

Radiographic Response in Metastatic Brain Lesions Treated with Stereotactic Radiosurgery

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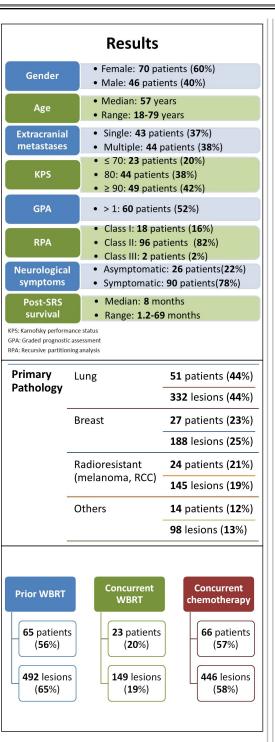


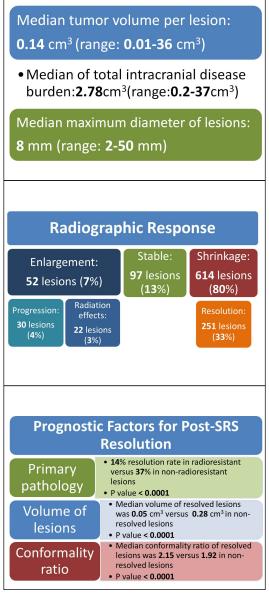
Introduction

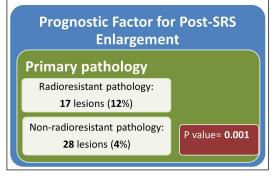
- Stereotactic radiosurgery (SRS) is one of the mainstays of treatment for patients with brain metastases (BM)
- Radiographic response to SRS has been reported to be between 85-95% based upon measurement of maximum tumor diameter, but studies evaluating treated lesions with use of precise volumetric measurements are lacking
- In this study, volumetric measurements were used to evaluate the radiographic response of BMs after SRS and associated prognostic factors

Methods

- 116 patients with multiple BMs (763 BMs total) who had been treated between 1999 and 2010 with SRS at the Cleveland Clinic were evaluated
- Volumetric measurements were made on day of treatment and first follow-up MRIs with use of BrainLAB iPlan software (in case of enlargement more follow up imaging were evaluated)
- Volume changes were measured.
 Greater than 20% volume increase was used as the threshold for tumor enlargement; more than 20% reduction in tumor size was used as tumor shrinkage threshold
- The effects of different prognostic factors on radiographic response were statistically evaluated
- This study has been approved by the Cleveland Clinic IRB







Conclusions

- SRS is a very effective method of local control of brain metastases in patients
- When measured volumetrically, BMs treated with SRS had a favorable response rate (shrinkage + stable) of 93% on initial post-SRS MRI scan
- Only 4% of the enlarged lesions had true progression and the other 3% eventually were diagnosed as changes related to the radiation effects
- Primary tumor pathology was the only important factor in radiographic response of BM to SRS. As radioresistant pathologies had 12% post-SRS enlargement compared with 5% in other tumors (p value = 0.001)
- No impacts of concurrent WBRT or chemotherapy on post-SRS radiographic response were shown by multivariate analysis
- Smaller tumors, non-radioresistant pathology, and those treated with less conformal plans had a statistically greater probability to resolve completely (seen in 33% of all lesion)