



# A method for removing cysts from the left ovary by using laparoendoscopic single-site surgery accompanied by an umbilical incision plastic surgery

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**Abstract:** In this video, we share the treatment of a 36-year-old woman of childbearing age. After a routine gynecological examination, this woman was found to have cervical poisoning, accompanied with bleeding. Meanwhile, her uterine body was in a horizontal position, of normal size, without feeling of pain. During color ultrasound screening, a mixed echo mass with a size of 6.7 cm × 4.9 cm × 5.1 cm was found in her left adnexal area, which was suspected to be a teratoma. Upon on further consultation, it was diagnosed as a left accessory tumor. It is also most likely to be a teratoma in the left ovary. After communication, the patient agreed to perform surgery to remove the tumor. In this study, we performed single-port laparoscopic surgery to treat patients. Intraoperatively, an endoscopic cyst was found in the patient's left ovary. After the cyst was removed, the laboratory results showed that it was indeed a mature teratoma, which was consistent with color ultrasound and outpatient results. After the removal of the tumor, we performed plastic surgery on the patient's belly button. This video captures and describes how the process works. The success of this operation not only eliminates the patients' physical pain, but also greatly reduces the patients' psychological burden. After all, the advantages and disadvantages of this operation and its future development trend are analyzed, too.

**Keywords:** Trans-umbilical single-port laparoscopy; ovarian cyst; stripping operation; umbilical incision plastic surgery

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## Introduction

Trans-umbilical single-port laparoscopic surgery conceals the surgical wound within the umbilicus, a natural scar, so that no additional scarring is left. The surgery acts as complement to traditional laparoscopic techniques by providing more humane care to patients and improving the patients' medical experience (1). Therefore, single-port laparoscopy is more acceptable to female patients, as it is the most feasible "scar-free" technique at present.

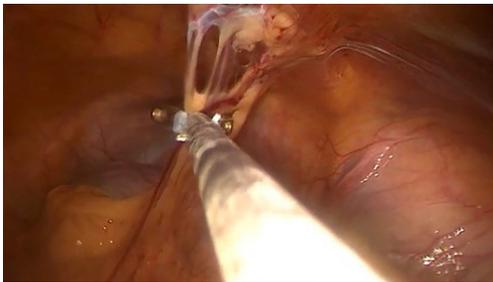
Usually, an ovarian cyst refers to the cystic bump which appears inside the female ovary. It has a high incidence in clinical practice, occurs in women of all ages, and is one of the main causes of infertility in women. According

to statistics, ovarian cysts mainly occur in women aged between 25 and 45 years old, and there is a potential risk of malignant change. Therefore, effective treatment should be applied in a timely manner (2). At present, patients with a persistent cyst larger than 5 cm in size should be treated with surgery.

In this video (*Video 1*), we share the treatment of a 36-year-old woman of childbearing age. She was admitted to hospital due to the discovery of a cyst in the left annex area by color Doppler ultrasound. The gynecological examination showed that her vagina was unimpeded and had no mucosal hyperemia. A small amount of milky secretion with no odor was observed. The cervix was of normal size



**Figure 1** A single-hole puncture cannula was placed through the umbilicus.



**Figure 2** Separation of the pelvic adhesions.



**Figure 3** A 2-cm incision on the left ovary.

but had moderate erosion and contact bleeding. The uterine body was in the horizontal position and was of normal size, with good activity and no tenderness. In the bilateral annex area, a cyst 6 cm × 6 cm in size was observed in the left annex area. Beyond that, this area had soft texture, good activity, and no tenderness. No obvious abnormalities were observed in the right annex area.

Color ultrasound indicated a mixed echogenic mass 6.7 cm × 4.9 cm × 5.1 cm in size in the left accessory area. Teratoma was thus considered. It was decided that the patient be admitted for further diagnosis as it was unclear whether or not there was a left ovarian teratoma in the

left accessory mass. After discussion, the patient agreed to undergo trans-umbilical single-port laparoscopic left ovarian cyst excision and umbilical plastic surgery. The postoperative examination ultimately showed a cystic mature teratoma of the patient's left ovary.

