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Radioterapia stereotassica esclusiva vs.irradiazione panencefalica più boost simultaneo nelle metastasi cerebrali: valutazione degli outcomes clinici

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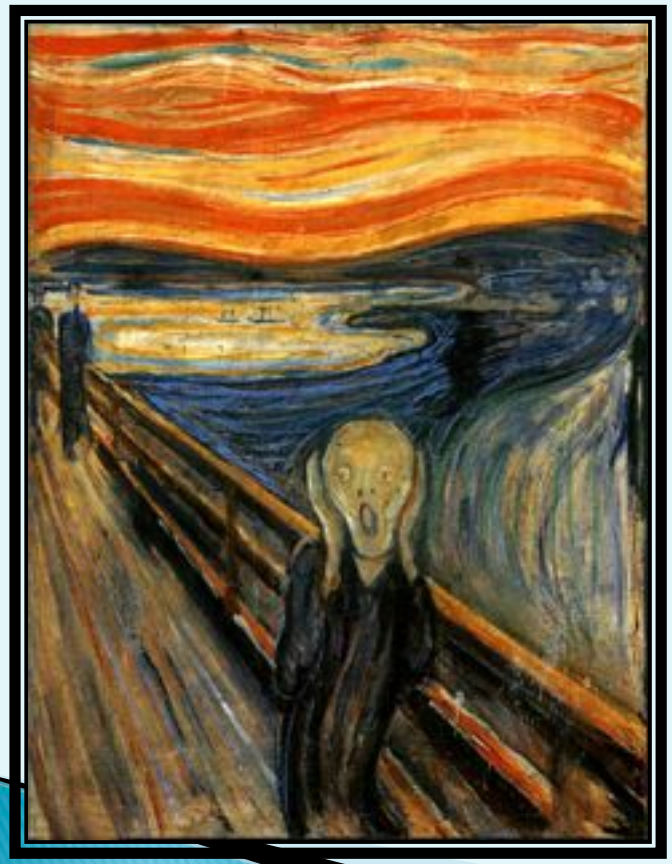
Background

- It is estimated that 20% - 40% of cancer patients will develop brain metastases during the course of their illness
- Historically treatment for patients with brain metastatic disease has been palliative: steroids plus whole brain radiotherapy (WBRT)



Outcome is poor

Median survival following WBRT alone: 3–4 months regardless of primary tumor histology (SCLC excepted)

Background

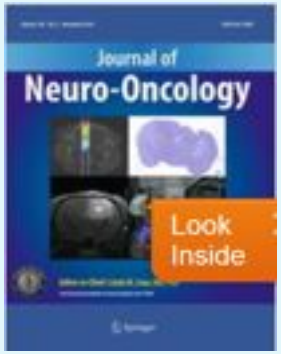
KPS ≥ 70
Oligometastatic brain disease
Controlled extracranial disease

Suitable for more aggressive multimodality therapies

Treatment options:

- Surgical resection
- Radiosurgery (SRS, SRT)

LITERATURE REVIEW



The role of stereotactic radiosurgery in the management of patients with newly diagnosed brain metastases: a systematic review and evidence-based clinical practice guideline

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SRS + WBRT vs WBRT

LEVEL I – SRS + WBRT improved survival for single brain metastases with KPS >70

LEVEL II – SRS + WBRT improved local tumor control and functional status for 1-4 brain metastases, KPS >70

LEVEL III – SRS + WBRT improved survival for 2-3 brain metastases.

SRS +WBRT vs SRS

LEVEL II – SRS alone gives equal survival advantage but decreased risk of distal recurrences with addition of WBRT

SRS vs WBRT

LEVEL III -SRS alone is superior to WBRT alone in patients with 1-3 brain metastases with survival advantage

Methods and Materials

January 2008 – May 2014
- 59 patients
- mean age 62 yr (range 34-82)
- 53% of the patients ≥ 65 yr

