

A Case of Ruptured Ovarian Ectopic After Embryo Transfer With Low Serum hCG and Fertility Conserving Laparoscopy

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Abstract

Ovarian pregnancy is a rare form of ectopic pregnancy that remains a diagnostic enigma. We report a 39-year-old nulliparous female undergoing *in vitro* fertilization (IVF) and presenting with severe abdominal pain to a hospital after embryo transfer. Serum beta-hCG after embryo transfer was low at 5.4 IU/L. Repeated serum beta-hCG in the hospital was elevated at 1,528 IU/L. Transabdominal ultrasound revealed a 9.8 cm complex mass in the midline in the pouch of Douglas. No intrauterine gestational sac was seen. She underwent emergency diagnostic laparoscopy revealing a small 2 × 2 cm ruptured right ovarian ectopic pregnancy with active hemorrhage seen. A wedge resection of the right ovarian ectopic was performed and hemoperitoneum was drained. Ovarian tissue sent for histopathology confirmed the diagnosis of a ruptured ovarian ectopic. Post-operative hCG level was negative after follow-up. Consequently, the patient was treated successfully with fertility-conserving laparoscopy.

Keywords: Ovarian ectopic; Fertility; hCG; Laparoscopy

Introduction

Ovarian pregnancy is a rare form of ectopic pregnancy that remains a diagnostic enigma. Incidence reported includes 0.5-3% of all ectopic pregnancies [1]. We report an interesting case of ruptured ovarian pregnancy after *in vitro* fertilization (IVF) after embryo transfer with low serum beta-hCG levels in a patient presenting with an acute abdomen and successfully treated by fertility-conserving laparoscopy.

Case Report

A 39-year-old nulliparous female presented to a tertiary

women's hospital complaining of severe epigastric pain and bloating. She has no significant past medical history or previous surgery. Her last menstrual period was 4 weeks ago with regular 28 days cycles. The patient was followed up for primary subfertility and recently underwent IVF treatment with embryo transfer 3 weeks ago. Initial serum beta-hCG after embryo transfer was low at 5.4 IU/L.

On physical examination, she reported a body temperature of 37.2 °C, blood pressure reading of 156/80 mm Hg and pulse rate of 87 beats/min. Abdominal examination elicited generalized severe lower abdominal tenderness with voluntary guarding and rebound positive on palpation. Speculum examination revealed no vaginal bleeding. Per vaginal examination was unremarkable. Cervical excitation was negative.

Subsequent urine pregnancy test was positive. Blood investigations indicated a hemoglobin level of 10.9 g/dL and white cell count of $14.5 \times 10^9/L$. Serum beta-hCG was elevated at 1,528 IU/L. Trans abdominal ultrasound (Fig. 1) revealed a large amount of echogenic fluid in pelvis with a complex mass measuring $9.8 \times 8.9 \times 3.8$ cm seen in the midline in the pouch of Douglas. No intrauterine gestational sac was seen. Both ovaries were not well seen due to the presence of hemoperitoneum.

A diagnosis of ruptured ectopic pregnancy was suspected. Consequently, the patient underwent an emergency diagnostic and therapeutic laparoscopy. Intra-operatively, a small 2 × 2 cm ruptured right ovarian ectopic pregnancy was seen with active hemorrhage seen. One and a half liter of hemoperitoneum was present. The uterus and bilateral tubes were normal. A wedge resection of the right ovarian ectopic was performed (Figs. 2 and 3) and hemoperitoneum evacuated. Ovarian tissue sent for histopathology reported hemorrhage, chorionic villi and trophoblastic attached which confirmed the diagnosis of a ruptured ovarian ectopic. Post-operatively, the patient remained stable and was discharged from hospital 2 days later. Post-operative hCG level was negative after follow-up.

Discussion

Risk factors for ovarian ectopic include previous adnexal surgery, pelvic inflammatory disease, use of intrauterine devices (IUDs), endometriosis, and previous fertility treatment including IVF which our patient had recently undergone. Other differential diagnosis also includes hemorrhagic corpus luteum and endometrioma.

Correct diagnosis of ectopic pregnancy is made on patient

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Figure 1. Transabdominal ultrasound showing with a midline complex mass measuring 9.8 × 3.8 cm with hemoperitoneum.

history, clinical acumen, serum beta-hCG levels and pelvic ultrasound. Preoperative diagnosis is often difficult, challenging and unpredictable. In our case, the ovarian ectopic was initially missed on trans abdominal ultrasound concealed by massive hemoperitoneum and diagnosed intra-operatively by laparoscopy.

Ectopic pregnancy cannot be excluded in patients after IVF treatment despite low serum beta- hCG levels after embryo transfer. These patients may present with an acute abdomen that require close surveillance. Low serum beta-hCG levels may also be misleading as ruptured ectopic pregnancies have been reported in cases with decreasing beta-hCG levels [2].

Ovarian pregnancy occurs when the ovum is not separated from the ovary during ovulation and is fertilized by sperm in the peritoneal cavity over the ovary and implanted [3]. Definite

diagnosis is the fulfillment of all four histological and anatomical criteria that Spiegelberg described in 1878 with the following [4]. 1) The fallopian tube on the involved side is intact. 2) The gestational sac is located in the region of the ovary. 3) The ectopic pregnancy is attached to the uterus by the ovarian ligament. 4) Ovarian tissue in the wall of the gestational sac is proven histologically. Our case fulfilled these criteria with negative beta-hCG levels on follow-up.

The management of an ectopic pregnancy includes medical treatment with methotrexate or surgery by laparotomy or laparoscopy. Methotrexate was not suitable in our case as the ultrasound features of a large 9.8 cm midline complex mass with hemoperitoneum were contraindicated. Laparoscopic management of ovarian ectopic includes oophorectomy, enucleation of gestational sac and wedge resection for fertility conservation [5]. This technique allows preservation of



Figure 2. Diagnostic laparoscopy with ruptured right ovarian ectopic.



Figure 3. Wedge resection of ovarian ectopic with hemostasis.

reproductive capability which is ideal for patients who want to conceive post-operatively. Laparoscopy remains the ideal treatment for diagnosis and treatment as it is associated with less operative time, lower blood loss, shorter hospitalization and quicker recovery compared to laparotomy [6].

In conclusion, ovarian ectopic pregnancy remains a rare occurrence with diagnostic challenges. Diagnosis of ovarian ectopic is made on patient history, clinical acumen, serum beta-hCG levels and pelvic ultrasound. Ectopic pregnancy must be suspected in patients presenting with abdominal pain after IVF treatment despite low serum beta-hCG levels. Laparoscopic management can be successfully used for fertility conservation.

Conflict of Interest

None.

Author Contributions

All authors contributed equally to writing the manuscript.

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