Interrupted aortic arch type B and hypoplastic ascending aorta as a hint of common arterial trunk type A4

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Interrupted aortic arch and aortic coarctation are difficult to differentiate on prenatal imaging in echocardiography. In suspected interrupted aortic arch in association with hypoplastic ascending aorta and potential abnormal branching of the supraaortic arteries, common arterial trunk type A4 [1,2], also called truncus arteriosus, should be considered. Common arterial trunk is a rare severe congenital cardiac defect characterized by a single great artery connecting both ventricles [3,4].

CASE PRESENTATION

Fetus at gestational age 32 with ventricular septal defect observed on routine obstetric ultrasound at the second trimester. Interruption of the aortic arch and hypoplastic ascending aorta were also suspected based on ultrasound. There were no maternal risk factors.

INVESTIGATION

Obstetric ultrasound has been performed at gestational age of 28 weeks. A fetal cardiac MRI was recommended to assess the aortic morphology and the supraaortic arteries that could not be sufficiently validated on ultrasound. On fetal MRI, a common arterial trunk was observed *(Figure 1)*. The interruption of the aortic arch distal of the left common carotid artery´s origin could be detected corresponding to a type B interruption. The descending aorta was connected to the common arterial trunk via a prominent arterial duct *(Figure 2)*. The ascending aorta was hypoplastic and supplied two supraaortic arteries, respectively. The right ventricle was enlarged in relation to the left ventricle *(Figure 3)*.

DIFFERENTIAL DIAGNOSIS

The fetal cardiac MRI was able to depict the interruption of the aortic arch and differentiate it from hypoplastic aortic arch and coarctation. The association with the very hypoplastic ascending aorta rose the suspicion of common arterial trunk as a possible differential diagnosis.

TREATMENT

Because of a prostin-dependent constellation the baby immediately received medication after birth to keep the arterial duct open. On day 1 banding of the pulmonary arteries was performed followed by Sano-Shunt placement after cardiac MRI on postnatal day 6 that confirmed the diagnosis of common arterial trunk type A4. The patient is currently in a critical state due to multifactorial complications in the context of his cardiac defect.

OUTCOME AND FOLLOW-UP

Due to prenatal diagnosis of severe cardiac defect the delivery took place at our tertiary university hospital to guarantee appropriate treatment in the neonatal intensive care unit. Definitive cardiac surgery is still pending due to the persisting critical state.

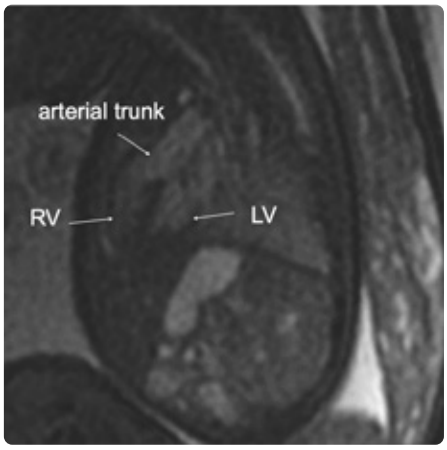

Figure 1: Sagittal CINE bSSFP sequence: common arterial trunk arising from both ventricles. RV: right ventricle, LV: left ventricle

TAKE HOME MESSAGES

Improved characterization of severe cardiac and vascular defects during the fetal period by additional fetal cardiac MRI may facilitate parents` support, medical care, patient`s neonatal management and surgical planning.

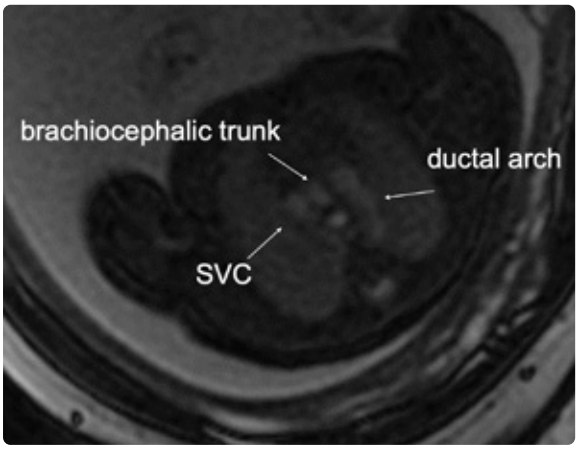

Figure 2: Axial CINE bSSFP sequence: interrupted aortic arch (no arch visible) and communication between the common arterial trunk and descending aorta via the ductal arch. SVC: superior vena cava

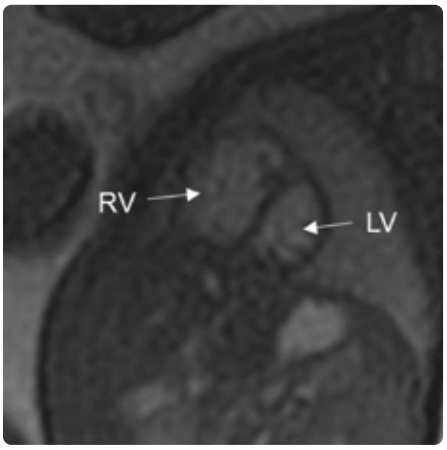

Figure 3: Short axis CINE bSSFP sequence: the right ventricle (RV) is enlarged compared to the left ventricle (LV)

REFERENCES

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