

Successful Reposition of an Incarcerated Gravid Uterus by Instrument: A Case Report and Literature Review

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Abstract: Incarcerated gravid uterus is a rare obstetric condition that contributes to pregnancy-related adverse outcomes, especially if the uterus remains incarcerated and the condition goes undiagnosed until delivery. An effective diagnosis of this condition is benefited from pelvic examination combined with imaging methods and based on suspected symptoms. We present a case of ultrasound-assisted instrument reposition of an incarcerated gravid uterus at mid-gestation and discuss its clinical characteristics, diagnosis, imaging features, and treatment. We believe that once manual reduction fails, the use of instruments will undoubtedly be a better choice.

Keywords: Pregnancy; Incarcerated gravid uterus; Reposition

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1. Introduction

The retroversion and retroflexion of the uterus in non-pregnancy and early pregnancy are normal phenomena. The fundus usually enters the abdominal cavity by the end of the first trimester. However, uterine retroversion occurs in approximately 15% of pregnant women before 14 weeks of gestation ^[1,2], thus leading to malposition of the gravid uterus. At 14–16 weeks of gestation, spontaneous reposition usually occurs ^[1]. However, in rare cases, due to the persistent abnormal position of the uterus, the fundus remains in the pelvic cavity. If the uterine corpus remains retroverted and becomes retroflexed in the Douglas pouch, the long axis of the uterus cannot extend to the abdominal cavity. The condition in which the uterus is confined within the pelvic cavity is known as incarcerated gravid uterus (IGU), which affects 1 in every 3,000 pregnancies ^[3-6].

There are several proposed risk factors associated with IGU: uterine anomalies ^[7], endometriosis, pelvic adhesions, uterine prolapse ^[8], and fibroids on the posterior wall. However, no such risk factors were identified in our reported case.

As the uterine volume increases, the incarcerated uterine fundus is locked and trapped within the pelvis behind the sacral promontory, resulting in the ventral displacement of the uterine cervix toward the pubic symphysis. After 12 weeks of gestation, the clinical complications are mostly related to the pressure from anatomical structures adjacent to the entrapped and deformed uterus, including lower abdominal and pelvic pain, rectal pressure, and worsening constipation; a series of urinary symptoms, such as dysuria, increased urinary frequency, urinary retention, overflow incontinence; and obstetric related complications, including

spontaneous abortion, intrauterine fetal death, threatened premature delivery, fetal growth restriction, and even uterine rupture ^[9].

Despite the early availability of ultrasound, many cases of incarcerations go unnoticed in early pregnancy until the second trimester due to their unusual clinical presentation. A small number of cases are not diagnosed until the third trimester or detected only during surgery. In addition, if the placenta is located in the fundus of an incarcerated uterus, the image may be misinterpreted as placenta previa by a normal physician ^[10]. The early identification of its clinical and imaging features is particularly important. We herein report a case of IGU at 14 weeks of gestation that was successfully treated following diagnosis. Previous literature reports were reviewed to highlight the importance of early recognition and management in improving the outcomes for pregnant women.

2. Case report

A 26-year-old multipara woman, who previously had cesarean delivery and was mentally retarded, was admitted to our hospital's obstetric emergency unit at 14 weeks and 2 days of gestation in view of urinary retention and dyschezia. Due to a full bladder, her cervix was extremely anteriorly displaced and out of reach of the examining fingers. After emptying her bladder via bladder catheterization, the polarity of her uterus remained folded back, filling the cul-de-sac, as detected by ultrasound. A final diagnosis of IGU was made (**Figure 1**).



Figure 1. Ultrasonography of the retroverted gravid incarcerated uterus in the present case. A longitudinal section showing that the uterus is fixed in retroversion with the cervix anteriorly transfixated behind the pubic symphysis and above the uterine fundus. Abbreviations: BL, bladder; CX, cervix; UT, uterus.

3. Treatment

After obtaining consent from the patient and her family, two obstetricians attempted to reduce the posterior incarceration through a persistent knee-elbow position combined with manual reduction. During the procedure, the long axis of the vagina was located between the uterine body and the cervix, the uterus was not in central position, and the examining fingers could not reach the uterine fundus through the vagina; hence, the fingertip strength could not be transmitted to the uterine body. After a failed trial, an anal examination was conducted, but only the fundus of the uterus was detected. It was difficult to reposition through single manual reduction.

