ROLE OF PLANNING MRI IN RADIOSURGERY TREATMENT: UNIVERSITY OF FLORENCE PRELIMINARY REPORTS

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S. Cappelli, I. Giacomelli, S. Cassani, G. Zei, I. F. Furfaro, E. M. Pasquetti, L. Di Brina, M. Loi, A. Mancuso, G. Francolini, S. Scoccianti, D. Greto, B. Detti and L. Livi (Firenze).

Background

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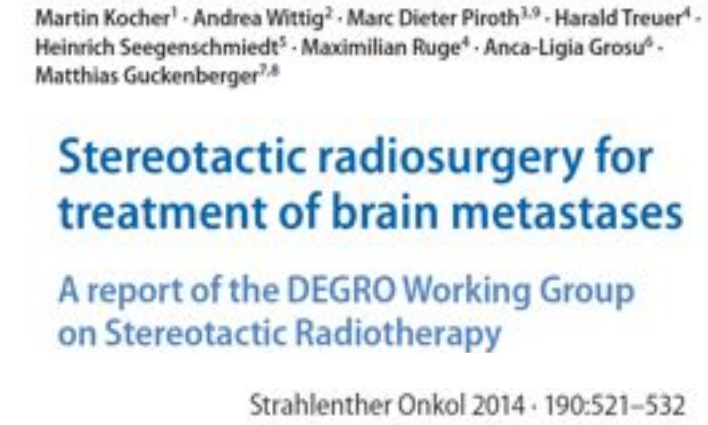
JOURNAL OF CLINICAL ONCOLOGY ASCO SPECIAL ARTICLE

Recommendations on Disease Management for Patients With Advanced Human Epidermal Growth Factor Receptor 2–Positive Breast Cancer and Brain Metastases: American Society of Clinical Oncology Clinical Practice Guideline

Naren Ramakrishna, Sarah Temin, Sanat Chandarlapaty, Jennie R. Crews, Nancy E. Davidson, Francisco J. Esteva, Sharon H. Giordano, Ana M. Gonzalez-Angulo, Jeffrey J. Kirshner, Ian Krop, Jennifer Levinson, Shanu Modi, Debra A. Patt, Edith A. Perez, Jane Perlmutter, Eric P. Winer, and Nancy U. Lin



Martin Kocher[1] · Andrea Wittig[2] · Marc Dieter Piroth[3,9] · Harald Treuer[4] · Heinrich Seegenschmiedt[5] · Maximilian Ruge[4] · Anca-Ligia Grosu[6] · Matthias Guckenberger[7,8]

Stereotactic radiosurgery for treatment of brain metastases

A report of the DEGRO Working Group on Stereotactic Radiotherapy

Strahlenther Onkol 2014 · 190:521–532

clinical practice guidelines

Annals of Oncology 23 (Supplement 7): vii11–vii19, 2012
doi:10.1093/annonc/mds232

Locally recurrent or metastatic breast cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up†

F. Cardoso[1,2], N. Harbeck[3], L. Fallowfield[4], S. Kyriakides[5] & E. Senkus[6], on behalf of the ESMO Guidelines Working Group*

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Practical Radiation Oncology (2012) 2, 210–225

Special Article

Radiotherapeutic and surgical management for newly diagnosed brain metastasis(es): An American Society for Radiation Oncology evidence-based guideline

May N. Tsao MD[a,*], Dirk Rades MD[b], Andrew Wirth MD[c], Simon S. Lo MD[d], Brita L. Danielson MD[e], Laurie E. Gaspar MD, MBA[f], Paul W. Sperduto MD, MPP[g], Michael A. Vogelbaum MD, PhD[h], Jeffrey D. Radawski MD[i], Jian Z. Wang PhD[e], Michael T. Gillin PhD[j], Najeeb Mohideen MD[k], Carol A. Hahn MD[l], Eric L. Chang MD[m]

Methods and Materials

Starting from October 2012 to February 2014, we treated with Gamma Knife radiosurgery (GKRS) 62 patients with brain metastases

On the diagnostic MRI, all the patients had a number of lesions ≤4.

