LA RADIOTERAPIA PALLIATIVA CON TECNICHE SPECIALI DELLA MALATTIA METASTATICA

TREVISO

7 giugno 2013

Terapie Ablative

Marco Massani

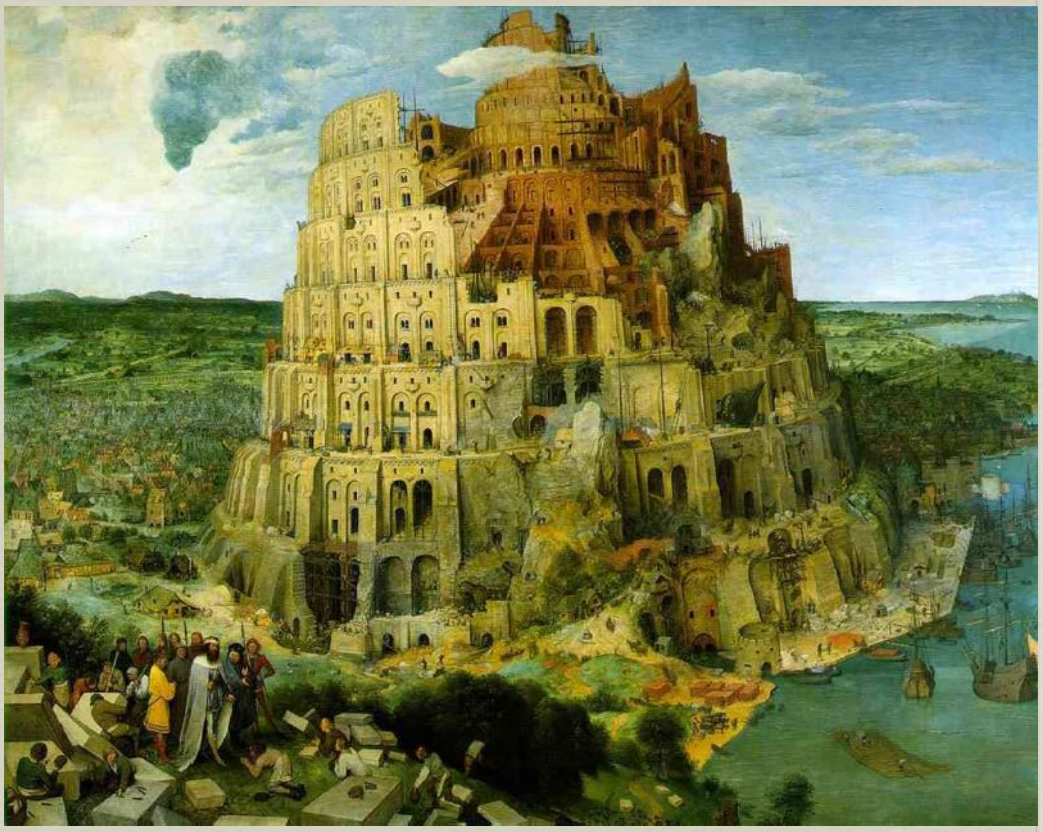
IV Divisione Chirurgica Ospedale Regionale Treviso

Centro Regionale Chirurgia epato-bilio-pancreatica

Direttore: Prof. N. Bassi

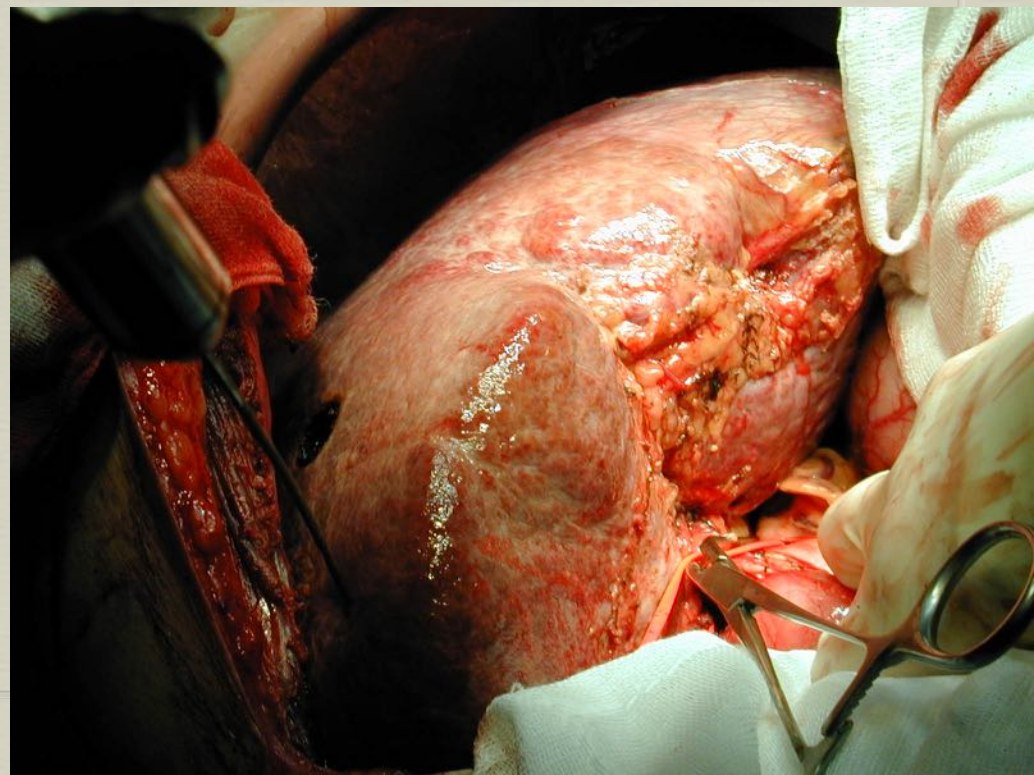
Quali terapie ablative

- Radiofrequenza
- Microonde
- Crioablazione
- Laser
- Focused US



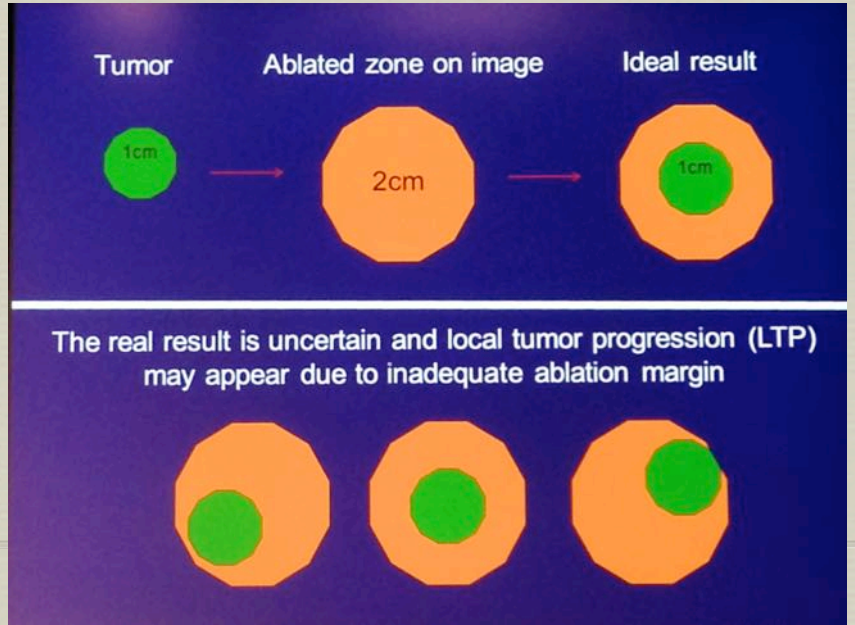
Quali lesioni si possono trattare?

- HCC
- CCH
- Metastasi
- Neoplasie benigne



La letteratura

- Molte esperienze sul trattamento dell'epatocarcinoma
- Indicazione quando la lesione è minore 3 cm (anche se plurifocale)
- Esperienze con risultati molto discordanti



