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CT Category

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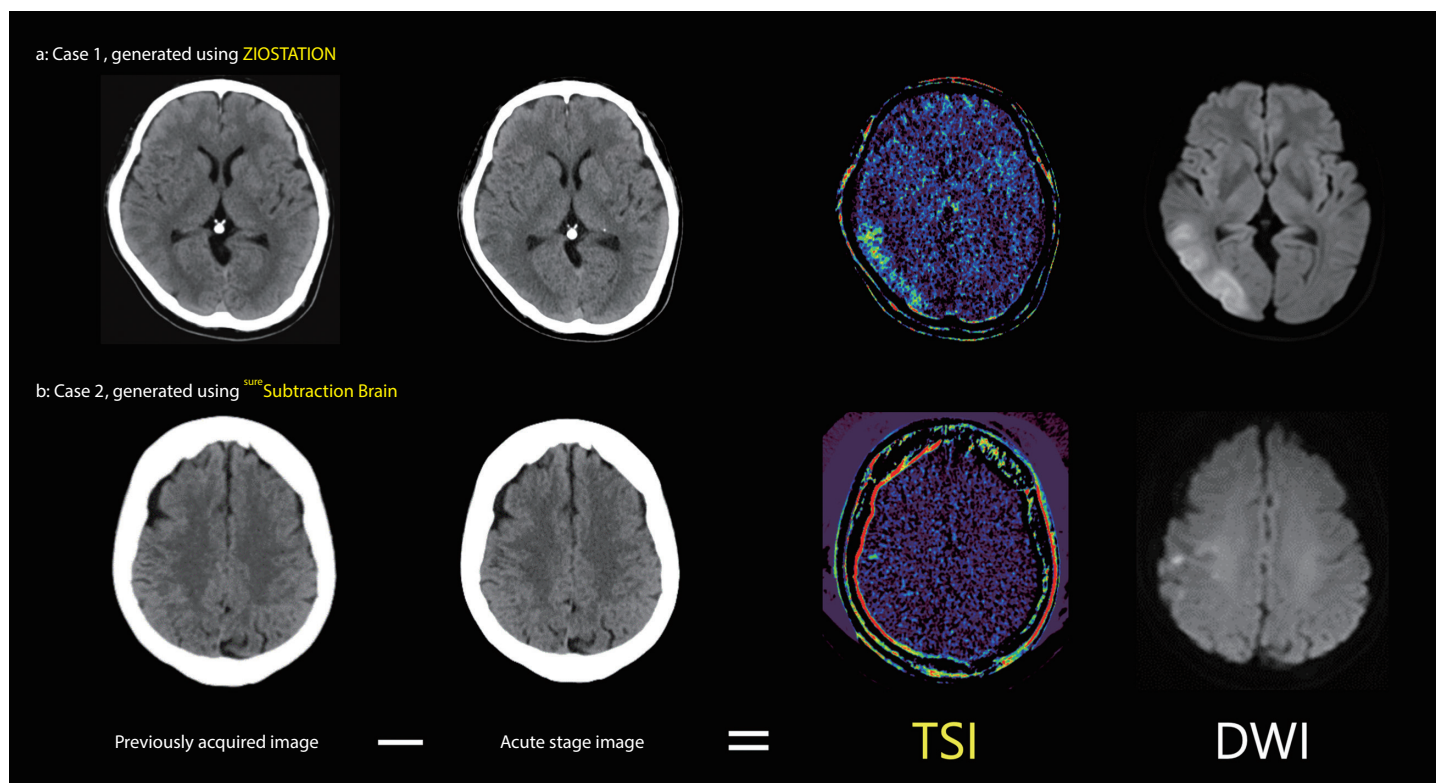
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Head/Neck

Detection of acute stage cerebral infarction using temporal subtraction imaging

Jichi Medical University Saitama Medical Center, Saitama, Japan
Atsuya Koishi

System used, number of rows: Aquilion Prime SP, 80 rows
Reason for examination: The presence of early CT signs in plain head CT images is a decisive factor in the detection of acute stage cerebral infarctions. However, in many cases, the difference in CT numbers is insufficient for effective detection, and DWI is therefore considered to be more useful for clinical diagnosis. In the two cases presented here, temporal subtraction imaging (TSI) was performed by subtracting post-infarction images from previously acquired plain head CT images, and the usefulness of TSI for the diagnosis of acute stage cerebral infarction was assessed.

Clinical comments: TSI is considered to be useful for the

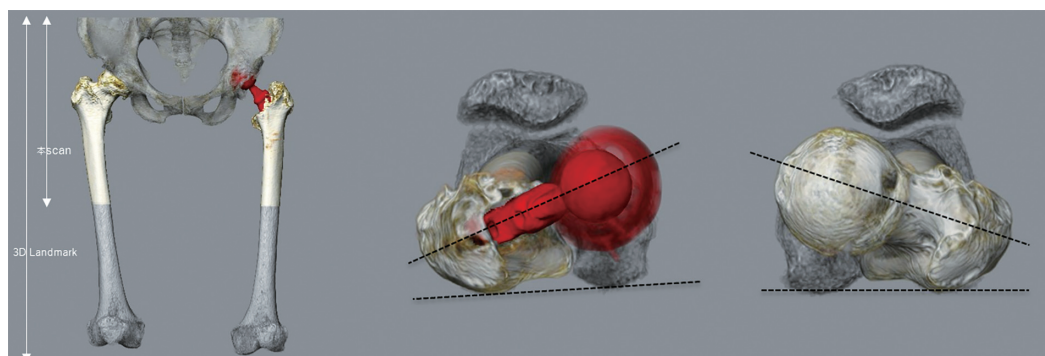
detection of lesions that may be missed in plain CT images. Extensive cerebral infarction in the territory of the right MCA (case 1) as well as small infarcts throughout the right frontal lobe (case 2) could be clearly visualized by TSI, with image quality comparable to DWI. Although one requirement is that previously acquired plain head CT images must be available, TSI can be used to diagnose acute stage cerebral infarction even when MRI or contrast CT is contraindicated for the patient or cannot be performed at the facility.

