

# Dysplasia of Ovary Without Abnormal Development of Uterus and Urinary System: A Report of Four Cases

**Weixia Wei**

Department of Obstetrics and Gynecology, Peking University Shenzhen Hospital Shenzhen, China

**Wenji Luo**

Department of Obstetrics and Gynecology, Peking University Shenzhen Hospital Shenzhen, China

**Qicai Hu**

Department of Obstetrics and Gynecology, Peking University Shenzhen Hospital Shenzhen, China

**Liping Zeng**

Department of Obstetrics and Gynecology, Peking University Shenzhen Hospital Shenzhen, China

**Huiru Tang**

Department of Obstetrics and Gynecology, Peking University Shenzhen Hospital Shenzhen, China

**Ruifang Wu** (✉ [wurpush@126.com](mailto:wurpush@126.com))

Department of Obstetrics and Gynecology, Peking University Shenzhen Hospital Shenzhen, China

---

**Case report**

**Keywords:** undescended, maldescent, ovary, infertility

**Posted Date:** August 13th, 2020

**DOI:** <https://doi.org/10.21203/rs.3.rs-58010/v1>

**License:** © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

---

# Abstract

## Background

Congenital anatomic abnormalities of fallopian tubes and ovaries are rarely reported. Herein, we describe four cases of abnormal ovarian descent during laparoscopic surgery with abnormal anatomy of fallopian tube, without abnormal uterine development and urinary system abnormalities. These cases are analyzed by their clinical features and their effects on reproductive function.

## Case presentation

For patients with undescended ovary, the upper part of the unilateral/bilateral ovary decline was much higher than that of the common iliac vessel bifurcation, and the fallopian tube on the same side opened in the para-colonic sulcus. Among four patients, two cases had primary infertility, one case had tubal pregnancy rupture and bleeding, and one case had uterine leiomyoma. The development of uterus was normal in all the four patients, and there was no abnormal development of urinary system. During the infertility examination, hysterosalpingography (HSG) suggestion of oviduct lift was a sign for possible undescended ovarian. The pelvic B-ultrasound examination was limited to discover ovarian maldescent.

## Conclusion

Laparoscopy was the gold standard for the diagnosis of poor ovarian decline. When B-ultrasound prompts one-sided or double-sided "ovary display is unclear" or detects "shrinking small ovaries", it might be ovarian maldescent. When there is periodic post-sacral spinal pain, MRI positioning or HSG can be used for diagnosis.

## Introduction

Congenital abnormalities of fallopian tube and ovary are rarely reported. The definition of undescended ovary has not been established. Two standards are commonly used to identify the abnormal position of the ovary(1). The ovary extends upward into the abdominal cavity, or the superior pole extends beyond the incisal edge of the pelvic entrance or above the bifurcation of the common iliac vessels, or even located in the intracolonic sulcus. The ovaries with the concomitant fallopian tube also lift and open in the normal position. The inherent ligaments are usually longer, while the pelvic ligaments are shorter. These conditions are considered as poor ovarian decline (1).

Typically, the incidence of poor ovarian decline is 0.3% (2). Undescended ovaries and fallopian tubes are more often associated with uterine abnormalities. Among them, up to 20% in patients are with Müllerian agenesis and 42% in cases of unicorn uterus(3). Therefore, the pathogenesis of poor ovarian decline may be caused by partial obstruction of the genitourinary crest during the embryonic period, or both.

Congenital anatomic abnormalities of fallopian tubes and ovaries are very rare, and there are only few reports of abnormal descent of ovaries and fallopian tubes. Herein, four cases of abnormal ovarian

descent found during laparoscopic surgery with abnormal anatomy of fallopian tube, without abnormal uterine development and urinary system abnormalities, were reported. Their clinical features and their effects on reproductive function were analyzed.

