

Total Pelvic Floor Lifting: A New Approach for the Anatomic Repair of Pelvic Floor Hypermobility and Vaginal Laxity in Parous Women

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Summary: Recent years have seen a steady increase in the information available regarding pelvic floor changes after childbirth. Obstetric trauma, to which all structures of the urogenital sphere are subjected, can affect different anatomical areas, including the vagina, perineum, deep pelvic floor muscles, and sphincter. Main complaints of parous women with regard to their pelvic floor are vaginal laxity, a wide introitus, and increased mobility of the uterus. Unilateral pectineal suspension is a novel method for surgical correction of the sequelae of vaginal birth-giving such as uterine hypermobility and perception of loose tissue, restoring a natural anatomy when conservative therapy has failed. Since the method is not ablative and does not interfere with anatomical structures, subsequent pregnancies and deliveries remain possible. Furthermore, there is no mesh application, adding to the safety aspects of this unique approach. The surgical technique is straightforward and can be adopted by laparoscopically trained surgeons without problems. The procedure consists of five clearly defined steps, which makes it easily reproducible. Unilateral pectineal suspension restores the pelvic floor and the vagina, with a single suture lifting the sagging structures back to their original position. If needed and according to the patient's choice, a short perineum associated with a wide introitus can be corrected in the same session by perineoplasty, resulting in a total aesthetic reconstruction of the female genital anatomy. (*Plast Reconstr Surg Glob Open* 2024; 12:e5584; doi: [10.1097/GOX.0000000000005584](https://doi.org/10.1097/GOX.0000000000005584); Published online 23 February 2024.)

INTRODUCTION

After vaginal deliveries, women frequently observe changes in their pelvic floor anatomy and functionality. Ligaments, pelvic floor muscles, and connective tissue may have become loose during delivery. Subsequently, increased pelvic floor mobility as well as laxity of the introitus and vagina are typical findings. The increased mobility of the pelvic floor may also result in disturbances of bladder or bowel function. Many women experience these symptoms, as they interfere with their sexual, physical, and psychological well-being.¹ Especially in women who have not completed their family planning, the restoration of a sagging pelvic floor is challenging.

We have recently established unilateral pectineal suspension (UPS) as a novel technique for apical and combined pelvic floor repair with the option to preserve the healthy uterus. UPS provides mesh-free midline uterus suspension using a single nonabsorbable suture to attach the anterior cervix to the lateral part of the iliopectineal ligament. This unique concept enables the correction of the sequelae of vaginal birth-giving in the absence of prolapse, such as uterine hypermobility and perception of loose tissue, restoring a natural anatomy without precluding subsequent pregnancies. UPS can be easily combined with perineoplasty to correct a residual wide or scarred introitus, if necessary.

Here, we describe the application of UPS as a pelvic floor lifting procedure to restore natural anatomy of the vulva and vagina and to support a positive female self-image and sexual well-being in parous women.

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CONCISE PRESENTATION OF UNIQUE IDEA, INNOVATION, OR TECHNIQUE

Information regarding pelvic floor changes after childbirth has increased in recent years. Pregnancy is associated with bladder neck lowering, increased bladder neck mobility, pelvic organ descent, decreased levator ani strength, and decreased urethral resistance.² Dynamic magnetic resonance imaging studies could recently demonstrate increased mobility of pelvic floor structures after first pregnancy.³

Women who gave birth vaginally have longer genital hiatus and lower anterior and posterior vaginal walls. The perineal body length is significantly decreased.⁴ At the same time, indicators for pelvic organ prolapse (POP) such as mean POP-Q points Ba and Bp remain within normal range.

Increased pelvic floor mobility without typical prolapse anatomy needs to be defined and addressed as a separate entity because classic procedures of prolapse surgery are not suitable for these women. Here, we present pelvic floor lifting as a comprehensive minimally invasive technique to restore pelvic floor anatomy in women complaining of hypermobility, wide introitus, and vaginal laxity. The method offers not only cosmetic restoration in mild cases, but also shows significant reconstructive benefits in advanced cases.

Ethical Considerations and Informed Consent

The work was conducted at University Women's Hospital of Klinikum Nuremberg, in accordance with the ethical standards of the Declaration of Helsinki. Approval by the internal review board was obtained (IRB-2022-009).

