

# DIAGNOSING OVARIAN TORSION IN THE EMERGENCY DEPARTMENT: A CASE REPORT AND LITERATURE REVIEW

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## **Abstract**

Diagnosing acute abdomen in emergency department setting, especially in women of childbearing age, is challenging. The patient may present with non-specific complaints. We were presented with a case of a 28-year-old lady with no known medical illness complaining of sudden onset left-sided abdominal pain. Multiple analgesics were given, but her pain persisted. Bedside ultrasonography was performed and noted a multiloculated cyst over the left ovary, with the largest measuring 4 x 4 cm. She then underwent laparoscopic left salpingo-oophorectomy, revealing an engorged, gangrenous left fallopian tube and the left ovarian cyst was twisted three times. Histopathological examination confirmed a left ovarian haemorrhagic twisted ovarian cyst with a paratubal cyst. This case concludes that acute abdominal pain in women of childbearing age requires prompt and thorough investigation. Clinicians should consider several potential diagnoses, including ovarian torsion.

**Keywords:** Ovarian Torsion, Emergency, Female

## **Introduction**

Ovarian torsion is an imminent gynaecological emergency that requires surgical intervention. The exact prevalence of ovarian torsion is yet unknown. It can manifest in females of any age (1). According to the available statistics, idiopathic ovarian torsion is more prevalent in women aged 20 to 40. Whereas those in their adolescence are uncommon (2). One of the important contributing factors for adnexal torsion is the size of the mass. An adnexal mass larger than 5 cm is a predominant risk factor for ovarian torsion, impacting 80% of patients. However, torsion can still happen even if there is no cyst or mass in the ovary (3). Diagnosing twisted ovarian cysts smaller than 5 cm requires a complex approach that integrates clinical expertise, high suspicion, and cutting-edge imaging methods. In this case report, we discuss the importance of early detection of ovarian torsion, exploring the symptoms, risk factors, and diagnostic techniques, focusing on the emergency department setting. Early detection is momentous to achieve a definitive management and reducing patient complications.

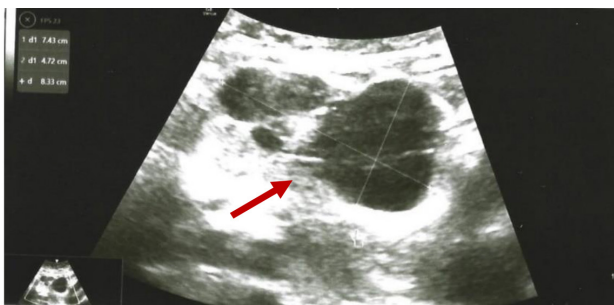
## **Case presentation**

A 28-year-old lady, Para 1, with no known medical illness, presented with left-sided abdominal pain. The pain was of sudden onset, sharp in nature, and increasing in intensity. It radiated to the back and associated with nausea and four episodes of vomiting. She reported no painful urination, haematuria, fever, vaginal bleeding, discharge, loose stool, regular bowel habits, or history of recent trauma to the abdomen.

Initially, she visited a private clinic and was given intravenous Fentanyl and Ketorolac. However, the pain did not resolve, and she was advised to come to the emergency department for further evaluation. Upon examination there, she was alert, pink, warm, with good pulse volume, capillary refill time of less than 2 seconds, moist mucous membranes, and not tachypnoeic. Physical examination revealed tenderness over the left iliac fossa. She was haemodynamically stable with a blood pressure of 119/65 mmHg, heart rate of 92 beats per minute, respiratory rate of 20 cycles per minute, oxygen saturation of 100% under room air, afebrile, random capillary blood sugar of 8.5 mmol/L and a pain score ten over ten.

