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Case Report

## Ectopic ovarian pregnancy following in vitro fertilization: case report

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### ABSTRACT

Ovarian pregnancy is a rare form of extrauterine ectopic pregnancy. Risk factors such as reproductive treatments and infertility have been identified in recent studies. In this article, we present a case of ovarian ectopic pregnancy occurring following in vitro fertilization treatment and a fresh embryo transfer. The diagnosis of ovarian pregnancy was made during transvaginal sonography performed due to suspected ectopic pregnancy. Ovarian ectopic pregnancy is a rare clinical phenomenon. Late diagnosis and lack of appropriate intervention may have catastrophic results. Several mechanisms and risk factors are proposed, and their acknowledgment may improve early diagnosis and prevention of complications.

**Keywords:** Ectopic pregnancy, Ovarian pregnancy

### INTRODUCTION

The Incidence of spontaneous primary ectopic ovarian pregnancy ranges from 0.5 to 3% of all the ectopic pregnancies.<sup>1</sup> Assisted reproductive techniques increase the risk of ovarian ectopic. The incidence of ovarian ectopic pregnancy following In vitro fertilisation - embryo transfer is around 0.3% and accounts for 6% of all the ectopic pregnancies post IVF-ET.<sup>2,3</sup> Two different mechanisms can explain the occurrence of ovarian pregnancy: direct fertilization of an ovulated mature egg inside the ovary (primary, follicular fertilisation) or ectopic implantation of a fertilized embryo with retrograde migration from the endometrial cavity to the ovarian surface (secondary).<sup>4</sup> The latter mechanism would most likely be responsible for ovarian ectopic after IVF-ET. Detecting ovarian ectopic at an early stage is challenging and in most cases the diagnosis is made during work up for acute abdominal pain or bleeding.

In this case report, study describe an ovarian pregnancy following IVF-ET.

### CASE REPORT

The patient was a 32-year female with primary infertility. She and her husband had no prior medical history and underwent investigations for the infertility. Her obstetric history was G2E1 with history of previous right tubal ectopic pregnancy in 2012 managed medically. The present pregnancy was a result of embryo transfer on day 5 (3 embryos transferred) after long protocol of ovulation. Her  $\beta$  Hcg level was 217 mIU/ml on day 1 which doubled to 553 after 36 hours. At six weeks period of gestation she presented with pain lower abdomen. She was hemodynamically stable with normal vital parameters. Trans-vaginal sonogram demonstrated empty uterine cavity and suspicious left adnexal mass with gestational sac like structure (7.4×8.4×2.9 cm dimension) observed in the mass. Left ovary could not be visualized separate from the mass and moderate free fluid was present in the peritoneum. Her  $\beta$  Hcg level was 1671 mIU/ml. A diagnosis of ruptured ectopic pregnancy was made. An exploratory laparotomy was performed shortly after and hemoperitoneum (1200 ml) was drained.

Uterus, right ovary and bilateral fallopian tubes with their fimbrial ends were found to be healthy. Ruptured left ovarian ectopic was identified and excised from the ovary via wedge resection and the remaining tissue sutured using catgut. The operative and postoperative period was uneventful and the patient was followed with sequential  $\beta$  Hcg levels till they dropped to zero. The histopathology report demonstrated ovarian tissue with the presence of trophoblastic tissue in the sample thus confirming the diagnosis.

## DISCUSSION

The case presented here is a result of fresh embryo transfer. The most likely mechanism for its occurrence is retrograde migration of the blastocyst through the tube and implantation into the ovary.

Symptoms of ovarian pregnancy are similar to the symptoms of tubal pregnancy, namely, absent or delayed menses, abdominal pain and vaginal bleeding; however, asymptomatic ovarian pregnancies have also been described.<sup>5</sup> As with other extrauterine pregnancies, an empty uterus and rising serum  $\beta$  hCG should raise suspicion; however, ovarian pregnancy is rarely diagnosed before the surgery due to poor clinical symptomatology and a difficult ultrasound diagnosis. Otto Spiegelberg, a German gynecologist established the diagnostic criteria for ovarian pregnancy based on intraoperative findings: (1) intact fallopian tube on the involved side, (2) the gestational sac is located in the same position as the ovary, (3) the ectopic pregnancy is connected to the uterus by the utero-ovarian ligament, and (4) the ovarian tissue is present in the wall of the gestational sac.<sup>6,7</sup>

Several factors have been suggested which result in increased incidence of ovarian ectopic like pelvic inflammatory disease, previous gynecologic surgery, intrauterine contraceptive devices, tubal pathology.<sup>8,9</sup> Factors associated with extrauterine pregnancy in IVF are tubal infertility, fresh embryo transfer compared to frozen, cleavage stage compared to blastocyst stage embryos, and large number of transferred embryos.<sup>10,12,13</sup> Injection of a high volume of transfer media and the patient in a tilted position are other possible associated factors that result in ovarian ectopic.<sup>14</sup> Several studies suggest a possible relationship between ectopic pregnancy and high levels of serum estradiol.<sup>13</sup> In their study, Wang et al found a higher prevalence of ectopic pregnancy following fresh embryo transfer compared to frozen embryo transfer, a sub-analysis of the results showed more ectopic pregnancies among patients with peak serum estradiol concentration exceeding 4085 pg/mL (15,000 pmol/L).<sup>15</sup>

The role of imaging and serum  $\beta$  Hcg levels is of limited value in ovarian pregnancy and the American Society for Reproductive Medicine recommends on a surgical intervention in such cases.<sup>16</sup> The surgical treatment may

be in the form of salpingo-oophorectomy, oophorectomy, wedge resection, and removal of gestational product. There are few reports of successful use of systemic methotrexate in ovarian pregnancy.<sup>17,18</sup> However it should be noted that unlike the role of MTX in the treatment of tubal pregnancy, its role in the management of ovarian pregnancy is not well established.

## CONCLUSION

Ovarian pregnancy is an infrequent and challenging diagnosis. Clinicians should be aware about its possible occurrence in ART treatment. Once suspected, it should be actively pursued and managed in order to prevent complications.

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