

Case 12

Evaluation of Williams-Beuren Syndrome in a Two-month-old Child using a Single Rotation Scan Mode

By Hans-Christoph Becker, MD

Department of Clinical Radiology, University Hospital Grosshadern, Munich, Germany

History

A two-month-old boy, with known Williams-Beuren syndrome, was presented to the hospital for surgical repair. Prior to surgery, a CT scan was ordered to evaluate the cardiovascular structures. The main focus was to define the origin of the coronary arteries relative to the aortic stenosis.

Diagnosis

CT images clearly showed a significant stenosis of the ascending aorta directly above the aortic root. Both coronary arteries originated slightly below the stenosis. A dysplastic right pulmonary artery and a very small

fistula were also seen between the descending aorta and the right upper pulmonary vein.

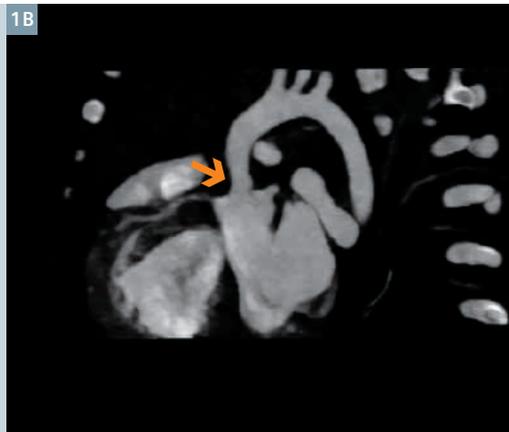
Comments

CT scans are routinely used for cardiovascular evaluations. In this case, the CT aided in the planning of the surgical correction of the aortic stenosis, also demonstrating that resection and re-insertion of the coronary arteries would not be necessary. Furthermore, it also showed a dysplastic right pulmonary artery and a very small DAPVF (descending aorta-pulmonary vein fistula), which would have not been echocardiographically detected.

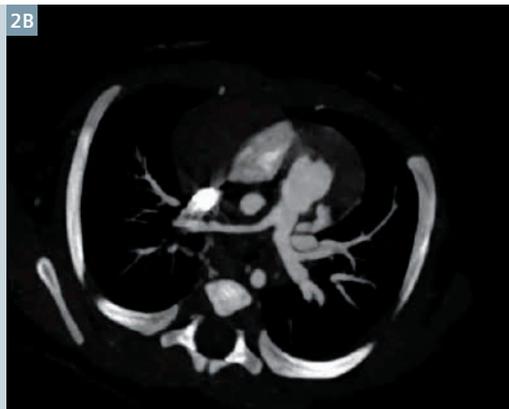
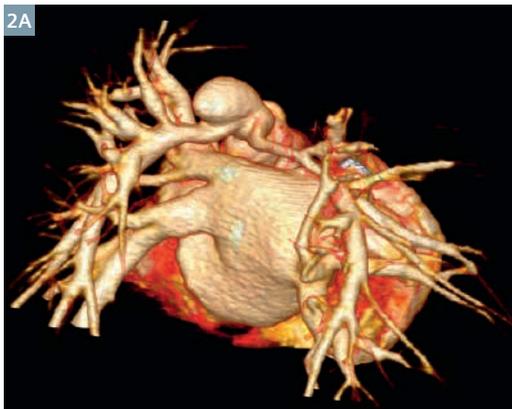
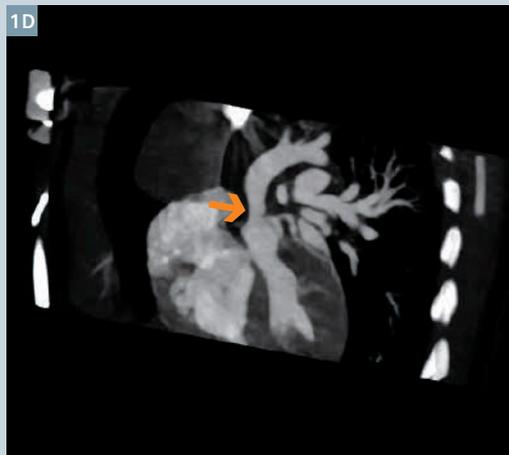
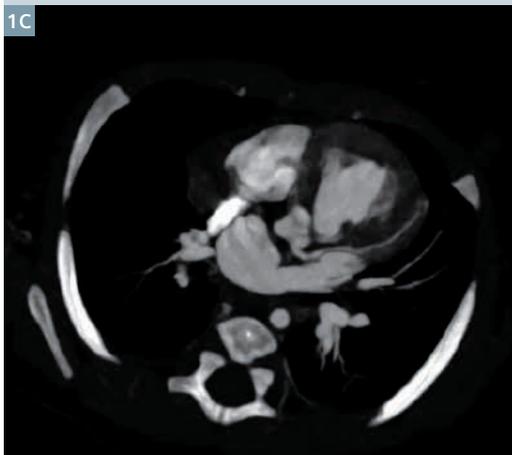
One of the challenges of performing a CT scan on a baby, with a heart rate of 153 bpm, was to complete scanning as quickly as possible. Therefore, a single rotation scan mode was applied to acquire the whole heart in just 0.15 s. This resulted in an excellent image quality without motion artifact even though the baby was free breathing during the scanning. Taking into consideration the exposure dose for the baby, 70 kV was selected to achieve a DLP of only 12 mGy cm. This scan mode is routinely applied in our department on small size babies. ■

