

# Transvaginal uterosacral ligament hysteropexy: a retrospective feasibility study

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## Abstract

**Introduction and hypothesis** Uterine-sparing procedures could be attractive in patients concerned about preservation of fertility and change in corporeal image and sexuality. Transvaginal uterosacral hysteropexy can provide an alternative mesh-free technique for uterine suspension. This study aimed to evaluate the feasibility of transvaginal uterine suspension to uterosacral ligaments in terms of operative data, complications, midterm efficacy, and patient satisfaction.

**Materials and methods** This retrospective study analyzed the first 20 cases of transvaginal hysteropexy through bilateral high uterosacral ligaments (modified Shull technique) performed in our Institution.

**Results** Mean follow-up was 33.2 months. The procedure was performed in  $84 \pm 19$  min, and blood loss was  $228 \pm 139$  ml. Three mild complications (15 %) were observed. Recurrence [Pelvic Organ Prolapse Quantification system (POP-Q) stage  $\geq$  II] was observed in five patients (25 %), and three of them (15 %) required reintervention. Mean Patient Global Impression of Improvement score was “much improved.” Two women (40 %) who had not fulfilled their childbearing desire obtained a pregnancy. Both underwent elective caesarean section at term.

**Conclusions** Transvaginal uterosacral hysteropexy appears a feasible mesh-free technique for apical support. This procedure can be indicated in women with the desire of preserving fertility or who prefer a uterine-sparing surgical option.

**Keywords** Uterosacral ligaments · Transvaginal route · Pelvic organ prolapse · Fascial repair · Hysteropexy

## Introduction

Pelvic organ prolapse (POP) is a common clinical condition. It is estimated that 44 % of parous women have some forms of POP, and the prevalence is going to increase as life expectancy increases [1]. Managing POP encompasses both conservative interventions and surgical treatment [2]. Surgical repair is aimed at restoring proper apical support [3]. Historically, uterine preservation has represented a cornerstone in POP surgery because of the lower risk of infective and hemorrhagic complications related to this procedure. However, over time, hysterectomy was established as the preferred treatment for prolapse repair worldwide. In the United States, prolapse repair accounts 12 % of the 600,000 hysterectomies performed annually [4]. According to surveys, hysterectomy appears to be the procedure of choice among gynecologists in the UK (82 %) and Australia/New Zealand (79 %) for managing prolapse [5, 6]. Recently, uterine-sparing procedures have been gaining back popularity in both clinicians and patients. In fact, uterine descensus is believed to be the effect rather than the cause in the pathogenesis of prolapse. Moreover, uterine-sparing surgery is associated with shorter operative time, less blood loss, and faster return to activities [7] and can be attractive not only in patients of childbearing age who desire preserving fertility, but also in women who are concerned about changes in their corporeal image and sexuality after hysterectomy. In fact, hysterectomy can lead to negative psychosocial outcomes, including depressive symptoms and impaired body image [8]. On the contrary, uterus-sparing procedures can be associated with better sexual function outcomes regarding desire, arousal, and orgasm [9]. Disadvantages include the lack

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of long-term outcomes and the need of surveillance for gynecological oncologic diseases. Women who choose uterus-sparing techniques must be adequately informed, and an accurate candidate selection is mandatory.

Hysteropexy can be performed both by the vaginal and abdominal route and with or without the use of prosthetic materials. Actually, the most commonly performed uterus-sparing procedure is sacral hysteropexy. However, this kind of surgery is associated with prosthetic-related complications, even though this risk is lower compared with via the vaginal route. A gold standard is missing, and there is lack of consensus on optimal treatment [10]. Transvaginal uterosacral hysteropexy can provide a mesh-free uterine suspension alternative to sacrospinous hysteropexy. This study aimed to evaluate the feasibility of transvaginal uterine suspension to uterosacral ligaments with a modified Shull technique in terms of operative data, complications, midterm efficacy, and patient satisfaction.

