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Title: Laparoscopic Extracorporeal Knot-Tying for Uterine Vessel Occlusion during Hysterectomy with Cervical Cerclage in Large Uteri

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Author Questionnaire

1. We have marked your project as author-provided footage, meaning you film the video yourself and provide JoVE with the footage to edit. JoVE will not send the videographer. Please confirm that this is correct.

✓ Correct

2. Microscopy: Does your protocol require the use of a dissecting or stereomicroscope for performing a complex dissection, microinjection technique, or something similar? **NO**

3. Software: Does the part of your protocol being filmed include step-by-step descriptions of software usage? **NO**

4. Proposed filming date: To help JoVE process and publish your video in a timely manner, please indicate the proposed date that your group will film here: **9/18/2025 or 09/19/2025 or 09/25/2025 or 09/26/2025**

When you are ready to submit your video files, please contact our China Location Producer, [Yuan Yue](#).

Current Protocol Length

Number of Steps: 07

Number of Shots: 15

Introduction

NOTE: Interviews were shot by the videographer

- 1.1. **Wenju Zhang:** This approach effectively overcomes the hemostatic and visualization challenges in laparoscopic hysterectomy for large uteri, thereby eliminating the risk of blood transfusion and lowering healthcare costs.

1.1.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera.

What are the current experimental challenges?

- 1.2. **Chaoxia Lyu:** Significant uterine enlargement compromises pelvic workspace, obscures surrounding anatomical structures, which may impair the surgeon's ability to operate effectively, and increase the risks of hemorrhage and adjacent-organ injury.

1.2.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera.

What advantage does your protocol offer compared to other techniques?

- 1.3. **Yuzhen Wei:** A laparoscopic extracorporeal knot-pusher is used to perform cervical cerclage, achieving a complete occlusion of uterine arteries. Thereafter, the corpus uteri are excised to enhance visibility and facilitate the operative field.

1.3.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera.

Ethics Title Card

This research has been approved by the Institutional Review Board (IRB) at the University of Hong Kong–Shenzhen Hospital

Protocol

2. Laparoscopic Uterine Vessel Occlusion and Hysterectomy with Cervical Cerclage

Demonstrators: Wenju Zhang, Chaoxia Lyu, Yuzhen Wei

2.1. To begin, examine the abdominal cavity using laparoscopy to determine the feasibility of the technique [1]. Sew a stitch and tie knots at the uterine lateral wall with a suture, for pulling the uterus to expose the pelvic anatomical structures [2].

2.1.1. LAB MEDIA: JoVE 69143-1 08:40–09:00

2.1.2. LAB MEDIA: JoVE 69143-1 12:55–13:15, 14:32–14:35, 14:57–15:00

2.2. Conduct coagulation and transection of the utero-ovarian ligament if salpingectomy is indicated [1]. Electrocoagulate and sever the round ligament [2]. Then separate the anterior and posterior layers of the broad ligament subsequently [3].

2.2.1. LAB MEDIA: JoVE 69143-1 22:55–23:25

2.2.2. LAB MEDIA: JoVE 69143-1 26:35–26:45, 26:55–27:05

2.2.3. LAB MEDIA: JoVE 69143-2 07:40–07:51

2.3. Utilize the Knot-Pusher to form a Roeder's knot with an absorbable synthetic polyglactin braided suture around the cervical isthmus [1]. Inject diluted vasopressin into the space between the uterine fibroid and myometrium [2]. Pull the Roeder's knot farther forward to occlude the uterine vessels completely as the uterine body turns blanched and firmed, with its color turning to pale or dark purple [3].

2.3.1. LAB MEDIA: JoVE 69143-3 29:00–29:17

2.3.2. LAB MEDIA: JoVE 69143-3 33:00–33:17

2.3.3. LAB MEDIA: JoVE 69143-3 35:00–35:30

2.4. Now, transect the uterine corpus 1 to 1.5 centimeters above the cerclage line using scissors [1]. Execute loop ligation around the residual cervical stump to reinforce hemostasis with the extracorporeal Roeder's knot [2].

2.4.1. LAB MEDIA: JoVE 69143-3 39:10–39:28

2.4.2. LAB MEDIA: JoVE 69143-4 12:10–12:30

2.5. Incise the vesico-uterine peritoneum with a unipolar hook to expose the uterine arteries [1]. Coagulate and divide the uterine vessels [2].

2.5.1. LAB MEDIA: JoVE 69143-4 31:00–31:20

2.5.2. LAB MEDIA: JoVE 69143-4 39:30–39:40

AND LAB MEDIA: JoVE 69143-5 00:00–00:05

- 2.6. Next, perform a circumferential colpotomy at the vaginal fornix with a monopolar hook [1]. Morcellate the uterus completely with scissors [2].

2.6.1. LAB MEDIA: JoVE 69143-5 19:00–19:20

2.6.2. LAB MEDIA: JoVE 69143-5 31:10–31:20

- 2.7. Lastly, perform peritoneal and vaginal stump closure with an absorbable synthetic polyglactin braided suture [1].

