



CASE REPORT

Technique for Minimally Invasive Treatment of Gestational Uterine Incarceration: A Case Series and Literature Review

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Abstract

Background: Uterine incarceration is a rare condition that can develop during pregnancy when an enlarging retroverted uterus becomes entrapped within the maternal pelvis. Diagnosis can be challenging as it often presents with vague symptoms, but identification and treatment are crucial for both the developing pregnancy and long-term maternal morbidity. Repositioning of the retroverted uterus is necessary for the development of normal pregnancy and can occur spontaneously, but oftentimes manual repositioning is required.

Cases: Here, we present an interesting case of two patients with a history of prior uncomplicated pregnancies who presented to our institution in their second trimester with urinary complaints and pain. They were subsequently diagnosed with gestational uterine incarceration after ultrasound revealed viable pregnancies entrapped within retroverted and retroflexed uteruses. Both patients then successfully underwent a minimally invasive treatment option for anatomical correction of the pregnant incarcerated uterus. They had successful restoration of the appropriate anatomical uterine position for the remainder of the pregnancy and went on to deliver full-term viable infants without complications.

Conclusion: Manual reduction techniques are minimally invasive and can achieve immediate relief in symptoms as well as long-term success throughout the remainder of pregnancy in a gestational age far more advanced than previously reported in the literature, all while avoiding the need for more invasive surgical intervention.

Keywords

Pregnancy, Uterine incarceration, Uterine repositioning, Retroverted uterus

Introduction

A retroverted uterus is a common condition affecting approximately 15% of pregnancies [1,2]. Spontaneous resolution of retroversion of the uterus typically occurs in the first trimester, which is imperative to the developing pregnancy as it allows the uterus to enlarge in the abdomen rather than remaining within the maternal pelvis [1]. Persistent retroversion or retroflexion can lead to a rare and serious condition called uterine incarceration, which occurs when the enlarging uterus becomes entrapped below the sacral promontory within the pelvis. Uterine incarceration complicates approximately 1 in 3,000 pregnancies [1,3] and can also compromise maternal well-being due to the impact on surrounding intra-abdominal and pelvic structures [1,4].

Diagnosis of gestational retroverted uterine incarceration can be difficult as patients often present with nonspecific symptoms due to the local effects on the bowel and bladder by the growing uterus. Patients may present with urinary retention, dysuria, urinary frequency or urgency, overflow incontinence, constipation, or pelvic pain. Early recognition is crucial as an incarcerated uterus can lead to serious maternal health implications including bladder rupture, uterine rupture, or renal failure, as well as pregnancy-related complications such as premature rupture of membranes or preterm labor [5].



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The diagnosis of uterine incarceration should always be considered in a patient that presents with urinary retention during their second trimester of pregnancy. Physical examination will likely demonstrate a palpable mass in the posterior cul-de-sac, an anteriorly displaced cervix wedged behind the pubic symphysis, and may reveal a decreased fundal height [6]. Ultrasound and MRI can then be used to further elucidate the diagnosis. Ultrasound may reveal an elongated anterior cervix with a superiorly displaced bladder along with the fetal head in the pouch of Douglas [7]. MRI can be utilized to diagnose more difficult cases as it can further demonstrate placental location, sacculaton, and anatomical relationships [6]. However, ultrasound is often more convenient and readily available, making it crucial for an early diagnosis [7].

Management of an incarcerated uterus has been described using several different methods. Conservative treatment can involve placement of a Foley catheter, pessary, knee-chest positioning, or manual reduction [4]. If these methods are unsuccessful, other options include endoscopic release, laparotomy, or eventual cesarean delivery if the patient presents in the third trimester. Manual reduction is less invasive and therefore is the preferred method of reduction whenever possible. Steps of manual reduction previously described include decompression of the bladder, patient positioning on all fours, inverted decubitus position, or dorsal lithotomy position, then subsequent anterior or cephalad pressure placed on the posterior uterine fundus via transvaginal, transrectal, or transabdominal approach [8]. Here, we describe a unique minimally invasive technique for anatomical correction of the incarcerated retroverted gravid uterus utilized in two different patient scenarios.

Case Report

Case 1

A 23-year-old gravida 2 para 1001 female presented to labor and delivery triage at 14 weeks and 1 day gestation with the chief complaints of urinary retention and right flank pain. She had no prior surgical history and a history of one prior term uncomplicated spontaneous vaginal delivery. On physical exam, she was found to have right costovertebral angle tenderness, an anteriorly displaced cervix, and a severely retroverted and retroflexed uterus. On ultrasound imaging, the patient's cervix measured 4.2 cm in length and a complete placenta previa was seen with a retroverted and retroflexed uterus (Figure 1). Renal ultrasound was significant for right hydronephrosis. Laboratory results were significant for mild leukocytosis and positive leukocyte esterase in urinalysis.

