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## Ovarian torsion in puerperium: A case report and review of the literature

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## ABSTRACT

**INTRODUCTION:** Ovarian torsion (OT) is a rare cause of acute abdominal pain that requires prompt recognition and treatment during puerperium. Diagnosis of OT can be challenging due to nonspecific clinical features and uncommon objective findings. The management of OT is often delayed because of diagnostic uncertainty. Early and timely recognition and prompt intervention are crucial to preserve ovarian function and to minimize morbidity.

**PRESENTATION OF CASE:** We report a 29-year-old postpartum woman who presented to the emergency department (ED) with severe right flank pain, nausea and anorexia initially considered as renal colic. After further investigation, OT caused by large mucinous cyst was diagnosed. Right-sided salpingo-oophorectomy was performed due to hemorrhagic ovary and huge cystic mass causing ischemic OT.

**DISCUSSION:** OT is often diagnosed based on the clinical presentation, including severe, sharp, sudden onset of unilateral lower abdominal pain and tenderness with a palpable laterouterine pelvic mass and nausea/vomiting. Emergency surgical intervention should be performed if OT is suspected to confirm the diagnosis and uncoil the twist to prevent ovarian damage.

**CONCLUSION:** In conclusion, emergency physicians should be aware of the possibility of OT in postpartum women. Therefore, early and timely surgical intervention should be undertaken.

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## 1. Introduction

Ovarian torsion (OT) is the fifth most common gynecological emergency with a reported prevalence of 2.5–7.4% in patients undergoing emergency surgery for acute pelvic pain.<sup>1,2</sup> It is defined as the partial or complete rotation of the ovary and portion of the fallopian tube upon the supplying vascular pedicle consisting of the infundibulopelvic and tubo-ovarian ligaments.<sup>3</sup> OT can occur at any age from prepubertal to postmenopausal with the greatest incidence in women 20–30 years of age.<sup>4</sup> The diagnosis of OT is based on a heightened awareness of the relevant risk factors, the clinical presentation, and a high degree of clinical suspicion. The diagnosis of OT during puerperium is often missed due to nonspecific clinical features and uncommon objective findings. Presentation of OT and other puerperium-related disorders is quite similar. Therefore,

special attention should be given to postpartum women with acute abdominal pain.

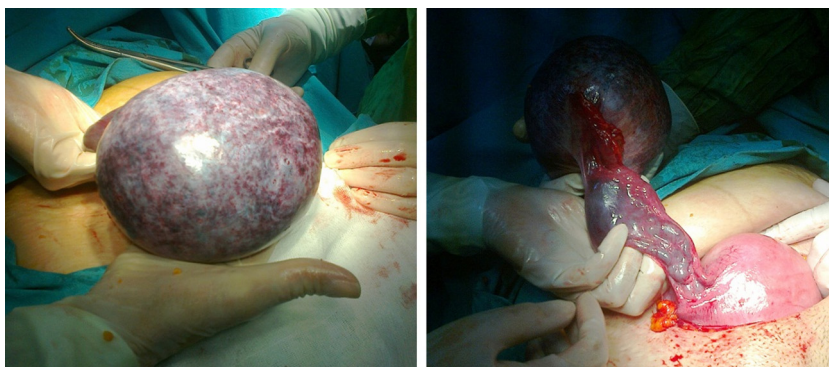
A simple OT may progress to necrosis of the ovary, fallopian tube or whole adnexal structure and necrosis will be followed by loss of the ovary or the adnexa because of delay in diagnosis or misdiagnosis.<sup>2,5,6</sup> More rarely, delayed surgical intervention due to delay or mistaken diagnosis may be responsible for potentially life threatening complications such as thrombophlebitis or peritonitis.<sup>6</sup> Therefore, early and timely recognition and immediate intervention are crucial to preserve ovarian function and to avoid the potentially fatal complications. We present a case of 29-year-old postpartum women treated in our clinic for OT, which was initially considered as renal colic.

