RIGHT SIDED AORTIC ARCH ASSOCIATED WITH TRISOMY 21

Case study

Background:

At 12 weeks (nuchal translucency scan) and 20 weeks (morphology scan) a fetus is assessed for structural abnormalities compromising the well being.

A normal fetal heart can be detected at 20 weeks however the earlier abnormality can be detected, the earlier appropriate intervention can occur.

This is a case of abnormal vessel pathway through the fetal heart. A female of 39 years presented at the department with her first pregnancy for a follow up fetal echocardiogram at 21 weeks 3 days.

Traditionally there should be three vessels aligned in a row from largest to smallest: the pulmonary artery, aorta and then the superior vena cava. In this case the pulmonary artery is positioned normally however the aorta is positioned to the right of the trachea adjacent and then the SVC alongside it.

Image one demonstrates a bmode image in a transverse orientation at the level of the fetal chest. The aorta moves posterior to the trachea in an abnormal pathway creating a characteristic ‘U’ shape of the vessels.
**Toshibas unique technology : ADF (Advanced Dynamic Flow)**

ADF is the colour application of choice for fetal hearts. It is a wide band Doppler technique meaning the machine sends a wide range of frequencies and receives a wide range of frequency shifts. It can therefore show low and high flow simultaneously giving amazing colour spatial resolution. In this case the fetal heart is approximately as small as your thumb nail and the ADF provides the colour spatial resolution to demonstrate the paths of the aorta and the pulmonary artery as two clearly separate structures. ADF gives clinical confidence.

![Transverse oriented image of the fetal chest at the level of the aortic arch. Notice the high quality spatial resolution of ADF to fill the vessels perfectly without overpainting](image)

Findings were a right sided aortic arch traditionally the aorta and pulmonary artery should form an arrow shape however in this case they formed a U shape indicating that the aortic was passing behind the trachea instead of in front.

According to Allen, Cook and Huggon right sided aortic arch can be an isolated finding or with additional intracardiac lesions, particularly tetralogy of fallot (about 30%) and common arterial trunk (10%)’ (Allen, Cook & Huggon 2009 p. 241). It can be associated with chromosomal defects such as 22q11 deletion and less commonly trisomy 21 or 18. If isolated it does not require any treatment or intervention.

The fetus can be genetically screened (called karyotyping) to detect genetic markers for down syndrome. The patient later underwent an amniocentesis and the results came back as trisomy 21 = Downs Syndrome.

Toshibas Aplio I-series provides the high quality spatial resolution in B mode and ADF to give clinical confidence detecting these heart abnormalities earlier.

**REFERENCES:**