Case Report
Three umbilical arteries resulting in a four-vessel umbilical cord in a stillbirth

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Abstract: Here we first describe a four-vessel umbilical cord including three umbilical arteries and one vein in a stillbirth. A 28-year-old woman delivered a 2360 g stillbirth in the 33th week of gestation. The infant had no gross anomalies. The placenta was examined pathologically, and the cord was measured as 60.0 cm long, which has four vessels with three arteries and one vein throughout its whole length confirmed by direct and microscopic examination. Fibro-necrosis and dotted necrosis were found in the placenta. A pregnancy with three umbilical arteries may need fetal monitoring during the second trimester. Further observation and adequate investigation are needed in such cases.

Keywords: Umbilical cord, umbilical arteries, stillbirth, anomalies

Introduction
Aberrations in the number of umbilical vessels do occur occasionally during pregnancy. The rate of four umbilical vessels is extremely unusual and has been previously reported to be associated with a high incidence of major congenital anomalies [1, 2]. There are only a few cases of a four-vessel cord with two umbilical veins and two umbilical arteries have been reported worldwide [3, 4]. Here we report a case of a stillbirth with a four-vessel cord which has three umbilical arteries and an umbilical vein for the first time.

Case report
A 28-year-old woman was admitted to our hospital at 33 weeks of gestation with no fetal movement for 18 hours. Vaginal bleeding like menstrual hemorrhage had occurred twice at 8 and 12 gestation weeks respectively, and no fetal abnormality was found by ultrasound examination. Thus the patient was treated as threatened abortion. Twice ultrasound examinations were given after and reported no anomalies of the fetal heart and other important organs (without cord scanning).

The patient delivered a dead neonate weighed 2360 g and had no gross anomalies excluding the vascular abnormality of three umbilical arteries and one vein throughout the whole length of the cord which was confirmed by direct or microscopic examination (see Figures 1, 2). Edema and thickening were found on the root of the cord while fibro-necrosis and dotted necrosis were found in the placenta (see Figure 3). No further information about the dead baby could be obtained because of no committing of the newborn families for autopsy.

Discussion
The umbilical arteries first appear as ventral branches of the paired dorsal aortas at the third week of embryo-genesis. With fusion of the paired dorsal aortas, the primitive umbilical arteries unite with the descending aorta, and the definitive umbilical arteries arise as two lateral branches from the caudal end of the descending aorta. Simultaneously, an arterial plexus develops around the allantois and coalesces to form a single artery extending almost the entire length of the body stalk. This allantoic artery becomes shorter as the right and left umbilical arteries advance in the body.
Three umbilical arteries in stillbirth

Figure 1. Four umbilical vessels in the cord of a stillbirth case.

Figure 2. A: An umbilical vein. B-D: Umbilical arteries.
Three umbilical arteries in stillbirth

stalk and eventually unites with both arteries to form the inter arterial anastomosis normally present in the region of the placental insertion. Under normal conditions the right umbilical vein regresses in the second month of fetal life. The left umbilical vein and the two umbilical arteries become the vessels found in the normal cord [5]. Here we just report a four-vessel cord which has three umbilical arteries and an umbilical vein.

Our report here further suggests that doctors should be encouraged to provide second trimester screening. Fetal sonography during the second trimester may allow a more exact prenatal diagnosis of a multivessel umbilical cord and thus may permit a more comprehensive workup for a better outcome [7].

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Disclosure of conflict of interest

None.

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Figure 3. Fibro-necrosis and dotted necrosis were found in the placenta.
Three umbilical arteries in stillbirth

References


