

HK researchers design neurosurgical robotic system

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A group of researchers at the University Hong Kong has developed a robotic system that can perform neurosurgery inside a magnetic resonance imaging (MRI) scanner.

Stereotactic neurosurgery involves using an external positioning system to locate targets of surgical interest and guide minimally invasive surgery. It is one of the few treatments available for neuropsychiatric disorders such as Parkinson's disease, essential tremor and major depression.

Since MRI scanners have very strong magnetic fields and most metallic components are forbidden in MRI environments, the team developed a tele-operated robotic system driven by liquid. The system does not generate any electromagnetic interference or affect imaging quality. A manipulator is designed to perform dexterous operations on the left and right brain targets, and the area required for an invasive anchorage is very small. Furthermore, the compact robot can fit inside a standard MRI head coil, and advanced three-dimensional tracking markers enable fast localization of robot instruments in MRI in real time.

According to the researchers, this innovation is expected to facilitate the treatment of Parkinson's disease and other neuropsychiatric disorders, allowing more accurate and effective brain surgery. Further clinical studies will be conducted to determine the efficacy of the system.