Metastasi

- Colon retto
- Mammella
- Colangiocarcinoma
- Stomaco
- GIST
- NET

Colon-retto

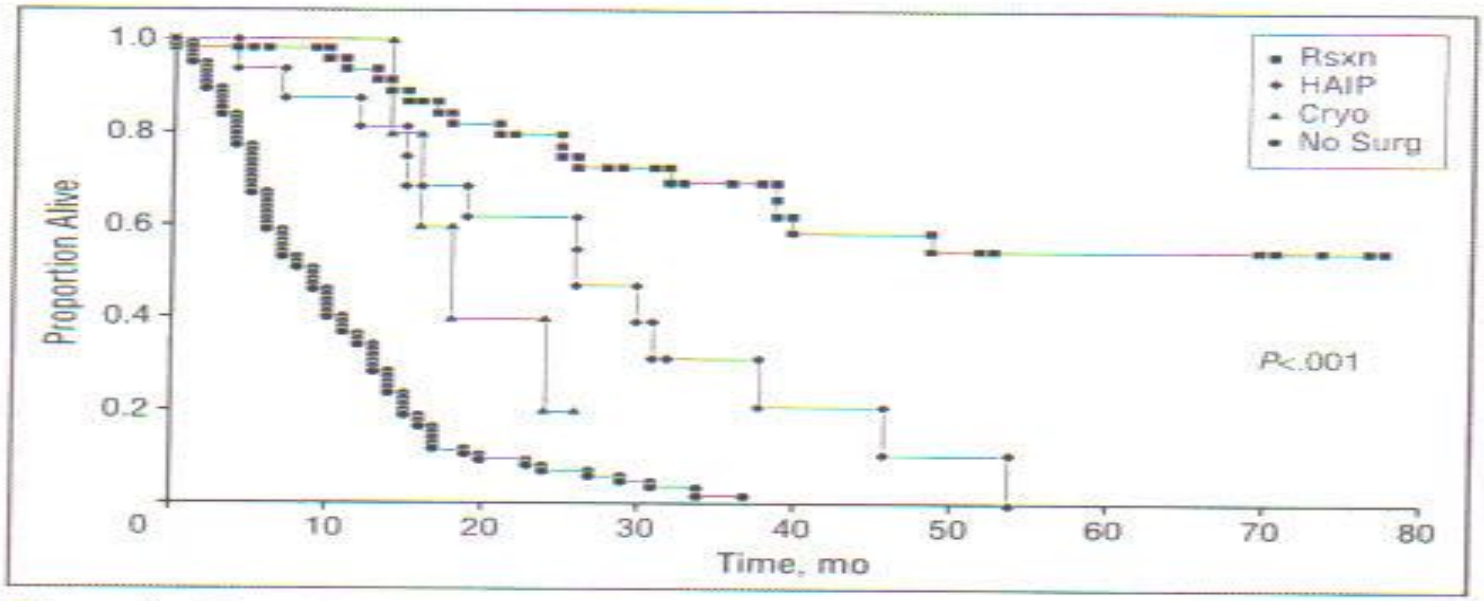


Figure 1. *Overall survival by procedure performed in all patients (N=174). For hepatic resection (Rsxn), n=52; hepatic artery infusion pump (HAIP), n=16; cryotherapy (Cryo) n=5; and no definitive hepatic surgery (No surg), n=101 (P<.001).*

Cosa ci dicono i Radiologi?

Eur Radiol (2009) 19: 1206–1213
DOI 10.1007/s00330-008-1258-5

A. R. Gillams
W. R. Lees

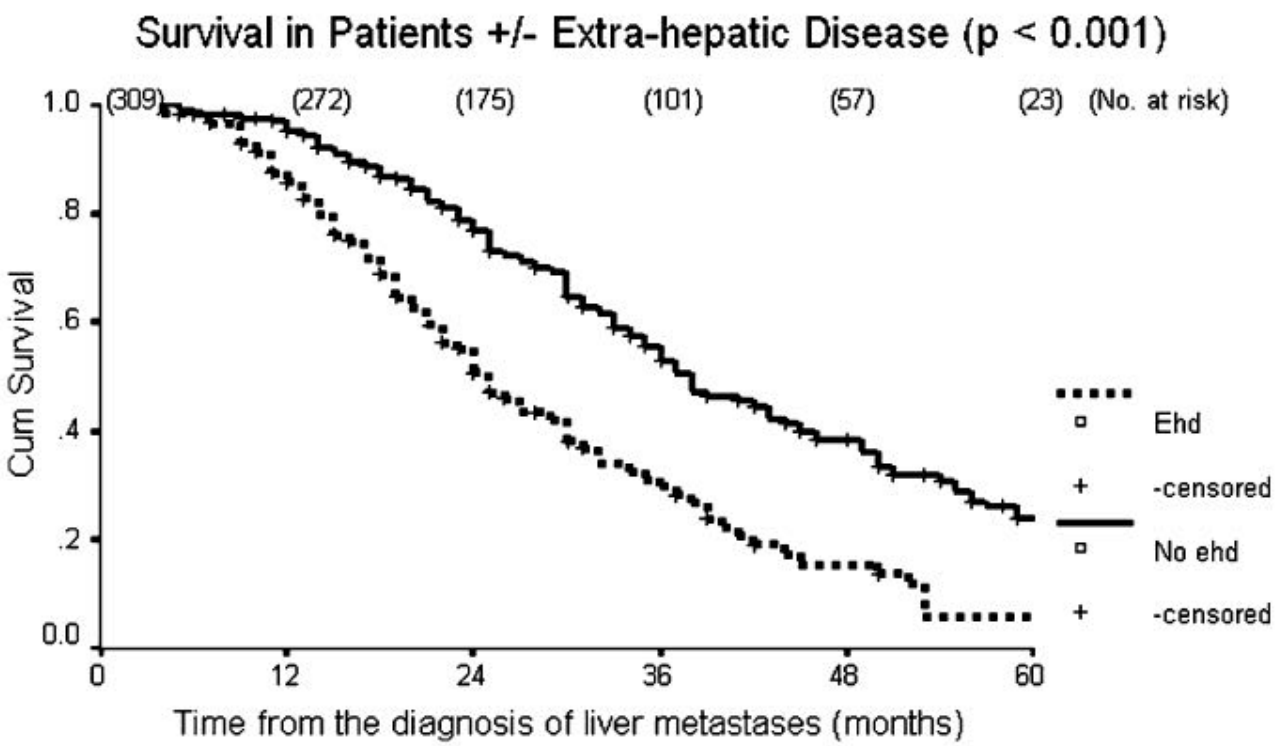
Five-year survival in 309 patients with colorectal liver metastases treated with radiofrequency ablation

Table 1 Univariate survival analysis

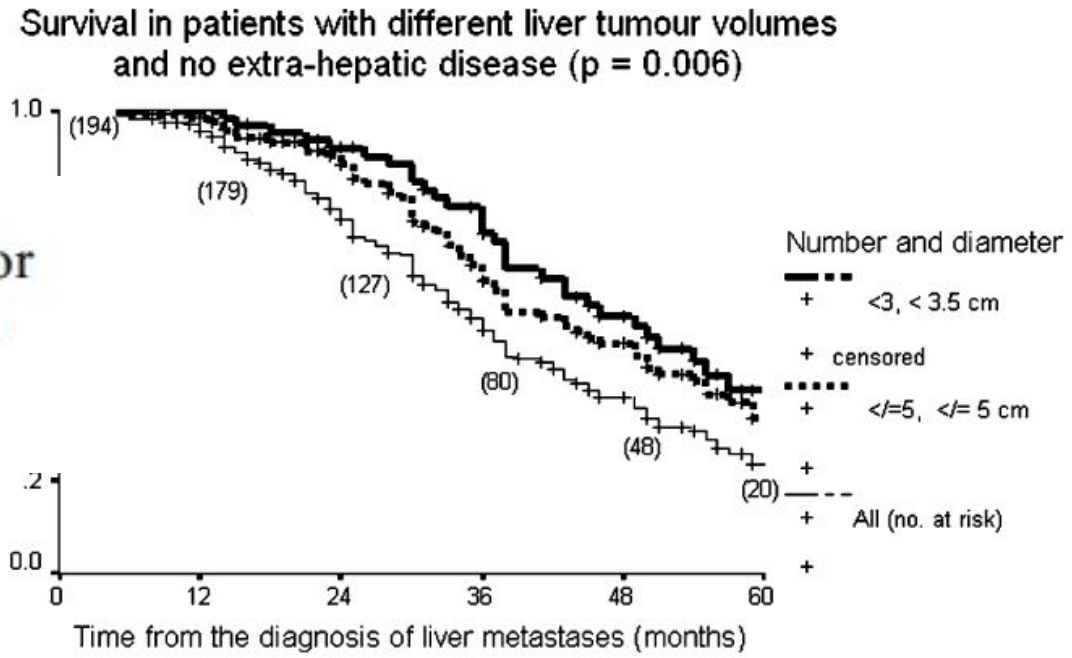
Variable	From diagnosis of liver metastases				From time of ablation			
	Median (months)	3-year (%)	5-year (%)	*p*	Median (months)	3-year (%)	5-year (%)	*p*
No. and size of liver metastases (*n*=309)								
Five or less of ≤ 5 cm (*n*=192)	39	58	26	0.000	28	40	18	0.000
More than five and/or > 5 cm (*n*=117)	25	29	5		14	13	3	
Extrahepatic disease (*n*=309)								
Yes (*n*=115)	25	30	6	0.000	14	10	2	0.000
No (*n*=194)	38	55	24		28	39	17	
Type of extrahepatic disease (*n*=105)								
Pulmonary metastases (*n*=20)	32	44	11	0.07	26	10	0	
Other with or without pulmonary metastases (*n*=85)	22	26	3		12	11	0	0.01
Dukes' stage (*n*=209)								
B (*n*=54)	39	60	28	0.05	29	35	24	0.13
C (*n*=155)	33	47	14		22	34	8	
Type of chemotherapy (238)								
None (17)	36	51	0	0.027	31	29	0	0.2(
5 FU (57)	26	32	6		18	19	0	
Oxaliplatin and/or irinotecan (142)	32	44	17		18	27	8	
Cetuximab or Avastin (22)	55	87	31		38	59	15	
Prior liver resection (*n*=309)								
Yes (*n*=48)	55	72	49	0.000	37	52	35	0.002
No (*n*=261)	31	39	11		21	25	9	
Year of treatment (*n*=309)								
1997–2000 (*n*=79)	40	38	14	0.44	22	23	9	0.48
2001–2004 (*n*=142)	35	50	19		24	36	14	
2005–2007 (*n*=88)	34	45	21		20			
Site of primary lesion (*n*=>264)								
Rectum (*n*=95)	32	42	19	0.76	21	26	14	0.76
Left colon (n=118)	34	40	17		26	31	11	
Right colon (*n*=51)	39	53	11		21	43	13	
Timing of liver metastases relative to the primary diagnosis (*n*=272)								
≤ 6 months (*n*=186)	33	45	23	0.2	22	33	14	0.84
> 6 months (*n*=86)	31	39	10		25	28	13	

