

Interventionen von Metastasen des Mammakarzinoms

K. Wilhelm



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Direktor: Univ.-Prof.Dr.H.H.Schild

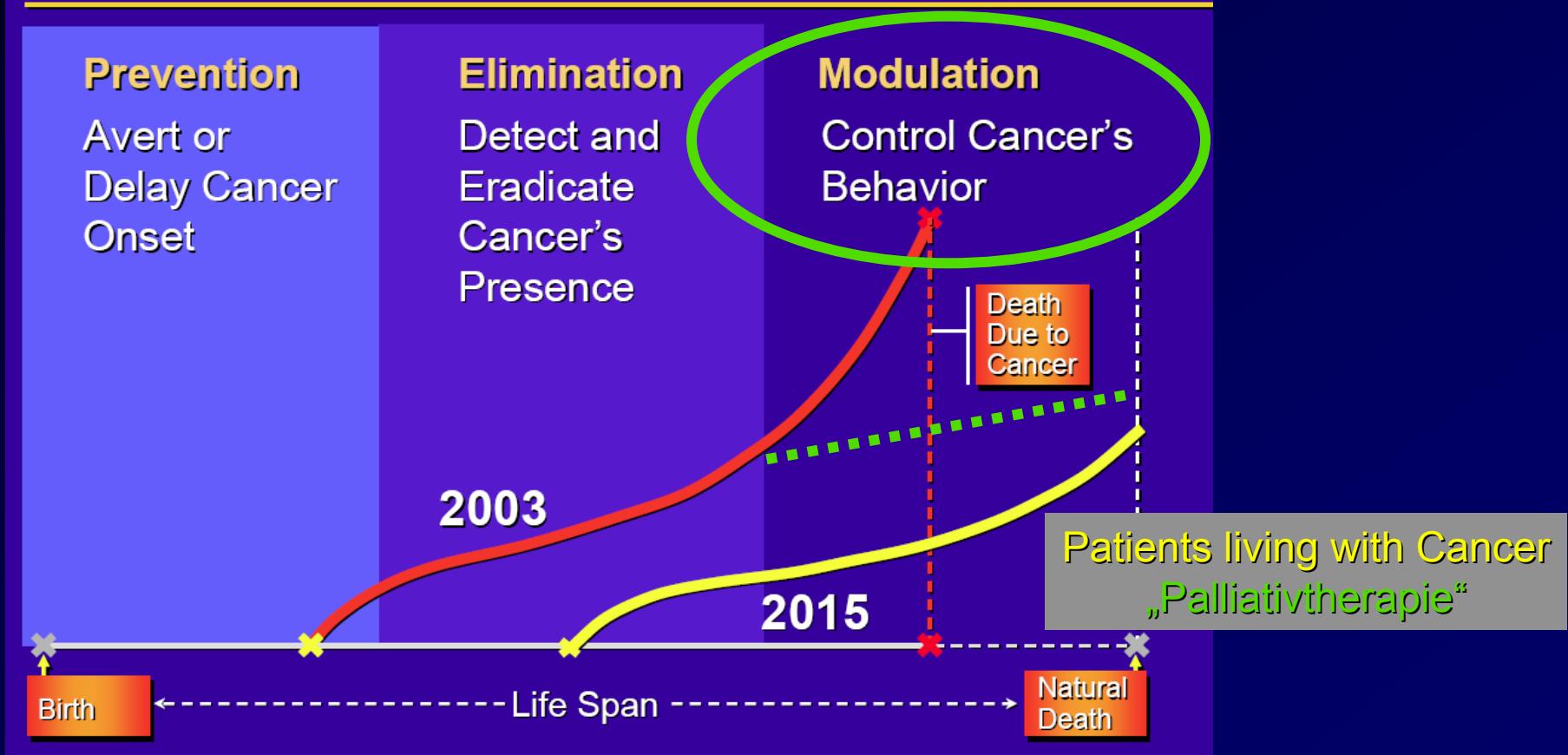


Interventionen von Metastasen des Mammakarzinoms

NATIONAL
CANCER
INSTITUTE

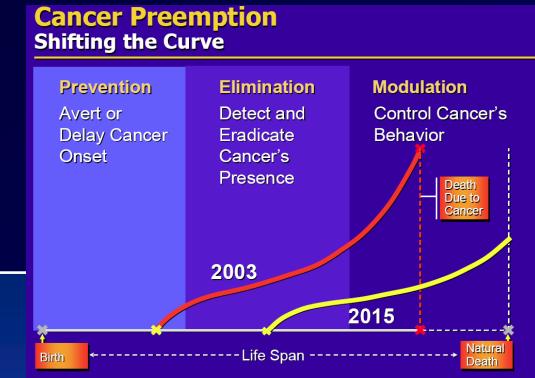
21st Century Challenge of Eliminating
the Suffering and Death Due to
Cancer: The Role of Science and
Technology

Cancer Preemption Shifting the Curve





Interventionen von Metastasen des Mammakarzinoms



Hepatisch metastasiertes Mamma Ca

RFA

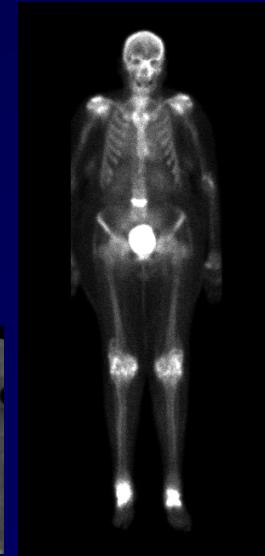
Transarterielle Chemoembolisation

SIRT - Selektive Interne Radio-Therapie

Ossär metastasiertes Mamma Ca

Vertebroplastie Zementoplastie

High-Intensity Focused Ultrasound



Patients living with Cancer
„Palliativtherapie“



Interventionen von Metastasen des Mammakarzinoms

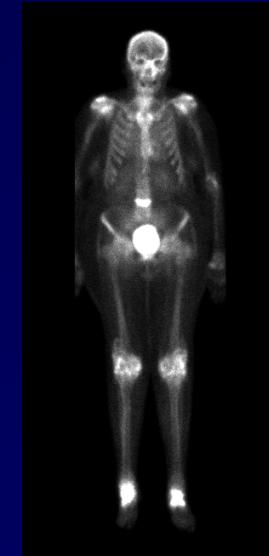
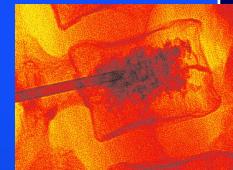
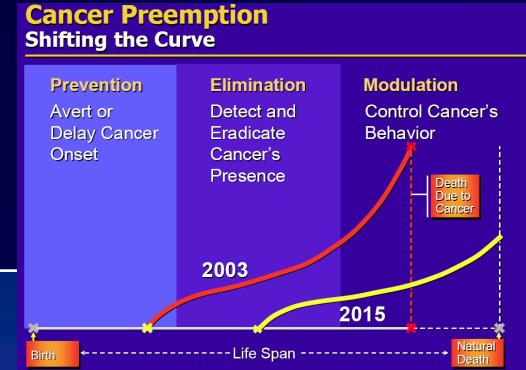
Zahl von Patienten mit Knochenmetastasen steigt, da verbesserte Therapie der Primärtumore mit längerem Überleben

70 % der Pat zum Todeszeitpunkt Skelettmetastasen
36 % Wirbelkörpermetastasen

Ossär metastasiertes Mamma Ca

Vertebroplastie Zementoplastie

High-Intensity Focused Ultrasound



Patients living with Cancer
„Palliativtherapie“

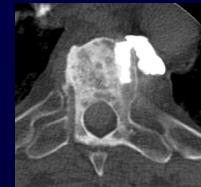


Indikation: Vertebroplastie



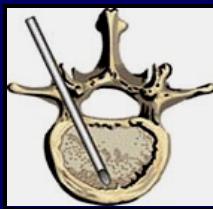
Radiologe 2003 · 43:703–708
DOI 10.1007/s00117-003-0942-3
Online publiziert: 29. August 2003
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Leitlinien der Deutschen Röntgengesellschaft zur Vertebroplastie



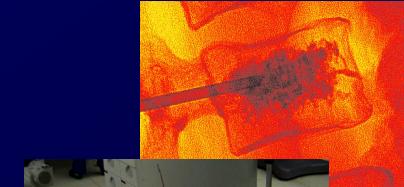
- Schmerzhafte nicht-/ osteoporotische Fraktur
 - konservativer Therapieversuch nicht ausreichend (3-6 Wochen)
 - keine Indikation zur OP
- Schmerzhafte Osteolyse (maligner /benigner Tu)
 - Metastasen, multiples Myelom, Hämangiome
- Adjuvante peri-/ intraoperative Stabilisierung

Abhängig von der klin. Situation kann hiervon abgewichen werden

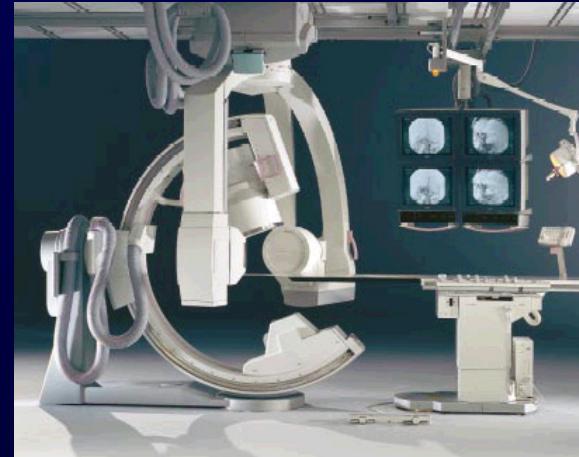
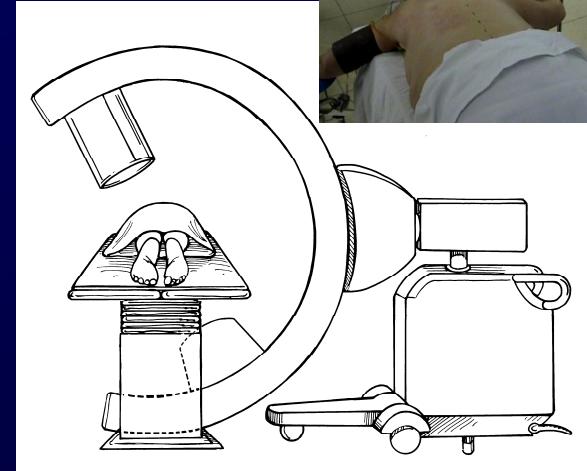


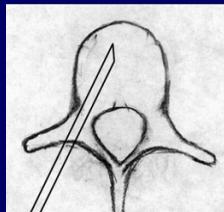
Technik: Vertebroplastie

Transpedikulärer Zugang



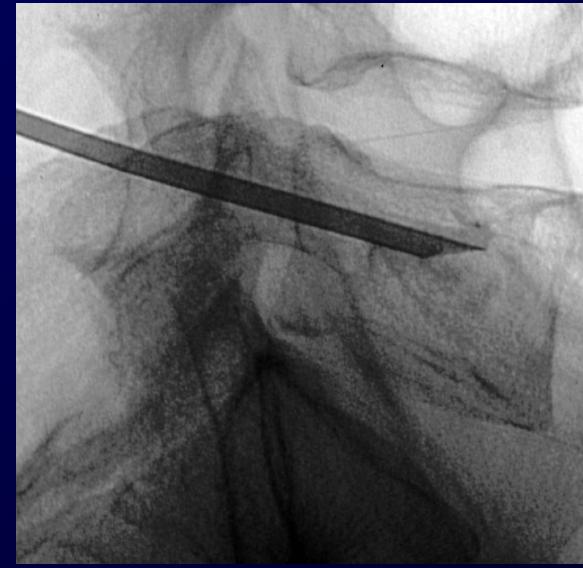
- Bauchlagerung
- frontaler Strahlengang
- C-Bogen 10-20° aus der ap-Projektion schwenken



