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# Surgical management of an incarcerated uterus in a gynecological patient: A case report

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ABSTRACT

Uterine incarceration is most often described as occurring in pregnancies. Presenting with severe pelvic pain, urinary retention, and in some cases spontaneous abortion, this complication often arises at 12–15 weeks of gestational age. Although usually considered an obstetrical complication, uterine incarceration can occur in nongravid females. This case report presents a gynecological patient with acute urinary retention secondary to uterine incarceration. The patient chose surgical management, and surgery provided immediate symptomatic relief. Our case highlights an uncommon etiology of acute urinary retention and demonstrates the importance of considering the diagnosis of uterine incarceration in nongravid as well as gravid females.


## 1. Introduction

Uterine incarceration occurs in approximately 1 in 3000 pregnancies [1]. This rare complication typically occurs when a retroverted uterus, found in approximately 15% of gravid females, is unable to ascend out of the pelvis due to impaction against the sacrum early in the second trimester [1–4]. Although the pathophysiology is unclear, uterine malformations, endometriosis, and prior abdominal surgery predispose patients to this complication [1,2,4,5].

Patients typically present with acute or intermittent urinary retention, urinary tract infection, and hydronephrosis when uterine incarceration occurs in the second trimester [2,6]. However, if uterine incarceration presents in the first trimester, patients may have uterine bleeding or a spontaneous abortion. Patients with uterine incarceration which persists into the second and third trimesters may develop intrauterine growth restriction, premature delivery, abnormal placentation, abdominopelvic pain, or uterine, bladder, or cervical rupture [7,8].

Management of uterine incarceration currently focuses on obstetric cases. Conservative management includes knee-chest positioning and manual reduction [5]. Colonoscopic reduction has also garnered attention because it is both safe and usually successful in gravid patients [7]. Additionally, a pessary is often placed for the remainder of the pregnancy to reduce the incidence of recurrence, especially when uterine retroversion is present [7]. The prevalence of uterine incarceration outside of pregnancy is unknown. Few case reports have discussed the management of uterine incarceration in nonpregnant women. We present such a case and discuss intraoperative management options. Consent was obtained prior to this case report and exemption was provided by the Community Medical Center Institutional Review Board.

## 2. Case

A 46-year-old gravida 3, para 3-0-0-3 woman presented to the emergency department with the inability to void. She explained that she had not been able to empty her bladder completely for the last two days, and at the time of presentation she was anuric. Her medical and surgical history was notable for regular menses, three previous spontaneous vaginal deliveries, and an abdominal myomectomy 14 years previously. She had a history of high-grade squamous intraepithelial lesions and a colposcopy had demonstrated ectocervical disease. In addition, recent imaging studies demonstrated multiple intramural leiomyomata and adenomyosis.

On physical examination, a grossly enlarged uterus measuring over 10 cm filled the posterior cul de sac. Her cervix was not palpable and could not be visualized during speculum examination. A Foley catheter was immediately placed, and one liter of urine was drained. An ultrasound scan demonstrated an enlarged uterus, measuring 13.4 × 0.8 × 10 cm, with multiple leiomyomas. A fundal leiomyoma of 2.6 × 2 × 2.5 cm was described, as well as a posterior lesion of 6.5 × 3 × 5 cm, and a centrally located leiomyoma of 8.2 × 8.1 × 8.1 cm. Magnetic resonance imaging (MRI) showed an anteriorly displaced cervix and was negative for hydronephrosis. A working diagnosis of uterine incarceration with a multifibroid uterus was discussed with the patient, as was the uncertainty as to the optimal management. Methods of manual reduction with or without colonoscopic insufflation were discussed, as were laparotomy and operative reduction without hysterectomy, with myomectomy, and reduction with hysterectomy. The patient was not

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concerned about childbearing and but was concerned about recurrence and the possibility of sarcomatous change in the leiomyomata. She therefore opted for operative reduction with abdominal hysterectomy.

The abdomen was entered through a midline incision from pubis to umbilicus. For optimal visualization, a Bookwalter retractor was set up. An enlarged uterus with multiple leiomyomata wedged deep in the pelvis and impacted upon the sacrum were encountered. The pelvic anatomy was markedly distorted. The anterior and lateral aspects of the uterus were clear of adhesions. The cervix was not visible or easily palpable. Furthermore, the bladder and peritoneal reflection appeared stretched out and the latter was folded over on itself, possibly indicative of the early stages of uterine sacculation. The folded-over bladder reflection was sharply released. With the release of tension on the tissue the local anatomy was normalized and the bladder reflection could be advanced off the lower uterine segment in a caudal direction. In an attempt to mobilize the uterus, a traction suture was placed in the anterior fundus. Upward traction did not free the uterus and the suture began to tear free. An attempt was then made to use malleable ribbon retractors in a shoe-horn fashion to deliver the uterus; however, they could not be maneuvered between the uterus and sacrum easily and safely, and so this method was abandoned. Use of an obstetric vacuum to provide traction on the uterus was considered but not attempted. Next, a Doyen tumor screw with Furniss modification was employed. The Furniss modification is a metal cup at the top of the shank of the tumor screw which compresses the uterus around the tissue pierced by the device. It is thought to enhance hemostasis by compressing vessels penetrated by the screw during insertion. An additional theoretical benefit might be to contain any shed malignant cells in the rare instance of a sarcoma. Care was taken to estimate a safe depth of penetration of the device by measuring the anterior to posterior width of the uterus. The tumor screw was advanced to a depth approximately 2 cm less than the measured width, in order to provide a sufficient buffer zone between the sharp tip and the anterior sacrum. The uterus was slowly elevated with traction in an upward and slightly caudal direction (away from the sacral promontory). A vacuum-like suction release occurred as the impaction was released. The uterus appeared to have multiple leiomyomata of varying sizes, with two dominant posterior lesions.