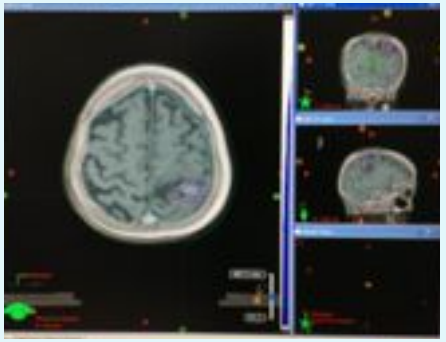
- ✧ Brain MRI consistent with mts
- ✧ Diameter ≤ 3cm
- ✧ No previous cranial RT

Characteristics	SIB (n=16)	SRT alone (n=43)
Age (mean) range	62 (34-71)	(38-82)
< 65	11	17
≥ 65	6	26
Gender		
M	8	25
F	8	18
RPA		
Class 1	4	11
Class 2	12	32
Primary disease		
lung	9	19
GI	2	8
breast	2	4
melanoma	1	3
kidney	1	6
Lesion number		
1	7	31
2	5	10
3	4	2

Treatment preparation

TC 3 mm + MRI coregistrated

GTV contrast-enhancing tumor on T1-weighted MRI



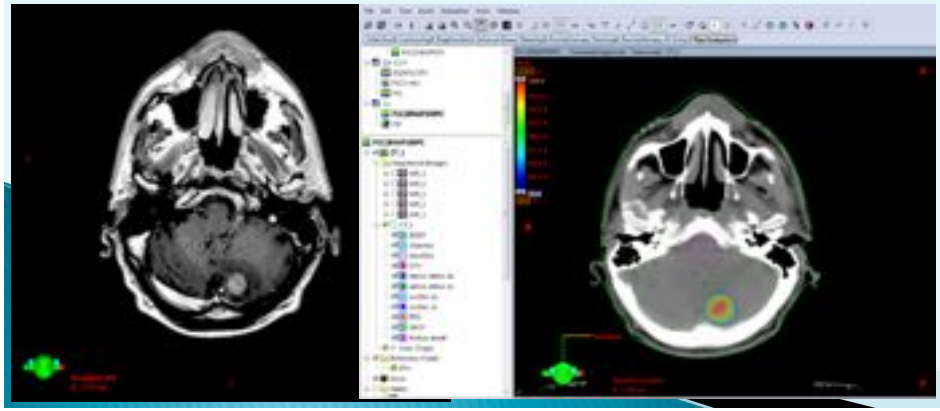
PTV= GTV + 3-5 mm

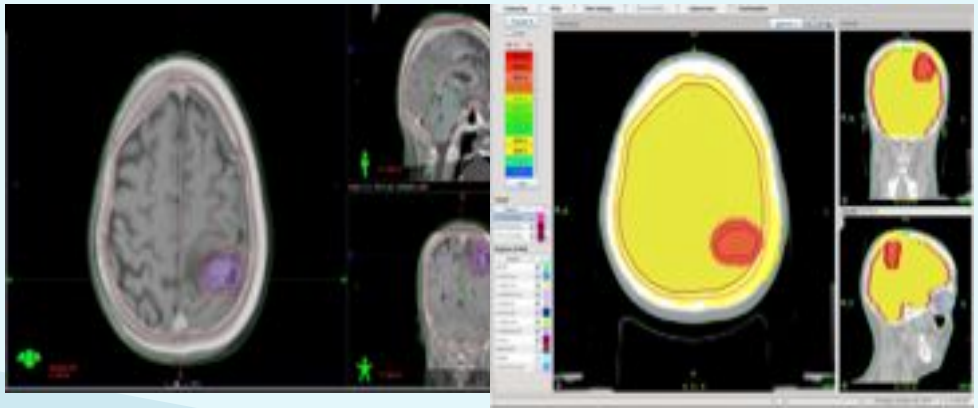
SRT

Total dose 24 Gy prescribed to the 80% isodose, delivered in 3 consecutive fractions

SIB

Total dose 30 Gy to WBRT and 60 Gy to M+ delivered in 10 consecutive fractions





Results

Outcome in All patients

- Median survival time = 10 mo, 1 yr actuarial survival rate of 59%
- 1 yr LC rate = 85%
- Cause of death: extracranial PD 76%, intracranial PD 16%, other 8%
- At univariate analysis the prognostic factors correlated with a good prognosis were:

  Age: <65 yrs vs >65 yrs → 1 yr OS 65% vs 50% (p=0.04)
  Histology of primary site: breast vs others → 1 yr OS 75% vs 35% (p=0.02)
  KPS: < 70 vs > 70 → 30 % vs 70% (p=0.03)

RPA	N. Patients	OS -Median Mths
Class 1	15	14
Class 2	44	7.4

P=0.03

N.Mts	N. Patients	OS -Median Mths
1	38	11
2-3	21	7.1

P=0.04

Results

- 1 yr local control rate:

  SIB - 89%
  SRT – 73%

- Median survival time:

  SIB – 10 months
  SRT – 9 months

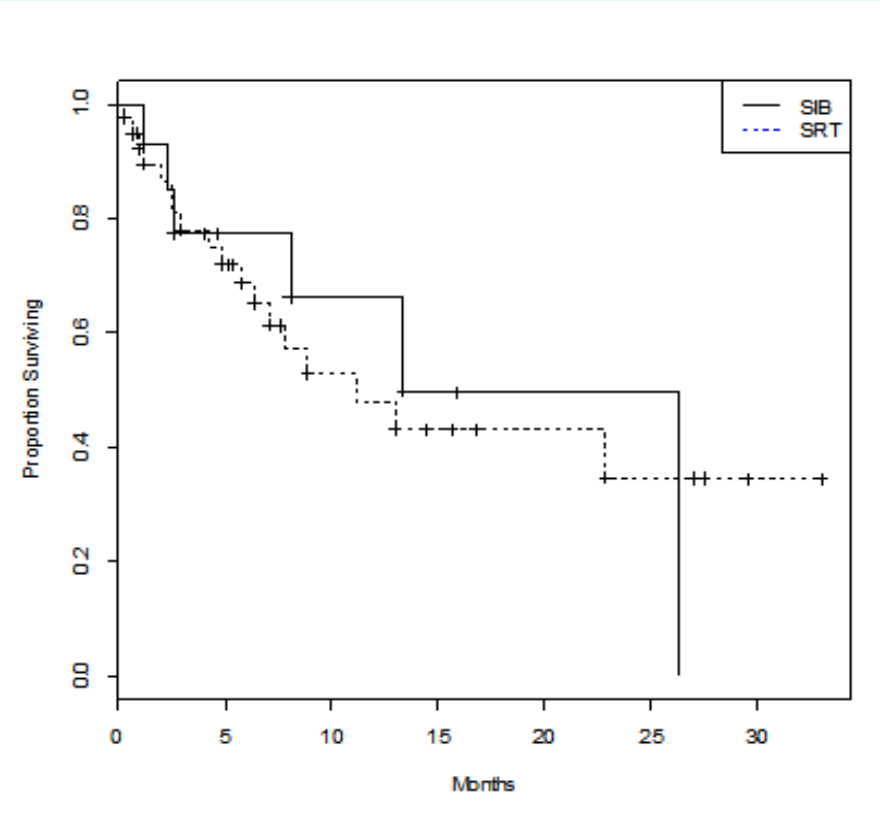
- OS rate at 6 mths and 12 mths:

  SIB – 77%, 68%
  SRT - 70%, 50%

- New brain lesions rate 12 mths:

  SIB – 32%
  SRT – 59%

Outcomes SRT vs SIB



Log-rank p= 0.761

Toxicity

	SIB (n=16)				SRT (n=43)			
	G1	G2	G3	G4	G1	G2	G3	G4
ACUTE	1	1	0	0	2	2	1	0
SEIZURES	0	0	0	0	1	0	1	0
OTHER	1	1	0	0	1	2	0	0
LATE	1	1	1	0	1	0	2	1
RADIATION NECROSIS	1	1	0	0	0	0	1	1
LEUKOENEP HALOPATHY	0	0	1	0	0	0	1	0
OTHER	0	0	0	0	1	0	0	0
Steroid use	7				12			