Technical comments: Because TSI involves the subtraction of images acquired in different phases, precise positional registration is essential. The non-rigid registration method of ZIOSTATION was used to perform subtraction processing in case 1. Although, the baselines differed significantly between the images, subtraction was performed without misregistration and visualization was improved with color map display. ^{sure}Subtraction Brain was used in case 2. It is generally not possible to load images with different scan dates in this software, but to circumvent this limitation, the patient information was changed to allow processing to be performed. The lesions could be clearly visualized, with contrast markedly improved by performing subtraction processing to show small differences in CT numbers.

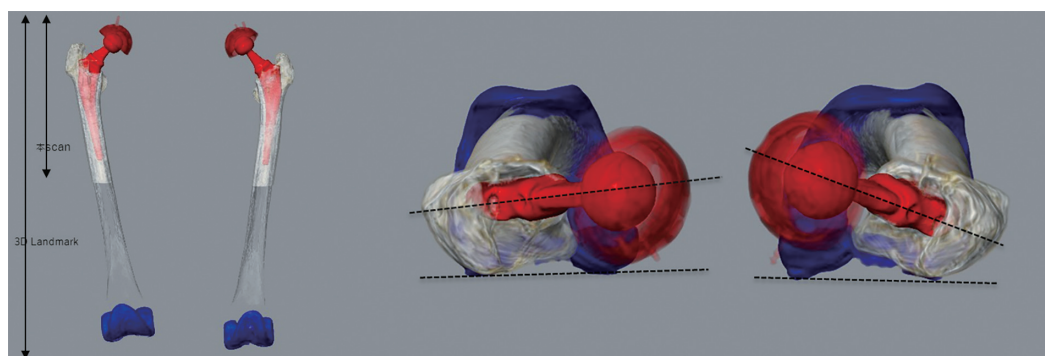
Comments on images: a: CT numbers in the territory of the right MCA are seen to be slightly lower in the post-infarction image. TSI allows the extent of infarction to be more clearly visualized and shows good agreement with DWI. b: In the post-infarction plain CT image, it is difficult to see findings clearly suggestive of cerebral infarction. However, TSI clearly depicts the small differences in CT numbers associated with the fine infarcts, in good agreement with DWI.

Comments of judges: To permit the diagnosis of acute stage cerebral infarction using plain CT, TSI can be performed by subtracting post-infarction images from previously acquired plain head CT images. This allows lesions to be clearly visualized, providing diagnostic information comparable to that obtained by DWI. The presence of early CT signs such as a clear boundary between the cerebral cortex and medulla is important for the diagnosis of cerebral infarction, but such findings cannot always be clearly seen in plain CT images. If pre-infarction images are available, TSI can provide diagnostic information comparable to that obtained by DWI. The method described here is therefore considered to be of great clinical value.

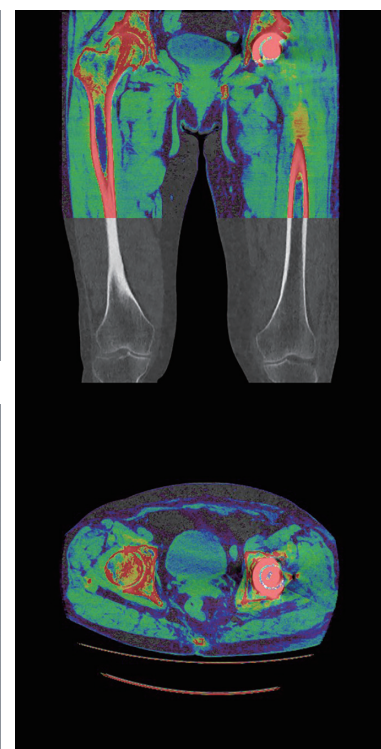
Sex	Age	Weight	Scan mode		Gated scan	Scan slice thickness	Number of rows	Tube voltage	Tube current	
Female	60-70 years	50-60 kg	Helical Scan			5 mm	80	120 kV	^{sure} Exposure SD2.5 (image slice thickness 5 mm, 150 mA-550 mA)	
Scan speed	Scan range	Helical pitch	Pitch factor	Exposure			Total number of scans	Total scan time	CTDI	DLP
1 sec/rot	160 mm	51	0.6375	—			—	8.36 sec	58.2 mGy	1224.2 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	0.4 mm	FC26	OSR		3D-Q10	Ziostation™2			
Contrast medium injection method					Contrast enhancement protocol			Saline flush	Delay time for next scan	^{sure} Start
Region for ^{sure} Start	Threshold for ^{sure} Start	Heart rate during scanning	Heart rate information during scanning		Cardiac phase for reconstruction	Reconstruction method	Phase NAVI	ECG Edit	Medications used	



a: Postoperative images after THA of the left femur



b: Postoperative images after THA and TKA of both femurs



c: Image combining 3D Landmark Scan and main scan

Extremities/Spine

Total hip arthroplasty in a patient with osteoarthritis of both hip joints

Fukuoka Rehabilitation Hospital, Fukuoka, Japan
Shuichiro Kamigama

System used, number of rows: Aquilion Serve, 80 rows
Reason for examination: Scanning was performed to evaluate the postoperative status after total hip arthroplasty (THA), to assess the areas where the artificial hip joints were implanted, and to measure the femoral anteversion angle (FAVA).

