

Low-dose Cardiac CTA: Five-month Old with History of Apnea

By Christopher Dory, MD, Pediatric Radiologist, RADY San Diego Children's Hospital and San Diego Imaging Medical Group

Patient history

A five-month old patient with a history of apnea and a family history of mitral valve prolapse was referred for evaluation. A prior echocardiogram indicated an inconclusive medical diagnosis of a congenital anomaly necessitating follow-up. A CT examination was ordered to rule out if the patient had a vascular ring and/or airway obstruction.

Acquisition protocol

Scanner	LightSpeed® VCT with SnapShot™ Pulse
Slice thickness.....	64 x 0.625 mm
Rotation time.....	0.35 sec
mA	100
kVp	80
Travel distance	2 rotations
Recon kernel.....	Standard
Heart rate.....	129 bpm

Calculated dose

Total exposure time.....	0.8 sec
Total scan time.....	2 sec
DLP (using 32 cm phantom body).....	6.99 mGy-cm
DLP (using 16 cm phantom body).....	15.12 mGy-cm
CTDI _{vol}	1.00 mGy
Effective dose.....	0.59 mSv*

*Obtained by ICRP newborn chest factor of 0.039 * DLP (using 16 cm phantom).
Reference: Annals of the ICRP, Volume 37, Issue 1, March 2007.

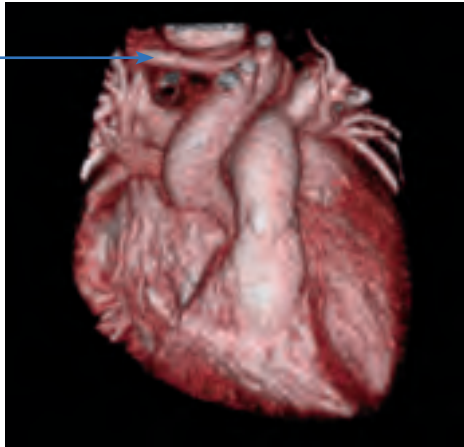


Clinical findings

The vascular ring demonstrated no abnormalities.

The patient was found to have an aberrant right subclavian artery and an atrial septal defect with an otherwise normal heart.

Abnormal right
subclavian artery



Follow-up diagnosis

As a result of the CT study, we were able to rule out the necessity for a surgical follow up. The patient and family were not subjected to an unnecessary surgical procedure and/or catheterization in order to diagnose this cardiovascular abnormality. The infant was treated for reflux disease and sent home.

Advantages of the scanner and application in this exam

Due to the rapid scan time and non-invasive nature of CT, I chose to have the CT assessment performed to rule out mitral valve disease.

CT was a more attractive alternative for the patient's family and the referring physician because of the dose lowering capabilities of the LightSpeed® VCT with SnapShot™ Pulse. With the assistance of GE Healthcare, I was able to set-up a new protocol specific to the patient's age and size that significantly reduced dose versus a multi-phase examination.

This 64-slice LightSpeed VCT scanner is a quantum leap above and beyond what we were using a few years ago. The development of SnapShot Pulse adds new possibilities to decrease radiation dose and obtain the same anatomic patient data. ■



Christopher Dory, MD, joined San Diego Imaging Medical Group in June 2006. He had previously practiced at the Children's Hospital of the King's Daughters' in Norfolk, Virginia where he served as chief of radiology and at the Children's Hospital in Minneapolis, Minnesota. At the Children's Hospital of the King's Daughters' he was voted teacher of the year. His expertise includes pediatric interventional radiology, musculoskeletal imaging, and pediatric neuroimaging.

Dr. Dory graduated with honors from the US Naval Academy and subsequently served as a surface warfare officer before attending medical school. He completed medical school at the University of Utah School of Medicine.

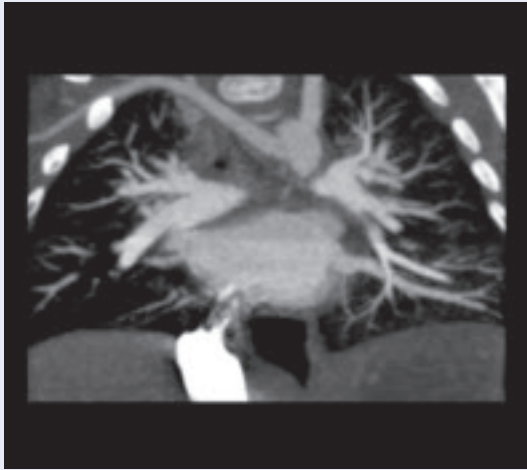
His internship was at Mercy Hospital in San Diego and residency in diagnostic radiology at the University of California, San Diego. He served as chief resident while at the University of California, San Diego. His fellowship in pediatric radiology was at the University of California, San Diego and Children's Hospital San Diego. He is board certified in Diagnostic Radiology from the American Board of Radiology and holds a certificate of Additional Qualification in Pediatric Radiology.