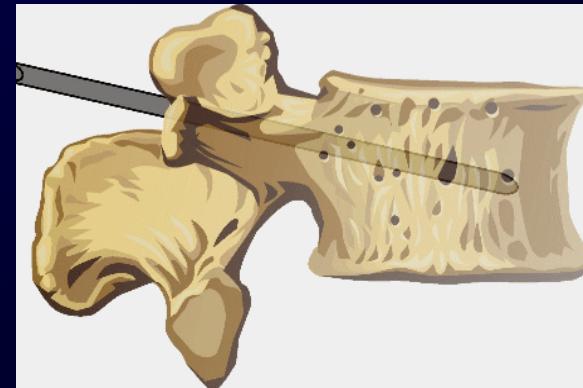


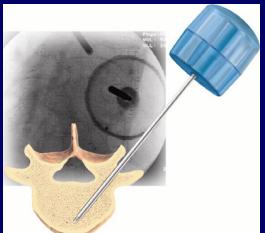
Technik: Vertebroplastie

Transpedikulärer Zugang

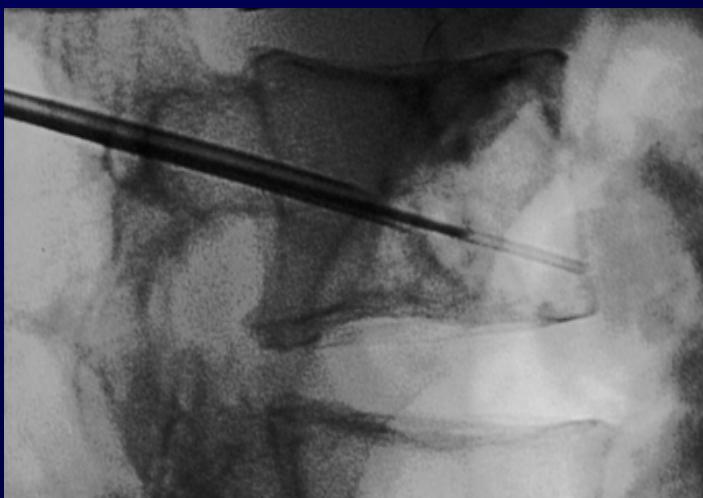
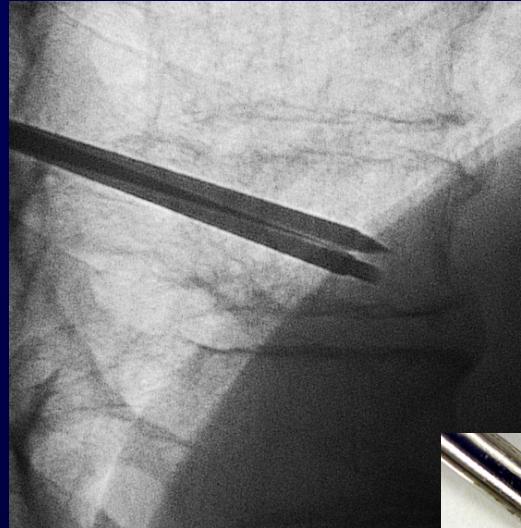
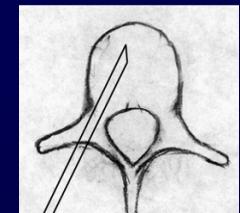


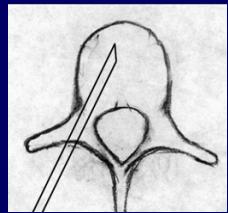
- unter seitlicher Durchleuchtungskontrolle Einbringen des Trokars bis in das mittlere / vordere Wirbelkörperdrittel
- **Strahlenexposition:**
Patient: Haut < 2 Gy – Erythem
Personal: Hände 0,5 – 8,5 mGy





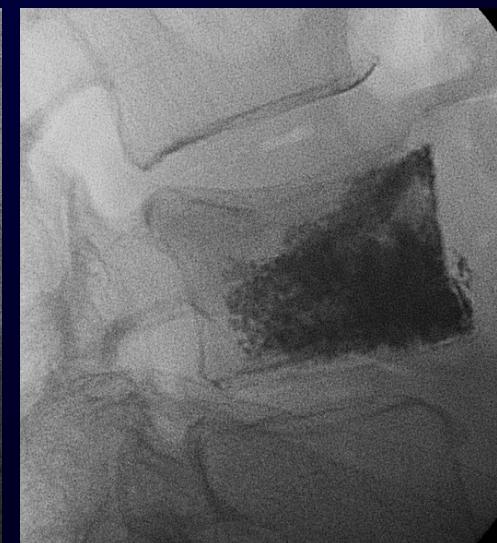
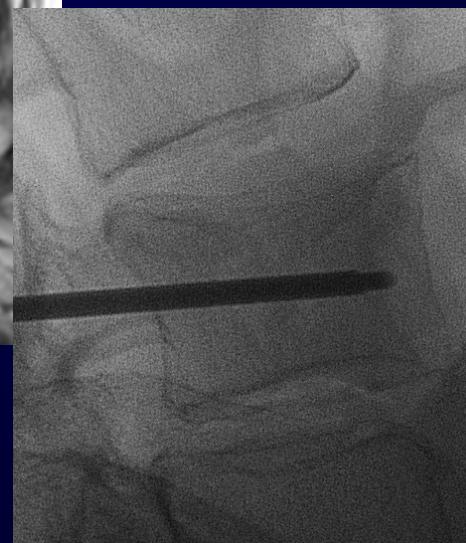
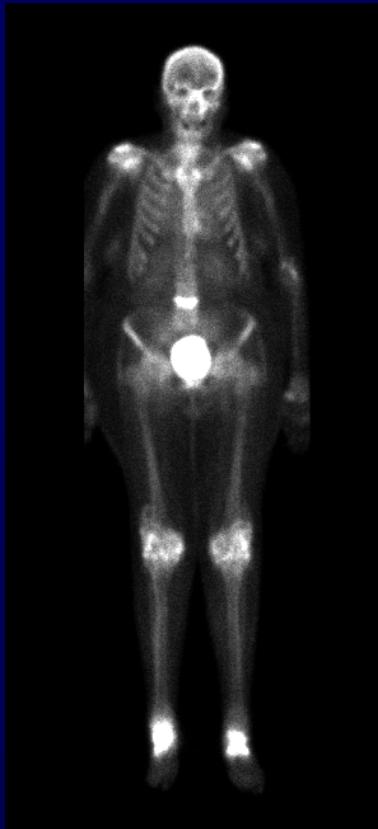
Technik: Vertebroplastie Transpedikulär - Biopsie





Vertebroplastie

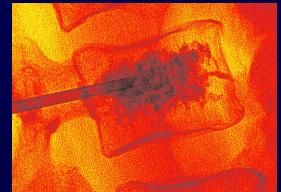
Metastase LWK 4





RFA in Kombination mit der Vertebroplastie

Rationale für Kombination

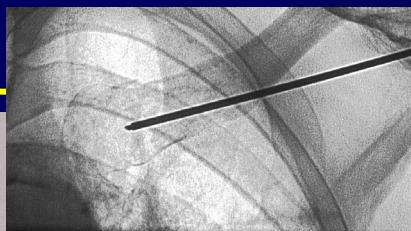
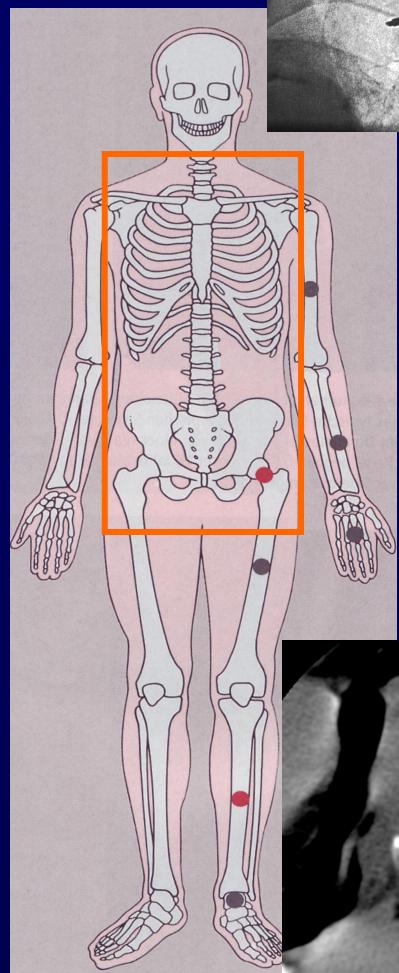


- **Schmerztherapie und Stabilisierung**
- **Zusätzliche Tumortherapie**
 - Tumorwachstum im Randbereich
- **Verbesserte Schmerztherapie ?**
- **Besser Zementverteilung ?**
- **Erweitertes Indikationsspektrum ?**





Radiofrequenzablation Knochen Indikation / Lokalisation



Maligne Läsionen
Ossäre Metastasen
in Kombination z.B. mit Osteoplastie



RFA Lebermetastase



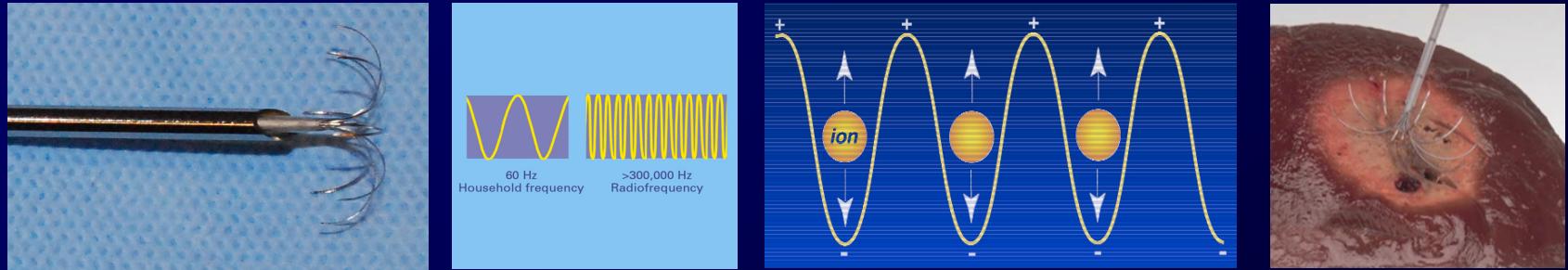
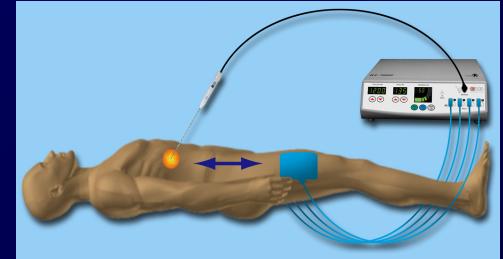
RFA Bronchialkarzinom



RFA Nierenzellkarzinom

RFA - Radiofrequenzablation

Prinzip



Hochfrequenz-Wechselstroms (ca. 460 kHz)

Induktion von Ionenbewegungen durch die elektromagnetische Energie
Wärmeentwicklung im Tumorgewebe → Koagulationsnekrose

Temperatur: 60 - 100° (vor der Karbonisation)

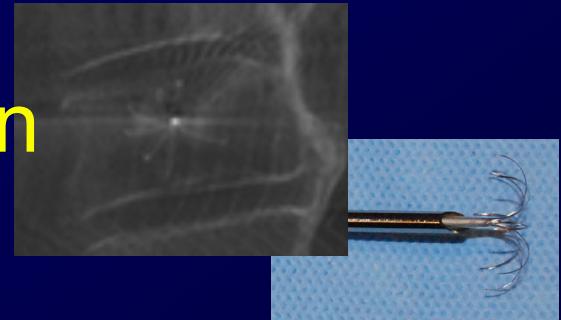
Temp > 60° - Denaturierung von Eiweiss

Temp > 100° Karbonisation verhindert die Ausbreitung der Nekrose
(Verkohlung erhöht den Widerstand)

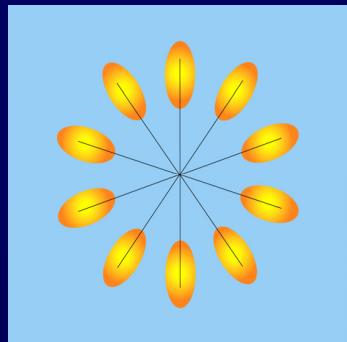


RFA - Radiofrequenzablation

Prinzip

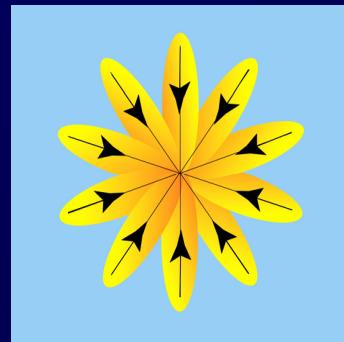


Beginn



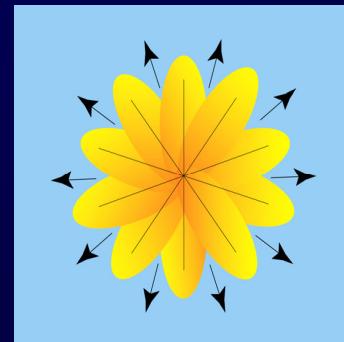
Wärme-
entwicklung
beginnt an
den
Drahtenden

Progress



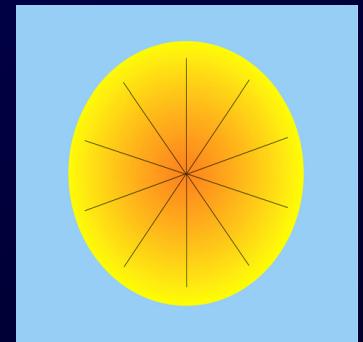
Ausbreitung
entlang der
dünnen Drähte
“zurück” zum
Zentrum

Expansion



Ausbreitung
zwischen den
Drähten und
nach außen

Ende



Koagulations-
nekrose



RFA Knochen / Wirbelkörper

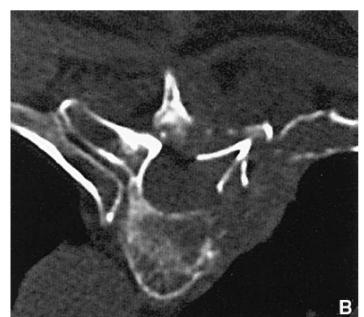
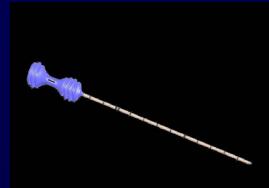
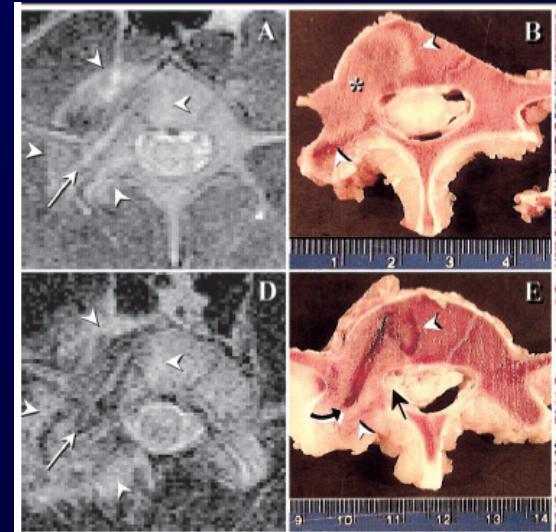


FIGURE 2 Intraoperative computed tomographic (CT) image of vertebral body T4 showing the deployed array electrodes in direct proximity to the spinal cord, the pleura, and the spinal nerves (A). Because of multislice CT imaging, a precise placement of the radiofrequency system is possible without injuring nearby sensitive structures. An overlapping, larger lesion was obtained by repeated ablation after catheter replacement (B).

