



**OSPEDALI RIUNITI S. GIOVANNI DI DIO E RUGGI D'ARAGONA
AZIENDA OSPEDALIERA UNIVERSITARIA DI SALERNO**

La Città d'Ippocrate



**U. O. C. DI RADIOLOGIA VASCOLARE ED
INTERVENTISTICA**



6th Infectivology Today[®]

“6th INFEC*t*ivology T*O*day”



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Paestum, 15 maggio 2014

CHEMIOEMBOLIZZAZIONE

- INIEZIONE CONTEMPORANEA NELL'ARTERIA EPATICA DI PARTICELLE EMBOLIZZANTI E FARMACI CHEMIOTERAPICI ATTRAVERSO UN CATETERE.
- **RATIONALE:** INDURRE ISCHEMIA DEL TUMORE E CONTEMPORANEAMENTE PROLUNGARE NEL TEMPO L'AZIONE DEL FARMACO

RUOLO DEL RADIOLOGO

- L'interesse del Radiologo Interventista è focalizzato sulle terapie regionali per un gruppo di tumori epatici non resecabili localizzati al fegato (HCC, meta da ca. coloretta, melanoma, carcinoidi, etc.)
- Gli studi di Clarkson e Sullivan hanno "aperto la porta" a diverse terapie locoregionali nei tumori epatici, con **l'infusione nell'arteria epatica di farmaci antitumorali attraverso un catetere**, posizionato chirurgicamente o per via percutanea

Clarkson B, et al. Effects of continuous hepatic artery infusion of antimetabolites on primary and metastatic cancer of the liver. *Cancer* 1962.

Sullivan RD, et al. Chemotherapy of metastatic liver cancer by prolonged hepatic artery infusion. *NEJM* 1964.

- Lo scopo di queste terapie era duplice:
 - aumentare la concentrazione del chemioterapico nel tumore
 - ridurre la tossicità abbassandone la dose sistemica

HEPATIC ARTERY: the route for different concepts in locoregional treatment

- **HIAC** Intra-arterial chemotherapy: chemical damage
- **TAE** Embolization: ischemic damage
- **TACE** Chemoembolization: ischemic and chemical effects
- **SIRT** Radioembolization: internal radiation therapy

J Comput Assist Tomogr. 2000 Nov-Dec;24(6):878-83

Value of hepatic arterial phase CT versus lipiodol ultrafluid CT in the detection of hepatocellular carcinoma.

Colagrande S, Fargnoli R, Dal Pozzo F, Bindi A, Rega L, Villari N.
Department of Clinical Physiopathology, University of Firenze,
Florence, Italy.

Radiol Med. 1989 Jul-Aug;78(1-2):44-52

Lipiodol UltraFluid in the imaging diagnosis of hepatocarcinoma with cirrhosis.

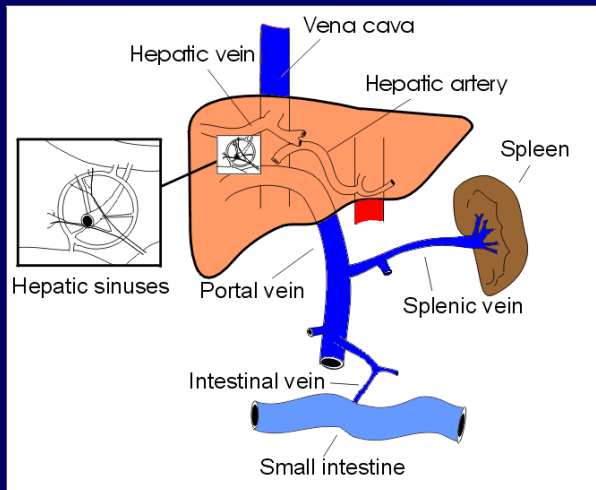
Roversi R, Ricci S, Rossi C, Gambari P, Galaverni MC, Teodorani A, Gardini G.

Istituto di Radiologia, Università, Bologna.

- AFFINITA' DEL LIPIODOL U.F. PER HCC

CIRCOLAZIONE EPATICA

- DOPPIA (arteria epatica, vena porta)
- DINAMICA
- I TUMORI EPATICI PRIMITIVI (HCC) HANNO UNA IRRORAZIONE PREVALENTEMENTE ARTERIOSA

