

Hysterectomy in patients with history of prior cesarean delivery: A reverse dissection technique for vesicouterine adhesions

Vesicouterine adhesions resulting from prior CDs or other surgeries can distort the pelvic anatomy and present challenges during laparoscopic hysterectomy. These experts describe a dissection technique that creates a “new” space and permits safe separation of the bladder from the uterus and cervix, reducing the risk of injury to adjacent structures.

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Minimally invasive surgical techniques, which have revolutionized modern-day surgery, are the current standard of care for benign hysterectomies.¹⁻⁴ Many surgeons use a video-laparoscopic approach, with or without robotic assistance, to perform a hysterectomy. The development of a bladder flap or vesicovaginal surgical space is a critical step for mobilizing the bladder. When properly performed, it allows for appropriate closure of the vaginal cuff while

mitigating the risk of urinary bladder damage.

In patients with no prior pelvic surgeries, this vesicovaginal anatomic space is typically developed with ease. However, in patients who have had prior cesarean deliveries (CDs), the presence of vesicouterine adhesions could make this step significantly more challenging. As a result, the risk of bladder injury is higher.⁵⁻⁸

With the current tide of cesarean birth rates approaching 33% on a national scale, the presence of vesicouterine adhesions is commonly encountered.⁹ These adhesions can distort the anatomy and thereby create more difficult dissections and increase operative time, conversion to laparotomy, and inadvertent cystotomy. Such a challenge also presents an increased risk of injuring adjacent structures.

In this article, we describe an effective method of dissection that is especially useful in the setting of prior CDs. This method involves developing a “new” surgical space lateral and caudal to the vesicocervical space.

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Steps in operative planning

Preoperative evaluation. A thorough preoperative evaluation should be performed for patients planning to undergo a laparoscopic hysterectomy. This includes obtaining details of their medical and surgical history. Access to prior surgical records may help to facilitate planning of the surgical approach. Previous pelvic surgery, such as CD, anterior myomectomy, cesarean scar defect repair, endometriosis treatment, or exploratory laparotomy, may predispose these patients to develop adhesions in the anterior cul-de-sac. Our method of reverse vesicouterine fold dissection can be particularly efficacious in these settings.

Surgical preparation and laparoscopic port placement. In the operative suite, the patient is placed under general anesthesia and positioned in the dorsal lithotomy position.¹⁰ Sterile prep and drapes are used in the standard fashion. A urinary catheter is inserted to maintain a decompressed bladder. A uterine manipulator is inserted with good placement ensured.

Per our practice, we introduce laparoscopic ports in 4 locations. The first incision is made in the umbilicus for the introduction of a 10-mm laparoscope. Three subsequent 5-mm incisions are made in the left and right lower lateral quadrants and medially at the level of the suprapubic region.¹⁰ Upon laparoscopic entry, we perform a comprehensive survey of the abdominopelvic cavity. Adequate mobility of the uterus is confirmed.¹¹ Any posterior uterine adhesions or endometriosis are treated appropriately.¹²

First step in the surgical technique:

Lateral dissection

We proceed by first desiccating and cutting the round ligament laterally near the inguinal canal. This technique is carried forward in a caudal direction as the areolar tissue near the obliterated umbilical artery is expanded by the pneumoperitoneum. With a vessel sealing-cutting device, we address the attachments to the adnexa. If the ovaries are to be retained, the utero-ovarian ligament is desiccated and cut. If an oophorectomy is

These videos demonstrate the reverse vesicouterine fold dissection technique

From the Center for Special Minimally Invasive and Robotic Surgery

<https://youtu.be/wgGssnd1JAo>

Reverse vesicouterine fold dissection for total laparoscopic hysterectomy

- Case 1: TLH with development of the “new space”: The technique with prior C-section
- Case 2: A straightforward case: Dysmenorrhea and menorrhagia
- Case 3: History of multiple C-sections with adhesions and fibroids

<https://youtu.be/6vHamfPZhdY>

Reverse vesicouterine fold dissection for total laparoscopic hysterectomy after prior cesarean delivery

indicated, the infundibulopelvic ligament is desiccated and cut.

Using the tip of the vessel sealing-cutting device, the space between the anterior and posterior leaves of the broad ligament is developed and opened. A grasping forceps is then used to elevate the anterior leaf of the broad ligament and maintain medial traction. A space parallel and lateral to the cervix and bladder is then created with blunt dissection.