## Case Presentation

### Case 1: Bilateral ovarian maldescent

A 21-year-old woman presented with 3 years of primary infertility (Height: 162 cm; body weight: 64 kg; body mass index (BMI): 24.4 kg/m<sup>2</sup>; Chromosome: 46 ther XX). Karyotype analysis showed normal female chromosomes. The menstrual cycle was 30-90 days and the menstrual period was 3-5 days. No abnormality was found in basic sex hormones (AMH:11.25 ng/ml). The results of B-ultrasound (Figure 1) showed the size of the uterus was about 40 × 32 × 25mm, and the left ovary was unclear, the size of the right ovary was about 19.8 × 10.5 mm, the structure was solid. Besides, no obvious follicular echo was found. The results of 3 D ultrasound salpingography showed bilateral distal tubal obstruction. Laparoscopic hysteroscopy was performed on July 4, 2016 (Figure 2). The= the uterus (4 × 3 × 2.5 cm) was observed under laparoscopy, and its surface was smooth. The bilateral ovaries had a long and narrow shape. The upper ovary bifurcated beyond the common iliac vessels and extended to the ipsilateral intracolonic sulcus. The cortex was thick (10 x 3 x 2.5 cm). No ovulation spot was found. The bilateral fallopian tubes were about 18 cm long, with the ipsilateral ovary extending, and the umbrella end opened in the para-colonic sulcus. The bilateral proper ovarian ligament lengthened about 5 cm and the ovarian suspensory ligament shortened about 1 cm. Methylene blue in the umbrella of bilateral fallopian tubes successfully overflowed after methylene blue was injected into the uterine cavity through the uterine catheter. The course of bilateral ureter was normal. The development of uterine cavity under hysteroscopy was normal.

### Case 2: Undescended right ovary

A 34 years oldwoman presented with primary infertility for 1 year.(Height: 163 cm; Body weight: 53 kg; BMI: 19.95 kg/m<sup>2</sup>; Menstrual cycle: 30-60 days; Menstrual period 5-6 days; Menstrual volume was normal). Sex hormones were in normal range. The Figure 3 showed results of B-ultrasound. We can found that left ovary had a PCO☐polycystic ovary☐change and the right ovary was unclear (Figure 3). The Hysterosalpingography showed that the appearance of the uterus was normal and the bilateral fallopian tubes extended to the level of the third lumbar vertebra. Tubal patency was judged by displaying opaque fluid adjacent to the colon. The left fallopian tube was blocked; the right fallopian tube was lifted and unobstructed (Figure 4). Hysteroscopy was performed on January 4, 2018 (Figure 5). The size of uterus was normal, and its surface was smooth in. The right ovary was long oval. The inferior pole of the ovary was in the bifurcation of the common iliac vessels. And the upper pole was in the right interintestinal sulcus of the lateral node after crossing the common iliac vessel bifurcation(a thick cortex (6 x 4 x 3 cm) without ovariectasis). The length of the right fallopian tube waa about 18 cm, accompanying with the ipsilateral ovary, and the umbrella end opened in the right intracolonic sulcus. The proper ovarian

ligament on the right side was lengthened about 6 cm, and the ovarian suspensory ligament was shortened about 1cm. The position of the left ovary was normal (5 × 4 × 3 cm), and the thickened cortex was white. There was no ovulatory spot, and the length and shape of the left fallopian tube were normal. Scattered lesions of pelvic endometriosis were found in the pelvis. When methylene blue was injected into the uterine catheter, it could be seen that the umbrella end of both fallopian tubes spilled smoothly. Hysteroscopy showed that the development of uterine cavity was normal.

