



Robotic assistance for ureteral endometriosis resection and ureteroneocystostomy by the Leadbetter-Politano technique

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Abstract: Ureteral endometriosis is a rare location of this medical condition, found in 0.01% to 1% of all women diagnosed with the disease. Ureteral endometriosis can be a major concern due to its potential morbidity of silent loss of renal function. Deep infiltrative endometriosis (DIE) can be safely dealt with using robotic assistance. This video article is about a patient with a right low ureter stenosis caused by intrinsic endometriosis. Complete resection of endometriosis, including en-bloc resection of the lower part of the ureter was performed with robotic assistance. A robotically assisted ureteroneocystostomy by the Leadbetter-Pollitano technique was carried out for the reconstructive part of the procedure.

Keywords: Robotic; endometriosis; ureteral; ureterovesical anastomosis; Leadbetter; minimal invasive surgery

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Introduction

Deep infiltrative endometriosis (DIE) is a complex disease, occurring in about 8% to 9% of women (1).

Its consequences can be severe, including chronic pain, infertility and organ dysfunction (bowel, bladder, kidney failure...)

A multimodal treatment, including hormonal regulation, and pain management is often required (2).

In a certain number of cases surgery has to be performed. DIE surgery can be complex and challenging, and the gold standard is minimal invasive surgery (3).

Robotic assistance has been proved to be a safe and reproducible technique to perform DIE surgery (4).

Ureteral location of DIE is a rare (1% to 5%) but potentially severe disease, likely to cause gradual silent loss of kidney function, resulting in complete kidney failure (5).

Surgical management of ureteral stenosis due to DIE can be conventional in most cases by performing a ureterolysis. However, if DIE is intrinsic to the ureteral wall, or if the stricture is too long or tight, it is necessary to carry out a ureteral resection.

In the case of a resection of the low ureter, a ureteroneocystostomy must be considered (6).

This video shows an «en-bloc» resection of a right

parameter DIE, including a resection of the low right ureter for intrinsic DIE in the ureteral wall. The reconstructive part was performed by practicing the Leadbetter-Politano technique using robotic assistance.

Operative technique

The Leadbetter Politano technique's purpose is to facilitate the creation of a "psoic-like" bladder without having to perform a full bladder dissection.

Step one

Dissection and resection of the DIE affected ureter is performed.

Extraction is made by vaginal route.

Suture of the vaginal defect is performed via an endoscopic path.

A suture of the ureteral stump could be considered but is not compulsory if there is no vesico-ureteral reflux prior to surgery.

Step two

Transversal cystotomy is performed on the anterior lateral

side of the bladder (the same side as the ureter to be treated).

Step three

A second cystotomy, of small diameter, is performed in order to create the entrance point for the future ureteroneocystostomy, using the transversal cystotomy to enable an accurate entrance point into the bladder.

Step four

At this stage, if a ureteral catheter is not already in the ureter, it is compulsory to insert one, which can be introduced by laparoscopic route.

Spatulation of the ureter can be carried out at this point.

Step five

The ureter is inserted into the bladder through the appropriate cystotomy. The intravesical length of the ureter should, if possible, measure between 1.5 and 2 cm.

The ureter is fixed to the bladder by one intravesical and one extravesical resorbable stitch.

Step six

An opening of the bladder's mucosa is performed, with cold blade scissors. The incision length is identical to the intravesical ureter portion.

Step seven

The ureter is placed in the mucosal zone opening, spatulation facing into the bladder, and a ureteral catheter is inserted.

Ureteral spatulation is optional, depending on the size of the ureter.

A ureter tension-free stitching is performed with non-braided 4/0 resorbable stitches in order to secure the ureter extremity into the bladder.

Step eight

The anti reflux system is created by suturing the dissected bladder's mucosae over the intravesical portion of the ureter.

This anti reflux system is performed with continuous suture of non-braided 4/0 resorbable suturing thread.

Step nine

Double layer vertical closure of the bladder is performed.

Step ten

Psoic fixation of the bladder is performed with two non-resorbable stitches.

It is vital to avoid injury of the femoral nerve, running into the psoas muscle.

A bladder catheter is maintained for ten days.

Comments

As far as the reconstructive option is concerned, the use of the Leadbetter-Politano technique has been chosen in order to compensate for the ureter's shortness, by extending the length of the bladder without performing a complete psoic bladder.

This video (Video 1) illustrates how robotic assistance can enhance laparoscopy in complex procedures.

Discussion

Dr. Liliana Mereu: *could the authors explain which are the advantages of Leadbetter-Politano technique comparing to psoas hitch ureteroneocystostomy?*

The Leadbetter-Politano technique is one of the numerous available way to perform a ureteroneocystostomia with an anti-reflux system. There are no evidence of its superiority in terms of leakage, stenosis or reflux when compared to the mainstream Lich Gregoire technique. Its main advantage is the extension of the bladder due to vertical suture of a transversal cystotomy. This trick makes it possible to gain the missing ureteral length without performing the complete bladder dissection, usually mandatory to have a tension free anastomosis between the bladder and the ureter.

Dr. Liliana Mereu: *which are the advantages to treat deep infiltrating endometriosis with robotic assistance?*

Deep infiltrating endometriosis treatment can be a challenging surgery, mainly due to the loss of anatomical plane and the need of being radical while preserving the organs function. Robotic surgery, with the amazing 10 times magnification with real 3D vision is really helpful in the identification of anatomical structures. In addition, the seven degrees of freedom and the third arm are very

convenient to perform mini invasive anastomosis which can be challenging using direct manual laparoscopy.

Dr. Liliana Mereu: *could the authors explain the perioperative management of patients submitted to ureteroneocystostomy by the Leadbetter-Politano technique?*

Enhanced recovery after surgery (ERAS) principles have been introduced 18 months ago in our unit, allowing very short length of stay in the hospital, with optimal preoperative management including nutrition and physical activities.

Of course, a urine culture is mandatory in the week before surgery. Patient is admitted to hospital in the morning of surgery after liquid hydro carbonate intake.

After surgery, the urinary catheter will be left for 7 days and removed at home by a Nurse.

Normal refeeding is authorized on the evening of surgical day and patient can leave the hospital on day 1 or 2 after surgery, depending on the additional techniques performed during surgery.

The ureteral stent is removed at outpatient clinics, 6 weeks after surgery.

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Footnote

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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. All procedures

performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for publication of this video. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

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