

Canon

画論

31st

The Best Image

Best Image Awards Compilation

CT Category

Judging Panel

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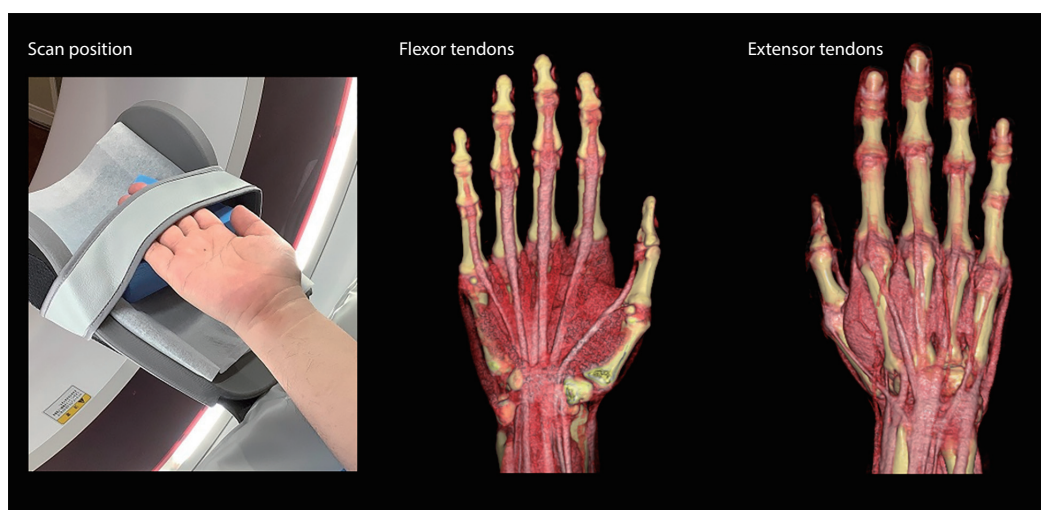
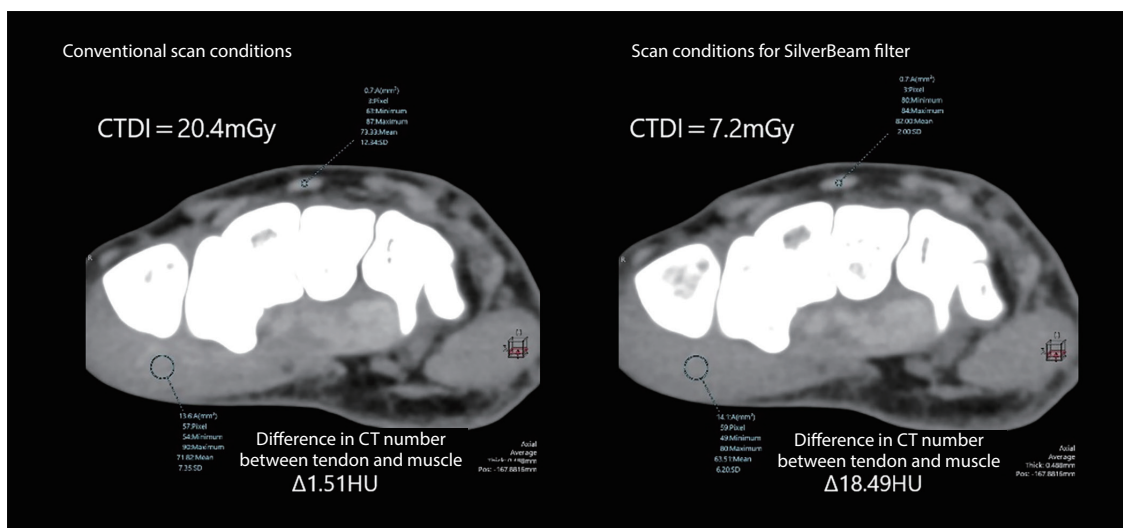
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Extremities/Spine

Visualization of the finger extensor tendons using the SilverBeam filter

Fukuoka Rehabilitation Hospital, Fukuoka, Japan
Satoshi Kagami

System used, number of rows: Aquilion Serve, 80 rows

Reason for examination: This patient was hit on the back of the hand by a baseball, after which he was unable to fully extend his fingers. A CT scan was performed for suspected extensor tendon rupture.

Clinical comments: The VR images confirmed the continuity of the extensor tendons, including the extensor digitorum communis tendons, extensor indicis tendon, extensor digiti minimi tendon, extensor pollicis longus tendon, extensor carpi ulnaris tendon, extensor pollicis brevis tendon, extensor carpi radialis longus tendon, and extensor carpi radialis brevis tendon. Tendon rupture could therefore be ruled out. MRI is considered to be useful for the diagnosis of tendon ruptures, but in this case, CT was able to

provide comparable image information in a much shorter scan time by employing an advanced scanning method. Although it is difficult to clearly visualize areas distal to the proximal phalanges as the tendons merge into the aponeuroses, the use of the SilverBeam filter at 120 kV is expected to expand the range of visualization as this technology undergoes further development.