Clinical comments: FAVA measurement is important for assessing postoperative joint motion, such as determining the range of motion of the hip joint and evaluating the risk of joint dislocation. The advantages of using VR images for FAVA measurement are that interoperator variation during the entire workflow from image generation through measurement is minimized, measurement can be performed using a single image, and the patient's position and the

degree of lower limb flexion do not affect the measured anteversion angle. In the method employed in this case, all the required information could be obtained while reducing the exposure dose by 30% compared to the conventional imaging method. The method was found to be applicable to all patients who have undergone THA, demonstrating its broad clinical utility.

Technical comments: At our hospital, FAVA measurements are obtained before and after all surgical procedures involving the hip joint. In the conventional method, the main scan is used to acquire an image over the entire range from the hip joint to the distal end of the femur (because SEMAR cannot be used with Variable Helical Pitch (vHP), standard helical scanning is performed instead). The main reason for including the distal end of the femur is to assess its general morphological characteristics, so relatively low-resolution imaging should be acceptable in this area. We therefore considered the possibility of using the 3D Landmark Scan data to generate a VR image of distal areas. By combining a VR image of the hip joint acquired in the main scan and an image of the distal end of the femur acquired in the landmark scan, it is possible to generate an image that can be employed for FAVA measurement. This method helps to reduce the burden on the patient by shortening

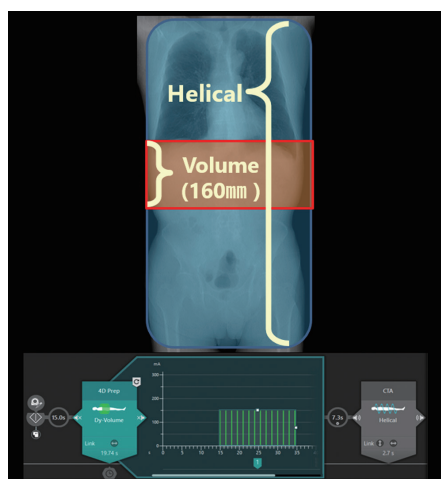
the scan time and minimizing the exposure dose.

Comments on images: a and b: Images generated from the 3D Landmark Scan and VR images. The images on the left are frontal views. The images at the center and on the right can be used for FAVA measurement. The images in "a" show the postoperative status after THA of the left femur, and the images in "b" show the postoperative status after THA and total knee arthroplasty (TKA) of both femurs. Artifacts could be reduced by using SEMAR in the areas where THA was performed. Artifacts in the areas where TKA was performed could easily be eliminated by adjusting the opacity curve.

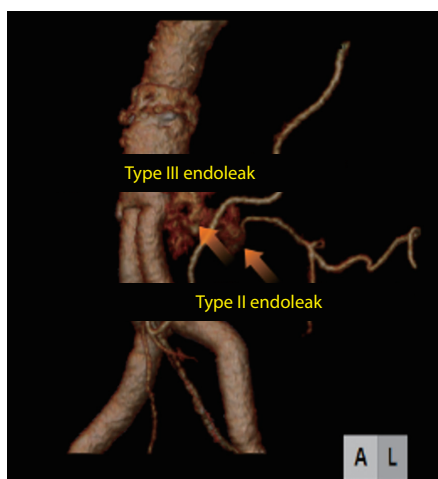
Comments of judges: The remarkable feature of this imaging method is that the 3D data acquired in the low-dose 3D Landmark Scan can be employed for actual clinical evaluation. Useful clinical data can be acquired in a shorter scan time with a lower exposure dose, and this method could prove to be widely applicable in clinical practice. It is anticipated that the method will undergo further refinement to ensure more precise alignment between the 3D Landmark Scan and the main scan.

Sex	Age	Weight	Scan mode		Gated scan	Scan slice thickness	Number of rows	Tube voltage	Tube current	
Female	70+ years	70-80 kg	Helical (standard) [condition 1] Helical (standard) [condition 2]			0.5 mm 0.5 mm	80 80	120 kV 120 kV	SURE [®] Exposure SD11 (image slice thickness 3 mm, 50-350 mA)	
Scan speed	Scan range	Helical pitch	Pitch factor	Exposure			Total number of scans	Total scan time	CTDI	DLP
0.5 sec/rot 0.5 sec/rot	727 mm 258 mm	— 65.0	— 0.813	— —			—	4.8 sec	0.2 mGy 10.6 mGy	13.3 mGy-cm 321 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	0.4 mm	Body Sharp	AiCE* (intensity: Mild (level 1))		—	Ziostation™ REVORAS™			
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	

