

Evidence That Difference in Size of Fraternal Twins May Originate During Early Gestation: A Case Report

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ABSTRACT: We describe a woman who conceived by in vitro fertilization (IVF) and embryo transfer (ET). Transvaginal ultrasound demonstrated at least 1 week's difference in size of twin gestations from 1 month post-transfer of embryos to delivery. Differences in sac size, crown-rump length, and gestational growth are discussed, as are implications of ultrasound in early pregnancy.

INTRODUCTION

DATING OF THE GESTATIONAL AGE by sac size was described in 1969 by Hellman [1], and similar measurements by the crown-rump length (CRL) were reported by Robinson and Fleming [2] in 1975. The introduction of new, improved ultrasound units with vaginal probe transducers has made it easier to diagnose early viable pregnancies. There are, however, significant deviations from the mean at each weekly measurement. Since their [2] initial data were evaluated from the reference point of the last menstrual period (LMP), some variations in size may be related to a range in days during the follicular phase when conception occurred [1,2]. However, there is also the possibility that size variance is related to differences in growth rates that are genetically predetermined.

The case report presented here describing at least

a 1-week difference in size of a twin gestation from 1 month post-transfer of embryos (conceived by in vitro fertilization) to delivery lends support to the concept that difference in sac sizes and CRLs in two different gestations may be related to early differences in gestational growth, and that these differences may be maintained until delivery.

CASE REPORT

A 40-year-old woman with a 2-year history of primary infertility related to bilateral tubal occlusion conceived by in vitro fertilization (IVF) and embryo transfer (ET). Six oocytes were fertilized; three embryos were transferred two days after oocyte retrieval, and three were cryopreserved. Twelve days post-embryo transfer, a positive pregnancy test was obtained. Real-time ultrasound was performed uti-

lizing an Ultramark 4 (Advanced Technology Laboratory, Bothell, WA) with a 5-MHz endovaginal probe 28 days post-embryo transfer. A 14-mm intrauterine gestational sac with a 3-mm viable fetal pole and yolk sac, consistent with 5.6 weeks \pm 2 SD from the last menstrual period (LMP), were detected. Also of note was a 4-mm echo-free area anterior to the viable gestation. The appearance was that of a gestational sac, although no yolk sac or fetal pole was identified within. The most likely explanation for the ultrasound findings was that initially two of the three embryos implanted but one of the two was a blighted ovum.

Follow-up transvaginal ultrasound was performed 15 days later by the same sonographer. The previously reported viable gestation demonstrated appropriate growth, with the CRL measuring 16 mm, consistent with 7.9 weeks \pm 2 SD from LMP. The 4-mm echo-free area noted on initial ultrasound was now clearly seen as a gestational sac with a viable embryo and yolk sac within. The CRL measured 10 mm, consistent with 6.9 weeks \pm 2 SD from LMP.

Sonography performed 14 days later demonstrated appropriate growth for both twins, with their sizes corresponding to 10.75 weeks \pm 2 SD and 9.8 weeks \pm 2 SD, respectively.

Both embryos showed appropriate growth during the pregnancy, but maintained the 1-week discrepancy. The mother delivered normal twins prematurely at 34 weeks. The larger sac produced a 5 pound 6 ounce male, and the smaller sac a 4 pound 0 ounce female. Other than some apnea in the female, there were no complications.

DISCUSSION

This report demonstrates that in some cases, differences in size of twins may be related to very early differences in gestational size, with a subsequent parallel growth rate occurring thereafter. This intrinsic variability in the first month of pregnancy limits to some degree the accuracy of exact dating by sonography in the first trimester. One study reported that 15% of normal pregnancies demonstrated considerable differences between the dates of actual birth and those predicted by ultrasound [3]. In another study, it was estimated that the menstrual history was accurate in only 18% of the women evaluated [4]. The problem of accurate dating by ultrasound was further addressed by MacGregor et al [5], who

found that even when the ovulation dates were known, there was an underestimation of gestational age by conventional crown-rump length dating. The reason for this underestimation may be related to Robinson and Fleming's [2] original data being skewed by somehow having a high proportion of study patients having short follicular phases, or even by mistaking the day of ovulation.

The observations presented herein suggest a third explanation for small-for-date CRL, that is, delayed implantation. The stages of embryo development were at best one day apart, and yet quite early in gestation a 1-week "age" discrepancy was noted. There did not appear to be an intrinsic genetic size difference, since the rate of growth was exactly the same following the initial lag phase. Finally, the fact that this was an IVF-ET conception suggests that delayed implantation may occur once the embryos are in the uterine cavity, rather than exclusively by delayed transit through the fallopian tubes.

We were initially convinced that the second smaller sac was a blighted ovum. This case emphasizes the importance of not drawing conclusions regarding the well-being of a pregnancy based on one sonogram, despite the newer sophisticated instrumentation, and it also underscores the need for follow-up sonography.

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