



# Surgical decision making for symptomatic pelvic organ prolapse: evidence-based approach

Myung Jae Jeon

Department of Obstetrics and Gynecology, Seoul National University College of Medicine, Seoul, Korea

Surgery is the mainstay of treatment for symptomatic pelvic organ prolapse (POP), and a variety of procedures can be performed to correct POP. When deciding on the proper surgical procedure, the surgeon must take into consideration the individual patient's risk for surgical complication and prolapse recurrence and her preference. This review will discuss the key issues faced in the surgical decision-making process for POP and recommendations based on the current scientific evidence.

**Keywords:** Decision making; Pelvic organ prolapse; Surgery

## Introduction

Surgery is the mainstay of treatment for symptomatic pelvic organ prolapse (POP). Epidemiologic studies have shown that women have an 11–19% risk of undergoing operation for POP during their lifetime [1-3], and up to one third of them undergo additional operation for disease recurrence [1].

There are a variety of procedures available for the surgical treatment of POP. The choice of procedure is frequently determined by the surgeon's training and expertise, but no single procedure fits to all patients. When deciding on the proper surgical procedure to be performed, the surgeon must take into consideration the individual patient's risk for surgical complication and prolapse recurrence and her preference [4].

This review will discuss the key issues faced in the surgical decision-making process for symptomatic POP and recommendations based on the current scientific evidence.

## Reconstructive versus obliterative surgery

If a woman has an isolated anterior or posterior vaginal wall prolapse without apical prolapse, surgical decision-making is easy. Traditional anterior or posterior colporrhaphy can be performed to treat this condition. However, significant apical prolapse is almost always present in cases of advanced

POP (i.e., POP Quantification [POPQ] stage 3 or 4) [5], where surgeons have to decide whether to perform reconstructive or obliterative surgery to correct the prolapse. The choice depends on the medical condition and sexual function of the patient.

Reconstructive surgery corrects the prolapse while restoring the normal vaginal anatomy, whereas obliterative surgery does so by closing off the vaginal canal either partly (LeFort's colpocleisis) or totally (total colpocleisis) [6]. Therefore, reconstructive surgery is appropriate for a woman who is sexually active or may be sexually active in the future. However, POP usually involves multiple anatomical sites (apical, anterior, posterior), and therefore, extensive dissection and long operating time are needed for reconstructive surgery. Fragile, older women cannot tolerate this procedure [7-9]; hence, less

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Corresponding author: Myung Jae Jeon

Department of Obstetrics and Gynecology, Seoul National University College of Medicine, 103 Daehak-ro, Jongno-gu, Seoul 03080, Korea

E-mail: jeonmj@snu.ac.kr

<https://orcid.org/0000-0001-5582-1488>

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invasive, obliterative surgery may be an appropriate option for these women. One large population-based, retrospective cohort study showed that women 80 years and older who underwent obliterative surgery had lower rates of perioperative complications compared with those who received reconstructive surgery for prolapse (17.0% vs. 24.7%,  $P<0.01$ ) [8]. Additionally, obliterative surgery has an extremely low-risk of prolapse recurrence [10]. One retrospective cohort study showed that women 70 years and older who underwent obliterative surgery had a lower risk of prolapse recurrence (defined as POPQ stage  $\geq 2$ ) compared with those who received reconstructive surgery for prolapse (9.3% vs. 31.5%,  $P<0.01$ ) [11].

## Decision-making in reconstructive surgery

If reconstructive surgery is planned, surgeons should make an effort to identify and correct all support defects requiring repair. There is growing recognition that adequate support for the vaginal apex is essential for a durable surgical repair. Because of the significant contribution of the vaginal apex to anterior and posterior vaginal support [5,12], surgical correction of the anterior and posterior walls may fail unless the apex is adequately supported. One large population-based, retrospective cohort study showed that concomitant apical suspension at the time of anterior or posterior colporrhaphy could significantly reduce the reoperation rates for recurrent prolapse within 10 years [13]. Therefore, apical suspension procedures should be included in the majority of pelvic reconstructions. Although there are no consensus statements or guidelines about the degree of apical support severe enough to warrant surgical correction, the descent of the vaginal apex at least halfway into the vaginal canal (i.e., POPQ point C  $> -1/2 \times$  total vaginal length) needs to be corrected because it is closely linked with prolapse symptoms [14].

