



# Asymptomatic Uterine Incarceration at Near-Term Pregnancy with a Successful Delivery Outcome: A Case Report and Review of Literature

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An incarcerated gravid uterus is a rare obstetrical complication that requires close monitoring to ensure fetal and maternal well-being and to plan a successful delivery. Most patients present with vague anatomic pressure-related symptoms, such as pelvic discomfort and urinary symptoms, in the early 2nd trimester. Initial presentation in the 3rd trimester is scarce, and asymptomatic cases are even rarer. In this case report, we present an asymptomatic patient who was referred at 30 weeks of gestation with an initial impression of placenta previa totalis. She was not a candidate for uterine reduction; therefore, after a close follow-up period, she underwent planned cesarean section at 36 weeks of gestation. Because of its rare frequency and related obstetrical complications, early clinical suspicion and diagnosis are critical for management until delivery and establishing a successful delivery strategy.

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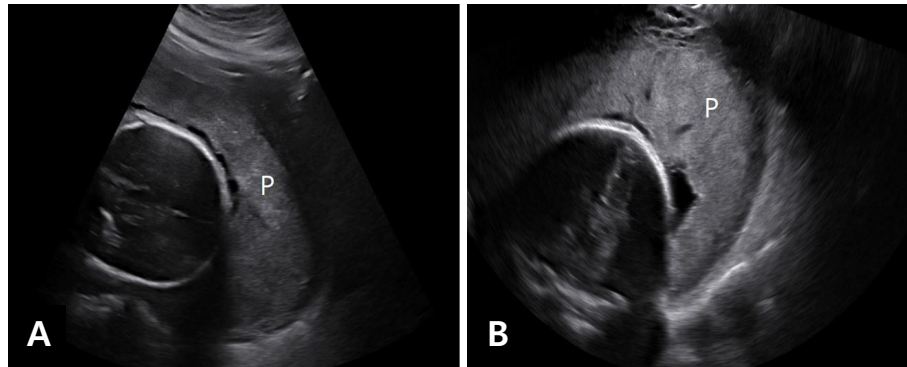
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## Introduction

An incarcerated gravid uterus is a rare condition in which a pregnant uterus is trapped between the sacral promontory and pubic symphysis. The prevalence is reported to be 1 in 3,000 to 10,000 pregnancies.<sup>1</sup> In up to 20% of women, the uterus is retroverted as a normal variant.<sup>2</sup> Even in the 1st trimester, up to 15% of gravid uteri are retroverted.<sup>3</sup> In the majority of cases, the retroverted uterus spontaneously resolves to a normal axial position by 14 to 16 weeks of gestation as it grows into the anterior ventral side, entering the abdominal cavity.<sup>4</sup> During incarceration, however, the uterine fundus is stranded in the sacral hollow, resulting in the cervix being drawn upward against or above the symphysis pubis with the bladder pressed towards the umbilicus.

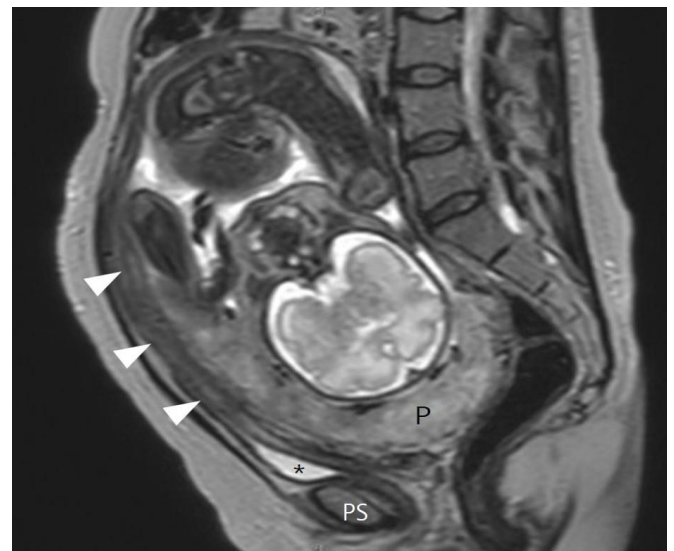
Most patients typically present with vague symptoms, including pelvic discomfort and urinary and gastrointestinal symptoms in the early 2nd trimester.<sup>5</sup> These symptoms may hint at the underlying incarcerated uterus and enable early diagnosis and management, including application of various reduction techniques possible. However, asymptomatic patients remain undiscovered until the 3rd trimester and without proper clinical suspicion, correct diagnosis and delivery planning are difficult. Here, we report a rare case of asymptomatic uterine incarceration detected at 30 weeks of gestation, along with a brief review of previous publications.



