

# Torsion of a nongravid myomatous uterus: radiological features and literature review

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Torsion of the nongravid uterus is a rare but potentially fatal acute abdominal condition. The non-specific clinical presentation of this condition makes preoperative diagnosis difficult. We describe a patient with uterine torsion in whom the diagnosis was made using contrast-enhanced computed tomography with multiplanar reconstruction. Features of uterine torsion and its complications can be demonstrated by computed tomography, which is an important means of making a preoperative diagnosis.

## Introduction

Uterine torsion is a rare condition in the nongravid uterus.<sup>1</sup> It was first reported in 1909. As uterine torsion may cause irreversible ischaemic damage to the uterus, leading to rapid clinical deterioration,<sup>2</sup> prompt and accurate diagnosis is crucial to effective management of this potentially life-threatening condition. We present a case of torsion in a nongravid myomatous uterus in which the preoperative diagnosis and subsequent management was assisted by use of contrast-enhanced computed tomography (CT) with multiplanar reconstruction.

## Case report

A 61-year-old postmenopausal woman was admitted to our hospital in October 2009 complaining of lower abdominal pain and distension for 2 days. She gave no history of vomiting, urinary symptoms, vaginal bleeding, or fever. A large pelvic mass was detected during physical examination. Transabdominal ultrasound showed that the pelvic mass was probably a large uterine fibroid. Both ovaries were not well seen and no free fluid was detected. She developed coffee-ground vomiting after admission and her haemoglobin level dropped from 137 g/L to 96 g/L but her blood pressure and pulse remained stable. In view of the coffee-ground vomiting and stable blood pressure and pulse, an oesophagogastroduodenoscopy was performed but this revealed a hiatus hernia only. Forty-six hours after admission she developed shock, her haemoglobin level dropped to 55 g/L and her abdominal pain increased.

A CT examination of the abdomen and pelvis was performed urgently and this showed a large pelvic mass continuous with the uterine cervix, measuring 23.4 cm (longitudinal) x 19.2 cm (transverse) x 13.1 cm (anteroposterior) and a haemoperitoneum. Intralesional hyperdensities were noted within the pelvic mass, indicating possible acute intralesional haemorrhage. No significant contrast enhancement was noted in the pelvic mass. The uterine cervix had a whorled appearance (Fig 1). The right common iliac artery and inferior vena cava showed evidence of mass effect. The presumptive diagnosis was a large pelvic mass with torsion at the level of the uterine cervix.

At emergency laparotomy, the uterus was found to be enlarged to 36-week gravid size with a 23-cm posterior wall fibroid. The entire uterus, both fallopian tubes, and both ovaries were gangrenous with uterine torsion of 720 degrees at cervical level (Fig 2a). Haemoperitoneum (350 mL) was detected. The patient underwent a total abdominal hysterectomy with bilateral salpingo-oophorectomy. Gross pathological examination revealed a markedly enlarged uterus showing extensive haemorrhagic infarction of the uterine wall, together with a large (15.5 cm) uterine fibroid (Fig 2b). Histological examination confirmed the presence of uterine and adnexal haemorrhagic infarction consistent with torsion. The uterine fibroid was a non-malignant leiomyoma.

## Discussion

Uterine torsion is defined as rotation of the uterus on its long axis by more than 45 degrees.<sup>3</sup> The position of the uterus is stabilised by the broad ligaments and the uterosacral ligaments.<sup>4</sup> A large heavy fibroid may rotate due to its weight and exert traction on the