## 2. Presentation of case

A 29-year-old G3P3 woman on the third postpartum day, presented to emergency department (ED) of our tertiary research hospital with severe right flank pain for 3 h before presentation. The discomfort had been progressively worsening over the preceding 3 h. She stated that 3 days before she had an uneventful

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**Fig. 1.** Intraoperative view of necrotic appearing mucinous cystadenoma causing ischemic ovarian torsion. The whole right adnexal area is filled by the cystic mass with a maximum diameter of 20 cm.

delivery of her third child at term after a normal pregnancy. She reported that her pain was sudden in onset, sharp, crampy in nature, and awoke her from sleep. The pain was associated with nausea, anorexia and cold sweating during every abdominal pain attack. It was not associated with any fevers, change in stool patterns, vaginal bleeding, or abnormal vaginal discharge. Her past medical and gynecologic history was unremarkable, and she had no history of fertility treatments. She was hemodynamically stable.

On physical examination, the patient was alert, cooperative and in mild distress, complaining of severe right flank pain and nausea. The patient's vital signs were within normal limits. Her abdominal examination showed lower abdominal tenderness, exclusively to the right lower quadrant with muscle guarding to palpation and a palpable uterus due to the physical involution during puerperium. Pelvic examination revealed right adnexal tenderness at vaginal touch as well as right adnexal fullness. Her full blood counts and serum biochemistry were within normal limits. Urinalysis showed 15–20 red cells per high power field.

Renal colic was initially considered, but after the detailed abdomino-pelvic examination, gynecologic emergencies such as hemorrhagic ovarian cyst, ovarian cyst rupture, salpingitis, adnexal torsion, and other puerperium-related complications were also included in the early differential diagnosis, which was also expanded to include entities such as appendicitis, and other non-gynecological conditions. The patient's clinical presentation was concerning for acute abdomen, most likely renal colic. Early bedside abdominal ultrasonography was performed and revealed a 20-cm complex cystic mass in the right adnexal area surrounded by minimal ascites. It also revealed no features suggestive of acute appendicitis and showed bilateral normal kidneys without hydronephrosis. Normal blood flow was detected on color Doppler sonography of the left ovary and right adnexal mass. On the basis of these findings, right flank pain related to the OT caused by adnexal mass was the likely diagnosis. The patient was urgently taken to the operating room for laparotomy.

Intraoperative findings confirmed a right OT secondary to a 20-cm mucinous cyst as diagnosed by ultrasound (Fig. 1). The right necrotic-looking ovary was found to be twisted twice over. Detorsion of the ovary was performed but necrotic appearance did not improve and bleeding was observed from the necrotic ovary. Because of such a huge cystic mass causing OT with ischemic change and hemorrhagic ovarian tissue, the decision was made by the surgical team to perform a right-sided salpingo-oophorectomy. There were no major intraoperative complications. The pain resolved completely after surgery and the final pathologic diagnosis was benign mucinous cystadenoma. The postoperative course was unremarkable, and the patient was discharged on the second postoperative day.

### 3. Discussion

OT is a rare gynecological emergency with a prevalence of 2.5–7.4% in patients undergoing emergency surgery for acute pelvic pain.<sup>1,2</sup> However, this prevalence is probably underestimated because a significant number of patients with OT are not diagnosed because they were not operated.<sup>7,8</sup> OT can be a more challenging diagnosis during early puerperal period, as the signs and symptoms are nonspecific and associated with a wide variety of other puerperal disease processes. OT is often diagnosed based on the clinical presentation, including severe, sharp, sudden onset of unilateral lower abdominal pain and tenderness with a palpable laterouterine pelvic mass and nausea/vomiting.<sup>9–11</sup> In this present case report, the patient had nonspecific and variable symptoms such as flank pain, nausea, anorexia during the course of her presentations and OT was not initially considered. These symptoms are common to many other differential diagnoses of acute abdomen, including: gynecologic and non-gynecologic surgical emergencies (ectopic pregnancy, ruptured ovarian cyst, renal colic, appendicitis, and diverticulitis).<sup>4</sup> In some cases, patients experience intermittent pain, making the diagnosis even more challenging.<sup>9</sup> In our case, the patient's pain was crampy in nature. Flank pain is commonly observed in ED patients. In our case, hematuria and flank pain with nausea and cold sweating during every pain attack could be initially confused with renal colic.

