

Empty Follicle Syndrome Associated with Ovarian Torsion in an In Vitro Fertilization Program

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ABSTRACT

We report a very rare case of ovarian torsion following controlled ovarian stimulation for in vitro fertilization in which no oocytes were obtained at the time of ovum retrieval from the left torsed ovary. The patient was a 33-year-old nulligravida female undergoing controlled ovarian stimulation. On day 14, the patient complained of lower left abdominal pain with nausea. Transvaginal oocyte retrieval from the right ovary was performed. The patient subsequently underwent laparoscopy 6 hours following oocyte retrieval. A portion of the left ovary was observed. The ovary was detorsed at the time of laparoscopy followed by peritoneal lavage.

Key Words: Empty follicle syndrome, Ovary, Torsion, Laparoscopy, IVF, Ovulation induction.

INTRODUCTION

Empty follicle syndrome (EFS) is characterized by failure to obtain oocytes from mature follicles after ovulation induction for assisted reproduction treatment. It has a reported incidence of 0.6% to 7%.¹ The etiology of EFS is a subject of controversy. Tsuiki et al² suggested that it might be a manifestation of intrinsic ovarian dysfunction. Ndukwe et al³ concluded that EFS is a drug-related phenomenon caused by very low serum hCG levels.

Adnexal torsion is the fifth most common gynecologic surgical emergency with a prevalence of 2.7%.⁴ Ovarian induction is believed to be a predisposing factor for adnexal torsion. Pena et al⁵ demonstrated in a recent study that ovulation induction was associated with ovarian torsion in 19% of patients.⁵

The purpose of this report is to describe a case of empty follicle syndrome associated with ovarian torsion. This appears to be the first published report.

CASE REPORT

The patient was a 33-year-old nulligravida female whose husband had asthenoteratospermia. Tubal patency had been demonstrated with hysterosalpingography. The day 3 FSH level was 2.6 IU/mL, and LH level was 2.1 IU/mL. The long protocol of pituitary desensitization was commenced and maintained with daily injection of 0.1 mg of triptorelin (Arvekap, Ipsen) administered on day 21 of the preceding menstrual cycle, for 2 weeks. Ovulation induction was achieved with daily subcutaneous injections of 300 IU of recombinant human FSH (Gonal F, Serono). On day 13 of stimulation, sonography of the left ovary showed 10 follicles of 19 mm in mean diameter and 5 smaller follicles (16 mm in mean diameter); the right ovary had 12 follicles of 19 mm in mean diameter and 6 smaller follicles. Estradiol level was 1741 pg/mL. A dose of 5,000 IU of hCG was administered intramuscularly on day 13, and oocyte retrieval was scheduled at 36 hours later on day 15. Late in the afternoon on day 14, the patient had a sudden onset of lower left abdominal pain with nausea. A physical examination revealed lower abdominal tenderness especially on the left side and signs of peritonitis on day 15. Transvaginal oocyte retrieval was undertaken. No oocytes were

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retrieved from the left ovary; 18 oocytes were obtained from the right ovary. After the procedure was completed, the patient's symptoms worsened. Laparoscopy was performed 6 hours later and revealed torsion of the left ovary. The ovary was detorsed under laparoscopic control and peritoneal lavage was performed. Antibiotics were given for 10 days. The patient's clinical symptoms resolved 2 days later, and transcervical transfer of 4 embryos, created from retrieved oocytes of the right ovary, was performed on day 18. Unfortunately, pregnancy did not ensue.

DISCUSSION

Acute adnexal torsion is an uncommon but serious complication of controlled superovulation in assisted reproduction programs. The enlarged stimulated ovaries may explain this association. Adnexal torsion may involve twisting of the ovary, fallopian tube, or both. If complete ovarian torsion remains undiagnosed and untreated, it can lead to necrosis with peritonitis, loss of the ovary, infertility, and even death. Early diagnosis and immediate surgical intervention are, therefore, essential if adnexal organs and function are to be preserved. Abnormal flow detected by Doppler sonography is highly predictive of adnexal torsion and, therefore, useful in the diagnosis of ovarian torsion. However, when normal flow is detected by Doppler sonography, it does not necessarily exclude ovarian torsion; in fact, torsion is missed in 60% of cases, and diagnosis in these cases is delayed.⁵ In our case, we did not perform a Doppler study.

Since successful conservative management of adnexal torsion by laparoscopy was described by Mage et al,⁶ this technique has been extensively used even when diagnosis is delayed and the adnexa appear ischemic and hemorrhagic with subsequent good functional results.

In a recent study, Robson and Kerin⁷ described a case of acute adnexal torsion before oocyte retrieval in an in vitro fertilization cycle. They had aspirated 8 follicles and obtained 7 oocytes from the torsed ovary. They noticed a great difference in the characteristics of the follicular fluid obtained from the 2 ovaries; in all the follicles from the affected ovary, fluid was heavily bloodstained, and in all the follicles from the contralateral ovary, it was clear. In our study we aspirated 12 follicles, and no oocytes were obtained from the affected left ovary. We also noticed that the follicular fluid from the left affected ovary was dark and bloodstained as compared with the clear-colored follicular fluid from the right ovary. EFS is defined as the failure to retrieve oocytes from mature follicles following ovulation

induction for assisted reproductive treatments. Its pathophysiology is unclear. Evidence has been provided⁸ to suggest that EFS is more likely to represent a defect in the in vivo bioactivity of hCG rather than being an intrinsic patient problem,² although Awonuga¹ has demonstrated its occurrence in the presence of normal hCG concentrations. In our opinion, evidence suggests that EFS may be a multifactorial problem with common manifestations and the lack of oocyte retrieval during the operation.²

It is known from pathological findings that venous and lymphatic stasis occur early in torsion and arterial flow is decreased at this stage. It seems that our case was one of ovarian torsion that resulted in decreased blood flow to the affected ovary, which in turn might have resulted in reduced concentration of hCG to that ovary inducing dysfunctional folliculogenesis. Venous and lymphatic stasis in torsion may also have contributed to intrinsic ovarian dysfunction and dysfunctional folliculogenesis. In conclusion, to the best of our knowledge this is the first published report of empty follicular syndrome from a torsed ovary.

Conservative management with detorsion under laparoscopic control represents the best option for treatment.

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