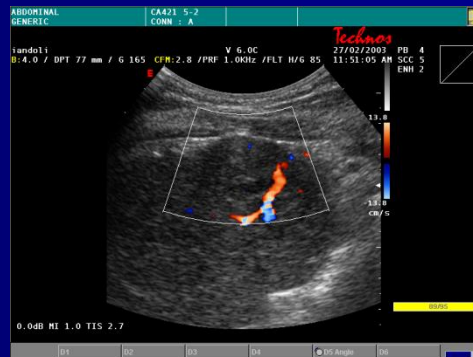
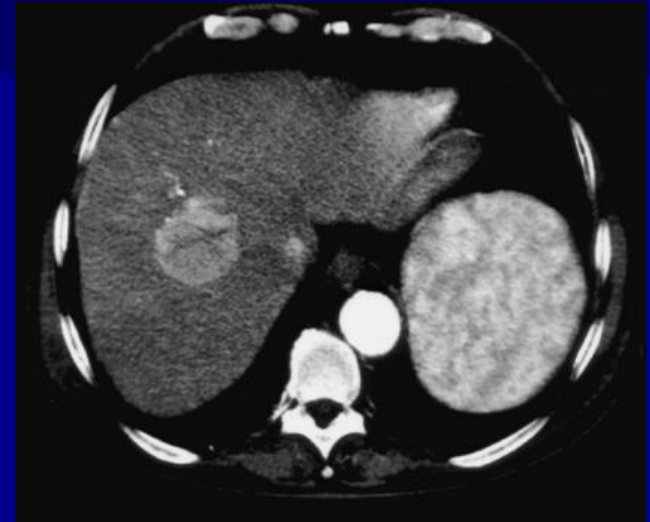


FARMACI ANTIBLASTICI

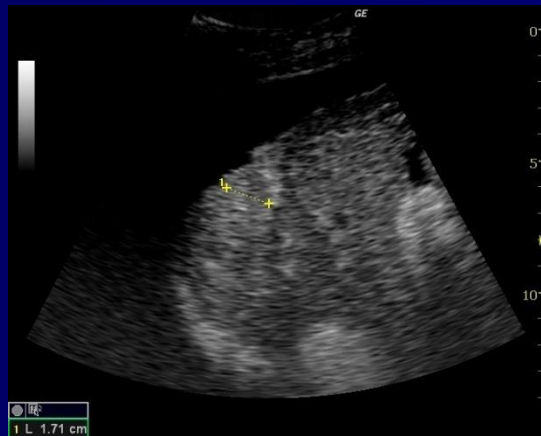
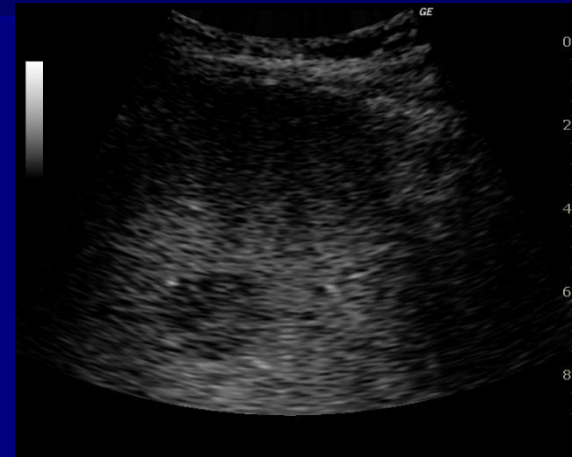
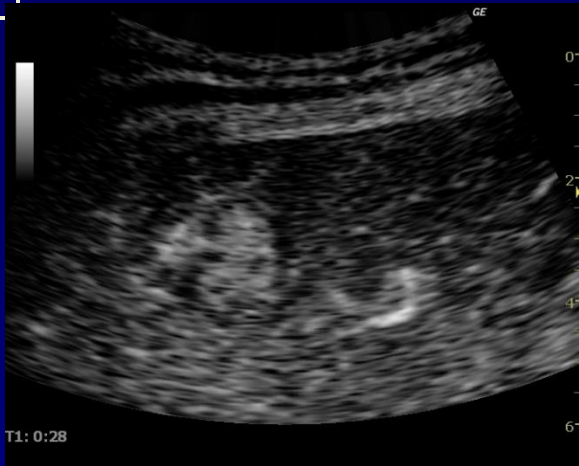
- quando iniettati in arteria epatica hanno una elevata concentrazione nel fegato rispetto alla concentrazione sistemica (high "first-pass" clearance)
- più efficaci ad alte dosi locali, con minore tossicità sistemica.
- **Doxorubicina**, cisplatino, mitomicina.

