

Takayasu Arteritis Treated by Aortic Stenting

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History

An 11-year-old girl with Takayasu arteritis and abdominal aortic narrowing underwent stent placement. A Dual Energy CT (DECT) examination was performed to evaluate the size of the aorta, the stent integrity, and the need for additional surgery.

Diagnosis

DECT images revealed a normal-caliber thoracic aorta and marked narrowing of the entire abdominal aorta, beginning just above the level of the diaphragmatic hiatus and extending into bilateral proximal common iliac arteries. Three patent stents were present within the abdominal aorta – two above the level of the celiac artery and the third in the infrarenal abdominal aorta (Fig. 1). These, along with collateral vessels arising from the dilated internal mammary, the superior and the inferior mesenteric arteries, were also demonstrated in 3D reconstructions using both conventional volume rendering technique (VRT) (Fig. 2a) and cinematic VRT (cVRT) (Figs. 2b–2d).

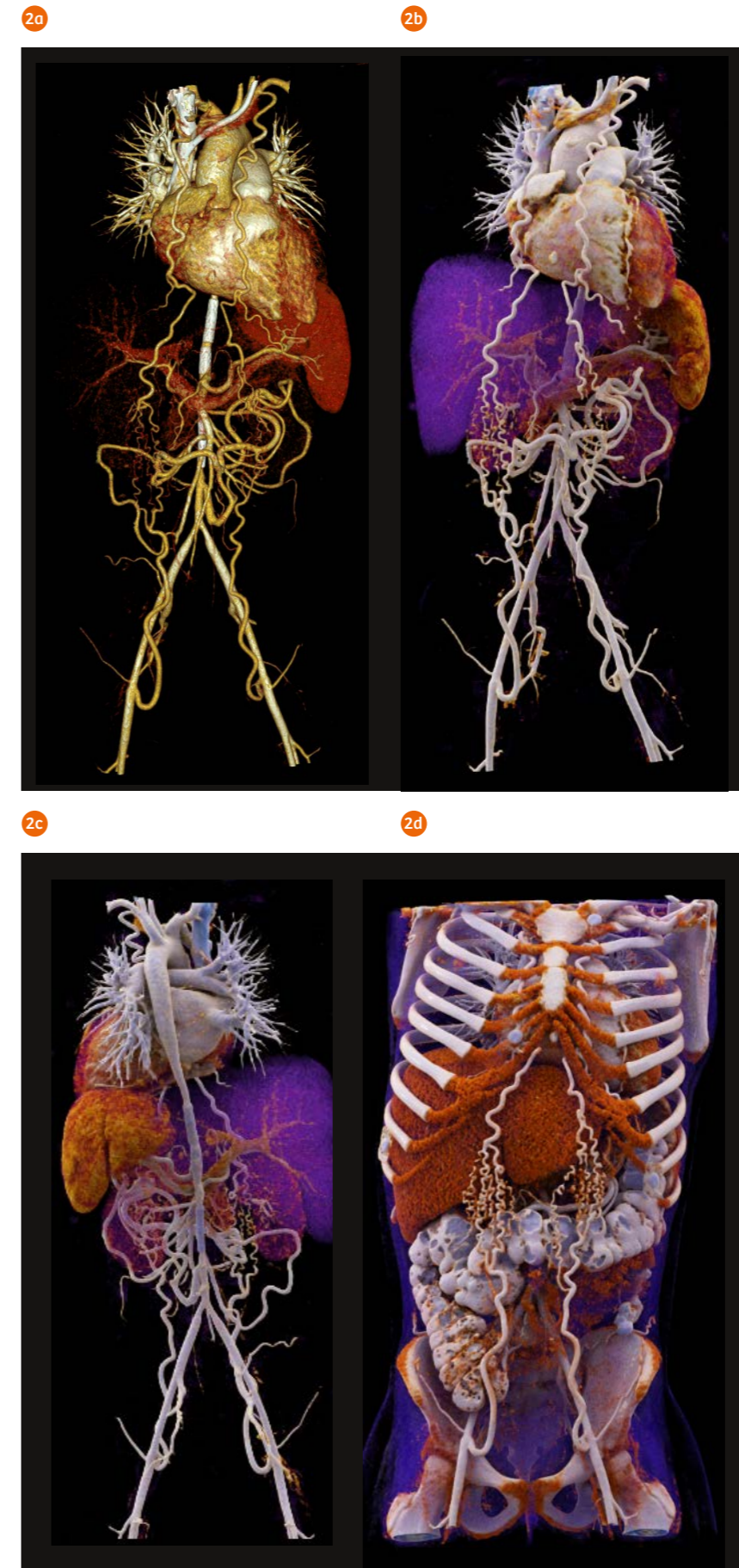
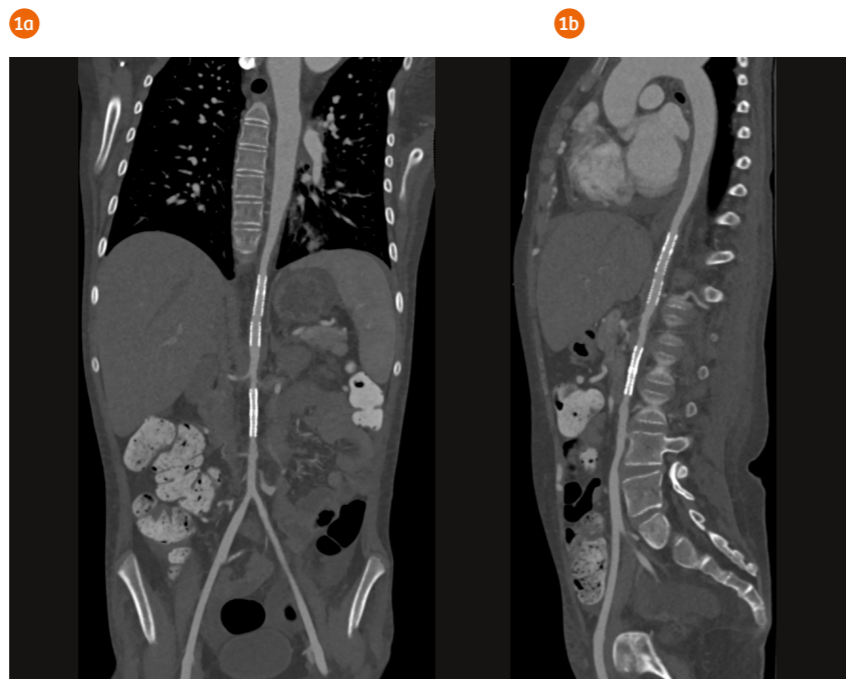
Comments