Table 2 Results of multivariate analysis

Variable	From diagnosis of liver metastases		From time of ablation	
	p	Hazard ratio (95% confidence intervals)	*p*	Hazard ratio (95% confidence intervals)
No. and size of liver metastases (five or less of ≤ 5 cm vs. more than five or >5 cm)	0.002	1.8 (1.2–2.8)	0.001	1.9 (1.3–2.9)
Extrahepatic disease	0.000	2.4 (1.6–3.7)	0.000	2.7 (1.8–4.1)
Dukes' stage	0.17	1.4 (0.9–2.1)	0.37	1.2 (0.8–1.9)
Type of chemotherapy	0.037	0.7 (0.6–1.0)	0.53	0.9 (0.7–1.2)
Prior liver resection	0.019	0.5 (0.3–0.9)	0.55	0.8 (0.5–1.5)



Five-year survival of 24–33% post ablation in selected patients is superior to any published chemotherapy data and approaches the results of liver resection.



Radiol med (2012) 117:1139–1151
DOI 10.1007/s11547-012-0803-3

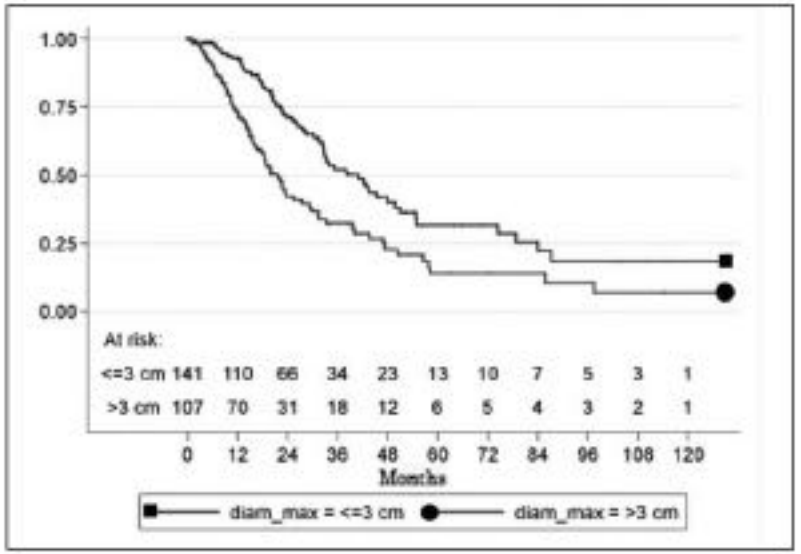
ABDOMINAL RADIOLOGY
RADIOLOGIA ADDOMINALE

Long-term outcome of radiofrequency thermal ablation (RFA) of liver metastases from colorectal cancer (CRC): size as the leading prognostic factor for survival

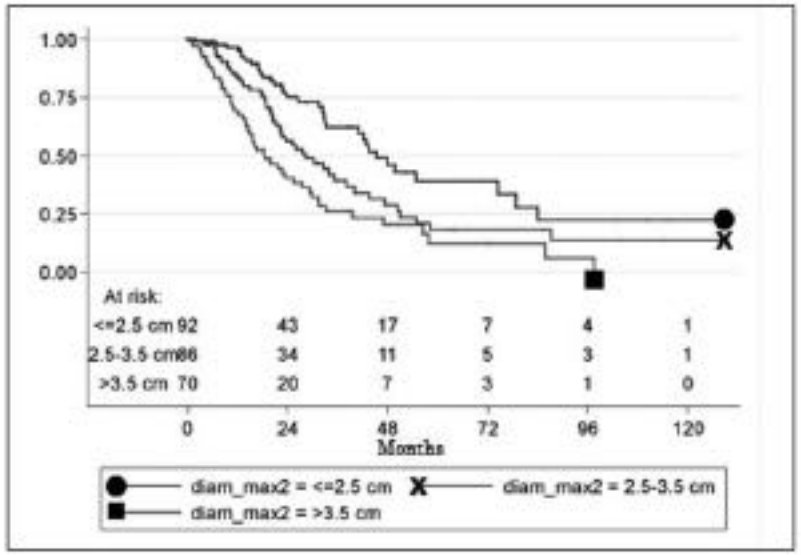
Risultati a lungo termine della termoablazione con radiofrequenza di metastasi epatiche da carcinoma colo-rettale (CRC): le dimensioni confermano il primo fattore prognostico

A. Veltri[1] · T. Guarnieri[1] · C. Gazzera[2] · M. Busso[1] · F. Solitro[1] · G. Fora[3] · P. Racc

Materials and methods. From 1996 to 2009, 262 patients with metastases from CRC were treated with RFA. Fourteen were lost to follow-up. The following predictors were analysed in the remaining 248: synchronous/metachronous metastases, single/multiple metastases, diameter of largest metastasis and absence/presence of extrahepatic metastases. Survival was measured from the date of metastasis diagnosis and from the date of RFA.



Conclusions. In light of our long-term results obtained with commonly used equipment, small lesion size (diameter of largest lesion ≤3 or 2.5 cm) proved to be the most favourable prognostic factor for survival in patients



Radiology

Small Liver Colorectal Metastases Treated with Percutaneous Radiofrequency Ablation: Local Response Rate and Long-term Survival with Up to 10-year Follow-up[1]

Luigi Solbiati, MD
Muneeb Ahmed, MD
Luca Cova, MD
Tiziana Ierace, MD
Michela Brioschi, MD
S. Nahum Goldberg, MD

Radiology: Volume 265: Number 3—December 2012

Figure 1

Study Inclusion Criteria	Criteria to Determine Resectability
• Diagnosed with primary colorectal cancer with hepatic metastases	• Unfavorable location (contiguity with at least two hepatic veins, the inferior vena cava, or the hepatic hilum) *n* = 17, 17.1%
• Maximum diameter of any hepatic metastasis < 4.0 cm	• Potentially resectable but would require large and/or difficult surgery *n* = 20, 20.2%
• Fewer than eight separate hepatic metastases	• Age and/or severe comorbidities *n* = 18, 18.2%
• Each treated metastasis >1 cm away from hepatic hilum, gallbladder, or bowel wall	• NM or LTP after surgical resection *n* = 18, 18.2%
• No extrahepatic tumors (exception: oligonodular [fewer than three and <3 cm] lung metastases)	• Extrahepatic disease *n* = 7, 7.1%
• Minimum of 3-year follow-up after first RF ablation	• Patients with resectable tumors but refused surgery *n* = 19, 19.2%
• Patients either ineligible for surgery or refused surgery	

Figure 1: Study inclusion criteria and criteria for determining resectability of colorectal liver metastases.

