surgical resection of spinal AVM should be proposed in few referral centres.

REFERENCE

1. Singh B, Behari S, Jaiswal AK, et al. Spinal arteriovenous malformations: is surgery indicated?. *Asian J Neurosurg* 2016;11(2):134–142. doi:10.4103/1793-5482.177663

Disclosure Nothing to disclose

EP29

THE DIAGNOSTIC PERFORMANCE OF 4D-DSA PRODUCT AND PROTOTYPE SOFTWARE ON CEREBRAL AVM

L Pan, W Xiang, Y Zhao. *Neurosurgery Department, General Hospital of Central Theater Command, Wuhan, China*

10.1136/neurintsurg-2021-ESMINT.29

Introduction Accurate diagnosis is essentially important for treatment of cerebral arteriovenous malformation (AVM). Conventional digital subtraction angiography (DSA) are limited due to the complex vessel overlapping. 4D DSA with both temporal and spatial resolution is able to reveal AVM angioarchitecture.

Objective We compared the performance of 4D imaging with the conventional method for visualizing AVM.

Aim To evaluate the diagnostic performance of 4D DSA and 4D prototype.

Methods 37 patients were selected. The standard medical records were based on the conventional 2D and 3D DSA combination method. 2 independent experienced surgeons recorded assessments based only on 4D datasets. The evaluation results were then compared with the medical records using agreement analysis.

Results Using either 4D DSA or 4D prototype, both reviewers reached a complete agreement with the medical records for Martin-Spitzler Scores and the presence of intracranial aneurysm. Assessing the number of feeding arteries, the agreement between 4D DSA and the medical records was 0.888 for both Reviewer A and B; the agreement between 4D prototype and the medical records was 0.917 for both reviewers. Determining the number of draining veins, the agreement between 4D DSA and the medical records was 0.97 for both reviewers; the agreement between 4D prototype and the medical records was 0.943 for Reviewer A and 0.941 for Reviewer B.

Conclusion The diagnostic performance of both 4D DSA product and prototype software were largely equivalent to the combination method for cerebral AVM. 4D prototype further optimized the temporal resolution and image quality compared to 4D product.

REFERENCES

1. Lang S, Göllitz P, Struffert T, Rösch J, Rössler K, Kowarschik M, Strother C, Doerfler A. 4D DSA for dynamic visualization of cerebral vasculature: a single-center experience in 26 cases. *AJNR. American Journal of Neuroradiology* 2017;38(6):1169–1176.
2. Ognard J, Magro E, Caroff J, Ben Salem D, Andouard S, Nonent M, Gentric JC. A new time-resolved 3D angiographic technique (4D DSA): description, and assessment of its reliability in Spetzler-Martin grading of cerebral arteriovenous malformations. *Journal of Neuroradiology = Journal de Neuroradiologie* 2018;45(3):177–185.

Disclosure Nothing to disclose

Miscellaneous

EP30*

THE NEGLECTED ARACHNOID TRABECULAE: AN IN-VIVO PRELIMINARY FEASIBILITY STUDY WITH USE OF TRANS-VASCULAR OCT IMAGING TO EXPLORE THE PERIVASCULAR SUBARACHNOID SPACE

V Anagnostakou, R King, G Ughi, A Puri, M Gounis. *Radiology, UMASS, 55 Lake Avenue North, Worcester, MA, USA*

10.1136/neurintsurg-2021-ESMINT.30

Introduction The micro-architectonics of the subarachnoid space consisting of multiple trabecular structures is not appreciated with traditional imaging methods. High-frequency optical coherence tomography (HF-OCT), is intra-vascular imaging with resolution of ~10µm. We describe the first pre-clinical observations with trans-vascular imaging of the subarachnoid space in a dog.

Material/Methods Five dogs were imaged using HF-OCT through the basilar, anterior spinal, middle and anterior cerebral arteries. We imaged the perivascular subarachnoid space at through vessels in the target area. Access was achieved through the vertebral artery to the P2-P3 segment with a microcatheter and through the internal carotid artery up to the M3-M4 segment for the MCA and A2-A3 segment for the ACA. The HF-OCT wire was delivered, unsheathed from the microcatheter and images were acquired with contrast injection at a flow rate of 4 ml/sec to clear the blood.

Results In all dogs, posterior circulation imaging was acquired while anterior circulation imaging was performed in three. Detailed images were obtained demonstrating perforating arteries and the surrounding environment. Multiple cobweb structures were depicted representing fine trabecular structures and arachnoid membranes of the subarachnoid space. Venous structures and nerve root origins were also recognized. In two animals, thickening of the vessel wall due to vasospasm from catheter manipulations did not allow for optimal images.

Conclusion HF-OCT imaging offers detailed visualization not only of the vessel wall, the branching pattern of cerebral perforators but also of structures of the subarachnoid space impossible to study with other imaging modalities due to inadequate resolution.

REFERENCES

1. Benko N, et al. Spatial distribution of human arachnoid trabeculae. *J Anat* 2020 Aug;237(2):275–284.
2. Alcolado R, et al. The cranial arachnoid and pia mater in man: anatomical and ultrastructural observations. *Neuropath and Applied Neurobiol* 14(1):1–17.
3. Scott G, et al. Utilizing multiple scale models to improve predictions of extra-axial hemorrhage in the immature piglet. *Biomech Model Mechanobiol* 2016;15:1101–1119.

Disclosure Acknowledgement: This research was funded by the Massachusetts Life Sciences Center under the Bits-to-Bytes program. The content is solely the responsibility of the authors, and does not represent official views of the MLSC. **Disclosures:** Dr. Ughi is employed by Gentuity, which manufactures the HF-OCT imaging device.