Washington University in St. Louis
Office of Technology Management

STRING THEORY: NEUROVASCULAR CATHETER SYSTEM WITH 2-IN-1 VARIABLE RIGIDITY

Chandrasekaran, Vinay, Genin, Guy, Hafez, Daniel, Hartquist, Chase, Leuthardt, Eric, Lowe, Halle, Osbun, Joshua, Zayed, Mohamed

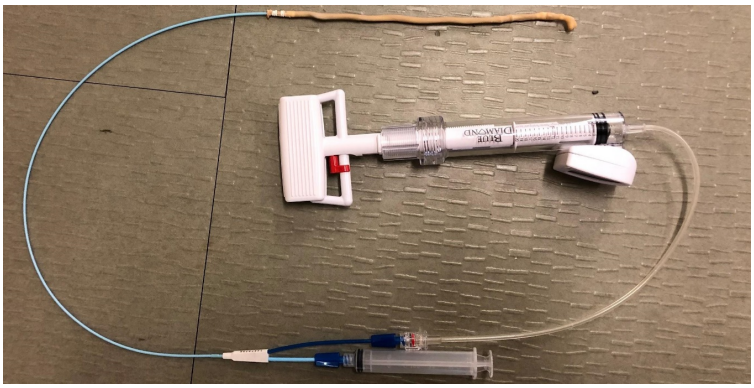
Weilbaecher, Craig

T-019184

An interdisciplinary team at Washington University has developed an easy-to-use neurovascular catheter system designed to reduce surgery time and prevent herniation during transradial interventions for stroke, aneurysms and other conditions. This device, called “String Theory”, can be switched during surgery from a floppy mode that maintains mobility while navigating vasculature to a rigid mode that can support medical devices.

Currently, transradial interventions employ a coaxial catheter procedure using a flexible intermediate guide followed by a separate stiff outer sheath. This system is time-consuming and the coaxial device can herniate and buckle within the blood vessel during the procedure. String Theory is designed to addresses these shortcomings using a single, three-layer device that surgeons deploy when floppy and then easily trigger to become rigid as needed during the intervention. This 2-in-1 technology is flexible enough to navigate through the aortic arch and then rigid enough to introduce other devices. String Theory’s vacuum-actuated system can increase stiffness by 8-fold during a procedure to potentially save time and prevent complications.

String Theory Prototype



Stage of Research:

- **Proof-of-concept** – inventors have built a prototype device to demonstrate the three-layer design can be used to effectively control rigidity

Applications:

- **Neurovascular or peripheral vascular medical device** – catheter system for transradial access during interventions to treat conditions such as stroke and brain aneurysms

Key Advantages:

- **Easy to use 2-in-1 system:**
  - 8x change in stiffness controlled by surgeon with minimal retraining
  - flexible mode maintains mobility to navigate vasculature
  - rigid mode effectively supports medical devices
  - designed to save time and reduce herniation compared to coaxial catheter system

Patents: Application pending

Related Web Links: Genin Profile; Leuthardt Profile and Lab; Osbun Profile; Zayed Profile and Lab