CTCAE ver. 3.0

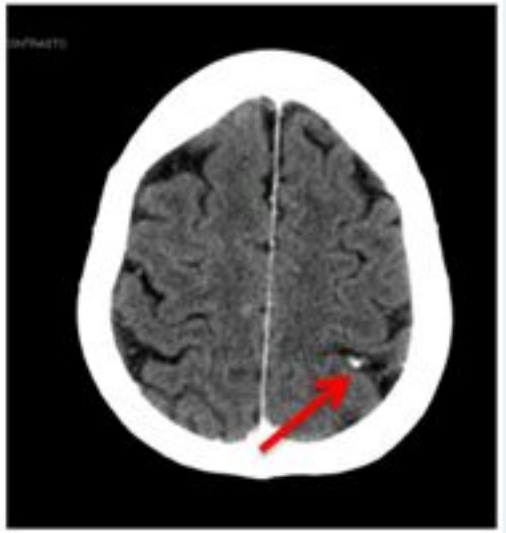
Female 51 aa, NSCLC

4 months after SRT → RC

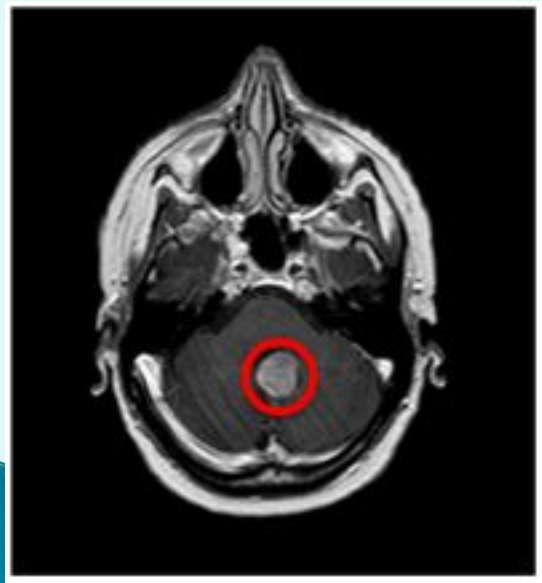
FU 22 months

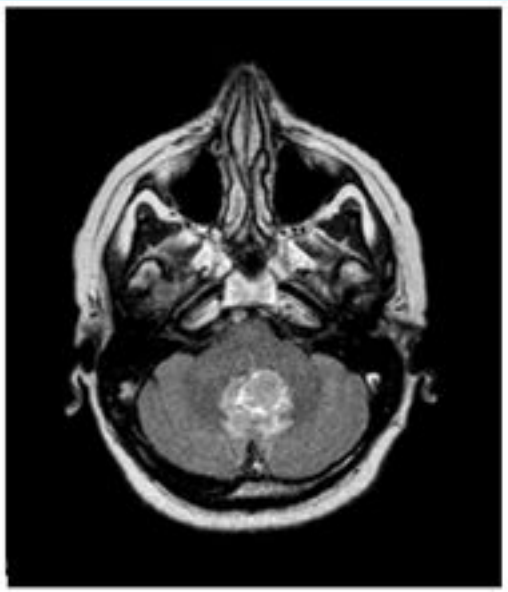
PD liver & lung

Alive



Female 40 aa, Ovarian Cancer

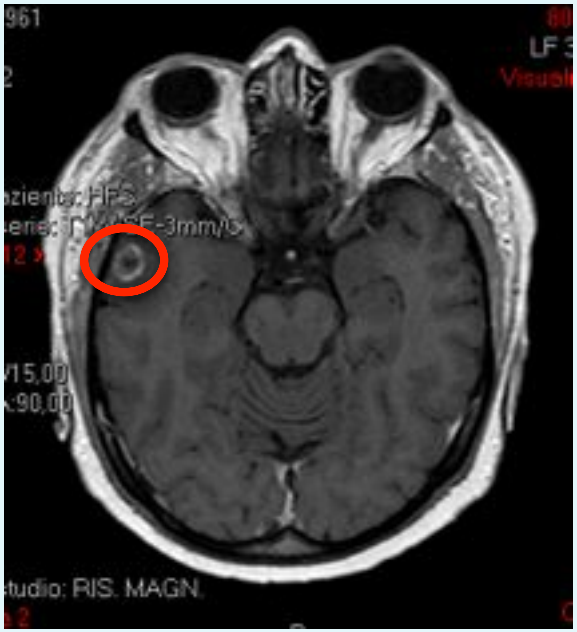


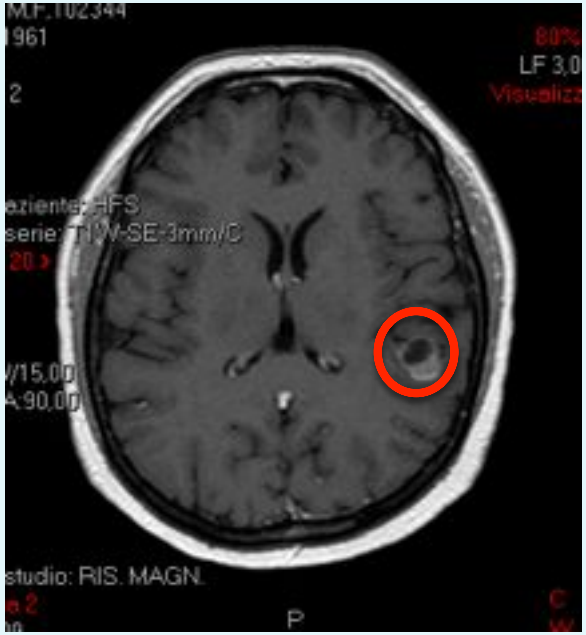


3 months after SRT → RP

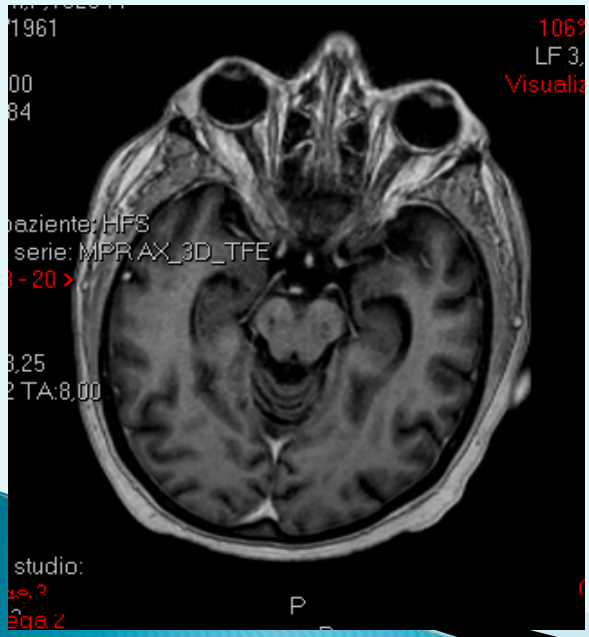