IMAGING

- ECOGRAFIA (CEUS)
- msCT
- angioRMN
- ANGIOGRAFIA : ruolo terapeutico



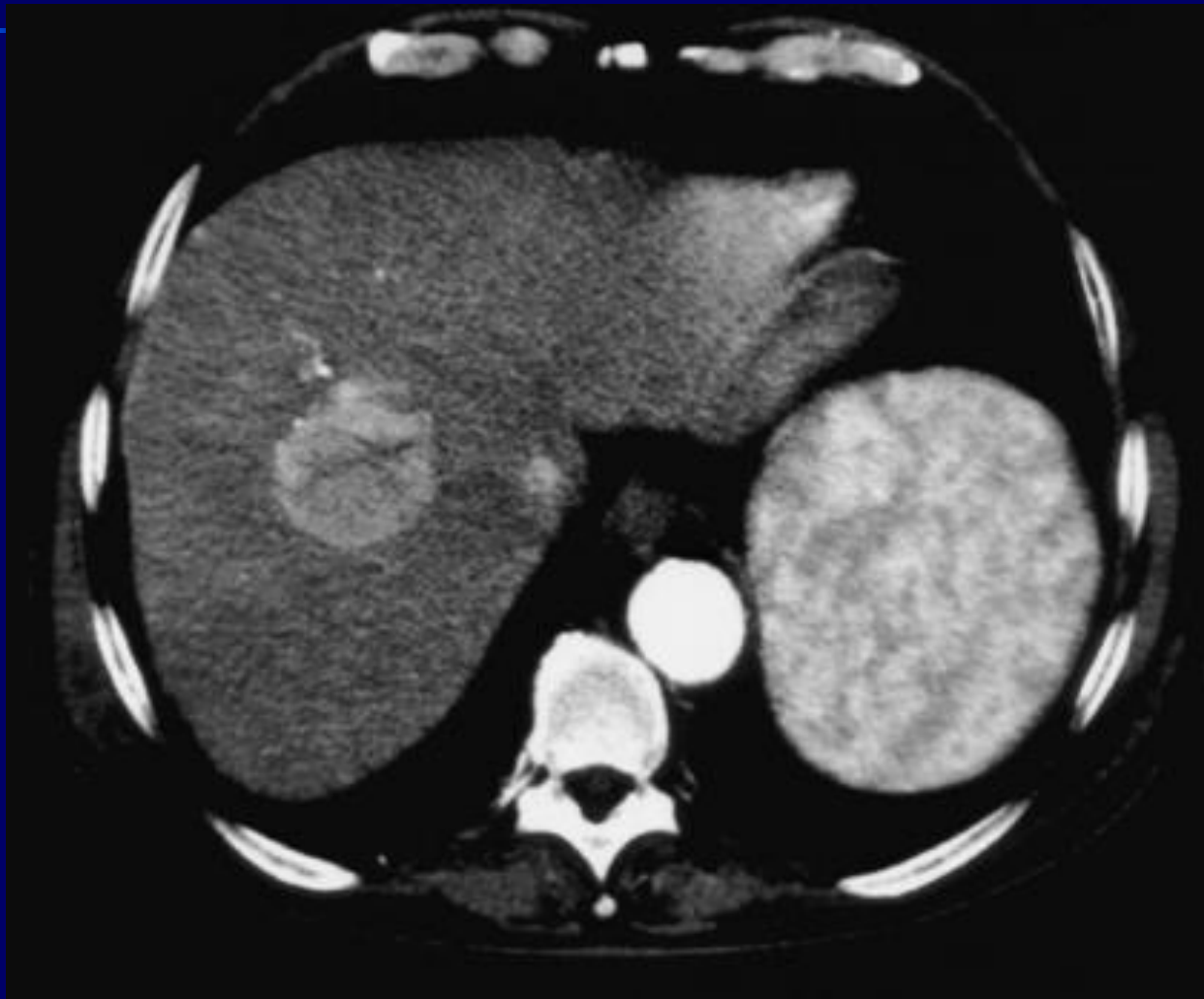
CEUS



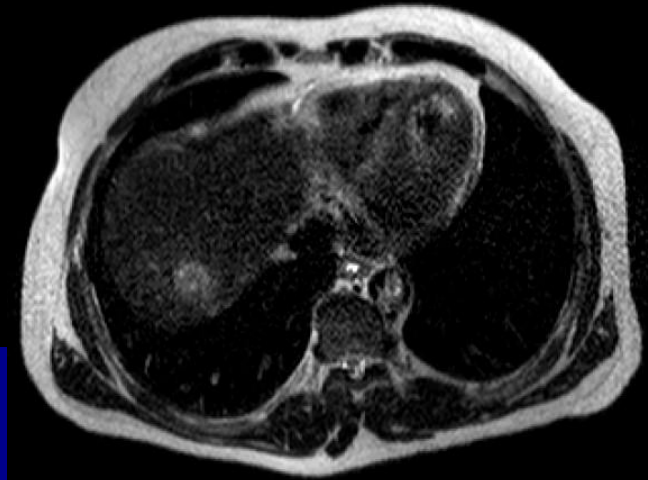
msTC

- Esame Gold standard nella diagnostica dell'HCC
- 5% degli HCC presenta calcificazioni
- Precontrasto : ipodenso rispetto al parenchima epatico
- Fase arteriosa (35 sec) : iperdenso
- Fase portale (60 sec) : ipodenso
- Fase tardiva (3-5 minuti) : iso-ipodenso