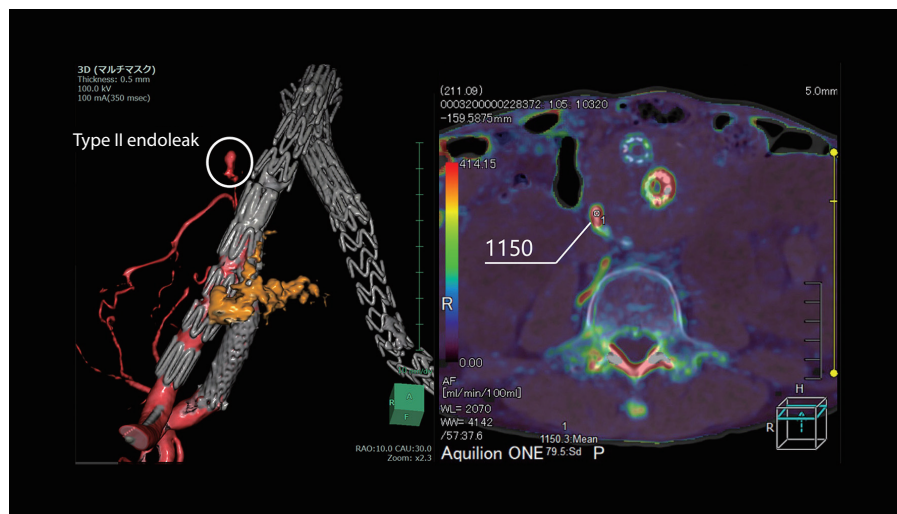
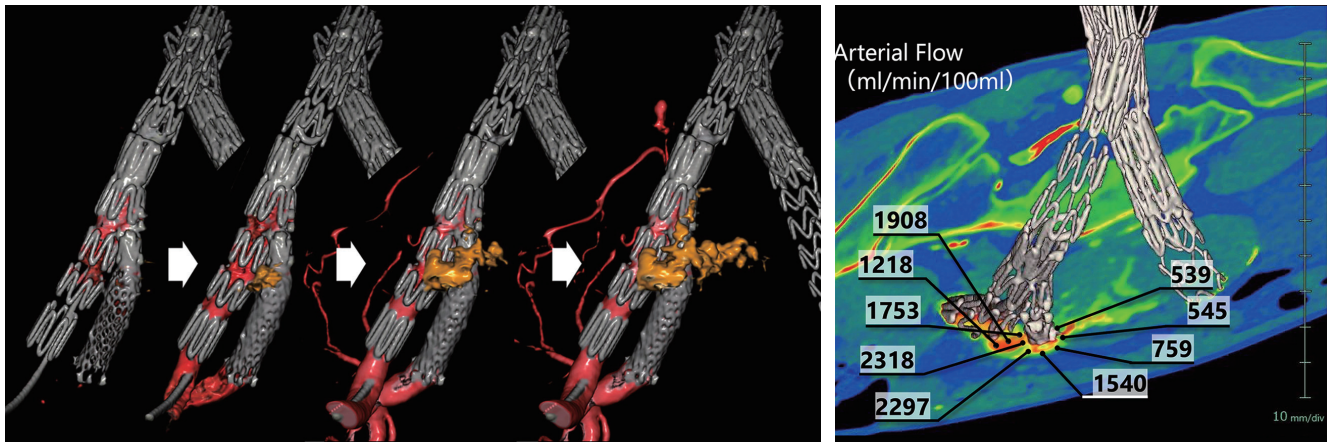
Technical comments: In CT imaging of the tendons, a high tube voltage is usually employed to increase the differences in CT number between tendons and muscles. Because scanning with the SilverBeam filter increases the effective energy compared to conventional scanning and should therefore improve the visualization of tendons, the images in this study were acquired using Helical (SilverBeam) scan mode at a tube voltage of 120 kV. The patient's hand was placed in the supine position so that gravity would help to increase separation of the tendons. With the combined use of the SilverBeam filter and Advanced intelligent Clear-IQ Engine (AiCE), the examination could be performed with a CTDI about 1/3 that required for conventional scanning.

Comments on images: (a) Images were acquired using conventional scan conditions (135 kV, 200 mA, 1.0 s/rot., HP65) and using the scan conditions for the SilverBeam filter, and the differences in CT number between the ten-

dons and muscles were compared. The differences in CT number were substantially increased by employing the scan conditions for the SilverBeam filter, and the radiation dose could be reduced to about 1/3 while maintaining an acceptable level of image quality. (b) Hand position during scanning and VR images of the tendons. The hand is placed in the supine position so that gravity helps to separate the tendons. The courses of the flexor tendons can be clearly visualized out to their distal limits. As for the extensor tendons, continuity of the extensor digitorum communis tendons, extensor indicis tendon, extensor digiti minimi tendon, extensor pollicis longus tendon, extensor carpi ulnaris tendon, extensor pollicis brevis tendon, extensor carpi radialis longus tendon, and extensor carpi radialis brevis tendon can be confirmed.

Comments of judges: The radiation dose could be substantially reduced by using the SilverBeam filter, which is a technology for blocking low-energy X-rays while passing high-energy X-rays. High-voltage scanning is usually employed for examination of the tendons, but in this case, the tendons could be clearly visualized by low-dose scanning with the SilverBeam filter. Excellent clinical images were obtained at a radiation dose about 1/3 that required for conventional scanning.

Sex	Age	Weight	Scan mode		Gated scan	Scan slice thickness	Number of rows	Tube voltage	Tube current	
Male	20-30 years	70-80 kg	Helical (SilverBeam) [Condition 1]			0.5 mm	80	120 kV	330 mA	
Scan speed	Scan range	Helical pitch	Pitch factor	Exposure			Total number of scans	Total scan time	CTDI	DLP
1.5 s/rot.	232.5 mm	—	—	—			—	12.95 s	7.2 mGy	195.6 mGy-cm
Reconstruction method	Image slice thickness	Reconstruction interval	Reconstruction function	Image quality option	Image filter	Quantum denoising filter	Workstation		Contrast medium	
V-TCOT	0.5 mm	0.3 mm	Body Sharp	AiCE (BODY SHARP) (Standard)		—	Ziostation™			
Contrast medium injection method					Contrast enhancement protocol			Saline flush	Delay time for next scan	SUREStart
Region for SUREStart	Threshold for SUREStart	Heart rate during scanning	Heart rate information during scanning		Cardiac phase for reconstruction	Reconstruction method	Phase NAVI	ECG Edit	Medications used	



Abdomen/Pelvis

Endoleak after EVAR

Hamamatsu University Hospital, Shizuoka, Japan
Takayuki Nomura

System used, number of rows: Aquilion ONE / PRISM Edition, 320 rows

Reason for examination: This patient had previously undergone endovascular aneurysm repair (EVAR). In 2023, it was found that the diameter of the aortic aneurysm had increased by 5 mm over a period of about 6 months. Contrast studies were problematic because the patient had severe chronic renal failure, but angiography was performed in order to formulate a treatment plan. DSA showed an endoleak, but it was difficult to determine whether it was type IB or type III. Blood flow analysis with 4D-CT was therefore performed for detailed evaluation of the endoleak.