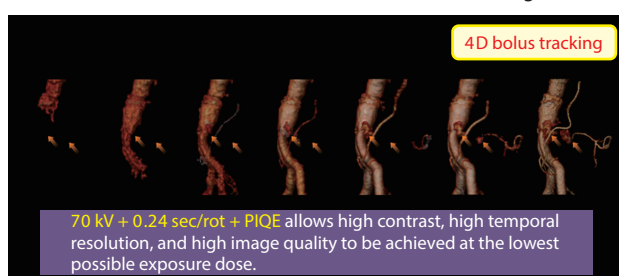
*Advanced intelligent Clear-IQ Engine



a: Protocol for 4D bolus tracking



b-1: Image after abdominal aortic repair with a Y-graft (1)



b-2: Image after abdominal aortic repair with a Y-graft (2)



b-3: Image after abdominal aortic repair with a Y-graft (dynamic image)



c: VR image



Heart, great vessels, peripheral vessels

Evaluation of endoleak using 4D bolus tracking

Saga University Hospital, Saga, Japan
Satoshi Takita

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

Reason for examination: This patient underwent abdominal aortic repair with a Y-graft for an abdominal aortic aneurysm. The aneurysm appeared to be expanding and a contrast study was requested to identify the cause.

Clinical comments: A 4D image acquired by dynamic volume scanning could be used to evaluate endoleaks of two different types in this patient. In addition, the use of Precise IQ Engine (PIQE) reconstruction (1024 matrix) in aortic CT scanning allowed the vessel responsible for a type II

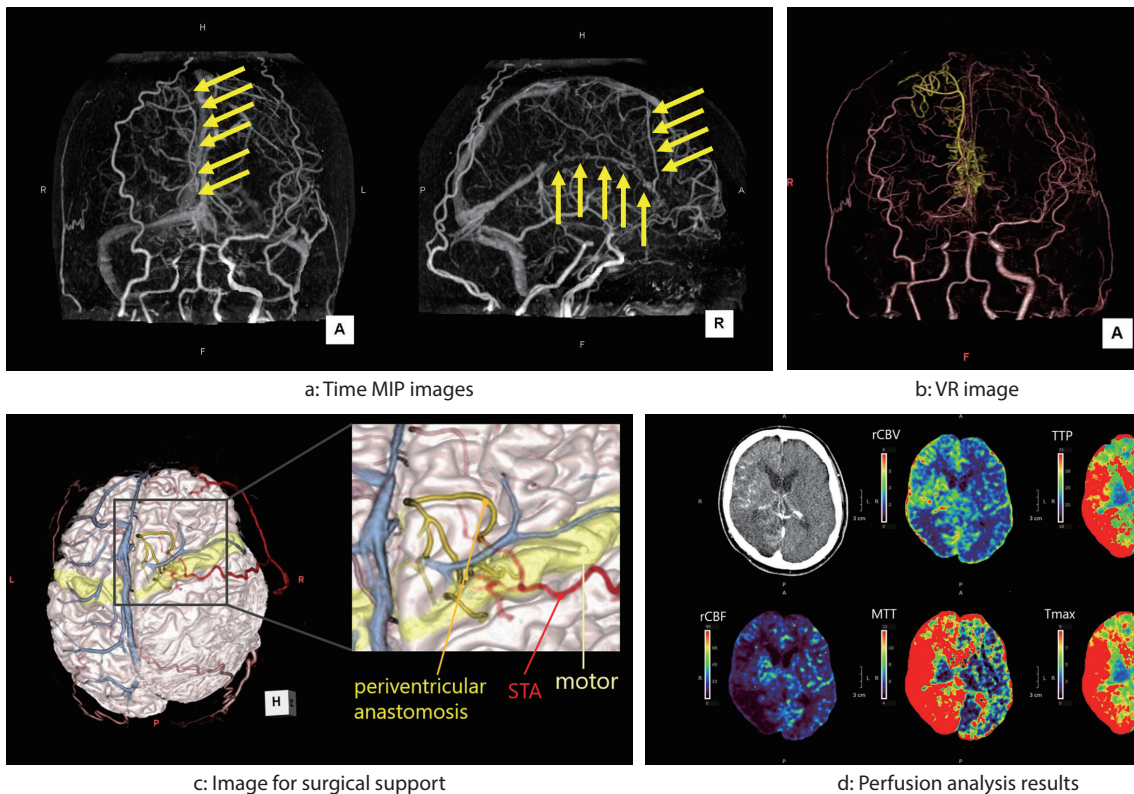
endoleak to be identified. 4D imaging and CT scanning of the entire aorta could be performed with a single injection of contrast medium, reducing the burden on the patient and also streamlining the overall clinical workflow. This method is therefore considered to be extremely useful in the clinical setting.

Technical comments: With dynamic volume scanning used as an alternative to SUREStart, 4D imaging of contrast medium flowing into the aneurysm after abdominal aortic repair with a Y-graft was successfully performed by carefully adjusting the contrast injection timing during a CT scan of the entire aorta. In addition, dynamic volume scanning was performed at 0.24 sec/rot, 70 kV, and 150 mA, with PIQE Body used for reconstruction. Employing this method allowed high contrast, high temporal resolution, and high image quality to be achieved at the lowest possible exposure dose. Contrast medium was administered by variable-rate injection, with the initial injection rate set to ensure good enhancement of the peripheral vessels and the duration of injection set to ensure complete 4D imaging.

