

# Conservative laparoscopic management of adnexal torsion based on a 17-year follow-up experience

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## Abstract

Laparoscopic unwinding of adnexal torsion has been proposed for decades. However, this technique is still controversial regarding the concern of thromboembolic events. We present two cases of conservative laparoscopic management of adnexal torsion. In the first case, a 16-year-old adolescent with serous cystadenoma was successfully managed by untwisting and cystectomy. We followed up this patient for 17 years with regular re-examinations in our hospital. To the best of our knowledge, this is the longest follow-up reported of this condition. In the second case, a 32-year-old infertile woman who received oocyte retrieval 3 days before being admitted to hospital was referred to hospital with right ovarian torsion. We treated her successfully based on our long-term follow-up experience, and she is now asymptomatic and in her 7th month of pregnancy.

## Keywords

Adnexal torsion, conservative treatment, fertility preservation, serous cystadenoma, laparoscopy, oocyte, ovary, ovarian hyperstimulation syndrome

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## Introduction

Adnexal torsion has a prevalence of 2.7%,<sup>1,2</sup> and has been reported to be the fifth most common gynaecological emergency.<sup>3</sup> Because of the potential detrimental effects of adnexal torsion on fertility and



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ovarian function, women who desire fertility are especially concerned.<sup>4</sup> Additionally, with the worldwide popularity of assisted reproductive technology, adnexal torsion following ovarian hyperstimulation syndrome (OHSS) is an emerging complication.<sup>5</sup> This condition is also a potentially life-threatening complication and should be properly managed. We herein report two cases of acute adnexal torsion that were successfully untwisted with preservation of fertility by laparoscopic conservative management.

### **Case 1**

In June 2000, a 16-year-old adolescent presented to our hospital complaining of severe right-sided pelvic pain associated with bouts of nausea and vomiting for 2 hours. A physical examination showed a tender mass of 7 cm at the right iliac fossa with rebound tenderness. Pelvic ultrasonography showed a large cystic mass arising from the right ovary, measuring 75 × 64 mm. The uterus and left ovary were unremarkable and only a small amount of free fluid in the cul-de-sac was noted. Doppler ultrasonography showed an absence of circulation in the right ovary, which supported the diagnosis of adnexal torsion. After obtaining informed consent, we immediately performed a diagnostic laparoscopy and ovarian cyst excision. At surgery, an intact ovarian cyst of approximately 7 × 6 × 5 cm was found to originate from the dark bluish right ovary, with the pedicle twisted 540 degrees. After detorsion of the twisted adnexa, the cyst was completely stripped without rupture, and this showed serous cystadenoma by further frozen section examination. We continued observation until the right ovary and adnexa changed to a normal colour to confirm improvement of the vascular supply before finishing surgery. At 1 month of follow-up, ultrasonography showed that the right ovary was

34 × 24 mm in diameter, and the patient reported menstruation as before surgery. Her 2-month and 3-month follow-up examinations were normal. She continued re-examinations in our hospital at annual visits, and the results were unremarkable. At follow-up, ovulation was detected in both ovaries. Ten years after surgery, the patient was admitted at 39 weeks of gestation and vaginally delivered a healthy male infant. Her most recent follow-up was 4 months ago, and her right ovary measured 20 × 16 mm (5 antral follicles) and her left ovary measured 22 × 13 mm (7 antral follicles). No remarkable indexes were observed.

The patient provided verbal informed consent for publication of this report.

### **Case 2**

A 32-year-old woman who had been attempting to achieve pregnancy for 6 years was referred to our reproductive medicine centre with a request for intracytoplasmic sperm injection in October 2016. The indication was primary infertility, and her husband had asthenozoospermia and teratospermia. At 3 days after oocyte retrieval, the patient presented to our hospital complaining of 7 hours of right lower quadrant and right flank pain with nausea and vomiting for no known cause. Her temperature and blood pressure were normal. An abdominal examination showed normal bowel sounds, moderate right lower quadrant tenderness, and voluntary guarding. A vaginal examination showed a tender mass of 10 cm at the right iliac fossa with rebound tenderness. An ultrasound scan indicated hyperstimulation with enlarged ovaries that measured 97 × 68 mm (right ovary) and 71 × 50 mm (left ovary), and excessive fluid in the pelvic area. Doppler imaging showed diminished right ovarian vascular flow compared with the left ovary. A diagnosis of OHSS with right

