

# Surgical management of pelvic organ prolapse: An update

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## Abstract

Pelvic organ prolapse (POP) is a common condition presenting in up to 50% of women depending on age, parity, body mass index, pelvic floor muscle strength and underlying diseases. The symptomatic POP usually presents at 3-10% of women, when the descent organ is at or beyond the level of hymen. Currently, guidelines for the best surgical treatment of POP are not available and an individualized approach for each patient should be followed. The International Urogynecologi-

cal Association and the International Continence Society has recommended various surgical procedures (vaginal, abdominal and obliterative) for the management of POP. In this review we present updated evidence concerning the recommendations of these 2 International Organizations.

**Key words:** POP; ligament suspension; apical prolapse; sacrocolpopexy; colpocleisis

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## Introduction

Pelvic organ prolapse (POP) defines the changes of the anatomical structures of the pelvis resulting in a "downward displacement" of the pelvic organs<sup>1</sup>. Normally, the vagina is supported by 3 levels of connective tissue: 1) Level I that includes the uterosacral/cardinal ligament complex resulting in suspension of uterus and upper vagina in its normal almost horizontal orientation, 2) Level II that consists of the paravaginal attachments that are continuous with the cardinal/uterosacral complex at the ischial spine, and 3) Level III that is composed of the perineal body, superficial and deep perineal muscles, and fibromuscular connective tissue which supports the distal third of the vagina<sup>2</sup>. Loss of level I support

contributes to prolapse of the uterus and/or vaginal apex, loss of level II leads to lateral or paravaginal anterior vaginal wall prolapse, while loss of level III in anterior and posterior vaginal wall prolapse, gaping introitus, perineal descent, urethral hypermobility, stress incontinence and/or rectocele<sup>2</sup>.

The prevalence of POP has been estimated up to 50% depending on women's age, body mass index, parity (including maximum birth weight) and pelvic floor muscle strength<sup>3-6</sup>. However, 3-10% of women with POP are symptomatic<sup>5-7</sup>. Usually, symptoms are presented when the descent organ is at or beyond the hymen<sup>8,9</sup>. Symptoms related to POP may include one or more of the following: Vaginal bulging, pelvic pressure, vaginal bleeding/discharge/infection, splint-

ing/digitation, low backache, lower urinary tract symptoms (i.e dysuria, urinary retention, urgency, post-micturition leakage, feeling of incomplete bladder emptying, urinary tract infections), anorectal dysfunction (i.e constipation, feeling of incomplete bowel evacuation, fecal/rectal urgency, post-defecatory soiling) and sexual dysfunction (i.e dyspareunia, obstructed intercourse, vaginal laxity)<sup>1,10,11</sup>.

POP symptoms have a negative impact in the quality of life of women<sup>11</sup>. It has been shown that surgical management of symptomatic POP may improve the quality of life<sup>1</sup>. Surgical approaches include vaginal or abdominal repairs or obliterative procedures<sup>1</sup>. The aim of this review is to identify the updated evidence of the recommended by the International Urogynecological Association and the International Continence Society surgical techniques for POP<sup>1</sup>.

## Vaginal repairs

### 1. Anterior vaginal wall repair using native tissue or mesh or graft reinforcement<sup>1</sup>

Anterior vaginal wall repair is well known as colporrhaphy<sup>1</sup>. Colporrhaphy includes the traditional repair or nonabsorbable mesh repair or biological graft repair<sup>1,12</sup>. The traditional anterior repair consists of repair of the fascial defects with sutures, excision of vaginal tissue and suture of the edges<sup>1,12</sup>. The fascial repair may include midline fascial plication, reattachment of the lateral edge of the damaged fascia to the arcus tendineous fasciae pelvis (paravaginal repair), transverse repair or anterior enterocele repair<sup>1</sup>. Mesh or graft repair may result in a further structural strengthening and may be followed by uterine or vaginal vault support<sup>1,13</sup>. The latter support may involve the arcus tendineous fasciae pelvis (ATFP) or fixation to sacrospinous ligament by an anterior approach<sup>1</sup>. However, the quality of the available evidence for the traditional or mesh repair is low or very low<sup>14</sup>. In the recent meta-analysis by Cochrane the authors concluded that graft or mesh provides minimal advantage compared with native tissue repair<sup>14</sup>. Moreover, the risk of *de novo* stress urinary incontinence, bladder injury, repeated sur-

gery for POP and mesh exposure was reduced following native tissue repair<sup>14</sup>. The replacement of polypropylene meshes by newer light-weighted, has not been evaluated by randomized controlled trials, should make clinicians and women cautious to their use<sup>14</sup>.

