

Vibration-related ovarian torsion in a patient undergoing in vitro fertilization: A case report

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Summary

Objective: Ovarian torsion, an uncommon cause of acute abdomen, represents a gynecologic surgical emergency. The incidence of ovarian torsion is high in patients receiving ovarian hyperstimulation due to enlarged ovaries, and ovarian hyperstimulation syndrome (OHSS) also facilitates the occurrence of ovarian torsion. Furthermore, intense exercise and body movement may increase the risk of ovarian torsion. **Case Report:** Herein, the case of a patient with ovarian torsion after ovarian hyperstimulation is reported here. This ovarian torsion may have been related to the vibration caused when she rode a motorcycle for an entire day on her holiday, 3 days after transvaginal oocyte retrieval. **Conclusion:** Ovarian torsion is a rare but severe complication in patients receiving assisted reproductive technology (ART), and emergent surgery with conservative treatment is recommended for final diagnosis and management. Exercise and vibration, which may increase the risk of torsion, should be considered as a risk factor for ovarian torsion, particularly in patients receiving ovarian hyperstimulation.

Key words: Artificial reproductive technology; Ovarian hyperstimulation syndrome; Ovarian torsion; Vibration.

Introduction

Ovarian torsion is implicated in 2% to 3% women with acute abdomen presenting at the emergency department [1], and its annual prevalence is approximately 2% to 6% [2]. However, its actual incidence remains unknown because this condition typically has non-specific symptoms and signs, and surgery is required to establish a final diagnosis [2]. The ovarian tissue twists around its pedicle, leading to a compromised blood supply from the infundibular ligament, and blockage of the venous return. Tissue swelling and edema occur, followed by infarction and internal bleeding [1]. For women of reproductive age, delayed diagnosis of ovarian torsion may result in the loss of ovary leading to fertility problems, thrombophlebitis, peritonitis and even death [3]. Risk factors for ovarian torsion include ovarian cysts, pregnancy, hypermobile adnexa due to hydrosalpinx, an elongated fallopian tube and previous tubal ligation, and ovulation induction [4]. Controlled ovarian hyperstimulation (COH), a standard protocol in assisted reproductive technology (ART), increases the number of follicles and oocytes to facilitate pregnancy. However, COH may induce ovarian hyperstimulation syndrome (OHSS) in some cases. Ovarian torsion can also occur due to the enlarged ovary. Intense exercise and sudden body movement may further increase the possibility of ovarian torsion [5]. Herein, we report an uncommon case of ovarian torsion in a patient undergoing in vitro fertilization (IVF). The ovarian torsion oc-

curred after the patient rode a motorcycle for an entire day, 3 days after transvaginal oocyte retrieval (TVOR).

Case Report

A woman aged 39 years, gravida 0, para 0, living in Hong Kong, underwent IVF treatment in our hospital for unexplained infertility. Antagonist protocol with follitropin alfa/lutropin alfa (Pergoveris[®], r-hFSH [150 IU] + r-hLH [75 IU]; Merck Sereno) and cetrorelix (Cetrotide[®]; Merck Sereno) was administered for ovulation stimulation, and 23 oocytes were retrieved. After 3 days, she rented a motorcycle for sightseeing. Thereafter, she presented to our emergency department with sudden-onset lower abdominal pain with intermittent nausea and vomiting in the night after the whole-day activity (longer than 12 hours). Physical examination revealed muscle guarding, right lower abdominal tenderness and rebound tenderness. Trans-abdominal ultrasonography revealed bilateral enlarged ovaries, sized 9.8 cm × 5.1 cm on the right side, and 9.0 cm × 4.9 cm on the left side (Figure 1). Scant ascites was also noted. Right ovarian torsion was highly suspected, and emergent laparoscopic surgery was performed. During the surgery, the right ovary was discovered to be twisted for two rounds along with the ovarian ligament and fallopian tube (Figure 2). Hemorrhage, of approximately 100 mL of fresh blood, and partial gangrenous change in the right ovary were also noted. Detorsion was performed, and the bleeding was controlled carefully through electrocauterization and compres-

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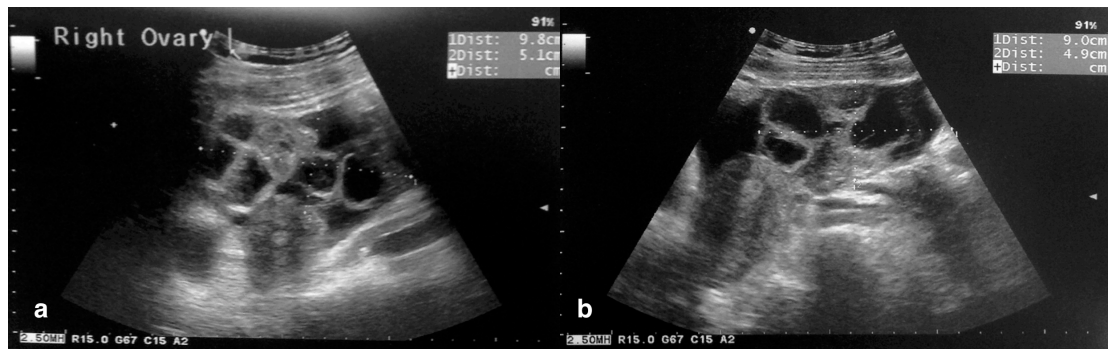


Figure 1. — Trans-abdominal ultrasound. (a) Enlarged right ovary (9.8 × 5.1 cm). (b) Enlarged left ovary (9.0 × 4.9 cm) with ascites.