Grönemeyer, et al. The Cancer Journal 2002;8: 33-39



Nour, et al. Radiology 2002;224: 452-462



RFA Knochen / Wirbelkörper Metastasen

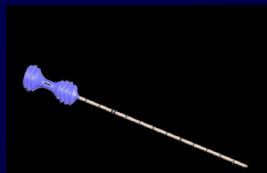
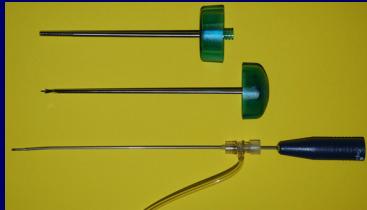


TABLE 1 Effect of Radiofrequency Ablation in 10 Patients with Unresectable Spinal Tumors

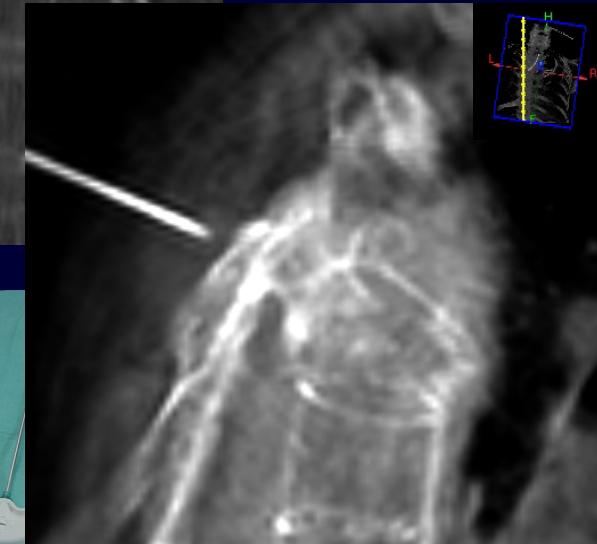
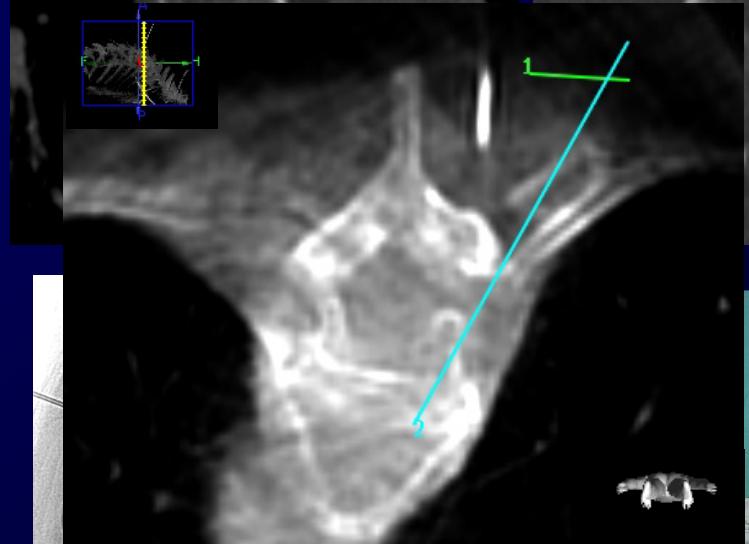
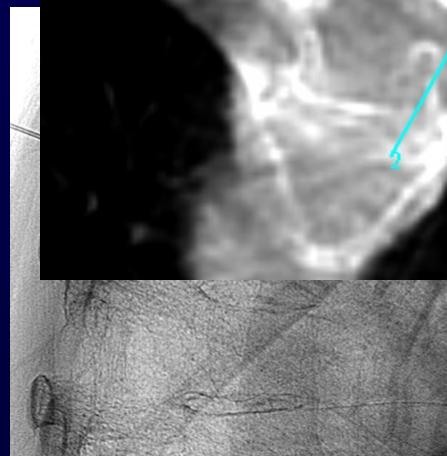
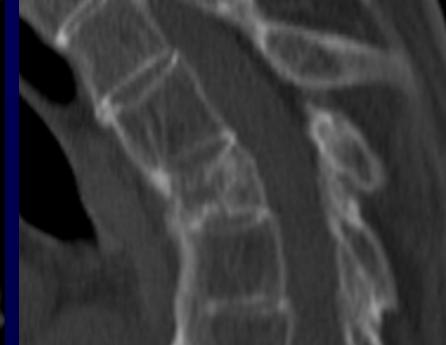
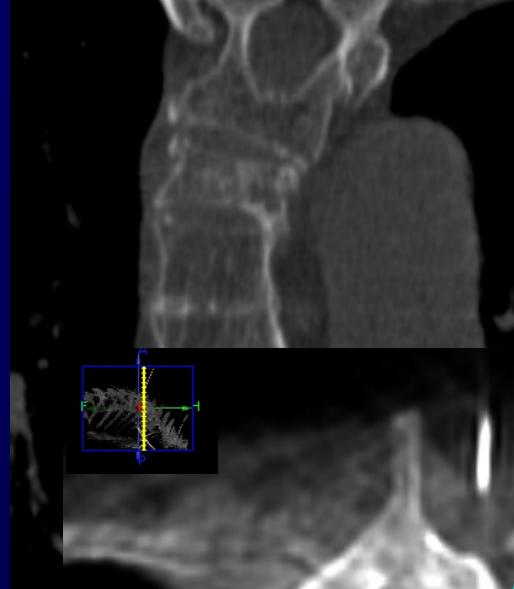
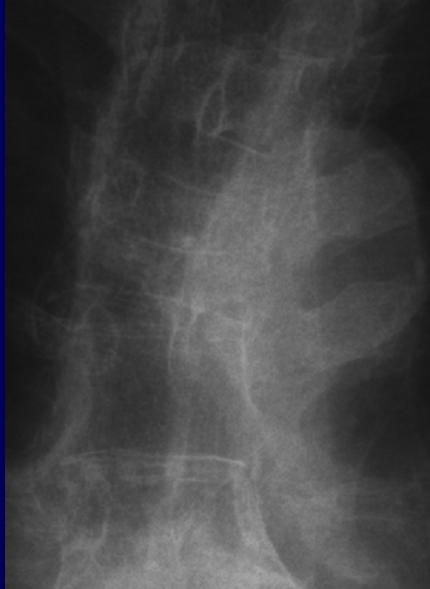
Patient No.	Age	Primary Tumor	Treated Level	No. of RFAs	n=4 Vertebroplasty	Follow-up (Months)	Pain Before Therapy ^a	Pain Follow-up ^a	Percentage Relative Pain Reduction	Percentage of Pain-Related Disability Reduction ^a
1	63	Melanoma	T3, T4, T10, T11	4	Yes	5	90	50	44	62.5
2	76	Renal Cell	L3	1	Yes	2	50	0	100	12.6
3	66	Prostate, Rectum	Sacral Bone	3	No	4	10	0	100	16.6
4	57	Mammary	T12	1	No	3	50	80	-60	-16.6
5	62	Mammary	L4, L5	5	No	11	100	70	30	75
6	66	Multiple Myeloma	L3	1	Yes	6	50	10	80	12.5
7	65	Renal cell	T8	1	No	10	70	10	86	25
8	60	Uterine Cervix	L4, L3	2	Yes	3	100	10	90	45.8
9	71	Rectum, Adeno	Sacral Bone, L5	2	No	6	50	30	40	12.5
10	58	Melanoma	T10	1	No	8	25	0	100	25

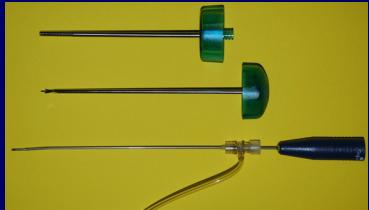
^aData on pain was assessed with a Visual Analogue Scale; data on back pain related disability was assessed with the Hannover Functional Ability Questionnaire (FFbH-R). A change of 12 percentage points on the FFbH-R has been shown to be clinically relevant by Kohlmann et al.¹³



Vertebroplastie

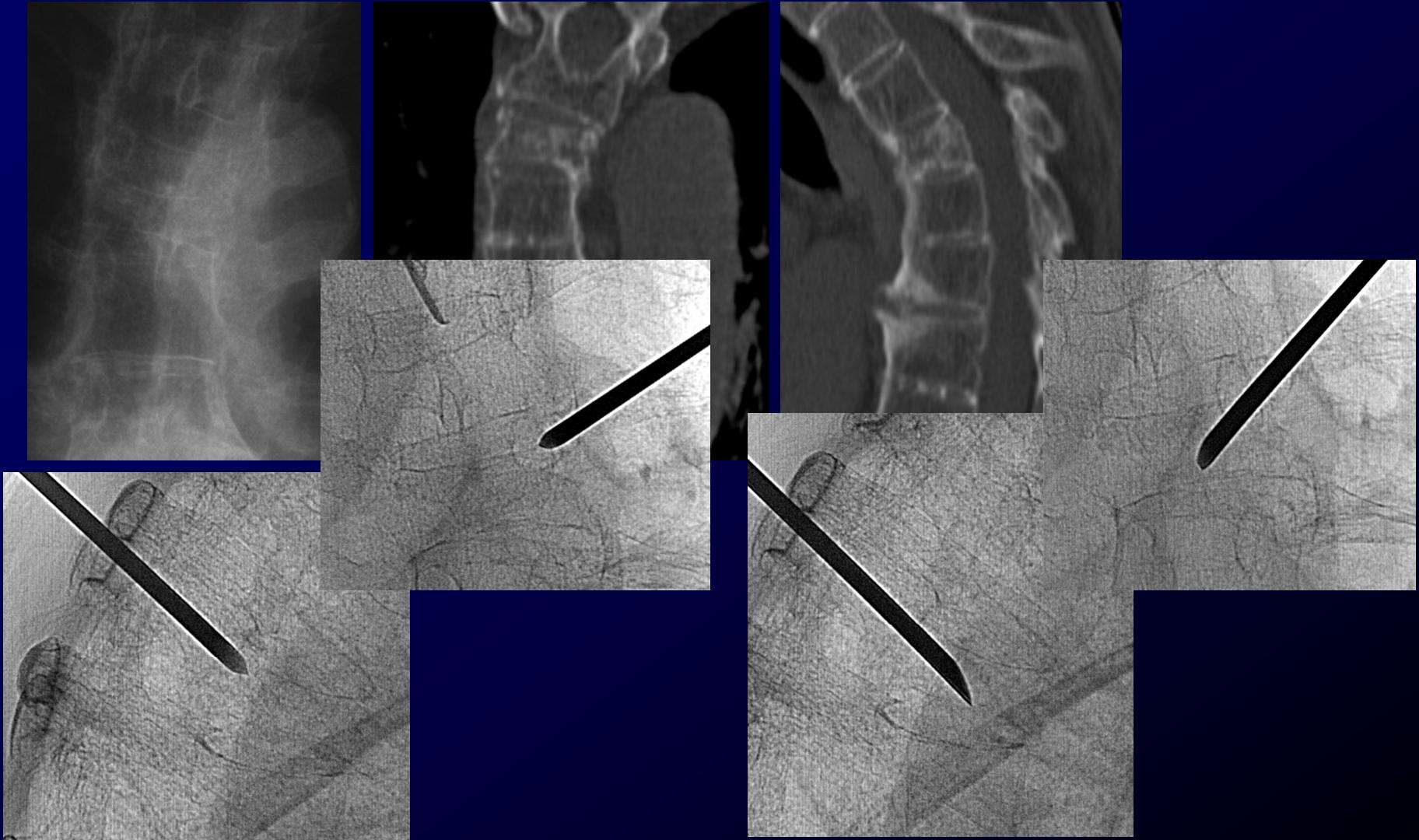
"Tumor Debulking"