Patients presenting with complaints of pelvic floor hypermobility were offered anatomic repair using UPS with or without additional perineoplasty as indicated. They were informed that a case description and documentation of their intraoperative situs might be used for publication purposes, and written consent was obtained. All patients had undergone one or more vaginal deliveries.

Surgical Technique

Since 2020, we successfully applied the surgical method in over 400 cases with excellent results. Here we present a typical case of a 45-year old White woman, who presented after four spontaneous vaginal deliveries. She complained of hypermobility as well as a wide introitus. She reported sexual discomfort and psychologic distress, asking for surgical correction after failed conservative therapy. (See Video 1 [online] which shows a preoperative demonstration of significant uterus hypermobility with accompanying traction cystocele and simulation of anatomical correction and repositioning of the cervix along the physiologic vaginal axis.) UPS was conducted by conventional laparoscopy in standard general anesthesia.

As previously described, UPS is performed in five defined steps.⁵ The main anatomical landmarks are the pectineal (Cooper) ligament at the S2 level and the anterior cervix at the isthmo-cervical transition. The two structures are exposed (Fig. 1A), then connected by an ethibond #2 not absorbable suture (Fig. 1B, C). Following UPS, the uterus is resting midline in physiologic position

Takeaways

Question: How to treat female patients with pelvic floor hypermobility and vaginal laxity.

Findings: Unilateral pectineal suspension offers a safe method for total pelvic floor lifting.

Meaning: We present an innovative surgical solution to restore natural anatomy of the vulva and vagina as well as to support a positive female self-image and sexual well-being in parous women.

(Fig. 1D), thereby restoring the natural vaginal axis and lifting the structures to their original anatomical position. The suspension offers tension-free adjustment, avoiding overcorrection. In the case presented, the introitus was subsequently corrected by perineoplasty.

Vaginal examination after the procedure verifies the cervix at the apex. The vaginal walls are straight without bulging. The vulva and introitus have regained their natural appearance, and the anal protrusion has disappeared. (See Figure, Supplemental Digital Content 1, which shows postoperative anatomy. A, A 45-year-old IVG IVP patient after UPS: the vaginal walls are straight as shown by insertion of the Breisky speculum. B, Normal external anatomy of vulva and anus. C, After UPS and posterior repair with correction of the remaining wide introitus. <http://links.lww.com/PRSGO/D131>.)

Postoperative ultrasound of bladder and kidneys is routinely performed on the first postoperative day to rule out urinary obstruction or retention. Patients are examined vaginally 2 days postoperatively and during a follow-up visit 3 months after surgery. Due to the minimally invasive nature of the procedure, the risk for late complications is low.

DISCUSSION

Patient interest in cosmetic genital procedures has increased. Typical surgical procedures to support a juvenile appearance are labiaplasty, clitoral hood reduction, hymenoplasty, labia majora augmentation, vaginoplasty, and G-spot amplification. Nonsurgical options offer "vaginal rejuvenation," most commonly local radiofrequency or laser treatment.⁶ The Food & Drug Administration issued a warning against energy-based medical devices for vaginal cosmetic procedures.⁷

Anatomical changes after pregnancy and delivery present a separate challenge. Clinical practice guidelines have been developed, including items for counseling and interventions for prevention of obstetric injuries and postnatal pelvic floor symptoms.^{6,8} Nevertheless, more than half of premenopausal primiparous women have some form of clinically significant pelvic floor symptoms.⁹ In a longitudinal cohort study, a worsening in general sex score after vaginal deliveries was demonstrated.¹⁰

Therefore, it is important to offer a valid option when conservative therapy has failed. UPS provides minimally invasive total pelvic floor lifting with an excellent long-term safety profile. Because the method is not ablative and does not interfere with anatomical structures,

