

Mobilization and protection of the ureter during laparoscopic total hysterectomy for cervical fibroids

✉ Jiahui Cao*, ✉ Aayale Chaimaa*, ✉ Weiyue Zhang*, ✉ Jiangnan Qiu, ✉ Chengyan Luo

Department of Gynecology, The First Affiliated Hospital with Nanjing Medical University, Nanjing, China

*These authors contributed equally to this work.

Abstract

Cervical fibroids (CFs) grow in the narrowest part of the uterus, which is adjacent to the ureter, uterine vessels and their branches. The ureter is at risk of being divided, thermally injured, and/or misligated when handling the vessels during total laparoscopic hysterectomy (TLH) to treat CFs. We present a series of videos to detail the methods and skills required to perform blunt ureterolysis and handle the uterine vessels during TLH for CFs. This video contains three cases of CFs that underwent TLH. In Case 1, the surgeon did not separate the ureter in advance and mistook the ureter for a vessel during coagulating the vessels with bipolar forceps, which resulted in thermal injury to the ureter. Therefore, a ureteral stent was placed under cystoscopy, which was removed three months after the operation. In both Cases 2, 3, the surgeon used a curved vascular clamp to bluntly separate and fully expose the pelvic part of the ureter and then coagulated and divided the vessels. The separation started when the ureter traced the base of the posterior lobe of the broad ligament until it entered below the uterine artery. The uterine artery dissection site differed in Cases 2 and 3, with Case 2 being at the origin of the internal iliac artery and Case 3 in an area close to the CF, depending on the space between the CF and uterine artery. After six months of follow-up, all three patients were free of pyelonephrosis and ureteral dilatation, and no ureterovaginal fistulae occurred. Blunt ureterolysis procedure can effectively avoid ureter injury in TLH for CFs. [J Turk Ger Gynecol Assoc.]

Keywords: Blunt ureterolysis, fibroids, Laparoscopic hysterectomy, ureteral injuries, urology

Received: 03 November, 2024 **Accepted:** 27 May, 2025 **Epub:** 31 July, 2025

Introduction

Cervical fibroids (CFs), with an incidence of 0.6% to 10%, grow in the narrowest part of the uterus, adjacent to the ureter, uterine vessels and their branches (1,2). Total laparoscopic hysterectomy (TLH) for CFs is challenging because CFs displaced the ureter from its anatomical positions, thus changing its alignment and the positions of associated structures. The ureter is at risk of being divided, thermally injured, and/or mis-ligated when handling the vessels during hysterectomy due to CFs, especially when the fibroids are large (3-6). In a Cochrane review, TLH was associated with a higher risk of genitourinary injury (bladder injury and ureteric injury combined) than abdominal hysterectomy [odds ratio: 2.44, 95% confidence interval: 1.24-4.80] (7). Therefore, we

present tips and tricks for release and protection of the ureter during laparoscopic TLH for CFs, with the aim of avoiding ureteral injury.

Methods

Management of uterine vessels is a crucial step in TLH for CFs. In this procedure, the ureter adjacent to the uterine vessels is separated and exposed in advance using blunt dissection technique for ureterolysis methods, and then the uterine arteries are electrocoagulated and disconnected, thus avoiding damage to the ureter. We present a series of videos to detail the methods and skills required to perform safe and effective blunt ureterolysis and handle the uterine vessels during TLH for CFs.



Address for Correspondence: Chengyan Luo

e-mail: betteryuan66@njmu.edu.cn **ORCID:** orcid.org/0000-0002-8154-8670

DOI: 10.4274/jtgga.galenos.2025.2024-11-1

Cite this article as: Cao J, Chaimaa A, Zhang W, Qiu J, Luo C. Release and protection of the ureter during laparoscopic total hysterectomy for cervical fibroids. J Turk Ger Gynecol Assoc.



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Results

To demonstrate the process of blunt ureterolysis, the video contains three example cases of CFs undergoing TLH, which varied in their management of the parametrium. The process of blunt ureterolysis required fully exposing the pelvic segment of the ureter, starting from the base of the posterior lobe of the broad ligament where the ureter travels until it enters beneath the uterine artery, without opening the ureteral tunnel. All three patients had their urinary catheters extubated on the 2nd day postoperatively and were discharged on the 4th day after surgery.

