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# Early Diagnosis and Surgical Treatment of Secondary Abdominal Pregnancy: A Case Report and Literature Review

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## Abstract

Abdominal pregnancy, a rare and life-threatening form of ectopic gestation, poses significant diagnostic and therapeutic challenges. This case report a 28-year-old female presented with amenorrhea for 13 weeks and intermittent lower abdominal pain. Transvaginal ultrasound revealed a left adnexal live fetus (equivalent to 13 weeks' gestation) with suspected ectopic implantation. Pelvic MRI confirmed placental attachment to the left broad ligament, surrounded by encapsulated hematoma. Ergency laparotomy achieved complete removal of the gestational sac and placenta via blunt dissection, with minimal intraoperative bleeding (50 mL). Serial Serum β-hCG levels normalized within two weeks postoperatively. This case underscores the superiority of MRI in placental localization and advocates for a tailored surgical approach in hemodynamically stable patients. Multidisciplinary collaboration and adherence to evidence-based guidelines are pivotal in reducing maternal morbidity.

**Keywords:** Abdominal pregnancy; MRI-guided diagnosis; Placental dissection; Multidisciplinary management; Surgical outcomes

## Introduction

Abdominal pregnancy, defined as ectopic implantation outside the fallopian tubes, ovaries, and broad ligaments, accounts for 1% of ectopic pregnancies, with an estimated incidence of 1:10,000–1:25,000 live births [1]. Despite advances in imaging, delayed diagnosis remains common,

contributing to maternal mortality rates of 5%–20% in resource-limited settings [2]. Risk factors include pelvic inflammatory disease (OR=3.2), prior ectopic pregnancy (OR=4.1), and assisted reproductive technologies (OR=2.8) [3]. We highlight surgical advancements and diagnostic challenges in this uncommon instance of secondary abdominal pregnancy with prolonged fetal life at Gansu Maternal and Child Health Hospital (Gansu Provincial Central Hospital).

## Case Presentation

A 28-year-old primigravida presented with amenorrhea for 13 weeks and intermittent lower abdominal pain for 40 days. She reported transient syncope and nausea but denied vaginal bleeding. Past medical history was unremarkable, with no prior pelvic surgery or infertility treatments.

The diagnostic tests are as follows: 1. Transvaginal Ultrasound: A viable male fetus (biparietal diameter: 19 mm; femur length: 10 mm) was identified in the left adnexa, with placental thickness of 13 mm and heterogenous endometrial thickening (16 mm). 2. Pelvic MRI: A 9-cm gestational sac adherent to the left broad ligament, surrounded by encapsulated hematoma and hypervascular parametrial vessels. 3. Laboratory Findings: Serum Serum β-hCG: 34,731 mIU/mL; progesterone: 13.69 ng/mL.

Exploratory laparotomy revealed a 9-cm gestational sac adherent to the left broad ligament and omentum. The fetus (9.5 cm, male) was delivered after umbilical cord ligation. Blunt dissection under direct visualization achieved complete placental removal, with adjunctive electrocautery for hemostasis. The left fallopian tube (ampulla and fimbria) was excised due to adhesions. Postoperative follow-up was actively performed: 1. Serum Serum β-hCG declined from 5,566 mIU/mL (postoperative day 1) to undetectable levels by week 2. 2. Gynecological ultrasound at postoperative day 5 showed no abnormalities. 3. No complications (e.g., infection, hemorrhage) were observed.

Statement: Written informed consent was obtained from the patient for the publication of this case report and accompanying images.

