



Making the difference where it really matters

Philips VasoCT – Reveal Hidden Complexities

Interventional neuroradiology procedures require rapid imaging of intracranial and extracranial vascular anatomy as well as visualizations of brain parenchyma before, during and after interventions. The ability to visualize sub-millimeter sized vascular anatomy and endovascular material enhances the clinician's ability to judge the chances of success and raises their treatment confidence. The VasoCT interventional tool was designed to meet these requirements and to help clinicians further enhance clinical outcomes, reduce procedural complications and patient trauma. This novel interventional acquisition technique provides high resolution 3D imaging that reveals key information about cerebral vascular structures to support the highest possible spatial assessment of vessels in the soft tissue context. It is designed to increase the confidence with which clinicians plan, perform and follow-up on various endovascular neuro procedures.

Key benefits

- Enhances visualization of endovascular devices (stents, flow diverters etc.) and vessel morphology down to perforator level
- Allows visualization beyond the clot with peri-procedural imaging of the distal vessel aspects in ischemic stroke
- Allows rapid non-traumatic follow up of interventional patients, as a consequence may help reduce procedural and hospital stay costs

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Understand the morphology and

The versatility and precision of VasoCT imaging makes it an invaluable tool for today's advanced neuro interventional facilities.

Having a thorough understanding of vessel morphology and its morpho-dynamic relationship to vascular pathology makes it easier for clinicians to decide upon a treatment strategy.

Detailed visualization of stents and vessel morphology

VasoCT imaging is used ahead of the interventional procedures in order to visualize the intracranial vessel anatomy down to perforator level. The ability to visualize sub-millimeter sized vascular anatomy enhances the clinician's ability to judge the chances of success and raises their treatment confidence.

During procedures VasoCT can be used to assess the correctness of the stent positioning and wall apposition. VasoCT uses a special protocol to show intracranial devices, like flow diverters and very fine mesh stents, against the background of a contrast enhanced vessel at the highest resolution possible today in medical imaging.¹⁾ These visualizations allow clinicians to quickly confirm, for instance, the apposition of the intracranial stent to the vessel wall and the level of the intra-stent flow. The IA enhanced VasoCT imaging requires the use of diluted contrast injections. Medical judgment is required for the use of percent diluted contrast

injections in your clinical application. Kizilkilic O, et al² utilized 10% contrast medium and 90% normal saline for IA enhanced VasoCT imaging. This will help minimize the use of contrast load in your clinical application. One study found that VasoCT provides clear visualization of flow-diverter stents. The images were obtained using intra-arterial or intravenous contrast injection protocols. The initial results provide a high confidence and reproducibility rate for further utilization of this new technique.²⁾ Another study concluded that, "We have developed a technique that enables simultaneous clinically useful imaging of neurovascular stents and their host arteries that is unobtainable with other current imaging modalities."¹⁾

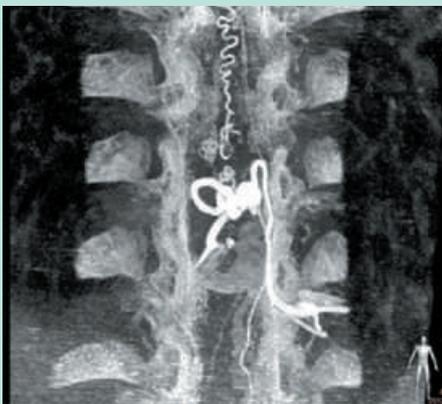
"VasoCT is done after every intervention in my institution. It provides an immediate feedback on our interventional result. It is a must for us."