**Fig. 1.** Sonography at 30 weeks of gestation. (A) Transabdominal sonogram. (B) Transvaginal sonogram. The cervix could not be evaluated in either approach due to its dislocation, which led to the misdiagnosis of placenta previa. P, placenta.

## Case

A 38-year-old primigravida was referred to our institution at 30 weeks of gestation for evaluation of placenta previa totalis. She had a history of exploratory laparotomy 23 years prior due to peritonitis. At our institution, sonography at 30 weeks of gestation revealed a severely retroverted uterus, bladder near the umbilicus, and placenta at the posterior wall. The cervix could not be evaluated due to its dislocation (Fig. 1). Pelvic magnetic resonance imaging (MRI) at 31 weeks of gestation showed a retroverted uterine fundus located below the sacral promontory, stretched and elongated cervix located anterior to the uterus, and bladder displaced above the pubic symphysis (Fig. 2). There was no evidence of placenta previa. The patient had no symptoms and was closely monitored every 2 weeks for evaluation of symptoms and fetal well-being. At 36 weeks of gestation, she underwent a planned cesarean section with an extended midline incision. After entering the abdominal cavity, the uterine fundus was not noted, and a transverse incision was made on the uterus over the upper bladder border for delivery. A healthy female baby weighing 2,680 g was delivered. Severe uterine-intestinal adhesions were also observed and adhesiolysis was performed, but the full operation was not possible due to bleeding. Though some adhesions remained, uterine incarceration was resolved after cesarean section. After 4 days of postoperative and nursery care, the patient was discharged with her baby without any complications to either party. At one-month postpartum follow-up, transvaginal and transabdominal ultrasonography

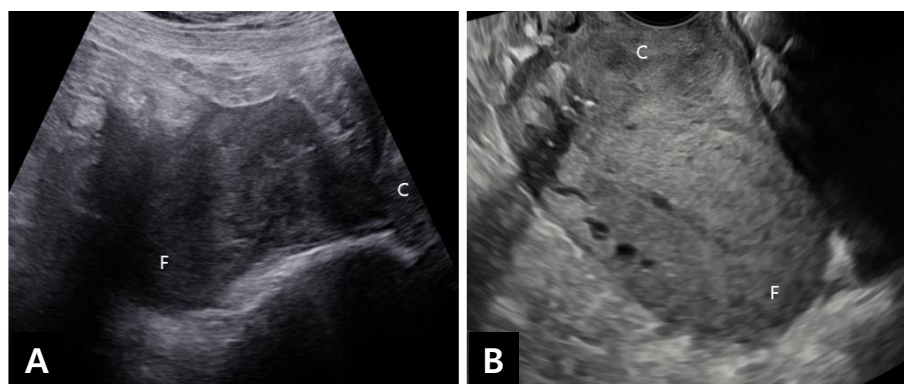


**Fig. 2.** Pelvic magnetic resonance imaging (MRI) at 31 weeks of gestation. Pelvic MRI showed severely retroverted uterine fundus located below sacral promontory, bladder (asterisk) displaced above the pubic symphysis, and stretched and elongated cervix (arrowheads) located anterior to the uterus with no evidence of placenta previa. P, placenta; PS, pubic symphysis.

revealed severe retroflexion of the uterus, which possibly be due to residual adhesions, but did not cause any discomfort to the patient (Fig. 3).