Examination Protocol

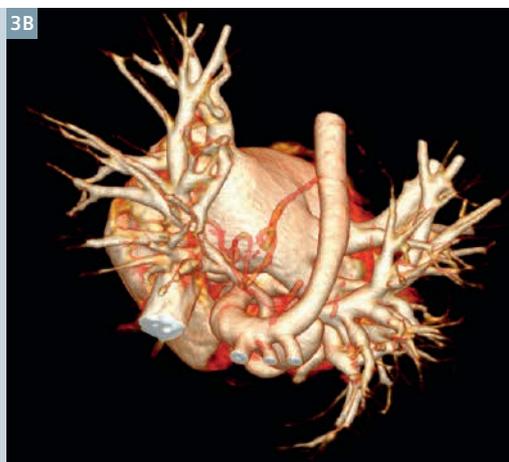
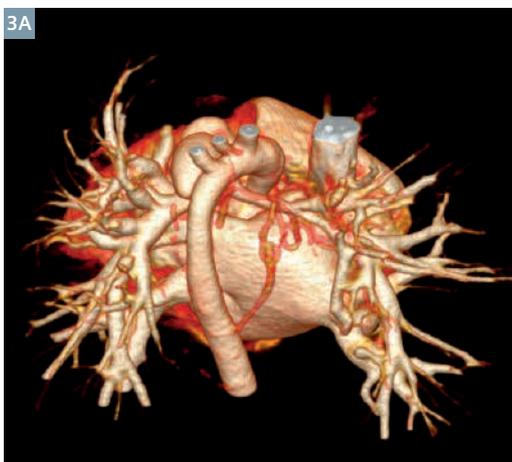
Scanner	SOMATOM Force		
Scan area	Heart	Rotation time	0.25 s
Scan mode	Single rotation scan	Slice collimation	192 × 0.6 mm
Scan length	46.8 mm	Slice width	0.6 mm
Scan direction	Cranio-caudal	Reconstruction kernel	Bv40 ADMIRE
Scan time	0.15 s	Temporal resolution	66 ms
Tube voltage	70 kV	Heart rate	153 bpm
Tube current	376 mAs	Contrast	400 mg / mL
Dose modulation	CARE Dose4D	Volume	5 mL + 20 mL saline
CTDI _{vol}	2.09 mGy	Flow rate	0.5 mL / s
DLP	12 mGy cm	Start delay	2 s after the contrast arrival at the ascending aorta
Effective dose	1.12 mSv		



1
A VRT (Fig. 1A) and three MIP (Figs. 1B, 1C and 1D) images show a significant stenosis (arrows) of the ascending aorta directly above the aortic root. Both coronary arteries originate slightly below the stenosis.



2
VRT (Fig. 2A) and MIP (Fig. 2B) images show a dysplastic right pulmonary artery.



3
VRT images show a DAPVF from two different views.