The patient was subsequently admitted for treatment of presumptive pyelonephritis and management of urinary retention. Timed voiding was initiated which resulted in symptomatic improvement. Additionally,

passive reduction of the patient's retroverted incarcerated uterus was attempted by assuming a knee-chest position several times per day without success. Unfortunately, on hospital day 4 of admission, the patient's symptoms of urinary retention worsened, and she required straight catheterization. On hospital day 5, the decision was made to attempt manual uterine repositioning in order to achieve more substantial alleviation of the patient's urinary retention and pain.

The patient was taken back to the labor and delivery operating room. Under spinal anesthesia, a Foley catheter was inserted to empty the bladder. The patient was then placed in a dorsal supine position with her hips abducted and knees flexed. Under transabdominal ultrasound guidance, reduction of the uterus from the cul-de-sac was attempted by placing a hand vaginally and applying moderate pressure to the uterine fundus in the posterior fornix of the vagina in a cephalad direction. When this was unsuccessful, the patient was placed in "all fours" position, and the same maneuver was attempted. When this was unsuccessful, the patient was placed once again in the dorsal supine position and given a dose of terbutaline. A ring forceps was then applied to the cervix and gentle traction was applied by pulling toward the introitus. Pressure was then reapplied in the posterior fornix to the uterine fundus in a cephalad direction. This maneuver successfully displaced the uterus out of the posterior cul-de-sac, and it was found to remain within the abdominal cavity on ultrasound. The fetus was found to have normal heart rate and fetal movements on ultrasound. The patient tolerated the procedure well.

The patient's symptoms of urinary retention and right costovertebral angle tenderness resolved completely after the procedure, and she was successfully discharged the following day. The patient's uterus remained in the correct anatomical position throughout the remainder of



Figure 1: Sagittal ultrasound view of the patient's retroverted and retroflexed uterus containing a single viable intrauterine gestation with complete placenta previa. Cervix is anteriorly displaced, long, and closed, measuring 4.2 cm in length.

her pregnancy on subsequent ultrasounds, her placenta previa resolved, and she underwent a successful term spontaneous vaginal delivery.

Case 2

A 35-year-old gravida 2 para 1001 female presented to labor and delivery triage at 23 weeks and 1 day gestation with acute onset, severe, intermittent lower abdominal pain described as cramping in nature and associated with right sided back pain. The pelvic pain was worse with sitting and prolonged standing. She also endorsed vaginal and rectal pressure with associated constipation and difficulty with ambulation. Surgical history was significant for one prior uncomplicated term cesarean delivery and no other surgeries.

Pelvic exam was significant for a severely anteriorly displaced cervix and a tender palpable bulge in the posterior fornix. Ultrasound imaging revealed a retroverted uterus and a 6.1 cm elongated cervix positioned between the bladder and uterus with right-sided hydronephrosis (Figure 2). Further imaging via MRI confirmed incarceration of the gravid uterus, demonstrating the entrapped anatomical positioning within the maternal pelvis. Of note, on both ultrasound and MRI, the placental position appeared consistent with a posterior placenta previa.

The patient was admitted for antepartum observation of presumed gestational uterine incarceration and conservative management was attempted with knees-to-chest positioning three times a day and while asleep using support pillows. After failed attempts of passive reduction and worsening hydronephrosis, a decision was made to attempt manual displacement of the uterus. Due to perivable gestational age, the neonatology team was consulted. She received corticosteroids for fetal lung maturity due to the risk of possible preterm birth. Additionally, the patient was given Rh (D) immune globulin for prophylaxis due to Rh negative blood type.

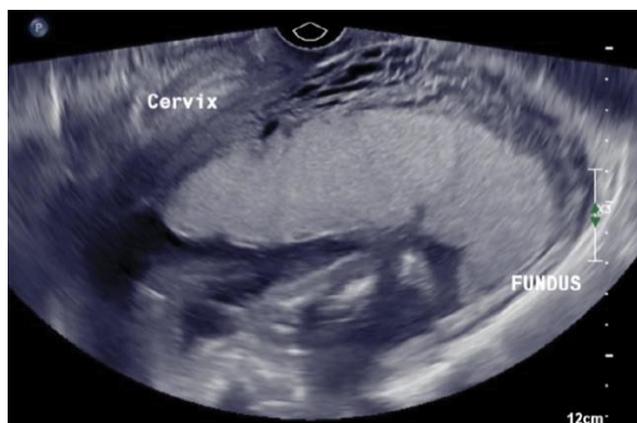


Figure 2: Sagittal ultrasound view of a retroverted and retroflexed uterus containing a posterior placenta previa that is displaced anteriorly. Cervix is long and closed, measuring 6.1 cm, displaced anteriorly.

