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Case report

Incarcerated gravid uterus: A rare but potentially devastating obstetric complication [☆]

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ABSTRACT

Incarceration of the gravid uterus is a rare obstetric complication characterized by entrapment of the gravid uterus between the sacral promontory and pubic symphysis. Clinical symptoms are highly variable and may include low back pain, urinary retention, and nausea. A presumptive diagnosis can often be established based on correlation of clinical history and physical examination. However, ultrasound and/or pelvic magnetic resonance imaging are essential for confirmation. Herein, we describe a 30-year-old female who presented with uterine incarceration and discuss the diagnosis, imaging features, and management of this uncommon but important clinical entity.

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Introduction

Incarceration of the gravid uterus (IGU) is a rare condition that results in the uterus becoming trapped between the sacral promontory and the pubic symphysis [1,2]. It is said to occur in 1 in 3000 patients [3]. When a retropositioned uterus persists during pregnancy, the uterine fundus become fixed in the hollow of the sacrum, and the cervix is displaced anteriorly against and above the pubic symphysis [4]. We report a case of incarceration of a retroverted uterus in the early

second trimester in a patient who presented with severe abdominal pain and uterine contractions.

Case report

A 30-year-old G9P2153 (gravida: 9, term births: 2, preterm births: 1, abortions: 5, living children: 3) with a history of 2 prior Caesarean sections and a known intrauterine pregnancy at 12 weeks and 6 days presented to the emergency

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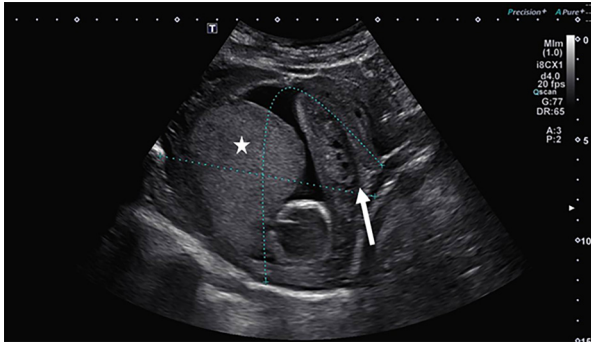


Fig. 1 – Transabdominal ultrasound demonstrating a single live intrauterine pregnancy within a markedly retroverted and likely incarcerated uterus, as evidenced by the abnormal position of the cervix relative to the uterine body (white arrow). The placenta is anterofundal (star).

department complaining of exquisitely painful uterine contractions occurring every 15 minutes. Symptoms were subacute in onset and had persisted for the previous 5 days. The patient denied vaginal bleeding, loss of fluid, or discharge.

Vital signs were within normal limits (temperature: 36.3°C, heart rate: 88 beats per minute, respiratory rate: 18, blood pressure: 113/69 mm Hg). Physical examination revealed a soft, nontender, nondistended abdomen. The uterus was 13 weeks in size, retroverted, and could be palpated posteriorly through the vaginal wall. On sterile speculum examination, the cervix was visualized immediately posterior to the pubic bone and was closed and 60% effaced. There was no blood or abnormal discharge in the vaginal vault.

A pelvic ultrasound showed a single live intrauterine pregnancy. Fetal heart rate was 157 beats per minute. Fetal growth parameters were within normal limits for gestational age. The uterus measured 16.2 × 10.9 × 9.9 cm and was markedly retroverted (Fig. 1).

Ultrasound findings were discussed with the obstetrics and gynecology team. Based on correlation of the clinical history, physical examination, and imaging findings, a diagnosis of IGU was established. The plan of care was discussed with the patient, who consented for manual reduction. Intravenous pain medication and an oral anxiolytic were administered. The patient was placed in a dorsal lithotomy position and manual cephalad displacement was performed by applying gentle pressure to the fundus. Three attempts were required with the patient assuming a knee-to-chest position between each attempt. Subsequent physical examination revealed the uterus in a normal anteverted position.

A follow-up ultrasound was recommended to confirm the position of the uterus. The patient refused sonography due to persistent pain, but agreed to pelvic magnetic resonance imaging, which demonstrated an anteverted and slightly retroflexed position of the uterus with an anterofundal placenta and intrauterine fetus (Fig. 2). Pain gradually subsided over the following 24 hours and the patient was discharged without complication or recurrence. Caesarean section delivery was performed 24 weeks and 5 days later.



Fig. 2 – Pelvic magnetic resonance imaging obtained after manual reduction reveals the uterus in a normal, anteverted and slightly retroflexed position with the fundus released from under the sacral promontory (white arrow). The placenta remains anterofundal (star).

Discussion

Incarceration of the gravid uterus (IGU) refers to the entrapment of the uterus in the pelvic cavity behind the sacral promontory. This condition has no clearly identifiable cause, but is strongly correlated to malposition of the nonpregnant uterus, which is typically retroverted or retroflexed. It is a rare and potentially devastating complication of pregnancy if not promptly recognized and treated. Uterine retroversion is recognized as a normal variant and its prevalence is reported to be up to 15% of pregnancies in the first trimester [5]. In most cases, retroversion can spontaneously return to a normal axial position by the 14th to the 16th week of gestation, when the gravid uterus grows into the abdominal cavity [6,7]. If the uterus remains in the pelvic cavity after 14 weeks of gestation, it is referred to as an incarcerated uterus [8]. The possibility of spontaneous reduction after 16 weeks of gestation is low and should prompt consideration of active reduction.

There are several risk factors predisposing to incarceration, such as retroverted uterus, endometriosis, pelvic adhesion, pelvic inflammatory disease, previous abdominal or pelvic surgery, leiomyomas, uterine anomalies, uterine prolapse, deep sacral concavity with an overlying sacral promontory, and uterine incarceration in previous pregnancy [9,10].