Professional memberships:

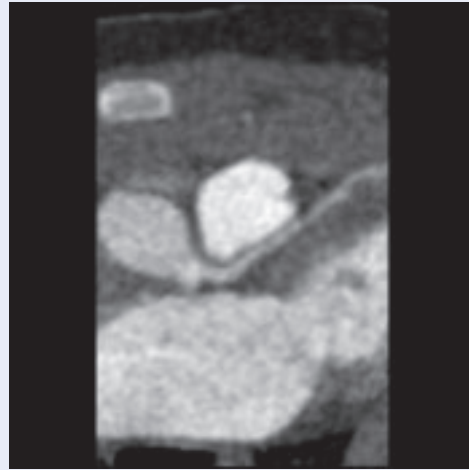
- Alpha Omega Alpha Medical Honor Society
- Society for Pediatric Radiology
- Society for Pediatric Neuroradiology
- American Roentgen Ray Society

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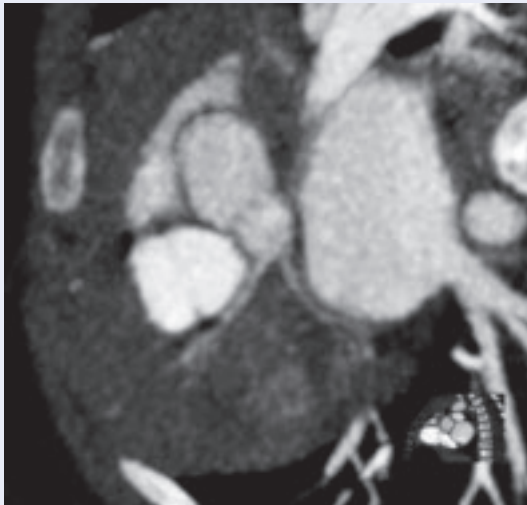
– Dr. Christopher Dory



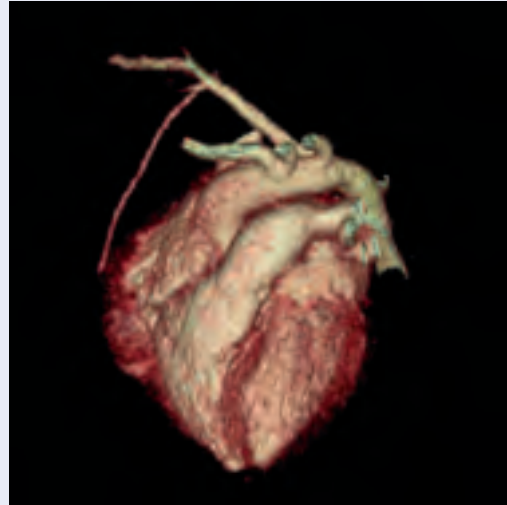
Oblique MIP image of the chest



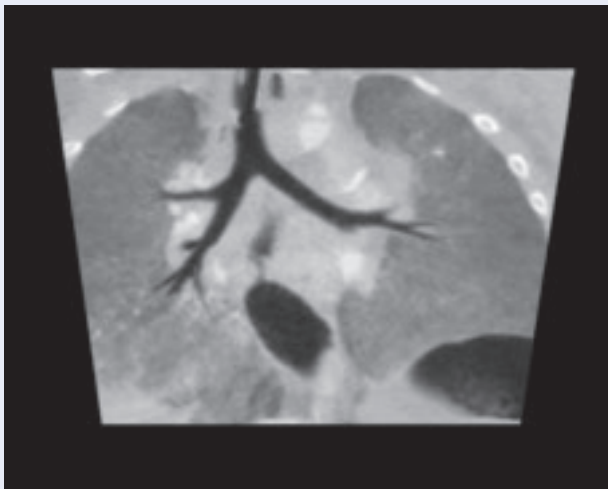
Curved reformat of the LAD



Oblique image of the LAD/Cx



VR depicting aberrant right subclavian



Coronal view of the chest with trachea and bronchi

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