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2. SRT for metastatic brain tumors －optimal number of fraction and dose.

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| **Early effect of stereotactic radiotherapy for large metastatic brain tumors –Comparison between the gamma knife and Novalis STx linear accelerator**  Please enter your Abstract Title in the 1st column.  Type the title **in bold in 11-Point**. |
| Takashi Shuto1), Shigeo Matsunaga2)  Please enter Name of Author(s) in the 2nd column. |
| 1) Department of Neurosurgery, Yokohama Rosai Hospital  2) Stereotactic Radiotherapy Center, Yokohama Rosai Hospital  Please enter Affiliation(s) of Author(s) in the 3rd column. |
| **Introduction** For large metastatic brain tumors (>8 cc), we mainly use 40 Gy/10-fraction stereotactic radiotherapy (SRT) using Novalis STx linear accelerator (Novalis STx) to reduce the risk of radiation damage. For patients in poor condition, we often use 35Gy/5 fraction SRT using gamma knife (GK) to shorten the treatment period. We examined the change in tumor volume at the end of irradiation as an early treatment effect and differences between GK and Novalis STx techniques.  **Methods** The Novalis group consisted of 51 patients (20 men and 31 women) with 58 lesions; their tumor volume was calculated at the beginning and end of 10 SRT sessions. Primary cancer was located in the lung in 21 patients, the breast in 13, and other locations in 17. Tumor volume of 25 lesions was calculated after administration of five fractions. In addition, 10 lesions treated with GK using 35Gy/5 fractions were examined, and the tumor volume was calculated at the beginning and end of irradiation. Treatment using Novalis STx used a dynamic conformal arc with an intensity-modulated radiation therapy beam; therefore, the dose distribution was homogenous, in contrast to the dose distribution with GK.  **Results** The average interval between pretreatment MRI and the end of irradiation was 17 days. The median pretreatment volume of the 58 lesions treated using Novalis STx was 11.6 cc, and 9.5 cc at the end of 10 fractions of SRT (*p* < 0.0001). However, the difference in tumor volume between pretreatment and midpoint (five fractions) was not significant. The median pretreatment volume of 10 lesions treated using GK was 11.9 cc, and 11.0 cc at the end of five fractions of SRT (*p* < 0.04).  **Conclusions** Ten fractions of SRT using Novalis STx for large metastatic brain tumor, significantly decreased the tumor volume at the end of irradiation, but the change was not significant after the 5th irradiation. Conversely, five fractions of SRT using GK significantly decreased the tumor volume at the end of irradiation. We recommend re-imaging and consideration of re-planning at the midpoint (five fractions) in 10 fractions of SRT using GK. |

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