## Discussion

Risk factors for uterine incarceration include previous pelvic adhesions, retroverted uterus, structural uterine malformation, multifetal gestations, prior uterine incarceration, etc.<sup>5-8</sup> Anato-



**Fig. 3.** One-month postpartum sonography. (A) Transabdominal sonogram. (B) Transvaginal sonogram. At one-month postpartum follow-up, transvaginal and transabdominal ultrasonography revealed severe retroflexion of the uterus. C, uterine cervix; F, uterine fundus.

mical distortions and subsequent pressure effects often lead to symptoms, such as pelvic discomfort; back pain; sensation of pelvic fullness; urinary symptoms (i.e., dysuria, frequency, retention); and gastrointestinal symptoms, including tenesmus and constipation.<sup>8</sup> We carried out the following systematic research in Pubmed after the latest case report by Han et al.<sup>8</sup> which covered 162 cases from 1859 to 2016. We found 15 more eligible articles<sup>9-23</sup> about 35 patients (full article accessible, English literature) since 2017 and produced the following comprehensive results (Tables 1 and 2). More than 60% of patients presented one or more symptoms and less than 20% of patients remained asymptomatic. Of all the maternal characteristics that could work as risk factors, uterine fibroids were the most common. Previous abdominal surgery and uterine anomalies were also very common risk factors. In our patient, a history of peritonitis and exploratory laparotomy may have contributed to preexisting adhesions. As the patient was asymptomatic, routine sonography of the incarcerated uterus played a vital role in making the correct impression.

Of a total of 197 patients, 144 delivered live babies and 106 delivered at 36 weeks and term. There were no cases of post-term pregnancy. Miscarriages and stillbirths accounted for 12.7% of the total. Overall, over 70% of patients delivered live babies and 50% of patients delivered live babies at 36 to 41 weeks of gestation. Even when the diagnosis was made in the third trimester of pregnancy, 87% delivered live babies. 38% of mothers diagnosed in the third trimester before term delivered live babies at 36 weeks and term. Among 106 patients who delivered at 36 weeks and term, 20, 55, and 31 patients were

**Table 1.** Symptoms of Incarcerated Gravid Uterus Based on Case Reports from 1859 to 2022 (n=197)

Symptoms	Value
Urinary symptoms	119 (60.4)
Urinary retention	72 (36.5)
Dysuria	19 (9.6)
Urinary frequency	12 (6.1)
Urgency	5 (2.5)
Paradoxical incontinence	1 (0.5)
Abdominal pain	62 (31.5)
Pelvic pain	13 (6.6)
Back pain	9 (4.6)
Perineal pain	1 (0.5)
Vaginal bleeding	11 (5.6)
Tenesmus	3 (1.5)
Constipation	11 (5.6)
Large painful mass prolapsed outside the anus	1 (0.5)
Cervix prolapse	1 (0.5)
Rectal pain	1 (0.5)
Asymptomatic	38 (19.3)
Total	197 (100.0)

Values are presented as number (%).

diagnosed in the first, second, and third trimesters, respectively. Only 5 of 75 patients diagnosed in the 1st and 2nd trimesters (6.7%) maintained pregnancy until 36 weeks and delivered without changes such as spontaneous resolution, reposition, myomectomy, or myoma degeneration (Table 2).

Similar to our case, Han et al.,<sup>8</sup> Hsu et al.,<sup>10</sup> and Tachibana et al.<sup>23</sup> described uterine incarceration cases misdiagnosed as

**Table 2.** Maternal Characteristics and Delivery Outcomes of Incarcerated Gravid Uterus Based on Case Reports from 1859 to 2022 (n=197)