Dr. Pedro Lylyk, ENERI clinic, Buenos Aires/Argentina

Perceiving extent of insult lowers treatment threshold in Stroke interventions

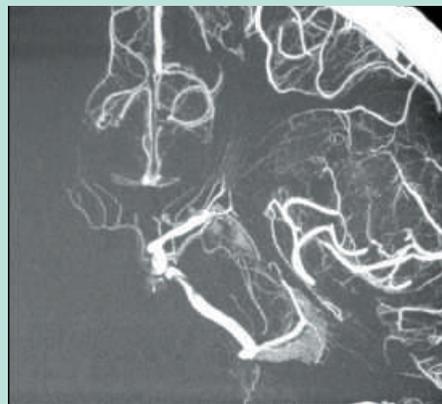
The intra-venous (IV) enhanced VasoCT visualization reveals the distal aspect of vascular brain insults, which was not possible in the interventional lab until now. The excellent images allow clinicians to perceive the extent and pattern of the vascular supply beyond the clot, and assess the location and size of the insult. This information helps clinicians better predict the expected outcome. By doing so, VasoCT helps lower the treatment threshold, meaning potentially more stroke patients can be treated.

This was confirmed in a recent study³⁾ that found that the VasoCT technique resulted in very reliable and high quality visualization of intracranial arteries with a standard IV injection. The technique was employed prior to or during interventional procedures. "IV FDCT [intra venously



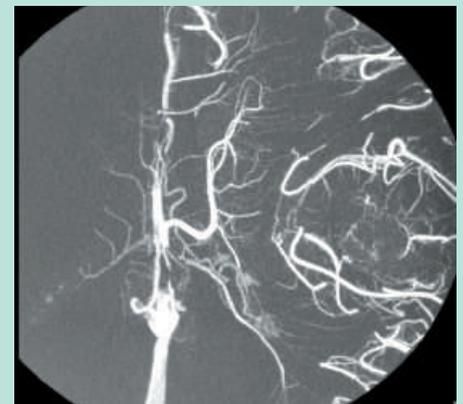
Understanding spinal vascular pathology

Prof. Civan Islak, Prof. Naci Kocer, Cerrahpasa University Hospital, Istanbul/Turkey



37y F presented with a single seizure. MRI revealed a haemorrhagic lesion without contrast enhancement. DSA was performed to rule out a vascular malformation. VasoCT shows a mass lesion with an abnormal network there appears to be cork screw type vascular structures compatible with dilated veins that are commonly seen in high grade tumors. Surgery confirms a high grade glioma.

Prof. Civan Islak, Prof. Naci Kocer, Cerrahpasa University Hospital, Istanbul/Turkey



you understand the problem

contrast-enhanced Flat-Detector CT] was performed successfully in all the cases and allowed for clot location and length visualization, assessment of communicating arteries patency, and evaluation of vessel collateral grade.”

The authors concluded that, “IV FDCT technology provided accurate delineation of obstructed vessel segments in acute ischemic stroke disease. It gave a significant help in the interventional strategy. This new technology available in the operating room might provide a valuable tool in emerging endovascular stroke therapy.”³⁾

Non-traumatic post interventional follow-up examinations

The IV enhanced VasoCT visualization supports clinicians in performing a non-traumatic post-interventional follow up of interventionally treated patients. Clinicians have found the spatial and contrast resolution achieved with VasoCT to be

highly satisfactory when used to re-confirm the results of interventional treatment(s) and to detect alterations in the size and location of vascular pathology. VasoCT technology allows post-interventional follow-ups to be rapidly completed, which has the potential to significantly decrease procedural costs. It is also well tolerated by patients. This eliminates the need for post follow-up hospitalization, while preserving the overall quality of the clinical assessment performed.

“IV enhanced VasoCT is our standard day to day post-interventional way of doing follow up's. It is totally embedded in our clinical workflow.”

Prof. Civan Islak, Prof Naci Kocer, Cerrahpasa University Hospital Istanbul/Turkey