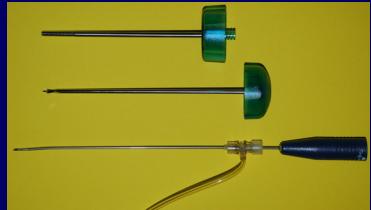




Vertebroplastie

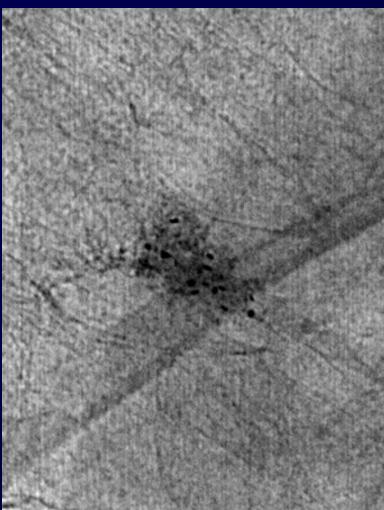
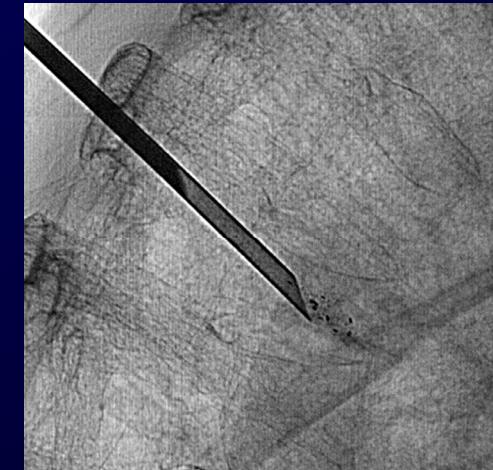
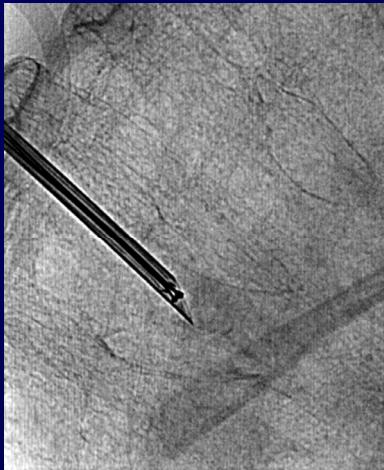
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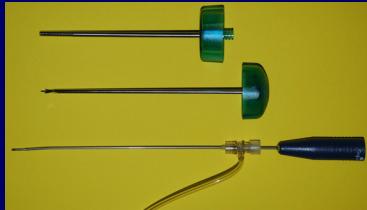




Vertebroplastie

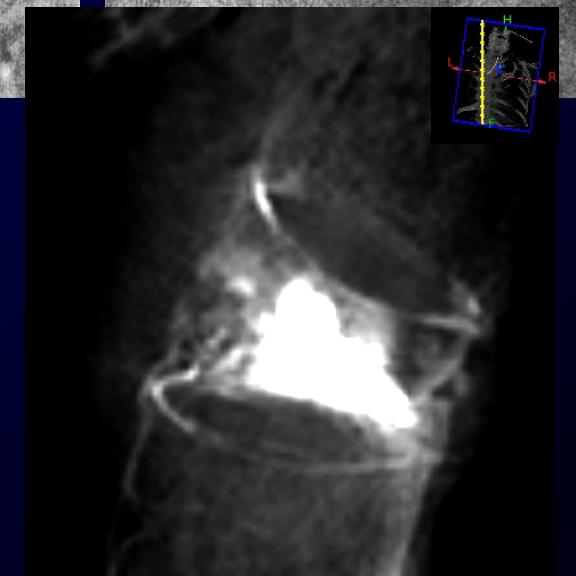
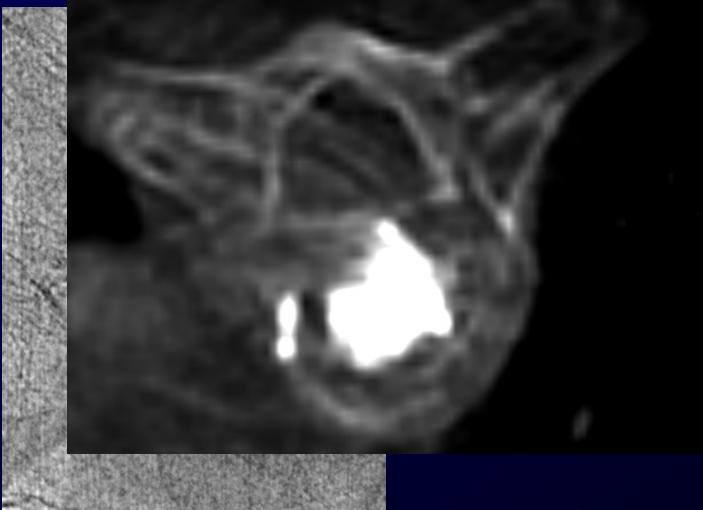
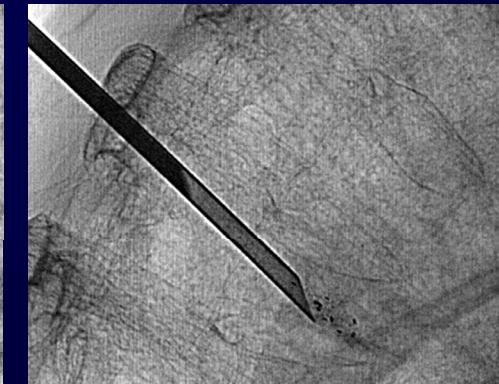
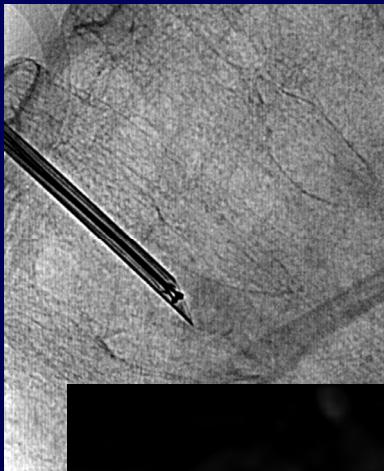
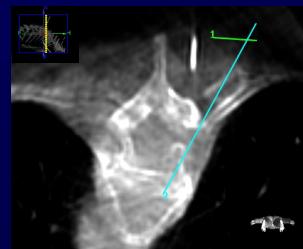
"Tumor Debulking"





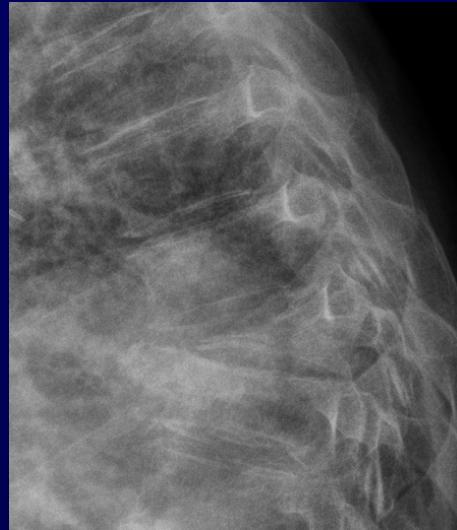
Vertebroplastie

"Tumor Debulking"





Vertebroplastie nach RFA Interventionszeitpunkt ?