Maternal characteristics	Value
Uterine fibroids	44 (22.3)
Previous abdominal surgery history	26 (13.2)
Uterine anomaly	24 (12.2)
Bicornuate uterus	12 (6.1)
Didelphys uterus	8 (4.1)
Uterus subseptus	2 (1.0)
Unicornuate uterus	1 (0.5)
A heart-shaped uterus with a transverse septum	1 (0.5)
Pregnant through assisted reproductive technology	12 (6.1)
Pelvic adhesions	11 (5.6)
Endometriosis	8 (4.1)
Retroverted/retroflexed uterus	3 (1.5)
Adenomyosis	3 (1.5)
Deep sacral concavity	2 (1.0)
Flat pelvis	2 (1.0)
History of pelvic inflammatory diseases	1 (0.5)
Uterine prolapse	1 (0.5)
History of peritonitis	1 (0.5)
Total	197 (100.0)
Delivery at 36 weeks and term	106 (53.8)
1st trimester diagnosis	20 (18.9)
2nd trimester diagnosis	55 (51.9)
3rd trimester diagnosis	31 (29.2)

Values are presented as number (%).

low-lying placenta or placenta previa totalis at first. Subsequent pelvic MRI confirmed the above diagnosis, as recommended by previous reports.<sup>24</sup> Other physical examination findings suggestive of an incarcerated uterus include small fundal height and inability to check the cervix during speculum or pelvic exams.<sup>2,3,25</sup>

Several complications can arise from this condition. Maternal complications such as urinary tract infection, bladder ischemia, bladder atony, rectal ischemia, and pelvic vein thrombosis may arise from anatomical derangement.<sup>5,8</sup> In addition, obstetrical complications, such as decidual hemorrhage, oligohydramnios, preterm labor, premature rupture of membranes, abortion, fetal growth restriction and fetal demise, may occur due to diminished uterine arterial blood flow.<sup>4,26</sup>

Management primarily depends on previous case reports because of its low frequency. Until 14 weeks of gestation,

expectant management is okay, as retroversion is an innocuous finding.<sup>3</sup> Previous reports suggest attempts for a reduction at 14 to 20 weeks of gestation.<sup>6,26</sup> Reduction techniques include passive, manual, colonoscopic, and laparoscopic reduction.<sup>8,27-29</sup> After 20 weeks of gestation, supportive care for maternal symptoms until delivery and cesarean section at 36 weeks before spontaneous labor are recommended to avoid intrapartum uterine rupture.<sup>4,30</sup> With increased risk of obstetrical complications, more frequent antenatal checkup should be considered.<sup>4,7</sup>

As for the cesarean section procedure, Hsu et al.<sup>10</sup> and Al Wadi et al.<sup>25</sup> reported severe intraoperative complications that would not occur if a preoperative diagnosis of an incarcerated gravid uterus was made, and the surgeon had known it. The bladder under the peritoneum was perforated, approaching the abdominal cavity through a Pfannenstiel incision. Furthermore, the elongated vagina and cervix misunderstood as the uterus were transected while making a low transverse incision. As these cases suggest, extended vertical midline incision is recommended over Pfannenstiel, as it can expose all of distorted anatomical structures and organize them in place.<sup>30</sup> We could safely deliver the baby without complications by the correct diagnosis and through extended vertical midline incision, confirming the entire intra-abdominal anatomy.

Recently, Tachibana et al.<sup>23</sup> reported a 78.5% spontaneous resolution rate of an incarcerated uterus in its natural course based on their institution's 14 cases collected over 10 years. The resolution week ranged from 16 to 26 weeks of gestation. Based on these data, they suggested that reduction intervention should be reserved for only symptomatic patients considering the cost accompanying the procedure and expectant management should be the standard of care, against preexisting advice of reduction trials before 20 weeks of gestation.<sup>26</sup> However, taking several severe complications following the condition into account, expectant management versus reduction intervention remains controversial and requires individual case-based approach.

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## Conflict of Interest

No potential conflict of interest relevant to this article was reported.

## Authors' Contributions

Conceptualization: YHK; Data curation: YK; Formal analysis: YK; Investigation: YK; Methodology: YK, YJ, YHK; Project administration: YHK; Resources: YHK; Software: YK, HM; Supervision: YJ, YHK; Validation: YJ, YHK; Visualization: YJ, YHK; Writing—original draft: YK; Writing—review & editing: YK, HM, YJ, YHK.

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