Successful Pregnancy and Delivery after Multifetal Pregnancy Reduction in A Woman with Monochorionic Triplet Pregnancy Following Intracytoplasmic Sperm Injection and the Transfer of Frozen-thawed Embryos

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This was the first report of multifetal pregnancy reduction (MFPR) with monochorionic triplet pregnancy following ICSI and the transfer of frozen-thawed embryos. A 30-year-old woman who had undergone ICSI and the transfer of frozen-thawed embryos subsequently developed monochorionic triplet pregnancy. She did a multifetal pregnancy reduction to remove one embryo limb from the fetal sac and remained a singleton pregnancy after pregnancy reduction. At last she delivered a healthy baby girl at 40 weeks of gestation. In conclusions, an early stage fetal reduction, selection of the appropriate reduction week, and the expertise of a highly experienced doctor using ultrasound can ensure a wonderful pregnancy outcome in monozygotic multiple pregnancies.

Key words: in vitro fertilization (IVF); monochorionic triplet pregnancy; multifetal pregnancy reduction (MFPR); intracytoplasmic sperm injection (ICSI)

Monochorionic triplet pregnancies remained quite rare even with assisted reproductive technologies. Several factors have been implicated in the etiology of monozygotic pregnancies, including in vitro fertilization (IVF), ovarian stimulation, increased maternal age, manipulation of the zona pellucid and in vitro culture[1-3]. Monochorionic twins have a 6-fold higher...
loss rate before 24 weeks of gestation and 2- to 3-fold greater risk of stillbirth and early neonatal death than dichorionic twins\cite{4}. Outcome rates for monochorionic triplets are even worse. We did multifetal pregnancy reduction (MFPR) for the first time to reduce the monochorionic triplet pregnancy to singleton and got satisfactory outcome.

Case report

A 30-year-old woman was referred with a 4-year history of primary infertility related to severe male oligozoospermia. She had no significant past medical history or physical findings, and no family history of monozygotic multiple pregnancy. After counseling, she was referred for IVF using intracytoplasmic sperm injection (ICSI).

Two fresh-cycle embryos were transferred, but at 6 weeks of gestation, the embryo suffered developmental arrest, and the patient suffered early stage artificial abortion.

Four months later, the patient returned for the transfer of two frozen-thawed day 3 embryos performed on day 18 of a natural menstrual cycle. Two weeks later she had a positive urine pregnancy test. An ultrasound scan performed 4 weeks after embryo transfer revealed a monochorionic triplet pregnancy. After extensive counseling with obstetrics concerning possible pregnancy complications, the patient elected to undergo transvaginal fetal reduction on the 31st day after embryo transfer and retain a singleton pregnancy.

During the process of MFPR, ultrasound showed three yolk sacs and heartbeats quite near to each other in one fetal sac (Figure 1). We first aspirated the nearest embryo limb bud and yolk sac using a 16G dual-chamber puncture needle. We were unable, however, to move the needle forward for further reduction due to the position of the yolk sacs. Postoperative re-examination by ultrasound showed two embryo limb buds in the sac: the left one had a clear yolk sac beside it, but the upper one didn’t show a clear incidental yolk sac; in addition, only the left embryo had a heartbeat (Figure 2). After the procedure, we gave the patient...
antibiotic intravenously for prevention of infection. She experienced no abdominal pain or vaginal bleeding and remained a singleton pregnancy after the MFPR.

We managed the patient in our tertiary level obstetric unit, carrying out regular fetal surveillance with serial growth scans. At 25 weeks of gestation she was diagnosed impaired glucose tolerance, which was managed by dietary modification. Other results remained in normal range.

At 40 weeks of gestation, the patient still had no premonitory labor. Obstetric ultrasound showed an amnionic fluid index (AFI) of 6.04 cm, an estimated fetal weight (EFW) of 4 231 g, a biparietal diameter (BPD) of 9.49 cm, and an abdominal circumference (AC) of 38.74 cm. Considering the possibility of “oligohydramnios and macrosomia”, we admitted the patient to the hospital and she delivered a healthy 3 960 g female baby by Caesarean section.

Discussion

The chorionicity of a monozygotic multiple pregnancy depended on the time when the embryo splits. Early splitting (within 72 h of fertilization) might lead to diamniotic, dichorionic multiple pregnancy; later splitting (after day 8) might give rise to monoamniotic, monochorionic multiple pregnancy. The timing of monozygotic twinning was probably not fixed, and the mechanism varies\[5\].

Several factors have been implicated in the etiology of monozygotic pregnancies, including in vitro culture\[1,3\], manipulation of the zona pellucid\[6\], and blastocyst stage embryo transfer\[2\], etc. The patient had no family history of monozygotic multiple pregnancy. The occurrence was probably due to the fact that the embryo underwent in vitro culture and ICSI.

Monochorionic multiple pregnancy presents a higher risk gestational period and poorer clinical outcomes, and is still a challenge for reproductive specialists and obstetricians\[7\]. Available methods to reduce these high risks are limited. Based on our previous success with MFPR in monochorionic twins by aspirating embryonic parts in early gestation with no drug injection\[8\], we used the same MFPR method for the first time to reduce the monochorionic triplet pregnancy to singleton.

We considered this to be the first report of the use of MFPR in monochorionic triplets by aspirating embryonic parts in early gestation with no drug injection resulting in successful pregnancy and full-term delivery of a healthy baby.

In this case, fetal reduction should be done at an early stage. If delayed until the week for fetoscopy, risks associated with monochorionic pregnancy such as twin to twin transfusion syndrome (TTTTS) or monoamniotic triplets such as cord entanglement will increase. At the same time, the three yolk sacs were close to each other; therefore, during the procedure the aspiration of one embryo bud injured the yolk sac of another embryo, thereby killing that
embryo as well. If the aspiration was conducted on 2 embryo buds, the risk of total abortion or injury to the last embryo would have increased greatly. Thus we could see that operation skill was quite important in cases like this.

In conclusion, in cases of monozygotic multiple pregnancy, multifetal pregnancy reduction is very important. The selection of the appropriate reduction week and the expertise of a highly experienced doctor using ultrasound can ensured a wonderful pregnancy outcome.

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References


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