

Rare Case of Dichorionic Triamniotic Triplets after Ivf Conception

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1. Abstract

1.1. Introduction

Multiple pregnancies, particularly triplets, are rare [incidence] and can be associated with various complications during pregnancy and delivery. Dichorionic triamniotic triplets (two placentas) are even more unusual, and the presence of single placenta for two gestational sacs adds to the complexity. The advent of in vitro fertilization (IVF) has increased the occurrence of multiple births, including higher-order multiples such as triplets [1]. Prematurity, low birth weight, pre-eclampsia, anemia, postpartum hemorrhage, intrauterine growth restriction, neonatal morbidity and high neonatal and infant mortalities are amongst the serious concerns that are linked to multiple pregnancies for both the mother and the fetus. In order to boost success rates, assisted reproductive technology (ART) therapies should fight patient demands for numerous embryo transfers at each transfer and instead focus on reducing such events. The chance of high-order multiple pregnancies can be reduced by single blastocyst transfer, embryo selection, and extended culture [2]. Interestingly, the risk of multiple gestations is significantly decreased but not entirely eliminated by elective single-embryo transfer (eSET). Identical twins are produced when monozygotic twinning (MZT) occurs. Compared to natural conception, it is more common in women undergoing in vitro fertilization (IVF). In this report, we present a case Dichorionic triamniotic triplets conceived via IVF.

2. Case Presentation

Patient Information: A 25-year-old woman primigravida, with a history of infertility, was referred for IVF due to difficulty conceiving after 5 years of trying to conceive naturally. The patient had history of PCOS with irregular menses and diagnostic hystero-laparoscopy was evident of presence of septum in the uterus. She was non-smoker and had no history of alcohol use. Her baseline hormone levels were 3.9 ng/mL for AMH, 0.8 mU/mL for LH, and 4.3 mU/mL for FSH. GnRH antagonist protocol and r-hFSH + r-hLH (1450 UI total dosage) were used for ovarian stimulation. The estradiol level was 1862 pg/mL on the day of the oocyte maturation trigger. Thirty-six hours before to oocyte retrieval 0.2 DECA given. On the day of ovum pick-up, the sperm count was 1 ml volume, with a concentration of 2.8 million/ml, 40% overall motility, and 12% sperm morphology. Ten oocytes out of the 11 follicles were obtained by transvaginal ultrasound (TV-US)-guided aspiration were aspirated by ovum pickup out of which 8 oocytes were in M2 stage. Two blastocysts were obtained by cultivating the resultant embryos until day five. On day five, 2 blastocyst were transferred, using a TV-US-guided technique to measure uterine length in advance of embryo transfer. **Infertility History and IVF Procedure:** After extensive evaluation, the patient was diagnosed with female factor infertility. The couple opted for IVF with embryo transfer. Ovarian stimulation was initiated with recombinant FSH, and a total of 8 M2 oocytes were retrieved. The

embryos were cultured, and 2 top-quality blastocysts were selected for transfer. A single embryo transfer was initially planned, but after counseling, the patient and her partner chose to transfer two embryos, resulting in a triplet pregnancy. **Ultrasound and Pregnancy Diagnosis:** At 6 weeks of gestation, the patient presented for her first ultrasound. A triplet pregnancy was confirmed, with three distinct gestational sacs seen on transvaginal ultrasound. The sacs were identified as being triamniotic (three amniotic sacs) and dichorionic (two placental structures). The characteristics of the triplet pregnancy indicated that two of the embryos had implanted in one sac (dichorionic) and one in a separate sac, with each placenta being separate and distinct (triamniotic). **Clinical Course and Management:** The pregnancy was closely monitored with serial ultrasounds to assess fetal growth, amniotic fluid volume, and placental development. At 12 weeks, all three fetuses had normal heartbeats, and the placental structures were well-vascularized. Due to the high-risk nature of a triplet pregnancy, the patient was counseled on potential complications, including preterm labor, intrauterine growth restriction (IUGR), and the risk of preeclampsia. At 16 weeks of gestation, the patient developed mild pregnancy-induced hypertension, which was managed with close monitoring and blood pressure medications. At 26 weeks, the patient was admitted for preterm labor, but it was successfully managed with tocolytics, and she remained on bed rest.

