CASE REPORT

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# Spontaneous rupture of ovarian tumor with complications

## Rotura espontánea de tumor ovárico con complicaciones

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**ABSTRACT**

Mucinous ovarian adenocarcinoma is rare among malignant neoplasms of the female reproductive tract and is common in child-bearing period women. Patients often have non-specific symptoms, and diagnosis is usually based on histopathologic findings due to the lack of specific preoperative diagnostic elements , spontaneous rupture of ovarian cysts leads to more difficult diagnosis for emergent cases, and our patient complicated by stress-induced gastrointestinal bleeding intraoperatively, which added complexity to the surgery, We hope that the publication of the present case will increase awareness of the management of ruptured ovarian tumor among physicians and prevention of stress-induced gastrointestinal bleeding.

Keyword: Rupture, Ovarian adenocarcinoma, Surgical stress, Gastrointestinal bleeding.

**RESUMEN**

El adenocarcinoma mucinoso de ovario es poco frecuente entre las neoplasias malignas del tracto reproductivo femenino y es común en mujeres en edad fértil. Las pacientes suelen presentar síntomas inespecíficos y el diagnóstico se basa normalmente en los hallazgos histopatológicos, debido a la falta de elementos diagnósticos preoperatorios específicos. La rotura espontánea de los quistes ováricos dificulta aún más el diagnóstico en los casos urgentes, y nuestra paciente presentó una complicación intraoperatoria de hemorragia gastrointestinal inducida por el estrés, lo que añadió complejidad a la cirugía. Esperamos que la publicación del presente caso aumente la concienciación de los médicos sobre el tratamiento de los tumores ováricos rotos y la prevención de la hemorragia gastrointestinal inducida por el estrés.

Palabras clave: Rotura, adenocarcinoma ovárico, estrés quirúrgico, hemorragia gastrointestinal.

## Introduction

Ovarian cancer is the fifth leading cause of women cancer-related deaths worldwide and has the highest mortality rate among reproductive tract tumors[(1)]. The mucinous ovarian adenocarcinoma is the most unique type of epithelial ovarian cancer(EOC)and accounts for only 3% . It is more common in women aged 20 to 40. Most of them are large in size and even cover the entire pelvic cavity. Early diagnosis has a good prognosis with a 5-year survival rate of about 80 to 90%[(2)]. Preoperative diagnosis of ovarian cancer is a challenge due to the lack of specific manifestations and test methods.

Stress-induced bleeding refers to a complication characterized by acute gastrointestinal mucosal erosion and bleeding that occurs under various stress conditions such as severe trauma, critical illness, or severe psychological disorders. It can aggravate the original disease and increase the mortality rate. Preventing Stress-related mucosal disease is an essential part of the treatment of critical patients.The incidence of stress gastrointestinal bleeding is on average 8%, and patients often have no obvious prodromal symptoms (such as abdominal pain or acid reflux), mainly manifested as hematemesis or melena, which can be diagnosed by digestive endoscopy.[(3)]

Our patient initially operated the right salpingo-oophorectomy as a simple rupture of an ovarian cyst. Moreover, upper gastrointestinal bleeding occurred during the operation . The final pathological result

confirmed it as mucinous ovarian adenocarcinoma. The authors hoped reader will attach importance to the principle of tumor-free and prevention of stress-induced gastrointestinal bleeding when facing emergency ovarian surgery with limited objective conditions,

## Case presentation

A 33-year-old G1P1A0 woman presented to the emergency department in the evening with a 3 day history of lower abdomen pain, accompanied by two episodes of nausea and vomiting, She took roxithromycin orally at home, but her abdominal pain has not been significantly relieved. Color doppler ultrasound revealed a multilocular cystic mass of the pelvic cavity that measured 17×14mm, an anechoic area with a clear boundary and an irregular shape, and the blood flow signal was rich. A 65mm anechoic area was observed in the rectouterine fossa. (As it was a simple bedside ultrasound instrument, no pictures were available.)

Abdominal CT scan: A multilocular 17.3*7.8*17.2cm in size cystic mass with solid parts and an irregular surface originating from the right adnexa. The densities of each cyst are uneven,the CT values are 85 Hu,46HU,20HU, and 8HU, fluid is seen in the pelvic and abdominal cavities. (Figure1.). Physical examination revealed a huge pelvic mass of medium texture with a clear boundary, the upper boundary level is up to the umbilicus, and diffuse lower abdominal tenderness and muscle guarding. Routine tests such as blood cell analysis, liver and kidney function, electrolytes and coagulation function were all normal.