The inferior and medial direction of this dissection is paramount to avoid injury to nearby structures in the pelvic sidewall. Gradually, this will lead to the identification of the vesicovaginal ligament and then the vesicocervical ligament. The development of these spaces allows for the lateral and inferior displacement of the ureter. These maneuvers can mitigate ureter injury by pushing it away from the planes of dissection during the hysterectomy.

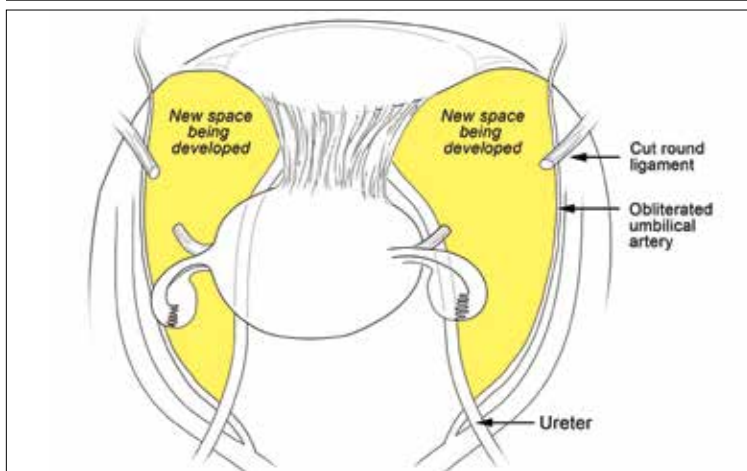
Continued traction is maintained by keeping the medial aspect of the anterior leaf of the broad ligament intact. However, the posterior leaf is dissected next, which further lateralizes the ureter. Now, with the uterine vessels fully exposed, they are thoroughly desiccated and ligated. The same procedure is then performed on the contralateral side.¹¹ (See the box above for links to videos that demonstrate the techniques described here.)

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FIGURE 1 New space created by the reverse vesicouterine fold dissection technique



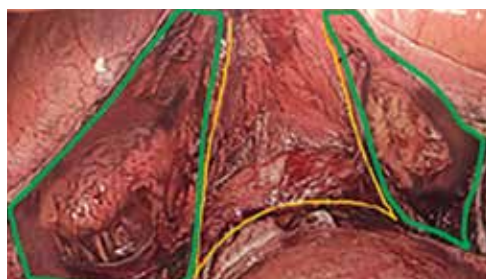
Creation of a “new” space in the vesicovaginal space, using a blunt sweeping motion from an inferior-to-superior direction, facilitates hysterectomy in patients with anterior cul-de-sac adhesions from prior cesarean deliveries or other surgeries.

Creating the “new” space

In the “new” space that was partially developed during the lateral dissection, blunt dissection is continued, using a sweeping motion from an inferior-to-superior direction, to extend this avascular space. This is performed bilaterally until both sides are connected from the inferior aspect of the vesicouterine adhesions, if present. This thorough dissection creates what we refer to as a “new” space¹¹ (FIGURE 1).

Medially, the new space is bordered by the vesicocervical-vaginal ligament, also

FIGURE 2 Vesicocervical space boundaries (yellow) and “new” space boundaries (green)



known as the bladder pillar. Its distal landmark is the bladder. The remaining intact anterior leaf of the broad ligament lies adjacent to the space anteriorly. The inner aspect of the obliterated umbilical artery neighbors it laterally. Lastly, the vesicovaginal plane’s posterior margin is the parametrium, which is the region where the ureter courses into the bladder. The paravesical space lies lateral to the obliterated umbilical ligament.

Visualization of this new space is made possible in the laparoscopic setting. The pneumoperitoneum allows for better demarcation of the space. Additionally, laparoscopic views of the anatomic spaces differ from those of the laparotomy view because of the magnification and the insufflation of carbon dioxide gas in the spaces.^{13,14} In our experience, approaching the surgery from the “new” space could significantly decrease the risk of genitourinary injuries in patients with anterior cul-de-sac adhesions (FIGURE 2).

Using the reverse vesicouterine fold dissection technique

Among patients with prior CDs, adhesions often are at the level of or superior to the prior CD scar. By creating the new space, safe dissection from a previously untouched area can be accomplished and injury to the urinary bladder can be avoided.

The reverse vesicouterine fold dissection can be performed from this space. Using the previously described blunt sweeping motion from an inferior-to-superior direction, the vesicovaginal and vesicocervical space is further developed from an unscarred plane. This will separate the lowest portion of the bladder from the vagina, cervix, and uterus in a safe manner. Similar to the technique performed during a vaginal hysterectomy, this reverse motion of developing the bladder flap avoids erroneous and blind dissection through the vesicouterine adhesions (FIGURES 3–5).

