International Journal of Contraception, Gynaecology and Obstetrics

ISSN Print: 2664-9861
ISSN Online: 2664-987X
Impact Factor: RJIF 5.42
IJCGO 2023; 5(1): 15-17
www.gynecologyjournals.com
Received: 17-05-2023
Accepted: 16-06-2023

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A nightmare to an IVF Specialist: A case report on heterotopic pregnancy

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DOI: https://dx.doi.org/10.33545/26649861.2023.v5.i1a.17

Abstract
Introduction: A heterotopic pregnancy (HP) is the coexistence of intrauterine and extra uterine pregnancy. It is sporadic but becoming more prevalent as a result of assisted reproductive technologies (ART). Heterotopic pregnancies are a diagnostic and therapeutic challenge for obstetricians. It can be a life-threatening condition and can be missed, with the diagnosis being overlooked.
Case presentation: A 39-year-old female with primary infertility for 10 years presented to our clinic. She had four IUI cycles in the past and was taken up for IVF. Ultrasound examination at 7 weeks of gestation revealed one intrauterine pregnancy of 7 weeks and 5 days and a right tubal ectopic pregnancy with mild hemoperitoneum. After an early and successful management with laparoscopic right salpingectomy, she finally delivered a healthy baby.
Conclusion: With IVF-ET, the probability of an HP rapidly rises, as a result, early sonographic tests should be conducted following ART, with special attention on the examination of the adnexa. The goal of managing an HP ought to remove the ectopic pregnancy while also protecting the life of the mother and the intra-uterine pregnancy. A successful intrauterine pregnancy can be achieved with timely intervention and avoiding potentially fatal complications. A suitable preventative approach against the incidence of HP would be the policy of elective single embryo transfer.

Keywords: Heterotopic pregnancy, ectopic pregnancy, intrauterine pregnancy, *in vitro* fertilization, Assisted reproductive technologies (ART), case report

Introduction
A heterotopic pregnancy (HP) is a life-threatening complication of early pregnancy in which both extra-uterine (ectopic pregnancy) and intrauterine pregnancy (IUP) occur concurrently. It is also known as amalgamated ectopic pregnancy, multiple-sited pregnancy, or coincident pregnancy [1]. It is sporadic but becoming more prevalent as a result of assisted reproductive technologies (ART). The fallopian tube is the most prevalent ectopic location in both spontaneous and ART heterotopic pregnancies. The cervix, ovary, and abdomen are highly uncommon locations for heterotopic growth, while the cornual site is the second most frequent [2]. The incidence of HP in spontaneous pregnancy is reported to be 1/30,000, but substantially higher (1/3900) when accompanied with ART, including intrauterine insemination (IUI), superovulation, and *in vitro* fertilization (IVF) [3].
In general, ectopic pregnancy was rarely considered when an IUP was present. As a result, the diagnosis may be delayed until internal bleeding from a ruptured ectopic sac is severe. Moreover, ascites caused by hyper stimulated ovaries are difficult to distinguish from internal bleeding in IVF patients [4]. A delayed diagnosis can lead to increased rates of morbidity and mortality for both the mother and the foetus [2]. The ultimate goal of HP is to remove the ectopic pregnancy while preserving the IUP [5].

Case presentation
A 39-year-old female with primary infertility for 10 years presented to our clinic for further treatment. On evaluation, she was diagnosed as having bilateral polycystic ovary syndrome (PCOS) with a normal uterus. She had four failed IUI cycles in the past. Husband semen analysis revealed oligoasthenoteratozoospermia. The couple was counselled and taken up for IVF. Fifteen oocytes were collected. On day 5, eight blastocysts were frozen. She underwent frozen embryo transfer next cycle. Two blastocysts were transferred.

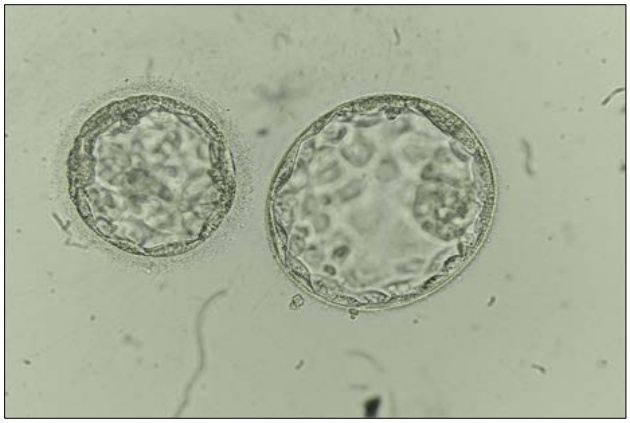

Image 1: Day-5 blastocyst

Beta HCG on day 14 was 994 IU/ml. Ultrasound examination at 7 weeks of gestation revealed one intrauterine pregnancy of 7 weeks and 5 days and a right tubal ectopic pregnancy with mild hemoperitoneum. She was counselled and admitted for a laparoscopic salpingectomy. She underwent a laparoscopic right salpingectomy. She was managed conservatively with progesterone and antibiotics. Her pregnancy period was uneventful. She was monitored with regular growth scans. She delivered a live-term female baby of weight 3.5 Kg at 37 weeks of gestation.