Range of new possibilities

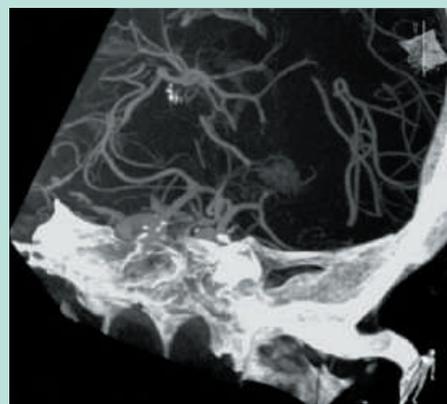
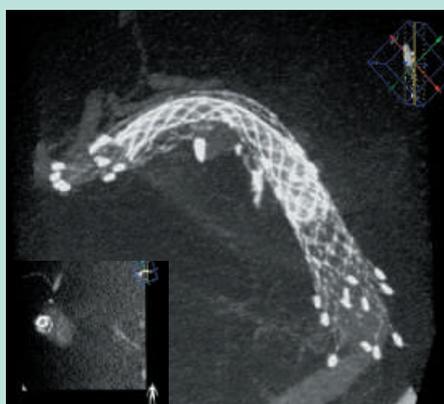
VasoCT brings a range of new possibilities to the neurointerventional lab, all of which support clinicians in gaining time and increasing treatment efficacy for a highly vulnerable patient population.

VasoCT acquisition

VasoCT is available for Philips Allura interventional systems which have XperCT functionality. The VasoCT images are acquired during a rotational C-arm movement and result in an isotropic stack of CT images that can be visualized in any random position without loss of image quality.



46y M presented with hyperplastic disease of the internal carotid artery. The patient was treated with triple Enterprise stents with the stent in stent method. Insufficient radial force was re-inforced with an additional Pipeline stent.
Dr Pedro Lylyk, ENERI clinic, Buenos Aires/Argentina



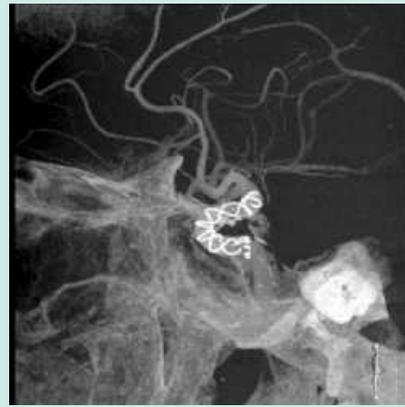
Observing distal vessel aspect beyond the clot in ischemic stroke

Prof. Jacques Moret, Beaujon Hospital, Paris/France

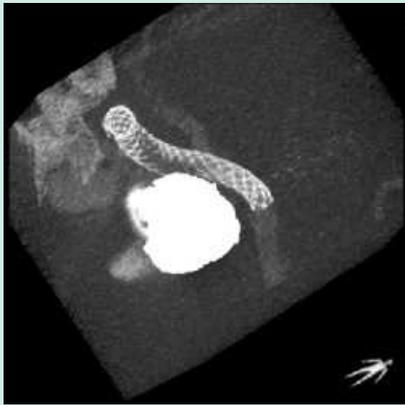
Gallery of special cases



67YF, ICA aneurysm, treated with remodelling technique with coils and a stent.
Dr P. Lylyk.



74YF, Right PCOM aneurysm, treated with a flow diverter.
Dr P. Lylyk.



63YM, SAH, choroidal artery aneurysm, treated with coil+flow diverter combination.
Dr P. Lylyk.



70YF, patient with multiple aneurysm, Right PCOM clipped, M1 segment of RMCA treated with coils. Left choroidal art. aneurysm treated with a flow diverter.
Dr P. Lylyk.

* Not for distribution in the USA.

Sources:

1. Patel NV, et al, Contrast-Enhanced Angiographic Cone-beam CT of Cerebrovascular Stents: Experimental Optimization and Clinical Application, *AJNR Am J Neuroradiol.* 2011 Jan;32(1):137-44. Epub 2010 Oct 21.
2. Kizilkilic O, et al, Utility of VasoCT in the treatment of intracranial aneurysm with flow-diverter stents, *J. Neurosurg*, 2012 May 4. [Epub ahead of print].
3. Blanc R, et al, Intravenous flat-detector CT angiography in acute ischemic stroke management, *Neuroradiology*, 2012 Apr 54(4):383-91. Epub 2011 May 31.

Please visit www.philips.com/VasoCT



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