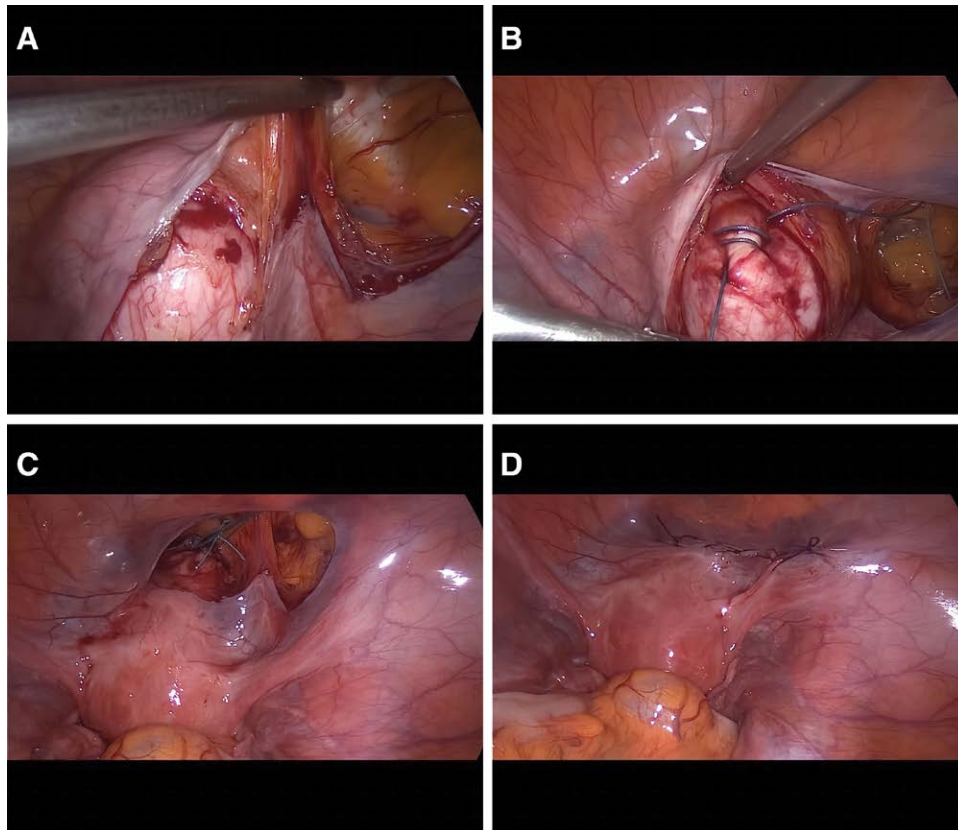


Fig. 1. UPS procedure. A, Exposure of the right pectineal ligament and the anterior cervix, complete peritoneal incision between the two structures. B, An Ethibond #2 suture connects the right pectineal ligament at the S2 level with the anterior cervix. C, The uterus is secured in its natural position with assistance from the vaginal side by the Ethibond suture using a sliding knot. D, Closure of the peritoneal incision with Vicryl #0 running suture, covering the ethibond thread.

subsequent pregnancies remain possible. Furthermore, there is no mesh application, adding to the safety of this unique approach. Short-term follow-up on the new technique has been published in a patient group with prolapse stages POP-Q 2 to 4. In this case series, apical correction was 100% successful. In a standardized follow-up interview, 93.6% of patients reported their satisfaction with the operative result. No unexpected complications were observed.¹¹ Furthermore, in the case series of over 400 procedures performed, we have until now no cases with bowel disorders, ureter or bladder complications or de novo incontinence, nor the need for re-operation (unpublished data). The straightforward concept performance (avoiding dissection of critical structures) allows for an accurate evaluation of the postoperative symptoms of the patient.

The surgical technique is straightforward, and the five clearly defined steps make it easily reproducible. The aesthetic correction of a disturbed genital anatomy seems appropriate to restore the anatomical and functional basis for a healthy pelvic floor. UPS uses a single suture to lift the sagging structures back to their original position. Care has to be taken of the external iliac vessels in the vicinity to the pectineal ligament. UPS is also very suitable for robotic surgery, shortening the operative time.¹² It is noteworthy to mention that

the tension-free principle of the UPS concept allows the midline repositioning of the cervix. Correct midline positioning is confirmed intraoperatively by vaginal examination. Additional tension would cause unilateral uterus placement and should be avoided. In our experience, bilateral fixation increases considerably the tension on the fixed structures and reduces significantly the desired mobility of the suspended apex. Furthermore, the adjustment options are reduced.

In view of the gynecologic aspects for correct indication and treatment, it is advisable to use an interdisciplinary approach, including the plastic aesthetic surgeon and a specialized gynecologist or urogynecologist.

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DISCLOSURES

Both Dimitrios Bolovis and Cosima Brucker hold a contract with Intuitive Surgical for proctoring and teaching using Da Vinci robotic systems. The authors declare that they have no other relevant financial or nonfinancial interests to disclose.

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