# Comparative Effectiveness of Stereotactic Radiosurgery (SRS) versus Whole Brain Radiation Therapy (WBRT) for Patients with Brain Metastases from Non-Small Cell Lung Cancer (NSCLC)

The following reports were chosen because of their relevance to patients during and after cancer treatment. These presentations were made at the 55th annual meeting of the American Society for Radiation Oncology (ASTRO) in Atlanta Georgia.

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Brain metastases are the most common tumor type that occurs in the brain and affect 10-30% of adults with cancer. They are most commonly seen in patients with lung cancer, melanoma, kidney cancer, colorectal cancer and breast cancer. With advances in imaging allowing for detection of smaller brain metastasis and improvements in systemic therapy that improve control of disease outside of the brain, the incidence of brain metastases appears to be increasing.

In patients with a limited number of brain metastases, the options for treatment include surgical removal and or radiation therapy. Radiation therapy can be delivered as either focused radiation to the metastases alone, called Stereotactic Radiosurgery (SRS), or radiation to the entire brain (WBRT). SRS is a one-day treatment and can decrease the risk of developing neurocognitive side effects (e.g. memory loss) compared to WBRT. However, WBRT is less expensive and treats microscopic disease that may not be visible on imaging, which can decrease the risk of developing subsequent brain metastases. Which treatment is recommended often depends on a multitude of factors including the life expectancy of the patient, the number of metastases in the brain, the size of those metastases, as well as the amount of disease outside the brain. The optimal treatment strategy for patients with newly diagnosed brain metastases remains controversial.

The current study was a national, multi-center retrospective study using data from the National Comprehensive Cancer Network (NCCN) Non-Small Cell Lung Cancer (NSCLC) Outcomes Database. It was designed to compare survival of patients treated with SRS versus WBRT as the initial treatment for brain metastases.

The study looked at 413 patients with brain metastases from NSCLC who received radiation therapy within 60 days of diagnosis. They excluded patients who underwent surgical resection. Among these patients, 29% received SRS and 71% received WBRT. The patients who had fewer brain metastases (1-3 versus ≥ 4), smaller size of the largest brain metastasis, and fewer sites of disease outside of the brain (0,1 versus ≥2) were more likely to get SRS. Additionally, a major factor in whether a patient received WBRT or SRS was also the institution at which they were treated.

Due to the differences seen between the two groups, it is apparent that the group that received WBRT was more likely to have more extensive disease than the group who received SRS. To allow for a better comparison between the two treatment groups, the authors looked at a specific group of 197 patients who would be considered candidates for either treatment (< 4 brain metastases & < 4 cm in size). Of this group, the median survival was 9 months in the patients who received SRS (48%) versus 3.9 months in the patients who received WBRT (52%). Despite using only a select group of patients, this large difference in survival is likely due to differences in the patients, as mentioned above. To help balance this out, the authors used a variety of statistical techniques and continued to see a survival benefit in the patients treated with SRS. In addition to seeing a survival benefit in patients treated with SRS, they also found a survival benefit in patients with fewer brain metastases (1 versus 2-3) and less disease outside the brain.

This study showed that NSCLC patients with 1-3 brain metastases had better overall survival when treated with SRS as compared to WBRT. However, as previously mentioned, this study relied on historical data and has limitations in the

 

conclusions of the study because of this. They did use statistical techniques to attempt to eliminate the difference between the two groups; however, a large randomized trial comparing these two treatment options is needed to verify the results seen in this study.