Comments on images: a: Protocol for the 4D bolus tracking method. Monitoring scan was performed in dynamic volume scan mode over a scan range of 160 mm (including the part of the graft where an endoleak was suspected). Scanning was started after a delay time of 15 sec to confirm the arrival time of the iodinated contrast medium in the target area. After it was confirmed that the maximum CT number was reached, the actual scan was performed in helical mode, with dynamic volume scanning skipped (switching time: approximately 7 sec). b: Image acquired after abdominal aortic repair with a Y-graft. A type III endoleak and a type II endoleak could be precisely visualized. c: VR image. CT scanning of the aorta could be performed at the optimal timing by employing the 4D bolus tracking method. The vessel responsible for the type II endoleak could also be clearly depicted.

Comments of judges: The novel CT scanning method described here in which bolus tracking is combined with dynamic volume scanning is very highly evaluated by the judges.

Sex	Age	Weight	Scan mode		Gated scan	Scan slice thickness	Number of rows	Tube voltage	Tube current	
Male	70+ years	50-60 kg	Dynamic (volume) Helical (standard)			0.5 mm 0.5 mm	320 80	70 kV 100 kV	150 mA SUREExposure SD14 (image slice thickness)	
Scan speed	Scan range	Helical pitch	Pitch factor	Exposure			Total number of scans	Total scan time	CTDI	DLP
0.24 sec/rot 0.24 sec/rot	160 mm 745 mm	— 111.0	— 1.388	— —			— —		3.32 mGy 3.2 mGy	53.2 mGy-cm 255.1 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	Body	PIQE (matrix: 1024)		—	Ziostation™		Omnipaque 300	
Contrast medium injection method					Contrast enhancement protocol			Saline flush	Delay time for next scan	SUREStart
600 mg/kg of Omnipaque 300 administered by variable-rate injection with a variation factor of 0.3 over 35 sec, immediately followed by a 20-mL saline flush injected at 3.0 mL/sec					100 mL of contrast medium administered with an injection rate variation factor of 0.3 over 35 sec, followed by a 20-mL saline flush injected at 3.0 mL/sec			Used	7.3 sec	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		
Abdominal aortic aneurysm										



Abdomen/Pelvis

Moyamoya disease

Fujita Health University Bantane Hospital, Aichi, Japan
Tatsuya Kuroyanagi

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

Reason for examination: It has been reported that the presence of periventricular anastomoses is strongly associated with a higher risk of hemorrhage in patients with moyamoya disease, and bypass surgery targeting such anastomoses can be expected to reduce this risk. In the case presented here, 4D CTA scanning was used to detect and evaluate periventricular anastomoses as well as to generate VR images to support surgical bypass grafting. Perfusion analysis was also performed to assess ischemic areas.

Clinical comments: Direct bypass grafting is known to reduce the risk of hemorrhage in patients with moyamoya

disease, with bypass surgery specifically targeting the cortical arteries associated with periventricular anastomoses considered to be particularly effective. In the present case, the periventricular anastomoses, medullary arteries, and cortical arteries were very clearly depicted by employing an optimized scan technique, and it is considered that this scan technique could become a standard method for evaluating patients with moyamoya disease prior to surgical bypass grafting.

Technical comments: 4D CTA scanning was used to assess the periventricular anastomoses, to generate VR images, and to perform blood perfusion analysis. Blood flow is typically delayed in patients with moyamoya disease, and the scan time was therefore extended. A longer scan time is usually associated with a higher exposure dose, but the exposure dose was minimized in this case by setting a lower dose in the second half of the scan and by decimating the scan intervals. In addition, VR images were generated by fusion processing with MRI to provide a clearer understanding of the positional relationships between the vessels and the brain surface for more precise surgical simulation. Perfusion analysis was also performed to assess the extent of ischemia.

Comments on images: a: Periventricular anastomoses in

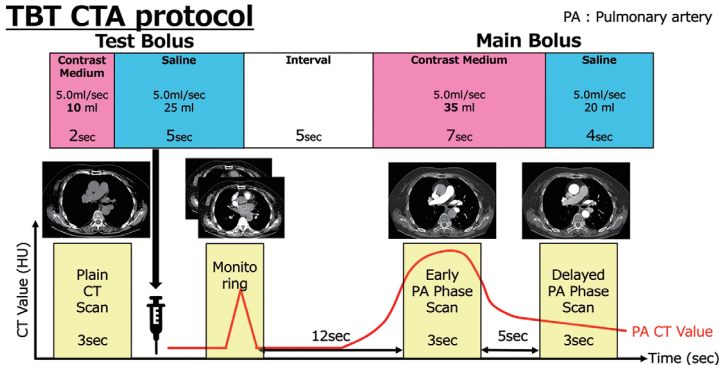
the territory of the posterior choroidal artery could also be identified by 4D CTA. b: These periventricular anastomoses were displayed in color to more clearly visualize the lesions. c: A fusion image with brain surface MRI was generated, with important vessels such as the periventricular anastomoses and the superficial temporal artery (STA) displayed in color for improved surgical support. The motor areas were also displayed in color to ensure that the procedure could be performed as safely as possible. d: Reduced blood flow and global ischemia were observed in the right cerebral hemisphere.

Comments of judges: In patients with Moyamoya disease, the presence of periventricular anastomoses is known to be associated with a higher risk of hemorrhage, but this risk can be reduced by performing bypass grafting targeting these vessels. 4D CTA images were used to evaluate the periventricular anastomoses, and VR images generated by fusion processing with MRI provided clear 3D depiction of the recipient artery on the brain surface extending from the periventricular anastomoses. Ischemic regions were also assessed by perfusion analysis. Such precise depiction of the vessels and ischemic regions in a single examination provided essential information to support the bypass grafting procedure.

