

# Transvaginal uterosacral ligament hysteropexy: a video tutorial

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## Abstract

**Introduction and hypothesis** Uterine-sparing procedures could be attractive in patients concerned about fertility preservation and corporeal image changes. Transvaginal uterosacral ligaments (USLs) hysteropexy can provide a mesh-free technique for uterine suspension. This video is intended to serve as a tutorial for surgical steps.

**Methods** A 38-year-old woman with symptomatic stage III POP desired preserving fertility. After proper counseling, the patient was admitted for vaginal hysteropexy through bilateral high USL suspension according to the featured technique.

**Results** Prolapse repair was successfully achieved without complications. We had already published a series of 20 cases that confirmed that transvaginal USLs hysteropexy is a promising technique for correcting genital prolapse with uterus preservation.

**Conclusion** Transvaginal USLs hysteropexy provides a feasible technique for apical support without the use of prosthetic material. This procedure could be attractive to women who desire a uterine-sparing surgical option.

**Keywords** Uterine-sparing surgery · Transvaginal route · Hysteropexy · Uterosacral ligaments suspension · Video tutorial

## Introduction

Uterus-sparing surgery represented a cornerstone in pelvic organ prolapse (POP) repair in the pre-antibiotic era because of the lower risk of infective and hemorrhagic complications. Recently, uterine preservation has regained popularity in patients and clinicians. In fact, hysterectomy is associated with a negative psychosocial burden, including sexual dysfunction, depressive symptoms, and body image impairment [1, 2]. Moreover, uterus-sparing surgery is characterized by shorter operative time, less bleeding, and faster return to activities [3]. As a consequence, hysteropexy represents a suitable choice for patients who desire fertility to be preserved or have concerns about psychosocial and sexual changes after hysterectomy. Disadvantages comprise gynecological cancer surveillance and lack of long-term outcomes data. Accurate counseling and candidate selection is mandatory. Patients with abnormal uterine bleeding, voluminous uterine fibroids, endometrial hyperplasia, or cervical dysplasia must be excluded from conservative surgery. Hysteropexy can be performed either via the abdominal or the vaginal route, both with and without the use of synthetic mesh.

Currently, there is no consensus on optimal treatment [4]. Abdominal sacral hysteropexy and transvaginal sacrospinous ligament hysteropexy are the most frequently performed uterus-sparing procedures. However, transvaginal uterosacral ligament hysteropexy has also been described and could represent an alternative mesh-free technique for uterine suspension [5, 6]. The aim of the video is to provide a tutorial

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**Electronic supplementary material** The online version of this article (doi:10.1007/s00192-016-3222-2) contains supplementary material. This video is also available to watch on <http://link.springer.com/>. Please search for this article by the article title or DOI number, and on the article page click on “Supplementary Material”

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showing the steps and surgical technique of transvaginal uterosacral ligament hysteropexy.

## Materials and methods

The patient is a 38-year-old woman with symptomatic POP. She had already had one pregnancy, but desired fertility to be preserved. There was neither significant surgery nor pathological conditions in her clinical history. She was bothered by POP symptoms and voiding dysfunction without incontinence; she did not mention dyspareunia or bowel dysfunction. Gynecological evaluation demonstrated anterior stage III, apical stage II and posterior stage I prolapse (POP-Q: +2 +2 +1; 4 3 9; -1.5 -1.5 -3). Preoperative urodynamics confirmed voiding dysfunction. Negative pelvic ultrasound and cervical smear completed the preoperative assessment. After proper counseling, the patient was admitted for vaginal hysteropexy through bilateral high uterosacral ligament (USLs) suspension according to the technique described.

The day before surgery the patient underwent mechanical bowel preparation with sodium phosphate monobasic monohydrate and dibasic heptahydrate. Broad-spectrum intravenous antibiotic prophylaxis was administered. She received locoregional anesthesia and was placed into the lithotomy position. A urethral catheter was inserted.

1. Gentle traction was exerted on the cervix uteri with Allis clamps to allow good exposure of the posterior vaginal fornix.
2. A transverse sharp incision of the posterior vaginal fornix was performed, followed by opening of the Douglas pouch with scissors.
3. The bowel was packed out of the operative field with long gauze to allow identification of USLs.
4. Gentle traction with Allis pliers in the caudal part of the ligament was carried out to improve USL visualization.
5. USL transfixion was performed ventral to dorsal to minimize the risk of ureteral injury. In total, three sutures were placed on each side (monofilament 0 delayed absorbable double-armed suture). The lowest suture was placed at the level of the ischial spine, and the others were placed 1 cm (0.4 in.) and 2 cm (0.8 in.) above the first one.
6. Each suture was marked with a different instrument to allow successive correct positioning and the long gauze was removed.
7. For each suture, one needle was passed dorsally through the peritoneum and vaginal fornix and the other ventrally through the peritoneum, pericervical stromal ring, and vaginal fornix. Distal USL sutures were passed laterally, the proximal ones medially, and the intermediate ones between the previous two.

8. All sutures were tightened to close both the pouch of Douglas and the posterior transverse colpotomy.

The procedure featured was completed by traditional anterior repair. Total operative time was 60 min and blood loss 100 ml. Diagnostic cystoscopy assessed ureteral patency. No surgical complications were observed. On post-operative day 2, the patient was successfully discharged home. At the current follow-up (24 months) both anatomical and subjective outcomes were successful (POP-Q: -3 -3 -6; 4 3 9; -2 -2 -9; PGI-I score = 1).

## Discussion

Most uterine-sparing studies focus on abdominal sacrohysteropexy and vaginal sacrospinous ligament hysteropexy. USL suspension can offer potential advantages compared with sacrospinous ligament (SSL) fixation. USL identification requires less dissection compared with SSL. Moreover, SSL is located near to both the rectum and the pudendal neurovascular bundle, which is characterized by anatomical variations. As a consequence, most frequently reported complications of SSL fixation include rectum damage with rectovaginal fistula formation and nerve damage with development of pain syndromes [7]. These complications may be persistent and difficult to treat. On the other hand, the most common complication of USL suspension is ureteral kinking, which can be identified by intraoperative cystoscopy and treated without adverse sequelae. In a large study considering 351 patients, ureteral injury after hysterectomy plus USL suspension occurred in 2.3% and was successfully treated in all patients with intraoperative suture revision/ureteral stenting [8]. In a uterine preservation setting there are no studies comparing SSL with USL hysteropexy in terms of both complications and efficacy. However, there are increasing data regarding the anatomical outcomes of USL hysteropexy. Reassuringly, recurrence rate after USL hysteropexy and hysterectomy seem to be similar, both via the laparoscopic and the transvaginal route [6, 9]. Our experience with the featured technique confirmed transvaginal USL hysteropexy as a feasible and promising technique to preserve the uterus. In our published series, we found a reoperation rate of 15% for recurrence and a postoperative pregnancy rate of 40%. Moreover, patient satisfaction was good, scoring “much improved” on average [5]. A comparison study between USL hysteropexy and hysterectomy plus USL suspension is ongoing at our Institution. We are currently passing from stage 2A (development) to stage 2B (exploration) according to the idea, development, exploration, assessment, long-term follow-up (IDEAL) collaboration surgical innovation staging [10].

## Conclusion

Prolapse repair was successfully achieved without complications using USL hysteropexy. Transvaginal USL hysteropexy provides a feasible technique for apical support without the use of prosthetic materials. This procedure can be attractive to women who desire a uterine-sparing surgical option.

## Compliance with ethical standards

**Conflicts of interest** None.

**Consent** Written informed consent was obtained from the patient for publication of this video article and any accompanying images.

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