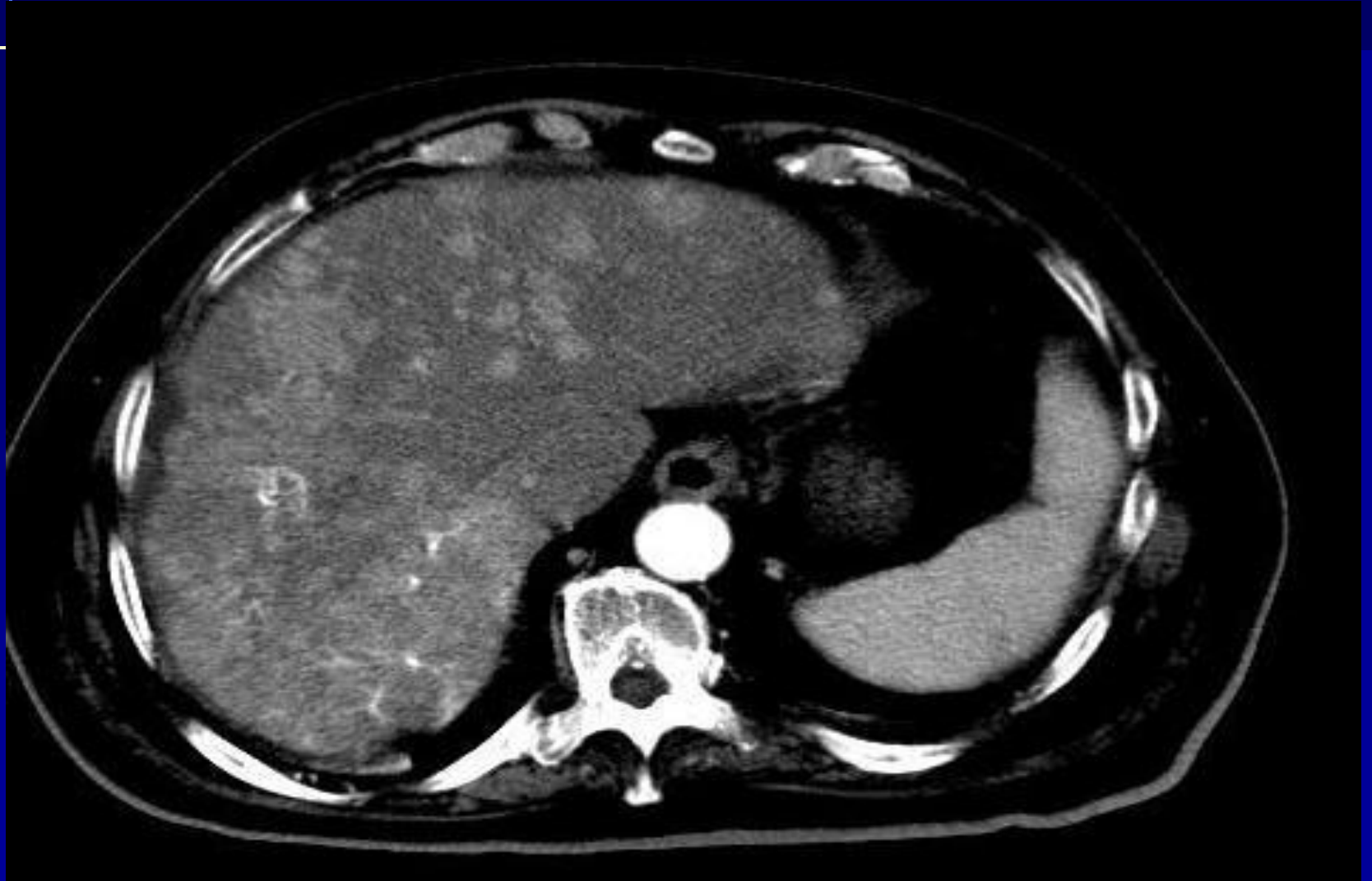
HCC – NODULO UNICO



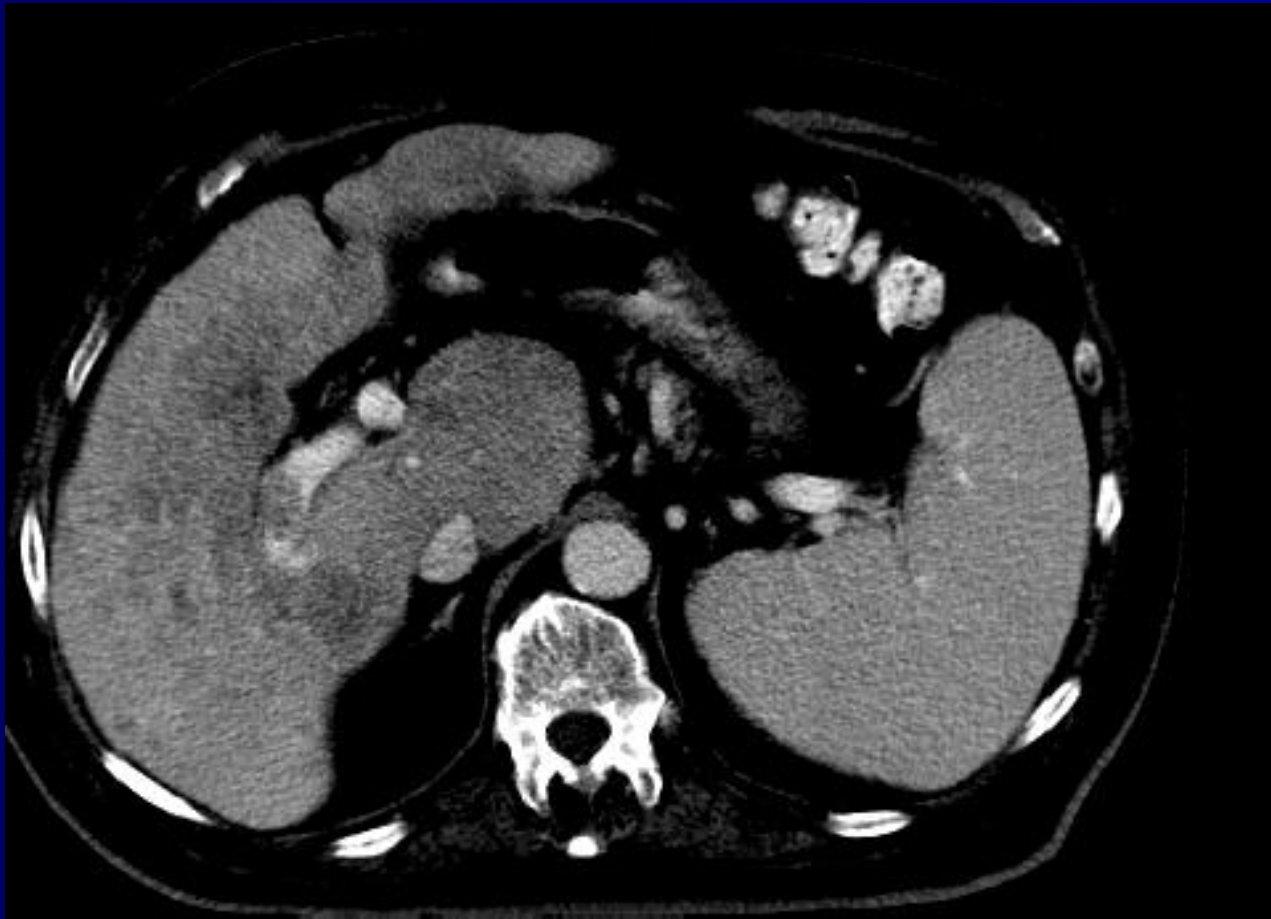
