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## Persistent Discordant Twin Growth Following IVF-ET

R. Ahiron<sup>1</sup>, I. Blickstein<sup>2</sup>

<sup>1</sup>Department of Obstetrics and Gynecology, Chaim Sheba Medical Center, Tel-Hashomer and Sackler Faculty of Medicine, Tel-Aviv University; <sup>2</sup>Department of Obstetrics and Gynecology, Kaplan Hospital (affiliated with the Hadassa-Hebrew University School of Medicine, Jerusalem) Rehovot, Israel.

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**Abstract.** We observed persistent first trimester growth disparity in a twin pregnancy following IVF-ET. The crown-rump length of the two fetuses was substantially different at 7 and 11 weeks and from the 20th week discordant growth was observed by intertwin differences in abdominal circumferences and estimated fetal weights. Birth weight discordance was 26.6% (1600/2180). This is apparently the first documentation of first trimester growth discordance persisting throughout pregnancy.

**Key words:** Twins, Fetal growth, IVF-ET.

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### INTRODUCTION

Intertwin growth discordance may result from either utero-placental factors or the twin-twin transfusion syndrome [1]. Generally, growth discordancy resulting from the former etiology develops during the late-second or third trimester while the latter factor is responsible for mid-trimester cases. Thus, sonographic measurements of fetal growth parameters in twin gestations are usually similar to those of singleton pregnancies until the second trimester. Persistent embryonal growth disparity has not been, however, previously documented. We describe in-vitro fertilized and simultaneously transferred, growth discordant twins.

### CASE REPORT

E.S., a healthy 35-year old nulligravida underwent IVF-ET in the United States, indicated for male infertility. Medical and gynecological histories were unremarkable, except



Fig. 1. Transvaginal sonography at 7 weeks' gestation showing two CRL-discordant embryos. The smaller (×) CRL=6 mm (6+3/7 wk), the larger (+) CRL=11 mm (7+2/7 wk).



Fig. 2. Abdominal sonography at 11 weeks' gestation demonstrating persistence of discordant CRL.

for minimal DES-exposure cervical changes. Her last menstrual period was February 11, 1989, ovum pick-up was on day 16, and five embryos were transferred on day 18. After pregnancy was confirmed, she returned to Israel.

Sonography performed 35 days after ET (at 7 weeks' gestation) showed two gestational sacs and two CRL-discordant embryos (Fig. 1). Cerclage was performed at 11 weeks' gestation and except for one episode of vaginal spotting, pregnancy continued uneventfully. The different embryonal sizes persisted (Fig. 2) and follow-up sonographies showed increasingly divergent abdominal circumferences, (Table 1) consistent with the presumed antenatal diagnosis of growth discordant twins [2].

At 35 weeks' gestation the patient was admitted because of preterm rupture of membranes and contractions. The cerclage was removed and she was delivered by cesarean section. Twin A was a 1600 g vertex-presenting male and twin B a 2180 g breech-presenting female (intertwin birthweight discordance was 26.6%). Both twins had a 5 minute Apgar score of 8. The mother had an uneventful post-operative course and the infants were eventually discharged on day 19 post-partum. At the age of 3 months the smaller boy weighed 4700 g and his larger cotwin sister weighed 5300 g.

## DISCUSSION

Two ovulations occurring within a substantial time interval may result in twin gestation with two embryos of different age [1]. This etiology for growth discordance is impossible in a pregnancy following IVF-ET whereby embryonal dates are beyond doubt. Our observation, therefore, raises several interesting points.

First, is it possible that growth discordant dizygotic twins follow a growth pattern

**Table 1 - Intertwin differences of paired sonographic indices**

Gestational age (wk)	CRL (mm)	FL (mm)	AC (mm)	EFW (g)
7	5 (45%) [6/11]			
11	7 (16%) [35/42]			
20		3 (10%) [28/31]	17 (11%) [135/152]	83 (22%) [300/383]
30		5 (9%) [53/58]	23 (10%) [214/237]	306 (23%) [1050/1356]
32		3 (5%) [61/64]	35 (13%) [243/278]	390 (20%) [1550/1940]

CRL = crown-rump length; FL = femur length; AC = abdominal circumference; EFW = estimated fetal weight.

similar to that seen in our case? This would suggest that growth discordance in advanced twin gestations may result from divergent early-embryonal maturation and development. Sloan et al [4] have investigated if the early onset of intrauterine discordant twin growth is predictive of discordance at birth and recently they showed that the presence of discordance at 20-24 weeks' gestation was significantly related to discordance at birth.

Second, very early intertwin size disparity may suggest that the mechanism of "fetal nurture competition", as proposed in the genesis of growth discordant twins [1], could be operative in early gestation without any conceivable developmental restriction. The observation of Isada et al [3], on patients with multifetal (triplets or more) pregnancies, suggests that interfetal size variability begins much earlier than is generally thought (ie. second trimester). However as multifetal pregnancy reduction was performed, no follow-up for any fetus was possible.

Finally, is it possible that pre-implantation events or differences between embryos are responsible for normal or abnormal intrauterine growth? What are the peri-implantation effects of the transfer of multiple embryos on subsequent fetal growth? Does early human development following extracorporeal handling of gametes and embryos differ from spontaneous multiple pregnancies?

Although we cannot estimate how common or how rare this condition is, we conclude that divergent twin growth may develop in the first trimester and persist to late gestation. Whether this phenomenon is a result of the IVF-ET process or reflects the natural situation has yet to be established.

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**Correspondence:** Dr. Isaac Blickstein, Department of Obstetrics and Gynecology, Kaplan Hospital, 76100 Rehovot, Israel