

Massachusetts Institute of Technology (MIT) engineers have developed a thread-like snake robot, equipped to be magnetically steerable in order to actively crawl with ease through the brain's narrow blood vessels.

Engineers hope to one day in the near future to have this robotic thread paired with existing endovascular technologies so as to enable doctors to remotely move the snake robot through a patient's brain vessels to quickly treat blood clots and lesions. This will hopefully help prevent damage to those who have suffered an aneurysm or stroke.

“Stroke is the number five cause of death and a leading cause of disability in the United States. If acute stroke can be treated within the first 90 minutes or so, patients' survival rates could increase significantly,” says Xuanhe Zhao, associate professor of mechanical engineering and of civil and environmental engineering at MIT. “If we could design a device to reverse blood vessel blockage within this ‘golden hour,’ we could potentially avoid permanent brain damage. That's our hope.”

Currently, doctors are delivering clot-reducing therapies and endovascular procedures using a catheter, which is manually threaded by a surgeon, with the help of a guide wire. This procedure is long and can be physically taxing for surgeons. Discovering a way to administer this procedure more efficiently could easily save lives, while also helping surgeons and revolutionizing this demanding and dying skill. Moving towards using this snake robot will also help to reduce the patient's and doctor's exposure to X-ray imaging tool, fluoroscope. Currently, fluoroscope is used to take images simultaneous as the surgeon

moves the thin wire through the patient's blood vessels. Moving to a magnetically steerable thread sized robot with a camera, will reduce the X-ray exposure significantly.

Zhao and his team understand that these developments could help improve such endovascular procedures, both with their inventive guide wire design and in reducing doctors' exposure to any associated radiation.

Check out MIT's video below of the snake robot threading it's way through blood vessels.

Massachusetts Institute of Technology (MIT) Robo-thread Video

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