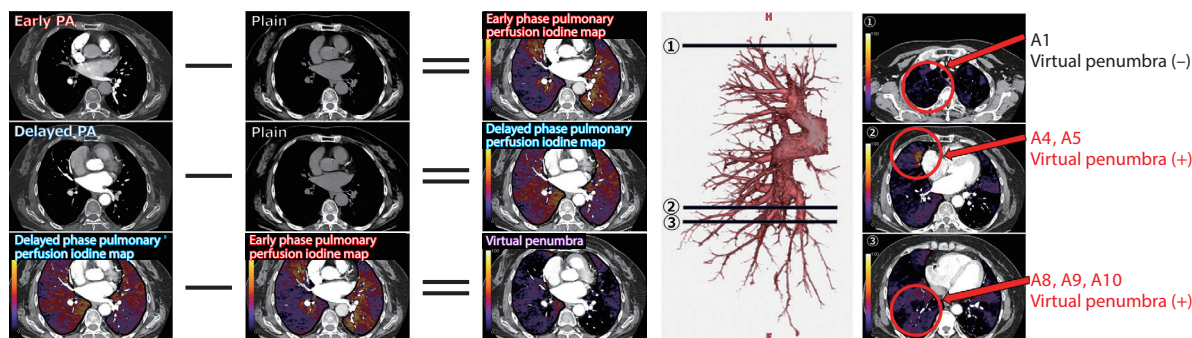
Sex	Age	Weight	Scan mode		Gated scan	Scan slice thickness	Number of rows	Tube voltage	Tube current	
Male	50-60 years	80+ kg	Dynamic (volume) [condition 1] Dynamic (volume) [condition 2] Dynamic (volume) [condition 3] Dynamic (volume) [condition 4]			0.5 mm 0.5 mm 0.5 mm 0.5 mm	320 320 320 320	80 kV 80 kV 80 kV 80 kV	SURE Exposure SD4 (image slice thickness 5 mm, 40-430 mA) 120 mA 70 mA 30 mA	
Scan speed	Scan range	Helical pitch	Pitch factor	Exposure			Total number of scans	Total scan time	CTDI	DLP
1.0 sec/rot 1.0 sec/rot 1.0 sec/rot 1.0 sec/rot	160 mm 160 mm 160 mm 160 mm	— — — —	— — — —	— — — —			— — — —	78 sec	14.5 mGy 40.5 mGy 23.62 mGy 7.09 mGy	232.40 mGy-cm 648 mGy-cm 378 mGy-cm 113.4 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	Brain CTA	AIDR* 3D (intensity: Weak (Level 1)), AiCE (intensity: Mild (level 1))		—	Ziostation™ Vitrea		Iopamiron 370	
Contrast medium injection method					Contrast enhancement protocol			Saline flush	Delay time for next scan	SURE Start
57 mL of contrast medium injected at 5.7 mL/sec over 10 sec, followed by a 30-mL saline flush injected at 5.0 mL/sec					Contrast medium 5.7 mL/sec (57 mL) + saline 5.7 mL/sec (30 mL)			Used	3 sec	Not used
Region for SURE Start	Threshold for SURE Start	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

Scan or click the two-dimensional code to view the image and related video.

TBT CTA protocol

a: Scan protocol



b: Pulmonary perfusion iodine maps created with Subtraction Lung

c: 3D image of the right pulmonary arteries and virtual penumbras

Chest

Hybrid scan method to obtain pulmonary perfusion iodine maps and images to support balloon pulmonary angioplasty

Sapporo Medical University Hospital, Hokkaido, Japan
Kenta Yoshikawa

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

Reason for examination: This is a patient with chronic thromboembolic pulmonary hypertension (CTEPH). Examination was performed to obtain pulmonary artery 3D-CTA images and iodine maps prior to balloon pulmonary angioplasty (BPA).

Clinical comments: Precise identification of the target pulmonary arteries is essential when performing BPA, which is one of the main treatment options for CTEPH. In the present case, low-perfusion areas supplied by collateral vessels arising from the bronchial arteries could be depicted using a hybrid scanning method, making it possible to identify pulmonary territories as either potentially salvageable by BPA (A4, A5, A8, A9, A10) or not salvageable (A1). In addition, 3D-CTA could be used to visualize the pulmonary territories, allowing precise determination of the target pulmonary artery branches for BPA.

Technical comments: The scanning method described in this report was used to acquire Subtraction Lung images