### **Case 3:** Bilateral undescended ovaries with right tubal ectopic pregnancy

A 28-year-old parturient woman presented was admitted. Cesarean section was performed because of "menopause 38 days, vaginal bleeding 4 days, lower abdominal pain 1 day" and sudden syncope emergency. Urine HCG was positive. The results of Gynecological double examination showed that uterine tilt with normal size was found, and it did not connect with bilateral ovaries. Normal uterus and uniform thickening of endometrium (13 mm), without signs of pregnancy (intrauterine or extrauterine) were found in the results of Transvaginal ultrasound. Pelvic and abdominal effusion (maximum anterior and posterior diameter 66 mm). No bilateral appendages were observed. Abdominal puncture took out 10 ml non-coagulation blood. The patient was diagnosed as ectopic pregnancy. Laparoscopic exploration found normal uterus, bilateral ovarian decline and bilateral fallopian tubes were too long. The superior pole of the bilateral ovary extends beyond the bifurcation of the common iliac vessels to the ipsilateral intracolonic sulcus. The bilateral fallopian tubes were associated by the lengthening of the ipsilateral ovary, and the umbrella end opened in the para-colonic sulcus. The ampulla of the right fallopian tube was enlarged by 3cm, with blood clot attached and active bleeding at the end of the umbrella. There were about 1500 ml pelvic hemorrhage and blood clots (Figure 6).

### **Case 4:** Undescended left ovary

A 32-year-old virgin woman presented with underwent laparoscopic myomectomy for uterine leiomyoma in July 2019. The patient had no menstrual changes and the basic sex hormones were normal. During the operation, intramural myoma of the posterior wall of the uterus was found to be 9◇8◇7 cm. The left ovary was narrow and oblate. The upper ovary was located above the bifurcation of the total iliac vessels (8.5◇4◇2.5 cm). (Figure 7)

The cortex was thick, and ovulation spots could be found. The left fallopian tube was about 20 cm long, accompanied by the ipsilateral ovary, and the umbrella end opened in the left intracolonic sulcus. The proper ligament of the left ovary was lengthened about 3 cm. The ovarian suspensory ligament was shortened about 1 cm. The position and shape of the right ovary and fallopian tube were normal. (Figure 7)

## **Discussion**

Previous study have found that a 0.3–0.5% incidence of ovarian maldescent in the general population(1). It can be associated with uterine or renal anomalies women with uterine dysplasia or hypoplasia. and

have the highest incidence of abnormal ovarian position which has a total incidence of 13% of all uterine abnormalities. This incidence is comparable to 17% of the level of the common iliac artery at or above the superior pole of the ovary found in MRI standard(2). Therefore, it is believed that the ovary defined in MRI as located at or higher than the bifurcation of the iliac artery can be used as a basis for the diagnosis of poor ovarian decline. If hysterosalpingography shows that the fallopian tube is elongated and raised, or pelvic ultrasound cannot locate the ovary in the normal position on both sides of the uterus, ovarian maldescent can be expected. If the upper pole of ovary found by pelvic and abdominal MRI scanning is located at or higher than the level of common iliac artery, these will also be the indications of ovarian maldescent(3). However, laparoscopic exploration is the best method for the diagnosis of ovarian maldescent by now.

Undescended ovary is often discovered in laparoscopic exploration during the examinations of infertility, uterine dysplasia, epigastric pain, or pregnancy(3). Our first case of ovarian maldescent had been incidentally reported in 2016 during a routine laparoscopy procedure of infertility. Of our 4 reported cases, 2 cases were found during examination of infertility; 1 case was discovered during exploration of ectopic pregnancy; and the remaind case was accidentally found by laparoscopic myoma surgery (Table 1).

