Dual Source CT
Pediatric Congenital Heart Disease – Anomalous Coronary Arteries

SOMATOM Definition Dual Source scanning

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HISTORY

A 3-year-11-month-old girl was referred to the pediatric cardiology department of our center for detailed examination and treatment of her congenital heart disease. Light cyanosis and heart murmurs were first noticed when she was examined at age 3, after having contracted influenza. Examinations by transthoracic echocardiography and catheter angiography lead to a diagnosis of pulmonary atresia with ventricular septal defect and major aortopulmonary collateral arteries (MAPCA). We took an ECG-gated, cardiac Dual Source CT scan to help confirm the diagnosis.

DIAGNOSIS

The same findings as obtained by echocardiography were also seen on the DSCT images, which were of excellent quality: a ventricular septal defect of about 10 mm diameter, an overriding of the aorta and pulmonary atresia. DSCT could confirm the MAPCA as seen on angiography, and the relative positions of MAPCA, trachea and bronchi could be easily identified from the volume rendered images. The DSCT images revealed a single coronary artery that was not clearly seen on angiography. The DSCT images further revealed that all major coronary arteries originated from the left sinus of Valsalva.

COMMENTS

With DSCT, isotropic volume data with high spatial resolution could be acquired. DSCT images have sufficiently high image quality to allow diagnosis of cardiac and vascular morphologies even for pediatric patients. DSCT can therefore complement echocardiography and angiography and provide valuable information, particularly for surgical treatment planning. The scan could be performed after only lightly sedating the patient by oral medication before the scan. A bolus of 18 mL iodinated contrast agent (370 mgI/mL) was injected. The patient's height was 93 cm, body weight was 12 kg, and mean heart rate during the scan was 123 bpm. This scan was performed shortly after installation of the Dual Source CT at our center, we have become able to reduce the dose to pediatric patients by about 2/3.

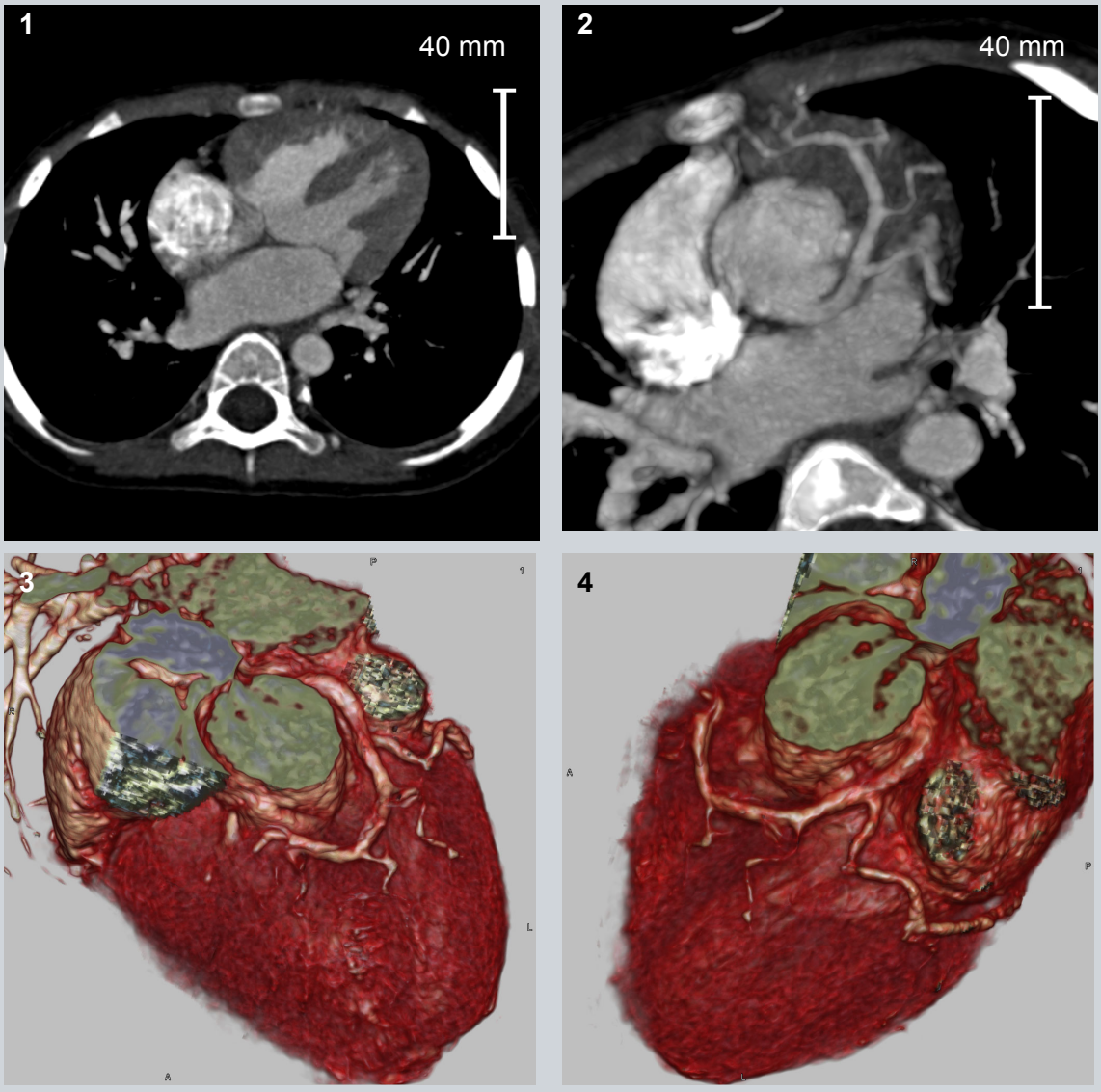

Fig 1: Ventricular septal defect (MIP)
Fig 2: Single coronary artery originating from left sinus of Valsalva (MIP)
Fig 3, 4: Single coronary artery of mean HR 123 bpm (VRT)

EXAMINATION PROTOCOL

Scanner	*SOMATOM Definition*
Scan area	*Thorax*
Scan length	*100 mm*
Scan time	*3 s*
Scan direction	*Cranio -Caudal*
kV	*100 kV / 100 kV*
Effective mAs	*280 mAs /rot*
Rotation time	*0.33 s*
Slice collimation	*0.6 mm*
Reconstructed slice thickness	*0.6 mm*
Increment	*0.5 mm*
Kernel	*B25f*
Temporal resolution:	*83 msec (Heart rate independent)*
Spatial Resolution:	*0.33 mm isotropic*