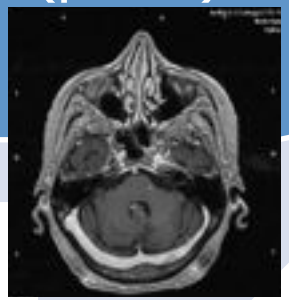
Median interval between dMRI and pMRI **11 days** [range 5-20 days]

Methods and Materials

Diagnostic MRI (dMRI)

INDICATION TO GKRS TREATMENT

Planning MRI (pMRI)

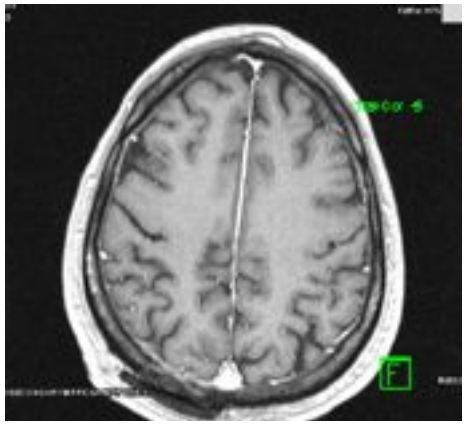


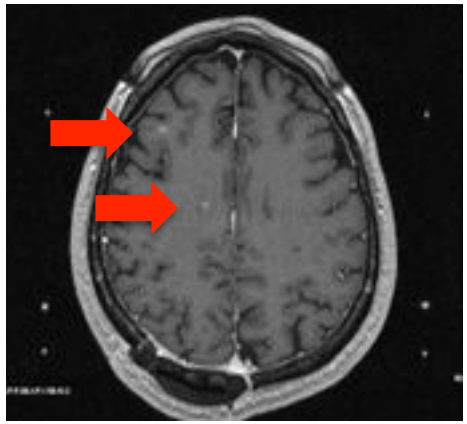
GKRS

-Post-contrast study with **T1-weighted,3DMPRAGE** sequence
-Slice thickness: **1 mm**
-GBCA: gadobenatedimeglumine
-Double dose contrast in selected cases