HCC – NODULI MULTIPLI



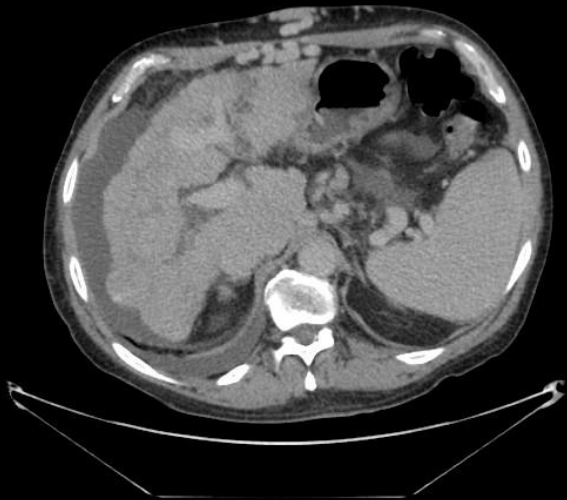
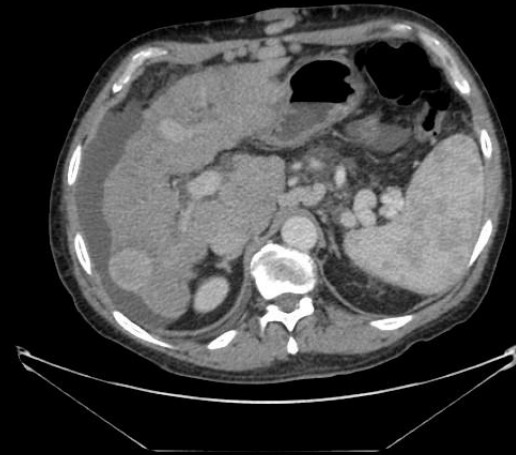
HCC MULTIFOCALE