### Key words

Myoma; Tomography, X-ray computed; Torsion abnormality; Uterine neoplasms

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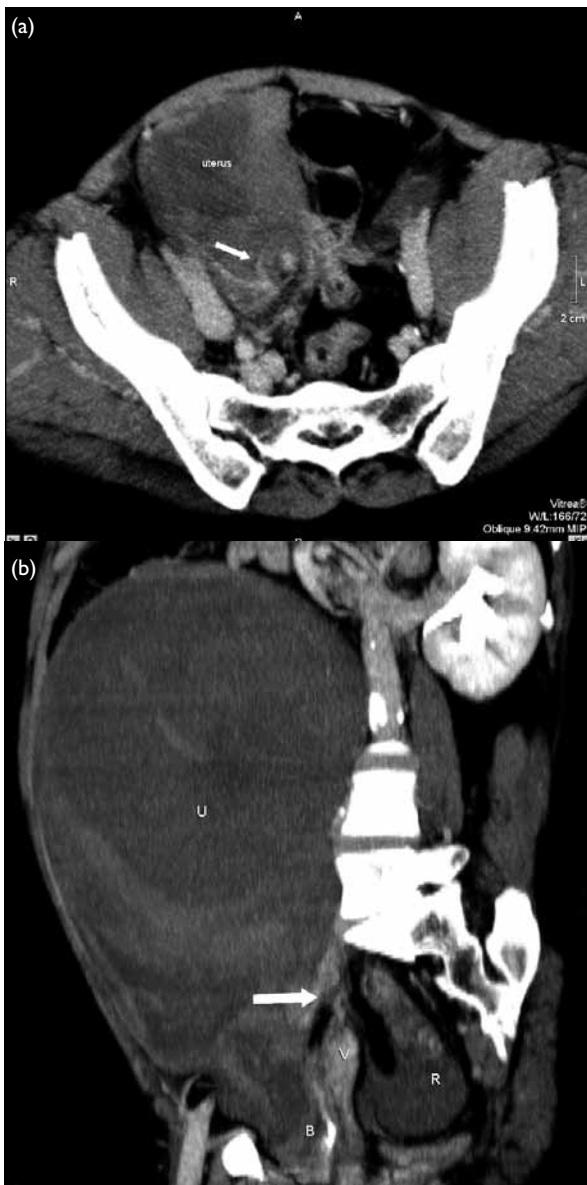


FIG 1. (a) Axial computed tomographic (CT) image after intravenous contrast showing the uterine cervix with a whorled appearance (arrow). (b) Oblique coronal CT image after intravenous contrast showing the uterine cervix with a whorled appearance (arrow)  
U denotes uterus, B bladder, V vagina, and R rectum

### 非妊娠肌瘤子宮扭轉的放射學特點和文獻回顧

非妊娠子宮扭轉是罕見但可致命的腹部急症；其不顯著的臨床症狀往往阻礙術前診斷。本文報告一名患者以對比劑電腦斷層掃描的多平面重建技術確診子宮扭轉病例。由於電腦斷層掃描可顯示子宮扭轉的特性和其併發症，這可說是一個重要的術前診斷方法。

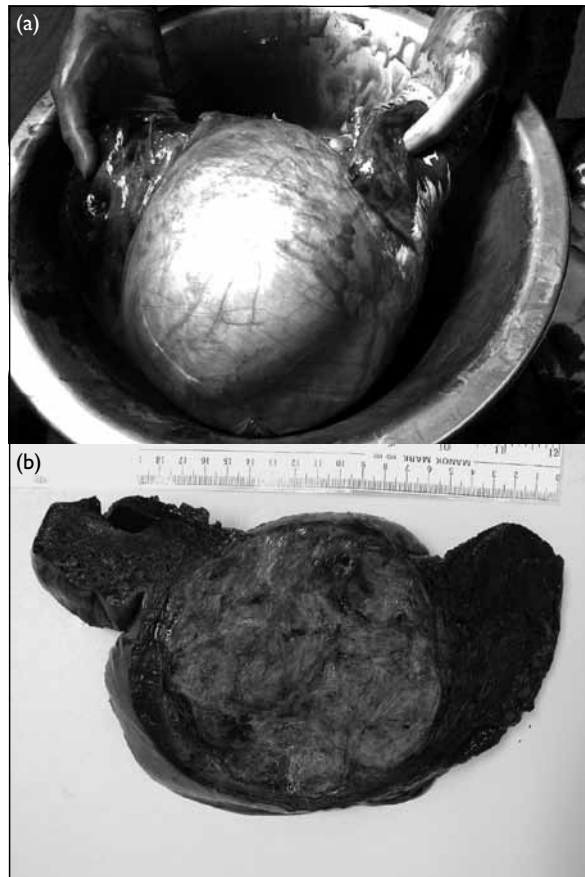


FIG 2. (a) Intra-operative photo showing gangrenous uterine body, bilateral fallopian tubes and ovaries. (b) Gross pathological examination showing a markedly enlarged uterus with extensive haemorrhagic infarction of the uterine wall, together with a large uterine fibroid (15.5 cm)

uterus. When the leiomyoma is sessile, torsion of the uterus occurs at the same time as that of the leiomyoma.<sup>4</sup> The point of torsion of the uterus occurs usually at the level of the uterine isthmus.<sup>4</sup>