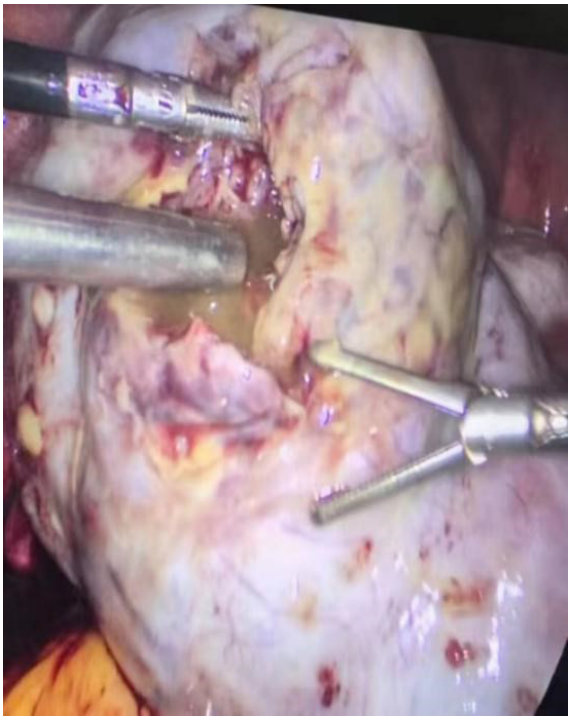
She did not receive treatment for pelvic mass about 10cm in size one year ago because she was pregnant and had no symptoms at that time.She has diagnosed as atrophic gastritis through AOHUA-AQ200 gastrointestinal endoscopy for three years without taking medication regularly ,she doesn't smoke and has no family history of tumors, one normal vaginal delivery at term in 2023.

Surgical process: we provided full informed consent before operation to the patient and her husband, included the final pathology, recurrence rate, the second operation for surgery staging is required if the tumor is malignant. About250ml of grayish-yellow viscous fluid was seen in the pelvic cavity, and a 2cm-sized ulceration-like rupture was seen with viscous grayish-yellow fluid which was similar to pelvic fluid. (Figure2.).

The appearance of the right fallopian tube and the left adnexa was normal. Therefore, the right adnexectomy was performed after the adhesiolysis.We using in-bag morcellation in order to prevent the retention of residual tissue fragments and further dissemination of malignant cells ,and the abdominal and pelvic cavities were repeatedly rinsed with distilled water after adnexectomy . The operation lasted for 150 minutes and there was a blood lost 100ml. Unexpectedly,coffee-colored liquid was found flowing

Fig. 1. Abdominal CT images demonstrating a large heterogenous mass (blue arrow) occupying the majority of the pelvis. The pelvic mass can be seen compressing the uterus (white arrow). pelvic and peritoneal fluid is noted (yellow arrow). A. Coronal view. B.Axial view. C.Sagittal view.

Fig2. The ruptured tumor and its fluid.



from the patient's mouth and nose at the end of the operation. About 60ml of liquid was immediately aspirated and the occulent blood test was positive. An internal medicine consultation was invited to consider stress-induced upper gastrointestinal bleeding, insertion of gastric tube and esomeprazole 80mg ivgtt was given. The patient was discharged without gastroscopy due to poor compliance. The values of serum tumour markers the next day were reported: CA19- 9: 122.96 U/mL was increased (normal<27U/mL), CA- 125 : 61.71 U/ ml (normal<35U/ ml) and CEA: 5.75 ng/ml(normal<5ng/ml) were mildly elevated, AFP: 2.2 ng/ml (normal<7ng/ml) and CA153: 9.70 U/ml(normal<25U/ml) and b-hcg; 0.15 mIU/mL(normal) were normal.

