

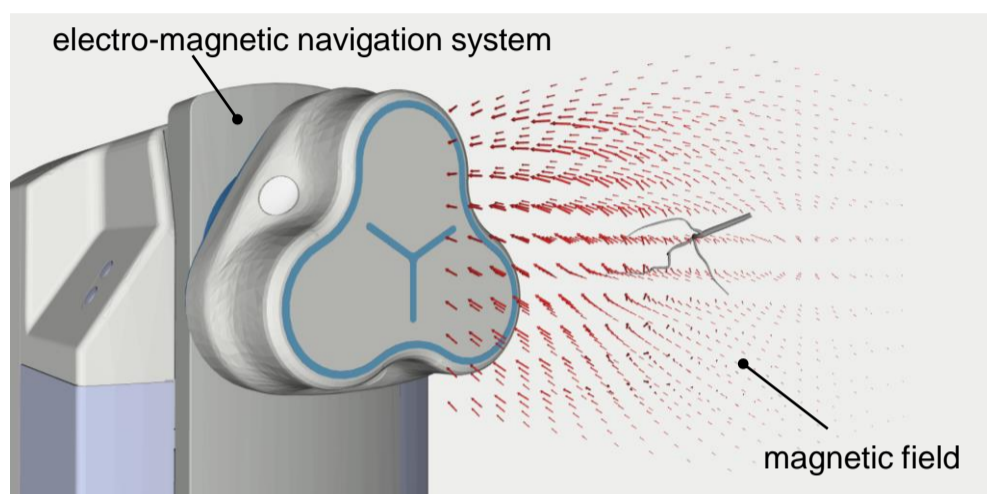


# Super-Selective Angiography and Robotic Navigation in a Porcine Vasculature using a Magnetic Micro-Catheter

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## Introduction

A newly developed magnetic steerable micro-catheter (MSM) controlled by an electromagnetic navigation system (eMNS) offers remote control and high navigability in small and distal vessels.

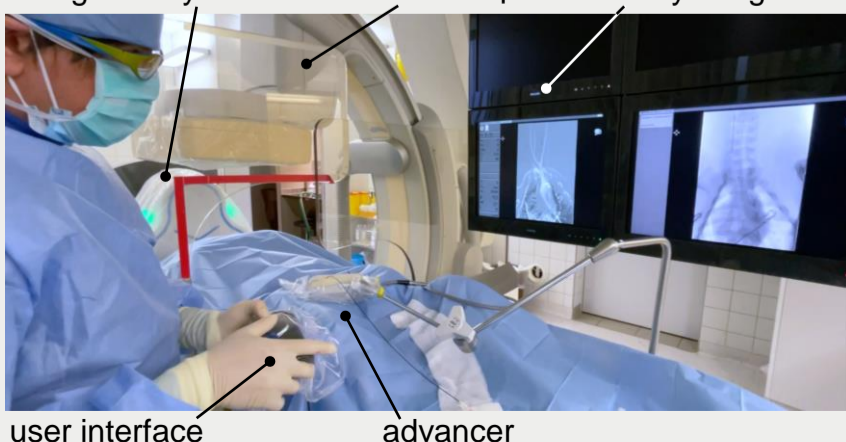
Currently, endovascular therapy (EVT) of distal vessel occlusion (DVO) in acute ischemic stroke (AIS) is increasingly performed [1]. Endovascular treatment of DVO requires a high degree of technical expertise and is not without risk.

Here we present a means of performing IAT in AIS patients with hard to reach DVOs using a novel MSM.