Since the actual position of the ovary is higher than that of the normal pelvic cavity, and the ultrasound probe does not go further beyond the pelvic cavity to go to the upper abdomen to look for the ovaries , ultrasound usually failures to detect or only to detect part of the ovarian sonogram (4-7). Therefore, we believe that the pelvic B-ultrasound examination is limited to determine ovarian maldescent. The position of normal pelvic ovary may not be detected or only partially be detected during ultrasound examination. In 2 of our cases, preoperative pelvic ultrasonography showed unclear or "atrophic small ovaries" in one or both sides of the ovary. Combined with the history of infertility, it was mistaken for congenital ovarian hypoplasia, but it was not consistent with the biochemical examination of ovarian function (the basic sex hormones were normal). In 1 case of acute abdomen, under the background of a large amount of fluid in the pelvic cavity, the sonogram of ovary and fallopian tube was still not observed in the adnexal area, which misled the doctor to ignore the possibility of ectopic pregnancy. In addition, 3D contrast-enhanced salpingography of infertility may also give a false positive result. In case 1, since the ultrasound probe could not extend to the iliac fossa to find ectopic fallopian tubes and ovaries, the developer could not be detected from the fallopian tube and the strong halo of the developer around the ovary. Therefore, it might be easy to be misdiagnosed as distal tubal obstruction. If combined with obesity or intestinal qi interference, the diagnosis will be more difficult. Compared with contrast-enhanced ultrasound, HSG has an advantage in the diagnosis of undescended ovarian. HSG in case 2 suggests that the fallopian tube on the dysplastic side (right side) is raised, and the right fallopian tube can be found on X-ray (Figure 4). The contrast medium was concentrated and diffused in the iliac fossa, indicating that the position of the fallopian tubewas abnormal but the lumen was unobstructed.

The mechanism of maldescent of the ovary remained unclear, but it had been suggested that it might be because of the lack of embryological caudal descent or the incidental growth restriction of a specific portion of the genital ridge.As Mullerian anomalies were previously thought to be a multifactorial process.

A review of the literature found that it may be more common in infertility patients or individuals with abnormal development of the uterine or renal system. The relationship between poor ovary decline and infertility is still not clear. However, literature reports suggest that infertility women have high risk in the incidence of poor ovarian decline with. This may be associated with high ovarian position accompanied by fallopian tubes correspondingly too long, and fertilized eggs cannot swim back to the uterine cavity bed on time. Therefore, women with poor ovarian decline combined with infertility may consider *in vitro* fertilization and embryo transfer (IVF/ET) to assist in pregnancy. Abnormal lyopositions combined the presence of fallopian tubes also increase the risk of ectopic pregnancy(8), ovarian twist, ovarian tumors, Changes of sex hormone, etc(9). Therefore, accurate diagnosis and consultation on the patient's potential risk of infertility are key factors in the treatment of poor ovarian decline.

## Conclusion

In conclusion, poor ovarian decline is rare. For normal ovary function examination, if B-ultrasound prompts one-sided or double-sided "ovary display is unclear" or detects "shrinking small ovaries", this might be an alert of ovarian maldescent. If there is periodic post-sacral spinal pain, MRI positioning or HSG can be used for diagnosis. Because this phenomenon is rare, it is necessary to communicate with radiologist well, to provide a accuracy of diagnosis. Laparoscopic profiling is the gold standard. Poor ovarian decline patients should understand that natural pregnancy is possible, but infertility couples could consider active IVF-ET to assist pregnancy.

## Declarations

### Authors' contributions

All authors were involved in drafting the article or revising it, and all authors approved the final version to be published.

**Conception & Design of Study:** WW and RW

**Data Collection:** WW, WL, QH, WZ, and LZ

**Data Analysis & Interpretation:** WW and WL

**Responsible Surgeon or Imager:** WW, WL, and LZ

**Patient Recruitment:** WW, WL and QH

## Declarations

### Funding

This work was supported by Medical Scientific Research Foundation of Guangdong (Grant No. A2019035), Shenzhen Science and Technology Innovation Committee Technical Research Project (Grant No. JCYJ20150601090833370 and JSGG20180703164202084), and Shenzhen Sanming Project (SZSM201412010).

### **Conflicts of interest**

The authors declare no conflict of interest.

### **Ethical approval**

The study was approved by the Institute Research Ethics Committee at Peking University Shenzhen Hospital. All patients gave informed consent prior to collection of specimens according to institutional guidelines.

### **Consent to participate**

Informed consent was obtained from all individual participants included in the study.

### **Consent to publication**

All the authors all the authors mutually agree that this manuscript published in *Clinical Rheumatology*.

