

CASE REPORT

Spontaneous reduction of an incarcerated gravid uterus in the third trimester

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Key Clinical Message

An incarcerated gravid uterus is an uncommon complication of pregnancy. On rare occasions, an incarcerated gravid uterus resolves spontaneously even in the third trimester of pregnancy. Severe abdominal pain might be caused by spontaneous reduction and should be considered as a possible cause.

Keywords

Incarcerated uterus, severe abdominal pain, spontaneous reduction, the third trimester.

Introduction

Approximately 15% of women have a retroverted uterus prior to pregnancy, and retroversion of the uterus occurs in 11–19% of women in very early pregnancy [1–4]. In most cases, the uterus ascends into the abdominal cavity from the pelvis, spontaneously correcting any retroversion before 14–16 weeks of gestation [1–3]. On rare occasions, the uterus remains in a retroverted position as it enlarges, becoming trapped in the pelvis between the sacral promontory and the symphysis pubis [1–3, 5]. This obstetric complication is called an incarcerated gravid uterus, which has been attributed to adhesions resulting from a previous surgery, pelvioperitonitis or endometriosis, fibroids, uterine malformation, a deep sacral concavity with an overhanging promontory, and laxity of the supporting tissues [1, 5–7]. Uterine incarceration can also occur in the absence of the predisposing factors. It is a rare condition, occurring in 1 in 3000–10,000 pregnancies [4]. It may cause not only premature rupture of membrane, miscarriage, and preterm delivery but also serious maternal and fetal complications such as bladder rupture, urinary retention, hydronephrosis, and renal failure resulting from compression of the bladder

and urethra, as well as uterine rupture and uterine wall necrosis resulting from excess extension of the uterine wall, rectal gangrene, cervicovaginal fistula, and thrombosis [1–4, 6, 8–16]. The primary symptoms include a sense of discomfort or pain in the pelvis, and dysuria that occurs intermittently. Furthermore, a common physical finding is a fundal height that is smaller than expected for the gestational age [1–3, 5, 6]. Therefore, if an incarcerated uterus is diagnosed before around 20 weeks of gestation, passive reduction in which the patient assumes the knee-chest position after urination is considered first, followed by manual reduction, and then endoscopic or laparoscopic reduction [2, 9, 10, 16–18]. However, some reports do not recommend reduction after 20 weeks of gestation because of a low success rate and the possibility of serious complications associated with reduction, such as miscarriage, preterm delivery, and uterine rupture [2, 7, 19, 20]. On the other hand, there have been some reports of a successful reduction after 20 weeks of gestation; therefore, reduction may be worth considering when patients are presumed to have no adhesion.

Because this condition is rare, its management during pregnancy is based on case reports; vaginal delivery is not

only contraindicated but also impossible, and cesarean delivery is recommended [2, 7, 16, 19]. Considering that the anterior wall of the uterus is abnormally stretched (i.e., the bladder and cervix are displaced anterosuperiorly), the uterine incision needs to be made as superiorly as possible to prevent bladder injury, as well as cervical and vaginal transection [13, 15, 21]. Therefore, preoperative careful examination and image assessment must be conducted. Magnetic resonance imaging (MRI) is a useful tool in that it not only enables an accurate diagnosis but also clearly delineates the pelvic anatomical relationships [11, 17, 22].

There are few reports about the spontaneous resolution of an incarcerated uterus in the third trimester. We present a case of an incarcerated gravid uterus that spontaneously resolved with abdominal pain at 31 weeks of gestation and illustrate the clinical features of our case and of previously reported cases in Table 1.

Case History

The patient was a 34-year-old gravida 1, para 0 woman. She had no notable medical history, including laparotomy and endometriosis. In the first trimester of pregnancy, she was found to have multiple uterine fibroids, including a fundal fibroid of 5-cm diameter at what appeared to be the posterior wall of the lower uterine corpus, a fibroid of 4-cm diameter in the right lateral wall, and a fibroid of 5-cm diameter in the left lateral wall. During pregnancy, she had obstetrical evaluations at the outpatient department without recognition of an incarcerated gravid uterus. Although she was free of symptoms until 20 weeks of gestation, she presented with intermittent lower abdominal pain from 21 weeks of gestation, which persisted for approximately 2 weeks. She had no dysuria. In

a pelvic examination, a tender, fibroid-like mass was palpable in the pouch of Douglas. Probable fibroid degeneration-related pain was diagnosed, and she was prescribed an analgesic agent (acetaminophen) and was followed-up.