Verlauf 1 Monat

73 a NSLC, Radiatio



73 a Plas

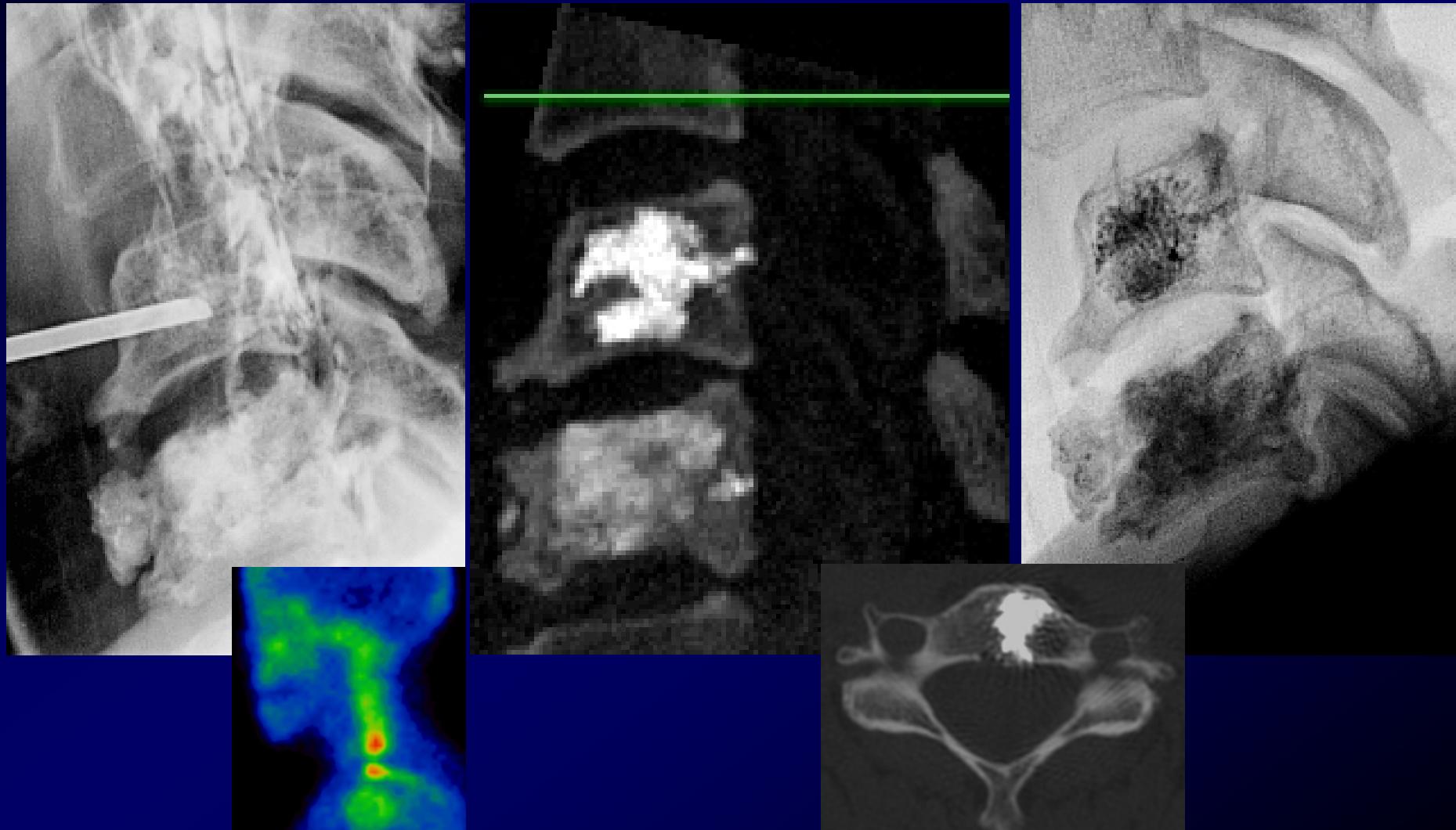


Verlauf 6 Wochen



Metastase HWK 5, 6 - Anterolateraler Zugang

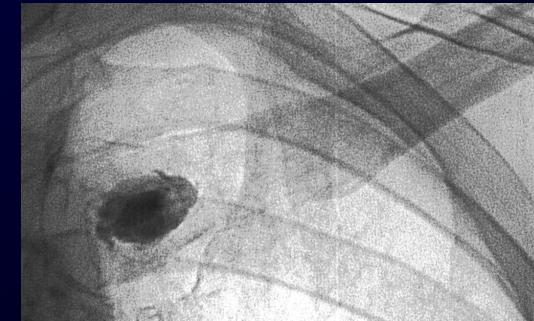
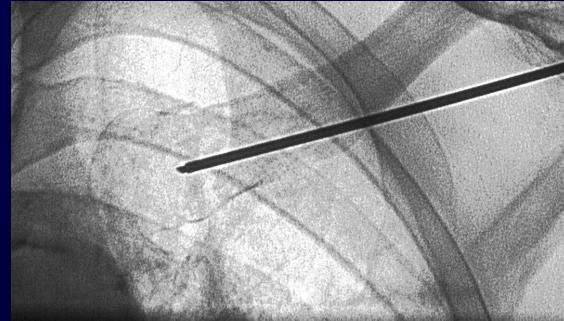
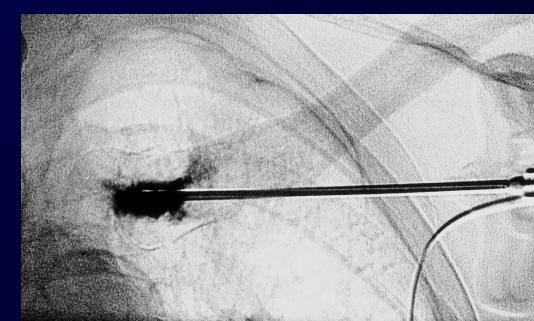
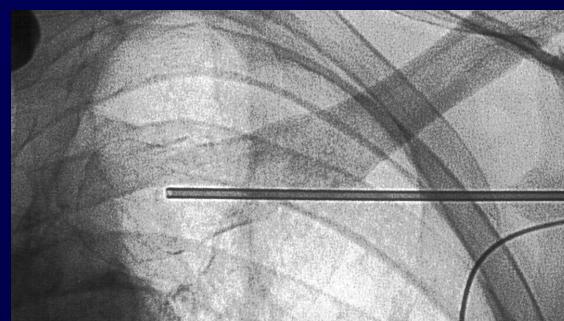
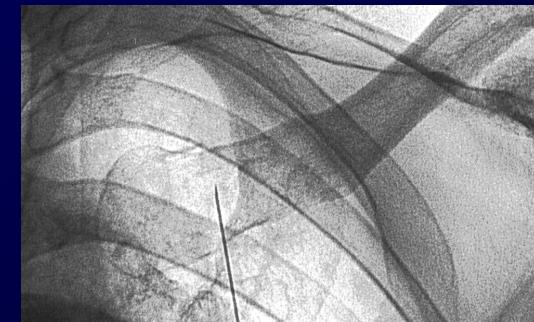
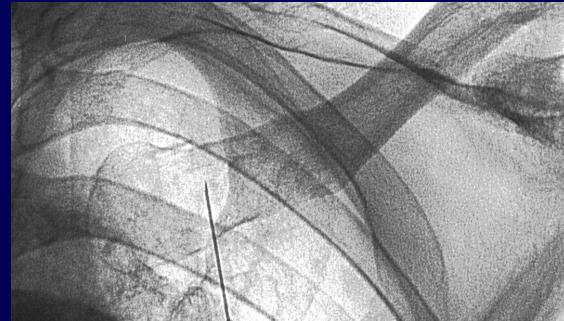
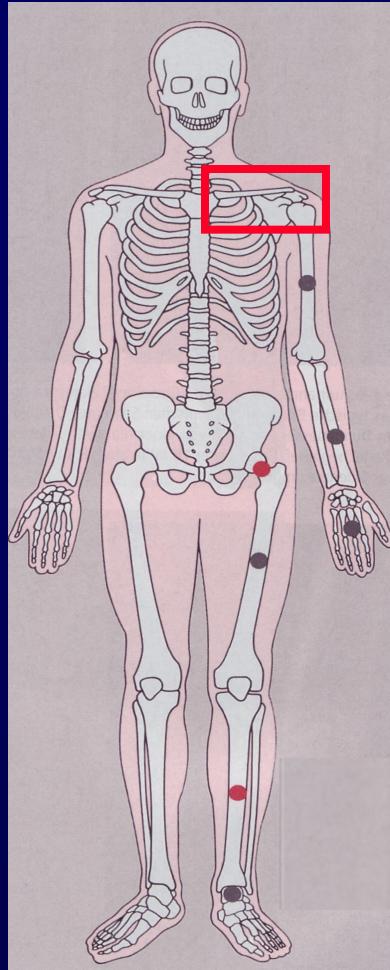
Vertebroplastie im Bereich der Halswirbelsäule





Osteoplastie

osteolytische Metastase



RFA Knochen Metastasen



Table 1. Lesion characteristics and treatments in 17 patients

Patient No./age/sex	Primary neoplasm	Treated location	Lesion size (mm)	Pre-RT (Gy)	RF No.	Temperature (°C)	Total RF time (min)
1/68/M	Liver	Th-spine	22 × 20 × 30	50	1	67	5
2/64/M	Renal	Humerus	41 × 37 × 54	39	2	65, 70	13
3/55/M	Liver	L-spine	53 × 50 × 60	39	1	70	5
4/75/M	Bladder	Ilium	49 × 45 × 45	39	1	60	7
		Ischium	39 × 39 × 33	39	1	80	7
5/81/F	Thyroid	Ilium	35 × 34 × 30	(—)	1	96	7
		Ilium	51 × 44 × 50	(—)	1	87	7
6/65/M	Renal	Femur	21 × 18 × 55	(—)	2	85, 83	10
		Maxilla	30 × 27 × 24	(—)	1	55	1
7/76/M	Liver	Ilium	47 × 23 × 45	39	2	85, 86	7
8/59/M	Renal	Ilium	95 × 56 × 135	15	4	78, 82, 83, 66	20
8/2nd		Ilium	125 × 67 × 160	33	8	84, 87, 87, 84 75, 77, 81, 79	32
9/54/M	Lung	L-spine	25 × 25 × 25	39	1	83	5
10/54/M	Rectal	Sacrum	90 × 53 × 95	90	8	43, 47, 42, 44 48, 48, 45, 46	20
11/61/M	Liver	Mandible	60 × 56 × 51	(—)	4	67, 77, 78, 73	20
12/61/M	Liver	Ilium	37 × 37 × 34	(—)	1	70	4.5
13/65/M	Renal	Ischium	51 × 44 × 60	(—)	3	67, 62, 70	5.5
		Th-spine	45 × 38 × 45	39	1	89	3
14/61/M	Renal	Humerus	51 × 44 × 60	39	2	50, 73	8.5
		Sacrum	45 × 38 × 45	39	2	65, 70	5.5
15/77/M	Liver	Th-spine	50 × 35 × 40	50	1	73	3
		L-spine	43 × 41 × 45	40	2	99, 91	7
16/56/M	Bladder	Ilium	85 × 60 × 125	25	3	77, 72, 82	13

Abbreviations: RT: radiation therapy; Gy: Gray; RF: radiofrequency ablation.

RFA Knochen Metastasen



Table 2. Clinical results

Patient No.	Analgesic reduction	Relief achieved (days)	ADL post-Tx	Duration of pain relief (months)	Recurrence of pain	Outcome
1	Yes	1	NC	3	No	Dead
2	Yes	2	NC	30	No	Alive
3	No	1	NC	1	NA	Lost to follow-up
4	No	2	Sitting	1	No	Dead
5	No	1	NC	20	No	Alive
6	Yes	1	Walking	3	No	Alive
7	Yes	2	NC	9	No	Dead
8	No	2	NC	3	Yes	Dead
8 (2 nd)	No	3	Standing	1	Yes	Dead
9	Yes	1	NC	15	No	Alive
10	No	2	Sitting	0.5	Yes	Dead
11	No	2	NC	7	No	Dead
12	No	1	NC	5	No	Dead
13	No	2	NC	9	No	Alive
14	Yes	1	Sitting	7	No	Alive
15	No	1	NC	6	No	Alive
16	Yes	3	NC	4	No	Alive

Abbreviations: VAS: Visual Analogue Scale; ADL: activity of daily life, Tx: treatment; NA: not available;

13/17

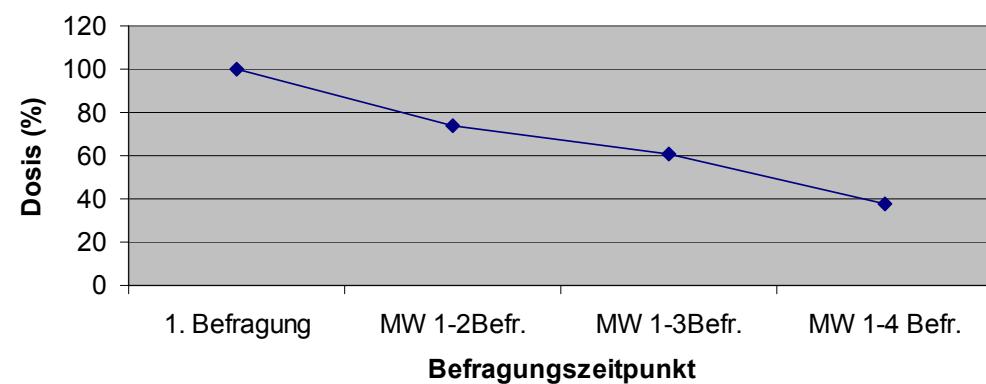
VERTEBROPLASTIE

ERGEBNISSE - Schmerzmedikation



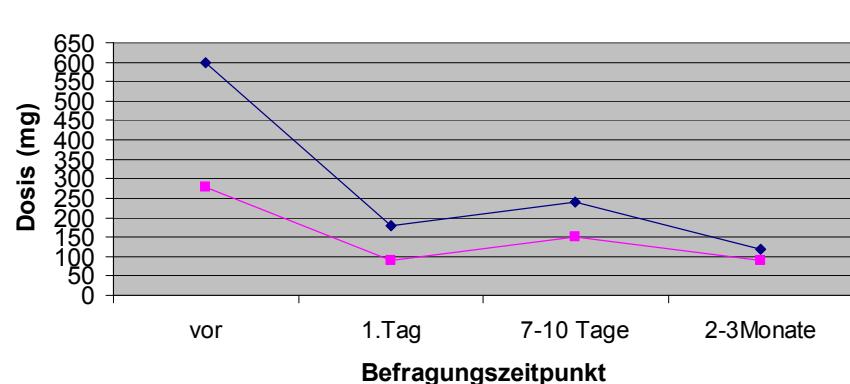
Analgetika-Tumorpatienten

◆ Dosis (%)



Morphindosis-Tumorpatienten

■ Mittelwert
◆ Maximum



Osteoplastie / Vertebroplastie Radiofrequenzablation (RFA)

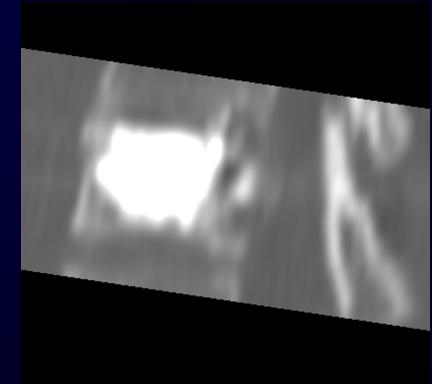
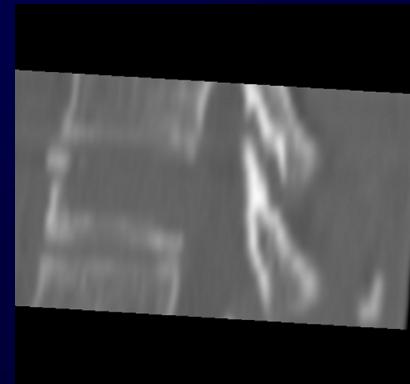


Sichere, minimal invasive Therapieoption zur
Schmerzreduktion
Stabilisierung
Wirbelkörpermetastasen



Skelettsystem

Palliativer Therapieeffekt
bei Metastasen



Kombinationseingriffe
Interdisziplinäre Therapieansätze



Interventionen von Metastasen des Mammakarzinoms

Hepatisch metastasiertes Mamma Ca

RFA

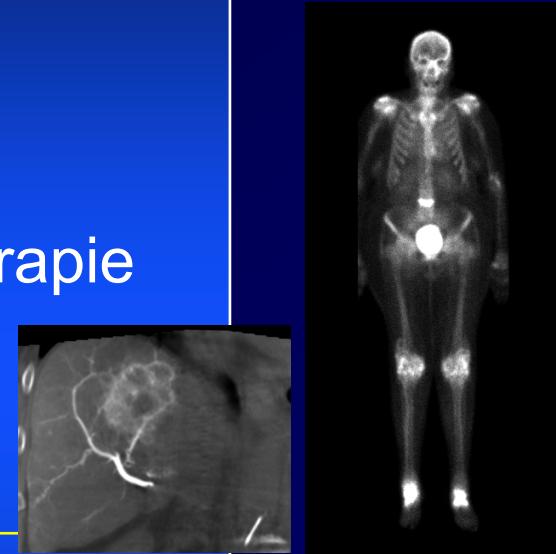
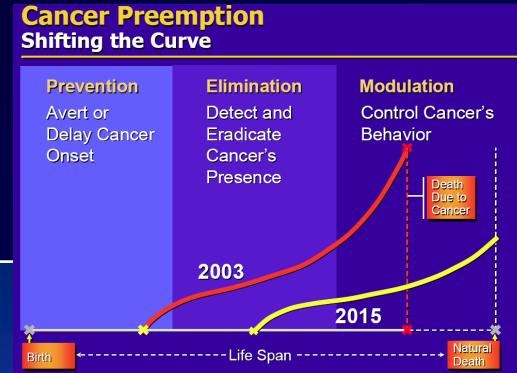
Transarterielle Chemoembolisation