Methods and Materials

Diagnostic MRI





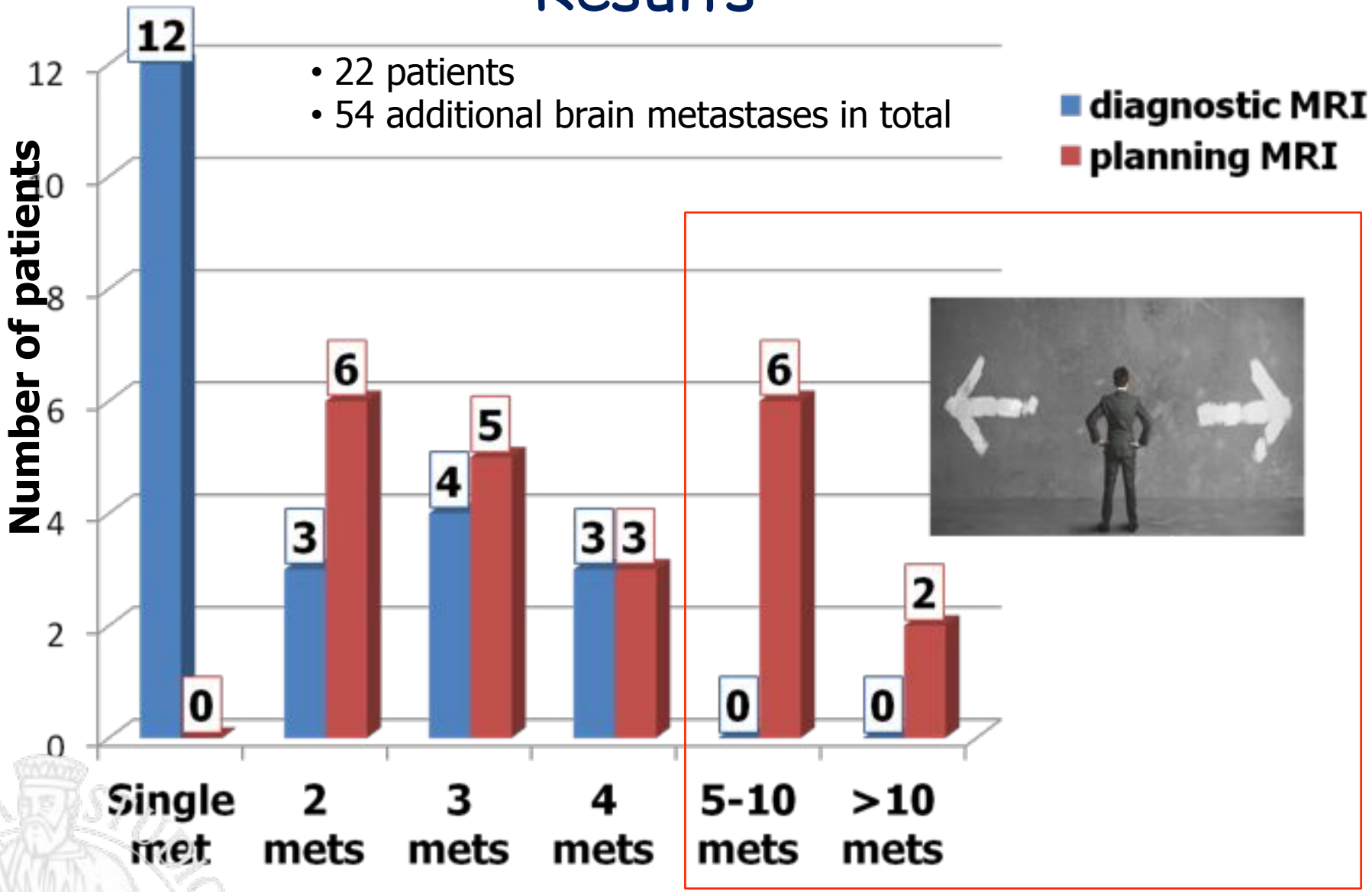
Planning MRI

- **22 out of 62 (35.5%) patients had an increased number of lesions in the planning MRI**

NSCLC	13
Breast	5
Kidney	2
Melanoma	1
Thyroid	1
RPA :	
Class 1	16
Class 2	8

Results

- 22 patients
- 54 additional brain metastases in total



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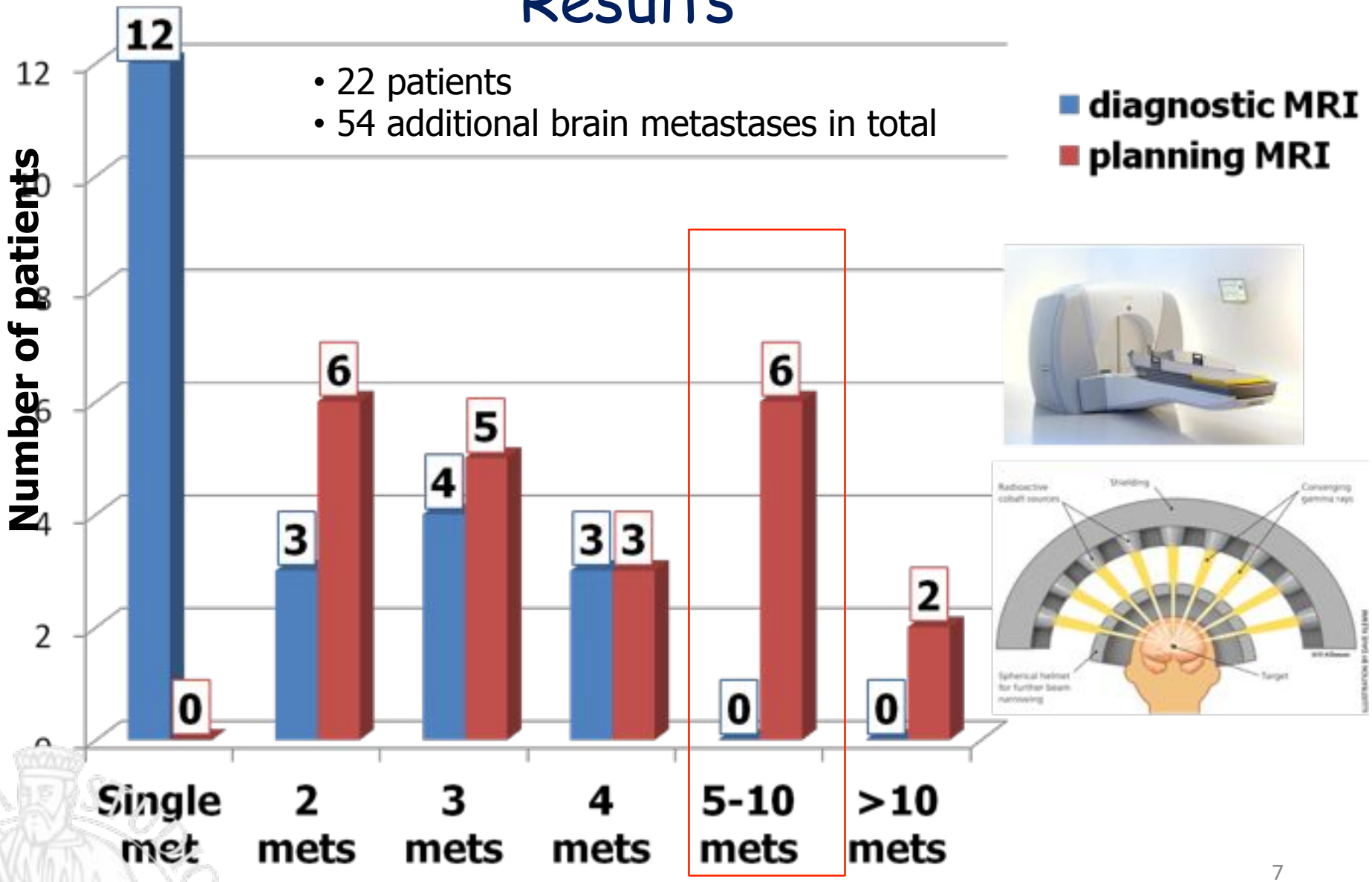