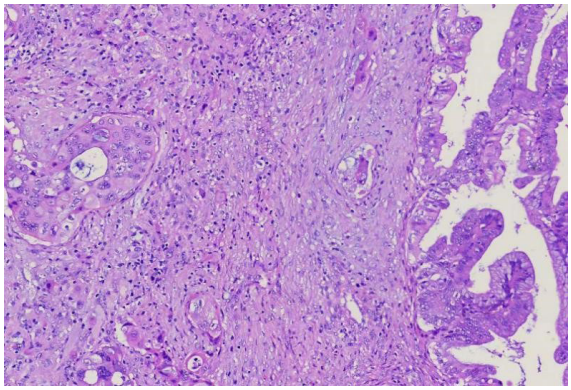
right ovary mucinous adenocarcinoma was confirmed by the pathology(Figure3.), and the right fallopian tube was normal. The immunohistochemical profile: P53 (wild type), WT-1 (-), CEA (focal +), CK20 (focal +), CDX-2 (weak +), Ki-67 (15%+), PAX-8 (minority +), ER (-), PR (-), CK7 (+). Tumor markers and immunohistochemistry have no specificity in the diagnosis of ovarian adenocarcinoma.The patient provided informed consent for publication of the case.

## Discussion

The incidence of ovarian tumor rupture is approximately 3%, which can be divided into spontaneous and traumatic types. Spontaneous rupture is often caused by excessive tumor growth, mostly due to invasive tumor growth penetrating the cyst wall[4]. Traumatic rupture is caused by heavy abdominal trauma, childbirth, sexual intercourse, gynecological examination and puncture, etc.[5] The severity of its symptoms depends on the size of the rupture, the nature and quantity of the fluid flowing into the abdominal cavity. When small cysts or simple serous cystadenomas rupture, patients only experience mild abdominal pain. However, when large cysts or mature teratomas rupture, they often cause severe abdominal pain, accompanied by nausea and vomiting. Sometimes, it can lead to peritonitis, intra-abdominal hemorrhage and even shock.[6] Our patient experienced mild abdominal pain in the first three days of the onset and took antibiotics orally at home until the abdominal pain worsened before hospitalization. The large tumor volume relatively leads to increase tension and causes rupture. Cyst fluid causes severe irritation to the peritoneum.

Clinically, spontaneous rupture of ovarian tumors is not only a rare gynecological emergency, but also has a significant impact on the prognosis of patients and the neoplasm staging. In the 2014 FIGO staging system, IC stage was further classified into three conditions: Intraoperative rupture was classified as stage IC1, while preoperative rupture of the tumor capsule or presence of tumors on the surface of the ovaries and

Fig3. pathology of ovary mucinous adenocarcinoma



fallopian tubes was classified as stage IC2 . This indicates that preoperative tumor rupture has escalated from stage IB to IC2 .

A meta-analysis involving 2,382 patients with early EOC showed that those with preoperative tumor rupture had a poorer prognosis than those with intraoperative tumor rupture, and those with intraoperative tumor rupture had a poorer prognosis than those without rupture.[7]. Another study has shown that the survival rate of patients with preoperative tumor rupture is lower than patients with intraoperative tumor rupture. The survival rate of patients with preoperative rupture is 59%, while that of patients with intraoperative rupture is 85%, if provided repeat irrigations is performed immediately to prevent the spread of cancer cells.[8,9]

It's easily confused with other diseases and increase the difficulty of diagnosis once the tumor ruptures, Supplemental table is the main differentiating points for four types of ovarian cyst rupture.

It is worth noting that for acute lower abdominal pain caused by cyst rupture, which are clear indications for surgical examination regardless of the diagnosis. Diagnostic laparoscopy is a diagnostic method and right salpingo oophorectomy were performed immediately.The patient was transferred to a specialized oncology hospital for staged surgery after the pathological results were available, the surgical staging showed stage Ic2. There was no chief complaint and evidence of recurrence during the one-year follow-up, and the follow-up is still ongoing.

The ruptured ovarian mucinous adenocarcinoma we reported occurred at night, and neither MRI nor intraoperative biopsy could be performed, this might have delayed the preoperative diagnosis until the papillary protrusion of the cyst wall was found during the operation, which might be the most direct evidence of the malignant tumor (Figure 4).

