HETEROTOPIC PREGNANCY AFTER BILATERAL SALPINGECTOMY IN AN IVF PATIENT

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VANMATERIČNA TRUDNOĆA POSLE OBOSTRANOG ODSTRANJENJA JAJOVODA KOD PACIJENTKINJE PODVRGNUTE VEŠTAČKOJ OPOLDNJI

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ABSTRACT

**Purpose:** To report a rare clinical case of a heterotopic pregnancy after in vitro fertilisation (IVF) was performed on a patient who had previously undergone bilateral salpingectomy.

**Methods:** A 32-year-old woman, suffering from mechanical infertility, underwent IVF. The patient had an extraterine pregnancy a year prior to the IVF procedure and underwent a laparoscopic bilateral salpingectomy of the right fallopian tube due to the extraterine gravidity and of the left fallopian tube due to hydrosalpinx.

The IVF treatment resulted in a heterotopic pregnancy that involved an intrauterine and a cornual pregnancy, which were managed by performing a laparotomy and a resection of the tubal stump. This intraterine pregnancy resulted in a term singleton delivery.

**Conclusion:** Although extremely rare, every gynaecologist treating an IVF patient should consider the possibility of a cornual heterotopic pregnancy under circumstances where the patient previously underwent a bilateral salpingectomy.

**Keywords:** Bilateral salpingectomy, Ectopic pregnancy, Heterotopic pregnancy, IVF

SAŽETAK

**Cilj:** Da prikažemo redak slučaj heterotopne trudnoće sa in vitro fertilizacijom (IVF), kod pacijentkinje sa prethodnom bilateralnom salpingektomijom.

**Metod:** prikaz slučaja: 32 godišnja pacijentkinja, zbog mehaničkog faktora steriliteta, tretirana je IVF metodom. Imala je vanmateričnu trudnoću pre godinu dana i tokom laparoskopske operacije obe tube su ostanjale: desna zbog vanmaterične trudnoće, a leva zbog hidrosalpine.

IVF tretman rezultirao je sa heterotopnom trudnoćom: intrauterinom i kornualnom trudnoćom sa rupturom i intraabdominalnim krvarenjem, zbog čega je usvojena laparotomija i resekcija tubalnog stumpa. Intrauterina trudnoća rezultirala je termom po intrauterinom radanjem.

**Ključne reči:** bilateralna salpingektomija, vonmaterična trudnoća, IVF, heterotopna trudnoća.

**Abbreviations**

ART - assisted reproductive technologies
ET - embryo transfer
IVF - in vitro fertilisation

**Skraćenice**

ART - asistirane reproduktivne tehnologije
ET - embrio transfer
IVF - in vitro fertilizacija

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INTRODUCTION

A heterotopic pregnancy is defined as the simultaneous occurrence of an intrauterine and ectopic pregnancy. Duverney first described this diagnosis in 1708 upon analysing the findings from an autopsy performed on a patient, who died during an ectopic pregnancy (2). The incidence of this diagnosis was initially thought to be on the order of 1 in 30,000 pregnancies, but more recent reports have revised this incidence to 1 in 3,889 pregnancies (5,8). When implementing assisted reproductive technologies (ART), the incidence of heterotopic pregnancies may increase to 1 in 100 pregnancies (5,8). The higher rates of heterotopic pregnancies among ART patients are not surprising because multiple embryos are usually transferred during the ART procedure, thereby increasing the potential for multiple embryo implantations (in the uterus or elsewhere). Heterotopic pregnancies are an obstetric complication with potentially serious consequences. Due to the presence of a concurrent intrauterine gestation, the ectopic pregnancy may be more difficult to diagnose, and this delay in diagnosis may increase the risk for adverse maternal outcomes such as rupture, hypovolemic shock or the need for a blood transfusion. These complications may also jeopardise the integrity of the intrauterine pregnancy. The presence of acute abdominal pain, haemorrhagic shock and an intrauterine pregnancy are some of the symptoms that could be used to diagnose a heterotopic pregnancy.