Lancet Oncol. 2014 Apr;15(4):387-95

Stereotactic radiosurgery for patients with multiple brain metastases (JLGK0901): a multi-institutional prospective observational study

Masaaki Yamamoto*, Toru Serizawa*, Takashi Shuto, Atsuya Akabane, Yoshinori Higuchi, Jun Kawagishi, Kazuhiro Yamanaka, Yasunori Sato, Hidefumi Jokura, Shoji Yomo, Osamu Nagano, Hiroyuki Kenai, Akihito Moriki, Satoshi Suzuki, Yoshihisa Kida, Yoshiyasu Iwai, Motohiro Hayashi, Hiroaki Onishi, Masazumi Gondo, Mitsuya Sato, Tomohide Akimitsu, Kenji Kubo, Yasuhiro Kikuchi, Toru Shibasaki, Tomoaki Goto, Masami Takanashi, Yoshimasa Mori, Kintomo Takakura, Naokatsu Saeki, Etsuo Kunieda, Hidefumi Aoyama, Soketaka Momoshima, Kazuhiro Tsuchiya

RS without WBRT as the initial treatment for 1194 pts with brain metastases (1-10)

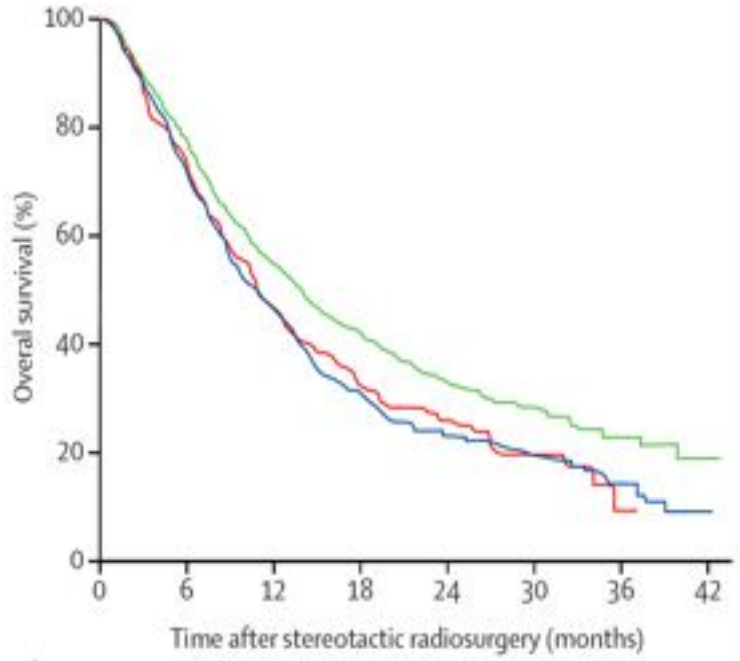
- ten or fewer lesions
- largest lesion < 10 mL

