

Dual Source CT Pediatric Congenital Heart Disease – Pulmonary Stenosis

SOMATOM Definition Dual Source Scanning

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HISTORY

This 15-month-old girl had first been referred to the pediatric cardiology department of our center as a newborn with low birth weight (1906 g) and cyanose. She was diagnosed with pulmonary atresia with ventricular septal defect (VSD) and patent ductus arteriosus. Using a synthetic vessel prothesis, a modified Blalock-Taussig shunt was implanted 3 months after birth. An intracardiac corrective surgery and pulmonary arterial reconstruction were performed when the patient was 15 months old. After the surgery, a Dual Source CT scan was taken for follow-up. The patient was lightly sedated by oral medication before the scan and a bolus of 18 ml iodinated contrast agent (370 mgI/ml) was injected. The patient's height was 70 cm, body weight was 6.5 kg, and mean heart rate was 99 bpm (93-101 bpm) during the scan.

DIAGNOSIS

The right ventricular outflow tract was reconstructed using a synthetic vessel graft. The VSD and modified Blalock-Taussig shunt were closed. In the post-surgical follow-up DSCT images, stenoses were detected at the origins of both pulmonary arteries. At the origin of the right pulmonary artery, the images also revealed a flap-like structure. Based on these findings, a catheter intervention was performed 3 months after surgery for both pulmonary stenoses.

COMMENTS

Acceleration of blood flow was observed by Doppler echocardiography in both pulmonary arteries at the anastomosis. Since stenoses were a concern, a CT scan

was taken in the early postoperative period. This time, the CT scan was performed with ECG gating to suppress vessel motion artifacts and to allow a precise morphologic evaluation. The Dual Source CT images were of good diagnostic quality. This scan was performed shortly after installation of the Dual Source CT at our center: with more experience, we are now able to reduce the dose for similar scans of pediatric patients by about 2/3.

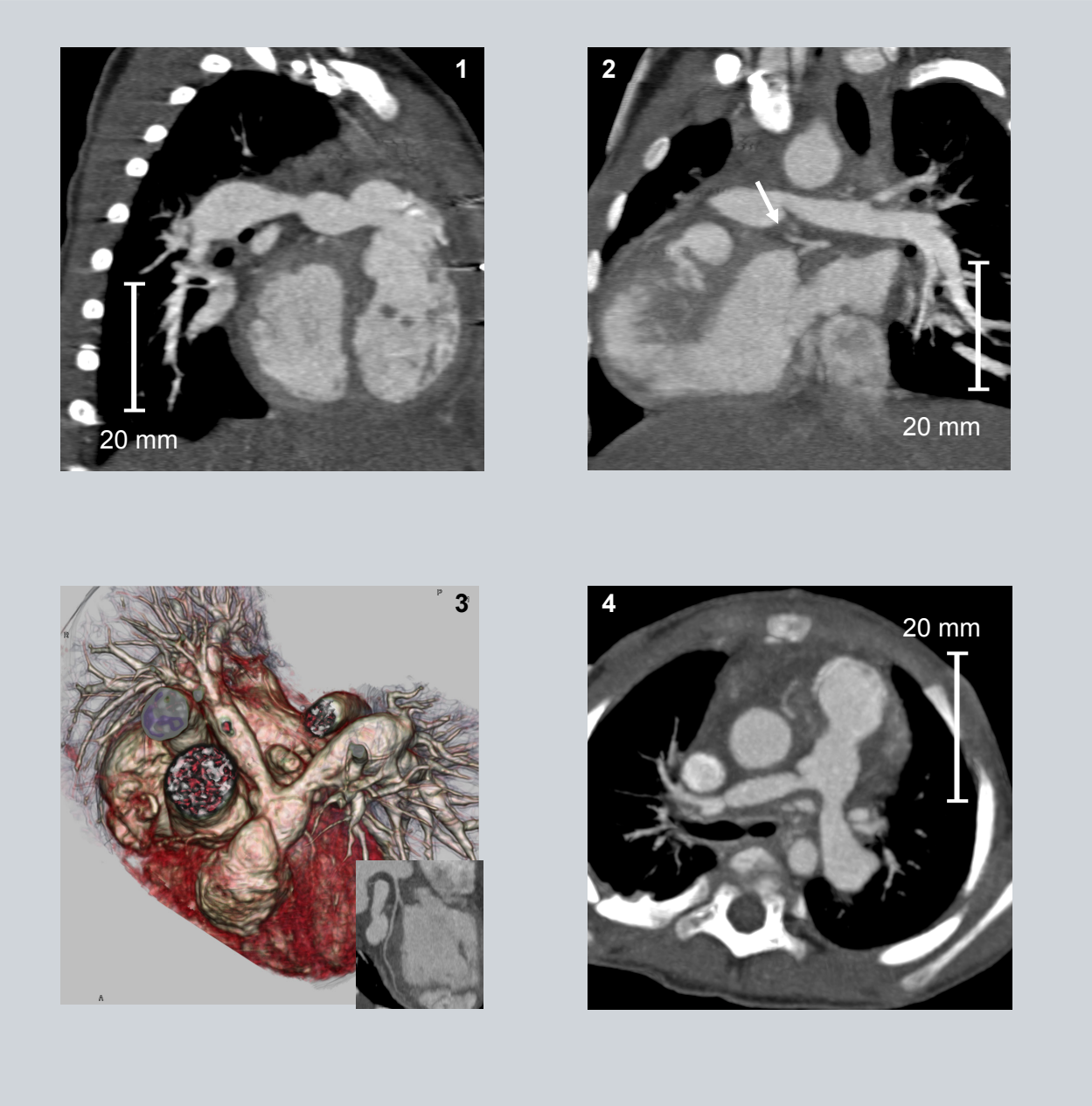


Fig 1: Left pulmonary artery, reconstructed vessel at right ventricular outflow tract and anastomosis.
Fig 2: Right pulmonary artery, reconstructed vessel at right ventricular outflow tract and anastomosis. A non-contrast enhanced flap-like structure was seen (arrow).
Fig 3 and 4: The morphologies of the stenoses were clearly revealed by DSCT.

EXAMINATION PROTOCOL

Scanner	SOMATOM Definition
Scan area	<i>Thorax</i>
Scan length	<i>120 mm</i>
Scan time	<i>4 s</i>
Scan direction	<i>Cranio -Caudal</i>
kV	<i>120 kV / 120 kV</i>
Effective mAs	<i>180 mAs /rot</i>
Rotation time	<i>0.33 s</i>
Slice collimation	<i>0.6 mm</i>
Reconstructed slice thickness	<i>0.6 mm</i>
Increment	<i>0.6 mm</i>
Kernel	<i>B25f</i>
Temporal Resolution:	<i>83 ms heart rate independent</i>

The information presented in this case study is for illustration only and is not intended to be relied upon by the reader for instruction as to the practice of medicine. Any health care practitioner reading this information is reminded that they must use their own learning, training and expertise in dealing with their individual patients. This material does not substitute for that duty and is not intended by Siemens Medical Systems to be used for any purpose in that regard.

The drugs and doses mentioned herein are consistent with the approval labelling for uses and/or indications of the drug. The treating physician bears the sole responsibility for the diagnosis and treatment of patients, including drugs and doses prescribed in connection with such use. The Operating Instructions must always be strictly followed when operating the CT System. The source for the technical data is the corresponding data sheets. Results may vary.