Adjustable tubular retractor for brain surgery

Duke File (IDF) Number

IDF #:T-006470

Meet the Inventors

Carroll, Kathleen "Katie"
Gonzalez, Luis "L. Fernando"
Haddad, Anthony-Fayez "Anthony-Fayez"
McVey, Aimee "Aimee"

Contact For More Info

Krishnan, Shweta
919-681-7541
shweta.krishnan@duke.edu

Department

Neurosurgery (Dept. & CRU)

Publication(s)

External Link(s)

- From inventors with Duke NeuroInnovations
- From inventors with Duke FastTrack

Unmet Need

In 2018 the Journal of Neurosurgery estimated that there were 22.6 million patients globally suffering from neurological disorders, with 13.8 million of them requiring surgery. During intracranial operations concerning aneurysms, tumor extractions, and hemorrhage it is often necessary to retract the brain to reach the lesions. Current tubular retraction systems offer an improvement over the aggressive retraction of traditional flat blade systems; however, their fixed length and port diameters make manipulation during surgery difficult. The only way to change length or diameter is to completely remove the device and insert a new retractor. Current tubular retractors are limited in length and maneuverability, impacting outcomes and costs. There is a need for a new tubular retractor device, with improved mounting, that can be inserted with a minimal diameter and length, minimizing damage to surrounding tissue and allowing access to deeper lesions.

Technology

Duke inventors have developed an adjustable device capable of minimizing tissue damage during brain surgery. This class II medical device is intended to be used by neurosurgeons during intracranial surgeries requiring brain retraction. Specifically, this new retractor can be precisely inserted after craniotomy, and changed *in situ* if needed, at a minimal diameter around an image guide probe. Once placed, the guide probe can be removed, and the length can be adjusted as needed. Once the length is fixed, the diameter can be adjusted allowing the insertion of tools. The device comes with a custom designed low-profile mount that eliminates bulky retractor arms that crowd the surgical field. The mount offers multi-axial positioning for precise access. This device has been demonstrated to medium-high fidelity prototyping.

Other Applications

This technology could also be used to retract muscles during minimally invasive spinal fusion surgeries.

Advantages

- 3D Printed
- Ideal for small deep lesions
- Minimizes tissue damage