After discussion, an attempt to reposition the uterus with the aid of oval forceps, wrapped with gauze at the head end, under real-time ultrasound monitoring was made. This approach successfully created an extra forward and upward force on the uterine fundus. Ultrasound showed that the angle between the longitudinal axis of the uterine body and the long axis of the cervix became larger, and ultimately, part of the anterior wall of the uterus was closer to the anterior abdominal wall (**Figure 2**). At the end of the process, the patient became uncooperative, and thus we terminated the operation in time. The patient was advised to lie in a knee-chest position and empty her bladder regularly. During the procedure, no anesthesia was used, no procedure-related complications occurred, and the fetal heart rate ranged from 140 to 150 beats per minute.



Figure 2. Ultrasonography of an incarcerated uterus during manual-assisted reposition. The angle between the longitudinal axis of the uterine body and the long axis of the cervix became larger, and a part of the anterior wall of the uterus closed to the anterior abdominal wall. Abbreviations: CX, cervix; UT, uterus.

4. Follow-up

A week later, the patient returned to the hospital, and there was complete resolution of urinary retention and dyschezia. Ultrasound imaging showed that the position of the uterus returned to normal, and the longitudinal axis of the uterus was almost parallel to the long axis of the cervix. Furthermore, normal intrauterine development of the fetus was observed (**Figure 3**). The instrumental-assisted reposition was successful. In order to prevent recurrence, we recommended her lie in a knee-chest position as scheduled and avoid holding in urine ^[11]. At the 19th week of pregnancy, her prenatal examination was uneventful. The patient eventually delivered a full-term baby boy via cesarean section.

5. Discussion

In this case, we successfully restored the uterine polarity by instrument assistance at a gestational age of less than 15 weeks. IGU is known as a rare complication during pregnancy. The diagnosis of IGU is challenging due to its non-specific symptoms in early pregnancy ^[12]. This is the first report about employing instruments for active reduction. An effective diagnosis can be made from pelvic examination combined with imaging methods and based on suspected symptoms.



Figure 3. Ultrasonography of the position of the uterus returned to normal. The longitudinal axis of the uterus was almost parallel to the long axis of the cervix. Normal intrauterine development of the fetus was observed. Abbreviations: BL, bladder; CX, cervix; UT, uterus.

Common physical examination findings include cervical displacement toward the symphysis pubis, which is indicated by the inability to palpate the cervix during vaginal examination, and saccular bulge of the posterior wall of the vagina, with fixed and palpable fundus in the cul-de-sac. It is also common to find the uterine fundus, through ultrasound, still folded back, filling the cul-de-sac, with an elongated cervix wedged behind the symphysis, even after emptying the bladder [11]. With the chief complaint of severe urinary retention and dyschezia, it is easier to make a diagnosis of IGU.

After diagnosis, most obstetricians tend to reduce the uterus to its natural position as soon as possible [11]. However, we should be aware that a retroverted uterus, in most cases, spontaneously returns to its normal axial position by the 14th–16th week of gestation. Nonetheless, there is a lower probability of spontaneous reduction after 16 weeks of gestation [13,14]. Related literature at home and abroad has recommended passive reduction from repeated knee-chest position under an empty bladder before 14 weeks of gestation. However, if this method is unsuccessful, manual manipulation may be attempted after 16 weeks of gestation. If all interventions fail, laparoscopy or laparotomy may be performed after 20 weeks of gestation [15]. In this case, we first attempted manual reduction but failed. Hence, we analyzed the possible reasons for it: (1) the cervix was transfixated behind the pubic symphysis, making it difficult to be exposed and palpated by the examining fingers; (2) the posterior wall of the vagina and posterior fornix bulge were observed, and a fixed large mass was felt in the cul-de-sac; (3) there had to be enough pressure exerted on the uterine fundus to facilitate the reposition. Our next effort was to restore the uterus with the aid of oval forceps wrapped with gauze at the head end under real-time ultrasound monitoring. Ultimately, this approach successfully created an extra forward and upward force on the uterine fundus. This maneuver is recommended before 20 weeks of gestation, as more complications, such as preterm labor, may result from manual manipulation later than 20 weeks of gestation [8]. Fortunately, in view of the appropriate method used and gentle action, no serious complications occurred in this case.

We are aware that no single treatment could be deemed more successful than the other for IGU. Additionally, we discovered that abdominal ultrasound examination has advantage over transvaginal sonography in exhibiting the position of the cervix, uterus, and bladder as well as monitoring the whole repositioning process [11].

6. Conclusion

IGU is a rare complication that may occur during pregnancy. Caution, along with a high degree of suspicion, is the key to timely diagnosis. As is observed in this case report, symptoms such as urinary retention during the early mid-trimester should alert clinicians. Ultrasound is a noninvasive and safe method for diagnosing IGU. At the same time, it can be used to monitor the process of retroversion in real time. Ultimately, reposition via instruments may be a good choice in cases of IGU.

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Disclosure statement

The authors declare that they have no conflict of interest. The authors alone are responsible for the content of the paper.

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