



Shape Memory Alloy Enabled Robotic Modular Mass Debrider

Tech ID: 34100 / UC Case 2024-712-0

FULL DESCRIPTION

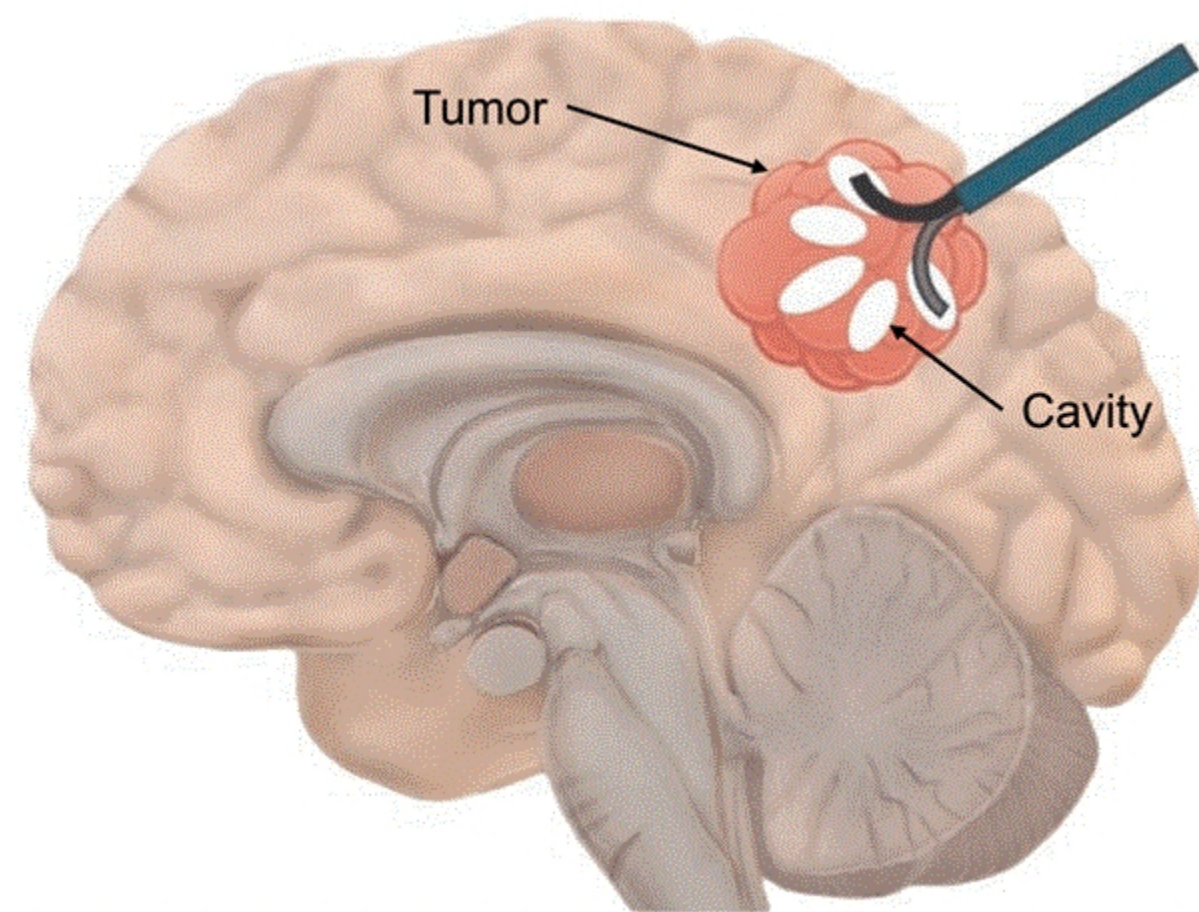
Background

For many types of brain mass lesions such as intracerebral hemorrhages (ICH) and brain tumors, debulking remains the gold standard procedure to save patients' lives and alleviate symptoms immediately. Minimally invasive surgery (MIS) techniques are emerging to improve surgical outcomes.

To improve the safety and efficacy of neurosurgery, a few steerable, mesoscale robots have been developed for manipulation inside brain mass lesions.

Technology

UCR faculty Jun Sheng, and his team, have developed a novel, steerable mesoscale robot for minimally invasive, removal of brain mass lesions. The novelty of this robot is the creation of concentric tube robot with a sufficiently large channel that allows for the integration and incorporation of tissue fragmentation and aspiration mechanisms in the robot.



Removing intracranial mass lesions at multiple locations by a steerable, robotic device equipped with a tissue cutting mechanism.