Discussion

The prevalence of heterotopic pregnancies is rising due to the increased use of artificial reproductive procedures; however, it is still a rare disorder [6]. It was initially described at an autopsy by Duverney in 1708, and it was later identified in ovulation induction, *in vitro* fertilization-embryo transfer, and gamete fallopian transfer [7]. According to the EP site, these HPs may be broadly categorized into three categories: (1) Embryos implanted at the tubal stump/interstitial part/cornua uteri, which accounted for the majority of cases. (2) Embryos implanted in the abdominal cavity, including the posterior uterine wall, the omentum, near the spleen, the ovary, and the proper ovarian ligament altogether (3) Embryos implanted in the retroperitoneum [8].

The risk factors include a high number of transferred embryos, poor embryo quality, and embryo transfer techniques such as transferring the embryos close to the uterine horn or applying excessive pressure on the syringe during transfer and deep insertion of the catheter during transfer. Other potential factors include the patient's age (< 35 years), the state of the pelvis, and the hormonal milieu [9]. The risk of ectopic pregnancy was lower in fresh cycles than in frozen cycles [10].

Due to the absence of clinical symptoms, HP is difficult to diagnose in its early stages. Some patients do not complain symptoms or report nonspecific symptoms such as vaginal bleeding or abdominal pain, which might be misinterpreted as a possibility of abortion. Because an intrauterine pregnancy exists, it is difficult to predict the possibility of another ectopic pregnancy [11].

There are no particular physical exam/lab findings for HP, but this diagnosis should be considered in any hypotensive pregnant patient with abdominal discomfort and an IUP detected on bedside ultrasound, especially in the presence of free fluid on ultrasound and/or a history of ART [2].

For patients who had IVF-ET and are in the first trimester of pregnancy, transvaginal sonographic evaluation is crucial. Even after a viable intrauterine pregnancy has been confirmed, examinations should be carried out regularly, especially when multiple embryos have been transplanted. The obstetrician should check the adnexa during routine ultrasonography for a possible concurrent ectopic pregnancy, especially in cases with an acute abdomen [12]. It is important to take the possibility of an HP into account, especially when an ultrasound discovery of a singleton intrauterine pregnancy is associated with an abnormally high serum β -HCG concentration (> 300 IU/l on day 15 after oocyte fertilization). The whole pelvis must be carefully sonographically evaluated [13, 14].

HP can result in serious and even deadly consequences include peritoneal haemorrhage, uterine rupture, preterm delivery, and miscarriage [15]. Early detection and management of HP are crucial for preventing potentially deadly consequences [11].

The most frequent mistake is to exclude ectopic pregnancy after finding intrauterine pregnancy without ultrasound examining on the appendages [15]. Due to this, late diagnosis and rupture of HP are frequent. In over half of the instances, there is a rupture, bleeding, and need for emergency treatment. In spite of this, patients with a viable IUP have a 70% probability of having a live child if the diagnosis and treatment are made appropriately [16].

The treatment of an HP is individualized based on the location of the ectopic pregnancy as well as the patient's clinical presentation and stability. The aim of treatment is to terminate the extrauterine pregnancy while taking care to minimize the danger to the IUP [17]. The most commonly described treatment is surgical, with uterine horn excision (salpingectomy) either laparotomy or laparoscopy. A non-surgical strategy can be used safely and effectively to manage individuals who are clinically stable and have a HP that is detected early in the pregnancy [3]. In HP, particularly in situations involving cervical pregnancy, local injections of potassium chloride or hyperosmolar glucose are options for medical therapy of HP. Methotrexate usage is not an alternative since it has damaging consequences on the IUP [12].

In our case, the patient underwent laparoscopic salpingectomy. Because of early diagnosis and prompt conservative management, patient and intra-uterine pregnancy was safe. After completion of her gestation period, she delivered a healthy female baby.

Conclusion

In conclusion, With IVF-ET, the probability of a HP rapidly rises, especially in patients with risk factors. As a result, early sonographic tests should be conducted following ART, with special attention on the examination of the adnexa. The goal of managing a HP ought to remove the ectopic pregnancy while also protecting the life of the mother and the IUP. A successful IUP can be achieved with timely intervention, avoiding potentially fatal complications such as tubal rupture and hemorrhagic shock. At last, it is indeed to adhere to the regulations set by international committees for ART regarding the number of embryos transferred. A suitable preventative approach against the incidence of HP would be the policy of elective single embryo transfer.

Conflict of Interest
Not available

Financial Support
Not available

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How to Cite This Article
Yaramareddy S, Sardena SK, Menavath TRN, Bhukya NKN. A nightmare to an IVF Specialist: A case report on heterotopic pregnancy. International Journal of Contraception, Gynaecology and Obstetrics. 2023;5(1):15-17.