## Materials and methods

This retrospective study was approved by the Institutional Review Board of San Gerardo Hospital in Monza, Italy. From March 2009 to August 2015, patients bothered by POP who desired uterus-sparing surgery were counseled about surgical alternative procedures, and the lack of long-term outcomes for uterine-sparing technique was elucidated. Patients with a personal history of abnormal uterine bleeding in postmenopausal age, voluminous uterine fibroids, endometrial hyperplasia, or cervical dysplasia were precluded from conservative surgery.

### Preoperative evaluation

Preoperative evaluation included medical interview, urodynamic evaluation, pelvic ultrasonography, cervical smear, and clinical examination. Clinical history assessed the presence of POP symptoms, lower urinary tract symptoms, and sexual and bowel disorders. Pelvic ultrasound was performed to exclude the presence of contraindications to conservative surgery. Urogenital examination was performed and vaginal prolapse staged according to Pelvic Organ Prolapse Quantification system (POP-Q) [11].

### Surgical technique

Patients underwent vaginal hysteropexy through bilateral high uterosacral ligament (USLs) suspension according to the described technique. Surgery was performed by two experienced urogynecological surgeons (RM, FS). After surgical-field preparation and insertion of a urethral catheter, a gentle traction was exerted on the uterine cervix to allow better

exposition of the posterior vaginal wall and cul-de-sac. Transverse incision of the posterior vaginal fornix was followed by opening the pouch of Douglas with scissors. Bowel was packed out of the operative field with long gauze to allow identification of USL each side. A gentle traction with an Allis clamp was exerted on the caudal part of the ligament, and triple transfixion of USLs was performed bilaterally according to the Shull technique (monofilament 0 delayed absorbable double-armed suture) [12]. The lowest suture was placed at the level of the ischial spine, and the two following were placed 1 cm (0.4 in.) above each. In total, six sutures were positioned. To minimize ureteral injury risk, sutures were passed ventral to dorsal. After suture placement, the vaginal pack was removed. Then, suspending sutures were used to close the peritoneum and colpotomy. Each dorsal needle was passed posteriorly through the peritoneum and vaginal fornix. Each ventral needle was passed anteriorly through the peritoneum, pericervical ring, and vaginal fornix. The most distal USL sutures were passed laterally, the proximal ones medially, and the intermediates ones between the previous ones. All sutures were tightened in order to close both the pouch of Douglas and the posterior vaginal fornix. Additional surgical procedures, such as anterior or posterior repair or anti-incontinence procedures, were performed when indicated. Trachelorrhaphy was performed only in case of severe cervical hypertrophy.

### Postoperative evaluation

Follow-up visits were performed 1, 6, and 12 months after hysteropexy and then annually. Prolapse recurrence was defined as the need of reoperation for POP or descent of at least one compartment  $\geq$  II stage according to the POP-Q system. Patient Global Impression of Improvement score (PGI-I) was used to evaluate patient satisfaction at every visit [13].

### Statistical analysis

Statistical analysis was performed using JMP software version 9.0.

## Results

The first 20 consecutive patients corresponding to the given period were analyzed. Mean follow-up was 33.2 (range 5–72) months. Population characteristics are summarized in Table 1. The procedure was performed in  $84 \pm 19$  min, and blood loss was  $228 \pm 139$  ml. Additional procedures are listed in Table 2. Three complications (15 %) were observed. One patient had urinary tract infection treated with antibiotics IV. One patient who received a concomitant suburethral sling had the monolateral tape cut to eliminate postoperative voiding

**Table 1** Population characteristics and preoperative prolapse stage

Population	Age (years)	BMI (kg/m <sup>2</sup> )	Parity ( <i>n</i> )
Mean ± SD	42.0 ± 6.8	23.7 ± 3.1	1.3 ± 0.5
Prolapse stage	Cystocele	Hysterocele	Rettocele
Median (IQR)	2 (1–2)	3 (2–3)	1 (0–1)

SD standard deviation, IQR interquartile range

dysfunction. One patient needed transvaginal cutting of the vaginal portion of one suspending suture in outpatient setting due to local granuloma and pain. Recurrence was observed in five patients (25 %): two were due to severe cervical elongation that developed after surgery. Three women (15 %) underwent surgical treatment (two vaginal hysterectomies, one sacral hysteropexy), one rehabilitation with pelvic floor exercises, and one was only mildly bothered and did not require treatment. Mean POP-Q values before and after surgery are reported in Table 3. Mean PGI-I score was 2.1 ± 1.2 (“much improved”). Two of the five women (40 %) who had not fulfilled their childbearing desire obtained a pregnancy; both underwent elective caesarean section at term. At the follow-up visit after caesarean section, they both had stage I cystocele and hysterocele and were asymptomatic for prolapse.