### 1. Surgical route for apical suspension: abdominal versus vaginal

Apical suspension procedures can be performed either transvaginally or abdominally. Abdominal procedures, including sacrocolpopexy (SCP) and uterosacral ligament suspension, can be performed via laparotomy or laparoscopy (with or

without robotic assistance). Transvaginal procedures include native tissue repair (uterosacral ligament suspension, sacrospinous ligament fixation, or iliococcygeus suspension) and mesh repair [15]. The choice of an apical suspension procedure should be individualized to the specific patient because each procedure carries its own risk and benefit.

A recent Cochrane systematic review of 6 randomized controlled trials (RCTs) has demonstrated that vaginal procedures are associated with a higher risk of subjective recurrence (risk ratio [RR], 2.11; 95% confidence interval [CI], 1.06–4.21), anatomical recurrence (RR, 1.89; 95% CI, 1.33–2.70), and repeat surgery for prolapse (RR, 2.28; 95% CI, 1.20–4.32) compared with SCP, with a shorter operating time (mean difference,  $-21.49$  minutes) being its only advantage. Comparing vaginal native tissue repair with transvaginal mesh (in 6 RCTs), there were no significant differences between the 2 groups even though mesh erosion rate was 18% and surgery for mesh erosion was required in 9.5% after repair with transvaginal mesh [4]. Another systematic review including large case series and comparative studies (both randomized and nonrandomized) also showed results that favored SCP over vaginal native tissue repair in terms of anatomical success. However, adverse events such as thromboembolism (0.6% vs. 0.1%,  $P=0.03$ ), ileus or small bowel obstruction (2.7% vs. 0.2%,  $P<0.01$ ), and mesh or suture complications (4.2% vs. 0.4%,  $P<0.01$ ) occurred more frequently after SCP [16].

For SCP, minimally invasive approach (laparoscopy with or without robotic assistance) begins to gain popularity [17]. A recent systematic review of 12 studies including 1 RCT found that minimally invasive SCP and open SCP had a similar efficacy in terms of apical support and recurrence rate. However, minimally invasive SCP was associated with less blood loss (mean difference,  $-113.27$  mL) and shorter hospital stay (mean difference,  $-1.57$  days) even though it required a longer operating time (mean difference,  $+87.47$  minutes). There were no differences in other intraoperative and postoperative complication rates [18]. The conventional laparoscopic SCP has also been compared to robotic SCP in 2 RCTs and 5 nonrandomized comparative studies. A systematic review of these studies found that both approaches were equally effective in correcting the prolapse, but laparoscopic SCP was more efficient in terms of operating time and cost compared to robotic SCP [19].

Given the current data, SCP may be more appropriate for

women with risk factors for prolapse recurrence, including young age, obesity, and advanced prolapse (POPQ stage 3 or 4) [20-23]. The preferred approach to SCP is laparoscopy. Vaginal native tissue repair benefits women who are at low-risk for prolapse recurrence or at increased risk for gastrointestinal morbidity (e.g., old age and prior laparotomy) and mesh-related complications (e.g., chronic steroid use and smoking) [24-27]. Additionally, concomitant hysterectomy may increase the risk of mesh erosion after SCP [27-29]; therefore, vaginal native tissue repair is preferred over SCP when hysterectomy is performed for uterine prolapse. Transvaginal apical mesh has no advantage over vaginal native tissue repair.

## 2. Uterine preservation versus hysterectomy for uterine prolapse

When the apical suspension procedure is planned for uterine prolapse, the decision must be made whether to perform hysterectomy as a part of the procedure. Historically, hysterectomy has been considered a mainstay in the treatment of uterine prolapse, but the clinical data on its effect are limited. Additionally, there is a considerable desire for uterine preservation among patients. Recent studies showed that 36–60% of women would decline hysterectomy if presented with an alternative to a hysterectomy-based prolapse repair with an equal efficacy, and 21% of women still preferred uterine preservation, even if uterine preservation was associated with inferior efficacy [30,31].

The most common procedures for correcting uterine prolapse with uterine preservation include sacrospinous hysteropexy (transvaginal), transvaginal mesh hysteropexy, uterosacral ligament uterine suspension (transvaginal or abdominal), and sacrohysteropexy with mesh (abdominal) [32]. Two recent systematic reviews including both randomized and nonrandomized trials compared hysteropexy with hysterectomy in terms of efficacy and complications [33,34]. Both studies have demonstrated that preservation of the uterus helps to reduce operating time, blood loss, and mesh exposure, provided that the surgical approach is the same. Regarding recurrent prolapse and reoperation for this condition, there was no significant difference between the groups among procedures using mesh even though there was a tendency for lower rates of recurrence and reoperation with hysterectomy. However, one study found a significant lower risk of recurrence with hysterectomy than with hysteropexy

when the vaginal native tissue repair was performed, whereas the other study did not. This discrepancy might result from the difference in the study selection for review. The largest RCT found that sacrospinous hysteropexy was not inferior to vaginal hysterectomy and uterosacral ligament suspension for recurrent apical prolapse over 12 months [35]. However, this study was not included in the former review because of the inclusion of a high number of women with less advanced apical prolapse. Indeed, apical prolapse beyond the hymen (i.e., POPQ point C>0) has been reported as a significant risk factor for surgical failure after transvaginal hysteropexy [36,37].