and <3.0 cm in longest diameter

-cumulative volume of all mets<15.0 mL

-no leptomeningeal dissemination

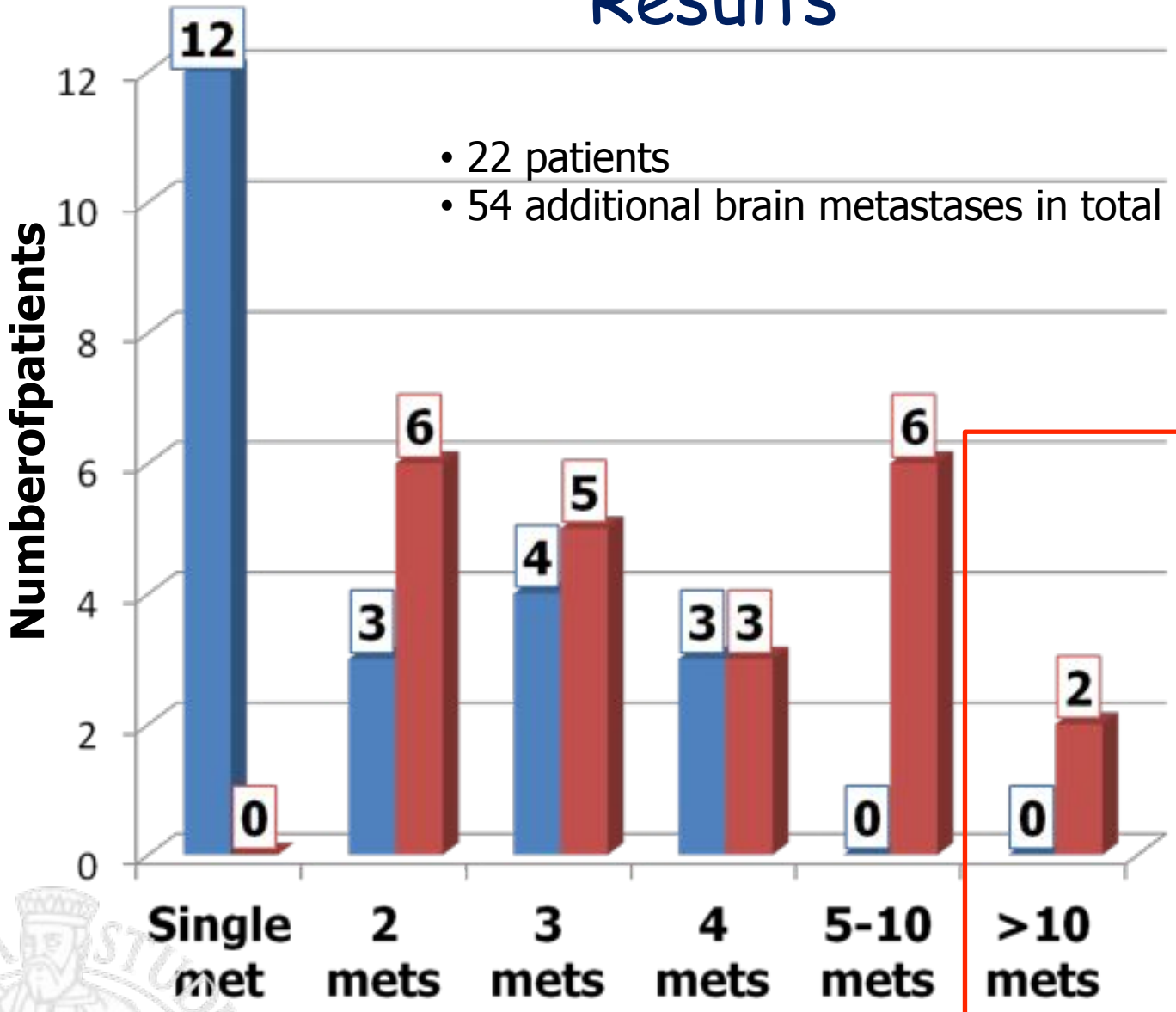
Group	Median overall survival, months (95% CI)	HR (95% CI)	p value
1 tumour	13·9 (12·0–15·6)	0·76 (0·66–0·88)	0·0004
2–4 tumours	10·8 (9·4–12·4)	Reference	
5–10 tumours	10·8 (9·1–12·7)	0·97 (0·81–1·18)	0·78