2.7.1. LAB MEDIA: JoVE 69143-8 23:25–23:45

Results

3. Results

3.1. Laparoscopic Extracorporeal Knot-Tying for Uterine Vessel Occlusion during Hysterectomy with Cervical Cerclage was successfully performed in 31 patients over the past 2 years [1]. The median age of the 31 patients were 48 years [2] and body mass index and 21.25 kilograms per square meter [3].

3.1.1. LAB MEDIA: Table 1.

3.1.2. LAB MEDIA: Table 1. *Video editor: Highlight the row for "Age" showing "48 (44, 49) years"*

3.1.3. LAB MEDIA: Table 1. *Video editor: Highlight the row for "BMI" showing "21.25 (21.35, 25.42)"*

3.2. Most patients had a total parity of 1 or more, with 35.48% having 1 [1] and 45.16% having 2 or more [2]. Vaginal parity was absent in 38.71% of patients [3], and cesarean parity was absent in 70.97% [4].

3.2.1. LAB MEDIA: Table 1. *Video editor: Highlight the row for "Total parity" showing "1 (35.48%)"*

3.2.2. LAB MEDIA: Table 1. *Video editor: Highlight the row for "Total parity" showing " ≥ 2 (45.16%)"*

3.2.3. LAB MEDIA: Table 1. *Video editor: Highlight the row for "Vaginal parity" showing "0 (38.71%)"*

3.2.4. LAB MEDIA: Table 1. *Video editor: Highlight the row for "Cesarean parity" showing "0 (70.97%)"*

3.3. The median uterine size was equivalent to 20 weeks of gestation [1].

3.3.1. LAB MEDIA: Table 1. *Video editor: Highlight the row "The median uterine size" showing "20 (18, 22) weeks of gestation"*

3.4. A history of previous abdominal surgery was reported in 32.26% of patients [1] and preoperative anemia was observed in 38.71% [2]. Menometrorrhagia was the most common surgical indication, reported in 58.06% of patients [3].

3.4.1. LAB MEDIA: Table 1. *Video editor: Highlight the row "History of previous abdominal surgery" showing "10 (32.26%)"*

3.4.2. LAB MEDIA: Table 1. *Video editor: Highlight the row "Anemia" showing "12 (38.71%)"*

- 3.4.3. LAB MEDIA: Table 1. *Video editor: Highlight the row "Menometrorrhagia" showing "18/31 (58.06%)"*
- 3.5. All 31 patients completed the surgery without conversion to laparotomy, resulting in a 100% objective success rate [1] and a subjective success score of 96.77% [2].
- 3.5.1. LAB MEDIA: Table 2. *Video editor: Highlight the row "No conversion to laparotomy" showing "31"*
- 3.5.2. LAB MEDIA: Table 3. *Video editor: Highlight the row "Subjective Success Rate PGI ≤ 2 " showing "96.77%"*
- 3.6. After the first 15 cases, median operative time decreased significantly from 214 to 116 minutes [1]. Median intraoperative blood loss was also significantly reduced after the first 15 cases, from 150 to 60 milliliters [2].
- 3.6.1. LAB MEDIA: Table 4. *Video editor: Highlight the "Operative time" row comparing Group A "214 (163, 245)" with Group B "116 (102, 141)"*
- 3.6.2. LAB MEDIA: Table 4. *Video editor: Highlight the "Intraoperative blood loss" row comparing Group A "150 (100, 250)" with Group B "60 (30, 80)"*

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1. **laparoscopy**
Pronunciation link: <https://www.merriam-webster.com/dictionary/laparoscopy>
IPA: /ˌlæpəˈrɒskəpi/
Phonetic Spelling: lap-uh-ROS-kuh-pee
 2. **utero-ovarian**
Pronunciation link: No confirmed link found
IPA: /ˌjuːtɪˌroʊ əˈvɛəriən/
Phonetic Spelling: yoo-tee-roh uh-VAIR-ee-uhn
 3. **salpingectomy**
Pronunciation link: <https://www.merriam-webster.com/dictionary/salpingectomy>
IPA: /ˌsæl.pɪnˈdʒɛk.tə.mi/
Phonetic Spelling: sal-pin-JEK-tuh-mee
 4. **broad ligament**
Pronunciation link: No confirmed link found for the full phrase "broad ligament"
IPA (broad): /brɔːd ˈlɪɡəmənt/
Phonetic Spelling: broad LIG-uh-ment
 5. **polyglactin**
Pronunciation link: No confirmed link found

IPA: /ˌpɒliˈglæk.tɪn/

Phonetic Spelling: pol-ee-GLAK-tin

6. **cerclage**

Pronunciation link: <https://www.merriam-webster.com/dictionary/cerclage>

IPA: /sərˈklɑːʒ/

Phonetic Spelling: ser-KLAAZH

7. **vesico-uterine**

Pronunciation link: No confirmed link found

IPA: /ˌvesɪˌkoʊ-juːˈtəriːn/

Phonetic Spelling: ves-ih-ko-yoo-TEER-eeen

8. **colpotomy**

Pronunciation link: <https://www.merriam-webster.com/dictionary/colpotomy>

IPA: /kɒlˈpɒtəmi/

Phonetic Spelling: kol-POT-uh-mee