

# Angioscopy

Kondo et al., report three patients in whom angioscopy helped confirm the stent lumen during retreatment after CAS.

**CASE DESCRIPTION:** Case 1 required retreatment for stent shortening that occurred 1 month after the first CAS. Preprocedure angioscopy showed the presence of neointima, which could not be revealed by intravascular ultrasound (IVUS). In case 2, which required repeat CAS for distal progressive stenosis of the internal carotid artery, the neointima was observed on the stent surface and was more pronounced on the distal side. In case 3, retreatment was necessary for recurrent ischemic stroke caused by stent restenosis; preprocedure angioscopy showed an unstable plaque, which was not detected as vulnerable by IVUS, protruding into the stent lumen, with partial ulceration and bleeding.

**CONCLUSIONS:** Compared with IVUS, angioscopy enables a more detailed observation of the stent lumen. Although angioscopy is relatively invasive, its use in evaluating changes in the stent lumen after CAS should be clarified by accumulation of reported cases <sup>1)</sup>.

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Endoluminal optical imaging or angioscopy, has not seen widespread application during [neurointerventional procedures](#) largely as a result of the poor imaging resolution of existing angioscopes. Scanning fiber endoscopes (SFEs) represent a novel endoscopic platform that allows for high resolution video imaging in an ultraminiature form factor that is compatible with currently used distal access endoluminal catheters.

**Objective:** To test the feasibility and potential utility of high resolution angioscopy with a SFE during common endovascular neurosurgical procedures.

**Methods:** A 3.7F SFE was used in a porcine model system to image endothelial disruption, ischemic stroke and mechanical thrombectomy, aneurysm coiling, and flow-diverting stent placement.

**Results:** High resolution, video-rate imaging was shown to be possible during all of the common procedures tested here, and provided information that was complimentary to standard fluoroscopic imaging. SFE angioscopy was able to assess novel factors such as aneurysm base coverage fraction and side branch patency, which have previously not been possible to determine with conventional angiography.

Endovascular imaging with a SFE provides important information on factors that cannot be assessed fluoroscopically and represents a novel platform on which future neurointerventional techniques may be based, as it allows for peri-procedural inspection of the integrity of the vascular system and the deployed devices. In addition, it may be of diagnostic use for inspecting the vascular wall and in post-procedural device evaluation. <sup>2)</sup>

<sup>1)</sup>

Kondo H, Kiura Y, Takeshita S, Magaki T, Sakoguchi T, Mukai T, Yuyo M, Tominaga A, Kurisu K. Angioscopic findings in three patients who required retreatment after carotid artery stenting. *World Neurosurg.* 2019 Jul 3. pii: S1878-8750(19)31848-0. doi: 10.1016/j.wneu.2019.06.191. [Epub ahead of print] PubMed PMID: 31279107.

<sup>2)</sup>

McVeigh PZ, Sacho R, Weersink RA, Pereira VM, Kucharczyk W, Seibel EJ, Wilson BC, Krings T. High Resolution Angioscopic Imaging During Endovascular Neurosurgery. *Neurosurgery.* 2014 Apr 23.

[Epub ahead of print] PubMed PMID: 24762703.

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