### Surgical techniques

In the surgery, endotracheal intubation was used for anesthesia of the patient. The patient was kept in a supine position, with her head lowered and her feet raised. The procedure for surgery was as follows:

- (I) After the anesthesia took effect, she was disinfected in routine fashion, and sterile surgical towels were placed.
- (II) A 2-cm longitudinal incision was made through the umbilical perforation, as shown in *Figure 1*. A single-hole disposable cannula was inserted into the pneumoperitoneal tube and the laparoscopic operating instrument was placed with abdominal pressure maintained at 13 mmHg.
- (III) By exploring the pelvic cavity, it was found that the omentum membrane adhered to the anterior pelvic wall. The uterus was of normal size, while the left ovary was enlarged to about 7.0 cm × 6.0 cm. The uterine surface was smooth, and the appearance of the left fallopian tube showed no obvious abnormality. Similarly, the right ovary and right fallopian tube did not appear abnormal.
- (IV) A disposable single-hole puncture cannula was placed, through which a pneumoperitoneum tube and operating apparatus were inserted. Biclamp and scissors were used to separate the pelvic adhesions, as shown in *Figure 2*. The anatomical structure of the organs was successfully restored.
- (V) A 2 cm incision was made at the thick area of the left ovary by electrocautery. The incision can be observed clearly in *Figure 3*. The cyst, as shown in *Figure 4*, was completely stripped by using a bending clamp. During the dissection, we used the whole dissection to avoid puncture the cyst wall, which was more in line with the principle of “no tumor”. When dissection to the pedicle of cyst, the spot electric coagulation pedicle with 100 grams forceps was used to reduce bleeding. However, the electric coagulation time is not easy to be too long, so as to avoid damage to the ovarian cortex and affect the ovarian function.



**Figure 4** Stripping of the cyst.



**Figure 5** Removing the cyst using a self-made bag.



**Figure 6** The left ovary after suturing.



**Figure 7** The umbilicus after suturing with the “anchor” method.

(VI) The whole stripped cyst was extracted through the puncture hole, as shown in *Figure 5*. Although laparoscopic special bag is more in line with the principle of aseptic surgery, it is expensive. After communication with the patient, we used the self-made fetch bag to reduce the additional expenses of the patient.

(VII) The left ovary and the peritoneum were then sutured continuously by using a 2-0 absorbable suture after we checked the patient's abdomen, released gas, and took out the speculum, as shown in *Figure 6*.

(VIII) After confirming that the patient had no active bleeding in the abdominal cavity, we repeatedly flushed the pelvic cavity with 0.9% sodium chloride solution until it was clean. Then we let the air out and take out the mirror. Lastly, we used the layered suture technique to close the wound. Firstly, the peritoneum was continuously sutured with 2-0 absorbable thread. Then the umbilical hole was closed with 3–5 stitches of the muscle layer and fascial layer interrupted with 2-0 absorbable thread. And finally the umbilical incision was sutured with 4-0 absorbable thread and shaped, as shown in *Figure 7*.

### Comments

This video shows the procedure for removing a left ovarian cyst using a single-hole laparoscopy through the umbilicus. The cyst is stripped intact and removed as a whole through the umbilicus. This operation is consistent with the principle of “no tumor left”. In addition, the absorbable suture of ovary can reduce the injury of electrocoagulation to ovary and avoid affecting ovary's functionality. After operation, the umbilical cord was reshaped. After evaluation, we found that this kind of operation can reduce blood loss during the operation, reduce the pain to patients, promote the recovery of gastrointestinal function, and significantly improve the prognosis of patients (2). Trans-umbilical single-port laparoscopy has gradually been applied to gynecological surgery. It has the advantages of easy plastic umbilical incision, postoperative scar covering, low risk of infection, and other benefits. Meanwhile, it

is minimally invasive, has good aesthetic effect, is more acceptable to women, and can also reduce the risk of infection. Undoubtedly, it will become a part of the new era of minimally invasive surgery (3).

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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 Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

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