At 28 weeks and 4 days of gestation, she presented with genital bleeding and uterine contraction; because warning bleeding due to total placenta previa was suspected, she was transported to our hospital. In the examination on admission, the cervix could not be visually recognized on speculum examination. At pelvic examination, a hard mass was palpable in the pouch of Douglas and part of external uterine orifice was palpable with difficulty superiorly to the pubis. Transvaginal ultrasound revealed a fibroid-like hypoechoic mass of 7-cm diameter in the pouch of Douglas and the cervix was displaced cranially and ventrally. Moreover, total placenta previa was suspected (Fig. 1). On the basis of these findings, an incarcerated gravid uterus was suspected. Magnetic resonance imaging (MRI) showed a large uterine fibroid in the pouch of Douglas, and the cervix and vagina were stretched cranioventrally, which led to the diagnosis of an incarcerated gravid uterus (Fig. 2). Betamethasone was administered to mature the fetal lung, and intravenous administration of tocolytic agents was started to prolong the gestational weeks. As a result, the uterine contraction and genital bleeding disappeared.

At 31 weeks and 3 days of gestation, she presented with sudden-onset continuous abdominal pain after urination. She had no dysuria. Because fibroid degeneration-related pain was suspected, 400 mg acetaminophen was orally administered, resulting in the disappearance of abdominal pain 6 h later. The physical nature of the pain was similar to the pain at 21 weeks of gestation. The fetal heart rate pattern was reassuring, and the fetal movement was also normal. The cervix was identified on speculum

Table 1. Summary of cases of spontaneous resolution of incarcerated uterus in the third trimester (Literature review and present case).

No.	Author	Year	Age (years)	Gravida/Para	Presenting symptoms before resolution	GA at resolution	Symptoms at the time of resolution	Outcome
1	Smalbraak	1991	28	1/0	Abdominal pain, dysuria	36	Extreme abdominal pain, dysuria	Emergency cesarean delivery at 36 weeks due to NRFS Live infant, 3035 g
2	Hamoda	2002	24	0/0	Urinary retention, abdominal pain	36	None (Asymptomatic)	Elective cesarean delivery at 36 weeks due to breech presentation Live male infant, 2493 g
3	Policiano	2014	34	0/0	Abdominal pain, dysuria and constipation	30	None (Asymptomatic)	Vaginal delivery at term Live male infant, 2825 g
4	Current case	2015	34	1/0	Abdominal pain, genital bleeding	31	Acute abdominal pain	Emergency cesarean delivery at 32 weeks due to placenta previa Live female infant, 1570 g

GA, gestational age (weeks); NRFS, nonreassuring fetal status.

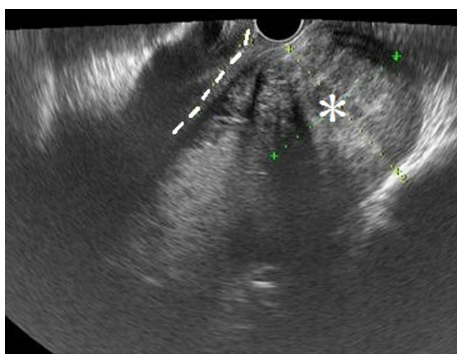


Figure 1. Transvaginal ultrasound image at 28 weeks of gestation shows a fibroid-like hypoechoic mass (white asterisk) of 7-cm diameter in the pouch of Douglas. Cervix (dotted line) is displaced cranioventrally.

examination on the following day, and at vaginal examination, the external uterine orifice was palpable as usual. Transvaginal ultrasound showed no tumor and the cervix was clearly detectable and furthermore, total placental previa was still strongly suspected (Fig. 3). The retroverted uterus returned to the normal position, and MRI showed that the uterine fundus, including the fibroid within it, had moved from the pouch of Douglas to the abdominal cavity (Fig. 4). We assumed that a spontaneous correction to a normal position had occurred.

At 32 weeks and 6 days of gestation, because of increased bleeding resulting from placenta previa, cesarean delivery was performed with a vertical skin incision of the lower abdomen. There was no elongation or

thinning of the uterine cervix and the lower uterine corpus, and a baby was delivered through conventional transverse lower segment uterine incision. After the delivery, an intramural myoma of 8-cm diameter was identified at the uterine fundus, which was the cause of the incarcerated gravid uterus. The blood loss was 1520 g, and no blood transfusion was required. The female infant weighed 1570 g, had Apgar scores of 3 and 8 at 1 and 5 min, respectively, and had an umbilical arterial pH of 7.320. Because of the preterm delivery and respiratory distress syndrome, the infant was admitted to a neonatal intensive care unit. The mother made an uneventful post-operative recovery and was discharged 7 days after the operation.