### 2. Posterior vaginal wall repair with native tissue or mesh or graft reinforcement

Similarly, to anterior vaginal wall repair with native tissue, the traditional posterior vaginal wall repair includes a fascial repair with midline fascial plication or site specific repair or enterocele repair<sup>1</sup>. The mesh or graft reinforcement provides a higher strength to the vaginal wall and may or may not be combined with uterine or vaginal vault support<sup>1</sup>. Additionally, concurrently to vaginal posterior repair perineal repair, levator ani muscle plication, anal sphincter repair or enterocele repair may be performed<sup>1</sup>. Failure to recognize and treat surgically the enterocele at the time of posterior vaginal wall repair may result to recurrence of posterior vaginal wall prolapse. Repair of enterocele vaginally is associated with lower recurrence compared to transanal repair<sup>15</sup>. Moreover, available evidence to date is not supportive of the mesh or graft use for the posterior repair<sup>15</sup>.

### 3. Apical prolapse (descent of the uterus or cervix or vaginal vault) repair

Several surgical techniques are available for the management of apical compartment descents<sup>16</sup>. Currently, recommendations of the best one are not available<sup>17</sup>.

## Vaginal hysterectomy

In case of uterine prolapse, vaginal hysterectomy is the operation most commonly performed. However, the most important part of the procedure is the suspension of the vault in order to avoid vault recurrences. Several vaginal vault suspension procedure have been proposed.

## McCall culdoplasty

This is the most commonly performed procedure

during vaginal hysterectomy in order to prevent future vault prolapse and it is suitable for cases of mild to moderate prolapse. The uterosacral ligaments are plicated in the mid-line to obliterate the posterior cul-de-sac. Despite the wide acceptance, few reports are available on its safety and efficacy. In retrospective series high satisfaction rates up to 82% with low recurrence (5.2%) have been reported<sup>18</sup>.

### Uterosacral ligament suspension (USLS)

With this technique the vaginal apex is suspended to the proximal uterosacral ligaments using an intraperitoneal or extraperitoneal surgical approach. According to a recent meta-analysis<sup>19</sup> the anatomical success is 81.2 %, 98.3 % and 87.4 % for the anterior, apical and posterior segment respectively with symptomatic relief in 82-100% of patients. The relatively high risk of ureteral kinking (5.9%)<sup>20</sup> associated with USLS makes the intraoperative cystoscopy imperative in all cases. A recent clinical trial compared the USLS to the SSF and found no differences in the surgical success rates and the adverse events at 2 years postoperatively<sup>21</sup>.

### Sacrospinous ligament fixation SSLF

With this technique the vaginal vault is suspended to the sacrospinous ligament unilaterally (right side) or bilaterally. Symptomatic relief of 80–99% has been reported by different retrospective and prospective studies<sup>21,22,23</sup>. According to a retrospective study, long term satisfaction rates (>5 years) up to 89% have been reported<sup>24</sup>. A Systematic review suggested that anterior vaginal wall prolapse is the most common site of recurrence (21.3%)<sup>22</sup>, but in the majority of the cases this is asymptomatic with only 3-5% requesting further surgery<sup>23</sup>.

### Transvaginal mesh kits

Transvaginal mesh kits were introduced with the aim to improve outcome and to treat all pelvic floor defects with a standardized technique.

Although these surgical procedures became very popular, current evidence does not support their routine use for the repair of apical prolapse<sup>16</sup>. Ana-

tomical success rate of transvaginal polypropylene meshes has been consistent high ranging from 87 to 100%, but this should be balanced against, complications related to the use of graft such as mesh erosion mesh contraction, voiding dysfunction and dyspareunia<sup>25</sup>. Mean complication rate has been reported to be 27% in anterior, 20% in posterior and 40% in combined mesh repair<sup>25</sup>.

### Abdominal procedures

#### 1. Abdominal Procedures with Mesh or Graft

- Open/laparoscopic/robotic sacrocolpopexy or sacrocervicocolpopexy or sacrohysteropexy are the procedures that may be performed<sup>1</sup> resulting in the suspension of the vagina vault or cervix on the anterior longitudinal ligament at the level of the sacral promontory<sup>1</sup>.

