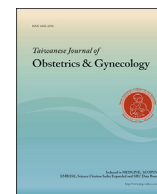




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## Case Report

## Two-phase laparoendoscopic single-site cervical ligament-sparing hysterectomy: A novel approach in difficult laparoscopic hysterectomy

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## ABSTRACT

**Objective:** To proposed a novel method for a difficult laparoscopic hysterectomy that spares the cervical ligaments and eliminates the cervical canal and transformation zone of the cervix.**Case report:** A 40-year-old women, gravida 3 para 3, who had had a cesarean delivery previously, was referred to the gynecology clinic due to adenomyosis with menorrhagia and severe anemia. Ultrasonography showed that the uterus was enlarged to 13.5 cm × 10.7 cm × 8.8 cm. After obtaining informed consent, a two-phase laparoendoscopic single-site (LESS) cervical ligaments-sparing hysterectomy was performed smoothly. The patient discharged on 4th day and resumed her sexual life less than 2 months after surgery.**Conclusion:** This novel minimal invasive method of hysterectomy makes difficulty laparoscopic hysterectomy easy and safe. Preservation of cervical ligaments retains stability in the pelvic floor and may reduce intraoperative complications and subsequent pelvic floor organ prolapse.Copyright © 2016, Taiwan Association of Obstetrics & Gynecology. Published by Elsevier Taiwan LLC. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## Introduction

Over 430,000 hysterectomies, the most commonly performed gynecological surgical procedure, are performed annually in the USA [1]. Nowadays, with rapid development of minimally invasive surgical procedures, a laparoscopic hysterectomy is the standard. However, in some cases, an enlarged uterus when approached laparoscopically is very difficult or even unsafe, especially in T-shaped uterus, in the presence of lateral or intraligamental myomas, or when the uterus is fixed at the pelvis.

The incidence of vaginal vault prolapse (VVP) after a hysterectomy varies from 0.2% to 45% in the literature [2,3], of which 3.6 patients/1000 person-years of risk required surgical repair. Cumulative risk increases from 1% at 3 years after a hysterectomy to 5% at 15 years after a hysterectomy [4]. VVP negatively impacts the quality of life for women. During the current hysterectomy procedures, ligaments or fascia including pubocervical fascia, the transverse cervical ligament (cardinal), and uterosacral ligament

(suspend the rectovaginal septum) are transected. Experts have failed to reach a consensus on whether a hysterectomy with transection of cervical ligaments related to vault prolapse or other pelvic organ prolapse [5,6]. Paracolpium, a connective tissue in the cardinal ligament of the cervix, was observed to be ruptured in a study of cadaver with VVP [7], and it had been transected during hysterectomy.

Bladder and ureter injury are not unusual complications during a hysterectomy [8]; most occur before or during transection of the cervical ligaments [9], especially in cases of congenital abnormality such as duplicate ureters or severe adhesion at the uterovesical junction. Sometimes these injuries are almost unavoidable. Although a subtotal hysterectomy preserves the cervix and cervical ligaments, patients must worry about cervical neoplasia or cyclical vaginal discharge and/or bleeding after the surgery.

Herein, a new hysterectomy procedure that preserves the cervical ligaments was deployed for a case of difficult laparoscopic hysterectomy.

## Case Report

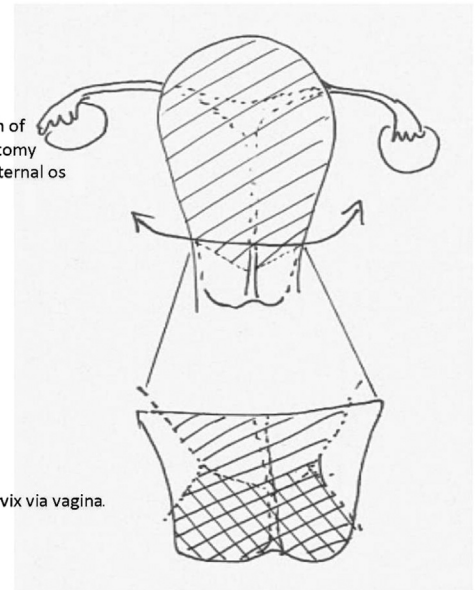
This 40 year-old woman, gravida 3 para 3, who had had previous cesarean delivery, was referred to the gynecologic clinic due to