Clinical comments: It is essential to accurately evaluate

endoleaks after stent graft placement in patients with abdominal aortic aneurysms because the therapeutic approach is very different depending on the type of endoleak. In addition, treatment may be required if an increase in aneurysm diameter is observed in a patient with a type II endoleak. It would therefore be of great clinical value to develop a method for predicting the future increase in aneurysm diameter based on quantitative indices. A large difference in arterial flow (AF) is typically observed between a type III endoleak and a type II endoleak, as in the present case. Application of this analytic approach to intravenous contrast-enhanced 4D-CT is expected to lead to the development of a new, less invasive method for evaluating endoleaks and predicting the future increase in aneurysm diameter.

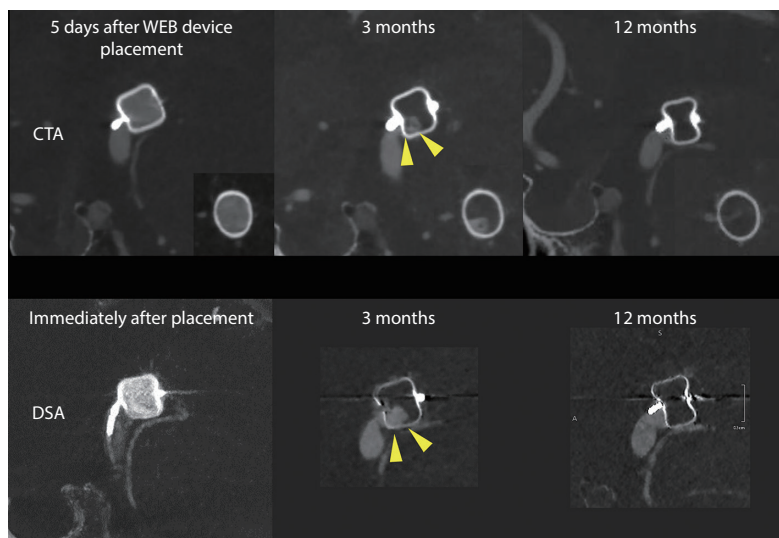
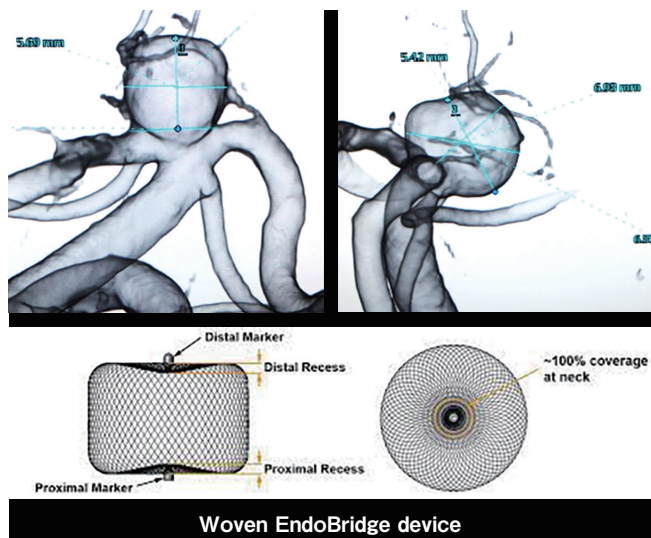
Technical comments: Because an endoleak was observed soon after the start of contrast injection in the immediately preceding DSA scan, imaging was performed with continuous exposure mode initiated at the same timing as the start of contrast injection. In consideration of the patient's impaired renal function, the contrast agent was diluted by a factor of 3 and the total volume of contrast medium used in the examination (including DSA scanning) was only 35 mL. In addition to the morphological information obtained

by 4D-CT, the AF at the endoleak was measured using the Body Perfusion analysis function, allowing the type of endoleak to be determined based on quantitative indices.

Comments on images: (a) 4D blood flow image (VR). Contrast medium was administered via a pigtail catheter placed in the right leg. The endoleak was visualized soon after the start of enhancement near the right bifurcation of the iliac branched device (IBD). (b) Image showing AF at a type III endoleak site. The AF around the IBD measured 2318 mL/min/100 mL in the area where blood flow was strongest, showing good agreement with the area where contrast was seen to begin leaking in 4D-CT. (c) Comparison with the results of 4D blood flow analysis. The AF at the type II endoleak site was 1150 mL/min/100 mL, about half that at the type III endoleak site.

Comments of judges: In this case, scanning was performed to evaluate the endoleak site after EVAR and to predict the future increase in aneurysm diameter using the 4D blood flow analysis function. The clinical usefulness of this analysis method should be assessed in larger numbers of patients in future studies. The range of applications of this method could be further expanded if similar analysis could be performed with intravenous contrast administration.