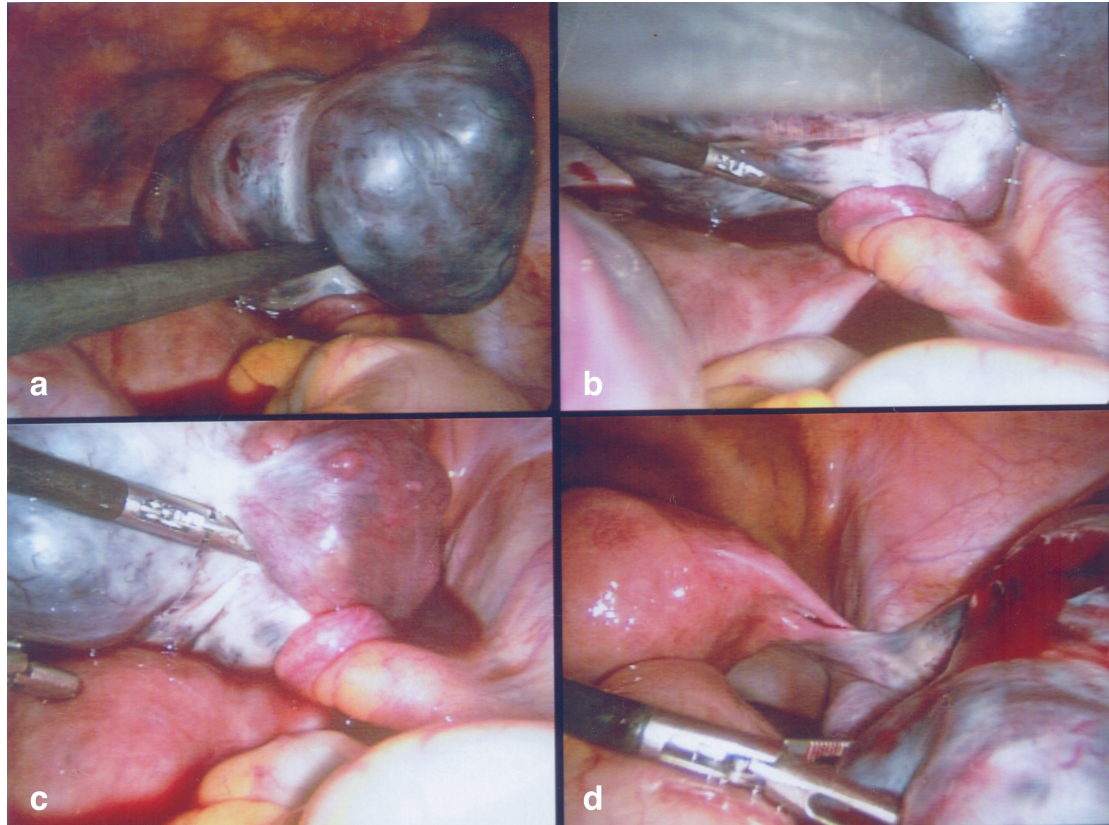


Figure 2. — Emergent laparoscopy. (a) Partial gangrenous change of the right ovary. (b) Torsion for two rounds along with the ovarian ligament and fallopian tube. (c) Approximately 100 mL of internal bleeding was noted. (d) After detorsion, the ovary regained blood perfusion.

sion (Figure 3). The postoperative course was uneventful, and the patient was discharged 1 day after the surgery.

Discussion

Although uncommon, ovarian torsion is a major complication in patients receiving ART, including IVF and intrauterine insemination. Bilateral ovaries enlarge under the stimulatory effect of gonadotropins; thus, the risk of torsion increases, particularly in patients with OHSS and persistent cysts due to pregnancy. In a large-scale study, the incidence of ovarian torsion after IVF was 0.08%, and the diameter of

the twisted ovary ranged from 5 to 22 cm (mean: 8 cm). In patients with OHSS, the incidence of ovarian torsion was 2.8%, which is 49 times higher than that in patients without OHSS (0.057%) [6]. Ovarian torsion mostly occurs when the size of the ovary is approximately 6 to 8 cm [7]. In patients with OHSS, the ovaries are iatrogenically enlarged, facilitating ovarian torsion. In moderate and severe OHSS, the ovaries are even more mobile due to the accumulation of ascites; therefore, the prevalence of ovarian torsion increases with the severity of OHSS [8]. In our patient, mild OHSS was diagnosed due to the presence of bilateral enlarged ovaries without accompanying ascites [9].

