

Ovarian Pregnancy: Diagnosis and Management of a Rare Case of Ectopic Pregnancy

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Abstract

Ectopic pregnancy (EP) is a common gynecological emergency, with ovarian pregnancy (OP) being a rare form, representing about 3% of EP cases. OP poses diagnostic and therapeutic challenges due to its often-asymptomatic progression and nonspecific clinical presentation. We report the case of a 32-year-old primiparous woman diagnosed with an ovarian pregnancy by ultrasound. The patient frequently used emergency contraceptives and presented with intermittent pelvic pain and secondary amenorrhea with positive urinary β -HCG tests. Ultrasound revealed a lateral uterine gestational sac attached to the left ovary, containing a living fetus of 15 weeks + 6 days, with moderate fluid accumulation. Upon admission, the patient was in shock with severe anemia and hemoperitoneum, necessitating emergency laparotomy. The laparotomy revealed a hemoperitoneum of 1400 mL and a hyper vascularized mass involving the left ovary, requiring left adnexectomy. The mass contained a deceased male fetus of 16 weeks. This case highlights the need for heightened vigilance and precise diagnostic and therapeutic approaches for rare forms of EP to prevent severe complications.

Keywords

Ovarian Pregnancy, Ultrasound Diagnosis, Surgical Complications

1. Introduction

Ovarian pregnancy (OP) is a rare form of ectopic pregnancies (EP) representing approximately 2% - 3% of cases [1]. Although its incidence is relatively low, the challenges associated with its diagnostic and management are significant. Ectopic pregnancy (EP) remains one of the most frequent medical and surgical emergencies

in gynecology, with the fallopian tube being the most common implantation site in about 93% of cases [1]. Ovarian pregnancy, although rare, accounts for approximately 3% of all ectopic pregnancies [2], with an incidence rate estimated between 1/2100 and 1/7000 pregnancies [3]. Its diagnosis prior to surgery is often difficult, due to non-specific symptoms and the ambiguity of ultrasound images [4]. Therefore, the diagnosis is made during surgery in numerous cases [5]. The physiopathology of ovarian pregnancies is not completely understood. There is a lot of existing literature concerning ovarian pregnancies. Some studies suggest that they could result from a reflux of the fertilized oocyte back to the ovary [6] [7]. The use of intra uterine devices has also been associated with a higher prevalence of ovarian pregnancies, reported in about 57% to 90% of patients [8]. Furthermore, cases of ovarian pregnancies progressing into the second trimester or even full term have been described particularly in regions with low medical density where access to medical care is limited [9] [10]. Potential maternal and fetal complications are worrying, especially in contexts where health infrastructure is insufficient and under equipped [11]. This article addresses the diagnosis and management at the Gynecology Obstetrics Department of the Treichville Teaching Hospital Center (Abidjan, Côte d'Ivoire) of an ovarian pregnancy discovered on ultrasound, while highlighting the impact of emergency contraception on the occurrences of these pregnancies.

2. Case Report

The patient was a 32-year-old primiparous woman with a vaginal delivery, who commonly used emergency contraceptives, with no other notable gynecological history. She was referred from a peripheral maternity facility for management of an EP identified by ultrasound. The history included intermittent pelvic pain for 1 month, in the context of secondary amenorrhea for about 4 months with positive urinary β -HCG tests. The previous day, she experienced severe, stabbing pelvic pain which was not relieved by usual analgesics, prompting her to consult at a peripheral maternity facility. An ultrasound revealed a lateral uterine gestational sac attached to the left ovary, containing a living fetus of 15 weeks + 6 days, with moderate fluid accumulation (Figure 1 and Figure 2).

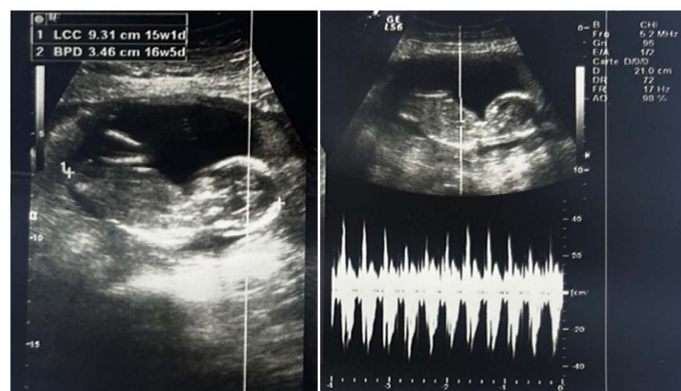


Figure 1. Ultrasound image of the living fetus.



