STEREOTACTIC RADIOSURGERY FOR METASTATIC BRAIN TUMORS 2016
Statistics

• 20 – 40 % of patients with systemic cancer develop brain metastasis

• Approximately 200,000 new cases are diagnosed each year in the US
Figure 7-36 The metastatic cascade. Sequential steps involved in the hematogenous spread of a tumor.
• Approximately 2/3 of patients have more than one brain metastasis. Rest have single lesions.
• This varies from series to series.
• Brain metastases are the most common intracranial neoplasms in adults
• Incidence has risen in last 30 years due to longer survival resulting from better systemic treatments for the primary neoplasm
• < 1-2 % of prostate and ovarian cancers spread to the brain but at least 50% of melanomas do
Sources

- Lung: 40-60%
- Breast: 15-20%
- Melanoma: 10-20%
- Colorectal: 5-10%
- Renal: 5-10%
Diagnostics

• Gadolinium enhanced MRI is the best diagnostic study
Treatment

• Treatment options:
  – Steroids
  – Surgery
  – Stereotactic Radiosurgery
  – WBRT (whole brain radiation therapy)
  – ? Chemotherapy
Improved survival for patients with brain metastases who are 50 and younger and receive SRS alone

- Source: International Journal of Radiation Oncology * Biology * Physics (Red Journal)
- March 15, 2015
SRS vs. WBRT

- Patients 50 years old and younger who have 1-4 brain metastases:
  
  SRS alone: Median survival of 13.6 months
  
  a 65% improvement as opposed to 8.2 months for patients receiving SRS plus WBRT
Distant Metastases

• Development of distant/new metastatic disease was the same whether or not patients received WBRT
• Pendulum has swung in favor of SRS alone as the standard of care
• ASTRO now states that it may not be necessary to add WBRT to SRS thus improving the patient’s quality of life and memory function
Risks of whole brain radiation therapy outweigh benefits for patients with limited brain metastases

Source: Paul Brown, MD, professor of radiation oncology at MD Anderson, Phase III randomized trial presented at the American Society for Clinical Oncology 2015 Annual Meeting
Cognitive Progression

At three months, CP was more frequent in the WBRT-radiosurgery arm, compared to those who received radiosurgery alone, 92% and 64% respectively. (CP = cognitive progression)
Added benefits

• SRS does not interfere with chemotherapy delivery
• SRS does not require discontinuation of anti coagulants
ADVANTAGES & DISADVANTAGES OF RADIOSURGERY

ADVANTAGES
• No incision
• Treats surgically inaccessible lesions
• More easily tolerated by physiologically compromised patients
• Short hospital stay (usually 1 day)

DISADVANTAGES
• Poor targeting for tumors >3cm in diameter
• Tumor persists on scans, so must be followed to prove success
• No tissue diagnosis
• Persistent edema or radio necrosis may require surgical removal of lesion
• Cannot be used on targets within 5mm of optic nerve or chiasm