Case Report

Trisomy 9 Mosaicism Diagnosed In Utero

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We present three cases of trisomy 9 mosaicism diagnosed by amniocentesis with ongoing pregnancies after referral to our center due to fetal abnormalities. Two cases were associated with severe fetal growth restriction (FGR), each of which resulted in an intrauterine fetal demise (IUFD) in the third trimester. The other case involved mild FGR with a congenital diaphragmatic hernia and resulted in a live birth with severe development delay. A major prenatal finding of trisomy 9 mosaicism is FGR. Fetuses with trisomy 9 mosaicism can rarely survive in the case of severe FGR.

1. Introduction

Trisomy 9 mosaicism is a rare chromosomal abnormality that manifests with multiple anomalies, such as facial, cardiac, osteal, genitourinary, and respiratory abnormalities. More than 50 cases have been reported, most of which were diagnosed after birth. As cases diagnosed prenatally usually culminate in induced abortions [1–4], the natural history of fetuses with trisomy 9 mosaicism remains unknown. We report three cases of trisomy 9 mosaicism diagnosed in utero with ongoing pregnancies.

2. Case Report

A 36-year-old primigravida was referred to our institute at 29 weeks of gestation because of fetal growth restriction (FGR). A fetal ultrasound examination demonstrated severe asymmetric FGR (<−3.0 standard deviation [SD]) and a single umbilical artery (SUA). An amniocentesis revealed that 27 were normal 46, XX cells and 3 cells (10%) were 47, XX, +9. An intrauterine fetal demise (IUFD) was confirmed at 33 weeks of gestation. The fetus was a 915 g female with a large forehead, a bulbous nose, and micrognathia. The placental weight was 150 g. An autopsy revealed an abnormal lobulation of the right lung.

The second case was that of a 36-year-old primigravida. She was referred to our institute at 31 weeks of gestation due to a left-sided congenital diaphragmatic hernia. The estimated fetal body weight by ultrasound was 1408 g (−1.7 SD). The fetal karyotype by amniocentesis indicated trisomy 9 mosaicism with 29% (6/21 cells) trisomic cells. At 37 weeks of gestation, a 1506 g male was delivered by elective cesarean section. The diaphragmatic hernia was repaired on day 2 of life, followed by a gastrostomy and bronchotomy in the 1st year. Although he had normal G-banding results on postnatal blood karyotyping, interphase FISH performed on abdominal wall muscle tissue obtained during the gastrostomy revealed a mosaic trisomy 9 karyotype. This case has been reported to highlight the cytogenetic discrepancy between amniocytes and postnatal blood [5]. He is now 4 years old and suffers from severe developmental delay.

The third case involved a 41-year-old primigravida. She was referred for evaluation of FGR at 26 weeks of gestation. An ultrasound examination revealed severe asymmetric FGR 530 g (~3.2 SD) and an SUA. Chromosomes from
Our cases contribute to clarifying the natural history of trisomy 9 mosaicism diagnosed in utero. Trisomy 9 mosaicism fetuses with severe FGR can rarely survive. These findings are helpful for genetic counseling for trisomy 9 mosaicism diagnosed.
Table 2: Characteristics and outcomes of reported cases of prenatal trisomy 9 mosaicism.

| Case | Reference | Maternal age (years) | Time of exam (weeks) | Trigger of detection | FGR | Other fetal findings | Outcomes |
|------|-----------|---------------------|---------------------|---------------------|-----|----------------------|----------|
| 1    | Bureau et al. [8] | 24 | 36 | CNS anomaly | – | Dandy-Walker variant | Liveborn, death at 2 weeks |
| 2    | Saura et al. [3] | 28 | 30 | PDA, polyhydramnios | – | PDA | Liveborn at 35 weeks |
| 3    | Greenberg et al. [9] | 39 | 16 | AAMA | – | – | Liveborn at term |
| 4    | Hsu et al. [10] | 48 | NA | AAMA | – | – | Normal development at 3 years, 8 months |
| 5    | Case 1 | 35 | 29 | Severe FGR | Severe | IUFD at 33 weeks |
| 6    | Smoleniec et al. [12] | 28 | 34 | Severe FGR | Severe | IUFD at 34 weeks |
| 7    | Case 2 in [5] | 36 | 31 | CDH | Mild | IUFD at 38 weeks |
| 8    | Sherer et al. [11] | 20 | 31 | FGR | Mild | IUFD at 34 weeks |
| 9    | Case 3 | 41 | 24 | Severe FGR | Severe | IUFD at 33 weeks |

AAMA: amniocentesis with advanced maternal age; CNS: central nerve system; FGR: fetal growth restriction; IUFD: intrauterine fetal demise; PDA: patent ductus arteriosus; NA: not available.

Conflict of Interest

The authors declare no conflicts of interest.

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