Sex	Age	Weight	Scan mode		Gated scan	Scan slice thickness	Number of rows	Tube voltage	Tube current	
Male	70+ years	50-60 kg	Dynamic scan / Dynamic Volume scan			0.5 mm	320	100 kV	V-EC SD30 (image slice thickness 5 mm, 100-350 mA)	
Scan speed	Scan range	Helical pitch	Pitch factor	Exposure			Total number of scans	Total scan time	CTDI	DLP
0.35 s/rot.	160 mm	—	—	Continuous exposure 0 to 10.5 s			1	10.5 s	31.3 mGy	501.2 mGy-cm
Reconstruction method	Image slice thickness	Reconstruction interval	Reconstruction function	Image quality option	Image filter	Quantum denoising filter	Workstation		Contrast medium	
	0.5 mm	0.5 mm		AiCE (BODY SHARP) (Strong)		—	VINCENT™		Iopamiron injection 300	
Contrast medium injection method					Contrast enhancement protocol			Saline flush	Delay time for next scan	SUREStart
A pigtail catheter was placed in the right leg of the stent graft. The timing for the start of scanning was determined based on DSA scanning.					15 mL of contrast medium (diluted by a factor of 3) was injected at 2.5 mL/s.			Not used	1 s	Not used
Region for SUREStart	Threshold for SUREStart	Heart rate during scanning	Heart rate information during scanning		Cardiac phase for reconstruction	Reconstruction method	Phase NAVI	ECG Edit	Medications used	



a | b

Head/Neck

Evaluation of intradevice contrast inflow after aneurysm treatment using a Woven EndoBridge device

Fujita Health University Hospital, Aichi, Japan

System used, number of rows: Aquilion Precision, 160 rows**Reason for examination:** CTA, which is a noninvasive imaging method, was employed for follow-up after placement of a Woven EndoBridge (WEB) device based on the assumption that there should be good agreement between the findings obtained by CTA and DSA.**Clinical comments:** In Japan, WEB devices have been used for the treatment of aneurysms since January 2021. The finding of contrast inflow into a WEB device after placement is considered to indicate the presence of an "aneurysm remnant", so it is essential to perform postoperative

evaluation in order to determine whether or not contrast inflow is present. The gold standard for postoperative evaluation is DSA, but DSA has the disadvantage of being an invasive procedure. On the other hand, MRI studies and many conventional CTA studies may fail to provide useful information due to artifacts. In the case described here, CTA was used for postoperative evaluation after placement of a WEB device for a basilar tip aneurysm. It was found that CTA could provide visualization comparable to that of DSA, permitting intra-aneurysmal blood flow to be accurately assessed without underestimating the amount of flow. This imaging method could prove to be a reasonable alternative to DSA for postoperative evaluation after WEB device placement.

Technical comments: This patient was followed for 2 years after initial treatment in 2021, with a particular focus on evaluating the usefulness of CTA as an alternative to DSA. Metal artifacts caused by the WEB device markers were found to be a challenge. Because the WEB device is intended for aneurysms at T-shaped bifurcations, a straight MIP image was created to evaluate the patency of the two

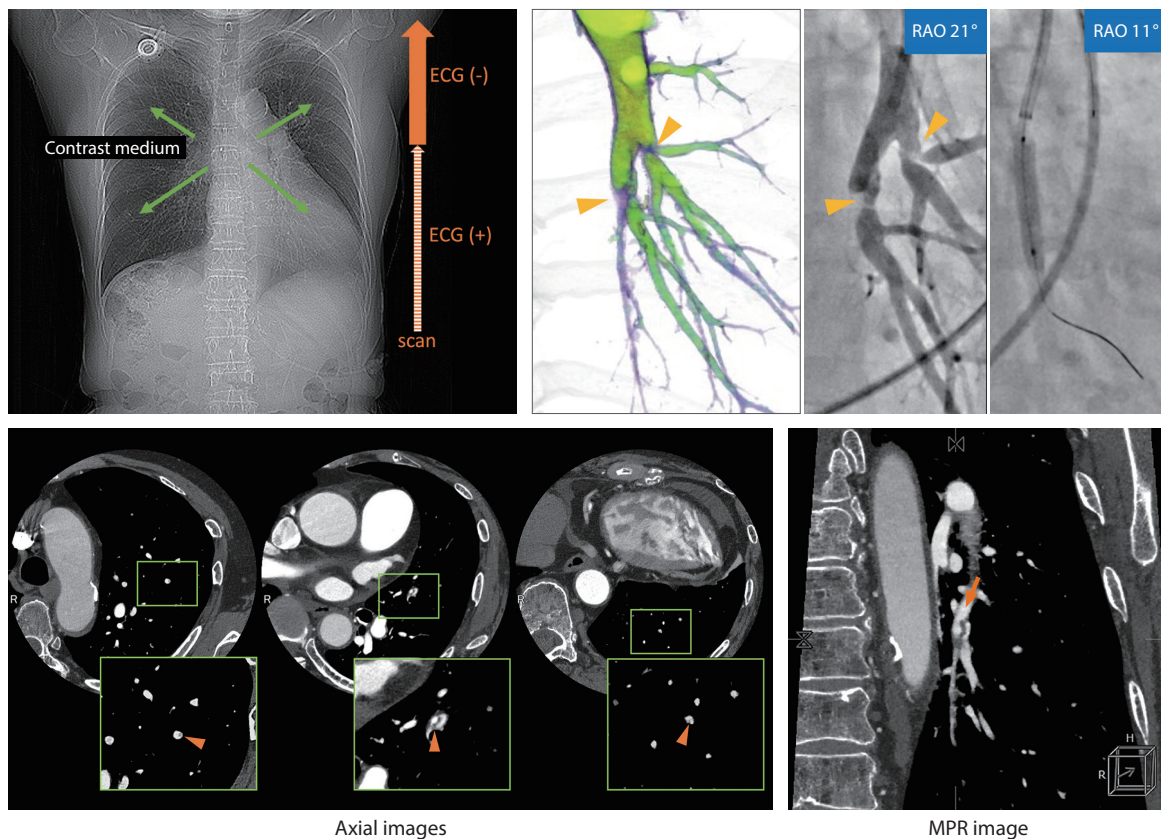
branches. Scanning was performed at an angle so that metal artifacts did not interfere with visualization of the normal bifurcation. Helical Pitch scanning was also performed using high-definition mode. AiCE BRAIN CTA was used for reconstruction.