Figure 2

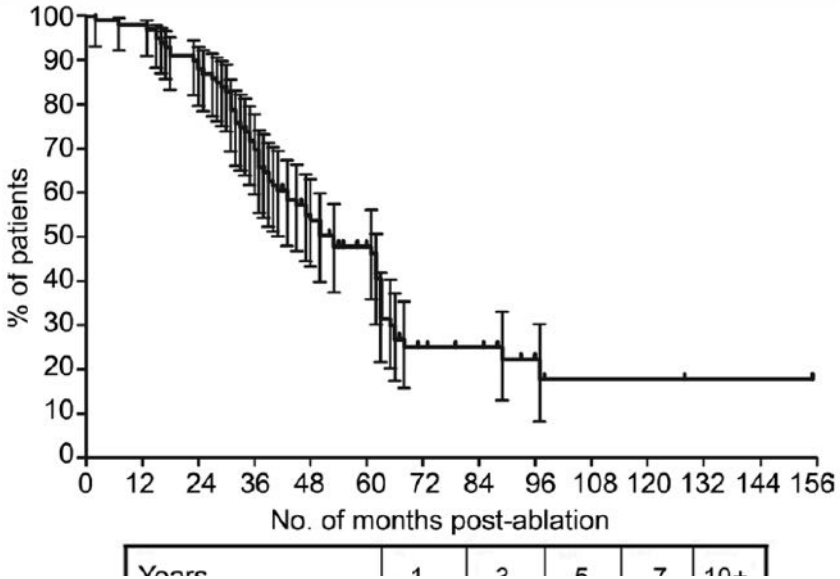


Figure 3

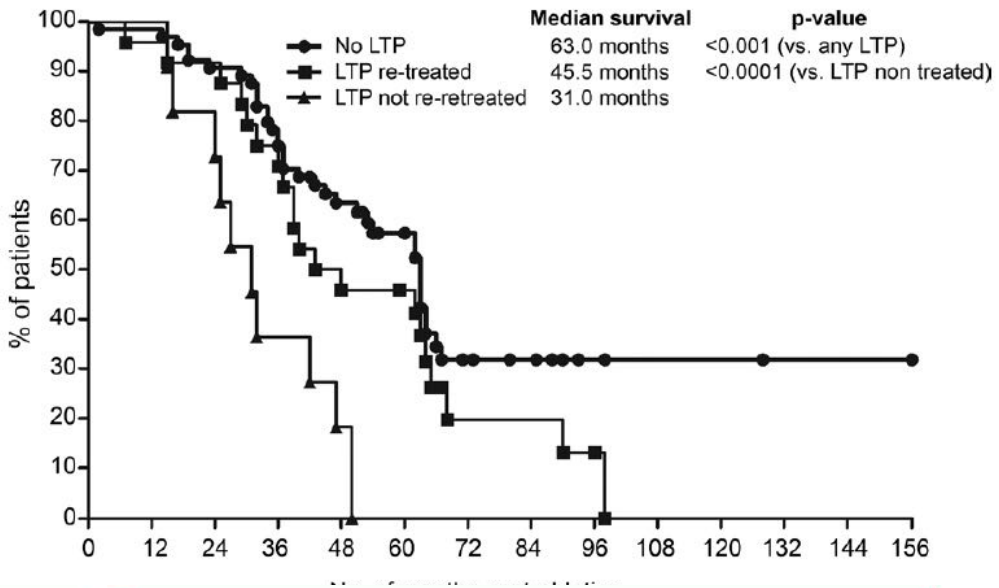
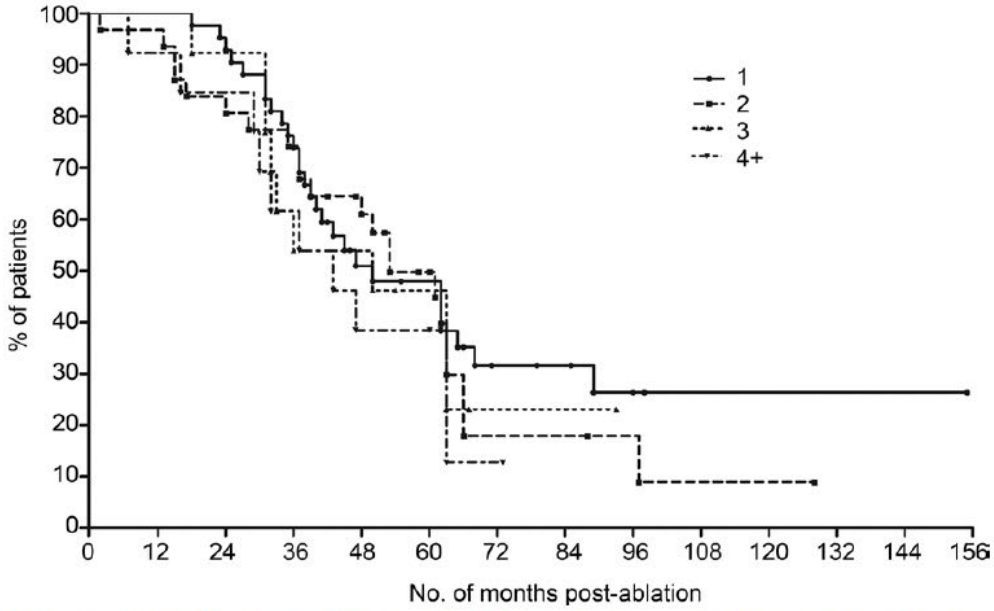


Figure 6



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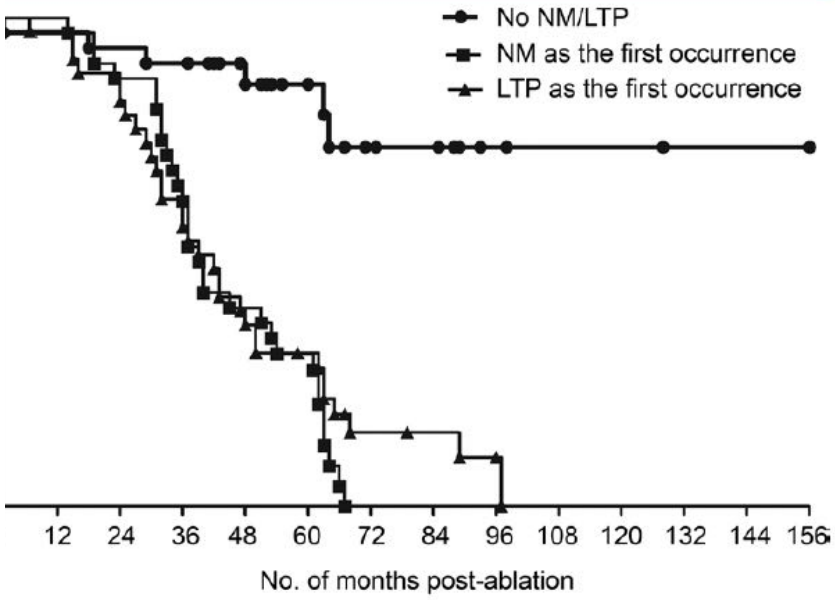
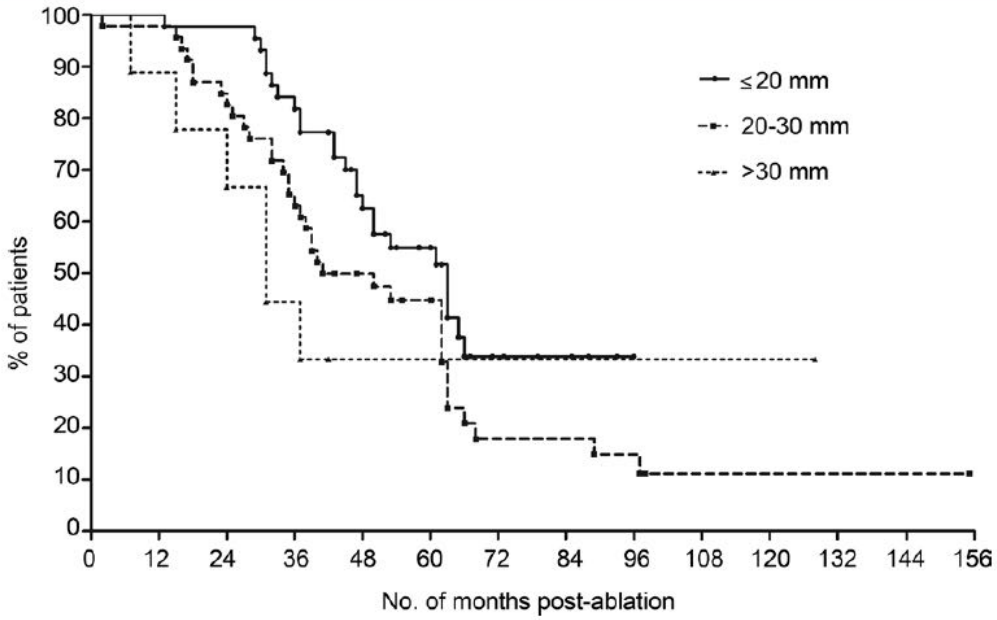


Figure 6: Kaplan-Meier curves show overall survival stratified by number of metastases *(1, 2, 3, 4+)* at time of initial RF ablation. Overall survival was not significantly related to number of metastases ($P = .72$).

Figure 7



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sults from surgical resection. These findings highlight improvements in ablation outcomes compared with early series and the viability of RF ablation as an alternative treatment in the large number of patients who are ineligible for surgical resection, which underscores the need to incorporate the routine use of ablative therapies into treatment paradigms for hepatic colorectal metastases.

Table 4

Incidence of Major and Minor Complications in 156 Treatment Sessions

Type of Procedure-related Complications	No. of Events
Major adverse events	2/156 (1.3)
Bowel perforation (successfully surgically repaired)	1
Intrahepatic hematoma (5 cm), hospitalization but no intervention required	1
No deaths	0
Minor adverse events	16/156 (10.3)
Small intraperitoneal or perihepatic hematoma	2
Pleural effusion	2
Fever	8
Malaise	4

Note.—Data were calculated with National Cancer Institute Common Terminology Criteria for Adverse Events, version 4.0; numbers in parentheses are percentages.

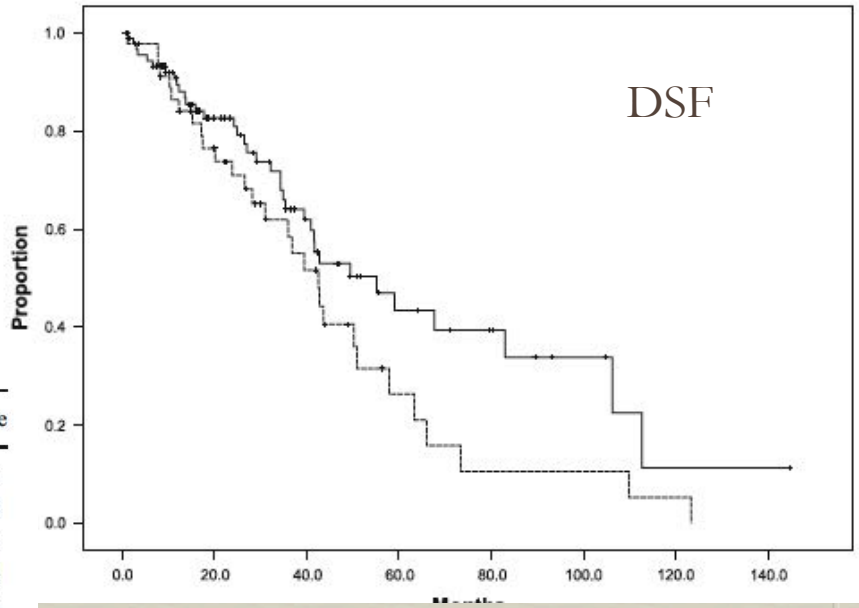
Ed i chirurghi?