SIRT - Selektive Interne Radio-Therapie

Ossär metastasiertes Mamma Ca

Vertebroplastie Zementoplastie

High-Intensity Focused Ultrasound



Patients living with Cancer
„Palliativtherapie“



Interventionen von Metastasen des Mammakarzinoms

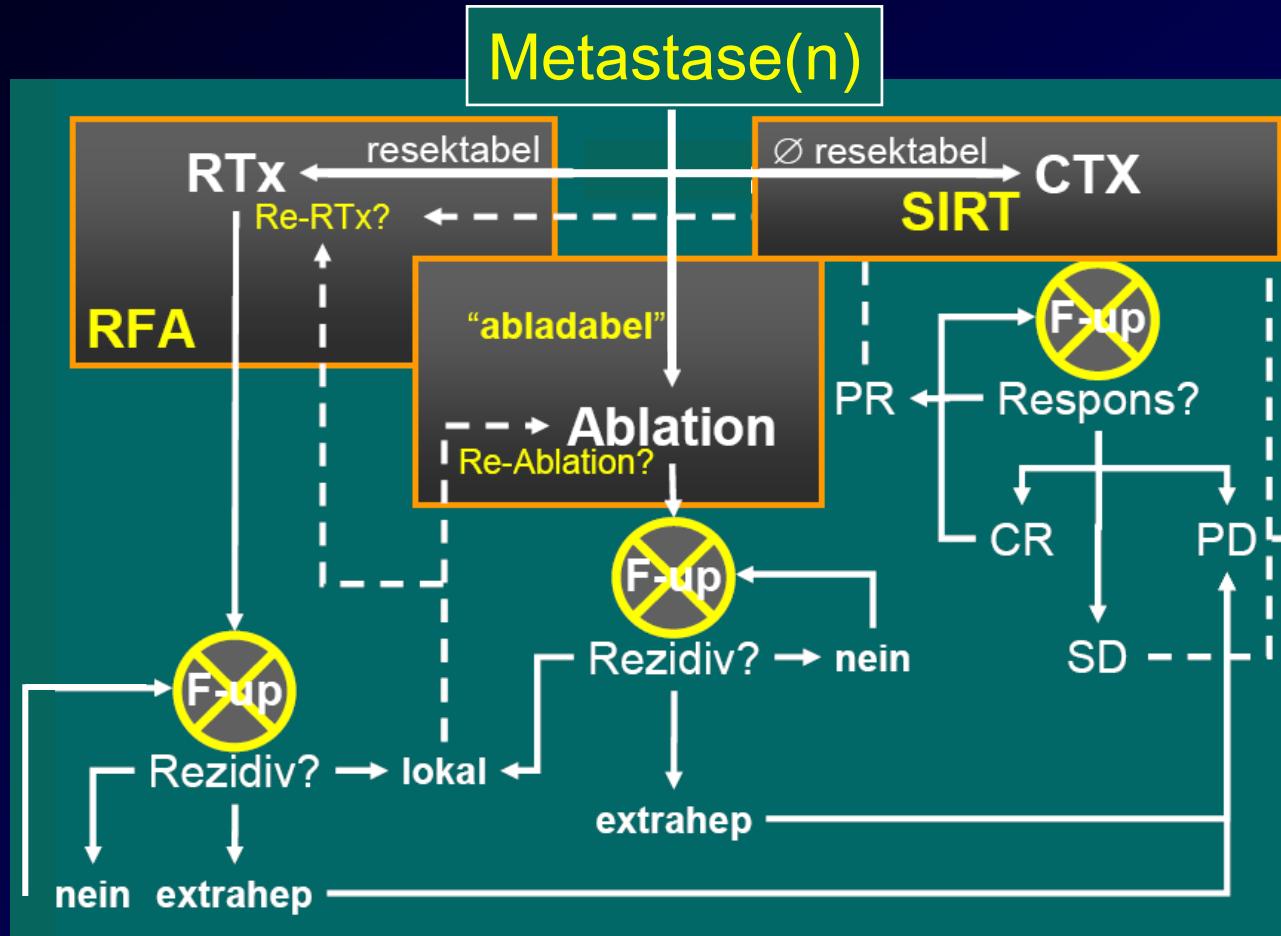
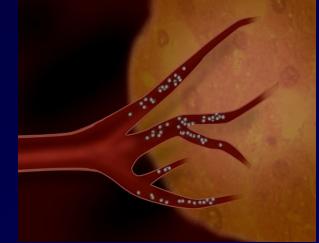
Hepatisch metastasiertes Mamma Ca

Interdisziplinäre Kooperation

- ✓ Onkologie / Chirurgie
- ✓ Interventionelle Radiologie
- ✓ Nuklearmedizin/Strahlentherapie



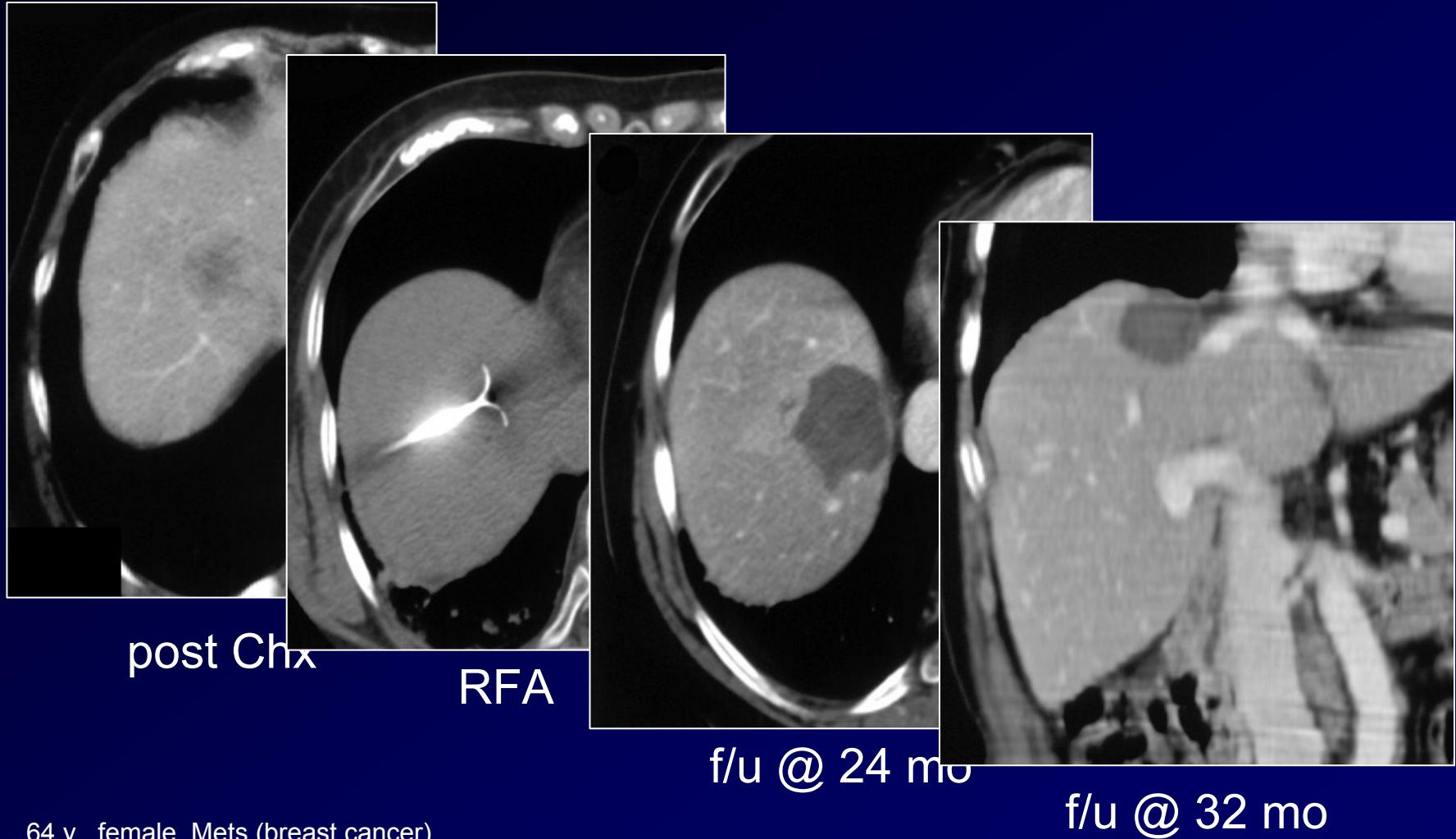
Therapiealgorithmus Lebermetastasen





RFA Behandlungsplanung und Durchführung

Therapieoption bei hepatisch metastasiertem Mamma Ca



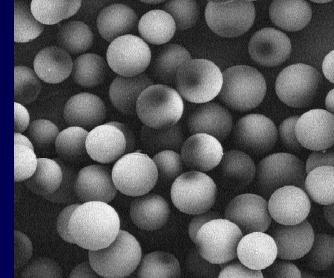


SIRT Interventional Radio-Embolisation

neue Therapieoption bei inoperablen Leber-tumoren

SIRT - Selektive Interne Radio-Therapie

Biokompatible Mikrosphären, die mit einer radioaktiven Substanz mit sehr kurzen Reichweiten versehen sind, werden direkt in die den Tumor versorgenden Lebergefäße injiziert



Das an den Mikrosphären haftende 90-Yttrium (β -Strahler) wird transarteriell selektiv appliziert



Hierdurch werden Tumoren / Metastasen einer lokal hohen Strahlendosis ausgesetzt und gleichzeitig Tumorgefäße embolisiert – “Transarterielles Seeding”





SIRT Interventional Radio-Embolisation

neue Therapieoption bei inoperablen Leber-tumoren

SIRT - Selektive Interne Radio-Therapie

- Yttrium ⁸⁹ – N - Beschuss

Betastrahler



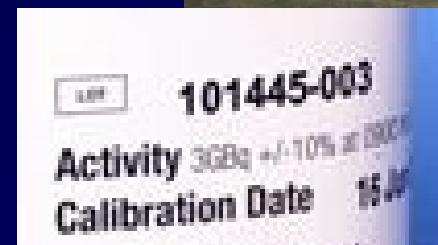
HWZ 64,2 h = 2,671 d

max. Energie 2,27 MeV

Durchschnittsenergie 0,9 MeV

Strahlungsbereich in Gewebe Ø 2,5 mm

eff. Behandlungszeit 92,3 Stunden





SIRT

Liver Tolerance & Tumour Sensitivity to Radiation

neue Therapieoption bei inoperablen Lebertumoren

RILD – Radiation-Induced Liver Disease

Gy: 20

30

40

50

60

70

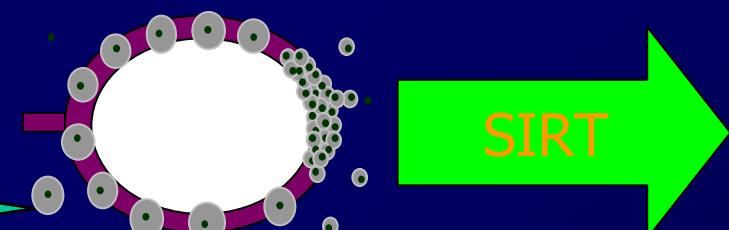
80

90

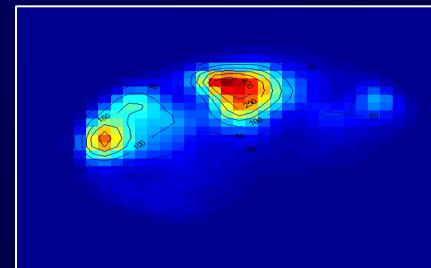
100

Eff. Dosis:
Hoden-CA,
Lymphom,
Myelom

Prä-OP
Bestrahlung
– CRC



Kurative Dosis:
Adeno-CA





SIRT Entwicklung neue Therapieoption bei inoperablen Leber-tumoren

SIRT - Selektive Interne Radio-Therapie

- 1988 Harz Mikrosphären (AUS)
- 1989 Glas Mikrosphären (USA)
- 2000 Universität von Maryland / Pittsburgh
- 3/02 USA: FDA Zulassung SIR Spheres®
- 10/02 EU: CE-Zertifizierung, Medizinprodukt





SIRT Y^{90} Sphären

neue Therapieoption bei inoperablen Leber-tumoren

Handelsname	SIRSpheres ® (SIRTEX)	TheraSpheres® (MSD Nordion)
Größe	$22 \pm 10 \mu\text{m}$	$32 \pm 10 \mu\text{m}$
Spezifisches Gewicht	1.6 g/dl	3.6 g/dl
Aktivität/Partikel	50 Bq	2500 Bq
# Mikrosphären/ 3 GBq (70 mCi) per E	40-80 Mio	~1.2 Mio
Material	Y^{90} + Harz	Y^{90} in Glasmatrix
Zulassung	EU	EU



SIRT

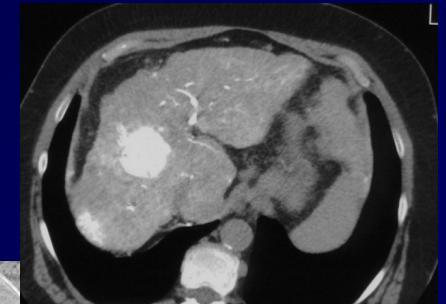
neue Therapieoption bei inoperablen Leber-tumoren

SIRT - Selektive Interne Radio-Therapie

Wirkprinzip

selektive i.a. Strahlentherapie

gefäßreicher, hypervaskularisierter Tumor

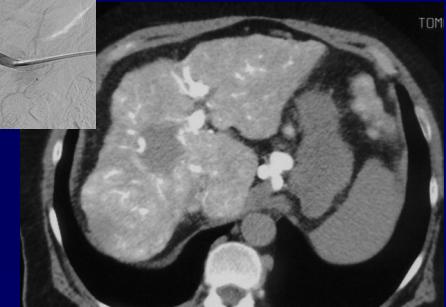


i.a. KM - A. hepatica

Indikation*

primäres Leberzellkarzinom (HCC)

Lebermetastasen



portalvenöse KM Phase

Fortgeschrittene, inoperative Leber-tumoren



SIRT Bestandteil eines Behandlungskonzepts neue Therapieoption bei inoperablen Leber-tumoren

- EU Zulassung für die Behandlung **nicht-resizierbarer** Leber-tumore
- Loko-regionale Therapie:
 - ➡ Kein Einfluß auf extrahepatische TU-Manifestation
- SIR-Spheres werden angewendet, wenn die Tumorlast ausschließlich oder hauptsächlich in der Leber liegt:
 - In Kombination mit systemischer Chemotherapie für...
 - mCRC (1st-line, 2nd-line etc)
 - in Studien - Salvage Therapie bei hepatisch metastasiertem Mamma Ca.



