A Robotic System for Treating Intracranial Hemorrhage (ICH)

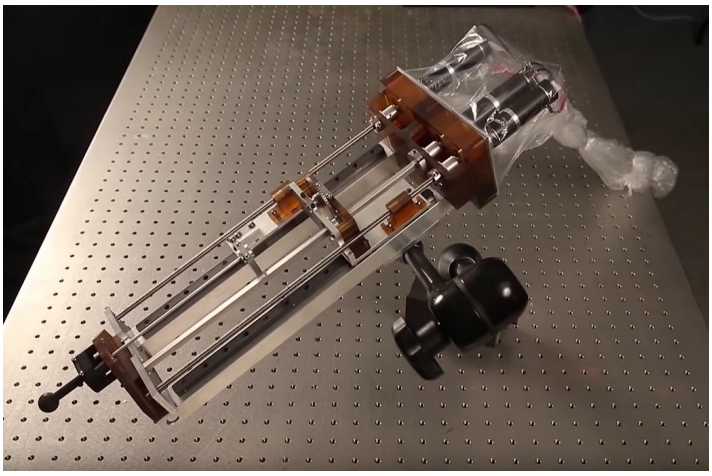
VANDERBILT UNIVERSITY
CTTC Center for Technology Transfer & Commercialization

Summary

Vanderbilt researchers have designed a minimally-invasive, image-guided robotic system for delivering a steerable needle through the brain to a blood clot. Aspiration is provided through the steerable needle to remove the clot and decompress the brain. The system is no more invasive than a standard brain biopsy, and preliminary studies show that the system is successful at removing phantom clots via the steerable needle approach.

Addressed Need

The current surgical treatment for ICH often involves an invasive craniotomy in order to expose the blood clot, which causes unnecessary displacement of healthy brain tissue. The robotic steerable needle system is designed to cause disruption of a minimal amount of healthy brain tissue on the way to the clot, and once there, to remove the clot from within.



Robotic system for minimally-invasive removal of blood clots in the brain

Technology Description

The robotic system controls the actuation of two tubes that comprise the steerable needle. Control of the system is performed under image-guidance, providing feedback to the surgeon during removal of the clot. The sterilizable, biocompatible robot incorporates a suction system for decompression of the hemorrhage site.

Unique Features

- Clot removal through a needle
- Sterilizable and biocompatible design
- Straightforward image registration procedure
- Minimally Invasive
- Quick release safety mechanism

Intellectual Property Status

- Pending patent application US20150223832
- Tech Video: https://youtu.be/KVeTfUozakc
- Reuters Video (Brain clots meet their match with robot needle): https://youtu.be/jF6kKMwzBNE
- Publication: P. J. Swaney, et. al., "Minimally-Invasive Intracerebral Hemorrhage Removal Using An Active Cannula", in IEEE International Conference on Robotics and Automation, 2013, pp. 219-224.
- Visit Research Group Webpage: http://research.vuse.vanderbilt.edu/MEDlab/research/decompressing-bleeding-brain

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VU REFERENCE: VU 14092

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