J Gastrointest Surg (2010) 14:1881–1887
DOI 10.1007/s11605-010-1339-z

2010 SSAT PLENARY PRESENTATION

Hepatectomy is Superior to Thermal Ablation for Patients with a Solitary Colorectal Liver Metastasis

Suzanne Claire Schiffman · Matthew Bower · Russell E. Brown · Robert C. G. Martin · Kelly M. McMasters · Charles R. Scoggins



	Ablation	Hepatic Resection	*p* value
Gender	53.3% male	50.5% male	0.632
Age	62.1 years	60.6 years	0.992
Preoperative chemotherapy	60.00%	57.90%	0.702
Liver tumor size	3.9 cm	5.6 cm	0.004
CRC tumor nodal status (N1)	53.30%	62.10%	0.368
CRC tumor depth			0.11
T1	0	2	
T2	2	9	
T3	38	73	
T4	3	9	
Unknown	2	2	
Metastatic diagnosis (synchronous)	42.20%	48.10%	0.627

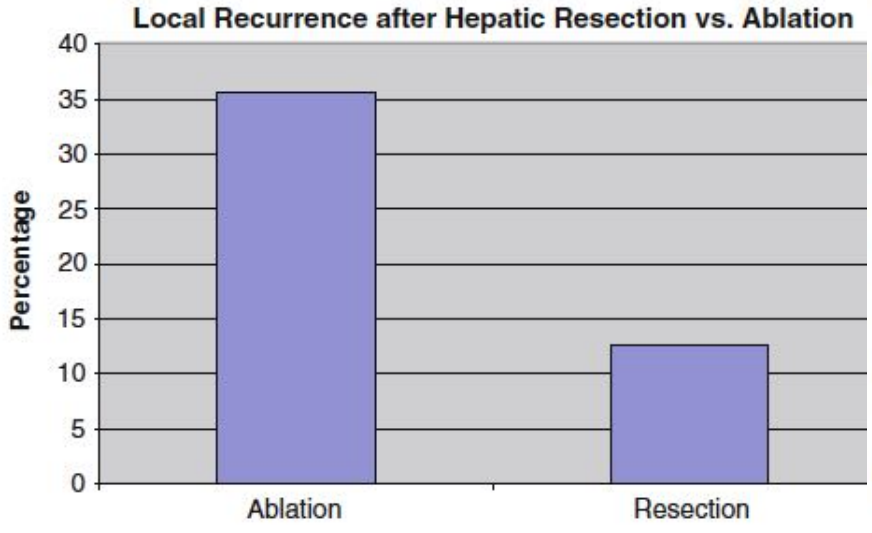
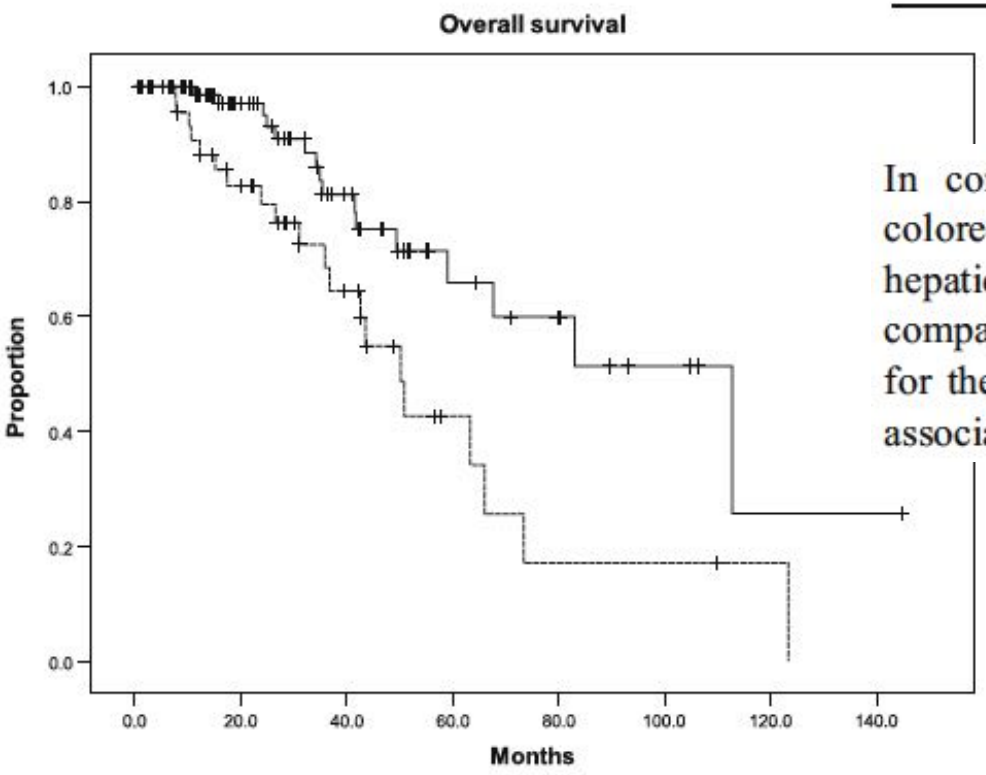


Table 3 Predictors of recurrence

Factor	Univariate *p* value
Treatment type (RFA vs resection)	0.07
Liver tumor size	0.092
CRC nodal status (N1)	0.20
Age	0.557
Gender	0.544
T stage	0.663
Primary location	0.910
Margin	0.569
Preoperative chemotherapy	0.749



In conclusion, suitable patients with solitary hepatic colorectal cancer metastases should be considered for hepatic resection as this provides superior survival when compared to thermal ablation. The present study advocates for the aggressive resection of solitary mCRC, as RFA is associated with a shorter DFS and OS.

ORIGINAL ARTICLE

HPB 2013, 15, 119–130

Locoregional surgical and interventional therapies for advanced colorectal cancer liver metastases: expert consensus statements

Eddie K. Abdalla[1], Todd W. Bauer[2], Yun S. Chun[3], Michael D'Angelica[4], David A. Kooby[5] & William R. Jarnagin[4]

[1]Department of Surgery, Lebanese American University, Beirut, Lebanon, [2]Department of Surgery, University of Virginia Health System, Charlottesville, VA, USA, [3]Department of Surgical Oncology, Fox Chase Cancer Center, Philadelphia, PA, USA, [4]Department of Surgery, Memorial Sloan–Kettering Cancer Center, New York, NY, USA and [5]Department of Surgery, Emory University School of Medicine, Atlanta, GA, USA

Ablation strategies including radiofrequency ablation, microwave ablation and external beam radiotherapy

Comparisons between RFA and resection have generally been limited to retrospective series that have attempted to match patients. These retrospective comparative studies have shown substantially higher local recurrence rates for RFA (16–60% versus 0–24%) and better longterm survival in resected patients.[102–104]

Consensus statements

1 Ablation strategies are inadequately studied and plagued by high local failure rates, and are limited by tumour size, tumour multiplicity and location, and thus are not recommended as first-line treatments for resectable CRLM.
2 Ablation strategies play a role in highly selected patients with small, appropriately located tumours when resection is not feasible or safe, but should be considered as second-line locoregional therapy to hepatic resection.
3 Prospective trials comparing ablative techniques or comparing resection with ablation in well-defined patients are needed to define the role of ablation in the treatment of CRLM in the future.

REVIEW

Gut and Liver, Vol. 7, No. 1, January 2013, pp. 1-6

…..gli altri specialisti….

Radiofrequency Ablation of Liver Metastases from Colorectal Cancer: A Literature Review

Yasunori Minami and Masatoshi Kudo

Department of Gastroenterology and Hepatology, Kinki University Faculty of Medicine, Osaka, Japan

Table 1. Local Tumor Progression Rate and Survival after Radiofrequency Ablation for Liver Metastases

Author (yr)	Origin	No.	Tumor size, mean, cm	Follow-up period, mean, mo	Local progression, %	Survival, %
Livraghi *et al.* (2003)[24]	C&R	88	2.1	33	40	-
Oshowo *et al.* (2003)[25]	C&R	25	-	-	-	53 (3-yr)
Abdalla *et al.* (2004)[26]	C&R	57	2.5	-	-	22 (3-yr)
Berber et al. (2005)[27]	C&R	135	4.1	-	-	36 (4-yr)
Aloia *et al.* (2006)[28]	C&R	27	3.0	50	31	27 (5-yr)
Machi *et al.* (2006)[29]	C&R	507	-	24.5	-	30.5 (5-yr)
Abitabile *et al.* (2007)[30]	C&R	147	-	33	8.8	57 (3-yr)
White *et al.* (2007)[23]	C&R	22	2.4	17	55	25 (3-yr)
Park *et al.* (2008)[31]	C&R	30	2.0	49	23	20 (5-yr)
Lee *et al.* (2008)[32]	C&R	37	-	-	-	48.5 (5-yr)
Reuter *et al.* (2009)[33]	C&R	66	3.2	-	17	21 (5-yr)
Gillams *et al.* (2009)[34]	C&R	309	3.7	-	-	34 (5-yr)
Knudsen *et al.* (2009)[35]	C&R	36	2.1	27	-	34 (3-yr)