Coffee-colored liquid was found flowing from the patient's mouth and nose at the end of the surgery ,and the occulent blood test was positive. Generally speaking, patients with stress-induced gastrointestinal bleeding usually occurs in intensive care unit (ICU )setting . due to the advancements in the resuscitation and management of intensive care level, stress induced gastrointestinal bleeding that occur in 0.26–0.27%

Supplemental Table. Differentiation of Four Types of Ruptured Ovarian Mass

| | Chocolate cyst of ovary | Tubo-ovarian abscess | Hemorrhagic ovarian cyst | Mature teratoma |
|---|---|---|---|---|
| Etiology | The enlargement of chocolate cysts leads to increased tension. | Serious complications of persistent pelvic infection | The cyst enlarges and fails to absorb on its own, eventually ruptures | In young women, rupture is usually associated with torsion or pregnancy, and after menopause, malignancy may lead to cyst rupture |
| Onset | Before or during menstruation | It mostly occurs in women of childbearing age | The luteal phase of menstruation | It can occur at any age, but mainly in young women |
| Imaging features | CT signs are similar to those of a corpus luteal cyst rupture, with spontaneously dense ovarian masses and ascites. MRI usually shows a distorted endometrioma and free peritoneal fluid with a high TI signal. | -Complex adnexal structure with thick walls, internal echoes likely pus with cellular debris. -Internal air foci can be seen. -Focal adjacent pyo/hydrosalpinx. | Cystic adnexal mass with posterior enhancement. Mixed internal echogenicity which changes with clot age. -No internal flow. -Fine fibrin strands. -May show "ring of fire" on color Doppler. -Usually unilateral and unilocular. | A diffusely or partially echogenic mass demonstrating sebaceous material and multiple thin echogenic bands caused by the presence of hair in the cyst cavity. Typically CT images demonstrate fat, fat ffuid level, calciffcation, rokitansky protuberance, and tufts of hair. |
| Clinical presentations | Acute lower abdominal pain, or infertility and dysmenorrhea. | Sudden intensification of abdominal pain, accompanied by chills, high fever, nausea, vomiting, abdominal distension, refusal to press on the abdomen or signs of toxic shock | Acute abdominal pain usually occurs after sexual activity or intense physical activity, or is accompanied by a small amount of vaginal bleeding | Abdominal pain, pelvic fluid, and distension caused by a large amount of mass fluid |
| Treatment principle | Laparoscopic surgery is performed; for those without rupture, the treatment plan is selected based on the fertility situation. | Once abscess rupture is suspected, surgical exploration should be performed simultaneously with antibiotic treatment. | Most hemostasis and intravenous infusions are effective, surgery is performed if ineffective | Small-sized cysts can be observed, surgically removed while larger ones |

of non-ICU setting patients[10]. Moreover,stress ulcer prophylaxis is not recommended for use in patients outside the ICU according to the official stress ulcer prevention guideline[11].

She denied a history of long-term oral non-steroidal anti-inflammatory drugs and cirrhosis ruled out gastric fundus esophageal variceal bleeding and drug-induced bleeding, and the absence of recent severe trauma excludes the major stressor of gastrointestinal bleeding[12].Therefore we conducted a retrospective analysis that might be related to the patient's severe pelvic adhesion and long operation time may be the stressor and the ovarian malignant tumor itself may be a high-risk factor for causing bleeding, moreover,he has a history of gastritis for three years, microcirculation disorders that occur locally in the gastric mucosa under stress conditions, reduced functions of the mucosa epithelial barrier, as well as decreased gastric pH value, the mucosal permeability increases and changes in normal protective mechanisms may also be contributing factors[13]. Fortunately, the patient was recovering well due to effective treatment timely.Andi Kurniadi reported a 39-year-old emergency patient with ruptured Brenner tumor who underwent staging surgery, ultrasonography revealed adnexal solid mass measuring 11.86×12.50×11.24 cm,but no stress-induced bleeding occurred during the operation.[14] Similar case reports are rare.

Figura 4. Protuberancia papilar en la pared interna del tumor.

Our patient could not be diagnosed in time, and stress-induced bleeding occurred during the operation, although the current recovery is good, but early diagnosis and treatment is undoubtedly the best choice for patients.

## Conclusion

We face emergency ovarian surgeries when the objective conditions for evaluating the nature of the tumor are limited,the principle of tumor free should be strictly followed throughout the operation, and preventive measures for stress-induced gastrointestinal bleeding should be considered especially in patients with a history of gastrointestinal disease or difficult surgery.How to optimize the diagnostic strategy and improve the treatment effect is a clinical issue worthy of our in depth consideration in this situation.

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