

# Monochorionic Triplet Gestation after *in Vitro* Fertilization

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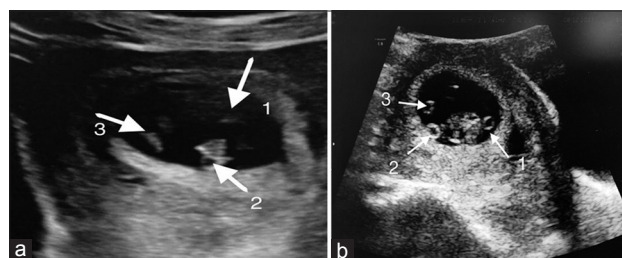
To the Editor: Although multifetal pregnancies are common, monozygotic triplets (MZTs) remain a relatively rare occurrence. MZT gestations present patients and physicians with a dilemma because the continuation of the pregnancy can seriously threaten the health of both the mother and fetuses, while selective fetal reduction carries the risk of losing all the fetuses and is associated with a high risk of obstetric complications, especially prematurity (>90%). Here, we present two cases of MZT after *in vitro* fertilization (IVF).

The first patient is a 35-year-old woman, gravida 0, para 0, with a 4-year history of infertility underwent a second course of IVF (March 8, 2017) after three failed attempts at artificial insemination by husband (AIH) and one previous course of IVF. Eleven oocytes were aspirated after a standardized long protocol, and eight oocytes were fertilized and cultured. Two morulas were transferred on day 4, and her human chorionic gonadotropin (HCG) level was 2186.4 U/L on day 15 posttransfer. Transabdominal ultrasound (US) at 35-day posttransfer showed monozygotic triplets, each with a heartbeat [Figure 1a].

The first and second pregnancy trimesters proceeded smoothly, but one fetus demonstrated intrauterine distress at 33 weeks of gestation, and three normal baby boys were born at the 33<sup>rd</sup> week of gestation by cesarean section. The babies weighed 1235, 1880, and 1855 g, respectively, and the Apgar scores were 9, 10, and 10.

The second patient is a 34-year-old woman, gravida 1, para 0, with a 4-year history of infertility due to secondary sterility. She resorted to IVF (October 27, 2017) after the failure of three courses of AIH. Eight oocytes were aspirated after a standardized long protocol and seven were fertilized and cultured. One blastocyst (4BB) was transferred on day 5, but her HCG level on day 14 posttransfer suggested that she was not pregnant. The patient, therefore, underwent frozen-embryo transplantation (FET) 2 months later, and one blastocyst (3BC) was transferred during a natural cycle. She was diagnosed as pregnant on day 12 posttransfer, with an HCG level of 479 U/L, and transabdominal US 42 days after transfer showed monozygotic triplets, each with a heartbeat [Figure 1b]. The patient was in her 33<sup>rd</sup> week of gestation at the time of this report, and prenatal examination indicated that both the mother and fetuses were in good health.

MZTs represent a very rare situation involving multiple gestations, accounting for only about 0.004% of natural



**Figure 1:** Transabdominal ultrasonogram images of the two patients showing monozygotic triplet pregnancy and the arrows represented fetuses. (a) The first case and (b) the second case.

pregnancies.<sup>[1]</sup> Although the incidence of MZT pregnancies after IVF is approximately 100 times higher than that associated with natural pregnancies,<sup>[2]</sup> the rate of MZTs remains very low. A systematic review of the literature identified reports of 29 MZTs (including the two current cases) worldwide to date. Among eight cases that underwent elective fetal reduction of one or two fetuses, five resulted in the loss of all the fetuses, suggesting that further investigations are needed to determine more effective methods of reduction. Radiofrequency ablation and selective cord laser photocoagulation have been suggested to be safe and effective methods of selective fetal reduction of MZTs during the second trimester.<sup>[3,4]</sup>

Although the mechanisms whereby assisted reproductive technology increases the incidence of MZT remain unclear, an increased incidence of monozygotic multiple pregnancies has been associated with advanced maternal age, ovulation induction, certain IVF culture conditions and prolonged culture, zona pellucida (ZP) micromanipulation such as intracytoplasmic sperm injection, assisted hatching, and FET.<sup>[5]</sup> The mechanisms may involve hardening of the ZP as a consequence of extended exposure to the culture medium, leading to the development of multifetal plates during blastocyst hatching; an effect of the culture medium on the

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**Received:** 28-04-2018 **Edited by:** Qiang Shi  
**How to cite this article:** Li XL, Fu YQ, Ma YM, Zhang J, Wang SY, Liu YJ, Zhang QL, Zhou LY, Jia CW. Monozygotic Triplet Gestation after *in Vitro* Fertilization. Chin Med J 2018;131:2235-6.

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10.4103/0366-6999.240811

junctions of the inner cell mass, leading to monozygotic multiple gestations; or manipulation of the ZP triggering splitting of the blastocyst and formation of MZTs through the hole in the ZP during blastocyst expansion.

### Declaration of patient consent

We certify that we have obtained all the appropriate patient consent forms. The patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

### Financial support and sponsorship

This work was supported by grants from the Beijing Municipal Science Technology Commission (No. Z171100001017047), Beijing Municipal Administration of Hospitals' Ascent Plan (No. DFL20151301), and Beijing Municipal Administration of Hospitals Clinical Medicine Development of Special Funding (No. ZYLX201510).

### Conflicts of interest

There are no conflicts of interest.

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