- Sacrocolpopexy is considered the “gold standard” for the management of apical prolapse with reported high success rates for anatomical correction and an acceptable low overall complication profile<sup>26</sup>. Specifically, sacral colpopexy compared to vaginal procedures (i.e sacrospinous colpopexy, uterosacral colpopexy and transvaginal mesh) is associated with lower risk of recurrence, repeat surgery for prolapse, postoperative stress urinary incontinence and dyspareunia<sup>15,16</sup>. Nevertheless, complications of sacrocolpopexy include sacral hemorrhage, spondylodiscitis, small bowel obstruction, port-site herniation and mesh erosion<sup>27</sup>.

- Minimally invasive (laparoscopic/robotic) compared to open sacrocolpopexy results in similar anatomical outcomes, recurrence rates or rates of other complications<sup>28</sup>. However, the operating time was longer for the minimally invasive procedures but the blood loss and transfusion rates were lower with an additional shorter length of hospital stay<sup>28</sup>.

- Robotic-assisted compared to laparoscopically-assisted sacrocolpopexy has been related to more postoperative pain, longer operating times

and higher cost, but with no differences in the anatomical outcomes, mortality, hospital stay or postoperative quality of life<sup>29,30</sup>. Additionally, robotic sacrocolpopexy compared to Mayo-McCall culdoplasty and open abdominal sacrocolpopexy had comparable symptom relief rates and reoperation rates for prolapse recurrence at 5-years follow-up<sup>31</sup>. Robotic assisted sacrohysteropexy compared to open sacrohysteropexy is associated with shorter operating time, less operative bleeding and fewer postoperative complications<sup>32</sup>.

## 2. Abdominal procedures without mesh or graft

Open/laparoscopic/robotic paravaginal repair, Burch colposuspension, suture hysteropexy or closure of enterocele are the surgical techniques that may be performed<sup>1</sup>. The procedures for the closure of enterocele involves the Moschowitz procedure or the Halban procedure or the uterosacral ligament plication<sup>1</sup>.

### Obliterative Procedures

Colpocleisis and total colectomy are the 2 surgical procedures that have been described<sup>1</sup>. Obliterative surgery corrects prolapse by removing and/or closing off all or a part of the vaginal canal (i.e., colpocleisis or colectomy). The choice to perform obliterative procedure depends upon the medical and sexual status of the patient. Colpocleisis is ideal for women who cannot endure major surgery or who are not sexually active<sup>33</sup>. The advantages of obliterative procedure are the short operative duration, low risk of perioperative morbidity, and an extremely low risk of prolapse recurrence. Disadvantages are the elimination of actual vaginal intercourse, as well as the inability to evaluate the cervix or uterus *via* a vaginal route.

### Concomitant hysterectomy

The need for hysterectomy at the time of surgery for POP is currently debatable as there are no data supporting uterine removal for every case of prolapse. Uterine sparing procedures correct apical prolapse by attaching the lower uterus or cervix to a support structure. Five techniques have been described for

uterine-sparing transvaginal surgery: The Manchester operation, uterosacral ligament fixation, sacrospinous ligament fixation, iliococcygeal suspension, and colpocleisis. Small published studies suggest that uterine preservation during the surgery for POP does not affect the risk of prolapse recurrence<sup>34,35</sup>. Advantages of uterine sparing techniques include the reduced intraoperative bleeding, operating times and hospital length of stay and the preservation of fertility. Yet, there are few data concerning the risk of intrapartum complication and postpartum recurrence of prolapse following these procedures<sup>36</sup>. Finally, the incidence of unexpected premalignant or malignant gynecological pathological conditions among asymptomatic women with prolapse is low but not negligible<sup>37</sup>.

### Bladder function following POP surgery

Symptomatic prolapse and stress urine incontinence often coexist and both situations can be treated with a combined prolapse repair and anti-incontinence procedure<sup>38,39</sup>. The addition of midurethral sling to prolapse surgery, reduces the risk of postoperative stress incontinence, but increases the frequency of short-term voiding difficulties, prolonged catheterisation and adverse events<sup>39</sup>. A long-standing debate exists whether occult stress urinary incontinence should be treated during prolapse surgery or should managed surgically if needed at a later stage<sup>38</sup>. Symptoms of bladder overactivity prior to POP surgery may regress up to 40% afterwards<sup>38</sup>.

### Conclusion

Pelvic organ prolapse is a common condition with rising prevalence depending on various risk factors (i.e. age, parity). Surgical therapeutic management involves vaginal or abdominal or obliterative procedures with additional various approaches. However, recommendations for the best surgical approach are not available. The surgical management should be individualised to each patient considering underlying diseases, risk factors for prolapse recurrence, stress or occult urinary incontinence and patients' preferences. ■

## Conflict of interest

The authors declare no conflict of interest.

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