## Discussion

Abdominal pregnancy carries a maternal mortality rate of 5%–20% and a fetal survival rate of <1% [1]. Abdominal pregnancy is divided into two categories: primary and secondary. Primary abdominal pregnancy refers to the direct implantation of fertilized eggs in the peritoneum, mesentery, greater omentum, and other areas, which is extremely rare. Secondary abdominal pregnancy refers to a condition that is secondary to tubal pregnancy rupture or miscarriage, and occasionally secondary to ovarian pregnancy or intrauterine pregnancy with uterine abdominal fistula. A significant maternal and infant mortality rate of 1–20% and 40–95%, respectively, is linked to advanced abdominal pregnancy [2]. Risk factors include a history of pelvic inflammatory disease (OR=3.2), previous ectopic pregnancy (OR=4.1), use of Assisted Reproductive Technology (ART) (OR=2.8), and a history of fallopian tube surgery [3]. The patient in this case had no clear risk factors, but adhesion between the left fimbrial end of the fallopian tube and the gestational sac was observed during surgery, which is a typical manifestation of secondary abdominal pregnancy, suggesting that abnormal fallopian tube function may be a potential cause. Due to abnormal placental attachment and insufficient blood supply during abdominal pregnancy, it is often difficult for the fetus

to survive until full-term. The patient has amenorrhea and early pregnancy symptoms, and the medical history often includes symptoms of tubal pregnancy miscarriage or rupture, or unexplained short-term anemia symptoms in early pregnancy, accompanied by abdominal pain and vaginal bleeding, which gradually improve later. Subsequently, vaginal bleeding stops and the abdomen gradually enlarges. During fetal movement, pregnant women often experience abdominal pain, which gradually worsens as the fetus grows. Abdominal examination revealed unclear uterine contours, but fetal limbs were easily palpable, fetal position was abnormal, shoulder or buttocks were first exposed, first exposed was high floating, fetal heart rate was abnormally clear, and placental murmurs were loud. Gynecological examination revealed that the cervix had shifted upwards, the uterus was smaller than the gestational month and biased towards one side, but sometimes difficult to reach, and the fetus was located on the other side of the uterus. During the near due period, there may be a false delivery with a contraction like appearance, but the cervix does not dilate and it is difficult to reach the exposed part of the fetus through the cervix. If the fetus dies, the signs of pregnancy disappear, menstruation returns, adhered organs and greater omentum wrap around the stillbirth, the fetus gradually shrinks, and over time, it may dry up or become a stone fetus. If secondary infection occurs and an abscess forms, it can penetrate the mother's intestinal tract, vagina, bladder, or abdominal wall to expel fetal bones. The diagnostic criteria for primary abdominal pregnancy are: ①Both fallopian tubes and ovaries are normal, with no evidence of recent pregnancy; ②No formation of uterine peritoneal fistula; ③Pregnancy only exists in the abdominal cavity and there is no possibility of tubal pregnancy. The factor that promotes the primary implantation of fertilized eggs in the peritoneum may be the presence of endometriosis lesions in the peritoneum. Secondary abdominal pregnancy often occurs after miscarriage or rupture of fallopian tube pregnancy, and occasionally after rupture of ovarian pregnancy or intrauterine pregnancy with uterine defects (such as scar uterus rupture or uterine peritoneal fistula). The embryo falls into the abdominal cavity, and some of the villous tissue still adheres to the original implantation site and continues to grow outward, attaching to the pelvic peritoneum and adjacent organ surfaces.

Although transvaginal ultrasound has been widely used in clinical practice, it is still extremely difficult to diagnose abdominal pregnancy. On the one hand, the incidence of abdominal pregnancy is very low, and ultrasound physicians have limited understanding of it, often misdiagnosed as tubal pregnancy; On the other hand, the attachment sites of abdominal pregnancy are extremely extensive, and early ultrasound images lack specificity, making early diagnosis of abdominal pregnancy very difficult. Gerli et al. **[4]** first proposed the criteria for diagnosing abdominal pregnancy through transvaginal ultrasound: ①No gestational sac was found in the uterine cavity; ②There is no clear enlargement of the fallopian tubes and cystic solid adnexal masses; ③The gestational sac is surrounded by the intestinal tract or separated by the peritoneum; ④The gestational sac has wave motion and mobility, especially when the vaginal ultrasound probe applies pressure to the posterior fornix. Previous studies have shown that the misdiagnosis rate of transvaginal ultrasound can reach 30% -40%, especially in determining the location of placental attachment **[5].** Although transvaginal ultrasound in this case