Discussion

This case highlights the following two learning points: an incarcerated gravid uterus can spontaneously resolve even in the third trimester, and this spontaneous resolution can cause lower abdominal pain.

First, an incarcerated gravid uterus may spontaneously resolve even in the third trimester. To the best of our knowledge, three cases of spontaneous resolution of an incarcerated uterus have been reported thus far, and our case is the fourth one (Table 1). In case 1, the cause of the incarcerated uterus was unknown; at 36 weeks of gestation, the patient had severe abdominal pain, which ended in a spontaneous correction [15]. A change in fetal position was identified. Although nonreassuring fetal status (NRFS) was seen immediately after the correction, a

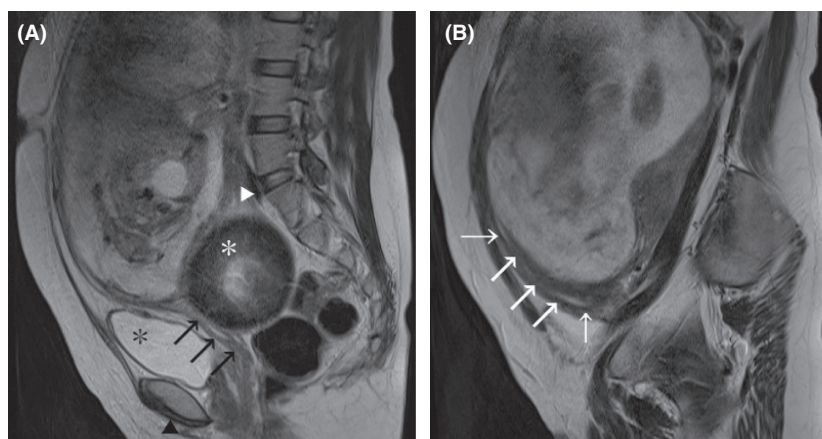


Figure 2. Sagittal T2-weighted magnetic resonance image at 28 weeks of gestation shows the incarcerated gravid uterus with a fundal fibroid in deep pelvis. A. is the midsagittal plane and (B) is the sagittal plane, 3 cm from the median to the left. A. Vagina (black arrow) appears vertically oriented and parallel to cervix (white arrow in Fig. 1B). Bladder (black asterisk) appears displaced superior to pubic symphysis (black arrowhead). A large intramural fibroid (white asterisk) which places uterine fundus has become entrapped in deep pelvis, wedged between sacral promontory (white arrowhead) and pubic symphysis. The entire area of the fibroid showed a low-signal intensity area with a high-signal intensity area within it; accordingly, a degenerative fibroid was suspected. B. Cervix (white arrow) is stretched and elongated, and located cranially and ventrally.

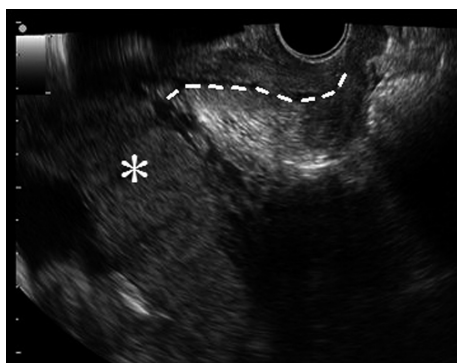


Figure 3. Transvaginal ultrasound image at 31 weeks of gestation after spontaneous resolution. Cervix (dotted line) appears corrected and the image was consistent with total placenta previa (white asterisk).

live infant was delivered through an emergency cesarean section. Case 2 presented with intermittent urinary retention from 18 weeks of gestation, which was improved with urethral catheterization [14]. The urinary retention was considered to have been due to a fibroid in the anterior wall of the lower uterine corpus. A change in fetal position was identified in an ultrasound performed immediately before the elective cesarean section at 36 weeks of gestation; the uterus was confirmed to be in a normal position during surgery, and a baby was delivered in breech presentation. In case 3, although the patient experienced abdominal pain, constipation, and dysuria from 21 weeks of gestation, the symptoms resolved at around 30 weeks; as the examination findings

changed at 30 weeks of gestation, the patient's condition resolved spontaneously and a healthy infant was born vaginally at term [19].

