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Familial Tetra-Amelia Syndrome

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Abstract

Tetra-amelia is known as an anomaly characterized by the absence of all four limbs. It is a rare congenital anomaly, with an incidence of 1.5-4 per 100,000 births. It occurs as a result of developmental interruption between 24th and 36th days after fertilization. Its etiology is not well known. It may be observed isolated or associated with other anomalies. In this paper, we present an interesting case of an intra-uterine diagnosed tetra-amelia male fetus with the recurrence in the previous two more male fetuses in the same family. Tetra-amelia syndrome observed in all three male fetuses of a couple with blood relationship is presented. The first two male newborn died just after birth due to prematurity in 28th and 32nd weeks. The third male fetus was in 23nd weeks of the intrauterine life. There was no exposure to teratogenic agents in this pregnancy. It detected that the third male baby had subcutaneous edema, intra-abdominal ascites and lateral ventricle enlargement in cranium. Since tetra-amelia due to genetic inheritance based on X chromosome was suspected, the family was offered the options of termination of pregnancy, karyotype analysis and genetic consultation.

Keywords: Amelia, Tetra-amelia multiple malformation, X-linked tetra-amelia

Introduction

Most maternal cardiac disease in Western societies is now congenital in origin. This relates to the significant tetra-amelia is a very rare congenital anomaly, with an incidence of 1.5-4 per 100,000 births (1). It is defined as the complete absence of all four limbs which occurs as a result of the developmental interruption between 24th and 36th days after fertilization. It is presented as an isolated defect or can be also associated with other anomalies (2,3). The clinical definition of the different anomalies related with tetra-amelia is not clear yet (4).

We describe here a rare case with familial recurrent tetra-amelia, which was occurred in previous three male fetuses and was accompanied with intra-abdominal ascites, subcutaneous edema and lateral ventricle enlargement in cranium.

Case Report

A 21 year old, gravida 4, parity 3 pregnant woman was referred to our perinatology clinic at her 28th gestational weeks. Regarding her obstetrical history, her first pregnancy resulted in premature birth. The newborn died just after birth due to extreme prematurity. Her second pregnancy passed beyond 32 gestational week, however her newborn died again after birth due to prematurity. She had only one child, a girl, was still alive. Both premature fetuses resulted in death shortly after birth were male and all four limbs were not developed. The outcome of the third pregnancy was an alive female infant.

The couple was second degree blood relative. There was no history of exposure to teratogenic agents in this pregnancy. Ultrasonography analysis determined that biparietal diameter was 23 weeks 4 days, head circumference was 23 weeks 3 days and abdominal circumference was 28 weeks 4 days. The fetus was male and upper and lower limbs were absent in the ultrasonography analysis (Figure 1). There were also intra-abdominal ascites, subcutaneous edema and lateral ventricle enlargement in cranium (Figure 2). Since tetra-amelia due to genetic inheritance on chromosome X was suspected, the family was offered the options of termination of pregnancy, karyotype analysis and genetic consultation. Family did not accept any of our proposals.

Discussion

Tetra-amelia is a rare congenital defect which takes place between 24th and 36th days after fertilization due to cessation of embryonic development. In most cases, its etiology can not be determined. It could be observed as a single case or as a part of a genetic syndrome (1,2). In many cases, tetra-amelia was accompanied by several malformations such as lip and palate cleft, choanal atresia, cataract, absence of the nose, cranial malformation, microphthalmia, ocular coloboma, microcornea, absence of optic nerve, neural tube defect, single-or double-sided absence of the kidneys, absence of external genitalia, anal atresia, pulmonary hypoplasia, diaphragmatic hernia and absence of the pelvic bones (4). In our case, we detected subcutaneous edema, ascites and lateral ventricle enlargement in cranium.

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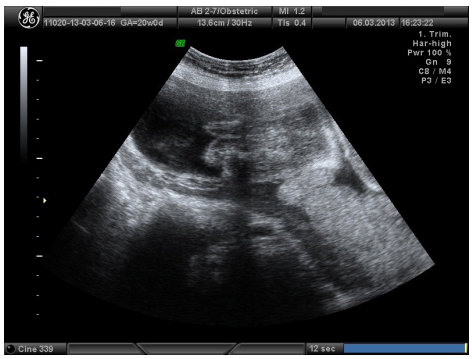

Figure 1. The absence of extremity was shown in ultrasound image.

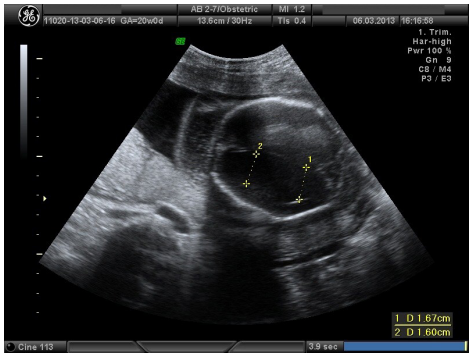

Figure 2. The lateral ventricle enlargement was shown in ultrasound image.

Tetra-amelia can be also a part of several genetic syndromes such as Roberts syndrome, caudal regression syndrome, femoral hypoplasia-atypical facial syndrome, Baller-Gerold syndrome and Herman-Pallister-Opitz syndrome (5). It has been shown that the cause of tetra-amelia is due to a defect in the WNT3 gene in Roberts syndrome. WNT3 gene, located at 17q21, regulates the development of the limbs and other organs (6).

In the past cases of tetra-amelia due to thalidomide use to treat hyperemesis on pregnant women were reported (7). In the literature, six tetra-amelia cases in the same family were reported by Zimmer et al. Since all tetra-amelia patients were male, it was called tetra-amelia syndrome due to X chromosome (8). Basaran et al. described two patients with tetra-amelia male infant accompanied by multipl anomalies (9). Both couples had one healthy daughter. In our case, similarly, there were only one healthy female child and two male fetuses with tetra-amelia. In her current pregnancy the fetus was again a male with tetra-amelia. Furthermore, the parents of these fetuses are second degree relatives.

Conclusion

To conclude, tetra-amelia could be seen as a syndrome or as an isolated case. Its etiology and the mode of inheritance is still not clear. There are different opinions about the genetic aspect of tetra-amelia. Syndromes that may be recognized with accompanying pathologies should be considered in evaluation of patient. Karyotype analysis and genetic counseling should be recommended.

Ethical issues

The local ethics committee approved the study.

Conflict of interests

The authors declare no conflict of interests in this study.

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