CASE REPORT

A 32-year-old female was admitted to the emergency department of our hospital with acute abdominal pain at 7 weeks of gestation after undergoing the IVF procedure. The patient's medical history included a pelvic inflammatory disease that was treated with antibiotics roughly ten years ago. The patient got married five years ago and had her first pregnancy three years ago. However, the aforementioned pregnancy was a right tubal extrauterine pregnancy that was treated with Methylotrexate. A year ago she became pregnant for a second time, however, once again it was a right tubal extrauterine pregnancy and as such, a laparoscopy was performed. A bilateral salpingectomy was subsequently performed due to a tubal pregnancy within the right fallopian tube and a hydrosalpinx within the left fallopian tube. Due to the patient's absolute requirement for assisted reproduction (bilateral salpingectomy), she was referred to our department. Routine investigations, in accordance with our established protocol for IVF were performed. One cycle of an agonist protocol of ovarian stimulation was initiated. Three days after oocyte retrieval, three embryos at the 8-cell developmental stage were transferred into the patient. Fourteen days after embryo transplant, B-HCG testing was positive. Five days later, a transvaginal ultrasound was performed and an intrauterine gestational sac of 10 mm in diameter that presented a yolk sac was detected. Two weeks thereafter the patient was admitted to our hospital with symptoms of acute abdominal pain. She described her pain, which originated in the lower abdomen, as severe, sharp and constant. The pain was not associated with nausea, emesis, dyspnea or the patient's body position. The initial physical examination revealed a blood pressure of 100/60 mmHg, a heart rate of 94 beats per minute and a temperature of 36.8 °C. Upon palpation, the patient had tenderness in the right lower quadrant of the abdomen. Subsequent laboratory analyses showed blood reduction indicated by haemoglobin (Hg b) levels of 93 gr/l and hematocrit (Hct) levels of 0.27. A vaginal ultrasonography (US) was performed that revealed an intrauterine pregnancy with an embryo of a cranio-caudal length of 15 mm (which is standard according to this stage of the pregnancy) with cardiac activity. Notably, a large amount of free fluid around the uterus and in the Morrison's Pouch (hepatorenal space) was detected. Due to the serious condition of the patient, she was taken to the operating room and an explorative laparotomy was immediately performed. During the laparotomy, we observed intra-abdominal bleeding (a total of 700 ml of blood was aspirated) from the rupture of right cornual portion of the uterus due to a coexistent heterotopic pregnancy. We identified and carefully removed the trophoblastic tissue. The cornual scar was closed by the use of Vicryl 1 stitches. The patient received a transfusion of 2 units of packed red blood cells and had a benign convalescence. Subsequent histological examination confirmed products of conception consistent with an ectopic pregnancy. The patient was discharged from the operating room on Postoperative Day 4. The testing of foetal vitality (performed using ultrasonography) at Day 4 and 2 weeks after the operation, both showed normal progress of the intrauterine pregnancy. The patient had an uncomplicated intrauterine pregnancy and spontaneously delivered a 3360 g boy at term (38 weeks of gestation).

DISCUSSION

Heterotopic pregnancies are an exceptional occurrence when the pregnancy occurs spontaneously (1 case out of 7,000 to 30,000 pregnancies) (1, 2, 4). Its incidence is increased after a patient receives IVF-ET treatment, reaching a rate that is estimated to be approximately 1% of such pregnancies. Possible risk factors include a high number of transferred embryos, a transfer that occurs near the uterine horn, excessive pressure on the syringe during the transfer, or difficulties during the ET procedure (2, 6). Bilateral salpingectomy is likely to be another risk factor for cornual pregnancies (6,7). For nonsalpingectomised patients, the peri- and intratubular adhesions, which may or may not be related to endometriosis, are additional risk factors. (2, 4, 9)

Certain authors also consider the quality of the embryos and the hormonal milieu at the moment of transfer as possible causes of this unusual type of pregnancy (5, 8).
The development of a pregnancy in the uterine horn creates a high risk for organ rupture and is often extremely haemorrhagic due to the richness of the local vascularisation through the branches of the uterine and ovarian arteries. The therapeutic objective is simple: to interrupt the evolution of the ectopic pregnancy and preserve the intrauterine pregnancy. The most frequently described treatment is surgically based, via resection of the uterine horn by laparotomy or laparoscopy (10). The rate of live births is around 60%.

The choice to perform the laparotomy seemed to be the more reliable direction to pursue compared to laparoscopy in order to ensure a solid myometrial suture and complete haemostasis. In this case, the extrauterine pregnancy was located in the junction of the right tubal stump within the uterine horn and resulted in rupture and intra-abdominal bleeding. No other therapeutic alternative was possible. Due to the direct correlation between the number of embryos transferred and the chances of a heterotopic pregnancy, it would have been prudent, in this case, to transfer only two embryos to the uterine cavity. However, three embryos were transferred in our patient. The most important diagnostic method for assessing a heterotopic pregnancy is the high-resolution transvaginal ultrasonography (5). However, the sonographic diagnosis of an ectopic pregnancy in cases of heterotopic pregnancy is difficult to confirm due to the presence of a concurrent intrauterine gestational sac and hyperstimulated ovaries. Thus, women with heterotopic pregnancies are at significantly greater risk for hypovolemic shock and thus require a blood transfusion.

Another factor was the age of the patient (32 years). It appears to be important to limit the number of embryos transferred to a young woman to two embryos of good quality.

In conclusion, the appearance of a heterotopic pregnancy after an IVF-ET procedure remains a rare occurrence, particularly after performing bilateral salpingectomy. It is very important to diagnose this occurrence as soon as possible if the associated symptoms appear (e.g., vaginal bleeding or pain). It is also important to understand the necessity of a systematic exploration of the pelvis upon the first ultrasound scan of the pregnancy performed at 7 to 8 weeks of gestation, even if there are no apparent risk factors. Our patient was certainly at a higher risk to lose the intrauterine pregnancy due to the intra-abdominal bleeding. However, the patient was fortunate to have underwent an uncomplicated intrauterine pregnancy. Thus, the "gold standard" for treating patients with heterotopic pregnancy is still surgery (7, 10).

REFERENCES