Single umbilical artery and its siding in the second trimester of pregnancy: relation to chromosomal defects

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OBJECTIVES

To determine the possible association between single umbilical artery (SUA) in the second trimester of pregnancy and the incidence of chromosomal abnormalities. To determine whether the presence of chromosomal defects in fetuses with SUA is related to the side of the missing artery.

METHODS

Color flow imaging of the fetal pelvis was used to determine the number of umbilical arteries in 2147 fetuses immediately before amniocentesis for karyotyping in the second trimester of pregnancy.

RESULTS

SUA was diagnosed in 102/2147 (4.8%) cases. The left umbilical artery was absent in 60/102 (58.8%) fetuses, compared with 42/102 (41,2%) for the right artery. The rate of chromosome abnormalities was significantly higher among fetuses with SUA than among those with 2 umbilical arteries (19/102 or 18.6% vs 109/2045 or 5.3%; OR = 4.1, 95% CI 2.3-7.1, p<0.0001). Among fetuses with SUA, there was no significant difference in the rate of chromosome abnormalities between those with absence of the left vs the right artery (11/60 or 18.3% vs 8/42 or 19.0%, p=0.93). There was an SUA in 5/39 (12,8%) cases with trisomy 21, 8/16 (50%) with trisomy 18, 1/4 (25%) with trisomy 13 and 5/69 (7.2%) with other chromosomal defects. There were no chromosome abnormalities in fetuses where a single umbilical artery was an isolated sonographic finding. All fetuses with SUA and chromosomal defects had associated abnormalities detected by ultrasound.

CONCLUSION

A single umbilical artery (SUA) in the second trimester of pregnancy has a high association with trisomy 18, 13, 21 and other chromosomal defects, but all chromosomally abnormal fetuses had associated malformations detected by ultrasound. The absence of the left artery is more frequent than the absence of the right artery. The association with chromosomal abnormalities seems to be equal on each side.

Table 1—Single umbilical artery in chromosomally abnormal fetuses with associated structural abnormalities and markers of chromosomal defects detected in the second-trimester scan ($n = 19$)

	Absent LUA (no. of cases)	Absent RUA (no. of cases)
Trisomy 21 ($n = 5$)	**3**	**2**
Ventriculomegaly	1	
Choroid plexus cysts		1
Enlarged cysterna magna		1
Cardiac anomalies	1	1
Mild hydronephrosis	2	2
Sandal gap	1	
Hydrops	1	
Total	6	5
Trisomy 18 ($n = 8$)	**5**	**3**
Strawberry-shaped head		1
Choroid plexus cysts	2	2
Absent corpus callosum	1	
Dandy–Walker malformation	1	1
Facial cleft	1	2
Cardiac anomalies	2	1
Diaphragmatic hernia		1
Exomphalos	1	1
Small for gestational age	1	
Radial aplasia	1	
Overlapping fingers	2	1
Total	12	10
Trisomy 13 ($n = 1$)		**1**
Holoprosencephaly		1
Facial cleft		1
Postaxial polydactyly		1
Total	0	3
Other chromosomal defects ($n = 5$)	**3**	**2**
Ventriculomegaly		1
Hygroma colli	1	1
Cardiac anomalies	1	
Mild hydronephrosis	1	
Generalized hydrops	1	1
Small for gestational age	1	
Syndactyly		1
Molar placenta	1	
Total	6	4

LUA, left umbilical artery; RUA, right umbilical artery.

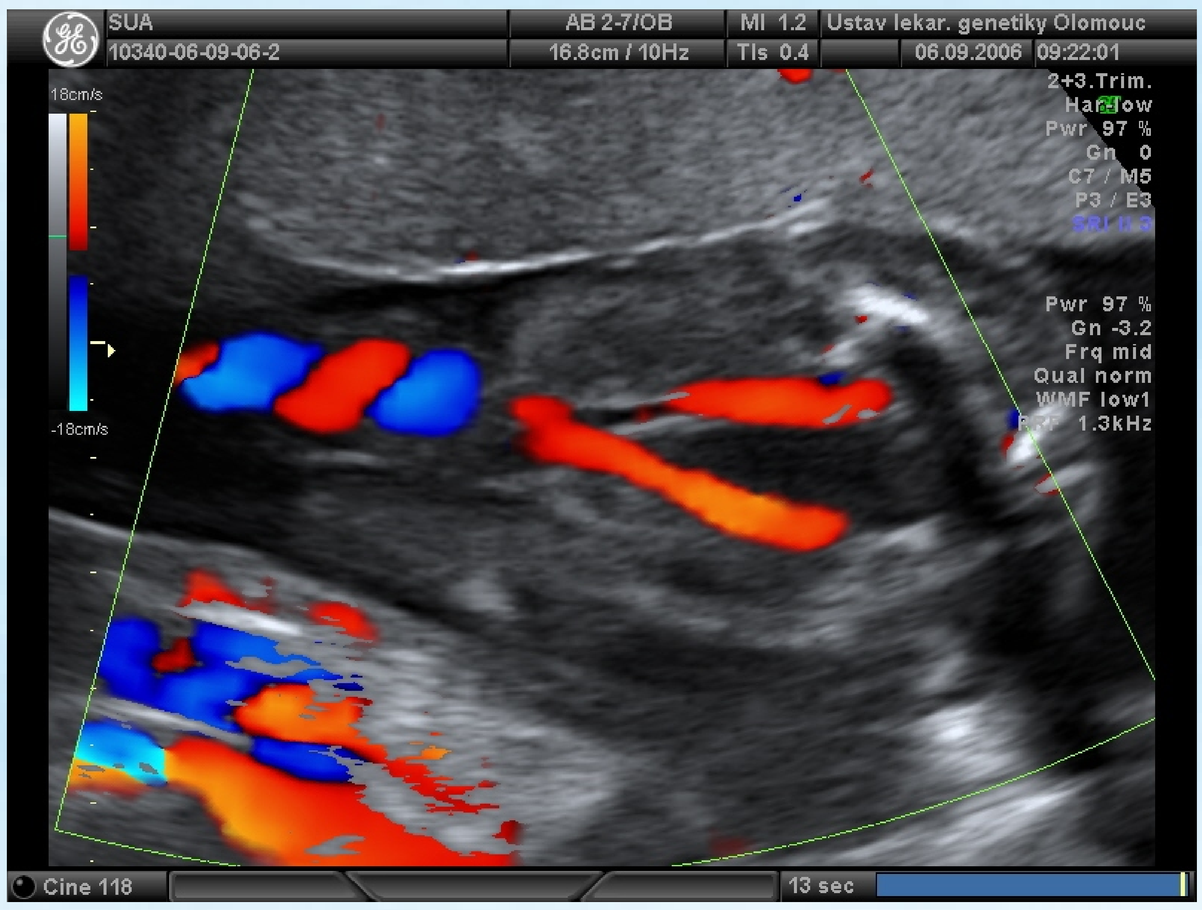

Figure 1 Transverse view of fetal pelvis, which color flow Doppler showing umbilical arteries as they course around the bladder

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