CONTACT

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OTHER INFORMATION

KEYWORDS

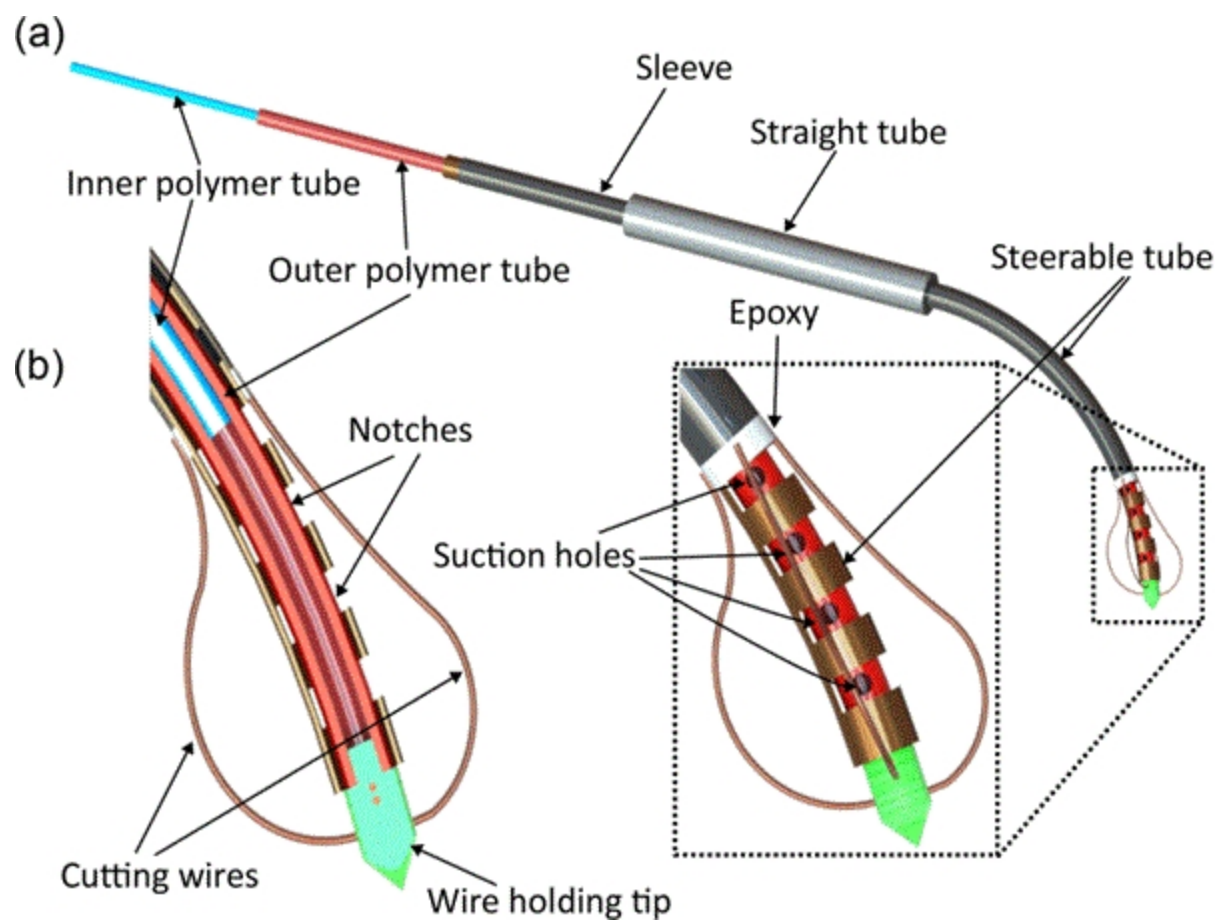
neurosurgical robot, steerable robot,
debulking, brain mass lesion,
concentric tube robot

CATEGORIZED AS

- [Medical](#)
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- [Robotics and Automation](#)

RELATED CASES

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Design of the surgical robot: (a) isometric view of the robot with the inset showing the details of the robot tip equipped with a tissue cutting and an aspiration mechanism; and, (b) sectional view of the robot tip showing the concentric configuration of the pre-curved tube and two polymer tubes.

FEATURES/BENEFITS

- Allows for more effective removal of brain mass lesions compared to existing steerable robots and conventional tools.
- Enables tissue removal at multiple locations under imaging guidance.
- Ability to navigate and remove tissue from a lesion without clogging.
- Demonstrated achievement of significant improvement in mass removal efficiency (about 500%).
- Compared to FDA approved straight debridors, the efficiency of this device is an order of magnitude higher for debulking.

SUGGESTED USES

- Minimally invasive debulking of brain mass lesions.
- Specifically targeted at deep intracerebral mass lesions.
- Relevant for conditions such as hematomas and brain tumors.

INVENTOR INFORMATION

- Please visit [Jun Sheng's research group website](#) to learn more about their research.
- Please review [all inventions by Jun Sheng](#) and his team at UCR.
- Please read [recent news coverage](#) of Jun Sheng at UCR.

RELATED MATERIALS

- [Towards a Steerable Neurosurgical Robot for Debulking of Brain Mass Lesions](#)

PATENT STATUS

Patent Pending

