# Will Uterine Preservation Prevail Over Hysterectomy in Pelvic Reconstructive Surgery?

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Pelvic organ prolapse (POP) is a prevalent health condition in women. Prevalences of 41.1%, for any degree of prolapse (grade 1-3) and 14.2% for uterine prolapse were reported by the Women's Health Initiative in women aged 50 to 79 years, especially in those at an advanced age, with a high parity, or who engage in heavy work [1]. POP is also known to have a significantly negative impact on health-related quality of life when measured on scales such as the 12-item Short-Form Health Survey and the Pelvic Floor Distress Inventory-20. Women with advanced POP are significantly more likely to feel self-conscious and less likely to feel physically and sexually attractive or feminine than normal controls [2]. Meanwhile, attitudes toward sexuality and the psychological value of reproductive organs have changed over the last few decades [3].

Pelvic reconstructive surgery (PRS) is designed to repair and reconstruct the weakened pelvic floor and restore normal function in women with significant symptoms. Therefore, whether concomitant hysterectomy is still the standard treatment for POP may need to be further verified in modern PRS practice. The concept of uterine preservation and the use of adjuvant prostheses have been evolving in PRS to repair POP [3]. Therefore, several novel uterus-preserving surgical techniques have been developed worldwide to avoid vaginal hysterectomies, e.g. sacral hysteropexy, uterosacral ligament fixation, and sacrospinous ligament uterine suspension, as well as transvaginal mesh (TVM) techniques [3].The use of TVM with either surgeon-tailored or commercial mesh kits has made uterine-preserving surgery more feasible and popular [4].

Recently, Wu et al investigated whether hysterectomy is now performed less commonly, and uterine-preserving surgery more commonly, than in the past [5]. Based on National Health Insurance claims data in Taiwan, a total of 31,038 operations for uterine prolapse were identified, over 11 years (1997-2007) in a population-based nationwide study. There was a significant increase in uterine-preserving surgery noted during the later years of the study. Uterine-preserving surgery increased significantly from 7.7% to 13.5% (slope=12.25, $p<0.005$) of operations. Interestingly, women who received a concomitant anti-incontinence procedure were more likely to have uterine-preserving surgery (15.9%) compared with those who did not (8.8%) (odds ratio [OR] 0.7 95% confidence interval [CI] 0.7-0.8, $p<0.0001$) [5]. The reasons for this difference are not yet clear. It is postulated that these combined procedures are more commonly performed by urogynecologists or female urologists, who have a more established concept of uterine preservation [5]. In a 30-year observational period using the Swedish Inpatient Registry, Altman et al reported that a hysterectomy increased the risk for subsequent anti-incontinence surgery, with a hazard ratio of 2.4 (95% CI 2.3-2.5) (179 vs 76 per 100,000 person-years) [6]. Other reports also showed a decrease in vaginal hysterectomies [7,8]. Postulated possibilities were a decrease in the incidence of uterine prolapse, the lack of exposure to vaginal surgery during gynecologic training, or the concept of uterine preservation during PRS [8].

Two major concerns in PRS are the recurrence of POP (e.g. failure of PRS, etc) and surgical complications. The high recurrence rate after PRS, up to 29.2%, makes more refined surgeries imperative [9]. Reoperation rates for prolapse recurrence were highest in the traditional vaginal surgery group, in which native tissue anterior repair was associated with more anterior compartment failures, than in surgeries using either polypropylene mesh repair as an overlay (relative risk [RR] 2.14, 95% CI 1.23-3.74) or armed transobturator mesh (RR 3.55, 95% CI 2.29-5.51) [10]. Lin et al reported a failure rate of up to 75% for transvaginal spinous uterine suspension in those with an elongated cervix and those with third degree uterine prolapse, which was significantly higher than for patients without either of these risk factors (6.9%). They suggested that a concomitant partial trachelectomy for those with an elongated cervix significantly reduced the failure rate [11]. Use of TVM in one study resulted in a low perioperative and immediate postoperative failure rate of 4.7% (5/110), which included asymptomatic patients and those with low-grade symptomatic prolapse [12]. In another study, there were lower reoperation rates for prolapse recurrence (1.3%, 95% CI 1.0%-1.7%) after TVM repair than after sacral colpopexy and traditional vaginal procedures [13]. Meanwhile, there were no differences in subjective outcomes, quality of life, de novo dyspareunia, stress urinary incontinence, and reoperation rates for POP or incontinence, compared with native tissue repair [10].

The use of TVM results in higher complication rates requiring reoperation than traditional vaginal surgery and scaral colpopesxy, owing to higher rates of mesh erosion and fistulae [13]. This procedure has been associated with high complication rates owing to mesh erosion, with a rejection rate between 5 and 15%, and an exposure rate of 12.3%. Two principal risk factors have been highlighted, concomitant hysterectomy (OR=5.17, $p=0.001$) and inverted T colpotomies (OR=6.06, $p=0.01$) [14]. Avoidance of those two procedures can

minimize the rate of complications from 17.5% to 2.7% [14]. In fact, uterine preservation is a protective factor in PRS using TVM.

Although the effects TVM on the choice of uterine-preserving surgery or hysterectomy can not yet be drawn from the literature at present, the increasing popularity of surgeon-tailored or commercial mesh kits may have contributed, at least in part, to the increase in uterine-preserving surgery. This changing trend in uterine-preserving surgery further highlights the importance of close observation of the progression of TVM use, weighing the risks and benefits. Preliminary data have shown the feasibility and acceptability of these procedures in POP; however, the long-term effects and complications deserve further sophisticated investigations.

The addition of an anti-incontinence procedure at the time of PRS surgery might be beneficial in reducing postoperative stress urinary incontinence; however, this must be weighed against potential adverse effects. Liang et al reported that continent patients with severe POP who have a positive pessary test are considered at high risk of developing postoperative symptomatic stress urinary incontinence [15]. The addition of tension-free vaginal tape to endopelvic fascia plication (RR 5.5, 95% CI 1.36-22.32) and Burch colposuspension to an abdominal sacro-colpopexy (RR 2.13, 95% CI 1.39-3.24) were followed by a lower risk of developing postoperative de novo stress urinary incontinence [16]. However, a meta-analysis from Cochrane Database Reviews revealed that the impact of anti-incontinence surgery at the time of PRS did not significantly reduce the rate of postoperative stress urinary incontinence (RR 1.39, 95% CI 0.53-3.70; random-effects model). The value of an anti-incontinence procedure in addition to PRS in women who are continent preoperatively remains uncertain [10].

There is a paucity of high-quality data comparing different types of apical prolapse procedures, e.g. uterine prolapse repair procedures; the literature mostly contains evidence from controlled studies rather than randomized trials. Further high-quality randomized control trials are still necessary to evaluate the advantages and disadvantages of uterine-preserving surgery. Consensus is growing that the uterus can be preserved at the time of PRS in appropriately selected women who desire it. The results of comparison trials and prospective studies confirm that uterine-preserving surgery is feasible and is associated with outcomes similar to those of hysterectomy, as well as shorter operating times. Surgeons should be ready to respond to the wishes of female patients who want to preserve vaginal function and the uterus [3]. However, recent warnings by the USA Food and Drug Administration and other groups regarding adverse events further complicate the decision to use synthetic mesh [2].

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