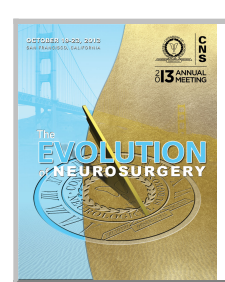


# Fractionated Stereotactic Radiosurgery for Intracranial Metastases: Tumor Control

Joel Sherman Katz DO; Marina Kushnirsky BA; Jonathan P.S. Knisely MD, FRCP; Maged Ghaly MD; Michael Schulder MD

Hofstra North Shore- LIJ School of Medicine  
Hempstead, NY



## Introduction

Fractionated stereotactic radiosurgery (SRS) may confer radiobiologic treatment advantages in the treatment of metastatic brain tumors. Large tumors (over 3 cc in volume) pose a treatment challenge and are less likely to be controlled by SRS. We compared the results of single and fractionated SRS for patients with large metastatic tumors.

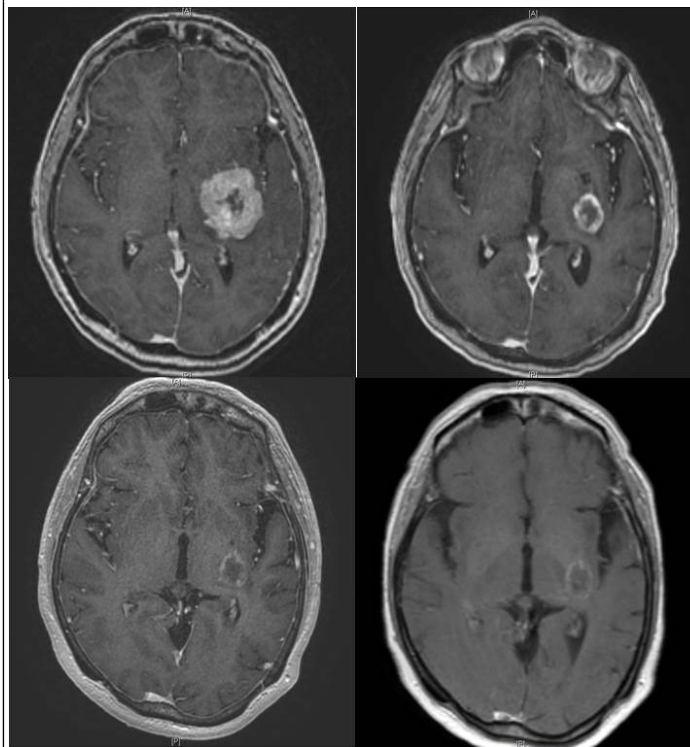
## Methods

We reviewed all patients from our institution who were treated with SRS for intracranial metastases between January 2010 and January 2013. Collected data included diagnosis, tumor location, lesion volume, and SRS dose. Local control (LC) and volume changes after fractionated or single fraction SRS were compared using Wilcoxon rank sum and t-test.

## Results

152 patients with 299 lesions underwent SRS. 213 lesions were available for follow-up with serial MRI from 0.2 –31.8 months ( $8.6 \pm 7.8$  months) after SRS, with overall LC of 74.2%. 62 of these lesions had treatment volumes greater than 3 cc. Of these, 32 lesions underwent single session SRS and 30 were treated in 3 sessions. Median prescription doses for single and fractionated SRS were 20 Gy and 24 Gy, respectively. Tumor progression was observed during follow-up in 6/32 lesions treated with a single session, compared with progression in 1/30 lesion treated with 3 sessions ( $p=0.02$ ). Overall, lesion volume following fractionated SRS decreased by 68.6%, vs. a 61.4% decrease after single session SRS ( $p = 0.001$ ).

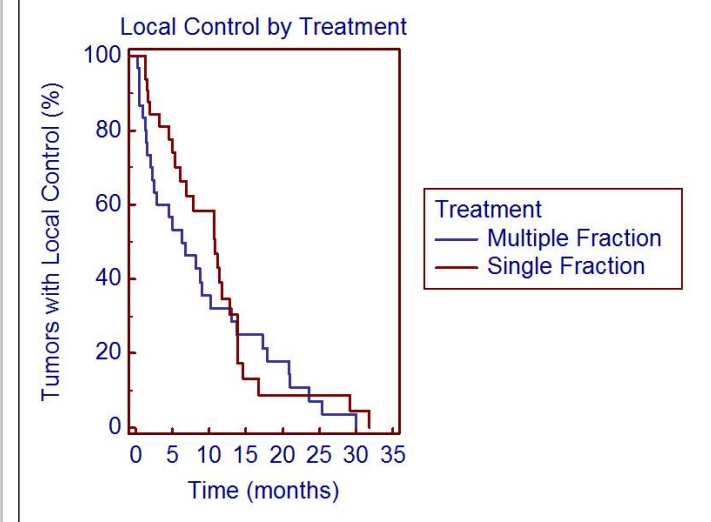
### Case Study: Fractionated SRS for Tumors Greater Than 3cc in Volume



77-year-old right-handed female with history of primary lung cancer, treated with 2400 cGy in 3 fractions. Shown pre-SRS, (upper L), 2 months post SRS (upper R), 9 months post SRS (lower L), and 14 months post SRS (lower R)

### Local Tumor Progression for Single and Multiple Fraction SRS

	Single Fraction	Multiple Fraction	P
Tumor Progression	6/32 (18.6%)	1/30 (3.3%)	0.02
Mean Lesion Volume Decrease	61.4%	68.6%	0.001



## Conclusions

In patients with metastatic tumors greater than 3 cc in volume, fractionated SRS yielded LC better than that obtained with single session SRS. In these patients, the volumetric decrease in tumor size was greater after multiple fraction than single fraction SRS. We recommend consideration of fractionated SRS for patients with metastatic tumors larger than 3 cc.