indicated the survival of the fetus in the left adnexa region, the relationship between the placenta and the broad ligament was not clearly defined. Pelvic MRI clearly showed placental attachment behind the left broad ligament, and evaluated the distribution of surrounding blood vessels and the extent of encapsulated hemorrhage, which is consistent with the conclusion of Rahaim et al.: MRI has a sensitivity and specificity of 91% and 88% for placental localization, significantly better than ultrasound **[6].** This discovery highlights the irreplaceable role of MRI in complex ectopic pregnancy, especially for patients with stable hemodynamics and requiring precise preoperative evaluation.

Abdominal pregnancy is relatively rare, but due to the abundant blood vessels at the implantation site, once ruptured, it may lead to hemorrhagic shock, causing intra-abdominal infection after fetal intra-abdominal death, which is extremely harmful to pregnant women. The mortality rate is about 8 times that of tubal pregnancy. Therefore, early diagnosis and treatment of abdominal pregnancy are particularly important, which can significantly reduce maternal mortality and improve prognosis. Conservative treatment: For patients with early abdominal pregnancy, small pregnancy tissue, and stable hemodynamics, drug therapy may be considered. The conservative approach often involves using methotrexate to kill embryos, which can be combined with mifepristone tablets for anti progestogen treatment. During the conservative process, it is necessary to closely monitor abdominal pain, vaginal bleeding, and vital signs. If conservative treatment fails, emergency surgical treatment is required. Surgical treatment is the main treatment for abdominal pregnancy, especially for patients with intra-abdominal bleeding or hemodynamic instability. Regarding the surgical approach, laparoscopy has the advantages of clear surgical field and fast postoperative recovery, and can be used as the first choice. But if the patient has unstable vital signs and urgently needs rapid hemostasis by entering the abdomen, it is advisable to choose open surgery. The core of abdominal pregnancy surgery is to balance the risk of bleeding and tissue preservation. Before surgery, it is necessary to fully assess the surgical risks, prepare sufficient blood, and if necessary, form a multidisciplinary team to safeguard the patient. The handling of the placenta during surgery should be particularly cautious, as arbitrary detachment may result in significant bleeding. It should be determined based on the location of placental attachment, fetal survival, and time of death. In this case, the placenta was attached to the left broad ligament. During the operation, blunt dissection combined with local electrocoagulation was used to stop bleeding, and the pregnancy tissue was finally completely removed with a bleeding volume of only 50ml.

Compared with typical abdominal pregnancies reported in the literature **[7]**, this case has the following characteristics: 1. Long fetal survival cycle: fetuses survive at 13 weeks of gestation (most cases $\leq$ 8 weeks), which may be related to the relatively abundant blood supply of the broad ligament attached to the placenta; 2. No serious complications: The patient did not experience major intra-abdominal bleeding or infection, thanks to early MRI diagnosis and timely surgical intervention; 3. Rapid postoperative recovery: Serum β-hCG turned negative 2 weeks after surgery, possibly due to complete placental clearance and no residual chorionic tissue. These differences suggest that for patients with special placental attachment sites but

stable hemodynamics, active surgical intervention can improve prognosis.

In conclusion, abdominal pregnancy is uncommon, lacks distinct clinical signs, is challenging to identify at an early stage, has a high rate of misinterpretation, and is frequently mistaken for a general ectopic pregnancy. In order to achieve early diagnosis and treatment, and reduce maternal and infant mortality rates, prioritize MRI in hemodynamically stable patients with equivocal ultrasound findings, blunt dissection reduces hemorrhage risk in broad ligament-implanted placentas and incorporate obstetrics, radiology, and general surgery teams for complex cases.


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