

Four-step Technique on Ureteral Safety in Total Laparoscopic Hysterectomy

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OBJECTIVE

Total laparoscopic hysterectomy (TLH) significantly increases ureteral injury risk compared to open abdominal hysterectomy.^[1-3] In difficult cases, ureter dissection is important for preventing ureteral injury.^[4] Dissecting the ureter is not always needed; however, in complicated cases, it is difficult for residents. During surgery, blood obscures the field of vision so that the anatomical elements are not as easily distinguished with no emphasis or contrast. Therefore, we train residents by bloodless surgery demonstration where structures clearly contrast and anatomy are easily recognized, resulting from not breaking adipose tissue. Herein, we introduce our educational video of bloodless TLH to help residents practice surgical procedures [Videos 1-5].

DESIGN

Step-by-step video demonstration of the surgical technique.

PATIENT

A laparoscopic hysterectomy patient.

SETTING

Laparoscopic hysterectomy.

INTERVENTIONS

The standardized procedure is as follows:

Developing the new paravesical/pararectal space

We developed a new paravesical space between the umbilical ligament and the bladder and also created Latzko's pararectal space to observe the entire ureter. Full medial traction of the peritoneum around the ovarian vessels at the pelvic brim exposes the ureter more clearly over the iliac vessels at their bifurcation.^[5] Most surgeons open the space for partial observation of the ureter; however, partial visibility makes it easy to lose sight of the ureter or cause injury. If we detect the uterine artery and identify the uterine artery and ureter crossing point, anatomy is more easily identified. If such case with endometriosis, we can easily open the inner portion of the ureter is known as the pararectal space of Okabayashi.^[5] If we develop this space partially at step 2, we can safely dissect the ureter more laterally.

Resecting the sacrouterine ligament before parametrial resection

Ureteral injuries during resection mostly occur near the parametrium at the cardinal ligament level. Particularly, the ureter is located near the ventral side of the cardinal ligament.^[6] Therefore, we resected the broad ligament and partially resected the sacrouterine ligament to avoid ureteral injury. In this procedure, we elevated the uterus cranially and ensured sufficient distance between the uterus and the ureter to avoid ureteral injury. After resection, the shapes of the cervix and fornix of the vagina were easily recognizable [Figure 1]. After steps 1 and 2, the ureter was visible at the uterine artery crossing point and the range of parametrium resection required less length. This method prevents ureter injury in cases where

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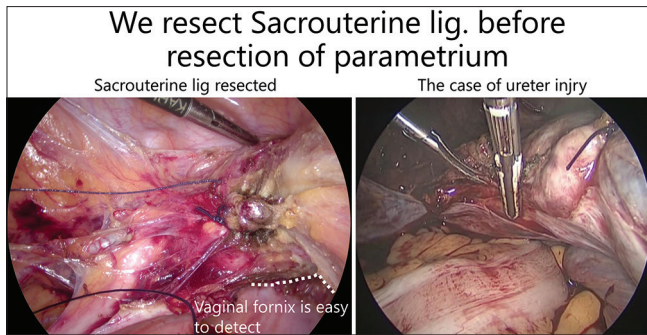


Figure 1: After resection of the sacrouterine ligament, the shapes of the cervix and the fornix of the vagina are easily recognizable <http://www.apagemit.com/page/video/show.aspx?num=309&kind=2&page=1>

a colpotomy cup cannot be used, including cases of cervical myoma.

Dissection of bladder pillar

The ureter was suspended in the cervix by the ureteric branch of the uterine artery; this is another factor that makes it susceptible to injury at the level of the cardinal ligament. The ureter was covered by the anterior leaf of the vesicouterine ligament, making dissection of the vesicouterine ligament difficult due to the risk of bleeding and technical difficulties. To further dissect the ureter safely, we dissected the bladder pillar instead of directly dissecting the vesicouterine ligament. The bladder pillar is a sequential structure of the vesicouterine ligament on the cranial side that is less vascular and easier to dissect.^[7] After the dissection of the bladder pillar, we could clearly see the vaginal fornix. Although the entire ureter was not visible, it was possible to assume that the ureter is more confined to a limited area.

Resection of the paracervical tissue

The video presents the safest resection order, as the ureter is ventrally close to the paracervical tissue. First, half of the ascending branches was resected, followed by the latter half of the ascending branches and the uterine attachment part of the sacrouterine ligament. Finally, the uterine attachment part of the bladder pillars was resected.

CONCLUSION

Our videos are edited to focus on skills for ureter detection, dissection, and avoidance of ureteral injury, providing valuable tips for the education of residents.

Ethical approval

Approval was obtained from the Institutional Review Board before the commencement of this study. The ethical committee of our institute approved this study (approval no.: S19-045).

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Nil.

Conflicts of interest

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