HCC - TROMBOSI PORTALE



HCC – IPERTENSIONE PORTALE

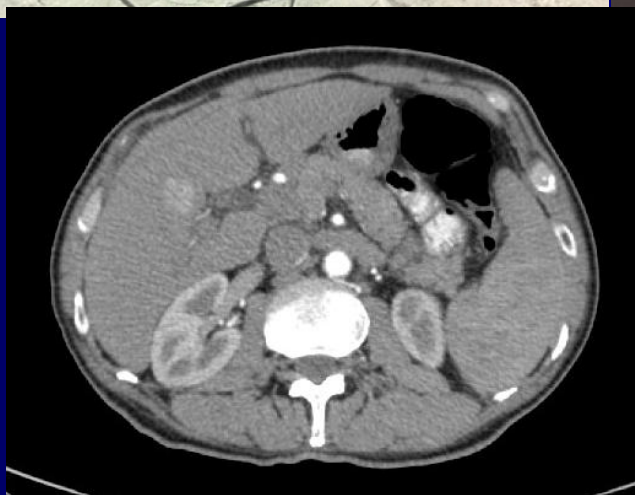


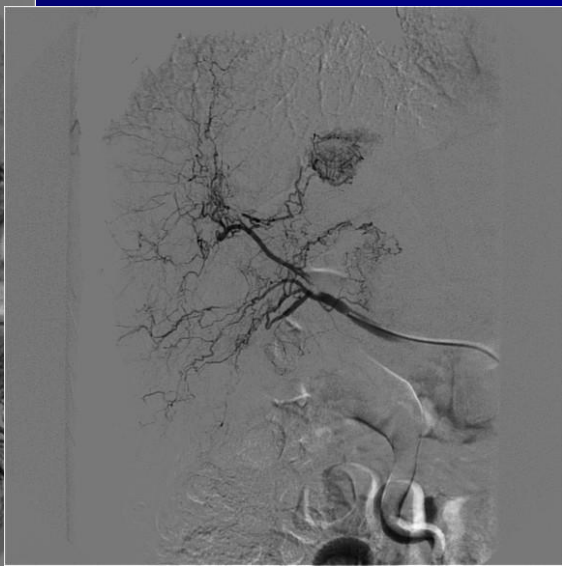
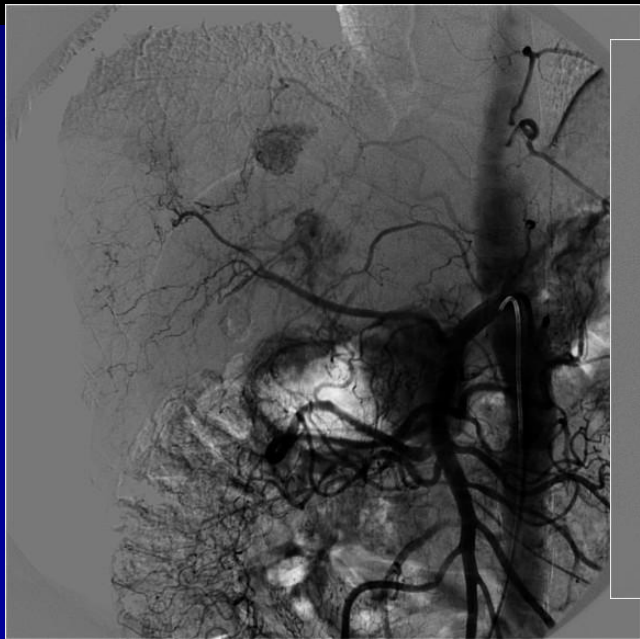
RMN

- FOLLOW UP (LIPIODOL)
- TRUFIL CORONALE
- HASTE ASS COR
- FL2D
- T1 IN OUTFACE
- DVI
- VIBE s e c contr
- FLASH 2 D
- MDC EPATOSPECIFICO
- DURATA: 2 ORE



ARTERIOGRAFIA SELETTIVA

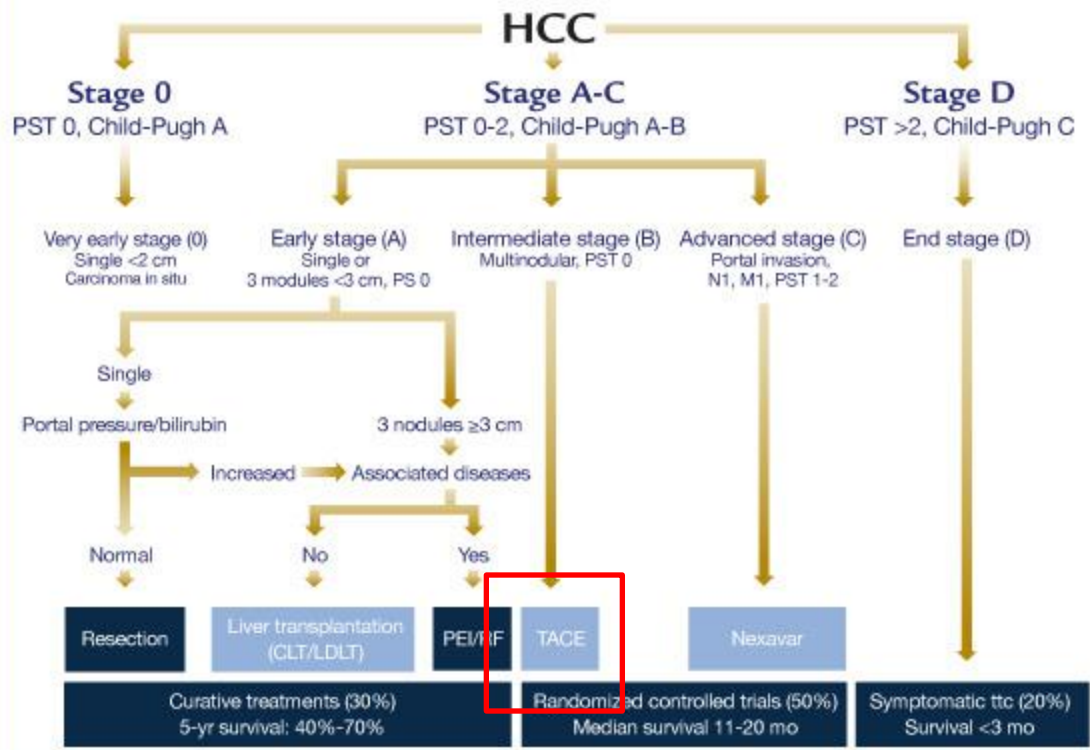




SELEZIONE DEI PAZIENTI

- IL TUMORE DEVE ESSERE CONFINATO AL FEGATO
- IL TUMORE DEVE ESSERE NON RESECABILE (O NON TRATTABILE CON RF)