Imaging is frequently used in the diagnosis of an acute abdomen. In gynecology, ultrasound has become the routine investigation for potential pelvic pathologies, and color Doppler studies have been used to assess ovarian blood supply. However, the diagnostic contribution of ultrasound scan in the diagnosis of ovarian torsion remains controversial.<sup>12</sup> The mere presence of blood flow on Doppler ultrasonography of the adnexa has a poor negative predictive value. Normal flow does not exclude torsion, and in one study 60% of surgically confirmed cases of torsion had normal Doppler flow.<sup>13</sup> In our case, ultrasound revealed a 20-cm complex cystic mass in the right adnexal area but normal blood flow was detected on color Doppler sonography of the left ovary and right adnexal mass. Therefore, Doppler blood flow has a high false-negative rate and should not outweigh clinical suspicion.

The most common predisposing factors for OT include ovarian enlargement, adnexal masses, pregnancy, ovarian stimulation, previous pelvic surgery, and tubal ligation.<sup>2–4</sup> Ovarian enlargement by a benign mass is the most common etiologic risk factor for OT. The most common encountered pathology is that of an ovarian dermoid, although other pathological masses include parameso/tubal cysts, follicular cysts, endometriomas and serous/mucinous cystadenoma.<sup>14</sup> Frequently, in up to 73% of cases, there is a complex adnexal or abdominopelvic mass, which can

be predominantly cystic, solid, or both.<sup>15</sup> During puerperium, the physical involution of uterus displaces the adnexa in the face of increasingly lax supporting tissues, increasing the likelihood of adnexal torsion. This is most common in the immediate puerperium.<sup>16</sup> The adnexal torsion in the presented case can be explained by the size of the tumor as well as the progressive reduction of the size of the uterus due to the physical involution during puerperium. In our case, early bedside abdominal ultrasonography was performed immediately and revealed a 20-cm complex cystic mass in the right adnexal area surrounded by minimal ascites. Before the ultrasonographic examination, OT was not initially considered. Clinical presentation was similar to renal colic.

The management of suspected OT is surgical. Traditionally in the past, radical treatment by adnexectomy was the standard approach to OT in cases of ovarian decolouration/necrosis, because of concern that untwisting of the adnexa might precipitate pulmonary embolism from a thrombosed vein.<sup>2</sup> In a study conducted by Rody et al., conservative management of OT regardless of the macroscopic appearance of the ovary was suggested.<sup>14</sup> Several studies have shown that in the absence of an ovarian decolouration or necrosis, untwist of the adnexa can be performed, and the ovary salvaged, without significant risk of thromboembolism.<sup>17,18</sup> Conversely, an obvious necrotic appearance or hemorrhagic infarction of adnexal structure requires surgical removal without attempt to untwist. In our present case, radical treatment by right-sided salpingo-oophorectomy was performed due to bleeding from the necrotic ovary and huge cystic mass causing ischemic OT. Emergency surgical intervention should be performed if OT is suspected to confirm the diagnosis and uncoil the twist to prevent ovarian damage. Importance of laparoscopic management of adnexal torsion was investigated in a paper. The authors advised that when OT is suspected emergency laparoscopy should be performed to establish accurate diagnosis and avoid ovarian damage.<sup>19</sup> Galnier et al. reported management of OT in fourty-five cases.<sup>20</sup> They concluded that laparotomy should be preferred in patients with adnexal masses greater than 75 mm. We preferred to perform laparotomy in this case due to big adnexal mass (greater than 75 mm, approximately 20 cm) and probability of additional acute abdominal pathologies. Surgical management to prevent recurrence of OT is oophorectomy, in which the utero-ovarian ligament is fixed either to the lateral pelvic Wall or posterior of the uterus.<sup>19</sup>

#### 4. Conclusion

OT is a rare cause of acute abdominal pain during puerperium. The diagnosis of OT during puerperium is difficult, and occasionally remains a diagnostic dilemma. The clinical and laboratory findings are variable and nonspecific. Early use of bedside abdominal ultrasonography is important in differential diagnosis of OT from other acute abdominal pathologies. A heightened awareness of the relevant risk factors, the clinical presentation, and a high degree of clinical suspicion are essential for early and accurate diagnosis of OT.

#### Conflict of interest

All the authors of this manuscript declare that there is no conflict of interests.

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None.

#### Ethical approval

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editor-in-chief of this journal on request.

#### Author contributions

HA: writing the paper, SO: collection of medical file of the patient, UA, GA, OIK: concept and design, MAK: supervisor.

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