VIDEO ARTICLE

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Laparoscopic hysterectomy for deep infiltrating endometriosis: anterior colpotomy first technique

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ABSTRACT

Background: Deep infiltrating endometriosis, particularly involving the rectovaginal space, represents one of the most challenging surgical benign gynaecologic conditions. While hysterectomy is a definitive option in women without fertility desire, these procedures are technically complex and associated with higher risks of complications. The anterior colpotomy first technique has been developed as an alternative approach to simplify dissection and improve surgical safety in such advanced cases.

Objectives: Stepwise video demonstration of laparoscopic hysterectomy for deep infiltrating endometriosis involving rectovaginal space by the anterior colpotomy first technique.

Participant: A 47-year-old woman presented with dysmenorrhea, dyspareunia and dyschezia unresponsive to medical treatment. Transvaginal ultrasound and magnetic resonance imaging (MRI) revealed bilateral 5 cm endometriomas, 2 cm endometriotic nodules on both utero-sacral ligaments, and a 4 cm nodule in the Douglas pouch. A further 3 cm superficial endometriotic nodule on the rectosigmoid colon was also revealed on MRI. According to the Enzian classification, the score was A3, B2/2, C3. Laparoscopic hysterectomy, bilateral salpingo-oophorectomy and endometriotic excision of lesions were planned. Operation time was 210 minutes, and blood loss was 50 mL. On the postoperative fourth day patient was discharged. The patient remained pain-free at 25 months follow-up.

Intervention: Surgical steps for anterior colpotomy first technique could be divided into following steps: 1) entry into retroperitoneum, 2) ligation of uterine artery at the branching point from hypogastric artery, 3) development of vesicouterine space, 4) dissection of ureter and transection of lateral parametrium, 5) combining lateral and anterior compartments, 6) anterior colpotomy, 7) developing rectovaginal space from lateral to midline, 8) completion of posterior colpotomy, 9) excision of endometriotic nodule and leaving nodule on rectosigmoid colon, 10) completion of hysterectomy, 11) rectal shaving and resection of endometriotic lesions, 12) Bubble test, assessment of ureteral integrity and ladder filling with saline. In this technique, it is more feasible to do anterior colpotomy first and to develop rectovaginal space from lateral sides towards midline instead of dealing with the posterior compartment at the beginning of surgery. Ultimately endometriotic nodule between the rectosigmoid colon and the uterus is cut, leaving the endometriotic nodule on the rectosigmoid colon.

Conclusions: Laparoscopic hysterectomy with anterior colpotomy first technique makes complicated hysterectomies easier in patients with deep infiltrating endometriosis.

What is New? This video article presents a stepwise demonstration of the anterior colpotomy first technique for laparoscopic hysterectomy in deep infiltrating endometriosis. By prioritising anterior colpotomy and developing the rectovaginal space from lateral to midline, this approach simplifies complex dissections, reduces the risk of rectal injury, and offers a safer, more reproducible strategy for advanced endometriosis cases.

Keywords: Deep infiltrating endometriosis, laparoscopic hysterectomy, anterior colpotomy, endometriosis surgery

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Introduction

Endometriosis is a debilitating chronic disease associated with significant pelvic pain.[1,2] In women without a desire for fertility, hysterectomy with or without salpingo-oophorectomy is the definitive treatment. As these women were previously operated on multiple times, the final surgery is challenging, frequently includes radical organ resections.[3,4] In our department, in the last 8 years, we have been using the anterior colpotomy first technique when hysterectomy is planned for deep infiltrating endometriosis rather than approaching from the posterior compartment first. In this technique, dissection of the posterior compartment (pararectal and rectovaginal spaces) is performed after the anterior colpotomy procedure. By following predetermined steps, the so-called "anterior colpotomy first technique", this complicated surgery turns into a simpler and faster operation. In this video article, a stepwise demonstration of laparoscopic hysterectomy for deep infiltrating endometriosis by the anterior colpotomy first technique is demonstrated.

Methods

A 47-year-old woman with 3 prior surgeries for endometriosis had significant dysmenorrhea (9/10), dyspareunia (8/10) and dyschezia (7/10) unresponsive to medical treatment. She underwent a colonoscopy with normal findings. Transvaginal ultrasound and magnetic resonance imaging (MRI) revealed bilateral 5 cm endometriomas, 2 cm endometriotic nodules on both uterosacral ligaments, and a 4 cm nodule in the Douglas pouch. A further 3 cm superficial endometriotic nodule on the rectosigmoid colon was also revealed on MRI. According to the Enzian classification, the score was A3, B2/2, C3. Laparoscopic hysterectomy, bilateral salpingo-oophorectomy and endometriotic excision of lesions were planned.

Results

The trocar configuration follows a diamond-shaped arrangement. The surgeon stands on the left side of the patient, while the first assistant is on the right. At the beginning of the surgery, the initial laparoscopic view revealed bilateral "kissing ovaries" and a frozen pelvis with an endometriotic nodule (Figure 1). The surgical approach (laparoscopic hysterectomy for deep infiltrating endometriosis involving rectovaginal space by anterior colpotomy first technique) could be divided into following steps: 1) entry into retroperitoneum by ligation and transection of round ligament, 2) ligation of uterine artery at the branching point from hypogastric artery, 3) development of vesicouterine space, 4) dissection of ureter up to ureteric tunnel and transection of lateral parametrium, 5) combining lateral and anterior compartments, 6) anterior colpotomy, 7) developing rectovaginal space from lateral to midline, 8) completion of posterior colpotomy, 9) excision of endometriotic nodule and leaving nodule on rectosigmoid colon, 10) completion of hysterectomy, 11) rectal shaving and resection of endometriotic lesions, 12) bubble test assessment of ureteral integrity bladder filling with saline.