The remainder of the surgery was uncomplicated and the patient tolerated the procedure well. The patient urinated without difficulty on post-operative day 1 and had minimal post-void residual urine. She was discharged in a stable condition on post-operative day 3. At follow-up, the patient no longer had urinary complaints. Her surgical pathology was remarkable for adenomyosis, multiple myomas, and cervical intraepithelial neoplasia III.

## 3. Discussion

Uterine incarceration continues to be a rare complication in obstetrics and gynecology. Current literature promotes the use of ultrasound and MRI in diagnosis. Classically, the cervix will be displaced anteriorly with the fundus of the uterus positioned in the cul de sac and pre-sacral area on ultrasound. Furthermore, the bladder reflection may become elongated and the bladder stretched in a cephalad direction [3,7,9,10]. The precise mechanism of incarceration in our case is unknown, but we hypothesize that the growth of posterior fibroids resulted in enlargement of the overall uterine mass which became impacted against the sacrum. Further growth of the uterine mass in the cephalad direction was no longer possible and the growth vector may have assumed an anterior direction, causing the lower uterine segment and cervix to elongate and be forced against the pubic symphysis. Presumably the resultant compression led to obstruction of the urethra and urinary retention. It is also possible that elongation of the bladder may have resulted in impaired functioning of the detrusor, contributing to the observed urinary retention. Consistent with other reports, MRI proved useful in elucidating the distorted anatomy of the cervix and bladder preoperatively [2,3].

Prompt diagnosis is necessary to prevent serious sequelae in both the obstetric and gynecological populations. Acute urinary retention and abdominal pain are common presenting symptoms. Uterine fibroids appear to be a predisposing factor leading to incarceration, particularly those in a posterior-fundal location [2]. Other predisposing conditions include adenomyosis, benign and malignant neoplasms, uterine retroversion and posterior pelvic adhesions. Delayed diagnosis may result in serious complications, such as hydronephrosis, upper tract injury, renal failure, bladder rupture, uterine necrosis and sepsis [9]. Kranti and Sachen reported a case of sepsis secondary to uterine necrosis in a perimenopausal woman [11].

Management of uterine incarceration in the nongravid female has generally been approached surgically in the few case reports currently available. Surgical options include myomectomy with or without abdominal hysterectomy and abdominal hysterectomy without myomectomy. To our knowledge, laparoscopic approaches, myolysis, and fibroid embolization have not been reported in the management of uterine incarceration.

Manipulation, disimpaction and removal of the uterus can prove to be technically difficult. Myomectomy to relieve the incarceration can be considered if feasible. Brisk bleeding deep in the pelvis may be a barrier to this approach. Vasopressin and pelvic vessel embolization or ligation are techniques to decrease blood loss. In our opinion, disimpaction of the uterus and normalization of surgical anatomy are important precursors to safe myomectomy and/or hysterectomy. Traction sutures, placed deep in the myometrium, can be used to assist in freeing the uterus; however, it is difficult to precisely control the vector of traction with this approach. Furthermore, suture pull-out limits the traction force which can be applied. In our case, malleable retractors used in a shoe-horn-like fashion were briefly tried. The retractors could not be manipulated between the posterior uterus and the pre-sacral peritoneum safely due to a tight seal between these tissues. The Doyen tumor screw proved, in this instance, to be a useful device with which to disimpact the uterus. Deep but cautious placement of the screw into the myometrium allowed for sufficient and measured traction to be applied without pull-through. Moreover, with this approach, the vector of applied force can be easily adjusted and fine-tuned in order to use the force more efficiently. In theory, the Furniss modification, by compression of the tissue surrounding the point of penetration, may curtail blood loss and contain shed tumor cells [12]. The device should be placed only after determination of a safe depth of penetration. Protection of the pre-sacral area from penetration by the sharp tip of the tumor screw is of paramount importance.

This case report illustrates the acute presentation of uterine incarceration in a nongravid perimenopausal woman and provides details of the surgical techniques utilized in her management. Continued exploration of the safe and effective surgical management of this condition is to be encouraged.

## Contributors

Fatimah Z. Fahimuddin– prepared the case and was involved in drafting the manuscript.

Rebecca Murphy was involved in the case and in drafting the manuscript.

Michael O'Shaughnessy was involved in the case and in editing the manuscript.

All authors saw and approved the final version of the case report.

## Conflict of Interests

The authors declare that they have no conflict of interest regarding the publication of this case report.

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## Patient Consent

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## Provenance and Peer Review

This case report was peer reviewed.

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