Laboratory investigation and imaging noted a total white count of  $11.7 \times 10^9/L$ , haemoglobin of 14 g/dL, platelet count of  $264 \times 10^9/L$ , and urine examination was normal. The urine pregnancy test was also negative. An X-ray of the kidney, ureter, and bladder was normal. Bedside abdominal ultrasonography was performed and showed a multiloculated left ovarian cyst, with the largest cyst measuring 4 cm x 4 cm, with absence of free fluid. The bilateral kidneys and abdominal aorta were normal, and no intimal flap was seen.

Given the patient was still in severe pain despite multiple analgesics given, she was started on an intravenous infusion of fentanyl. Subsequently, the case was referred to the gynaecology team to rule out ovarian torsion due to a twisted left ovarian cyst. She then underwent an emergency laparoscopic left salpingo-oophorectomy. The intraoperative findings noted that the left fallopian tube was engorged and gangrenous, with the presence of a left ovarian cyst measuring 7 cm x 5 cm. The fallopian tube was twisted thrice and gangrenous, with a blood clot at one side of the ovary. Histopathological examination of the left ovary and left fallopian tube was suggestive of a haemorrhagic twisted cyst and paratubal cyst. The procedure was uneventful, and the patient was discharged well on post-operative day one with a follow-up appointment in three months times to review her well-being.



**Figure 1:** Multiloculated left ovarian cyst. Largest cyst (red arrow)

### Discussion

The ovary is held in place in the pelvic cavity by two main ligaments: the infundibulopelvic ligament and the utero-ovarian ligament. Ovarian torsion occurs when the ovary twists along these ligaments, cutting off its blood and lymphatic supply (4). This twist first obstructs the veins and lymphatic vessels, as they have thinner walls compared to the arteries. If the twist isn't resolved, it eventually also blocks arterial blood flow, leading to swelling, lack of oxygen, and eventually, tissue necrosis of the ovary. Patients with partial torsion might experience intermittent pain, while those with complete torsion typically have continuous severe pain. A study of 22 cases found that the time from the initial examination to surgery averaged 11 hours for salvageable ovaries and 21 hours for non-salvageable ovaries (5). In this particular case, the patient

had severe, continuous pain requiring opioids for relief, indicating ongoing ischemia. She was taken to surgery about 9 hours after her symptoms began.

For 10 years, research conducted at a Women's Hospital found that adnexal torsion ranked as the sixth most prevalent gynaecologic surgical emergency condition. It constituted 2.7% of the total 3,772 cases at that hospital (6). In comparison, the prevalence of ectopic pregnancy was 63.8%, followed by corpus luteum accident at 14.5%, pelvic infection at 9%, and appendicitis at 4.8% (6). Bridwell et al. (7) found that 15% of patients undergoing surgical intervention for adnexal masses were diagnosed with ovarian torsion. In contrast, another paper by Pramana et al. (8) found that the frequency of adnexal torsion is lower, ranging from about 2.5-7.4%.

As an emergency doctor, it is very vital for a physician to detect the condition early. This is to avoid complications whether immediate or long term. Those complications include ovarian infarction and the possibility of associated subfertility, haemorrhage, and peritonitis. Diagnosis can be challenging as it can be presented with a variety of signs and symptoms. The classic presentation of ovarian torsion is sudden, severe, unilateral, lower abdominal or pelvic pain with nausea and vomiting, and our patient's background history and age were very suggestive towards the diagnosis of ovarian torsion. The most common presentation of ovarian torsion is a sudden onset of abdominal pain (87%), followed by nausea/vomiting (59%) (9). The character of the pain can vary from sharp, colicky, dull aching to nonspecific abdominal pain (10). It can also radiate to the flank, loin, and groin, making the diagnosis more challenging and mimicking renal colic, as occurred in this patient. In one of the series evaluating 50 patients with ovarian torsion, 90% of patients had pelvic pain, followed by a palpable ovarian mass in 85-96%, nausea with or without vomiting in 47-70%, and fever in 2-20%, which is typically low-grade and may be a marker of necrosis, particularly in the setting of leukocytosis. Other nonspecific symptoms include non-menstrual vaginal bleeding, which accounts for 4.4%. A high index of suspicion and early diagnosis are crucial and momentous to prevent further adverse outcomes such as infertility, haemorrhage, and peritonitis (11).