BCLC STAGING SYSTEM¹



Resection	Liver transplantation (CLT/LDLT)	PE/MF	TACE	Nexavar	
Curative treatments (30%) 5-yr survival: 40%-70%			Randomized controlled trials (50%) Median survival 11-20 mo	Symptomatic ttc (20%) Survival <3 mo	

TACE - INDICAZIONI

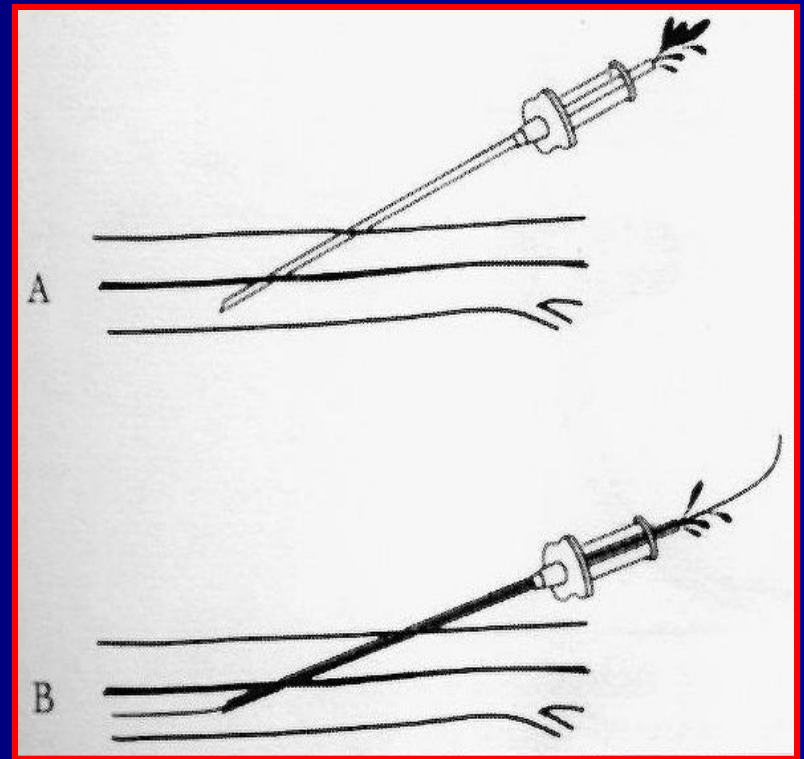
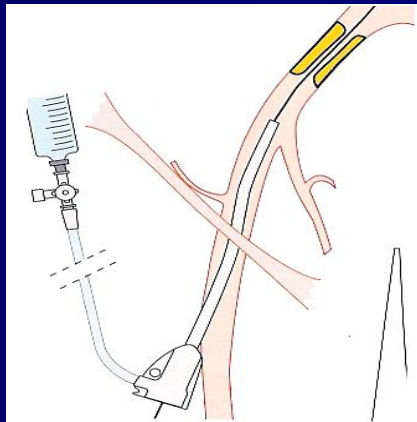
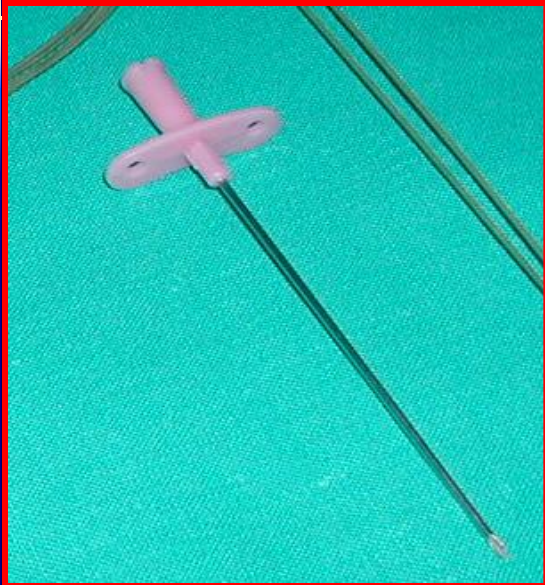
- TRATTAMENTO DI NODULO UNICO (> 5 cm.) NON RESECABILE O NODULI MULTIPLI
- PRIMA DI RESEZIONE CHIRURGICA
- IN ASSOCIAZIONE CON RF
- NEI PAZIENTI IN ATTESA DI OLT

Curley SA et al. Non surgical therapies for localized Hepatocellular carcinoma. Uptodate 2010