Figure 2. Empty uterus and fluid accumulation in the Douglas pouch.

Upon admission to our department, the patient was in shock, with severe anemia (5.3 g/dL) and hemoperitoneum revealed by culdocentesis. An emergency laparotomy was performed, revealing a hemoperitoneum of approximately 1400 mL. The uterus was of subnormal size, with a large, hyper vascularized, partially ruptured, hemorrhagic mass (**Figure 3**).



Figure 3. Intraoperative photograph of the lateral uterine mass. Gynecology-Obstetrics Department, CHU de Treichville, 2024.

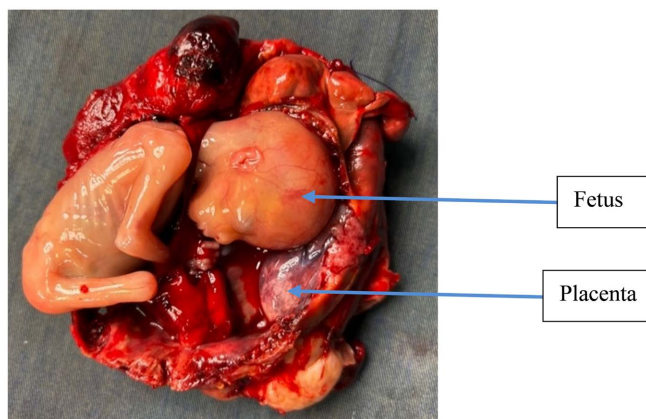


Figure 4. Photograph of the contents of the mass, including a fetus and its appendages. Postoperative recovery was uncomplicated; after correction of the anemia, the patient was discharged three days postoperatively.

It measured approximately 13 × 6 cm and developed at the expense of the left ovary. The ipsilateral fallopian tube was nearly absorbed by the mass. The right adnexa was unremarkable. A left adnexectomy was performed. Postoperative dissection revealed the mass contained a deceased male fetus of approximately 16 weeks gestational age (**Figure 4**).

To correct the anemia, the patient received a total blood transfusion of 730 mL of packed red blood cells during and after surgery.

There were no complications observed after the surgery. The complete blood count (CBC) showed a hemoglobin level of 9.3 g/dL. The patient was discharged after 72 hours of monitoring. Before leaving, we discussed with the patient on the need of an adequate contraceptive method and she opted for a subcutaneous progestin implant. The outpatient consultations showed good progress and the patient was encouraged to consult with us in the pre-conception period in order to ensure better monitoring and check the quality of the remaining tube.

3. Discussion

The diagnosis of OP is based on specific ultrasound criteria, particularly the identification of a latero-uterine mass independent of the ovary [12]. However, β -HCG level measurement is essential to confirm the diagnosis, which is not always possible in facilities with limited resources [13]. Early diagnosis of OP is often hampered by symptoms similar to those of other EPs, including abdominal pain, secondary amenorrhea, and metrorrhagia [12]. Diagnostic methods, such as ultrasound, have limits, particularly due to the variable interpretation of results and the limited availability of hormonal dosage in emergency settings [13]. The classic diagnostic triad is based on the β -HCG level, the absence of an intrauterine sac and the presence of a latero-uterine mass, but these criteria can often lead to confusion with other pathologies [14] [15]. The treatment of OP depends on several factors, such as the patient's hemodynamic status and β -HCG levels [14]. Surgical treatment is often necessary, but late diagnosis can complicate the management [15]. Spielberg's anatomical criteria remain fundamental to confirm the nature of the ovarian pregnancy [16].

Ovarian pregnancy, although rare, represents a distinct form of ectopic pregnancy (EP) where the implantation occurs directly on the ovary rather than in the fallopian tube or the uterus. It appears to be associated with a reflux of the fertilized oocyte back to the ovary. This location does not provide an indication of its primary or secondary origin [4]. This condition poses considerable challenges both diagnostically and clinically due to its rarity and the complexity of its clinical presentation. The diagnosis of ovarian pregnancy primarily relies on anatomical criteria and imaging techniques, such as ultrasound. However, the specificity of ultrasound in identifying ovarian pregnancy can be limited, making early diagnosis particularly challenging [17] [18]. Certain ultrasound criteria are very suggestive of the location of the ovarian pregnancy: The presence of an anechoic round image with a hyperechoic corona on the surface of the ovary, the presence of ovarian

parenchyma like a corpus luteum or a follicle surrounding the mass, and an echogenicity of the mass higher than that of the ovary. The differential diagnosis often arises with a corpus luteum cyst or a hemorrhagic cyst. In that case, three-dimensional (3D) ultrasound seems to be able to make the difference thanks to the cutting planes [19]. Therefore, ultrasound remains a valuable diagnostic tool, as evidenced by our case where ultrasound images revealed an abnormal gestational sac attached to the ovary, an atypical yet indicative feature of this condition.