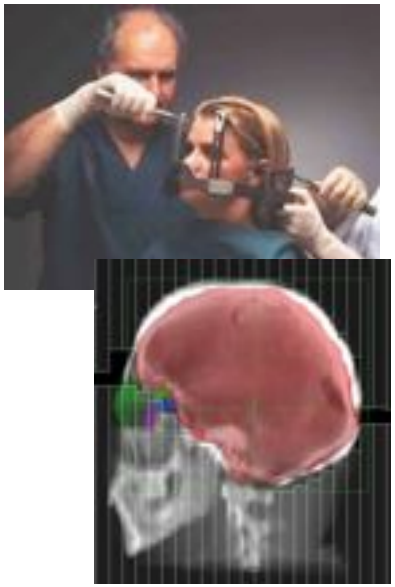


Number at risk				
1 tumour	455	234	97	22
2–4 tumours	531	215	61	16
5–10 tumours	208	84	31	1

Results

- 22 patients
- 54 additional brain metastases in total

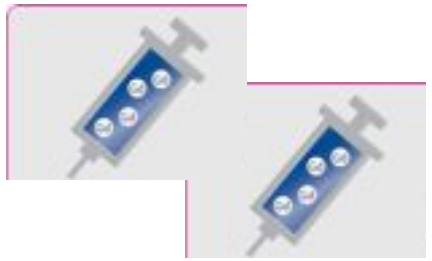




Conclusions

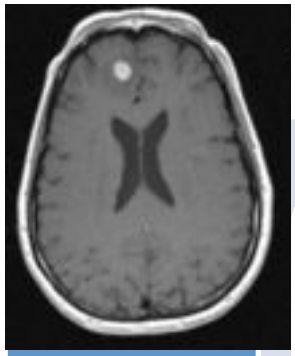
Thin slices
3D GE T1-weighted post-contrast imaging

GBCA	High relaxivity
	Double dose
	Delayed acquisition



Higher field strenght if available

Conclusions



Diagnostic MRI

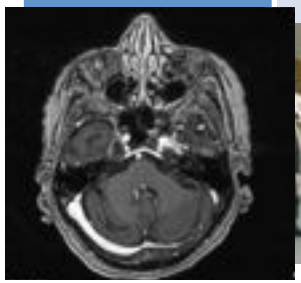
INDICATION TO GKRS TREATMENT

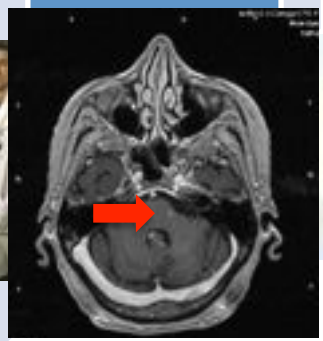
High resolution Pretreatment MRI

CONFIRMATION OF INDICATION TO GKRS TREATMENT

High resolution Planning MRI

GKRS





Diagnosis

Proper selection of patients

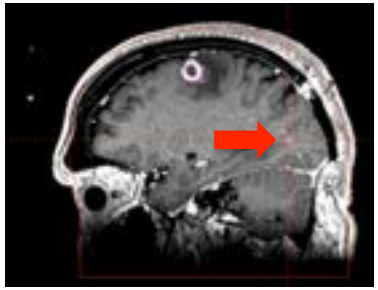
Planning

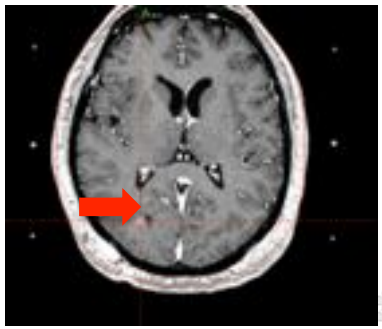
Take-home message

A double-contrast study with T1-weighted, volumetric MPRAGE sequence may offer better staging for patients with brain metastases

Neuroradiological protocols for pretreatment MRI

Wherever the numeric cutoff for radiosurgery will be placed, **precise intracranial staging** will be crucial because the success of radiosurgery depends on appropriate identification of each single brain metastases





Definition of pts candidable to radiosurgery

Grazie per l'attenzione