Takayasu arteritis is a large-vessel vasculitis that affects the aorta and its major branches. In patients with symptomatic stenotic or occlusive lesions, percutaneous transluminal angioplasty and stenting or bypass surgery are common palliative treatments. It is particularly important to identify and characterize areas of stenoses and collateral vessel formation on CT images in guiding surgical planning and avoiding morbidity from vascular injury. DECT allows for an automated workflow of bone removal, using syngo.CT DE Direct Angio, to generate free views of CT angiographic

(CTA) images. Compared with conventional VRT, cVRT images demonstrate a better 3D perspective with improved depth and shape perceptions, allowing for a lifelike demonstration. In this follow up case, an overview of the entire aorta, the patency of the stents, the pulmonary vessels, as well as the origin and caliber of the collateral vessels were clearly presented to both radiologists and referring physicians. ●

The outcomes by Siemens Healthineers customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption), there can be no guarantee that other customers will achieve the same results.

1 Curved MPR images show marked narrowing of the entire abdominal aorta and three intraluminal patent stents.



Examination Protocol

Scanner	SOMATOM Definition Flash
Scan area	CAP
Scan mode	Dual Source Dual Energy
Scan length	536 mm
Scan direction	Cranio-caudal
Scan time	3.5 s
Tube voltage	80 / Sn140 kV
Effective mAs	90 / 41 mAs
Dose modulation	CARE Dose4D™
CTDI _{vol}	3.26 mGy
DLP	207.5 mGy cm
Rotation time	0.28 s
Pitch	1.2
Slice collimation	128 × 0.6 mm
Slice width	1.0 mm
Reconstruction increment	1.0 mm
Reconstruction kernel	130f
Contrast	320 mg/mL
Volume	100 mL
Flow rate	2 mL/s
Start delay	Bolus tracking

2 VRT (Fig. 2a) and cVRT (Figs. 2b–2d) images show aortic narrowing, luminal stents and collateral pathways arising from internal mammary vessels and mesenteric arteries. Note that cVRT images demonstrate a more realistic representation for much better anatomical and depth perception.