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Research Letter

A case of fetomaternal transfusion in trichorionic triamniotic triplets

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Dear Editor,

Fetomaternal transfusion (FMT) is the loss of fetal blood cells into the maternal circulation which causes severe fetal anemia. We report a case of FMT in one of trichorionic triamniotic triplets.

The patient was a 37-year-old primigravida, pregnant after artificial insemination with her husband's semen using human menopausal gonadotropin injection. Her blood group was O and Rh-positive, with a negative antibody screen. She was hospitalized because of threatened premature labor. At 31 weeks and 2 days of gestation, cardiotocography revealed small variable decelerations. She experienced more frequent uterine contractions on that day. We concluded that the deceleration was due to umbilical cord compression; therefore, ritodorine hydrochloride therapy was initiated. After administration, prolonged decelerations with minimal variability were revealed following the sinusoidal heart rate pattern. Moreover, cardiotocography of the fetus showed loss of variability. Middle cerebral artery peak systolic velocity (MCA-PSV) was 108.5 cm/s, suggesting fetal anemia. Therefore, we performed an emergency cesarean section. The newborn was female (Table 1). Her results of umbilical artery blood gas analysis were pH of 7.048 and hemoglobin (Hb) level of 2.9g/dL. Both the newborn and her placenta were extremely pale because her Hb level was 4.0 g/dL (Figure 1). FMT was diagnosed from a maternal blood sample with fetal Hb (HbF) of 3.8% and alpha-fetoprotein (AFP) concentration of 9600 ng/mL. The female newborn received an immediate blood transfusion. Despite the intensive care for disseminated intravascular coagulation, she died at 3 months of age because of multiple organ failure.

FMT is defined as transfusion of fetal blood into the maternal circulation. Causative factors are trauma, choriocarcinoma, abruptio placentae, cesarean section, amniocentesis, and external cephalic version; however, the etiology of several cases remains unknown [1]. The incidence of FMT (> 30 mL) is 1/300 deliveries. In contrast, massive FMT (> 80 mL or > 150 mL) occurs in 1/1000 deliveries and 1/5000 deliveries, respectively [2]. Acute FMT is a more serious condition because fetuses are often delivered in an asphyxiated state. A diagnosis of FMT is made to detect fetal components (i.e., HbF or AFP) in the maternal circulation. HbF is detected using the Kleihauer–Betke test or high-performance liquid chromatography (HPLC) [3]. In this case, the HbF level was 3.8% as measured using HPLC, and the estimated volume of red cell transfusion was 83 mL. The estimated whole blood volume of the baby was 90 mL (85 mL/kg); therefore, she lost most of her blood. In general, the mother can detect decreased fetal movement. However, even after massive transfusion, it is difficult

Table 1
Result of the fetuses.

	Sex	Body weight	Apgar score at 1 min & 5 min	Umbilical arterial blood pH value	Hemoglobin level	Outcomes
I	**Female**	**1070 g**	**1/4**	**7.048**	**4.0 g/dL**	**Died at 3 months of age**
II	Male	1444 g	9/10	7.396	21.0 g/dL	Grew up healthy No neurological complication
III	Male	1320 g	8/9	7.374	18.8 g/dL	Grew up healthy No neurological complication

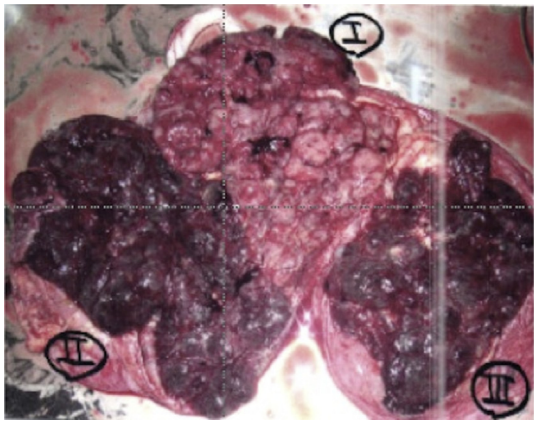

Figure 1. Gross appearance of the placentas. The placenta of the first baby (I) was pale because of fetomaternal transfusion. The other two placentas (II and III) were normal.

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to estimate fetal morbidity in a multiple pregnancy. If MCA-PSV is greater than 1.5 multiples of the median, immediate delivery should be considered [4]. It would be helpful to measure HbF in the maternal blood to make a diagnosis. FMT in triplets is an extremely rare condition, and we were unable to find any cases in the literature, although some case reports of twins are available [5]. FMT should be considered in multiple as well as in single pregnancies. Further research is required to reveal the mechanism of FMT.

Conflicts of interest

The authors have no conflicts of interest relevant to this article.

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