



# Treatment of ureteral tunnel in laparoscopy radical hysterectomy

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**Abstract:** We introduce an approach for making a ureteral tunnel with the aim of illustrating the importance of finding the tunnel dissection of the tissue spaces. The key to radical hysterectomy is identifying the tissue space that naturally exists between tissues rather than clamping a manual tunnel. For example, the urogenital sinus and Müllerian duct are very near each other; however, they never completely merge together. The method for finding the tunnel and avoiding the manual clamping of tunnels will maximally reduce intraoperative bleeding. Furthermore, the instructional significance of the surgery makes this technique worthy of promotion. Its main aspects include finding the gap, reducing or eliminating tunnel bleeding, and reducing collateral damage.

**Keywords:** Cystovaginal space (fourth space); axillary space (fifth space); anterior lobe of the cystocervical ligament; posterior lobe of the cystocervical ligament

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## Introduction

This paper mainly describes and discusses the treatment of ureteral tunnel in a patient with of cervical squamous cell carcinoma (IB1 period).

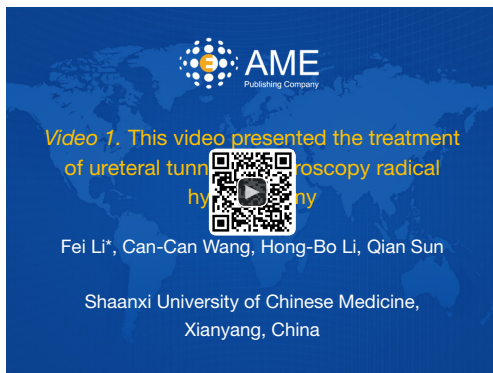
## Surgical technique

Surgery techniques for cervical cancer have been standardized in gynecology, and mainly include two types: extensive hysterectomy and pelvic lymph node excision. The difficulties that need to be overcome in extensive hysterectomy are the processing of ureter tunnel dissection and the treatment of the ureter tunnel after surgery, as they directly affect the operation range and survival rate. Therefore, surgery must have standardized practices and concepts (the principle of tumor-free technique) and use surgical techniques that are conducive to popularization.

After the Laparoscopic Approach to Cervical Cancer (LACC) trial (1), as opposed to lifting the uterus traditionally, we chose to adopt the method of lifting the uterus with a figure-8 suture at the bottom of the uterus (*Figure 1*). The number of operators needed was reduced

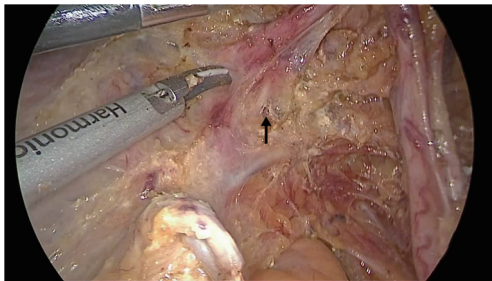
from 4 to 3 in each operation. In this procedure, the tension from the left hand should be precisely maintained to completely expose the interstitial tissue space. There are almost no blood vessels in the interstitial space. The Harmonic scalpel can be completely closed, that is, if there is no bleeding. At the same time, the tissues among the uterus, ureter and bladder must be made into thin layers. These tissues will look like puff pastry (a kind of snack from Shaanxi province). Many of these layers of tissues are stacked together, and blood vessels and nerves are found between these tissues. To ensure the tissues are in thin layers, the vessels should be exposed and the nerve protected in order to obtain a clear field under laparoscopy. Only when the tissue structure is adequately exposed, will the field of view under an ultrasonic knife be clear enough for the operator and assistants.

The preparation of the tunneling is also critical. First, the fourth and fifth clearance should be located (*Figure 2*). This clearance, which is between the two spaces, is the length of the tunnel. The tunnel itself consists of the anterior and posterior lobes of the vesicocervical ligament with the ureter running through it. The anterior and posterior lobes of the cystocervical ligament are made up of blood vessels,

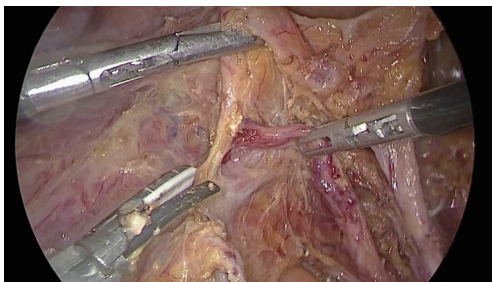


**Figure 1** This video presented the treatment of ureteral tunnel in laparoscopy radical hysterectomy (2).

Available online: <http://www.asvide.com/watch/33036>

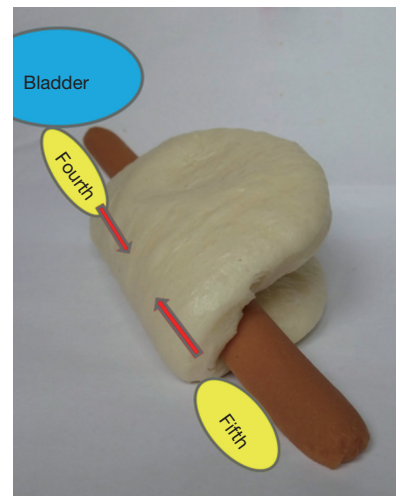


**Figure 2** The Harmonic scalpel points to the fourth clearance, while the arrow shows the fifth clearance.



**Figure 3** The Harmonic scalpels indicating the bladder's cervical ligaments.

nerves, and fibrous connective tissue. The posterior lobe in particular has a three-layer network of blood vessels. The superior bladder vein flows back into the deep uterine vein, the middle bladder vein flows back into the internal iliac vein, and the inferior bladder vein flows back into the middle rectal vein. The anterior and posterior lobes of the cervix ligament hold this ureter (*Figure 3*) like a sausage in a



**Figure 4** A sausage in a pancake demonstrating the right ureteral tunnel.

pancake (*Figure 4*).

Meanwhile, it is important to emphasize that in the process of pushing the bladder, tunneling and abducting the urinary canal and maintaining the integrity of the pubic cervical fascia are necessary. This is because this layer of fascia is the protective layer of the cervix, and if broken, exposure to iatrogenic cancer may follow.

### Comments

The proper use of the Harmonic scalpel can improve the safety and appreciation of tunneling. First, the Harmonic scalpel converts mechanical energy into thermal energy, instead of converting electrical energy into thermal energy. Among all the commonly used endoscopic instruments, the thermal radiation range of the Harmonic scalpel should be the smallest (3). Moreover, the energy of the Harmonic scalpel is mainly focused on the tip of the knife, which enables many fine movements and insertions into a small gap. The correct use of the scalpel can avoid damage to the surrounding tissues. As long as the direction is right, there is no bleeding along the way, the level is very clear, while the movement is steady, accurate, and gentle. Even if the operation is slower, the overall operation time will not be too long.

Ultimately, this video mainly emphasizes finding the correct space and not clamping a manual tunnel. With the right space, the tissue can be gently pushed instead of cut, and the operation can be easily completed without fighting

bloody battles.

### Acknowledgments

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### Footnote

*Conflicts of Interest:* The authors have no conflicts of interest to declare.

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*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Informed consent was obtained from the patient.

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