

Early treatment, baseline mental health are predictors of quality of life following radiosurgery for brain metastasis

25 January 2019, by Cindy Starr, Msj



Ronald Warnick, MD, Co-Director of the Gamma Knife Center at The Jewish Hospital - Mercy Health. Credit: The Jewish Hospital - Mercy Health

Clinical researchers who study tumors that have metastasized to the brain have frequently asked, "How long do our patients live?" A newly published study asks a different question: "How well do our patients live?"

A team of neurosurgeons and radiation oncologists posed the question to [patients](#) before and after they underwent [stereotactic radiosurgery](#), including Gamma Knife [radiosurgery](#), for metastatic [brain](#) tumors. The answers, published in the *Journal of Neurosurgery*, included expected results and a surprise.

"Patients treated early with Gamma Knife did better in quality-of-life measurements, and patients who had more metastases fared worse," says Ronald Warnick, MD, a neurosurgeon with Mayfield Brain & Spine, Co-Director of the Gamma Knife Center at The Jewish Hospital – Mercy Health, and a study co-investigator.

"That is not surprising. More unexpected was our finding that patients who suffered from anxiety and depression at the time of their radiosurgery continued to suffer these [mental health issues](#), no matter how successfully their tumors were treated."

The study underscores the need for proactive [treatment](#) of brain metastases as well as mental health issues, Dr. Warnick says. "When a patient is given a diagnosis of lung cancer, for example, we should also screen for brain metastases with an MRI scan. And if brain tumors are detected, we should treat them even as the primary cancer is being evaluated and treated. Because Gamma Knife does not interrupt other treatments, such as chemotherapy, there is no need to wait.

"We also need to realize that addressing anxiety and depression at the time of radiosurgery treatment may help improve our patients' quality of life as they cope with their disease."

During stereotactic radiosurgery, high-energy rays are delivered by a machine to one or more tumors. The radiation beams are precisely aimed, sparing healthy tissue nearby. There is no incision, and patients usually go home the same day.

The *Journal of Neurosurgery* study included 116 patients who were part of a national quality registry for stereotactic radiosurgery. The registry is an initiative of the American Association of Neurological Surgeons and the American Society for Radiation Oncology. The patients were treated at 19 centers, including The Jewish Hospital, the University of Virginia, New York University, Yale University, Vanderbilt University, Duke University, UCLA, and the University of Southern California.

Principal investigator was Jason Sheehan, MD, Ph.D., Professor in the Department of Neurological

Surgery at the University of Virginia.

[10.3171/2018.8.JNS181599](https://www.jco.org/doi/10.3171/2018.8.JNS181599) ,
[thejns.org/view/journals/j-neu ...](https://www.jco.org/doi/10.3171/2018.8.JNS181599)
[2018.8.JNS181599.xml](https://www.jco.org/doi/10.3171/2018.8.JNS181599)

"Survival is frequently used as the primary endpoint in brain metastasis studies," the authors write.

"Nevertheless, there has been increasing interest in QOL [quality of life] as an indicator of outcome in studies of advanced cancer patients."

Provided by Mayfield Clinic

Patients were asked five quality-of-life questions prior to treatment with radiosurgery and at least once following radiosurgery. The clinicians also collected information about several variables, including treatment parameters, the number of metastatic tumors, and the tumors' total volume.

The researchers found that stability or even improvement in quality-of-life scores was associated with earlier radiosurgery treatment following the diagnosis of brain metastasis, while worsening scores were associated with an increased number of metastases.

A secondary finding was that male patients expressed higher levels of pain and discomfort than female patients, both before and after their radiosurgery treatment.

Insights related to depression, anxiety, and men's experience of pain are a reminder that a one-size-fits-all approach to disease does a disservice to individual patients, Dr. Warnick observes.

"Sometimes we forget about conditions that accompany the disease we are trying to treat. In our study we asked only a handful of questions. But the results were very powerful, and they will help guide us in our quest to provide the best, most compassionate care to our patients."

"We are extending life and improving survival with Gamma Knife, but we also want to enhance quality of life. Patients may require other modalities of treatment, such as cognitive behavioral therapy, medical management for mental health, and support groups, and Gamma Knife centers can provide the appropriate resources and support."

More information: Quality of life outcomes for brain metastasis patients treated with stereotactic radiosurgery: pre-procedural predictive factors from a prospective national registry, [DOI:](#)

APA citation: Early treatment, baseline mental health are predictors of quality of life following radiosurgery for brain metastasis (2019, January 25) retrieved 11 October 2022 from <https://medicalxpress.com/news/2019-01-early-treatment-baseline-mental-health.html>

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