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Uterine Torsion Due to Uterine Fibroid in Non-Pregnant Women: A Case Report

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Abstract: Uterine torsion is a rare gynecological emergency. It occurs mainly in gravid uterus and extremely rarely in non-gravid uterus. In this article, we report a case of torsion of non-gravid uterus accompanied by a large intramural leiomyoma with focus on computed tomography and magnetic resonance imaging.

Keywords: Uterus; Leiomyoma; Torsional abnormality

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1. Introduction

Uterine torsion is defined as a condition in which the uterus is rotated more than 45 degrees around its longitudinal axis. Uterine torsion is very rare, occurring primarily in pregnant women and even more rarely in non-pregnant women. The clinical presentation of uterine torsion may vary from asymptomatic to mild abdominal discomfort to acute abdominal pain with shock [1]. These non-specific symptoms and the rarity of the disease may lead to a delayed diagnosis of uterine torsion, which, if left untreated, may lead to irreversible ischemic damage to the uterus, resulting in infertility, life-threatening hemorrhage, and shock. Early diagnosis and surgical treatment are therefore necessary [2]. We present a case of uterine torsion with uterine fibroid in a 60-year-old non-pregnant woman reported by computed tomography (CT) and magnetic resonance imaging (MRI).

2. Case report

A 60-year-old female patient presented to the outpatient clinic with pain in the lower abdomen that suddenly occurred the preceding day.

On CT, a uterine mass of approximately 20 cm in size was observed, and she was referred to the hospital. The patient had an intrauterine device inserted 26 years ago after a spontaneous miscarriage and attained menopause 4 years ago. She reported that her abdominal mass had been palpable for the past 10 years, but it was not accompanied by pain. She had not sought medical attention for it. On physical examination, abdominal distension was observed, a mass of approximately 20 cm in size was palpable, and there was generalized abdominal tenderness. On vaginal ultrasound, a large mass was observed in the pelvic cavity, and bilateral ovaries were not well observed.

On a contrast-enhanced abdominal CT taken at another hospital, a mass of approximately 21 cm × 23 cm × 16 cm in size was observed in the abdominal cavity. This mass was connected to the cervix and received blood supply from the uterine vessels. Vortex sign (whirlpool sign) was observed between the

mass and the cervix. There was no contrast enhancement inside the mass, although multiple calcifications were present. Bilateral ovaries were clear.

A small amount of ascites was observed in the abdominal cavity (**Figure 1A**–**B**). An intrauterine device was observed at the lower part of the mass. For detailed evaluation of the mass, pelvic MRI was performed in our hospital. The mass was well-demarcated and inhomogeneously hypointense on T2, moderately or hypointense on T1, and inhomogeneously contrast-enhancing on T1. A vortex-like structure was observed inferiorly to the mass, and it was connected to the upper part of the cervix (**Figure 1C**–**E**). The uterine body was not clearly observed. These findings were suspicious of torsion of the uterine body due to leiomyoma within the wall of the uterine floor. The ovaries on both sides were not clearly observed on CT, and the ovarian vessels crossed the vortex structure, leading us to consider the possibility that the ovaries on both sides were twisted together (**Figure 1D**–**E**).

The patient underwent total abdominal hysterectomy with bilateral salpingo-oophorectomy. Surgical findings showed a mass of approximately 22 cm in size with clear boundaries in the uterine floor, and the uterus was rotated 360 degrees clockwise. The bilateral adnexa were also twisted (**Figure 1F**). Pathological examination confirmed the mass to be a uterine fibroid, without any bleeding or infarction. No abnormal findings were observed in the adnexa bilaterally. The patient was discharged without postoperative complications.

