Acardiac fetus: a case report

S. Özuysal[1], Ö. Yerci[1], G. Uncu[2], G. Filiz[1]

Department of [1]Pathology, [2]Gynaecology and Obstetrics, Medical School, University of Uludağ, Bursa (Turkey)

Introduction

Acardiac fetuses comprise about 1% of the monozygotic twin pregnancies [1]. Macroscopically acardius is an abnormal and bizarre shaped fetus (parasitic fetus). The blood circulation is maintained by the other twin (donor twin) because it does not have a functioning heart [2].

Case

Clinical findings. A 27-year-old female had a healthy male baby by caesarian section after a normal pregnancy. During the operation a fairly large nodular mass attached to the placenta was identified and sent to the pathology department with the placenta.

This was the patient's first pregnancy and there was no history of drug abuse, trauma, exposure to radiation, or kinship marriage.

Pathologic findings. A specimen designated as the placenta was a soft hemorrhagic tissue measuring 17x11x4.5 cm in maximum dimensions. An umbilical cord measuring 21 cm in length, was attached which showed three vessels on section. Insertion of the umbilical cord was normal. Maternal surface of the placenta was not remarkable. There were focal yellowish discoloration areas measuring 0.3 and 1.5 cm in diameter. Sectioning of the specimen revealed pinkish-brown tissue.

A round-shaped mass was also present attached to the periphery of the chorionic membranes by a 3.5 cm cord-like structure. This mass was partially covered by hairy skin (Fig. 1). The cord-like structure showed two vessels on section.

Sectioning of the mass revealed soft solid pinkish-brown tissues and gelatinous material. Hard bony-like structures were also identified. Organoid development grossly was not observed.

Fig. 1. — Round-shaped mass attached to the periphery of the chorionic membranes by a 3.5 cm cord-like structure.

Microscopic examination revealed placental villi with normal vascularization and cellularity, focal infarcts in yellowish areas consistent with macroscopic findings were also identified. Vascular structure and wharton gel component of the umbilical cord of the co-twin was normal.

Cut sections through the external surface of the mass showed a thin epiderm, beneath it. Fetal-type lipomatous tissue, immature mesenchymal structures such as fibrous-cartilaginous-osseous and lymphoid tissues were also present.

Discussion

Monozygotic twins are generally identical but sometimes asymmetrical divisions may occur during embryonal development causing various abnormalities. Acardia is a sample of this type of twin anomally. In this condition one of the embryos will develop in normal course while the other one will become rudimentary or show abnormal development [3]. The malformations may vary from a partly-developed head, deformed trunk and extremities to an amorphous teratoma-like mass, as in our case [2].

Cord vessels of the acardiac fetus are composed of one artery and one vein and are attached to the donor twin's vessels. Blood flow to the acardius has a reverse course from the donor twin's heart through a large placental artery-to-artery anastomosis to the umbilical artery of the acardius. After circulation through the organs of the parasitic twin blood returns to the circulatory system of the donor twin by a large placental vein-to-vein anastomosis. The different shape, size and development of the acardiac fetus may be due to this abnormal perfusion [2, 4].

Various studies on this type of case have revealed cardiovascular overload in the donor twin resulting in heart failure, right ventricular hypertrophy, relative pulmonary stenosis, hepatosplenomegaly, ascites and hydrops due to hypoalbuminemia, and other malformations [5, 6]. Mortality rates in donor twins are over 50% [3]. In our case the co-twin was born healthy after a normal pregnancy. This was possibly due to the presence of the extremely small and rudimentary parasitic twin which caused no adverse effect on the co-twin.

References

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Address reprint requests to:
SEMA ÖZUYSAL
Uludağ Üniversitesi Tıp Fakültesi Patoloji ABD
Görükle, Bursa (Turkey)