The right ovary seems more commonly affected by torsion than the left ovary. This is due to the longer right utero-ovarian ligament and the presence of a sigmoid colon on the left side (12). Other common risk factors of torsion include previous torsion, a mass of approximately 5cm, pregnancy, and ovarian stimulation (10, 13, 14). Other than the mentioned risk factors, torsion can also be associated with ovarian pathology like dermoid cysts. A dermoid cyst increases the ovary's size and predispose it to twisting (15, 16). A twisted ovary compromises blood flow and results in ovarian torsion. However, it is important to remember that ovarian torsion can occur even in the absence of an ovarian mass or cyst (3). The only noted risk factor in this patient was an ovarian cyst measuring approximately 5 cm, which

was identified by bedside ultrasound upon presentation. Despite the right side being more commonly affected, the torsion in this patient occurred on the left side.

The role of ultrasound, in this case, is a game changer. It changes the paradigm of diagnosis from just simple renal colic to ovarian torsion, which is a gynaecological emergency. Bedside ultrasound is critical not only to exclude other differential diagnoses, but the finding by expertise may also suggest the viability of the ovary. Pelvic ultrasonography is the first supporting examination for patients with suspected ovarian cyst torsion. The ultrasonography grayscale description of ovarian cyst torsion is unilateral ovarian enlargement > 4 cm, the presence of the “pearl strand” sign, the coexistence of a bent ovarian mass, free of pelvic fluid and a twisted vascular pedicle. Doppler ultrasound is also used as a diagnostic tool for ovarian cyst torsion. While the presence of flow on Doppler does not exclude torsion, it shows that the ovaries are viable. A systematic review and meta-analysis were conducted to study the diagnostic accuracy of ultrasound signs for detecting adnexal torsion. Based on this study, five ultrasonography signs were being compared: ovarian oedema, adnexal mass, ovarian Doppler flow, whirlpool sign, and pelvic free fluid. Among those, ovarian oedema, whirlpool signs, and decrease or absence of Doppler flow were shown to have good specificity with moderate sensitivity in detecting adnexal torsion (17). However, the presence of Doppler flow does not exclude torsion (4).

For this case, a bedside ultrasound of this patient did not find any signs suggestive of ovarian cyst torsion. However, due to ongoing severe pain, she was still arranged for a diagnostic laparoscopic as a definitive treatment, as a twisted ovarian cyst can cause ovarian torsion. It is important to remember that ultrasonography has a sensitivity range of 35% to 85%, thus while it can be used to rule in the condition, it should not be used to rule out ovarian torsion (3). The findings of ultrasound may be influenced by few factors such as patient body habitus, presence of a good scanning window at that point of time, and many more. A study shows that pelvic ultrasound done by emergency physicians can statistically and clinically contribute to a reduction in emergency department length of stay (18). It also helps to diagnose intraperitoneal complications. Most commonly, the affected ovary will appear enlarged, rounded, and heterogenous in appearance (18). Thus, early recognition is crucial to expedite the gynaecology team referral and ensure proper definitive management.

### **Conclusion**

Ovarian torsion is a challenging diagnosis due to the lack of specific symptoms or definitive diagnostic measures. Conditions such as acute appendicitis, acute pelvic inflammatory disease, and ectopic pregnancy can closely mimic adnexal torsion, particularly in females with no prior gynaecological issues. Ovarian torsion should be seriously

taken into consideration when a young female presents with severe abdominal pain and an ultrasound reveals an ovarian cyst. Prompt care and early diagnosis are essential to avoid complications.

### **Acknowledgement**

The authors would like to express our utmost gratitude to the patient for her permission and consent for this case report.

### **Competing interests**

The authors declare no conflict of interest.

### **Informed Consent**

A verbal informed consent had been obtained prior to writing this case report.