The first video shows a 43-year-old woman with a body mass index (BMI) of 27.5 kg/m² undergoing TLH and bilateral salpingectomy. Intraoperative exploration revealed an enlarged uterus, equivalent to 4 months' gestation, and a fibroid on the right anterior wall of the cervix, about 11 cm in size, protruding into the broad ligament, with the right ureter and its adjacent uterine vessels in close proximity to the fibroid. When we coagulated the vessels with a bipolar forceps, there was thermal injury to the right ureter because of the large CF that displaced the ureter in close proximity to the blood vessel, and the two were strikingly similar in appearance (Figure 1). Afterwards, the alignment and peristalsis of the ureter were examined. We found part of the ureter close to the right parametrial vessels had turned light burnt yellow in appearance due to thermal injury. Therefore, a ureteral stent was placed under cystoscopy, which was removed three months after the operation. The occurrence of ureter injury in this patient was considered to be related to her increased BMI, large CF causing displacement of the ureter and narrowing of the paracervical space, and the surgeon's lack of prior separation and exposure of the ureter. The second video presents a 47-year-old woman who

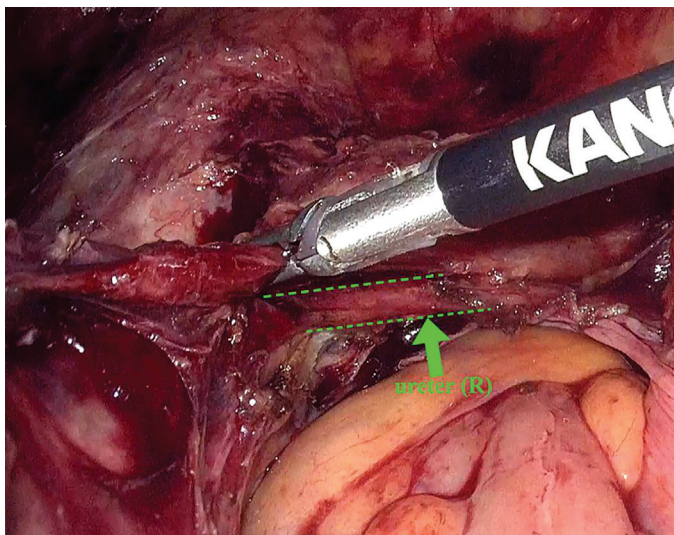


Figure 1. Distribution of the right ureter and uterine vessels

underwent TLH and bilateral salpingectomy for CFs. During the operation, a slightly enlarged uterus was observed, and there was a fibroid of about 8 cm in diameter with abundant blood vessels protruding from the right side of the cervix. Only a small part of the fibroid was located in the cervix, and most of it was located in the right broad ligament; these CFs are also termed “broad ligament fibroids” (Figure 2). Although this fibroid was very close to the ureter, we bluntly separated and exposed the ureter beforehand until the ureter was freed from the fibroid, thus avoiding damage to the ureter. The right uterine artery was cut off after being clamped with titanium clips at the beginning of the internal iliac artery, and then the fibroid was lifted medially. The deep uterine vein was exposed and cut off after being clamped, all of which were done to avoid intraoperative hemorrhage. After completing these important