Comments on images: (a) Details of the WEB device. (b) Comparison of CTA images and DSA images obtained during follow-up (axial and sagittal planes were selected for CTA of the WEB device). At 3-month follow-up, inflow of contrast agent into the WEB device is clearly seen, as confirmed by DSA. At 12-month follow-up, aneurysmal occlusion is observed, as confirmed by DSA.

Comments of judges: High-definition CT using AiCE BRAIN CTA for reconstruction was performed for follow-up after treatment of an aneurysm using a WEB device, and the usefulness of CTA for evaluating the inflow of contrast agent into the device was compared against 3D angiography. It was found that high-definition CT is able to provide diagnostic information comparable to that obtained by 3D angiography and may prove to be very useful for postoperative follow-up.

Sex	Age	Weight	Scan mode		Gated scan	Scan slice thickness	Number of rows	Tube voltage	Tube current	
Female	70+ years	50-60 kg	Helical Scan [Condition 1] Helical Scan [Condition 2]			0.25 mm 0.5 mm	160 1	120 kV 120 kV	V-EC SD5 (image slice thickness 5 mm, 100-260 mA) V-EC SD5 (image slice thickness 5 mm, 100-310 mA)	
Scan speed	Scan range	Helical pitch	Pitch factor	Exposure			Total number of scans	Total scan time	CTDI	DLP
1.0 s/rot. 0.35 s/rot.	160 mm 160 mm	101 91	0.63125 91	— —					40.4 mGy 44.1 mGy	852.1 mGy-cm 930.6 mGy-cm
Reconstruction method	Image slice thickness	Reconstruction interval	Reconstruction function	Image quality option	Image filter	Quantum denoising filter	Workstation	Contrast medium		
Other	0.25 mm	0.25 mm		SEMAR* AiCE (BRAIN CTA) (Standard)		—	Ziostation2	Iopamiron injection 370		
Contrast medium injection method					Contrast enhancement protocol			Saline flush	Delay time for next scan	SUREStart
Fractional dose set to 28 mgI/kg/s					64 mL of contrast medium injected at 4.0 mL/s followed by a 30-mL saline flush injected at 4.0 mL/s			Used		Used (manual)
Region for SUREStart	Threshold for SUREStart	Heart rate during scanning	Heart rate information during scanning	Cardiac phase for reconstruction	Reconstruction method	Phase NAVI	ECG Edit	Medications used		
Ascending aorta										

*Single Energy Metal Artifact Reduction



Axial images

MPR image

Heart, great vessels, peripheral vessels |

Severe peripheral chronic thromboembolic pulmonary hypertension successfully treated by high-definition CT-guided BPA

Fujita Health University Hospital, Aichi, Japan

System used, number of rows: Aquilion Precision, 160 rows

Reason for examination: To perform definitive diagnosis in a patient with chronic thromboembolic pulmonary hypertension (CTEPH), to precisely determine the location and distribution of thrombus, and to acquire images useful for guiding treatment during balloon pulmonary angioplasty (BPA).

Clinical comments: When BPA is performed for CTEPH, it is essential to obtain a precise three-dimensional understanding of the vascular anatomy because the pulmonary arteries branch into a large number of segmental arteries. In the present case, ECG-gated high-definition CT was used to accurately identify the distribution of thrombus. In addition, by adjusting the fluoroscopic angle using the 3D CT images for guidance, the position of the guidewire could be precisely determined and the thrombus could be clearly visualized based on the difference in CT number.

Following the BPA procedure, the mean pulmonary arterial pressure was reduced from 60 mmHg to 20 mmHg. The pulmonary artery lumen could be clearly visualized using virtual endoscopy, and the angles of vascular bifurcations and the locations of thrombus could be accurately identified. High-definition CT as described here is an ideal imaging method for ensuring accurate diagnosis and treatment when performing BPA procedures.

Technical comments: At this time, the primary objectives for evaluating thrombus in the left pulmonary subsegmental branches were as follows: scanning in high-definition mode, scanning in the caudocranial direction in the event that recovery was required due to insufficient breath-holding, minimizing motion artifacts due to cardiac motion by employing ECG-gated vHP (variable Helical Pitch), and achieving uniform contrast enhancement in a short scan time out to peripheral areas. In the 3D images, regions with low CT numbers were displayed in a different color so the locations of thrombus could be more easily identified. During the BPA procedure, these 3D images were used for guidance to ensure that treatment could be performed with the highest possible accuracy.