In this video, the patient underwent bilateral salpingo-oophorectomy. Ovaries could be preserved depending on the patient and involvement of the ovaries, and this is not an essential step of this surgery. Moreover, the radicality of the hysterectomy is tailored according the extent of the disease in the parametrium. In this case, 1-2 cm lateral parametrium was involved with the disease and was excised. The size of the superficial rectal nodule was 3 cm without any sign of obstruction or involvement of the rectal mucosa. Rectal shaving to clear the endometriotic lesion was decided. The integrity of the rectosigmoid colon was confirmed using a bubble test. The serosa was reinforced with three interrupted sutures at the end of the surgery. Total operation time was 210 minutes, and total blood loss was 50 mL without any intraoperative complications. On the postoperative fourth day patient was discharged. It has been 25 months since the surgery, and she has no pain symptoms (pelvic pain 1/10, dyspareunia 1/10 and dyschezia 0/10).

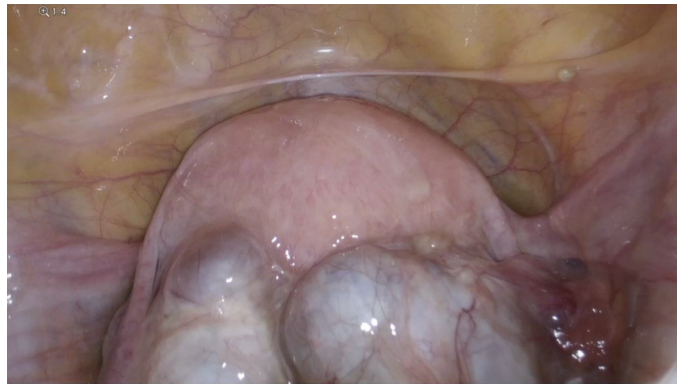

Figure 1. Laparoscopic view demonstrating bilateral kissing ovaries in a frozen pelvis associated with an endometriotic nodule on Douglas.

Discussion

Total hysterectomy is an option and has an additional benefit for the control of endometriosis-associated pain compared to conservative surgery when fertility is not a concern.[5] However, the dissections carried out in this complicated surgery are extensive, and the type of operation is not a simple hysterectomy, but a more radical approach should be performed to preserve vital structures.

The rate of intraoperative complications is about 3% and any major postoperative complication is 9% in women undergoing surgery for complex endometriosis. About 10% severe complication rate (Clavien-Dindo grade >2) was reported for women undergoing laparoscopic hysterectomy with stage 3-4 endometriosis.[3,6,7] When deep infiltrating endometriosis is of concern, even in highly specialised surgical departments, these are high-risk surgeries with a higher possibility of significant complications.

In a standard fashion, surgery proceeds from the lateral compartment (development of pararectal spaces, ureterolysis) to posterior spaces (rectovaginal pouch), (i.e., lateral to medial approach). On the contrary, in our anterior colpotomy first technique, in our opinion, it would be more feasible to do anterior colpotomy first and then to develop rectovaginal space from lateral sides towards midline instead of dealing with the posterior compartment at the beginning of the surgery.[3] Ultimately, the endometriotic nodule between the rectosigmoid colon and uterus is transected, leaving an endometriotic nodule on the rectosigmoid colon, which will subsequently be resected. In this technique, when anterior colpotomy is performed, the healthy tissue and right dissection plane in the rectovaginal pouch is clearly visible, and the most distal part of the lesion on the rectosigmoid colon is easily seen. In this way, dissection of the rectovaginal space becomes easier, and a possible injury to the rectosigmoid colon is significantly reduced, particularly when rectal shaving is planned. Beginning from 2017, we have been performing hysterectomies for deep infiltrating endometriosis by using the anterior colpotomy first technique, and we did not experience any surgery-related bowel complication.

There are a number of studies reporting surgical outcomes of hysterectomy performed for endometriosis, but only in a limited number of these studies, anatomical and surgical details of the type and hysterectomy had been addressed. Rosati et al.[8] presented 23 patients undergoing radical hysterectomy for deep infiltrating endometriosis with the parametria involved. In this study, the steps of the procedure were described and functional results were presented. The so called "nerve-sparing radical hysterectomy for parametrial deep endometriosis" was described as adhesiolysis and ovarian surgery if needed, transection of round ligaments, incision of broad ligament, identification of uterine arteries and veins branching from internal iliac vessels, formation of medial and lateral pararectal spaces, development of medial paravesical space, dissection of vesicouterine space and exposition of 1-2 cm distal vagina, ligation of uterine artery at its origin, lateralization of ureters and ureterolysis, lateralization of hypogastric nerves, dissection of rectavaginal space, nerve sparing tailored parametrectomy and finally colpotomy and uterus removal. The technique resembles a radical hysterectomy performed for cervical cancer. The rate of complications (Clavien-Dindo grade 1, 2) was 34%.

Hysterectomy for deep infiltrating endometriosis is a challenging surgical intervention compared to other benign indications. The surgery requires significant expertise, and strict steps should be followed to complete the surgery without any visible endometriotic lesions. Different techniques have been described for hysterectomy associated with endometriosis, but there is no consensus for the optimal surgical approach. Anterior colpotomy technique is an alternative way to perform hysterectomy for complex endometriosis cases, and in our opinion, makes the dissection of the rectovaginal pouch easier and faster.

Conclusion

Laparoscopic hysterectomy with anterior colpotomy first technique makes complicated hysterectomies easier in patients with deep infiltrating endometriosis involving the pouch of douglas.

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Video 1. https://www.youtube.com/watch?v=ETkU31rrbYA