SD up to 14 months

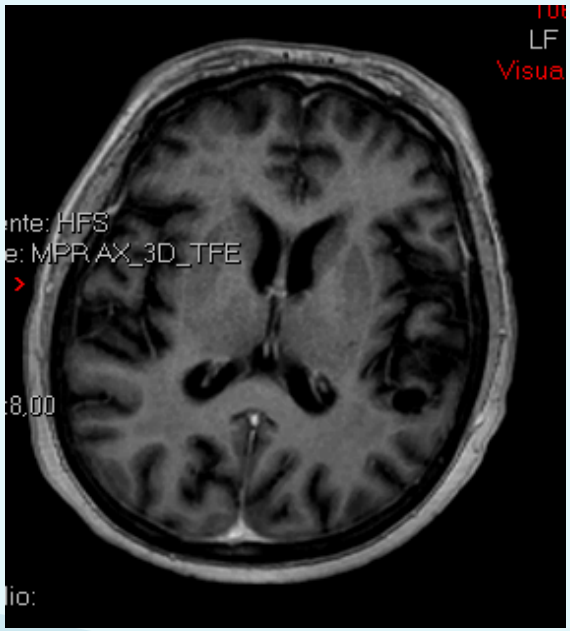
Died of brain PD
After 17 months
from RT





Female 58 aa, Breast Cancer
SIB





RC 4 Mths

Died of systemic disease
after 19 months from RT

Conclusion

- SIB increase the local control
- SIB decrease the new brain metastases rate
- No statistically significant difference in the 1-yr survival rate

Neurocognitive impairments ???


Grazie