2.1. Outcome

At 32 weeks of gestation, the patient delivered three healthy neonates via cesarean section due to the risk of complications associated with multiple pregnancies. The triplets weighed 1.4 kg, 1 kg, and 1.5 kg at birth, all requiring brief neonatal intensive care unit (NICU) observation for respiratory support, but none had long-term complications.

3. Discussion

Dichorionic triamniotic triplets (two placentas), where each fetus has its own amniotic sac and placenta, are very rare in assisted reproductive technology (ART) [3]. This form of multiple pregnancy typically arises when multiple embryos are transferred, and each embryo implants in a separate location within the uterus, with each fetus developing its own amniotic sac and placenta. In IVF, the likelihood of triplet pregnancies has increased with the transfer of multiple embryos to achieve higher pregnancy rates [4]. Dichorionic triamniotic triplets (two placentas) can present several risks, including preterm birth, low birth weight, and complications related to placental insufficiency or preeclampsia. The triplet pregnancy in this case had a favorable outcome, with close monitoring and timely medical intervention. An embryo that divides between 4 and 8 days after fertilization often produces a monozygotic twin, whereas an embryo that splits up to 3 days after fertilization typically produces a dichorionic twin. A triplet pregnancy may also present with a similar problem. Nonetheless, it is believed that natural conception is the



Figure 1: Placenta of Diamniotic Triamniotic Triplets.

basis for determining chorionicity and amnionicity[5]. Dichorionic diamniotic twins produced from SET were documented during the ART era; these twins could be monozygotic. Dichorionic triamniotic triplets (two placentas) were produced from a single blastocyst transfer that was cultivated for five days following fertilization, according to the findings. Thus far, this has not been consistent with the notion of trizygotic dichorionic triplet formation and embryo splitting timing. In these instances, there can be splitting of blastocyst. Four to eight days after fertilization, the transferred embryos were most likely divided[6]. Moreover, embryo splitting may have taken place following the embryo transfer in the current cases, as demonstrated in dizygotic dichorionic triamniotic twins. As a result, neither the developmental mechanisms driving dizygotic triplets nor the exact mechanisms or timing of embryo splitting for dizygotic multiple pregnancies are fully characterized[7]. Many ART techniques are likely thought to be risk factors for zygotic splitting, which results in dizygotic multiple pregnancies. dizygotic triplets are the subject of the majority of research on the risk factors for zygotic splitting following ART procedures. Mothers who are younger appear to have a higher incidence of zygotic splitting. Big-data analyses of dizygotic triplets have recently shown that aided hatching is a risk factor for zygotic triplet pregnancies [4], although fertilization techniques are not a risk factor for zygotic splitting. An protracted culture of embryos to blastocysts has been shown in numerous publications to be a significant risk factor for dizygotic triplet pregnancies. Although the rate of artificial zona pellucida and/or plasma membrane breakdown was 58% in the current investigation and the literature evaluation that included our current cases, the rate of blastocyst transfer in triplets following sequential embryo transfer was as high as 75%. Regarding the likelihood of zygotic splitting in frozen-warmed embryo transfer cycles, there are contradictory reports. Additionally, there is also the quantity of cycles of frozen-warmed embryo transfer.

4. Conclusion

This case highlights the complexities and risks of a Dichorionic triamniotic triplets (two placentas) pregnancy following IVF[6].

Despite the challenges, with proper prenatal care, monitoring, and management of complications, a favorable outcome can be achieved. Fertility clinics and patients should be well-informed of the risks associated with multiple embryo transfers in IVF to make informed decisions regarding the number of embryos to transfer. In conclusion, DZT triplets are uncommon during natural conception but more common with IVF treatments. Multiple pregnancies are less likely when the number of transferred embryos is limited. But even after a single blastocyst transfer, there is a tiny but detectable risk[7]. Additional research on the timing of embryonic splitting and the placental structure of dizygotic triplet is necessary in light of the described case.

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