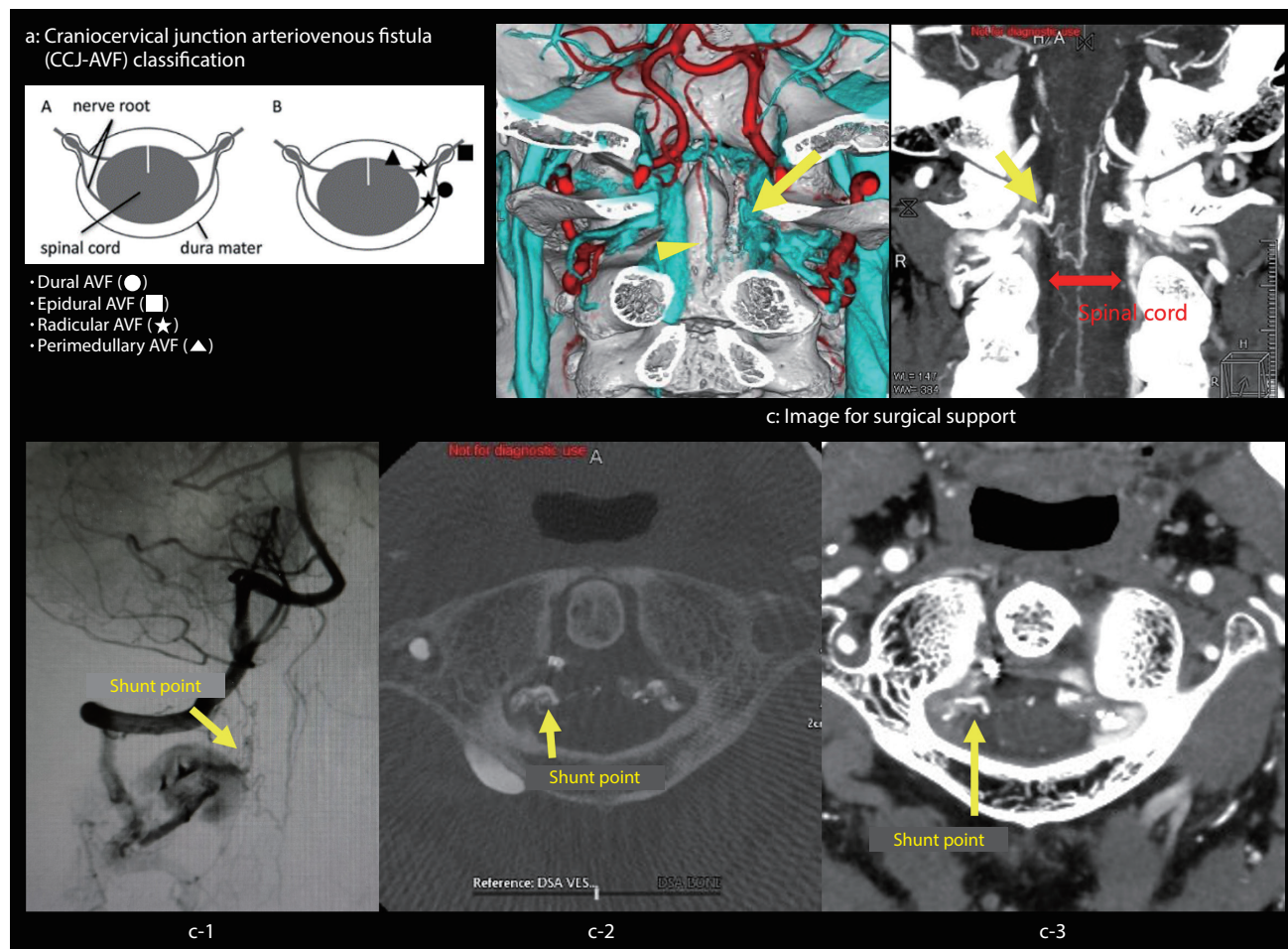
for evaluating pulmonary perfusion to support a BPA procedure. An early phase pulmonary perfusion iodine map was generated by subtracting the early pulmonary arterial phase from plain CT (1), and a delayed phase pulmonary perfusion iodine map was created by subtracting the delayed pulmonary arterial phase from plain CT (2). Then (1) was subtracted from (2) to identify salvageable pulmonary territories. In addition, high-resolution CT was performed to clearly visualize the pulmonary arteries out to their peripheral branches, which was extremely helpful for supporting the BPA procedure. As another advantage of this method, use of the test bolus tracking (TBT) method allowed all scanning to be performed with only a minimal amount (45 mL) of contrast medium.

Comments on images: a: Conceptual diagram of the TBT CTA scan protocol. After plain CT, the early pulmonary arterial phase (Early PA) and the delayed pulmonary arterial phase (Delayed PA) are scanned using the TBT method during a single breath-hold. b: An early phase pulmonary perfusion iodine map is generated by subtracting the early pulmonary arterial phase from plain CT (1) and a delayed phase pulmonary perfusion iodine map is generated by subtracting the delayed pulmonary arterial phase from plain CT (2). Then (1) is subtracted from (2) to determine the territories with delayed pulmonary arterial phase blood flow, allowing the potentially salvageable pulmonary territories (virtual penumbras) to be identified. c: The A1 segment of the right upper lobe (①) was determined to be unsalvageable (virtual penumbra (-)), but the A4 and A5 segments of the middle lobe (②) were determined to be salvageable (virtual penumbra (+)), indicating that pulmonary perfusion to these segments should be improved

by BPA. In addition, VR images of the pulmonary arteries were generated, making it possible to precisely determine the courses of the blood vessels and as well as the working angles during the BPA procedure.

Comments of judges: The case presented here demonstrates the clinical usefulness of the Subtraction Lung method for identifying pulmonary territories in which blood flow is increased in the delayed phase of plain chest CT (virtual penumbras), in the contrast-enhanced early phase, and in the contrast-enhanced delayed phase. The territories identified as virtual penumbras would be expected to show an improvement in pulmonary perfusion following BAP. This method may prove to be extremely useful for evaluating patients with CTEPH in the future, although its clinical value needs to be verified in further studies involving larger numbers of patients. In order to perform pulmonary arterial phase (early phase) scanning and bronchial arterial phase (delayed phase) scanning at the optimal timing, the TBT method was used to accurately identify the pulmonary perfusion territories. In addition, scanning was performed at a tube voltage of 100 kV to increase contrast enhancement and thus allow images to be acquired with a minimal amount of contrast medium. Furthermore, by also subtracting the Subtraction Lung images obtained from the early phase and delayed phase images, the pulmonary territories considered to be virtual penumbras could be visualized. This novel method for generating iodine maps fully exploits the high-precision nonrigid registration capabilities of Subtraction Lung and is expected to be of great value for treatment planning in patients with CTEPH.