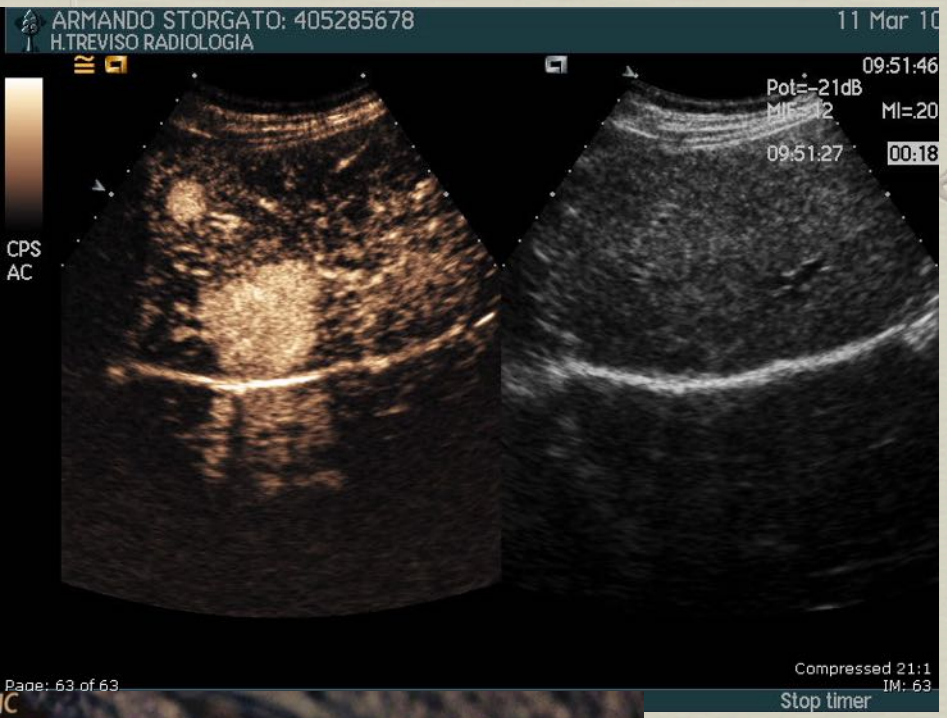
C&R, colon and rectum.

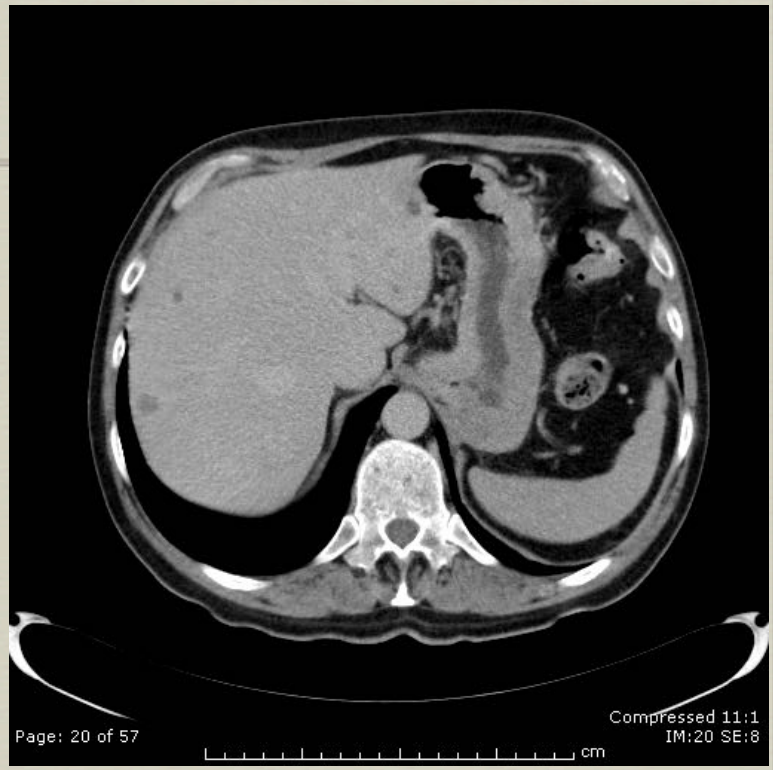
Table 2. Survival Rates Associated with RFA versus Hepatic Resection for Liver Metastases

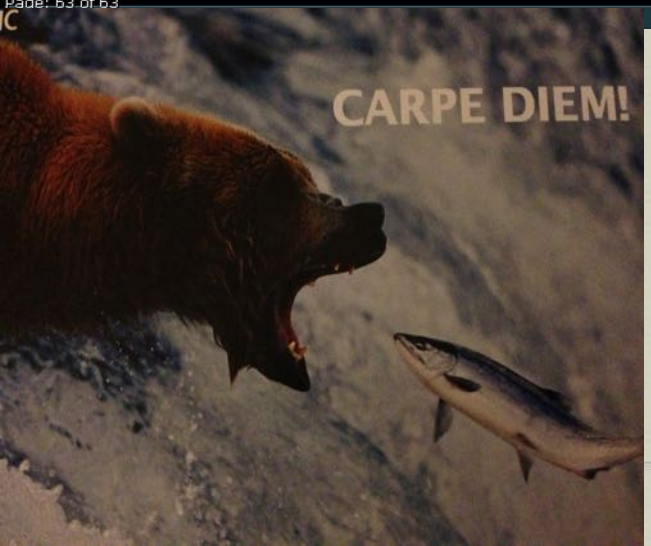
Author (yr)	No., RFA/resection	Mean tumor size, RFA/resection, cm	Overall survival, RFA vs resection, %	p-value
White *et al.* (2007)[23]	22/30	2.4/2.7	25 vs 82 (3-yr)	-
Oshowo *et al.* (2003)[25]	25/20	-/-	53 vs 55 (3-yr)	NS
Abdalla *et al.* (2004)[26]	57/190	2.5/-	22 vs 65 (3-yr)	<0.001
Aloia *et al.* (2006)[28]	27/147	-	27 vs 71 (5-yr)	<0.001
Park *et al.* (2008)[31]	30/59	2.0/3.1	20 vs 42 (5-yr)	0.0002
Lee *et al.* (2008)[32]	37/116	-	48.5 vs 65.7 (5-yr)	0.227
Reuter *et al.* (2009)[33]	66/126	3.2/5.3	21 vs 23 (5-yr)	NS

RFA, radiofrequency ablation; NS, not significant.

Noi ci comportiamo cosi….