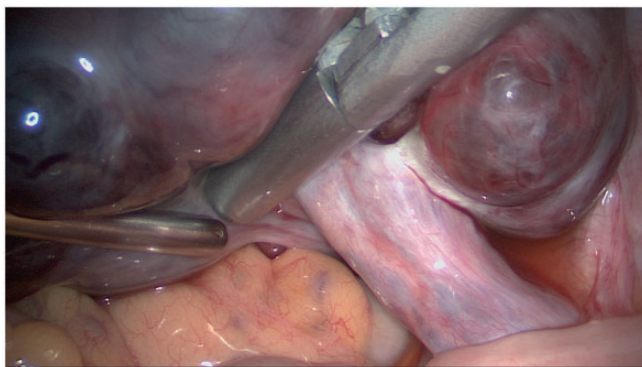
ovarian torsion was made and an emergency operation was immediately performed. At laparoscopy, there was approximately 500 ml of clear ascitic fluid. The right ovary was  $9 \times 6 \times 5$  cm in size, dark blue, and the pedicle was twisted 360 degrees (Figure 1). The left ovary appeared healthy, was  $5 \times 4 \times 4$  cm in size, and had multiple follicles on the surface. At 5 minutes after untwisting the right pedicle, there was an improvement of colour. We continued observation until the right ovary, as well as the fallopian tube, turned a similar colour to the left ovary 30 minutes later (Figure 2). At 9 days after operation, an ultrasound scan indicated that the right ovary was  $63 \times 48$  mm in size with good

blood flow signals. The patient was then discharged. On 3 April 2017, frozen-thawed embryo transfer was performed, and her pregnancy test 12 days later was positive. Currently, the patient is asymptomatic and in her 7th month of pregnancy.

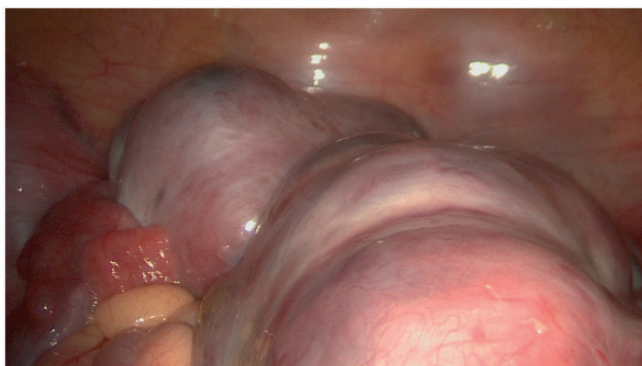
The patient provided verbal informed consent for publication of this report.

## Discussion

Because of the potential loss of ovarian function with a prolonged time of adnexal torsion, making an early diagnosis and immediately proceeding with management are important. Despite the absence of specific diagnostic tests for ovarian torsion,



**Figure 1.** Photograph showing a dark blue appearance of the twisted right adnexa.



**Figure 2.** Photograph showing improvement in colour of the right adnexa 30 minutes after untwisting.

ultrasonography and Doppler may facilitate its diagnosis.<sup>4,6</sup> An enlarged ovary with diminished Doppler flow is consistent with torsion.<sup>6,7</sup> However, normal blood flow may be seen in this condition if the adnexa has transiently untwisted, it is only partially twisted, or if ultrasound is performed early in the torsion process when only venous and lymphatic drainage are obstructed, but not the arteries.<sup>7</sup> These are conditions that clinicians should especially be aware of.

Adnexal torsion has traditionally been treated by adnexectomy in case uncoiling of the ovarian pedicle results in a thromboembolic event. Since conservative management of adnexal torsion by laparoscopy was first described in 1990,<sup>8</sup> several other reports have also described successfully managing the same situation with the same technique.<sup>9,10</sup> A review of the literature showed that none of the 309 patients who underwent conservative surgery demonstrated a thromboembolic event, while two cases of thromboembolism followed 672 adnexectomies.<sup>11</sup> Subsequently, two large retrospective series showed no thromboembolic event in any case of detorsion,<sup>12,13</sup> further supporting the conservative approach to adnexal torsion.

As found in our cases, the ischaemic-haemorrhagic appearance of the adnexa does not indicate necrosis, which is likely secondary to venous-lymphatic stasis, rather than gangrene.<sup>4,14</sup> Even if the adnexa is twisted for longer than 7 hours, as in case 2, conservative management should also be attempted. After untwisting the pedicle, detecting an improvement in colour indicates an improvement in blood supply and conservation. Even if immediate turning to a normal colour is not observed in the untwisted adnexa, conservative management should not be precluded.<sup>4</sup> This is because numerous retrospective studies, case series, and animal studies have shown

postoperative ovarian function biochemically and histologically.<sup>13,15–20</sup>

The increasing infertility rate and superiority of infertility treatment have led to an increase in using assisted reproductive technology, with its possible complications, including OHSS.<sup>21</sup> An enlarged ovary due to exogenous gonadotropin stimulation is an important factor for adnexal torsion, which is a contributing factor to the increasing torsion rate in patients with OHSS.<sup>14</sup> For these infertile women, ovarian preservation is especially important because adnexectomy will jeopardize their fertility, lead to dissatisfaction, and even cause medical disputes and ethical events. We managed our situation by untwisting based on our 17-year follow-up experience, and the patients recovered well with preservation of their fertility. Because more surgeons may face the same situation, the long-term follow-up results should be reported and evidence provided for conservative management of adnexal torsion.

Besides the patients who we presented in this report, there were also two similar patients whose adnexa was twisted, but was successfully managed by this conservative technique in our hospital. Their follow-ups showed recovery of ovary function. Therefore, with no infections, no adhesion, and no malignant problems, this conservative approach for managing adnexal torsion should always be considered whenever fertility is desired.

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The authors declare that there is no conflict of interest.

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