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Case Report

Couvelaire Uterus-Does Ultrasound Have a Diagnostic Role?

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Abstract

Objective: We present a rare and serious case of Couvelaire uterus, where an abdominal ultrasound prompted consideration of this diagnosis.

Background: Couvelaire uterus is a rare condition of placental abruption characterized by posterior bleeding dissecting into the myometrium of the uterus. The condition is commonly observed and diagnosed during cesarean section.

Case Report: We report a case of a 36-year-old woman at a gestational age of 27+3 weeks who experienced mild abdominal pain, vaginal bleeding, uterine irritation, and a slightly affected cardiotocography (CTG). An abdominal ultrasound revealed a large retro placental hematoma and disrupted myometrium. A cesarean section was performed, revealing a fulminant Couvelaire uterus and subsequent obstetric and surgical complications. Both subjective and objective clinical findings were considered, with the ultrasound image significantly influencing the timing of delivery by acute cesarean section, thereby reducing morbidity for both the mother and child.

Conclusions: The presented case highlights the crucial role of ultrasonography in the prenatal detection of Couvelaire uterus. The timely ultrasound findings were instrumental in the decision to perform an emergency cesarean section, thereby preventing further complications and reducing morbidity for both the mother and the child. This case underscores the complex diagnostic challenges encountered in Couvelaire uterus, particularly in the context of suspected placental abruption and preterm delivery. Despite the challenges and the need for confirmation post-delivery, the ultrasound findings significantly influenced clinical decision-making. This underscores the importance of thorough management and ongoing monitoring for potential complications. Overall, the value of ultrasound as a diagnostic tool in prenatal care is evident, particularly when other clinical indicators are inconclusive or absent.

Keywords: Couvelaire Uterus; Abdominal Ultrasound; Myometrium; Cesarean Section.

MeSH Keywords: Couvelaire Uterus; Placental Abruption; Retro placental Hematoma; Ultrasound Diagnosis; Emergency Cesarean Section; Prenatal Care.

Introduction

Couvelaire uterus, also known as utero-placental apoplexy, is a severe complication associated with placental abruption, where the placenta prematurely separates from the uterus. The incidence of this condition is approximately 1%, with a maternal mortality rate of around 5% [1-3]. In this condition, blood infiltrates the uterine musculature (myometrium) and can extend to the serosa, resulting in a characteristic bluish or purplish discoloration of the uterus [4]. The uterus often appears tense, tender, and enlarged. Couvelaire uterus is a rare but critical obstetric emergency that

demands immediate recognition and intervention to manage the potentially life-threatening complications for both the mother and the fetus [1].

During placental abruption, blood accumulates between the placenta and the uterine wall. This blood collection can dissect through the uterine muscle fibers and extend to the uterine serosa, leading to significant hemorrhage and the formation of a hematoma within the uterine wall [4]. The infiltration of blood into the uterine muscle can severely impair its contractility, resulting in uterine atony and markedly increasing the risk of postpartum hemorrhage. A serious coagulopathy may be triggered by the release of thromboplastin from the damaged uterine and placental tissues into the maternal circulation. Reduced uteroplacental blood flow can lead to fetal hypoxia, acidosis, and, in severe cases, fetal death [1,4].

Ultrasound imaging may assist in identifying placental abruption, but it is not specific for diagnosing Couvelaire uterus [1]. Diagnosis is typically confirmed during surgical exploration, such as a cesarean section, where the characteristic uterine discoloration is observed. Most case reports are based on retrospective identification of this clinical condition [1]. In this manuscript, we present a rare and serious case of Couvelaire uterus, where an abdominal ultrasound prompted the consideration of this diagnosis.

Case History

A 36-year-old woman, gravida 2, para 1, was admitted to the labour ward at 27+3 weeks of gestation due to decreased fetal movements, increasing abdominal pain, and vaginal bleeding at 15:40. Her obstetric history included a cesarean section performed five years ago upon maternal request. During a routine prenatal examination the previous week, borderline elevated blood pressure was noted. Until this point, the current pregnancy had been uneventful. The patient reported no headaches, visual disturbances, new partner, history of domestic violence, or recent trauma. A previous ultrasound confirmed a non-accreta placenta. Her pre-pregnancy body mass index (BMI) was 21. She had no history of steroid use, connective tissue disorders, and her gestational diabetes mellitus (GDM) screening was negative. No cervical ripening agents had been administered.

