Vanishing twins in diamniotic dichorionic in vitro fertilization gestation in mid-second trimester

P. Pinidis, E.N. Kontomanolis, T. Mylonas, A. Georgiadis, S. Kokkoris, G. Galazios

Department of Obstetrics & Gynecology, Democritus University, Alexandroupolis (Greece)

Summary

The authors report a diamniotic dichorionic twin pregnancy after in vitro fertilization (IVF) in mid-second trimester. The dead fetuses were delivered by cesarean section at the 20th week of gestation. The authors discuss management aspects and review of the literature.

Key words: Vanishing twins; IVF gestation; Twin pregnancy; Intrauterine demise in second trimester.

Introduction

It is common knowledge that the incidence of abortion decreases as pregnancy progresses. The risk of perinatal morbidity and mortality in twins is higher than in singletons. In comparison to dichorionic twins, monochorionic twins are at increased risk for perinatal mortality and morbidity. In both types of twins growth disordance can occur. Complications (acardiac twins, acute and chronic twin to twin transfusion syndrome) are due to different combinations of vascular anastomoses. Monochorionic diamniotic twin pregnancies have a riskier pregnancy course than their dichorionic counterparts because of the vascular anastomoses between the two fetal circulations.

Case Report

A 51-year-old woman with a history of one induced abortion was referred at the antenatal clinic at 18 weeks of gestation after an in vitro fertilization (IVF) attempt.

Blood tests were normal at that time. Detailed ultrasonography showed an intrauterine diamniotic dichorionic gestation with two viable fetuses. The first fetus had an estimated fetal body weight (EFBW) of 212 g that sonographically corresponded to 17 + 5 weeks of gestation, whereas the second one had an EFBW of 165 g that corresponded to 16 + 6 weeks of gestation.

During the next visit at the clinic, negative embryo pulses of both twins were revealed while the infection and blood coagulation parameters remained within the normal range and no signs of chorioamnionitis were detected. Antibiotics were administered and an effort for evacuation of the uterus of the dead embryos was initiated. Finally, due to psychological distress of the woman, the two embryos were removed from the uterus via hysterotomy.

Results

The first dead embryo corresponded to 17th week of gestation whereas the second one to 16th week of gestation approximately. Laboratory blood findings of the mother after surgery remained unchanged, excluding any infection or coagulation disorder.

Polymerase chain reaction (PCR) testing was negative for cytomegalovirus (CMV), mycoplasma, chlamydia, and toxoplasma gondii infection. The placenta demonstrated multiple infarcts, ischemic necrosis at the umbilical cord's insertion point, and signs of non-specific chorioamnionitis were detected. The male's umbilical cord had a complete twist around its axis (Figure 1), which led to total obstruction of blood supply to both fetuses and eventually to their death (Figure 2).

Discussion

The uniqueness of this case report lies on the fact that both fetuses demised inside the uterus during mid-second trimester, whereas in most cases a healthy twin is delivered after demise and expulsion of the first twin [1].

In such cases, when the fetus dies inside the uterus and remains therein a few weeks prior to its abortion, it becomes usually dry and papery, resulting in what is widely-known as fetus papyraceous [2].

In terms of managing twin IVF pregnancies, it is highly recommended that transvaginal ultrasound should be performed between 11 and 14 weeks of gestation in search for structural and chromosomal anomalies [3].

Undoubtedly all patients with twin pregnancy – moreover when that results from assisted reproductive technologies like IVF intracytoplasmatic sperm injection (ICSI) – should have first-trimester ultrasound examination performed (for amnionicity, chorionicity, and gestational age estimation) [4].

Since monozygotic monochorionic twins seem to have a greater risk of a spontaneous abortion and congenital malformations compared to dizygotic dichorionic twins, most experts recommend serial ultrasound assessment every two to three weeks for the first group starting at 16th week and every three to four weeks starting at 20th week for the second group.

Pregnancies diagnosed with the vanishing twin syndrome after IVF carry a higher rate of adverse pregnancy outcome in terms of preterm deliveries and low birth weight compared to IVF singleton pregnancies [5]. Furthermore, significant similarities were observed in pregnancy outcome of vanishing twin pregnancies and twin

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Fig. 1

Fig. 2

Figure 1. — Photograph of the umbilical's cord twist in the male fetus.
Figure 2. — Photograph of the two fetuses demonstrating the umbilical cord's twist in the male (left side).

pregnancies. Early demise of one twin may in turn affect the co-twin either due to infection or to disturbed placental circulation of blood shunting through inter-twin anastomoses, especially in monochorionic twins.

Clinical studies [6] have shown an increased risk of perinatal mortality of the co-twin in case of intrauterine death of one fetus during the second and third trimesters in twin pregnancies. Recent review reported a risk of co-twin death in utero of 12% and 4% for monochorionic and dichorionic pregnancies, respectively.

Both maternal and perinatal outcomes in non-IVF dichorionic diamniotic twin pregnancies compared to those that originated from successful IVF efforts are similar in the two study groups [7].

IVF patients show an increased rate of cesarean section due to the obstetrician's and woman's anxiety for successful management of the 'precious' pregnancy. In IVF twin pregnancies, the authors anticipate a higher frequency of cervical incompetence and discordant growth of the twins when compared to dichorionic – diamniotic and monochorionic – diamniotic twin pregnancies conceived spontaneously [8].

Most guidelines recommend limiting the number of transferred embryos in order to obtain singleton IVF pregnancies with a more favourable pregnancy outcome.

However, there are studies in the literature where it is noted that IVF twin pregnancies have a better potential for survival than singleton pregnancies [9]. In addition, the risk of abortion declined as gestational age progressed while an increased risk of fetal death with increasing maternal age was confirmed.

In twin gestations, the vast majority of spontaneous abortions occurred during or after the second trimester [10]. In the same study, it was suggested that placental blood flow imbalance was the cause of spontaneous reduction in second trimester, whereas implantation site crowding and genetic factors seem to be responsible for first trimester's fetal loss.

Intrauterine death of a twin can severely affect the co-twin especially in monochorionic twins who are at a greater risk than dichorionic ones [11]. Fetal intracranial hemorrhage and periventricular leukomalacia can be revealed in a surviving co-twin via magnetic resonance imaging (MRI) and detailed neurosonography despite the fact that their diagnostic value is currently under debate.

The need to determine zygosity and chorionicity in all twins is fundamental for managing the pregnancy and evaluating the probability of any complications [12]. Monochorionic diamniotic twin pregnancies present a more adverse pregnancy course than their dichorionic counterparts because of the vascular anastomoses that connect the two fetal circulations [13]. Placental anastomoses are a major contributor to adverse outcome in these pregnancies [14]. Monochorionic twins often tend to have a significant body weight discordance and polyhydramnios due to shared fetal circulation [15] .

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Address reprint requests to:
P. PINIDIS, M.D.
Praxitelous 15
Alexandroupolis 68100 (Greece)
e-mail: ppinidis@hotmail.com