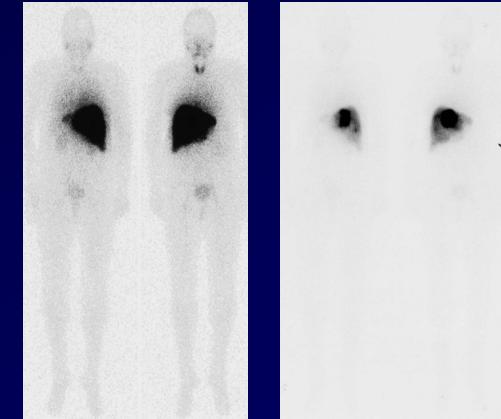
SIRT Patientenauswahl - Einschlußkriterien neue Therapieoption bei inoperablen Leber-tumoren

➤ Die SIRT muss technisch durchführbar sein

Geeignete hepatische Gefäßanatomie

Ausschluß Pfortaderthrombose

Kein signifikantes hepato-pulmonales Shuntvolumen



➤ Klinisch, Laborchemisch

“Ausreichende Leberfunktion”, Lebenserwartung > 3 Monate

Serum Bilirubin < 2 mg/dL, Quick > 75 %, Serum Albumin > 3.0 g/dL

Thrombozyten > 75.000/L

Serum Kreatinin < 2 mg/dL

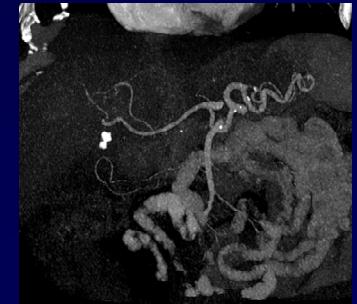


SIRT Patientenauswahl - Einschlußkriterien neue Therapieoption bei inoperablen Leberumoren

➤ Bildgebung

Staging CT/ PET CT

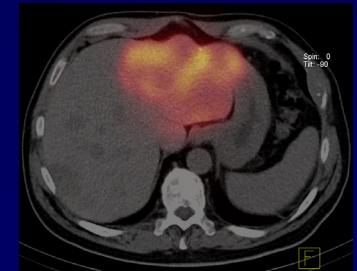
CT / MRT Leber (Verlaufskontrolle)



➤ Testkatheteruntersuchung:

i.a. DSA - Tc⁹⁹m-MAA Testinjektion

- Klärung der Tumorversorgung
- Beurteilung der MAA-Aktivitätsverteilung
- Ausschluß pulm. Shunt Volumina





SIRT Vermeidung therapieassozierter Komplikationen neue Therapieoption bei inoperablen Leber-tumoren

- GI Ulzeration

In der Vorbereitung sorgfältiger Verschluss der Gefäßabgänge,
die den GI-Takt versorgen

- Pankreatitis

In der Vorbereitung sorgfältiger Verschluss der
Gefäßabgänge, die die Bauchspeicheldrüse versorgen

- Strahleninduzierte Hepatitis

Minimierung der Dosis, die das gesunde Lebergewebe
erreicht

- Strahleninduzierte Pneumonie

Abfluss in die Lunge ermitteln und ggf. die Dosis
reduzieren



SIRT Tc^{99m} -MAA Testinjektion

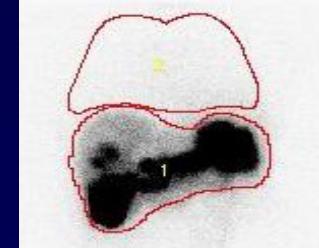
neue Therapieoption bei inoperablen Leber tumoren



SIRT - absolute Kontraindikationen

- ausgeprägte hepatopulmonale Shunts

– ≥ 30 Gy- Strahlenpneumonitis

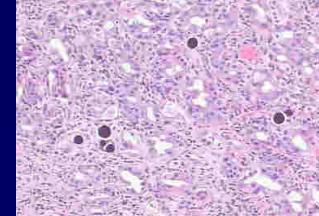
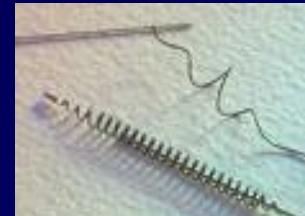


- Reflux in Magen, Pankreas, Darm, Gallenblase

– Ulzera, Pankreatitis, Cholezystitis



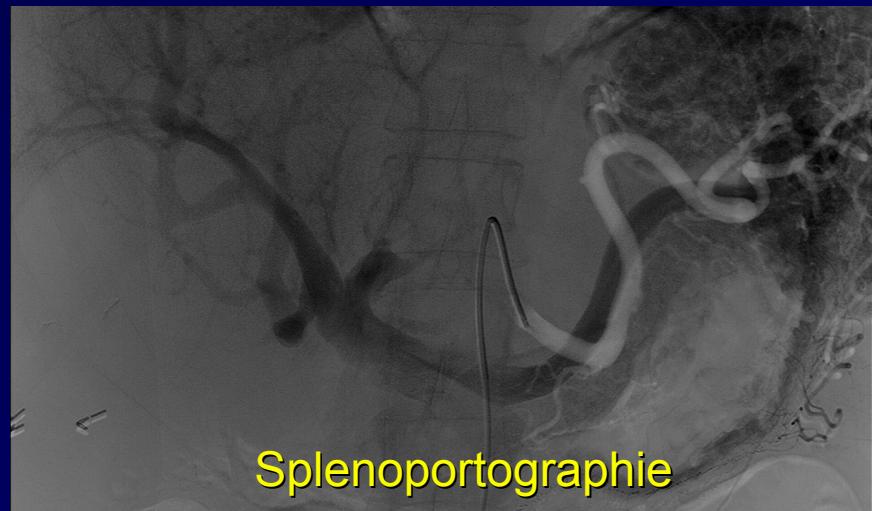
→ SCHUTZEMBOLISATION





SIRT Tc^{99m} -MAA Testinjektion

neue Therapieoption bei inoperablen Leber tumoren





SIRT Tc^{99m} -MAA Testinjektion

neue Therapieoption bei inoperablen Leber tumoren



Schutzembolisation A.gastroduodenalis



SIRT Tc^{99m} -MAA Testinjektion

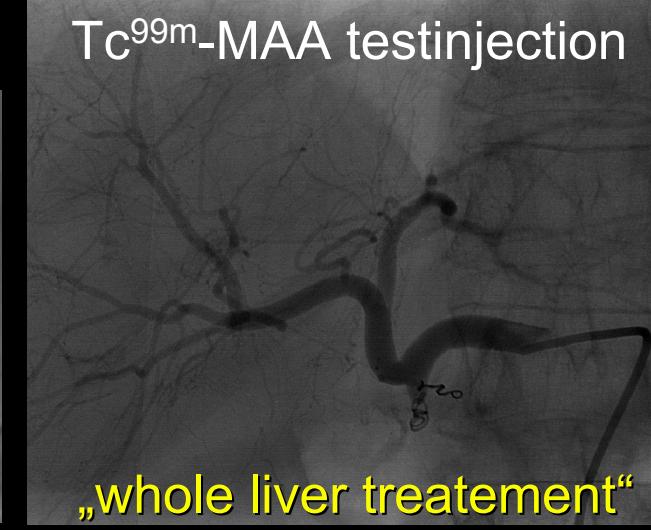
neue Therapieoption bei inoperablen Lebertumoren



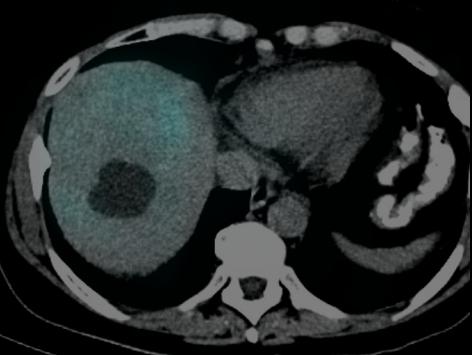
right gastric artery



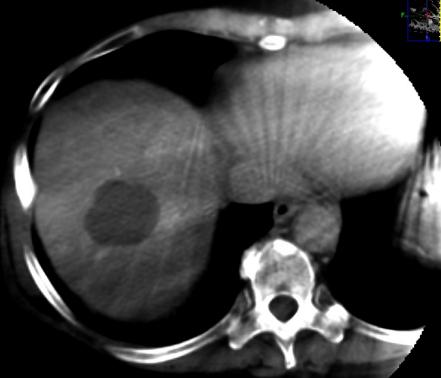
Tc^{99m} -MAA testinjection



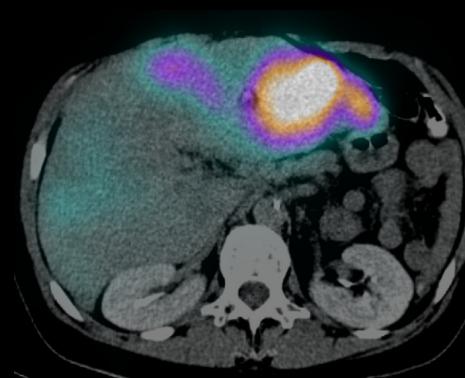
„whole liver treatment“



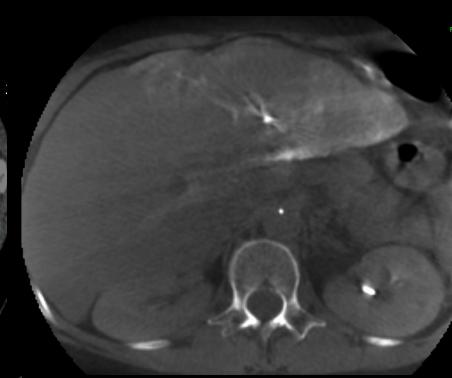
MAASpect CT



Xper-CT



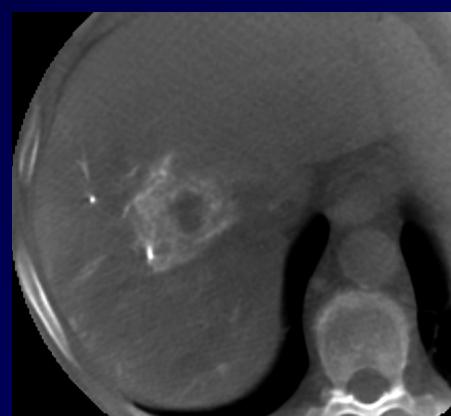
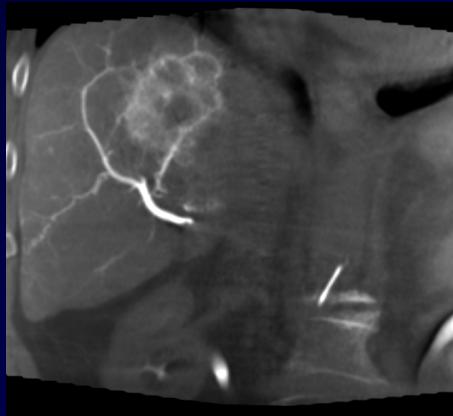
MAA Spect CT



Xper-CT



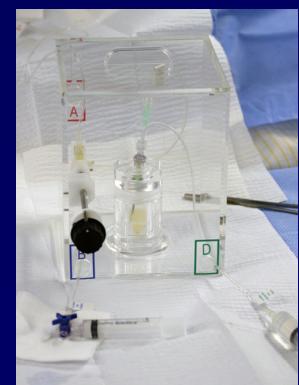
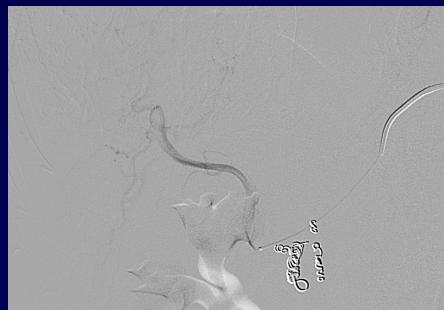
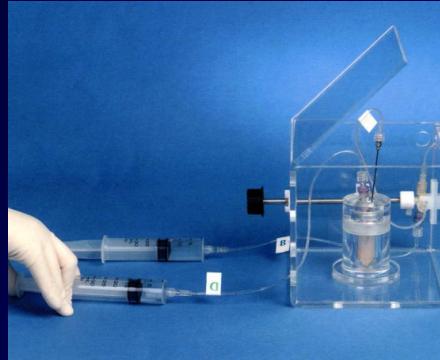
SIRT Tc^{99m} -MAA Testinjektion neue Therapieoption bei inoperablen Lebertumoren





