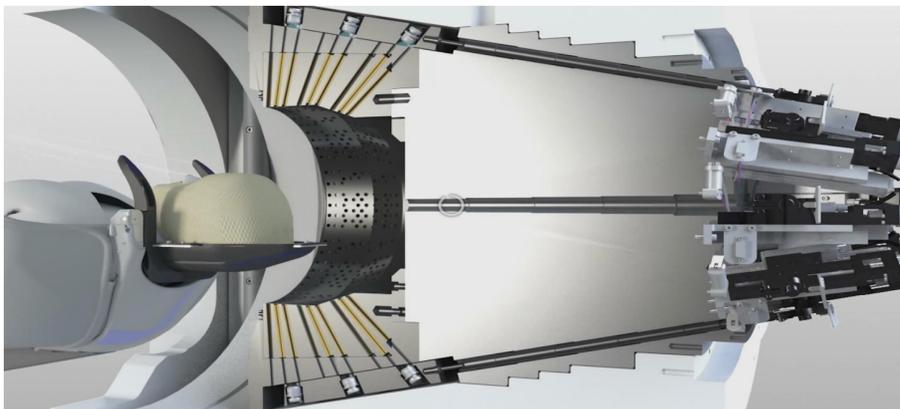


Normal brain tissue sparing in patients with multiple metastatic lesions treated with Gamma Knife radiosurgery

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PURPOSE/ OBJECTIVES

- Traditionally, patients with metastatic brain lesions have been treated using whole brain radiotherapy (WBRT). More recently, studies have suggested that treatment with stereotactic radiosurgery (SRS) alone may result in preservation of neuro-cognition, with no change in overall survival. The total volume of brain treated may be directly linked to neurocognitive decline, therefore SRS may help preserve patient quality of life by sparing as much normal tissue as possible.

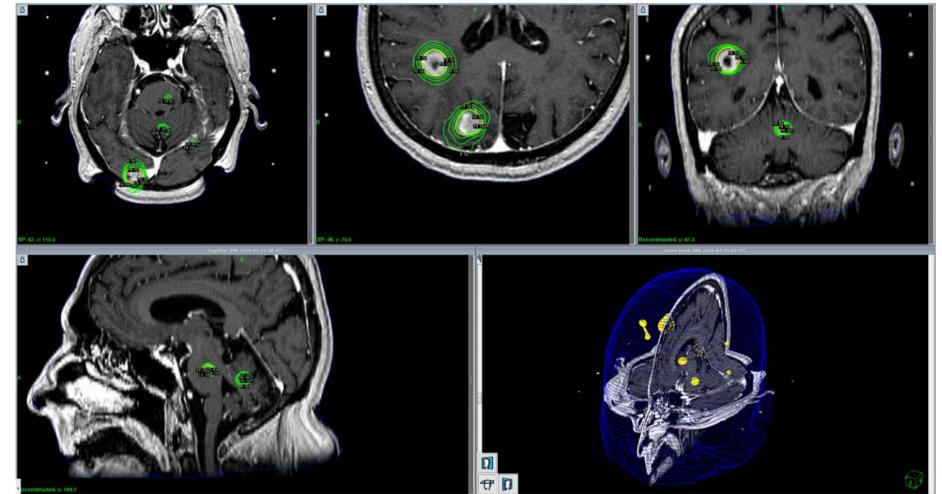


- The purpose of the study is to re-evaluate the appropriate number of brain lesions (from one to twenty nine as opposed to the traditional maximum of four) for which SRS may be useful in terms of sparing normal brain tissue, and therefore potentially improving patient quality of life.

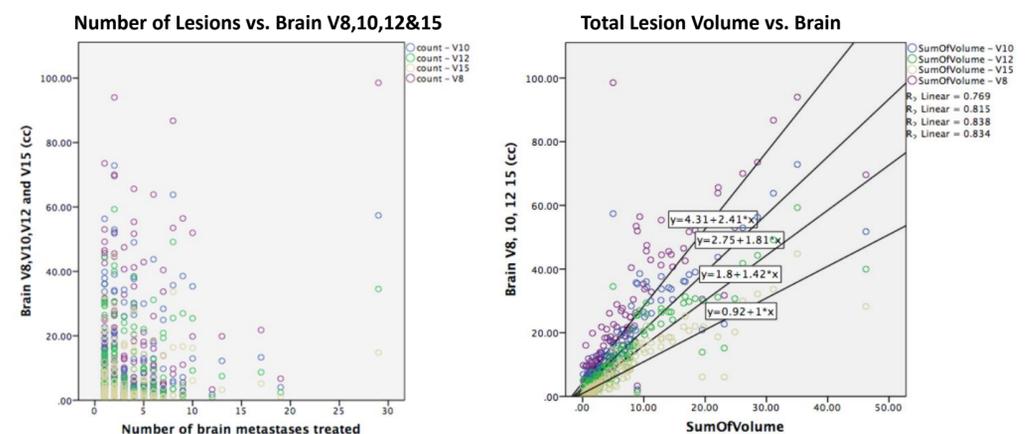
METHODS

- Approximately 500 patients with brain metastases (of any primary) treated with gamma knife radiosurgery at a single institution were identified using a database search.
- Using the patient's pre-gamma knife MRIs, brain tissue was segmented using Eclipse software and then exported into the Gamma Knife planning system.
- The following data points were recorded: total brain volume, number of lesions treated, and volume of brain receiving 8 Gy (V8), V10, V12, and V15.

RESULTS



- The V 8,10,12& 15 of brain treated did not correlate with number of lesions treated.
- The volume of brain treated did correspond, however, with the total volume of the brain metastases.



CONCLUSIONS

- The number of metastatic brain lesions does not correlate with total brain volume treated when using stereotactic radiosurgery (SRS).
- A significant amount of normal brain tissue may be spared by treating these patients with SRS as opposed to WBRT.
- SRS should not be discarded as an option in patients with multiple brain lesions as an alternative to WBRT, based on lesion count alone. Total tumor volume is the best predictor of the volume of brain receiving significant dose.