Recently, Dallas et al. [38] evaluated the association between hysterectomy at the time of prolapse surgery and the risk of undergoing subsequent prolapse surgery in a cohort of nearly 100,000 women. Hysterectomy at the time of prolapse surgery reduced the risk of repeat POP surgery at a median follow-up of 4 years, even when controlling for patient and surgical factors. However, there was a modest difference (1–3%) in risk, and hysterectomy was associated with higher perioperative morbidity. Nonetheless, this result needs to be interpreted cautiously. Reoperation is the “tip of the iceberg,” and the difference in the risk for prolapse recurrence might be significantly higher because patients tend to monitor the prolapse or use a pessary instead of undergoing a repeat surgery [39].

Given the current data, concomitant hysterectomy is recommended over uterine preservation at the time of apical suspension. Hysteropexy may be a reasonable alternative for women who have mild uterine prolapse and desire to preserve their uterus if they have no contraindications for uterine preservation [40] (Table 1).

**Table 1.** Contraindications for uterine preservation

Contraindications
Enlarged fibroids, adenomyosis, endometrial hyperplasia
Current or recent cervical dysplasia
Abnormal uterine bleeding or postmenopausal bleeding
BRCA1 and 2 mutations
Hereditary nonpolyposis colorectal cancer (Lynch syndrome)
Taking tamoxifen therapy
Unable to comply with routine gynecologic surveillance
Cervical elongation (relative contraindication)

### 3. Concomitant repair of anterior or posterior prolapse

As with apical prolapse, there is no consistent recommendation on which degree of anterior or posterior prolapse is to be corrected during reconstructive surgery. Nonetheless, when stage 2 or greater anterior or posterior vaginal prolapse (i.e., point Ba or Bp  $\geq -1$ ) is detected during the preoperative POPQ examination, several surgeons think that it needs to be addressed at the time of reconstruction.

An effective apical suspension can correct other sites of vaginal prolapse, but this is not always the case. Therefore, the decision must be made whether to perform an additional procedure to correct anterior or posterior prolapse. Simulated apical support during the preoperative POPQ examination can mimic the results following apical suspension and may help in this decision-making. One study has demonstrated that a significant proportion of anterior (55%) and posterior prolapse (30%) stage 2 or greater are resolved under simulated apical support [12]. Nonetheless, it remains unclear how the omission of anterior or posterior colporrhaphy for anterior or posterior prolapse corrected under simulated apical support in women undergoing apical suspension will affect the surgical outcome. Hence, further studies are needed to clarify this issue.

### Conclusion

Surgical decision-making for POP requires a complex process. It is important that a surgeon provides adequate information on the risks and benefits of options available for correcting prolapse and guides a patient's decision-making. Recommendations based on the current scientific evidence are summarized as follows:

- Obliterative surgery should be considered as a first-line surgical procedure for fragile, older women with advanced POP who no longer desire vaginal intercourse. Otherwise, reconstructive surgery is recommended.
- Loss of apical support should be corrected at the time of reconstruction.
- The choice of an apical suspension procedure should be individualized to the specific patient. SCP is appropriate for women with risk factors for prolapse recurrence. The preferred approach to SCP is laparoscopy. Vaginal native tissue repair benefits women who are at low-risk for pro-

lapse recurrence or at risk for gastrointestinal and mesh-related complications. Vaginal native tissue repair is also preferred over SCP when performing hysterectomy for uterine prolapse.

- Concomitant hysterectomy is recommended over uterine preservation at the time of apical suspension. Hysteropexy may be a reasonable alternative for women who have mild uterine prolapse and desire to preserve their uterus if they have no contraindications for uterine preservation.

### Conflict of interest

No potential conflict of interest relevant to this article was reported.

### Ethical approval

The study is not applicable to Institutional Review Board (IRB).

### Patient consent

There is no need for patient consent in this review article.

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