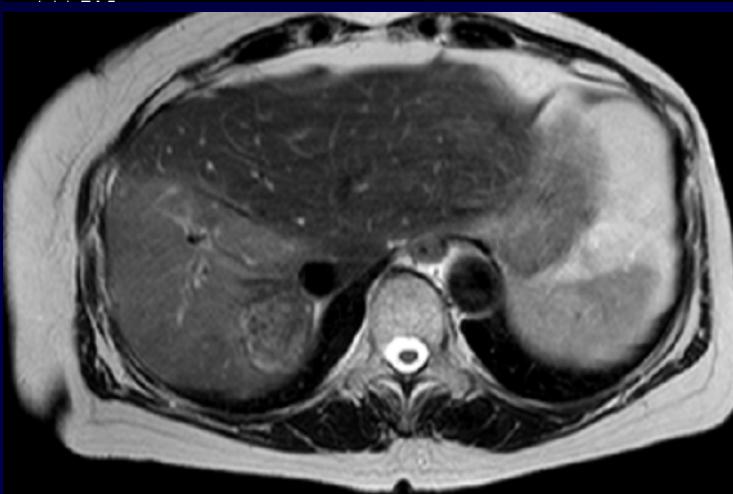
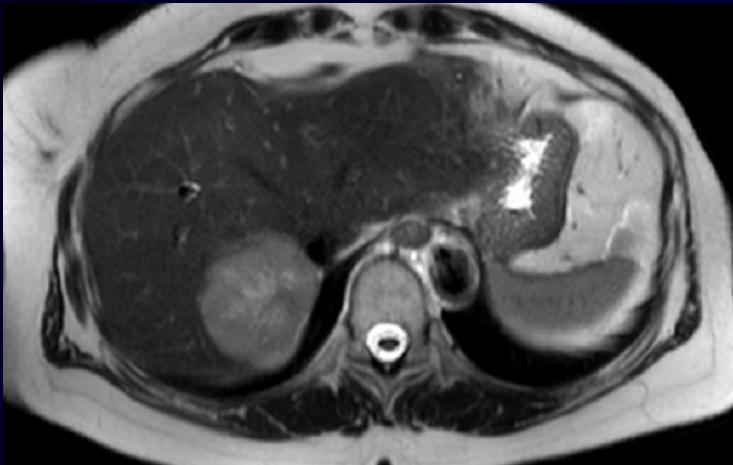
SIRT Therapie

neue Therapieoption bei inoperablen Leber-tumoren





SIRT Verlaufskontrolle nach Selektiver SIRT Re LL neue Therapieoption bei inoperablen Lebertumoren



66-j. Pat. met. Mamma-CA - 3 Mo. nach SIRT - selektive Therapie Re LL



SIRT bei fortgeschrittener Lebermetastasierung neue Therapieoption bei inoperablen Lebertumoren

Randomisierte Studie bei fortgeschrittener
Lebermetastasierung durch CRC (74 Patienten)
Hep. art. Chemo (HAC) versus HAC + SIRT

Ansprechen (CR + PR)		
(CT Response)		
	HAC	HAC + SIRT
CR + PR	6 (18%)	16 (44%)
<i>Difference between groups p=0.02</i>		

Gray BN, Van Hazel G, Hope M et al: Randomised trial of SIR-Spheres plus chemotherapy versus chemotherapy alone for treating patients with liver metastases from primary large bowel cancer. Annals Oncology 2001, 12:1711-1720



SIRT bei fortgeschrittener Lebermetastasierung neue Therapieoption bei inoperablen Lebertumoren

Zeit bis Disease Progression (CT Response)		
	HAC	HAC + SIRT
Mean (Monate)	10,1	19,7
Median (Monate)	9,8	15,9
<i>Difference between groups (Logrank test) p=0.001</i>		

Gray BN, Van Hazel G, Hope M et al: Randomised trial of SIR-Spheres plus chemotherapy versus chemotherapy alone for treating patients with liver metastases from primary large bowel cancer. Annals Oncology 2001, 12:1711-1720



SIRT bei fortgeschrittener Lebermetastasierung neue Therapieoption bei inoperablen Lebertumoren

Überlebenszeit

	1. Jahr	2. Jahr	3. Jahr	5. Jahr
HAC	68%	29%	6%	0%
HAC + SIRT	72%	39%	17%	4%

Gray BN, Van Hazel G, Hope M et al: Randomised trial of SIR-Spheres plus chemotherapy versus chemotherapy alone for treating patients with liver metastases from primary large bowel cancer. Annals Oncology 2001, 12:1711-1720



SIRT bei fortgeschrittener Lebermetastasierung

Therapieoption bei inoperablen, hepatisch metastasiertem Mamma Ca

SIR-Spheres® in Breast Cancer
microspheres

The following summarises the key data supporting the use of SIR-Spheres microspheres in the treatment of liver metastases from breast cancer:

Lead Author	n	Treatment	ORR	SD	Median TTP	Median Survival
<i>Treatment Hiatus or Chemorefractory Disease</i>						
Coldwell ¹	44	SIR-Spheres microspheres	47%	47%	nr	86% alive at 14 months
<i>Chemorefractory Disease</i>						
Jakobs ⁴	30	SIR-Spheres microspheres	61%	35%	nr	11.7 months

Key: ORR: objective response rate (complete response + partial response); SD: stable disease; TTP: time to progression; nr: not reported;

Retrospective study of patients with breast cancer treated with SIR-Spheres microspheres

Coldwell DM, Kennedy AS, Nutting CW.

Use of yttrium-90 microspheres in the treatment of unresectable hepatic metastases from breast cancer.

Int J Radiat Oncol Biol Phys. 2007;69:800-804

Jakobs TF, Hoffmann RT, Fischer T, Stemmler HJ, Tatsch K, La Fougerie C, Murthy R, Reiser MF, Helmberger TK.

Radioembolization in patients with hepatic metastases from breast cancer.

J Vasc Interv Radiol. 2008;19:683-6890



SIRT

bei fortgeschrittener Lebermetastasierung

Therapieoption bei inoperablen, hepatisch metastasiertem Mamma Ca

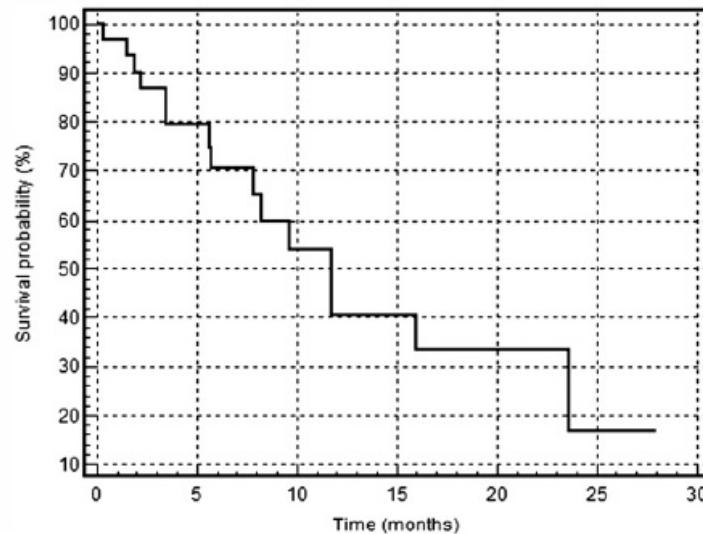


Figure 2. Graph illustrates the overall survival probability calculated with the Kaplan-Meier method for 30 patients with liver metastases from breast cancer. Calculation was started at the date of the radioembolization procedure. The estimated median survival was 11.7 months.

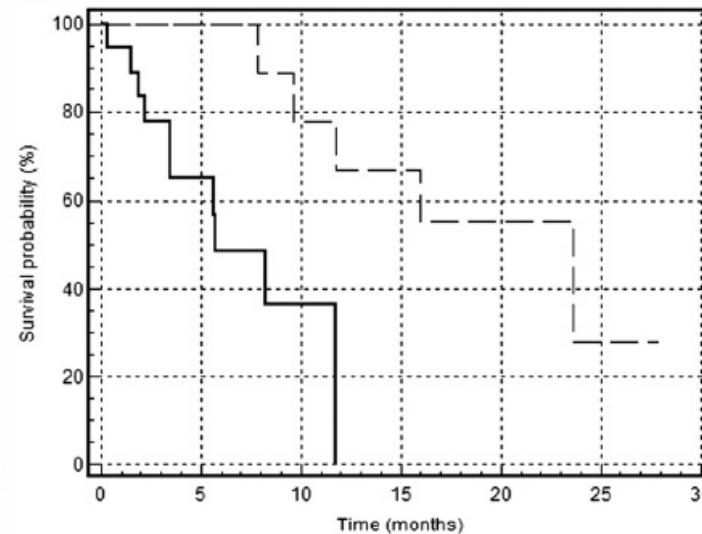


Figure 3. Graph illustrates the survival probability calculated with the Kaplan-Meier method on the basis of the presence or absence of initial response to radioembolization. There was a statistically significant difference in the survival probability ($P = .005$), with a median survival for patients with (dashed line) and patients without (solid line) response of 23.6 months and 5.7 months, respectively.

Jakobs TF, Hoffmann RT, Fischer T, Stemmler HJ, Tatsch K, La Fougerie C, Murthy R, Reiser MF, Helmberger TK.

[Radioembolization in patients with hepatic metastases from breast cancer.](#)

J Vasc Interv Radiol. 2008;19:683-6890



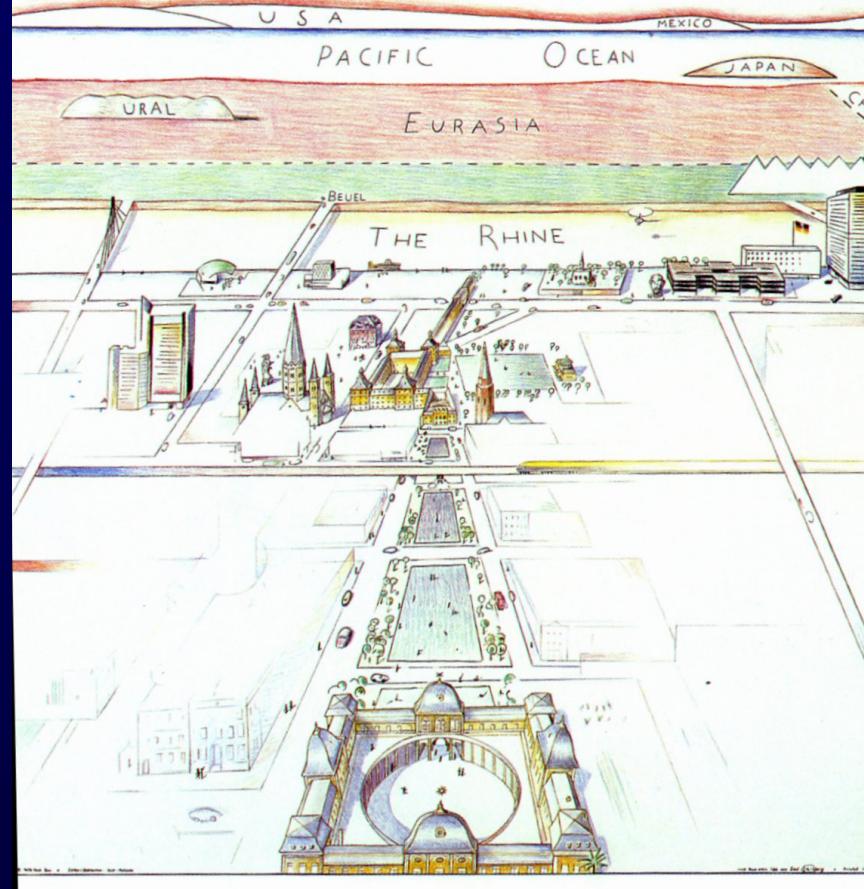
SIRT

Zusammenfassung

Therapieoption bei inoperablen, hepatisch metastasiertem Mamma Ca

- Effektive
- Interventionell radiologische Therapie/ergänzung
 - Anspruchsvolle technische Durchführung
 - Geringe Nebenwirkungsrate
 - Interdisziplinäre Maßnahme
 - Evidenz für verlängertes ÜL auch bei 1.-line Therapie bei mCRC
- Salvage Therapie bei hepatisch metastasiertem Mamma Ca.

THE BONNER



We hope to see it ...

...grow