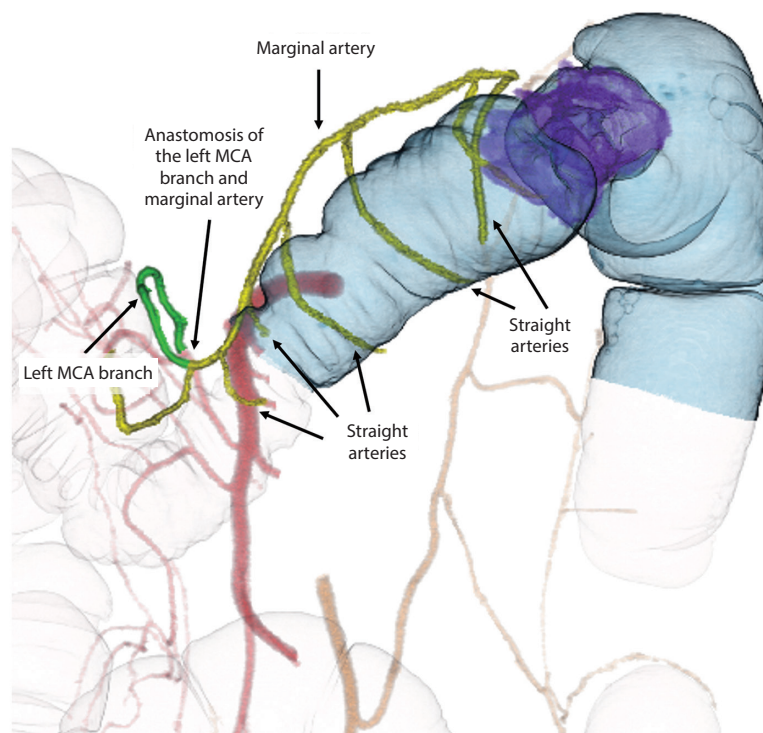
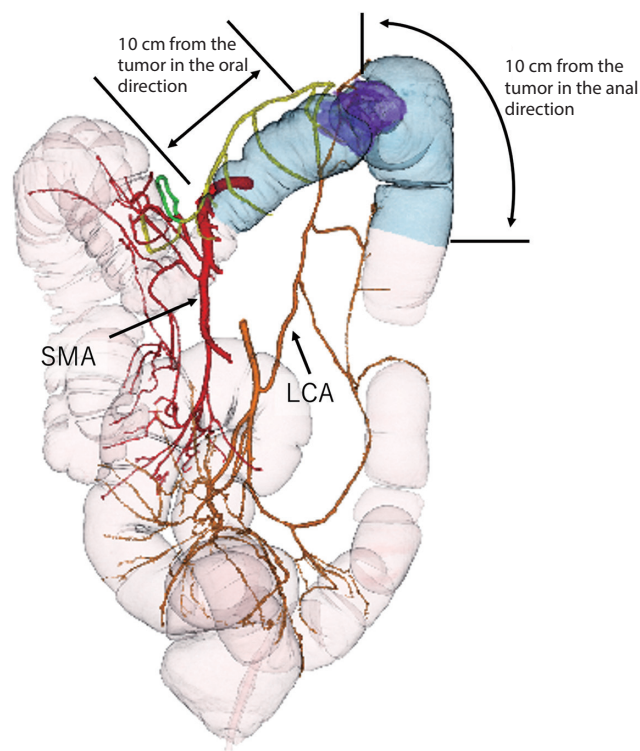
Comments on images: (a) Image showing the scan protocol, scan direction, and contrast method. In order to minimize the effects of insufficient breath-holding and cardiac motion as well as artifacts from the ascending aorta, scanning was performed in the caudocranial direction with ECG-gated vHP. (b) From left to right: 3D image of the left

pulmonary artery, CAG RAO 21° image, and CAG RAO 11° image. Areas with low CT numbers are displayed in a different color in the 3D image. Following selective pulmonary angiography of left A9+10, the lesion in A10 (arrowhead) was dilated with a 4.0-mm balloon. (c) High-definition CT axial images. A web (arrowhead) is clearly depicted out to the left pulmonary subsegmental branch level. (d) MPR image of the left pulmonary artery acquired by high-resolution CT.

Comments of judges: The precise visualization of organized thrombosis and the detailed anatomical information provided by CTPA images are considered extremely useful in the treatment of CTEPH. High-definition CT would be expected to improve the detectability of lesions in more peripheral areas, but a serious concern is that the acquired images might be more strongly affected by cardiac motion. In the case described here, in addition to motion suppression by employing ECG-gated vHP scanning, a variety of measures were taken to address this challenge, such as scanning in the caudocranial direction, minimizing the scan time, and so on. The 3D images were also displayed in an intuitive and easily understandable manner to ensure that they were as helpful as possible for guiding treatment during the BPA procedure.

The imaging method employed in this case is also highly evaluated because it provides high-resolution images that can clearly depict findings of a fine thrombus web in patients with pulmonary arteriovenous thromboembolism.

Sex	Age	Weight	Scan mode		Gated scan	Scan slice thickness	Number of rows	Tube voltage	Tube current	
Female	70+ years	50-60 kg	Helical Scan [Condition 1] vHP [Condition 2]		ECG-gated scan	0.5 mm 0.25 mm	160 160	120 kV 120 kV	V-EC SD15 (image slice thickness 5 mm, 100-300 mA) V-EC SD5 (image slice thickness 0.5 mm, 100-540 mA)	
Scan speed	Scan range	Helical pitch	Pitch factor	Exposure			Total number of scans	Total scan time	CTDI	DLP
0.5 s/rot. 0.35 s/rot.	336 mm 305 mm	65 14.0, 65	0.40625 0.0875, 0.40625	—			—	24.65 s	5.5 mGy 26.8 mGy	216.3 mGy-cm 873.6 mGy-cm
Reconstruction method	Image slice thickness	Reconstruction interval	Reconstruction function	Image quality option	Image filter	Quantum denoising filter	Workstation		Contrast medium	
Other	0.25 mm	0.25 mm		AiCE (BODY SHARP) (Standard)	US0	—	Ziostation2		Iomeron syringe 350	
Contrast medium injection method					Contrast enhancement protocol			Saline flush	Delay time for next scan	SUREStart
The injection of contrast medium was started while giving breathing instruction to the patient. Scanning was started as soon as the contrast medium is confirmed in the right atrium.					80 mL of contrast medium injected at 4.0 mL/s followed by a 30-mL saline flush injected at 4.0 mL/s			Used		Used (manual)
Region for SUREStart	Threshold for SUREStart	Heart rate during scanning	Heart rate information during scanning		Cardiac phase for reconstruction	Reconstruction method	Phase NAVI	ECG Edit	Medications used	
Right ventricle	Manual	63			284 ms / 547 ms	Segment	Used	Not used		



a b

Abdomen/Pelvis

Cancer of the transverse colon

Japan Seafarers Relief Association, Otaru Ekisaikai Hospital, Hokkaido, Japan
Yusuke Oya

System used, number of rows: Aquilion Precision, 160 rows

Reason for examination: A circumferential tumor of the transverse colon was found by colonoscopy, and 3D CT examination of the colon was requested for detailed evaluation and for obtaining images to support surgery. The objectives of this examination were to localize the lesion, to visualize the vascular anatomy of the superior mesenteric artery (SMA) and inferior mesenteric artery (IMA), and to identify the dominant blood vessels. High-definition images acquired by Aquilion Precision clearly depicted the middle colic artery (MCA) near the lesion as well as peripheral vessels, including the marginal artery and straight arteries.