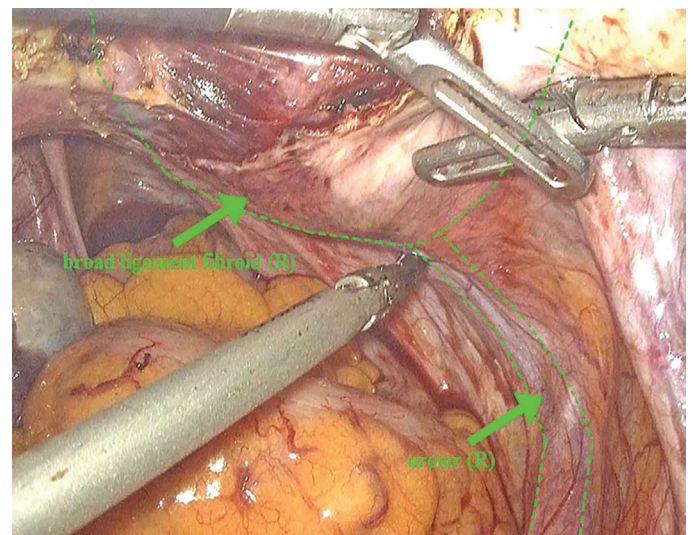


Figure 2. The cervical fibroid compressed the right ureter

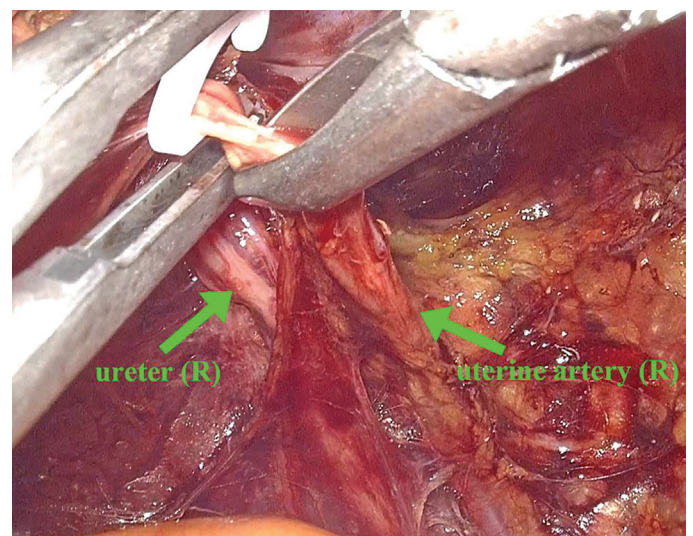


Figure 3. The right uterine artery and the right ureter are identified by blunt ureterolysis

Table 1. Clinical characteristics and operative details

Patient	Age at diagnosis (years)	Menopausal status	BMI (kg/m ²)	Operation	Fibroid size (cm)	Operation time (mins)	Blood loss (mL)	Blood transfusion (mL)	Indwelling urinary catheter time (days)	Hospital stay (days)	Postoperative ureteral stenosis	Postoperative pyelonephrosis	Postoperative ureterovaginal fistulae
1	43	Premenopausal	27.5	TLH + BS	11	209	100	No	2	7	No	No	No
2	47	Premenopausal	20.2	TLH + BS	8	310	150	No	2	8	No	No	No
3	54	Postmenopausal	21.0	TLH + BSO	10	126	100	No	2	7	No	No	No

BMI: Body mass index, TLH + BS: Total laparoscopic hysterectomy and bilateral salpingectomy, TLH + BSO: Total laparoscopic hysterectomy and bilateral salpingo-oophorectomy.

steps, the hysterectomy was then performed with ease. For this patient, the uterine artery was dissected at the beginning of the internal iliac artery to minimize bleeding, as there was a rich blood supply to the CF demonstrated in the preoperative magnetic resonance imaging.

The third video shows a 54-year-old postmenopausal woman undergoing TLH and bilateral salpingo-oophorectomy. Intraoperative exploration revealed a normal-sized uterus with a fibroid on the right wall of the cervix, approximately 10 cm in size. During exposure of the right uterine vessels, the right ureter was noted to be in close proximity to the fibroid. The right ureter was bluntly separated and pushed outward until it went below the uterine artery, and then the uterine vessels were sufficiently exposed, clamped, coagulated and severed on the medial side of the ureter (Figure 3). In Cases 2, 3, we avoided ureter injury by isolating and pushing the ureter in advance, subsequently exposing the uterine vessels and clamping and severing them during TLH for large CFs.

After six months of follow-up, none of the three patients developed pyelonephritis, ureteral dilation or ureterovaginal fistulae (Table 1).

Conclusion

This blunt ureterolysis technique can effectively avoid ureter injury in TLH for CFs. We believe it will be of interest to our colleagues in training and in practice. Informed consent was obtained from the patients prior to the utilization of clinical data and surgery video in the study.

Video 1. <https://youtu.be/GZfBK1MilBk>



<https://www.doi.org/10.4274/jtgga.galenos.2025.2024-11-1.video1>

Acknowledgements: The study was supported by the Project of Maternal and Child Health of Jiangsu (F202118) and Science and Technology Medical Development Foundation Project of Beijing (KC2023-JX-0288-RM129). The funders had no role in the design of study, data collection, analysis, interpretation, or in the preparation of the manuscript.

Informed Consent: Informed consent was obtained from the patients prior to the utilization of clinical data and surgery video in the study.

Conflict of Interest: No conflict of interest is declared by the authors.

Financial Disclosure: The study was supported by the Project of Beijing Science and Innovation Medical Development Foundation, China (No. KC2023-JX-0288-RM129), and by the Project of Maternal and Child Health of Jiangsu, China (No. F202118).

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