## **Reference**

1. Verkauf BS, Bernhisel MA. Ovarian maldescent. Fertility and sterility. 1996;65(1):189-92.
2. Allen JW, Cardall S, Kittijarukhajorn M, Siegel CL. Incidence of ovarian maldescent in women with müllerian duct anomalies: evaluation by MRI. American Journal of Roentgenology. 2012;198(4):W381-W5.
3. Dietrich JE, Hertweck SP, Bond S. Undescended ovaries: a clinical review. Journal of Pediatric and Adolescent Gynecology. 2007;20(2):57-60.
4. Exacoustos C, Di Giovanni A, Szabolcs B, Binder-Reisinger H, Gabardi C, Arduini D. Automated sonographic tubal patency evaluation with three-dimensional coded contrast imaging (CCI) during hysterosalpingo-contrast sonography (HyCoSy). Ultrasound in Obstetrics and Gynecology: The Official Journal of the International Society of Ultrasound in Obstetrics and Gynecology. 2009;34(5):609-12.
5. Cheng Q, Wang S-s, Zhu X-s, Li F. Evaluation of tubal patency with transvaginal three-dimensional hysterosalpingo-contrast sonography. Chinese Medical Sciences Journal. 2015;30(2):70-5.
6. Alcázar JL, Corral TM-A, Orozco R, Dominguez-Piriz J, Juez L, Errasti T. Three-dimensional hysterosalpingo-contrast-sonography for the assessment of tubal patency in women with infertility: a systematic review with meta-analysis. Gynecologic and obstetric investigation. 2016;81(4):289-95.

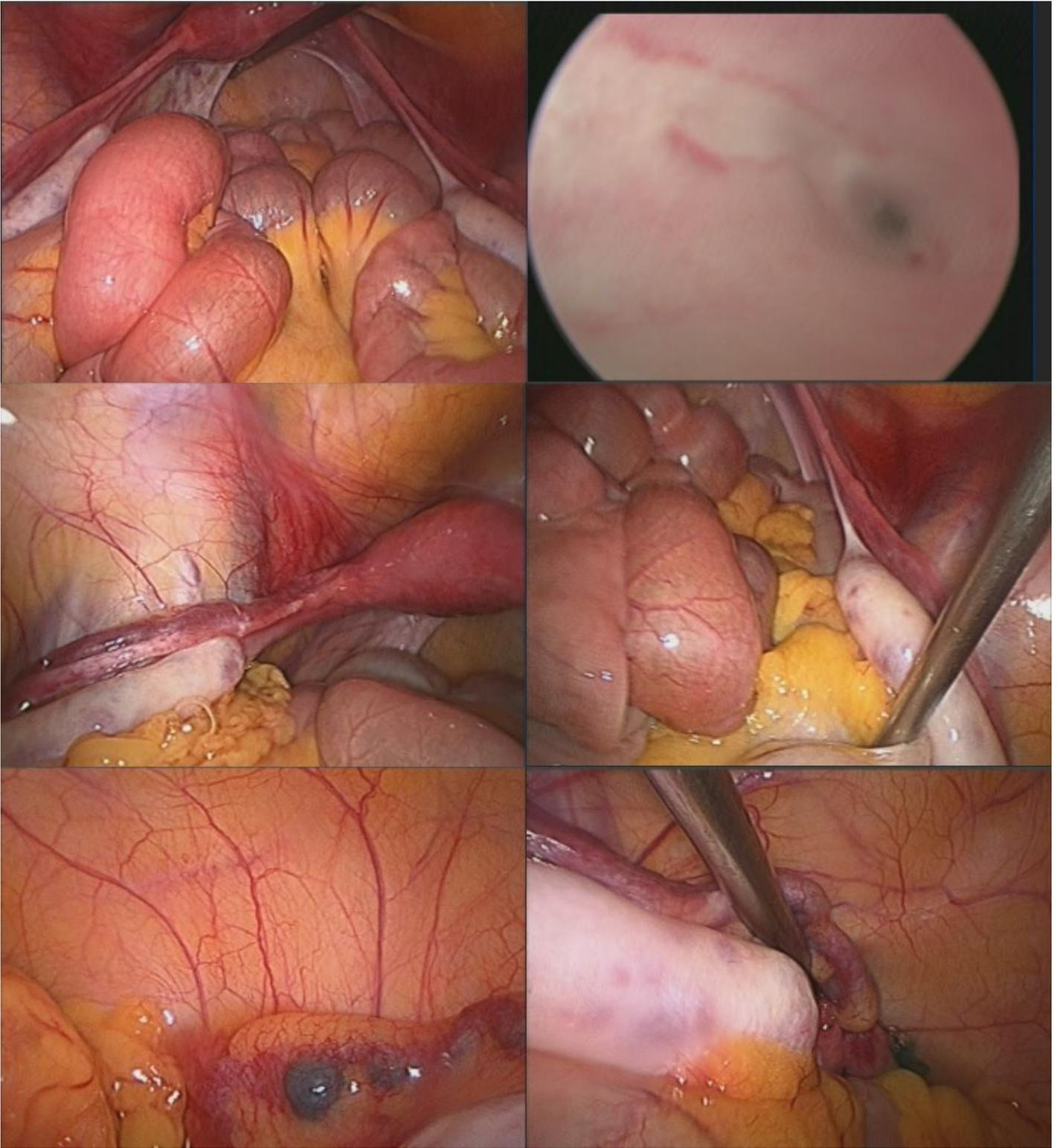
7. Rajesh H, Lim SL, Yu SL. Hysterosalpingo-foam sonography: patient selection and perspectives. International journal of women's health. 2017;9:23.
8. Kives SL, Perlman S, Bond S. Ruptured hemorrhagic cyst in an undescended ovary. Journal of pediatric surgery. 2004;39(11):e4-e6.
9. Seyam E, Hefzy E. Evaluation of the correlation between insulin like factor 3, polycystic ovary syndrome, and ovarian maldescent. Gynecological Endocrinology. 2018;34(6):481-8.