Clinical comments: In patients with cancer at the splenic flexure, the MCA and the left colic artery (LCA) are often the dominant vessels. The 3D reconstruction image

showed that the anastomosis of the marginal artery and the left branch of the MCA was located more than 10 cm away from the tumor, but the anastomosis with the LCA was less than 10 cm away. Because the LCA was identified as the only artery supplying the tumor, lymph node resection was limited to the region supplied by the LCA. In patients with cancer at the splenic flexure, lymph node resection is usually performed for both the region supplied by the LCA and the region supplied by the MCA, but in the present patient, the marginal artery and the straight arteries were clearly visualized and the dominant vessels could be precisely identified. Based on these findings, it was possible to perform a less invasive procedure that did not involve lymph node resection in the region supplied by the MCA. High-definition CT was useful for determining the range of lymph node resection required in this patient.

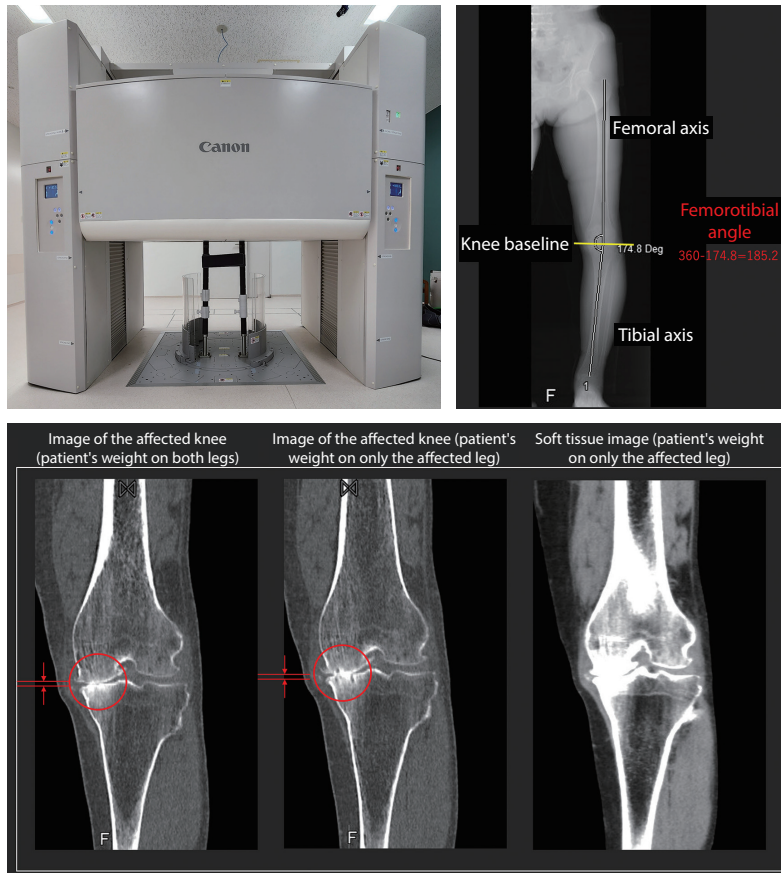
Technical comments: Scanning was performed with a 1024×1024 matrix and a slice thickness of 0.25 mm in order to visualize the fine vessels. To address issues related to insufficient exposure dose, Body Sharp Standard was used with AiCE reconstruction. For contrast enhancement, 650 mg/kg was injected over 25 s, the SUREstart threshold was set to 250 HU for detecting the start of contrast enhancement at the venous end, and scanning was started immediately after the contrast medium reached the lesion. This made it possible to clearly visualize the marginal artery as well as the peripheral straight arteries, which is im-

possible using conventional imaging methods. In addition, by estimating the range of resection and displaying these areas in a different color, the relationships between the peripheral arteries and the lesion could be more clearly understood.

Comments on images: (a) The vascular anatomy of the SMA (red) and IMA (orange) and their positional relationships with the intestinal tract are shown. A 10-cm margin (blue) from the tumor (purple) was specified. By displaying the areas to be resected in a different color, the relationships with each artery could be clearly visualized. The IMA (orange) was identified as the dominant vessel and was therefore the target for resection. (b) The positional relationships between the tumor and the MCA are shown. The anastomosis of the left branch of the MCA (green) and the marginal artery (yellow) was seen to be outside the resection margin, and lymph node resection in the region supplied by the MCA was judged to be unnecessary.

Comments of Judges: Detailed examination was performed prior to surgery for colon cancer, and Aquilion Precision was able to clearly depict arteries such as the marginal artery and the straight arteries of the colon, which are very difficult to visualize using conventional imaging methods. The examination techniques employed were also carefully considered in order to fully exploit the high spatial resolution of Aquilion Precision.