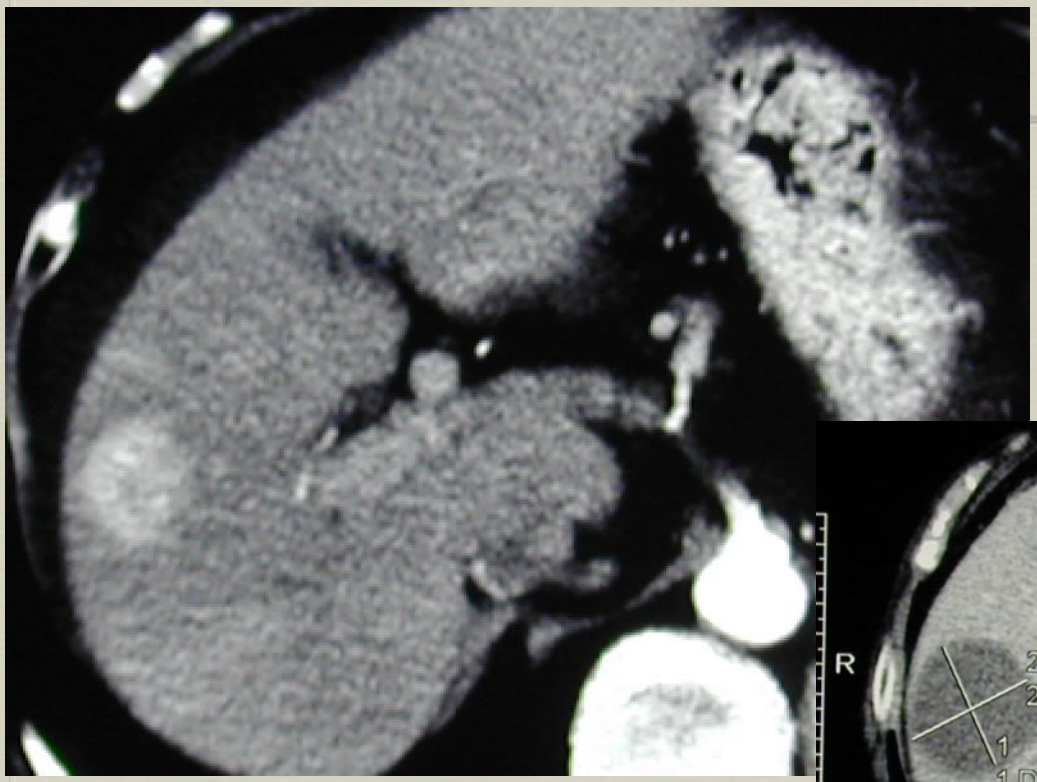


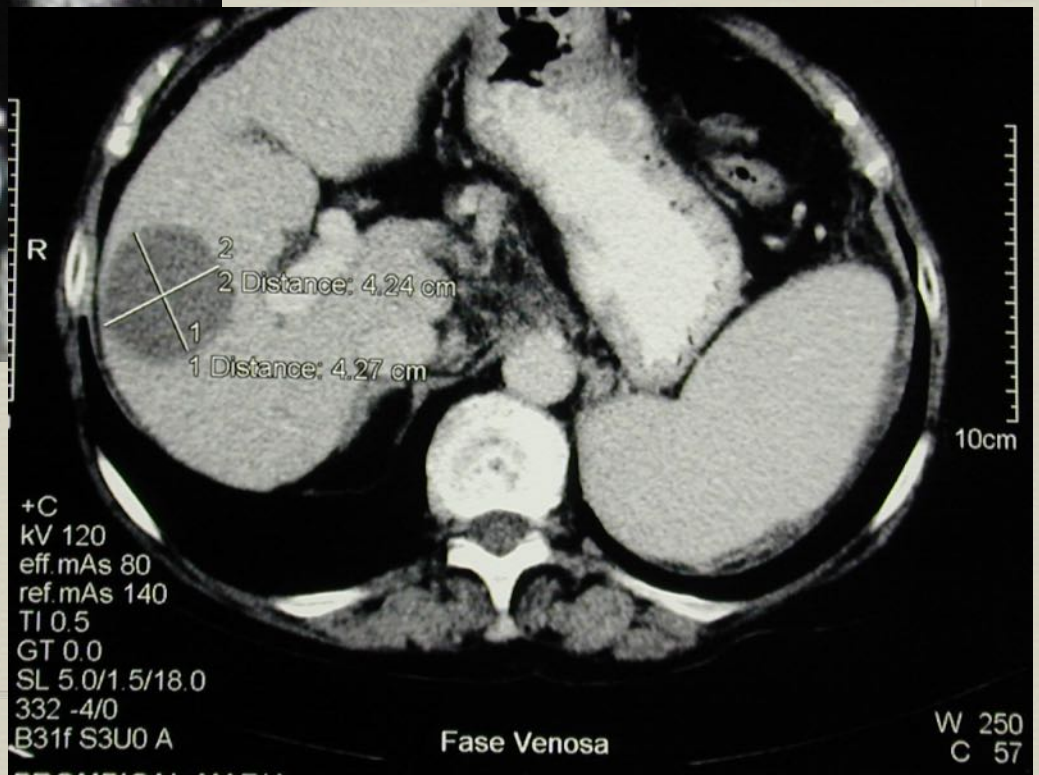




All'ecointra-operatoria riscontro di lesione di ca 1 cm tra segmenti 4 e 8, si decide pertanto di eseguire duplice resezione lesioni 4° e 7° e <u>RF della lesione cavallo 4/8</u>

Metastasi non resecabile per comorbidità maggiori





Ruolo ablazione nelle metastasi non colo-rettali

Thermal ablation therapies in patients with breast cancer liver metastases: A review

Eur Radiol (2013) 23:797–804

Thomas J. Vogl · Parviz Farshid · Nagy N. N. Naguib · Stephan Zangos

Table 1 The impact of RFA therapy in patients with liver metastases from breast cancer

Author/year	No. of patients	Local response (%)	Median survival (Month)	Survival rate (%)			Survival from the first RFA	Progression rate (%)
				1 year	3 years	5 years		
Livraghi et al. 2001 [27]	24	63	-	-	-	-	Not stated, 63 % at 4–44 months	58
Lawes et al. 2006 [28]	19	63.2	-	-	-	-	41 % at 30 months	15.8
Gunabushanam et al. 2007 [29]	14	88	-	-	-	-	64 % at 12 months	29
Sofocleous et al. 2007 [30]	12	-	60	-	70	30	-	-
Meloni et al. 2009 [31]	52	97	29.9	-	-	27	-	25
Jakobs et al. 2009 [32]	43	85	58.6	-	-	-	-	13.5
Illing et al. 2010 [6]	164	-	30–60	-	-	-	-	-
Carrafiello et al. 2011 [33]	13	-	10.9	-	-	-	-	53.8

Ablazione per lesioni non chirurgiche, presenza malattia extra-epatica non controindicazione

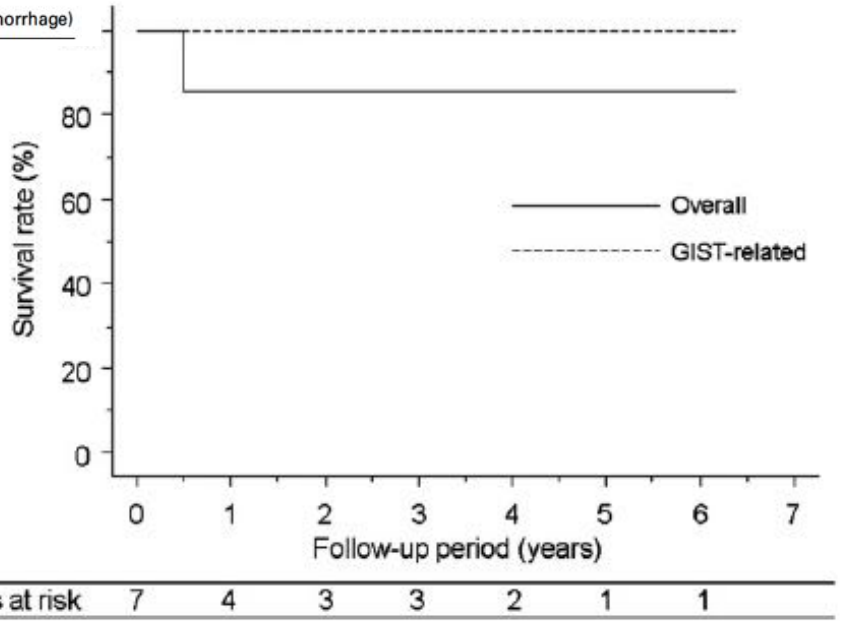
Radiofrequency Ablation for Liver Metastasis from Gastrointestinal Stromal Tumor

Takashi Yamanaka, MD, Haruyuki Takaki, MD, Atsuhiro Nakatsuka, MD, Junji Uraki, MD, Masashi Fujimori, MD, Takaaki Hasegawa, MD, Hajime Sakuma, MD, and Koichiro Yamakado, MD

J Vasc Interv Radiol 2013; 24:341–346

Table 2. Treatment Results and Clinical Outcomes after RF Ablation

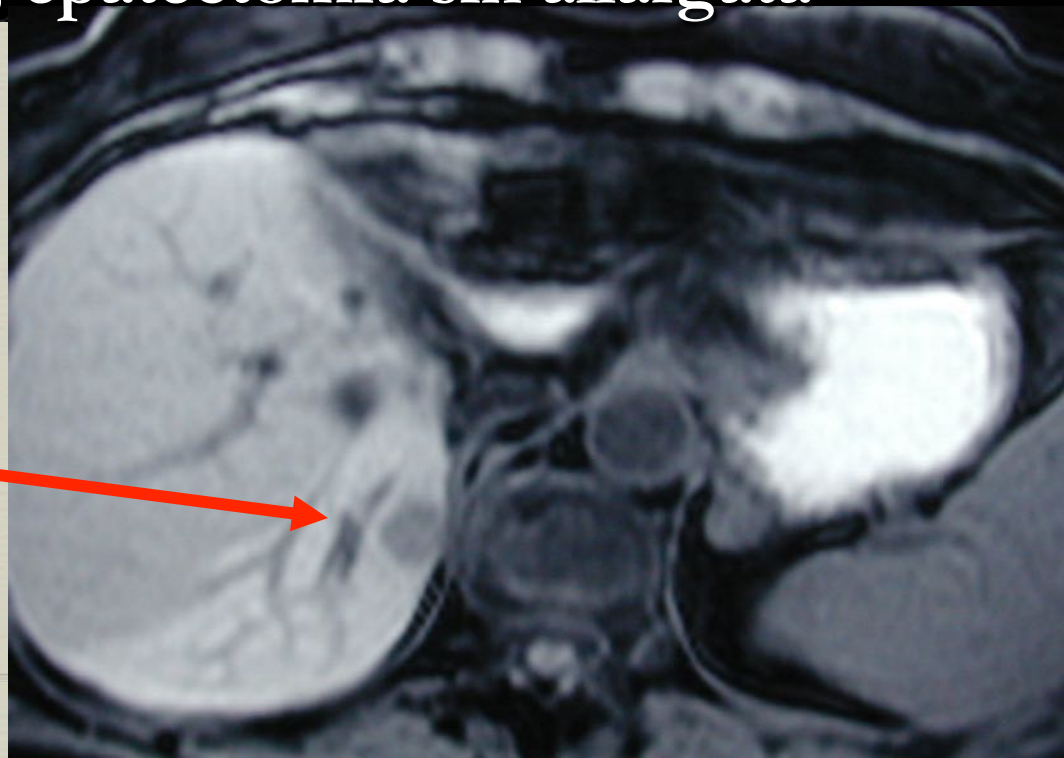
Case	RF Session No.	Complication	Imatinib Resume?	Local Tumor Progression	Distant Recurrence	Follow-up Periods (mo)	Alive/death (Cause of Death)
1	2	No	Yes	Yes	No	76.4	Alive
2	1	No	No	No	No	49.7	Alive
3	2	No	Yes	No	Lung	48.0	Alive
4	1	No	Yes	No	Liver	18.8	Alive
5	2	No	No	No	No	9.8	Alive
6	3	No	Yes	No	No	6.0	Alive
7	1	No	No	No	No	5.9	Death (subarachnoid hemorrhage)



