Image-Guided Irrigating Suction Cannula for Removal of Intracerebral Hemorrhage and Other Lesions

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SUMMARY

UCLA researchers in the Department of Neurosurgery have developed a minimally invasive image-guided irrigating suction cannula for intracerebral hematoma evacuation.

BACKGROUND

Intracerebral hemorrhage (ICH) secondary to brain trauma or stroke is a debilitating condition with high mortality and morbidity rates. Evacuating blood from the hematoma is a routinely performed surgical intervention for ICH, which has been shown to improve survival rates. Minimally invasive surgical evacuations, such as image-guided stereotactic procedures and endoscopic-guided hematoma evacuation, are gaining more attention due to the minimal risk of these procedures to the surrounding healthy brain tissue and favorable survival benefit.

INNOVATION

Dr. Neil Martin at UCLA has developed a minimally invasive image-guided cannula for hematoma evacuation from the brain through a burr hole. The cannula is designed to perform both suction and irrigation of the hematoma. The cannula can be easily integrated with a surgical stereotactic image guidance system and endoscopes for safe and easy introduction of the cannula into the hematoma. The cannula is also designed to permit the visualization of the surrounding tissue using the attached endoscopes during the introduction and evacuation procedures. It is also compatible for intraoperative imaging-guided localization using CT or MRI. Additional attachments permit safe introduction of the cannula with minimal traumatic injury to the surrounding tissue, and fragmentation of the clots. The cannula is available in different diameters and lengths, and is provided with a suction regulator to control the suction pressure and a graduated suction trap to measure the volume of the evacuated fluid.

APPLICATIONS

The cannula can be used for intracerebral fluid evacuation such as:

- Evacuation of blood from intracerebral hemorrhage
- Evacuation of pus from an abscess
- Evacuation of cystic fluid and necrotic debris from tumors
- Evacuation of fluid from other types of lesions

ADVANTAGES

- Simple design
- Minimally invasive
- Easy integration with surgical stereotactic image guidance systems and endoscopes
- Availability of a fixation platform for attachment of other devices such as self-retaining retractors, burr-hole fitted fixation devices, manual adjustable tool or endoscope holders, or hydraulic fixation devices
- Permits visualization of the surrounding tissue during the introduction and hematoma evacuation procedures
- Compatible for intraoperative imaging-guided localization using CT or MRI
- Minimal traumatic injury to the surrounding healthy tissue during the entire procedure
- Ability to fragment clots
- Reusable or disposable as per the need

STATE OF DEVELOPMENT

Conceptual drawings of the cannula exist.

PATENT STATUS

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ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

▶ Non-invasive Assessment of Intracranial Pressure