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adenomyosis with menorrhagia and severe anemia (hemoglobin 5.6 mg/dL). Ultrasonography and abdominal computed tomography revealed an enlarged uterus of 13.5 cm × 10.7 cm × 8.8 cm (Figures 1A and 1B). After informed consent was obtained, the novel approach two-phase laparoendoscopic single-site cervical ligament-sparing hysterectomy (LESS-CLSH) was performed smoothly. During surgery, moderate intra-abdominal adhesions were seen at the left adnexal and right lower abdomen. The single-port setting was described previously [10]. Briefly, a 2.5-cm vertical incision through the umbilicus was made and a retractor (Alexis; Applied Medical, Rancho Santa Margarita, CA, USA) was inserted. A home-made adaptor composed of a surgical glove and trocars was connected to the retractor. The fingers of the glove functioned as multiple ports for laparoscopic instruments and a camera. A rigid 5-mm 30° laparoscope (Karl Storz, Tuttlingen, Germany) was used. This method of total hysterectomy has two phases (Figure 2): (1) a laparoscopic approach for a supracervical hysterectomy and conization from the internal os of the cervix; and (2) wide excision of the cervix via the vagina. Phase 1 of the procedure is almost the same as the conventional laparoscopic supracervical hysterectomy. Briefly, the round, ovarian and broad ligaments are transected with Ligasure (Valleylab Inc., Boulder, CO, USA) and the peritoneum between the uterovesical junction is opened. The uterine artery at the bilateral side of the cervix is identified by slow dissection and it is transected after coagulation with Ligasure. A cutting LOOP (26183 MB; Karl Storz) is then used to loop the cervix at the supracervical level. After ensuring that no bowel or other organ is trapped in the loop, 70–80 W blending cutting energy is applied for electrocauterization. After transecting the body of the uterus, a hook (MH-615; Olympus, Tokyo, Japan) is used to mark the incision tract with electrocauterization in coagulation mode, and approximately 0.5–1 cm from the external surface of the cervix should be

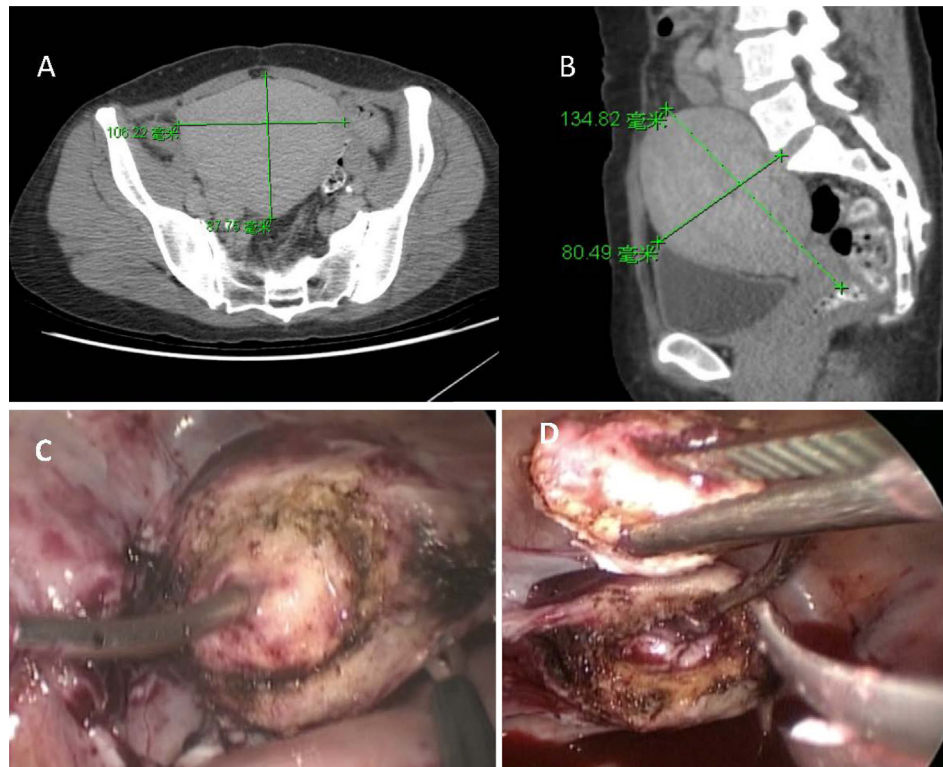
**Phase 1:**  
Laparoscopic approach of supracervical hysterectomy and conization from internal os of cervix.



**Phase 2:**  
Wide excision of cervix via vagina.

**Figure 2.** Schema of the two phases of laparoendoscopic single-site cervical ligaments-sparing hysterectomy. Phase 1: laparoscopic approach for supracervical hysterectomy and conization from the internal os of the cervix. Phase 2: wide excision of the cervix via the vagina.

left (Figure 1C). Conization of the endocervix in this case was done using hook and scissor laparoscopically (Lagis, Taichung, Taiwan; Figure 1D). A piece of Surgicel (Ethicon, Somerville, NJ, USA) was placed into the hole of the endocervix after conization for hemostasis and as a guide for the wide excision in Phase 2. The transected



**Figure 1.** Abdominal computed tomography shows an enlarged uterus sized 13.5 cm × 10.7 cm × 8.8 cm. (A) Coronal view; (B) sagittal view; (C, D) laparoscopic approach for conization from the internal os of the cervix.

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