### **Financial support**

No funding was received for this work.

### **References**

1. Huang C, Hong MK, Ding DC. A review of ovary torsion. *Tzu Chi Med J.* 2017; 29(3):143.
2. Idris S, Daud S, Ahmad Sani N, Tee Mei Li S. A Case of Twisted Ovarian Cyst in a Young Patient and Review of the Literature. *American Journal of Case Reports.* 2021 Nov 17; 22:e933438
3. Long B, Targonsky E, Koyfman A. Just the Facts: Ovarian torsion in the emergency department setting. *CJEM.* 2020 Nov 11; 22(6):756–9.
4. Moro F, Bolomini G, Sibal M, Vijayaraghavan SB, Venkatesh P, Nardelli F, et al. Imaging in gynecological disease (20): clinical and ultrasound characteristics of adnexal torsion. *Ultrasound in Obstetrics & Gynecology.* 2020 Dec 10; 56(6):934–43.
5. Anders JF, Powell EC. Urgency of Evaluation and Outcome of Acute Ovarian Torsion in Pediatric Patients. *Arch Pediatr Adolesc Med.* 2005 Jun 1;159(6):532.
6. Hibbard LT. Adnexal torsion. *Am J Obstet Gynecol.* 1985 Jun; 152(4):456–61.
7. Bridwell RE, Koyfman A, Long B. High risk and low prevalence diseases: Ovarian torsion. *Am J Emerg Med.* 2022 Jun; 56:145–50.
8. Pramana C, Monica I, Rizkik O, Dewanti I, Andriani D, Adeliyani RE. Ovarian cyst torsion: A case report. *Int J Med Rev Case Rep.* 2020 Dec 31; 4:44-6.
9. White M, Stella J. Ovarian torsion: 10-year perspective. *Emergency Medicine Australasia.* 2005 Jun 7; 17(3):231–7.
10. Houry D, Abbott JT. Ovarian torsion: A fifteen-year review. *Ann Emerg Med.* 2001 Aug; 38(2):156–9.
11. Kokoska ER, Keller MS, Weber TR. Acute ovarian torsion in children. *The American Journal of Surgery.* 2000 Dec; 180(6):462–5.

12. Breech LL, Hillard PJA. Adnexal torsion in pediatric and adolescent girls. *Curr Opin Obstet Gynecol*. 2005 Oct; 17(5):483–9.
13. Larraín D, Casanova A, Rojas I. Ovarian Torsion after Hysterectomy: Case Report and Concise Review of the Reported Cases. *Case Rep Obstet Gynecol*. 2018 Jul 4; 2018:1–3.
14. Oltmann SC, Fischer A, Barber R, Huang R, Hicks B, Garcia N. Cannot exclude torsion—a 15-year review. *J Pediatr Surg*. 2009 Jun; 44(6):1212–7.
15. Lucchetti MC, Orazi C, Lais A, Capitanucci ML, Caione P, Bakhsh H. Asynchronous Bilateral Ovarian Torsion: Three Cases, Three Lessons. *Case Rep Pediatr*. 2017; 2017:1–6.
16. Aksoy H, Ozyurt S, Aksoy U, Acmaz G, Karadag OI, Karadag MA. Ovarian torsion in puerperium: A case report and review of the literature. *Int J Surg Case Rep*. 2014; 5(12):1074–6.
17. Garde I, Paredes C, Ventura L, Pascual MA, Ajossa S, Guerriero S, et al. Diagnostic accuracy of ultrasound signs for detecting adnexal torsion: systematic review and meta-analysis. *Ultrasound in Obstetrics & Gynecology*. 2023 Mar 11; 61(3):310–24.
18. Chiem AT, Chan CHY, Ibrahim DY, Anderson CL, Wu DS, Gilani CJ, et al. Pelvic ultrasonography and length of stay in the ED: an observational study. *Am J Emerg Med*. 2014 Dec; 32(12):1464–9.