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	Orbit synchronization	0.25 mm	160	100 kV	SURE Exposure SD18 (image slice thickness 0.25 mm, 100 mA-500 mA)	
Scan speed	Scan range	Helical pitch	Pitch factor	Exposure		Total number of scans	Total scan time	CTDI	DLP
0.35 sec/rot	400 mm	221	1.38125	-		-	10.4 sec	5.4 mGy	667.8 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 (level 2))		-	Ziostation™	Iopromide (370) 80-mL syringe	
Contrast medium injection method					Contrast enhancement protocol		Saline flush	Delay time for next scan	SURE Start
Scanning was performed using the TBT method. Test bolus: contrast medium injected over 2 sec followed by a saline flush injected over 5 sec. Main bolus: contrast medium injected over 7 sec followed by a 20-mL saline flush.					10 mL of contrast medium injected at 5.0 mL/sec, followed by a 25-mL saline flush injected at 5 mL/sec 35 mL of contrast medium injected at 5.0 mL/sec, followed by a 20-mL saline flush injected at 5 mL/sec		Used	12 sec	Used (manual)
Region for SURE Start	Threshold for SURE Start	Heart rate during scanning	Heart rate information during scanning	Cardiac phase for reconstruction	Reconstruction method	Phase NAVI	ECG Edit	Medications used	
Pulmonary artery									



Head/Neck

Localization of an arteriovenous fistula at the craniocervical junction (radicular arteriovenous fistula)

Fujita Health University Hospital, Aichi, Japan

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

Reason for examination: Examination of a craniocervical junction arteriovenous fistula (CCJ-AVF) was performed for localization of the shunt point and evaluation of its positional relationships with surrounding tissues.

Clinical comments: It is known that CCJ-AVFs have a high risk of bleeding, and surgical treatment is therefore indicated. Shunt points can be dural, epidural, radicular, or perimedullary, and precise localization is essential for treatment planning and surgical simulation. In the case discussed in this report, DSA was able to identify the shunt

point based on the vascular morphology, but anatomical localization was difficult. CTA allowed the lesion to be identified as a radicular AVF. The method described here is useful for localization of the shunt point of CCJ-AVFs.

Technical comments: The target feeder vessels of CCJ-AVFs are very thin, and detailed examination is necessary for precise localization of the shunt point. In the present case, examination focused on accurately determining the location of the shunt point in the spinal canal. FIRST Brain LCD original image and the VR image allowed the shunt point to be identified as radicular. In addition, shunt flow into the anterior spinal vein (ASV) could be clearly depicted.

Comments on images: a: Classification of CCJ-AVFs. b: VR image (left) and MIP image (right) acquired before surgery. The MIP image clearly shows the shunt point (yellow arrow) and flow into the ASV (yellow arrowhead), making it easy to understand the positional relationships with the spinal cord. c: DSA (c-1), Slab MIP (c-2), and FIRST Brain LCD (c-3). Angiography clearly shows the presence of the

CCJ-AVF, but it is not possible to determine whether the shunt point is dural, epidural, radicular, or perimedullary (c-1 and c-2). CTA with the use of FIRST Brain LCD allows accurate localization of the shunt point (c-3).

Comments of judges: In the evaluation of arteriovenous fistulas of the spinal cord and spine, precise localization of the shunt point is essential for determining the optimal treatment plan. In the case presented here, images acquired with Aquilion Precision were useful for precise localization of the shunt point of a CCJ-AVF as well as for detailed evaluation of its positional relationships with surrounding tissues. Spinal cord imaging with FIRST Brain LCD allowed the spinal cord and surrounding cerebrospinal fluid to be visualized to some extent, which is considered to provide valuable information for the localization of CCJ-AVFs. In addition, flow from the shunt into the anterior spinal vein could also be clearly depicted by taking full advantage of 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	60-70 years	60-70 kg	Helical Scan (SHR mode)			0.25 mm	160	120 kV	SUREExposure SD5.0 (image slice thickness 5 mm, 100-260 mA) SUREExposure SD5.0 (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
0.75 sec/rot	225 mm 140 mm 140 mm	91	0.56875	— — —			— — —	22.58 sec	37.5 mGy 45.1 mGy 45.1 mGy	1035.9 mGy-cm 862.4 mGy-cm 862.4 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 (Brain CTA, Standard (level 2)) / FIRST (Brain LCD)		—	REVORAS™		Iopamiron 370	
Contrast medium injection method					Contrast enhancement protocol			Saline flush	Delay time for next scan	SUREStart
Single-stage injection (followed by saline flush) FD31 (set relatively high to allow visualization of fine feeder vessels in the spinal canal)					99 mL of contrast medium injected at 5.5 mL/sec followed by a 30-mL saline flush injected at 5.5 mL/sec			Used	7 sec	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		
Internal carotid artery										

Memo

Memo

Memo



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