The patient was brought back to the labor and delivery operating room, received spinal anesthesia, and was placed in the dorsal lithotomy position. Under ultrasound guidance, manual displacement of the uterus was completed by inserting a hand into the posterior fornix and applying continuous pressure to the fundus in a cephalad direction until the fundus was elevated out of the sacral hollow of the pelvis. Fetal heart tracing was reassuring, and ultrasound confirmed that the uterus had fully extended into the abdomen and was no longer incarcerated. The patient tolerated the procedure well with minimal reported pain. Vaginal packing and Foley catheter were placed for 24 hours to maintain the corrected anatomical position of the uterus.

The patient reported significant relief of symptoms. The vaginal packing and Foley catheter were removed, and patient was able to spontaneously void without difficulty. After correction of the uterine position, the cervical length was reassessed using transvaginal ultrasound and found to be > 3 cm. Furthermore, the placenta previa was now a normal appearing posterior placenta with the placental edge > 3 cm from the cervical os. The patient was discharged the following day. Her uterus remained in the correct anatomical position for the duration of pregnancy on subsequent ultrasounds. The pregnancy was carried to term with subsequent delivery of a viable infant via elective repeat cesarean delivery. There were no complications or abnormal intraoperative findings during delivery.

Discussion

In this case series, we presented a minimally invasive technique used to reposition the rare finding of second trimester gestational retroverted uterine incarceration. This condition can be associated with uterine anomalies such as leiomyomas, endometriosis, Müllerian anomalies, or pelvic adhesive disease [9]. Here we describe the occurrence of incarceration in two different patients who not only had no detectable uterine or pelvic anatomic anomalies, but also both had a history of prior uncomplicated pregnancies. In both of our cases, the patients presented with vague urinary complaints and abdominal pain. Upon evaluation, they were found to have frank urinary retention and hydronephrosis. This demonstrates the importance of early identification of and prompt treatment of gestational retroverted uterine incarceration. In doing so, it is possible to avoid maternal health complications that could accompany long-term urinary retention, such as severe hydronephrosis or pyelonephritis.

Conservative treatment was initially attempted in both cases with intermittent knees-to-chest positioning. However, this method failed both early in the second trimester at 14 weeks and at a later gestational age of 23 weeks. Furthermore, both patients were noted to

have placenta previa complicating the presentation of their gestational retroverted uterine incarceration. The finding of placenta previa is important to note as planned uterine manipulation in the setting of previa is typically avoided and should be proceeded with extreme caution. Interestingly, our patient at 23 weeks gestational age was found to have a normal posterior placenta with no identifiable previa immediately after successful disimpaction of the uterus, thereby elucidating the severe anatomical distortion that can be caused by the uterus being retroflexed and retroverted.

We were able to successfully complete our manual repositioning technique in both patients at 14 weeks and 23 weeks gestational age. The crucial step in the procedure is properly elevating the uterine fundus above the sacral promontory. The technique was completed by placing the patient in the dorsal lithotomy position and applying vaginal pressure in the posterior fornix in a cephalad direction. During each procedure, the physician placed applied constant pressure on the uterine fundus in a cephalad manner. The physician should then be able to feel the uterus elevating out of the sacral region of the pelvis. Cervical countertraction was applied in one of the cases to aid in decompression.

The procedure was completed under spinal anesthesia, which aided in patient comfort and allowed for relaxation of the maternal pelvis. Additionally, ultrasound guidance was used to assess fetal well-being and to aid in visualization during the elevation of the uterus out of the maternal pelvis. In one of our cases, we also used vaginal packing to occupy the space that previously contained the uterine fundus to prevent the uterus from reverting to its incarcerated position.

Conclusion

In this case series, we demonstrated that anatomical correction of the incarcerated uterus is feasible up to 23 weeks gestational age by using a minimally invasive manual reduction technique that avoids intraabdominal surgery. This is also at a significantly more advanced gestational age than previously described in symptomatic patients, as other successful manual reduction maneuvers in the literature have all occurred before 20 weeks of gestation [4-9]. This brings about many other considerations as the fetus may be considered viable at this gestational age at some

institutions. Because of this, neonatology consultation should be included in the management, and the patient should be thoroughly counseled on the implications of possible premature delivery.

Conflicts of Interest

There are no conflicts of interest to disclose for any of the involved authors.

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Author's Statement

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