

INITIAL EXPERIENCE WITH FETAL CARDIOVASCULAR MAGNETIC RESONANCE

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Background:

Fetal cardiovascular magnetic resonance (CMR) imaging may provide a valuable adjunct to fetal echocardiography in the diagnosis of congenital heart disease (CHD). We assessed the utility and safety of fetal CMR.

Materials and Methods:

Four fetuses (gestational age 29-31 weeks) were examined using 1.5 T CMR scanners between March and April 2022 at our Institution. All fetuses had a suspicion for congenital heart disease at fetal echocardiography. All participants provided written informed consent. The CMR protocol consisted of anatomical balanced steady state free precession images in the sagittal, transversal and coronal planes. Cine image acquisitions were acquired in 4-chamber, 2-chamber and short axis views using Doppler Ultrasound (DUS) gating. Fetal CMR images were evaluated by 4 observers in consensus, all together with extensive experience in fetal cardiology, echocardiography and CMR.

Results:

Scan duration was approximately 20 to 40 minutes without maternal and fetus complications. CHDs were confirmed in all fetuses: one transposition of great vessels, one interruption of aortic arch, one aortic stenosis and one aortic coarctation (Fig.1). In fetus with transposition of the great vessels CMR demonstrated interatrial communication via the restrictive foramen ovale. In fetus with aortic stenosis, fetal CMR demonstrated that the mitral valve was severely underdeveloped and left ventricular contractility reduced making biventricular correction more difficult.

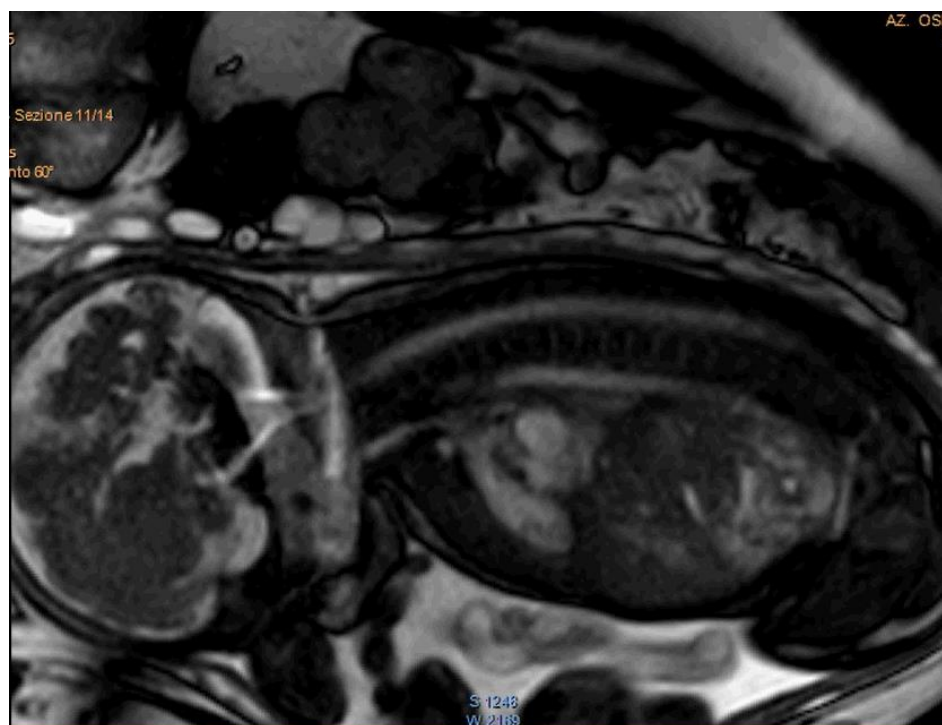


Fig.1 Fetus with aortic coarctation

Conclusions:

Fetal CMR is a useful and safety complement to fetal echocardiography for evaluating cardiac function and both and vascular anatomy in a wide spectrum of CHDs. CMR added clinically useful information that affected planning of delivery, postnatal care and/or parental counselling.