The symptomatology of OP is similar to that of other EPs, characterized by abdominal pain, amenorrhea, and metrorrhagia [20]. Clinical examination can often lead to erroneous diagnoses, thus delaying treatment [21]. The rupture of an ovarian pregnancy can result in shock, necessitating urgent surgical intervention. According to CNGOF recommendations, laparoscopic surgery with ovarian conservation is considered the gold standard for ovarian ectopic pregnancies due to its minimal blood loss, reduced risk of adhesion formation, and generally uncomplicated postoperative course while preserving fertility. Medical treatment, based on the administration of methotrexate *in situ* under ultrasound guidance, may offer a higher success rate compared to intramuscular administration. However, published data do not yet allow for definitive conclusions, and this protocol requires rigorous monitoring of β -HCG levels as well as ultrasound surveillance. In our study, an emergency laparotomy was performed due to significant hemoperitoneum and the patient's hemodynamic instability [22]. Therefore, rigorous monitoring is essential for diagnosing these rare forms of EP, especially in patients with nonspecific symptoms or with a history of emergency contraception. It is important to note that the use of emergency contraceptives, such as emergency contraceptive pills (ECPs), may be associated with an increased risk of EP in case of method failure as encountered in our case [23]. Although this method is effective in preventing unwanted pregnancies, some studies suggest an increased risk of EP, possibly due to hormonal changes or abnormalities in tubal motility [24] [25]. It is therefore essential that patients be informed about this risk in order to adopt less risky methods, such as the progestin implant or etonogestrel contraceptives which also help reduce the risk of ectopic pregnancy. This can be explained on the one hand, of course, by its anti-gonadotropic action, but also, on the other hand, by its participation in reducing the risk of pelvic inflammatory disease, which leads to tubal abnormalities and the main cause of ectopic implantation in the event of a pregnancy [26]. Other etiologies of ovarian pregnancies have been reported in the literature, including pelvic inflammatory disease, history of abortion, and the use of intrauterine devices as emergency contraception has been associated with a high proportion of ovarian pregnancies, ranging from 57% to 90% in case of failure of this method [27]. Studies also show that ultrasound alone may sometimes be insufficient for early diagnosis of ovarian pregnancy, highlighting the need for thorough clinical evaluation to avoid complications such as hypervascularization and partial rupture observed in our case [28].

The Treatment of OP is generally surgical, especially in cases of late diagnosis

with complications [15]. Current recommendations emphasize on the importance of an individualized approach, taking into account clinical characteristics and ultrasound results [16]. The Fernandez score, used to assess the severity of EP, remains a valuable tool to guide therapeutic decisions [29]. However, medical treatment with methotrexate may be considered in some cases, but requires careful risk assessment [8]. Emergency management often requires surgical intervention via laparotomy or laparoscopy [27] [30]. Additionally, improvements in treatment protocols, facilitated by earlier use of medical and surgical treatments, have led to more effective management of ovarian pregnancies [31]. To improve the detection and management of ovarian pregnancies, several recommendations can be made. A rigorous evaluation of patients, particularly those using emergency contraceptives, must be carried out for those presenting with pelvic pain in the context of amenorrhea. Furthermore, regular monitoring of patients with symptoms more suggestive of EP includes imaging by qualified providers for early diagnosis. Finally, a multidisciplinary approach favoring collaboration between gynecologists and radiologists is important to guarantee correct care [30] [32].

4. Conclusion

The presented case highlights the challenges inherent in the diagnosis and management of ovarian pregnancies, a rare but potentially serious clinical entity. This pathology requires special attention due to its distinct semiological characteristics and the complexity of its diagnosis, often carried out preoperatively. Management remains primarily surgical, despite advances in medical treatments. To optimize results and reduce complications, it is imperative to improve the training of practitioners and strengthen the equipment of health establishments. Enhanced alertness and a multidisciplinary approach are essential to ensure early detection and rapid intervention, thereby helping to improve patient prognosis. In this context, ovarian pregnancy emerges as an obstetric emergency that deserves recognition and appropriate management within the effective health system.

Consent

An informed consent for publishing clinical details and images was obtained from the patient.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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