## Figures



**Figure 1**

Transvaginal ultrasound image of Case 1: the size of the right ovary was about 19.8 × 10.5 mm, the structure was solid and there was no obvious follicle-like echo.



**Figure 2**

Exploratory laparoscopy of Case 1: Exploratory laparoscopy showed that the bilateral undescended ovary with bilateral fallopian tubes were too long, Meilan overflow was observed at the umbrella end, and the shape of the uterine cavity was normal.

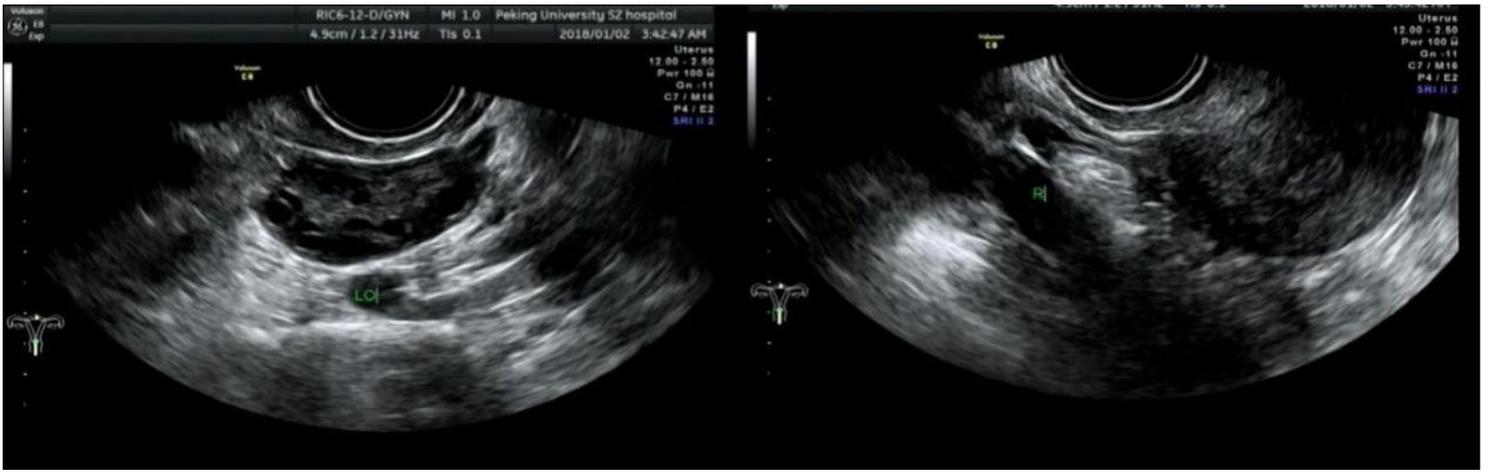


Figure 3

Transvaginal ultrasound image of Case 2: transvaginal ultrasound showed PCO (polycystic ovary) changed in the left ovary and was unclear displayed in the right ovary.



Figure 4

Salpingography result of Case 2: Salpingography showed that the right fallopian tube was raised and unobstructed, and the left proximal fallopian tube was blocked.