## Discussion

Most studies about uterine-sparing procedures focus on abdominal sacrohysteropexy and vaginal sacrospinous ligament hysteropexy, which seem to have similar outcomes compared with hysterectomy-based techniques [7]. In particular, sacrospinous ligament hysteropexy can offer a valuable mesh-free technique to achieve successful apical suspension. In fact, a recent randomized controlled trial showed that sacrospinous ligament hysteropexy is not inferior to uterosacral ligament suspension after hysterectomy at 1 year follow-up in terms of objective and subjective outcomes [14]. Fewer studies analyze uterosacral ligaments hysteropexy, mainly by the laparoscopic route, which has encouraging results in terms of anatomical outcomes, blood loss, and operating time [15, 16]. Rosen et al. compared laparoscopic uterosacral hysteropexy with total laparoscopic hysterectomy without differences in recurrences. Notably, 14 % of patients

**Table 2** Additional procedures performed

Procedure	No. (%)
Anterior repair	6 (30 %)
Vaginal paravaginal repair	7 (35 %)
Posterior repair	16 (80 %)
Suburethral sling	7 (35 %)
Trachelorrhaphy	3 (15 %)

**Table 3** POP-Q values before and after surgery

	Before surgery	After surgery	<i>P</i> value
Aa	−0.4 ± 1.6	−2.1 ± 1.0	0.0002
Ba	+0.8 ± 1.5	−1.8 ± 1.3	<0.0001
C	+0.8 ± 2.1	−4.1 ± 3.0	<0.0001
gh	3.8 ± 0.6	3.5 ± 0.6	ns
pb	2.8 ± 0.4	3.0 ± 0.4	0.049
tvI	11.3 ± 1.0	10.8 ± 1.2	ns
Ap	−2.0 ± 0.9	−2.9 ± 0.3	0.0006
Bp	−1.4 ± 1.2	−2.9 ± 0.3	0.0001
D	−2.2 ± 1.7	−8.2 ± 1.5	<0.0001

Data expressed as mean ± standard deviation

POP-Q Pelvic Organ Prolapse Quantification system

in the conservative group developed cervical elongation [17]. However, very little is known about the vaginal uterosacral hysteropexy technique. To our knowledge, there is only one study regarding this procedure [18], which—when compared with vaginal hysterectomy—showed no difference in terms of recurrence-free survival (POP halfway system grade ≥2). Moreover, there was one pregnancy in the uterine-sparing group.

Our experience confirmed that transvaginal uterosacral hysteropexy appears to be a feasible and promising technique to preserve the uterus. Operative data showed a 15 % complication rate, with none being directly related to uterine preservation. Recurrences were noted in 25 % of patients, but 40 % of them were due to cervical elongation. This is in accord with other series, in which cervical elongation can occur after hysteropexy in up to 62 % of patients [17, 19]. Overall, patient satisfaction was good, scoring “much improved” on average. Literature data regarding pregnancy following hysteropexy is fragmentary, and limited information is available with which to counsel women desiring to give birth [10]. In our series, we registered an encouraging 40 % pregnancy rate, although the population was too small to reach valid conclusions. More limitations of this study are its retrospective design, the absence of a control population, and the lack of a sexual quality of life questionnaire. Strengths include multimodal evaluation with objective and subjective outcomes and pregnancy data. A comparison study on Shull's uterosacral ligament suspension between hysteropexy and hysterectomy is now being performed in our Institution.

## Conclusions

Transvaginal uterosacral hysteropexy appears a feasible technique for apical support without the use of prosthetic material. This procedure could be indicated in women with a desire to

preserve fertility or who prefer a uterine-sparing surgical option.

#### Compliance with ethical standards

**Financial disclaimers/Conflict of interest** None.

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