Cleveland Clinic Innovations

ANTI-BRAIN SHIFT DEVICE

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PRODUCT

A burr hole device with fluid irrigation for minimizing brain shift.

INDICATION

Prevents pneumocephalus, stereotactic surgery, neurosurgery, brain shift.

VALUE PROPOSITION

- Prevents CSF egress and intracranial air entry, the two main sources of brain shift.
- Accurate positioning of probes, catheters, or devices.
- Lower perioperative complications.

DEVELOPMENT STAGE

- Prototype tested in phantom.

INTELLECTUAL PROPERTY

PCT Application Filed

CONTACT INFORMATION

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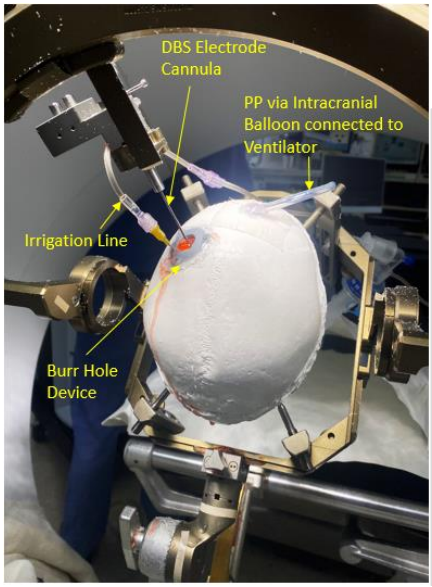
OPPORTUNITY

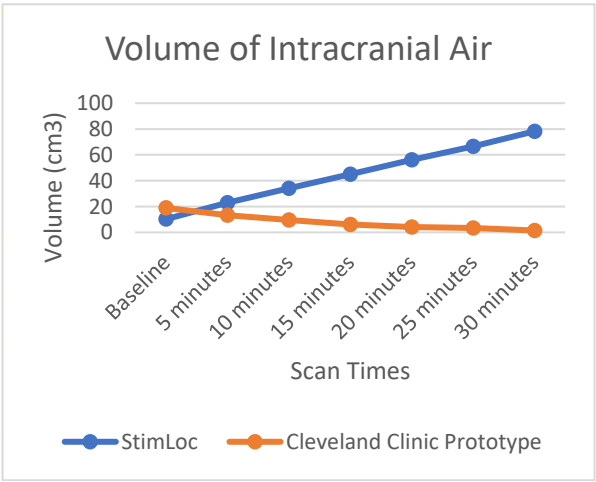
Stereotactic surgery is a very common procedure for the treatment of a multitude of disorders as well as for establishing a diagnosis. There are several challenges to accurate and precise stereotactic surgery, including egress of cerebrospinal fluid (CSF) and brain shift. Brain shift leads to a change in the co-registration between the brain parenchyma and the fiducial-based stereo-image. That leads to error in the delivery of the stereotactic probe or catheter or device that, in turn, causes inaccuracy, imprecision and elevates the risk for perioperative complications. Surgeons resort to several strategies to minimize brain shift, but brain shift continues to be a concern in stereotactic surgery and improvements are needed.

SOLUTION

Recently published articles found that brain shift is correlated with increased levels of intracranial air. Our invention consists of a burr hole device which incorporates fluid irrigation to contain CSF egress and prevent air entry. The added irrigation will keep a required pressure inside the burr hole device. If that pressure is equal or slightly greater than the pressure of the CSF coming out, it will contain the CSF in the intradural scape and thus minimize brain shift. The intent is to achieve a steady hydrostatic pressure that will control any CSF egress.



Prototype testing in a phantom



Prototype test result