Upon admission, the patient presented with slight vaginal bleeding, an irritable uterus, elevated blood pressure (175/107 mmHg), and a normal cardiotocography (CTG) reading. The clinical presentation was suggestive of placental abruption, but given the relatively minimal bleeding, normal CTG, and the prematurity of the pregnancy, she was treated with Labetalol and Tranexamic acid. Lung maturation was induced with Betamethasone, and continuous CTG monitoring was initiated. A neonatologist was consulted and briefed on the situation. Urinalysis revealed 3+ proteinuria, fulfilling the criteria for severe preeclampsia. Blood tests showed hemoglobin: 7.6 mmol/L, platelets: 180 × 10^9/L, alanine aminotransferase (ALAT): 12 U/L, and urate: 0.32 mmol/L. No prophylaxis for eclampsia had been administered previously.

An abdominal ultrasound was performed at 16:05, which revealed a live fetus with no detectable movements. The ultrasound also identified a disrupted myometrium and a large retro placental hematoma, findings that raised the suspicion of Couvelaire uterus. Although ultrasound is generally nonspecific for this condition, these particular findings indicated a high risk of myometrial involvement and potential uterine atony. Doppler studies indicated normal flow in the umbilical artery (Pulsatility Index [PI] = 0.91) and middle cerebral artery (PI = 2.05).

The patient's condition improved during observation: her pain subsided, vaginal bleeding decreased, and the CTG showed normal variability, exactly five beats per minute, without accelerations or decelerations. However, due to the persistent non-reactive CTG pattern and concerning ultrasound findings, an emergency cesarean section was performed at 16:16. The primary indication for the cesarean section was placental abruption, despite the absence of uterine irritability and the cessation of vaginal bleeding.

A horizontal incision was made in the abdominal wall, and the baby was delivered within intact membranes, floating freely in the uterine cavity. The amniotic fluid was clear, but the uterine cavity contained clots estimated to be around 1000 ml. The uterus exhibited a subserosal bluish-purple discoloration throughout, consistent with Couvelaire uterus, and was notably atonic. Medical management included intravenous oxytocin, a concentrated oxytocin infusion, and intramuscular Carboprost. Additionally, a B-Lynch suture and four quadrant sutures were applied to achieve adequate uterine contraction. Methylergonovine maleate was not administered due to the patient's preeclampsia. The estimated blood loss was 2500 ml, and despite transfusion of three units of SAG-M and three units of fresh frozen plasma, her post-operative hemoglobin level dropped to 3.9 mmol/L.

The neonate had Apgar scores of 0/1, 1/5, and 7/10, with a hemoglobin level of 10.8 mmol/L. Weighing 3050 g, the baby was transferred to the neonatal unit for supportive care and monitoring of a mildly affected ductus venosus. Both mother and baby were discharged in stable condition after three days (Figure 1).

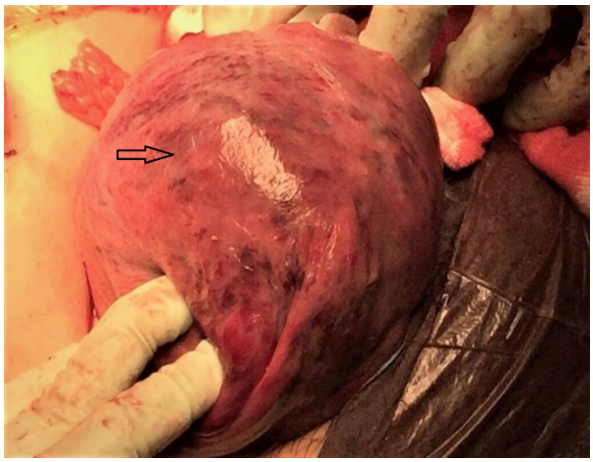

Figure 1: The dark purple and copper colour patches with ecchymosis and indurations diagnostic of Couvelaire uterus or utero-placental apoplexy - Fundal view.