## Methods

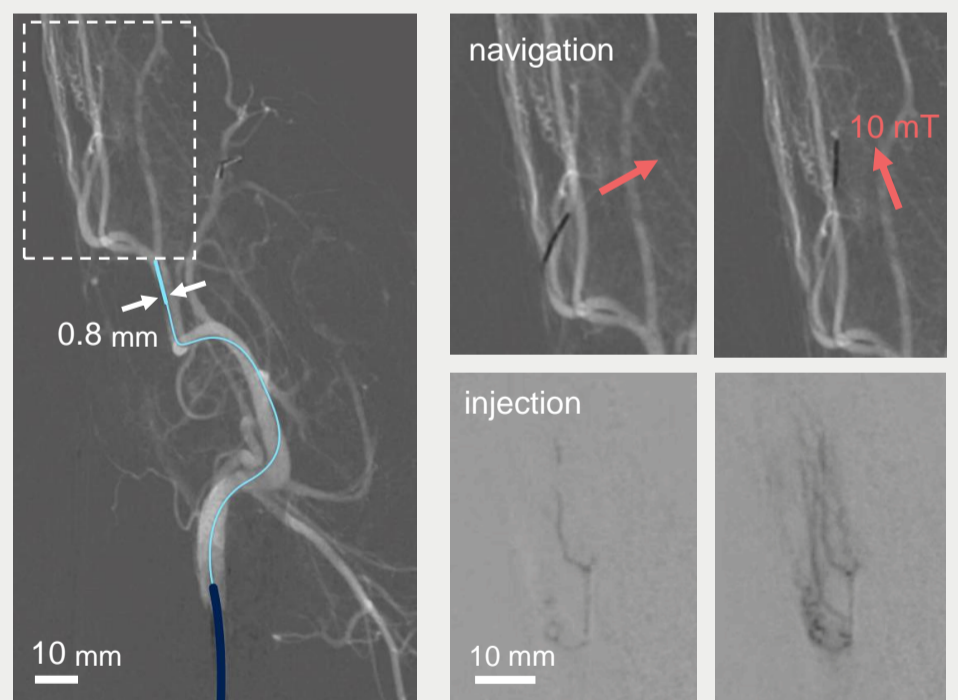
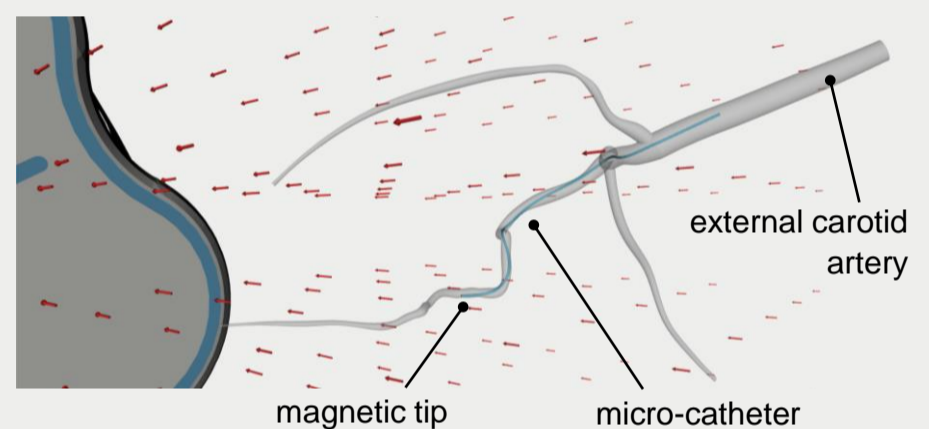
- A 2Fr (0.8mm) micro-catheter with magnetic tip
- Navigation through the small branches of the external carotid artery (ECA) of a 45kg pig
- The MSM tip was controlled with external magnetic fields generated by an eMNS and advanced by a motorized advancer
- The operator interacted with the system via a hand-held controller
- The MSM was imaged using a mono-planar angiography system (Philips Allura Xper FD20)
- At the target site, an IAT-mimicking contrast agent solution (50:50 Iopamiro 300) was injected

electro-magnetic navigation system    fluoroscope    X-ray image



## Results

- The MSM was successfully navigated in small diameter (< 1.5mm), tortuous vessels (small branches of the ECA)
- An injection of contrast agent was performed at multiple target sites imitating IAT application
- The magnetic catheter showed high controllability for selecting multiple millimeter-sized arteries



## Conclusion

We demonstrated the feasibility of an MSM using an eMNS in small vessels in a porcine model. Due to the ease of use of this novel technique, the MSM has the potential to facilitate EVT in AIS patients by reaching more distant vessel occlusions and addressing complex anatomical situations.

## References

1. Safer JL et al. Thrombectomy for distal, medium vessel occlusion. Stroke 2020; 51: 2872-2884.