Radiofrequency ablation of liver metastases from cancer of unknown primary site

Colangio lobo sin, epatectomia sin allargata

Ripresa di malattia



e le complicanze….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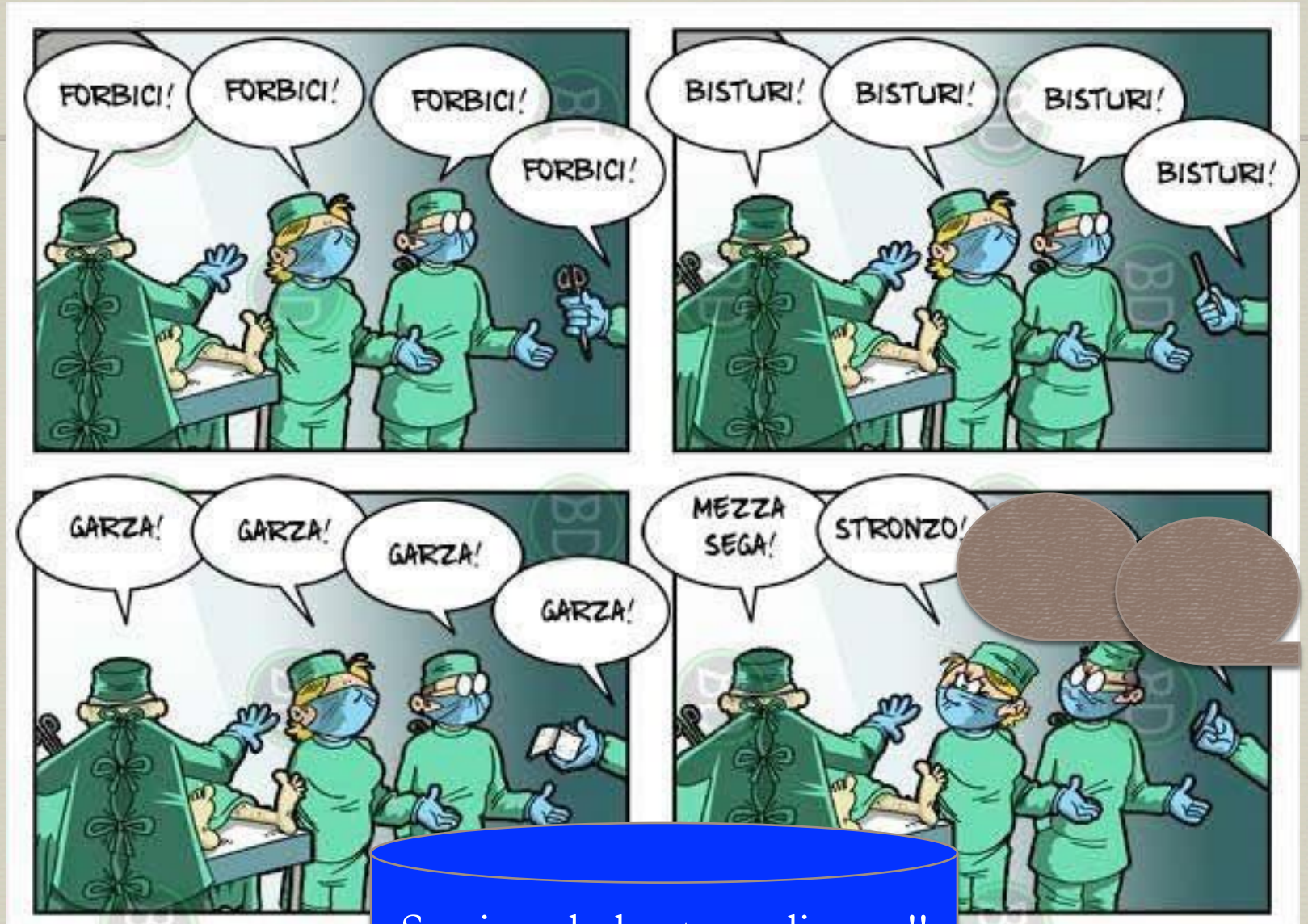
Compressed 7:1
IM: 81 SE: 17



Se si parla la stessa lingua!!

Effect of specialist decision-making on treatment strategies for colorectal liver metastases

Br J Surg 2010; 97(Suppl 5): 2

R. P. Jones[1,3], J.-N. Vauthey[6], R. Adam[7], M. Rees[4], D. Berry[5], R. Jackson[2], N. Grimes[3], S. W. Fenwick[3], G. J. Poston[3] and H. Z. Malik[3]

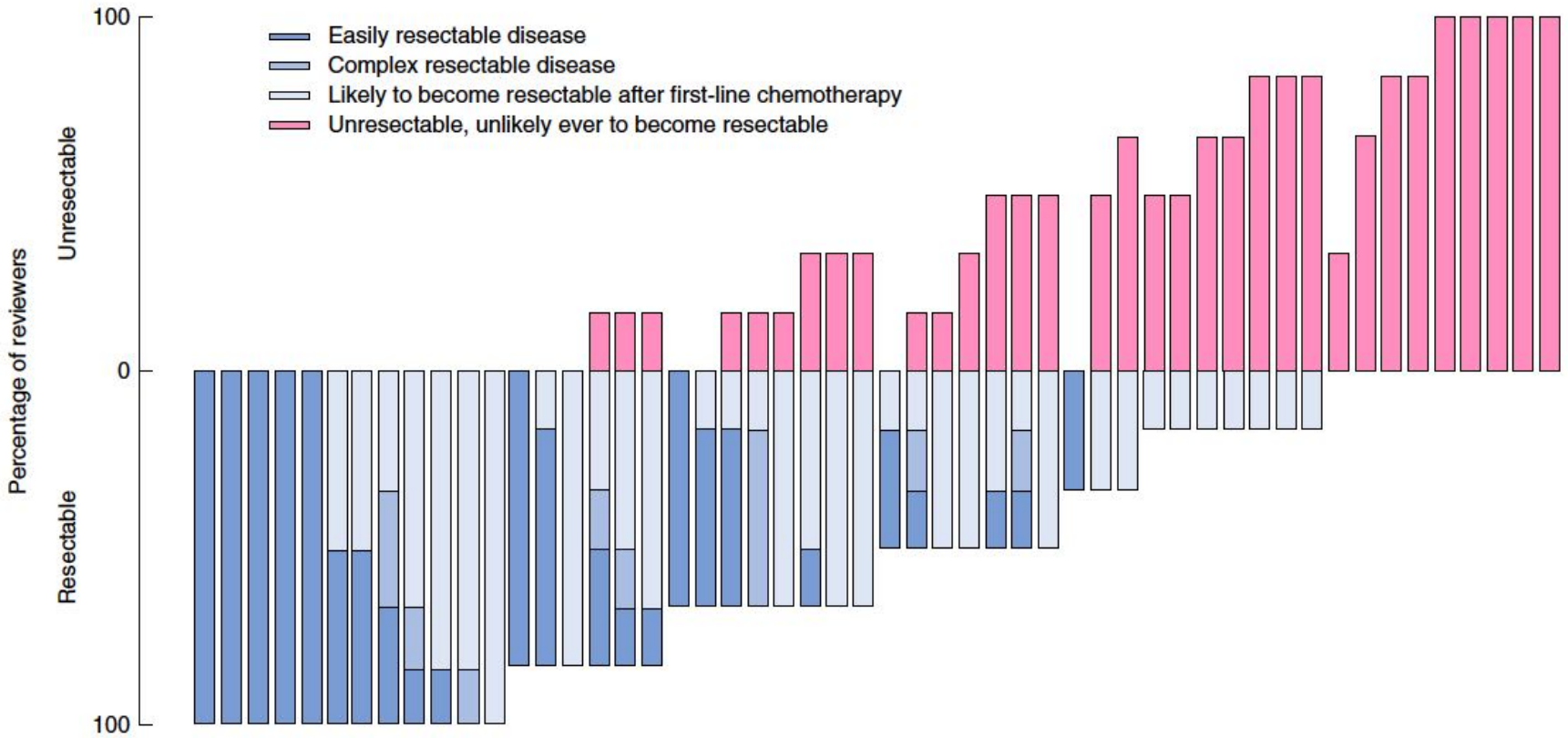


Fig. 2 Forest plot showing decisions on resectability of tumours in 52 patients. Each bar represents one patient. The percentage of reviewers who felt that the tumour was unlikely to ever become resectable (red) or to become resectable (blue) is shown. No colour coding was used when a reviewer felt unable to comment on a scan. In 33 cases (63 per cent), the majority of reviewers felt that the patient had potentially resectable liver disease

Conclusioni

- Non esiste il paziente del chirurgo, del radiologo, dell'oncologo e…… del radioterapista!!!!!!
- Non possiamo solo ragionare per linee-guida, consensus etc
- Dobbiamo discutere in
- ***sede multidisciplinare ogni caso***