Cystic brain metastases treatment

When the size of the tumor interferes with radiosurgery, stereotactic aspiration of the metastasis should be considered to reduce the target volume as well as decrease the chance of radiation-induced necrosis and provide symptomatic relief from the mass effect. The combined use of stereotactic aspiration and radiosurgery has strong implications for improving patient outcomes ¹⁾.

Ommaya reservoir implantation during stereotactic cyst aspiration is necessary to prevent fluid reaccumulation, thereby avoiding the need for a second surgical procedure $^{2)}$.

Flickinger ³⁾ reported that tumors with a cystic component greater than 10 mL did not appear to be effectively controlled by radiosurgery alone. Therefore, it is essential to decrease the volume of the cystic components before treating them with radiosurgery. The combination of cyst aspiration and radiosurgery is one possible method ^{4) 5) 6) 7)} that may be more effective and safer than radiosurgery alone.

Tumor cyst aspiration followed by Gamma Knife radiosurgery (GKRS) for large cystic brain metastases is a reasonable and effective management strategy. However, even with aspiration, the target lesion tends to exceed the dimensions of an ideal target for stereotactic radiosurgery. In this case, the local tumor control rate and the risk of complication might be a critical challenge.

A study aimed to investigate whether fractionated GKRS (f-GKRS) could solve these problems. Between May 2018 and April 2021, eight consecutive patients with nine lesions were treated with f-GKRS in five or ten sessions after cyst aspiration. The aspiration was repeated as needed throughout the treatment course to maintain the cyst size and shape. The patient characteristics, radiologic tumor response, and clinical course were reviewed using medical records. The mean follow-up duration was 10.2 (2-28) months. The mean pre-GKRS volume and maximum diameter were 16.7 (5-55.8) mL and 39.0 (31-79) mm, respectively. The mean tumor volume reduction achieved by aspiration was 55.4%. The tumor volume decreased for all lesions, and symptoms were alleviated in all patients. The median overall survival was 10.0 months, and the estimated 1-year survival rate was 41.7% (95% CI: 10.9-70.8%). The local tumor control rate was 100%. No irradiation-related adverse events were observed. f-GKRS for aspirated cystic brain metastases ⁸.

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2)

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