post-operative SUI (32% for Burch vs 45% for no Burch)

- For women with occult SUI on pre-testing, 37% had SUI after Burch and 60% had SUI after no Burch

- For women with no occult SUI on pre-testing, 20% had SUI after Burch and 39% had SUI after no Burch

- However, it is still controversial what to do to the bladder neck in women with symptomatic prolapse having vaginal surgery who have no SUI on pre-operative testing with reduction
OPUS Trial

• In this multicenter RCT, 337 women without SUI but having vaginal surgery for POP were randomized to TVT or sham surgery

• The rate of UI at 12 months was 27.6% in the TVT group and 43.0% in the sham group (P=0.002)

• 6.3 slings were placed to prevent 1 case of UI at 12 months

• UTI’s, bleeding complications (3.1%), and voiding disorders (3.7%) were all higher in the TVT group

References

References

• Siddique SA, Gutman RE, Schon Ybarra MA, Rojas F, Handa VL. Relationship of the uterosacral ligament to the sacral plexus and to the pudendal nerve. Int Urogynecol J Pelvic Floor Dysfunct 2006;17:642–5.
• Cheryl B. Iglesia, MD, Andrew I. Sokol, MD, Eric R. Sokol, MD, Bela I. Kudish, MD, Robert E. Gutman, MD, Joanna L. Peterson, RN, and Susan Shott, PhD, Vaginal Mesh for Prolapse A Randomized Controlled Trial Obstet Gynecol VOL. 116, NO. 2, PART 1, AUGUST 2010
• Robert E. Gutman, MD, Patrick A. Nosti, MD, Andrew I. Sokol, MD, Eric R. Sokol, MD, Joanna L. Peterson, RN, Hong Wang, PMD, MS, and Cheryl B. Iglesia, MD, Three-Year Outcomes of Vaginal Mesh for Prolapse A Randomized Controlled Trial. Obstet Gynecol 2013;122:770–7)