Once the bladder adhesions are well delineated and separated from the uterus by the reverse vesicouterine fold dissection technique, it is safe to proceed with complete bladder mobilization. Sharp dissection can be used to dissect the remaining scarred

ILLUSTRATION: MARCIA HARTSOCK FOR OBG MANAGEMENT

FIGURE 3 Laparoscopic view of the dense bladder adhesions to the uterine corpus prior to dissection

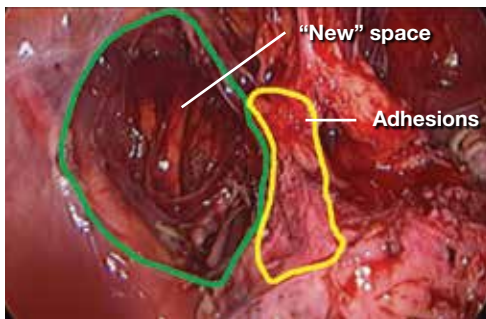
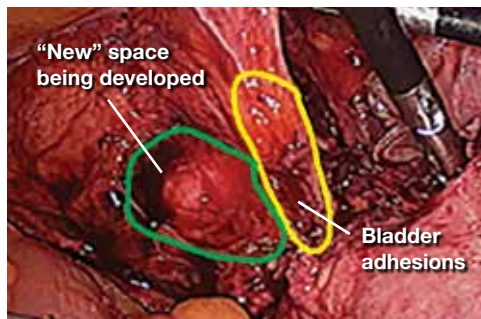


FIGURE 4 Laparoscopic view demonstrating blunt dissection to create the “new” space



bladder at its most superior attachments. Avoid the use of thermal energy to prevent heat injury to the bladder. Carefully dissect the bladder adhesions from the cervicouterine junction. Additional inferior bladder mobilization should be performed up to 3 cm past the leading edge of the cervicovaginal junction to ensure sufficient vaginal tissue for cuff closure. Note that the bladder pillars occasionally may be trapped inside a CD scar. This surgical technique could make it easier to release the pillars from inside the adhesions and penetrating into the scar.¹⁵

Completing the surgery

Once the bladder is freely mobilized and all adhesions have been dissected, the cervix is circumferentially amputated using monopolar cautery. The vaginal cuff can then be closed from either a laparoscopic or vaginal approach using polyglactin 910 (0-Vicryl) or barbed (V-Loc) suture in a running or interrupted fashion. Our practice uses a 1.5-cm margin depth with each suture. At the end of the surgery, routine cystoscopy is performed to verify distal ureteral patency.¹⁶ Postoperatively, we manage these patients using a fast-track, or enhanced recovery, model.¹⁷

An effective technique in challenging situations

Genitourinary injury is a common complication of hysterectomy.¹⁸ The proximity of

the bladder and ureters to the field of dissection during a hysterectomy can be especially challenging when the anatomy is distorted by adhesion formation from prior surgeries. One study demonstrated a 1.3% incidence of urinary tract injuries during laparoscopic hysterectomy.⁶ This included 0.54% ureteral injuries, 0.71% urinary bladder injuries, and 0.06% combined bladder and ureteral injuries.⁶ Particularly among patients with a prior CD, the risk of bladder injury can be significantly heightened.¹⁸

The reverse vesicouterine fold dissection technique that we described offers multiple benefits. By starting the procedure from an untouched and avascular plane, dissection into the plane of the prior adhesions can be circumvented; thus, bleeding is limited and injury to the bladder and ureters is avoided

FIGURE 5 Laparoscopic view showing the skeletonized bladder adhesions



FAST TRACK

By starting the procedure from an untouched, avascular plane, dissection into the plane of the prior adhesions can be circumvented. Thus, bleeding is limited and injury to the bladder and ureters is avoided or minimized.

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or minimized. By using blunt and sharp dissection, thermal injury and delayed necrosis can be mitigated. Finally, with bladder mobilization well below the colpotomy site, more adequate vaginal tissue is free to be incorporated into the vaginal cuff closure, thereby limiting the risk of cuff dehiscence.¹⁶

While we have found this technique effective for patients with prior cesarean deliveries, it also may be applied to any patient who has a scarred anterior cul-de-sac. This could include patients with prior myomectomy, cesarean scar defect, or endometriosis. Despite the technique being a safeguard against bladder injury, surgeons must still use care in developing the spaces to avoid ureteral injury, especially in a setting of distorted anatomy. ●

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