Abnormal foetal presentation is a slightly more common cause of uterine torsion than uterine fibroids, with these two causes seen in 23% and 21% of patients, respectively.<sup>3</sup> A myomatous uterus is the most common abnormality seen in nongravid uterine torsion.<sup>5</sup> Most of the cases caused by congenital uterine abnormalities are seen in women with bicornuate uteri. Pelvic adhesions and adnexal

masses have also been found.<sup>5</sup> It has also been suggested that peristaltic movements of the sigmoid may cause uterine torsion.<sup>4</sup> A study using magnetic resonance imaging (MRI) to evaluate women after lower uterine segment caesarean section showed that poor isthmic healing may result in suboptimal restoration of normal cervical length.<sup>6</sup> This may result in an elongated cervix with structural weakness and angulation in the isthmic region and may predispose to torsion of the uterus. The increased size of the uterus caused by the intramural leiomyoma in our patient may have predisposed to uterine torsion.

Uterine torsion is a rare condition. Although it has been reported since 1909,<sup>4</sup> only about 200 cases have been reported in the past 100 years.<sup>7</sup> Most reported cases involved gravid uteri, thus torsion of the nongravid uterus is even more rare. For this reason, the clinical course, prognosis, and mortality rates associated with torsion of a nongravid myomatous uterus are not well documented. Uterine torsion is difficult to diagnose preoperatively.<sup>5</sup> This may be due to lack of symptoms specific to the condition. The clinical presentation varies from non-specific mild abdominal discomfort to acute abdomen with shock.<sup>7</sup> Our patient presented with non-specific symptoms (abdominal pain, distension, vomiting coffee grounds) rendering a prompt and accurate diagnosis of uterine torsion extremely difficult. Specific clinical signs including vaginal bleeding, uterine tenderness, a twisted vaginal canal and urethral displacement have been reported.<sup>7</sup> The differential diagnosis should include appendicitis, fibroid degeneration, torsion of a pelvic tumour, abdominal pregnancy, and placental abruption.

Radiologically, gas in the uterine cavity—on plain radiographs and CT scanning—has been described as a feature of uterine torsion.<sup>8</sup> On ultrasound, torsion of a myomatous uterus may be suspected if fibroids noted on previous ultrasound scans are seen to have changed position.<sup>8</sup> In our patient, CT scanning showed a whorled structure in the uterine cervix together with a large pelvic mass, which was useful for making a preoperative diagnosis of uterine torsion. The whorled appearance of the uterine cervix represents twisting of the cervix. Radiologically, the main differential diagnoses of our patient's CT features included uterine torsion, ovary/adnexal torsion and a massive infarct inside a leiomyoma. Areas of hyperdensity and a lack of contrast enhancement in the large pelvic mass seen in our patient are CT features compatible with histological findings of haemorrhagic infarction. There are descriptions of the magnetic resonance features of uterine torsion in the literature.<sup>5</sup> The

wall of the upper vagina changes from the normal H configuration to an X-shaped configuration in uterine torsion. The high soft-tissue contrast resolution of MRI allows accurate evaluation of pelvic organs.<sup>5</sup> Another advantage of MRI is image acquisition without the use of ionising radiation but the longer scan time needed for MRI means movement artifact may degrade the image quality.

Torsion of the uterus may progress to congestion and gangrenous changes in the uterus or adnexae. Since torsion of the uterus is a rare condition, the critical time after which ischaemic change is irreversible is not well documented. Therefore, prompt and accurate preoperative diagnosis of torsion of the uterus is vital and surgery should be performed as soon as possible. In young patients who may wish to preserve fertility, operative considerations are the viability of the uterus and the patient's desire to preserve fertility. Hysterectomy should be considered in women past reproductive age with uterine necrosis resulting from prolonged torsion.<sup>4,7</sup> In uncomplicated cases in women who wish to retain fertility, myomectomy and detorsion of the uterus may be considered.<sup>4</sup> Bilateral plication of the round or uterosacral ligaments may be considered to prevent recurrence of uterine torsion. In our patient, the entire uterus and both tubes and ovaries were found to be gangrenous intra-operatively. Thus, a total hysterectomy with bilateral salpingo-oophorectomy was performed.

## Conclusion

Torsion of the nongravid uterus is an uncommon condition. Delay in diagnosing this condition may prove fatal, hence there is a need for a high index of suspicion. Uterine torsion should be considered as a differential diagnosis in women presenting with abdominal pain. We have presented this case to demonstrate how CT may assist with the diagnosis and appropriate management of this condition.

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