Discussion

The case of Couvelaire uterus presented here illustrates the potential diagnostic role of ultrasonography in the prenatal detection of this rare and severe condition. Couvelaire uterus, characterized by blood infiltrating the myometrium due to placental abruption, is often undiagnosed until surgical exploration during a cesarean section. However, this case suggests that ultrasound can provide critical early indicators that prompt timely intervention.

While placental abruption typically presents with similar clinical symptoms, such as abdominal pain, vaginal bleeding, and uterine irritability, the ultrasound findings in this case, specifically the disrupted myometrium and extensive retro placental hematoma, were suggestive of Couvelaire uterus, a diagnosis that was later confirmed during surgery. In contrast, severe placental abruption without myometrial involvement may not exhibit such distinct sonographic features, often leading to delayed or less definitive diagnosis. The presence of these specific ultrasound findings indicated a high risk of myometrial involvement and potential uterine atony, setting this case apart from more typical presentations of placental abruption.

The ultrasound findings were pivotal in the decision to perform an emergency cesarean section [5]. Despite the absence of severe clinical symptoms such as extensive vaginal bleeding or pathological CTG patterns, the disrupted myometrium and large hematoma observed on ultrasound necessitated urgent intervention to prevent further complications. These findings significantly influenced the clinical decision to proceed with an emergency cesarean section, even in the context of a non-irritable uterus and minimal external bleeding. Without these specific sonographic indicators, the decision to deliver might have been delayed, potentially leading to a worse outcome for both the mother and the fetus.

The abdominal ultrasound revealed a large retro placental hematoma and disrupted myometrium, which were key indicators of a potential Couvelaire uterus. These findings were crucial in accelerating the decision to perform an emergency cesarean section, which might have otherwise been delayed until pathological CTG patterns or worsening maternal conditions were observed. The ability of ultrasound to detect significant hematomas and disruptions in the myometrium suggests that it can play a pivotal role in the prenatal diagnosis of Couvelaire uterus. Previous case reports have highlighted the challenges in diagnosing Couvelaire uterus prenatally. This case adds to the literature by demonstrating the potential role of ultrasound in early detection, particularly when clinical symptoms are not severe.

Placental abruption is defined as the complete or partial separation of the placenta from its implantation site before delivery, occurring in 0.8 to 1% of births [6]. The etiology remains unclear, and women with placental abruption face increased risks of perinatal morbidity and mortality, maternal postpartum hemorrhage, shock, and cardiovascular disease [7]. Risk factors include maternal asthma, prior cesarean section, cocaine use, endometriosis, chronic hypertension, advanced maternal age, smoking, use of assisted reproductive technology, obesity, preeclampsia, uterine leiomyoma, and marijuana use. In this case, the patient's previous cesarean section increased her risk of placental abruption [7,8].

Currently, there is no universally established clinical criterion for diagnosing placental abruption. According to the New Jersey Placental Abruption Study [9], the most common reason for a clinical diagnosis of abruption was the presence of retro placental clot(s) or bleeding (77.1%), followed by vaginal bleeding with uterine hypertonicity (27.8%) and vaginal bleeding with non-reassuring fetal status (16.1%). In our patient, despite relatively sparse bleeding and a relaxed uterus, persistent non-reactive CTG patterns and the ultrasound findings guided the clinical management.

Conclusions

The presented case highlights the critical role of ultrasonography in the prenatal detection of Couvelaire uterus. The timely ultrasound findings were instrumental in the decision to perform an emergency cesarean section, thereby preventing further complications and reducing morbidity for both the mother and the child. This case underscores the complex diagnostic challenges encountered in Couvelaire uterus, particularly in the context of suspected placental abruption and preterm delivery. Despite the challenges and the need for confirmation post-delivery, the ultrasound findings

significantly influenced clinical decision-making. This underscores the importance of thorough management and ongoing monitoring for potential complications. Overall, the value of ultrasound as a diagnostic tool in prenatal care is evident, particularly when other clinical indicators are inconclusive or absent.

Ethical Approval: Tis study was conducted in accordance with the Declaration of Helsinki.

Consent: The patient has given her permission for the publication of this report and the accompanying images.

Conflicts of Interest: The authors declare that they have no conflicts of interest.

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