

Study on minimally invasive laser and 'mini' craniotomy for 'inoperable' brain tumors

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A new paper in the October issue of the journal *Neurosurgical Focus* finds the use of laser beneficial for the removal of large, "inoperable" glioblastoma (GBM) and other types of brain tumors. The paper is authored by Andrew Sloan, MD, and colleagues from University Hospitals Cleveland Medical Center, Case Western Reserve University School of Medicine and Case Comprehensive Cancer Center.

Dr. Sloan and other investigators at the Case Comprehensive Cancer Center led the first in human trials, published in 2013, of a procedure with laser interstitial thermotherapy (LITT), a minimally invasive approach using a laser to "cook" a tumor through a tiny hole in the scalp and bone and the intra-operative MRI (iMRI) to fine tune the treatment rather than the surgeon's direct vision.

However, one problem that he and other surgeons faced was tumor swelling. While LITT was successful for brain tumors smaller than the size of a golf ball, larger tumors often swelled following LITT, sometimes threatening the life of the patient.

This was initially disappointing to Dr. Sloan as these larger tumors, especially "butterfly" gliomas, usually considered inoperable using conventional approaches, were the very ones he had hoped LITT would allow him to treat.

But during an operation to remove the swelling, Dr. Sloan made a surprising finding. The cooked tumor, rather than being tense and bloody

as he expected, was soft, and its blood supply had been clotted off. This gave him the idea that he could treat even the larger inoperable tumors safely with LITT if he combined it with a very small craniotomy (a small opening in the head) which would allow him to "suck out" the cooked tumor to prevent swelling.

The *Neurosurgical Focus* paper (and an accompanying video) describe this treatment on 10 patients who had difficult-to-access malignant tumors. The tumors had a median volume of 38 cc. Eight patients had GBMs including "butterfly GBMs," one had previously treated GBM, and one had a melanoma brain metastasis. GBM is the deadliest of [brain tumors](#) and patients with them have a very poor prognosis. Since the study, six patients remain alive and four have died.

"I am very excited by the results of this study. This procedure is a new option for patients with these large malignant tumors," said Dr. Sloan. "We have seen similar results and overall survival compared to LITT procedures performed in patients with smaller lesions and with lower risk."

"We feel with further studies, LITT will continue to develop into a safer, more user-friendly technique that may help remove more of these deadly tumors than surgery alone can accomplish," said Dr. Sloan.

More information: James Wright et al, Laser interstitial thermal therapy followed by minimal-access transsulcal resection for the treatment of large and difficult to access brain tumors, *Neurosurgical Focus* (2016). [DOI: 10.3171/2016.8.FOCUS16233](https://doi.org/10.3171/2016.8.FOCUS16233)

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