Sex	Age	Weight	Scan mode		Gated scan	Scan slice thickness	Number of rows	Tube voltage	Tube current	
Male	70+ years	60-70 kg	Helical Scan			0.25 mm	160	120 kV	V-EC SD20 (image slice thickness 5 mm, 50-520 mA)	
Scan speed	Scan range	Helical pitch	Pitch factor	Exposure			Total number of scans	Total scan time	CTDI	DLP
0.5 s/rot.	600 mm	129	0.80625	—				10.34 s	15.9 mGy	4189.13 mGy·cm
Reconstruction method	Image slice thickness	Reconstruction interval	Reconstruction function	Image quality option	Image filter	Quantum denoising filter	Workstation		Contrast medium	
	0.25 mm	0.25 mm		AICE (BODY SHARP) (Standard)		—	Ziostation2 1K Premium		Iopamidol injection syringe F	
Contrast medium injection method					Contrast enhancement protocol			Saline flush	Delay time for next scan	SUREStart
650 mg/kg of contrast medium injected over 25 s					136 mL of contrast medium injected at 5.4 mL/s					Used (automatic)
Region for SUREStart	Threshold for SUREStart	Heart rate during scanning	Heart rate information during scanning		Cardiac phase for reconstruction	Reconstruction method	Phase NAVI	ECG Edit	Medications used	
Margin between the thoracic and abdominal aorta	250 HU									



Extremities/Spine

Current status and future prospects of knee joint imaging under weight loading with upright CT

Fujita Health University Hospital, Aichi, Japan

System used, number of rows: TSX-401 R upright CT scanner (standing/sitting), 320 rows

Reason for examination: Upright CT scanning was performed to measure the femorotibial angle (FTA) and to obtain various diagnostic information in a short examination time for preoperative evaluation of a patient with osteoarthritis of the knee.

Clinical comments: FTA measurement is usually performed using plain X-ray images. However, the same degree of measurement accuracy can be obtained using upright CT scanning, which has the additional benefits of permitting evaluation of not only the bone cortex and bone marrow, but also joint fluid and soft tissues such as muscles and ligaments. One of the most notable advantages of upright CT is that it allows patients to be scanned with the target structures under weight loading, which is difficult using conventional scanning methods. It is expected that the range of clinical applications of upright CT scanning will continue to expand in the future, and this

imaging method may prove to be useful not only for performing other types of orthopedic examinations, but also for obtaining venous return measurements, for diagnosing superior mesenteric artery (SMA) syndrome, for evaluating swallowing function, and so on.

Technical comments: The entire lower limb was scanned using upright CT. In conventional X-ray examinations, it takes some time to acquire the various images required for evaluation. In upright CT examinations, on the other hand, the required images can be acquired in a short time by performing only two scans: a scan in which the patient places their weight on both legs and a scan in which the patient places their weight on only the affected leg. In the present case, a Styrofoam block was cut to the appropriate length and placed under the healthy knee for scanning with the patient's weight on both legs and was then quickly removed for scanning with the patient's weight on only the affected leg. Unlike plain X-ray imaging, CT scanning provides volume data, and the reconstruction function can be selected after image acquisition has been completed in order to reconstruct CT images for evaluation of the soft tissues or the bones. In addition, a variety of images such as 3D images and MPR images can be generated, making it possible not only to obtain accurate FTA measurements, but also to perform precise preoperative simulation.

Comments on images: (a) External appearance of the upright CT scanner. Patients with osteoarthritis of the knee

develop narrowing of the joint space and osseous changes in the cartilage (bone spurs and bone cysts). Images acquired with the patient in the standing position (with the target structures under weight loading) are extremely useful for detecting degeneration of the articular cartilage and for evaluating the joint space. Using this CT scanner, such images can be acquired in an examination time of only 5 minutes. (b) Plain X-ray image. Because there is a strong correlation between the degree of severity of osteoarthritis of the knee and the lateral FTA of the knee joint, MPR images are generated and the FTA is measured in each image. (c) MPR images of the knee. Such MPR images can be used to accurately evaluate the degree of degeneration of the articular cartilage, the status of osseous changes, and the formation of bone spurs. Kellgren-Lawrence classification is also possible.

Comments of judges: Upright CT is useful for the preoperative evaluation of patients with osteoarthritis of the knee, allowing a large amount of diagnostic information to be obtained in a short time. In the present case, scanning could be performed under weight loading, which is difficult using conventional imaging methods. Unlike plain X-ray imaging, CT scanning provides volume data which can be used to reconstruct a wide variety of images, such as 3D images and MPR images, after image acquisition has been completed. It is expected that this method will prove to be useful not only for FTA measurement, but also for precise preoperative simulation.

Sex	Age	Weight	Scan mode		Gated scan	Scan slice thickness	Number of rows	Tube voltage	Tube current	
Female	70+ years	60-70 kg	Helical Scan [Condition 1] Helical Scan [Condition 2]			0.5 mm 0.5 mm	80 80	120 kV 120 kV	V-EC SD13 (image slice thickness 5 mm, 10-900 mA) V-EC SD13 (image slice thickness 5 mm, 10-900 mA)	
Scan speed	Scan range	Helical pitch	Pitch factor	Exposure			Total number of scans	Total scan time	CTDI	DLP
0.5 s/rot. 0.5 s/rot.	945 mm 945 mm	65 65	0.8125 0.8125	—				30.74 s	5.1 mGy 5.1 mGy	503.8 mGy-cm 503.8 mGy-cm
Reconstruction method	Image slice thickness	Reconstruction interval	Reconstruction function	Image quality option	Image filter	Quantum denoising filter	Workstation		Contrast medium	
V-TCOT	0.5 mm	0.5 mm	FC03, FC30	AIDR 3D* (Standard) (Level 3)		—	Ziostation2			
Contrast medium injection method					Contrast enhancement protocol			Saline flush	Delay time for next scan	SUREStart
Region for SUREStart	Threshold for SUREStart	Heart rate during scanning	Heart rate information during scanning	Cardiac phase for reconstruction	Reconstruction method	Phase NAVI	ECG Edit	Medications used		

*Adaptive Iterative Dose Reduction 3D

Memo

Memo

Memo



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Model number: TSX-304A, TSX-306A, TSX-307A, TSX-401R, MCACT0367EA 2024-07 CMSC/MET/Produced in Japan

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Clinical outcomes may vary dependent upon clinical use and environment.

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