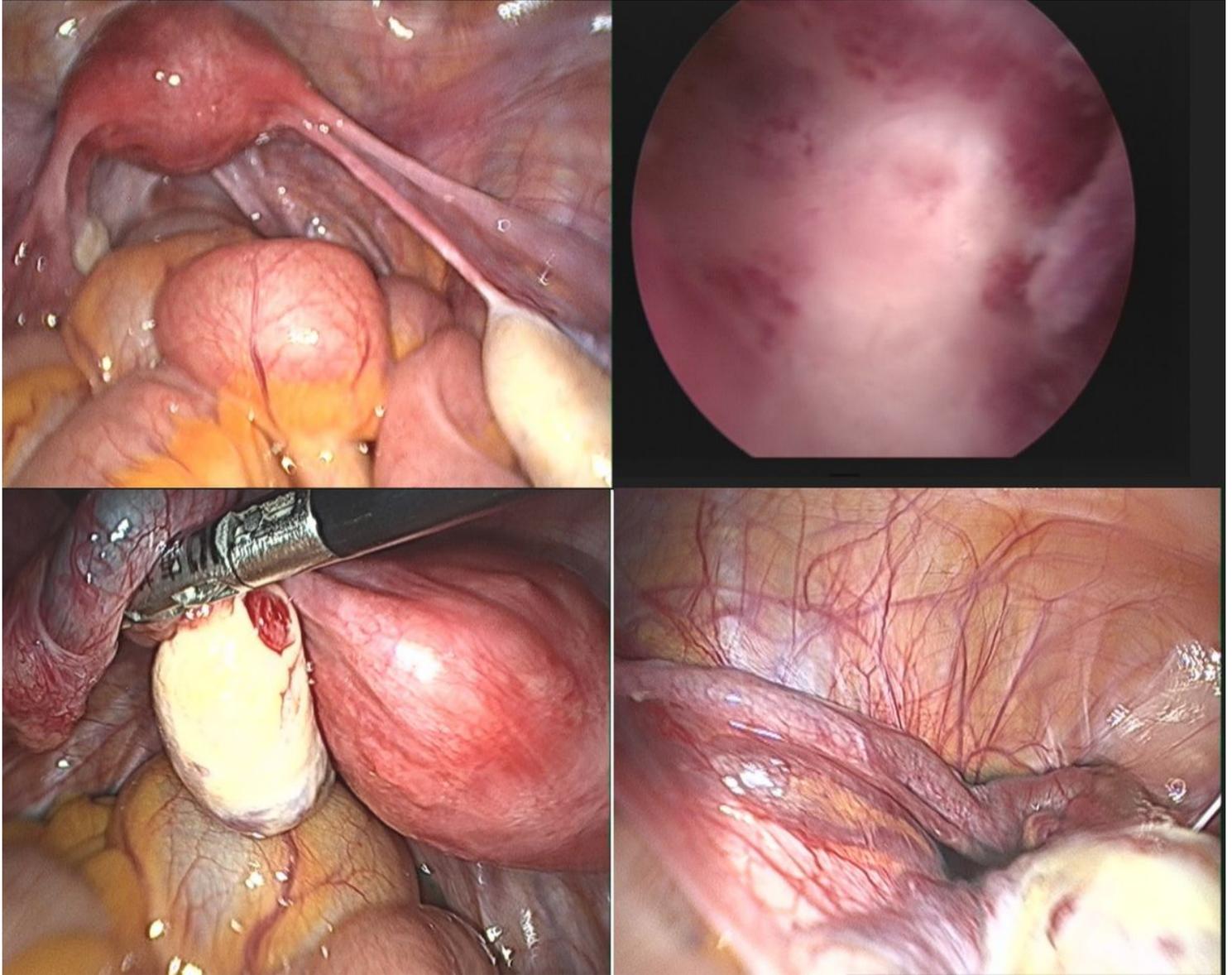


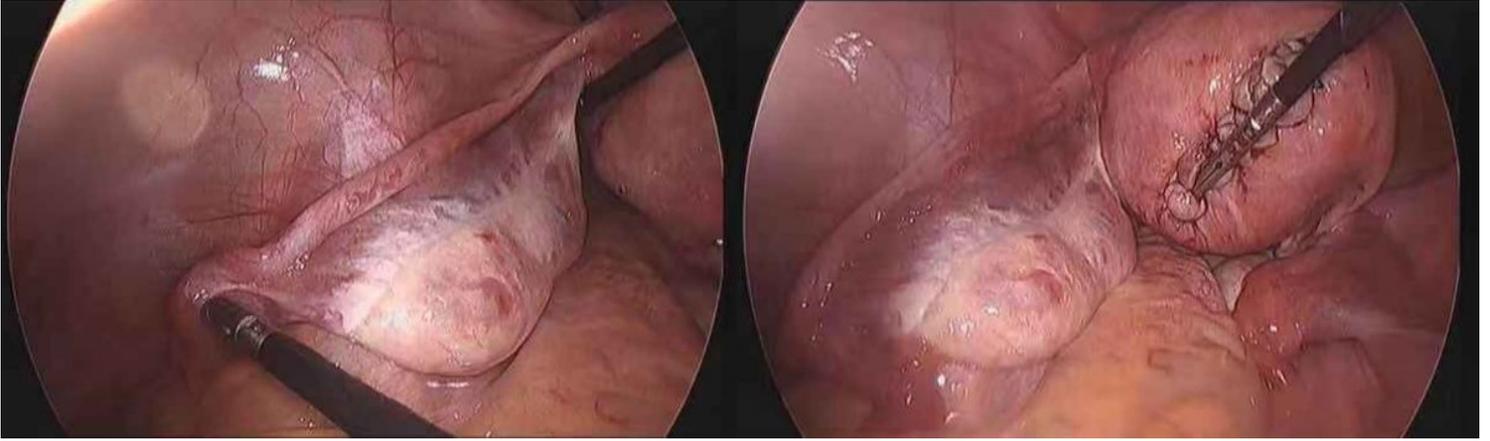
Figure 5

Exploratory laparoscopy result of Case 2: exploratory laparoscopy showed poor drop of the right ovary with long right fallopian tube; normal position of the left accessory; normal shape of the uterine cavity.



Figure 6

Exploratory laparoscopy of Case 3: exploratory laparoscopy showed the undescended right ovary with long right fallopian tube and active bleeding at the umbrella end of the right fallopian tube.



**Figure 7**

Exploratory laparoscopy of Case 4: laparoscopy showed the left undescended ovarian with long fallopian tube; the position of the right attachment was normal.