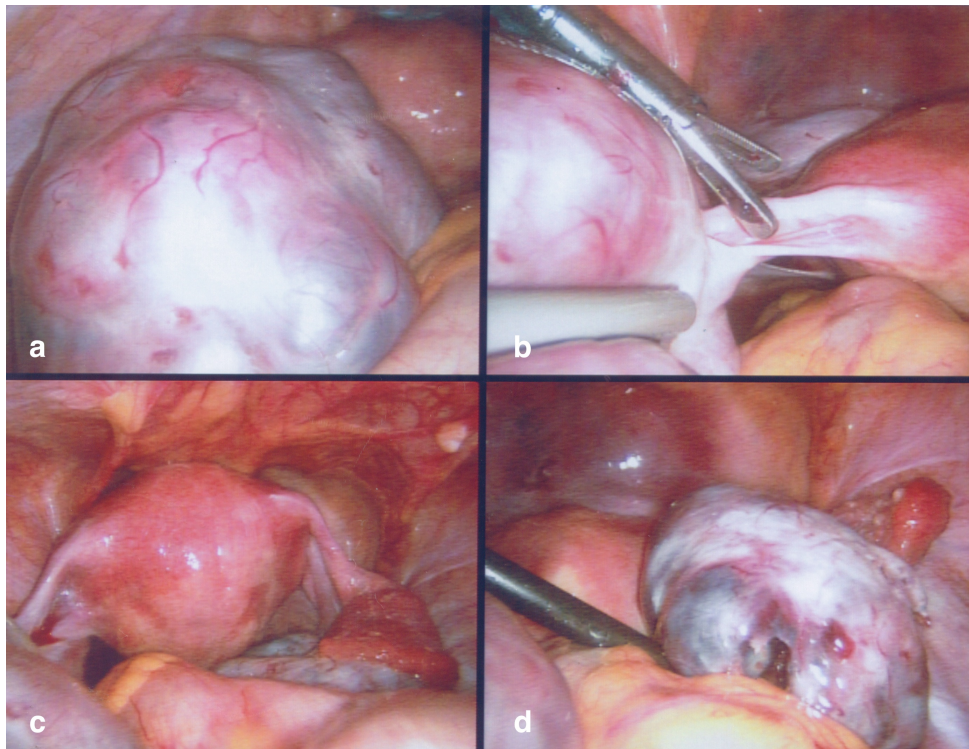


Figure 3. — (a, b) The left ovary was enlarged without torsion. (c, d) After the procedure, the bilateral ovaries revealed normal perfusion with similar size.

One risk factor for ovarian torsion is sudden body movements, and patients receiving ovarian stimulation should be advised to avoid intense exercise for at least 1 month, or until after the ovaries have regressed to their baseline size [5]. Our patient lived in Hong Kong and traveled to Taiwan for IVF treatment. After oocyte retrieval, she rode a motorcycle for an entire day, and the persistent vibration may have increased the risk of ovarian torsion. Motorcycle-related vibrations can cause hand-arm vibration syndrome (HAVS), including carpal tunnel syndrome and Raynaud's phenomenon [10]; however, vibration-associated ovarian torsion has rarely been mentioned in the literature. Cross-border-assisted reproduction [11] and cross-border reproductive care [12] have become increasingly common in recent years, and patients traveling overseas for ART may perform more exercise and physical activity during their treatment course than when they received the treatment at home. More emphasis should be placed on obtaining all the patient information, including that regarding daily activity. The possibility of ovarian torsion should be considered in patients receiving ovarian stimulation. Early diagnosis and conservative surgical management with detorsion are essential to preserve fertility, regardless of the ischemic-hemorrhagic features of the ovary [13]. Placing the enlarged ovary in the cul-de-sac, posterior to the uterus, can aid in reducing ovary mobility [8].

Conclusion

Ovarian torsion is a rare but severe complication in patients who receive ART. Although the symptoms of ovarian torsion can vary and diagnostic tools, such as sonography, Doppler imaging, and computed tomography or magnetic resonance imaging, can be unreliable [3], ovarian torsion should be considered, and exploratory laparoscopy with conservative treatment is required for final diagnosis and management. Exercise and vibration can increase the risks of ovarian torsion, particularly in patients opting for medical tourism.

Ethics Approval and Consent to Participate

The study was approved by the ethics committee of Taipei Medical University Hospital (Institutional Review Board Number: N201711084), and as this was a retrospective study, the need for informed consent was waived.

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Conflict of Interest

The authors declare no competing interests.

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