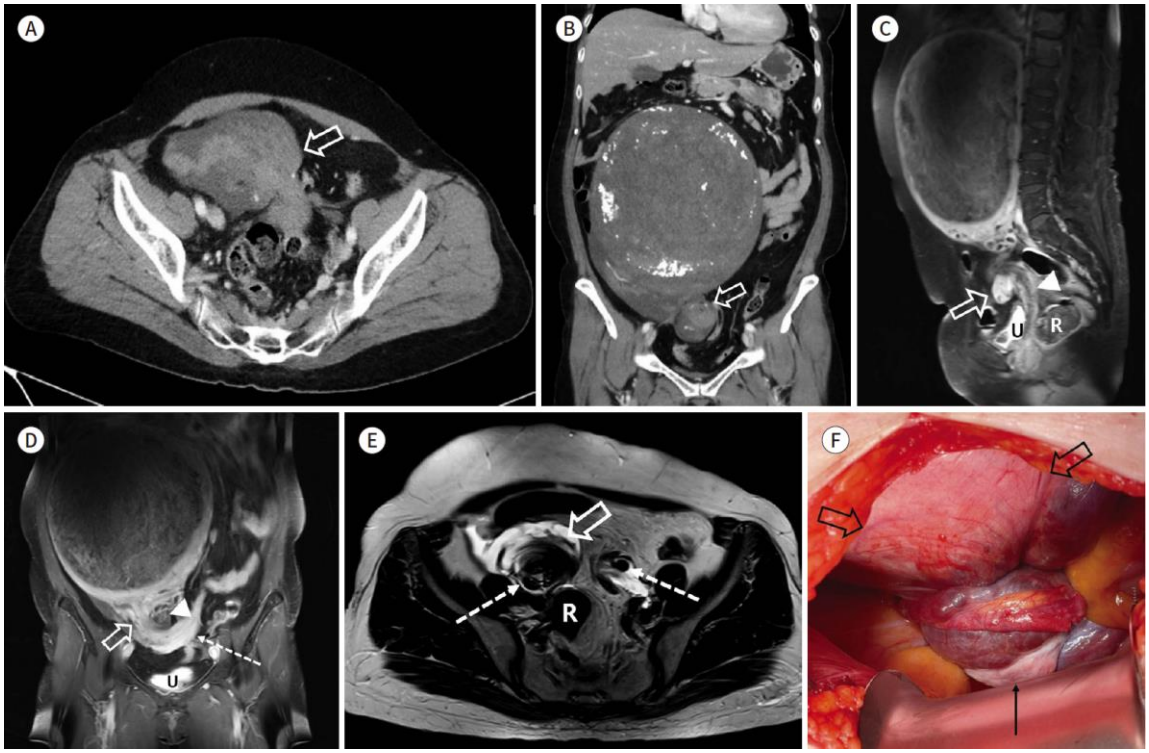

Figure 1. A 60-year-old female with torsion of myomatous uterus. (A) Axial and (B) coronal reformatted contrast-enhanced computed tomography (CT) images showing a well-defined large heterogeneous abdominopelvic soft tissue mass with calcifications, representing intramural leiomyoma in the uterus. Note the whirlpool sign (arrows) in the inferior aspect of the mass, connected to the cervix and a small amount of fluid around the mass. (C) Enhanced sagittal and (D) coronal T1-weighted images showing a huge intramural leiomyoma at the uterine fundus and extended uterine cervix (arrowheads). Note the whirlpool sign (arrows) between the leiomyoma and the cervix and involved left ovarian vessel (dashed arrow). (E) Axial T2-weighted image showing a whirlpool sign (arrow), representing twisted uterine corpus. Both ovarian vessels (dashed arrows) are involved in the whorled structure. (F) Intraoperative image showing an enlarged uterus with a huge mass (open arrows), rotated 360 degrees on its long axis at the level of the lower uterine segment. Note the normal appearance of the ovary (arrow) involved in the twisted pedicle. Abbreviations: R, rectum; U, urinary bladder.

This case report was exempted from written informed consent by the Institutional Review Board (IRB approval number: UC22ZASI0052).

3. Discussion

Uterine torsion is a very rare condition that has been reported mainly in pregnant women and very rarely in non-pregnant women. It occurs mainly at the isthmus of the uterus between the cervix and the uterine body, where the cervix and surrounding ligaments are stretched. The degree of torsion usually ranges from 45 to 180 degrees, although up to 720 degrees has been reported [3]. Non-pregnancy causes of uterine inflammation include leiomyomas, congenital anomalies of the uterus, pelvic adhesions, and adnexal masses [1,4,5]. Symptoms of uterine torsion are highly variable and non-specific, ranging from asymptomatic to abdominal pain, vaginal bleeding, digestive and urinary system symptoms, and even shock. When uterine torsion occurs, lymphatic and venous congestion of the uterus occurs; if the torsion persists, the arteries eventually become compressed, causing ischemic damage and necrosis of the uterus, and if the ovaries are involved, they may also be damaged. Uterine torsion is a gynecological emergency that can be life-threatening and infertility-causing if diagnosed late, but due to its non-specific clinical presentation and rarity, it is difficult to make a diagnosis of uterine torsion preoperatively. This condition is often discovered at the time of surgery. Differential diagnoses include appendicitis, secondary degeneration of fibroids, torsion of intrapelvic masses, and ectopic pregnancy.

Imaging modalities for the diagnosis of uterine torsion include pelvic ultrasound, CT, and MRI. On pelvic ultrasound, uterine inflammation should be suspected if there is a change in the position of a previously known fibroid [6], and if the ovaries are involved, color Doppler studies may show the ovarian vessels crossing the uterus abnormally [1]. However, pelvic ultrasound is limited in terms of identifying uterine torsion when fibroids are large. CT is the primary test used in women presenting with acute abdominal pain in the emergency department, and MRI can be helpful in preoperative diagnosis due to its high soft tissue resolution and contrast, which allow for accurate evaluation of the organs in the pelvis. The most characteristic and common findings on CT and MRI in the diagnosis of uterine torsion are vortex structures in the isthmus or cervix [1,4]. The predisposing factors of uterine torsion, such as intrapelvic masses and uterine malformations, can be identified on CT and MRI, while ischemia and infarction of pelvic masses can be demonstrated with contrast [4]. In addition, gas in the uterine cavity may suggest necrosis of the uterine wall due to uterine torsion [2]. An X-shaped appearance at the upper vagina on axial MRI images has been reported to be helpful in the diagnosis of uterine torsion [7], but it may not be seen depending on the location or extent of the torsion.

The treatment of uterine torsion is surgery. In patients who wish to preserve fertility, surgery is performed to release the torted uterus and remove the cause, provided there is no uterine necrosis. Hysterectomy is performed in postmenopausal women when the condition has progressed to uterine necrosis or when thrombosis is present. Salpingo-oophorectomy may also be performed if bilateral adnexa are involved [6]. In conclusion, uterine torsion can lead to life-threatening complications and infertility if diagnosis is delayed, so it is important to be suspicious of uterine torsion in acute abdominal pain in women with predisposing factors for uterine torsion, such as large fibroids or uterine malformations, as well as to understand the findings of uterine torsion on imaging in order to ensure early diagnosis and treatment.

Disclosure statement

The authors declare no conflict of interest.

Author contributions

Conceptualization: Young Mi Ku

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