Patients with IGU usually seek medical attention at approximately 17 weeks gestation due to nonspecific abdominal pain, rectal pressure, constipation and urinary retention or overflow incontinence [4]. Han et al., [6] in a review of 262 cases of IGU, concluded that IGU is mostly diagnosed in the second trimester. They also summarized symptoms of IGU to include urinary manifestations (53.70%, urinary retention, frequent urination, dysuria, urgency and paradoxical incontinence), abdominal pain (35.80%), constipation (6.79%), vaginal bleeding (6.17%), pelvic pain (6.79%), back pain (4.94%),

tenesmus (1.85%), perineal pain (0.62%), and large painful mass prolapsed outside the anus (0.62%); with 8.64% of patients being asymptomatic.

Diagnosis

Diagnosis of IGU remains difficult because its symptoms are often non-specific or absent in early pregnancy [11]. Common physical examination findings include forward and superior displacement of the cervix to the symphysis pubis, making it difficult to evaluate on vaginal examination. In addition, sacculation of the posterior wall of the vagina and posterior fornix bulge may be observed, with the fundus unmovable and palpable within the curvature of the sacrum.

The key to diagnostic imaging resides in the ability to visualize clearly the anteriorly displaced cervix. Ultrasound is the main imaging modality for fetal assessment and for monitoring the course and the progression of pregnancy. Difficulty in identifying the cervix with ultrasound during the second and third trimesters should raise initial suspicion for underlying uterine incarceration or abdominal pregnancy [12]. Abdominal sonography shows an advantage over transvaginal sonography in exhibiting the position of the cervix and its internal ostium and in determining the relationships between vagina, uterus and bladder, when the cervix is elongated and wedged behind the symphysis [13]. Slama et al. report trapping of the bladder pole by the gravid incarcerated uterus [2].

Although the magnetic resonance imaging (MRI) appearance of IGU is characteristic, the diagnosis of incarcerated uterus is rare, so IGU can go unrecognized. MRI is superior to ultrasound in the detailed scanning of IGU [14]. Characteristic MRI findings of IGU include depiction of the cervix as a T2 hypointense linear structure along the anterior aspect of the retropositioned uterus [14]. It is frequently elongated and thinned and is parallel to the vagina, which differs from the normal appearance of the cervix at a right angle to the vagina [12]. On sagittal T2-weighted images, the fundus of the retropositioned uterus is located deep in the posterior pelvis, below the sacral promontory. Additionally, there is anterior or superior displacement of the bladder, which may be positioned above the pubic symphysis [14,15]. It is important to note that when not suspected, IGU can be misinterpreted for ectopic pregnancy, abdominal pregnancy, placenta previa, or fetal malpresentation [4,6,12].

Treatment

Reduction of IGU may be obtained by urination or urine drainage using a urinary catheter, followed by the chest-knee position. If this maneuver is unsuccessful, a manual reduction by vaginal examination should be attempted after ensuring that the bladder is empty. This can be performed with the patient awake or under regional or general anesthesia. Two fingers are inserted into the vagina and upward pressure is applied to the incarcerated fundus; traction can be applied simultaneously to the cervix by grasping with an atraumatic clamp [16]. This maneuver is recommended before 20 weeks of gestation, as more complications such as preterm labor may be caused by manual manipulation later than 20th week of gestation [17]. Therefore, cases with failed reduction or late

diagnosis should be managed carefully and followed up until a cesarean section is performed for delivery. This is also necessary because descent may be impeded by the incarcerated fetal parts and uterine displacement [4]. There are risks associated with manual reduction and potential complications include placental abruption, preterm delivery, and intrauterine fetal death. Cases of reduction achieved with colonoscopy, laparoscopy, or laparotomy have been reported [18]. These methods may be considered in the event of a failure of manual reduction.

Complications of IGU

Gardner et al [14], summarized the complications of IGU based on the stage of pregnancy, as follows:

- First trimester: Acute urinary retention, rectal pressure, tenesmus, miscarriage
- Second and third trimester: Fetal death, uterine rupture, bladder rupture, uterine ischemia, intrauterine growth retardation, premature labor and delivery, renal failure, sepsis
- Delivery: Vaginal, cervical, or bladder injury
- Postpartum: Venous thrombosis, pulmonary embolism
- Future pregnancy: Increased risk of recurrent uterine incarceration

Furthermore, Newell et al [16], also described complications such as acute renal failure, severe hypertension, significant lower limbs edema. Fetal complications include the development of polyhydramnios, anterior sacculation of the uterus, preterm prelabor rupture of membranes, and subsequent miscarriage.

Prognosis

IGU is a risk factor for fetal growth restriction, miscarriage, premature delivery, and uterine rupture [19]. In general, it resolves after intervention, with many cases resolving spontaneously especially in early pregnancy. Several cases of recurrence have been reported. This can be prevented by addressing the underlying cause.

Conclusion

IGU is a rare condition that can be devastating if left untreated. Early diagnosis and treatment are important to optimize maternal and fetal outcomes, as management becomes difficult as pregnancy progresses. Advancements in medicine, and particularly in imaging, have made the diagnosis of IGU less complex. It is important for physicians to have a high index of suspicion as many other conditions present with similar symptoms. Fortunately, pelvic ultrasound is highly sensitive for IGU and should be obtained without delay in the appropriate clinical setting. In equivocal cases, pelvic magnetic resonance imaging can be used to establish a definitive diagnosis.

Patient consent

Informed patient consent was obtained for publication of the case details.

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