Although the causes of the incarcerated gravid uterus in cases 1 and 3 were unknown, it was caused by uterine fibroids in the present case and in case 2. This indicates that an incarcerated uterus may spontaneously resolve even in the third trimester when the condition was caused by uterine fibroids in the absence of intraperitoneal adhesion.

Second, lower abdominal pain may occur when an incarcerated uterus resolves spontaneously. Among the cases with spontaneous resolution, there were no descriptions of pain in the patients of cases 2 and 3, whereas, the patient of case 1 complained of strong pain at the time of spontaneous correction. The causes of abdominal pain associated with incarcerated gravid uterus vary; these include uterine rupture, bladder rupture, uterine wall necrosis, and necrosis of the urinary tract and the rectum, obstipation, hydronephrosis or urinary retention, venous thrombosis, and other causes [2–4, 6–9]. In case 1, the abdominal pain was presumed to have resulted from dysuria or excessive uterine contraction. A case has been reported in which rupture of the incarcerated gravid uterus occurred at 23 weeks of gestation in association with severe abdominal pain and hypotension [11]; therefore, it is particularly important to differentiate this condition from threatened uterine rupture.

In threatened uterine rupture, excess elongation of the lower uterine segment gradually enhances intermittent, labor-like abdominal pain, often resulting in NRFS [23].

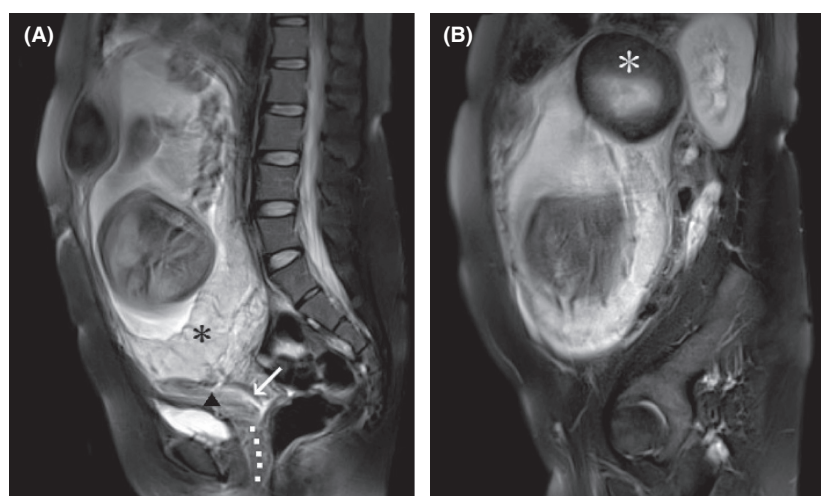


Figure 4. Sagittal fat suppression T2-weighted magnetic resonance image at 31 weeks of gestation shows the gravid uterus after spontaneous resolution. A. Cervix (white arrow) appears almost correct angle to vagina (dotted line). Placenta (black asterisk) completely covers internal uterine orifice (black arrowhead), it is the state of total placenta previa. B. A large uterine fibroid (white asterisk) is located at the level of the kidney, which has moved from deep pelvic cavity to its original position. There was no change in the signal intensity of the fibroids before and after reduction.

In the present case, fetal health was reassured by monitoring the fetal heart rate while the mother was complaining of pain. The abdominal pain was suspected to be related to uterine fibroid degeneration because the location of the fibroids corresponded to the site of pain, and furthermore, the possibility of threatened uterine rupture was ruled out because the pain gradually improved. However, the possibility of serious diseases should have been considered. When a pregnant woman with an incarcerated gravid uterus presents with lower abdominal pain, it is essential to evaluate the condition of both the mother and the fetus because this condition may be associated with severe diseases, as mentioned above. Checking of the vital signs and estimating the nature of pain should be done, in addition to fetal heart rate monitoring and ultrasound and pelvic examinations.

In summary, early diagnosis and reduction of an incarcerated gravid uterus will lead to the prevention of various complications; even if the uterus is still incarcerated in the third trimester of pregnancy, the incarcerated uterus spontaneously resolves even in the third trimester on rare occasions, which may be accompanied by lower abdominal pain. It is common for a pregnant woman with incarcerated gravid uterus to present with lower abdominal pain. When acute severe pain is present, spontaneous reduction may occur, as in the present patient; however, it is important to carefully evaluate the conditions of the mother and the fetus considering the risk of serious conditions such as threatened uterine rupture and necrosis.

Conflict of Interest

None declared.

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