MATERIALI ANGIOGRAFICI

- AGHI PER PUNTURA ARTERIOSA
- INTRODUTTORI
- CATETERI
- GUIDE IDROFILE
- MICROCATETERI COASSIALI
- MATERIALE PER
CHEMIOEMBOLIZZAZIONE

ACCESSO PERCUTANEO FEMORALE



cTACE - TECNICA



- DOXORUBICINA + LIPIODOL UF + EMBOLIZZANTE (spugne di gelatina)
- CHEMIOEMBOLIZZAZIONE CONVENZIONALE
- CHEMIOEMBOLIZZAZIONE SEGMENTARIA

- EMULSIONE DI DOXORUBICINA + LIPIODOL UF
- EMBOLIZZAZIONE CON SPONGOSTAN (O PVA)
- ELEVATA AFFINITA' DEL LIPIODOL PER HCC

cTACE

- **Takayasu K** et al. Hepatocellular carcinoma: treatment with intra-arterial iodized oil with and without chemotherapeutic agent. Radiology 1987
- **Nakamura H** et al. Transcatheter oily chemoembolization of hepatocellular carcinoma. Radiology 1989
- **Associazione tra Lipiodol, doxorubicina e spongostan: MAGGIORE NECROSI TUMORALE E MIGLIORE SOPRAVVIVENZA**

EMBOLIZZAZIONE

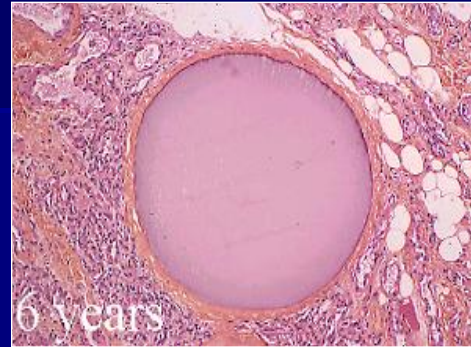
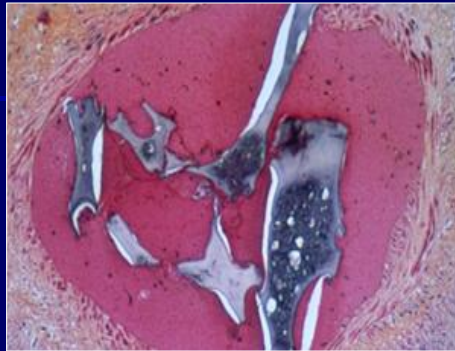
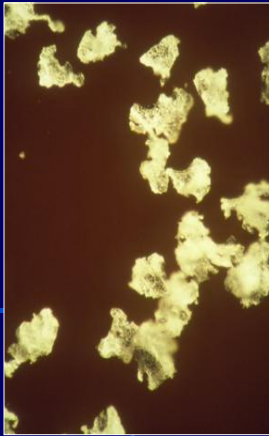


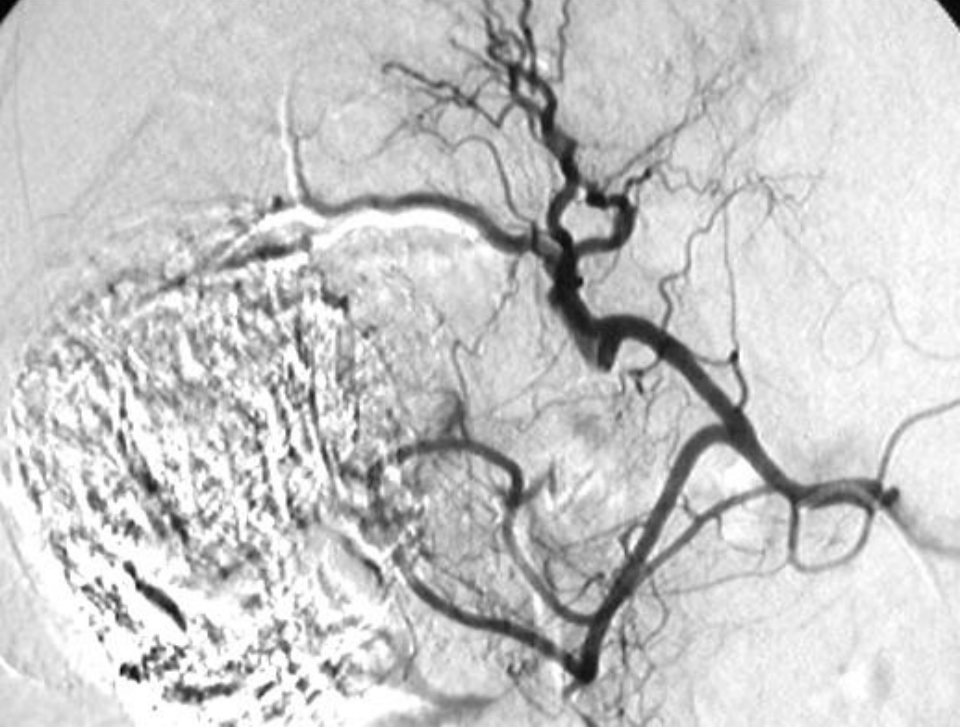
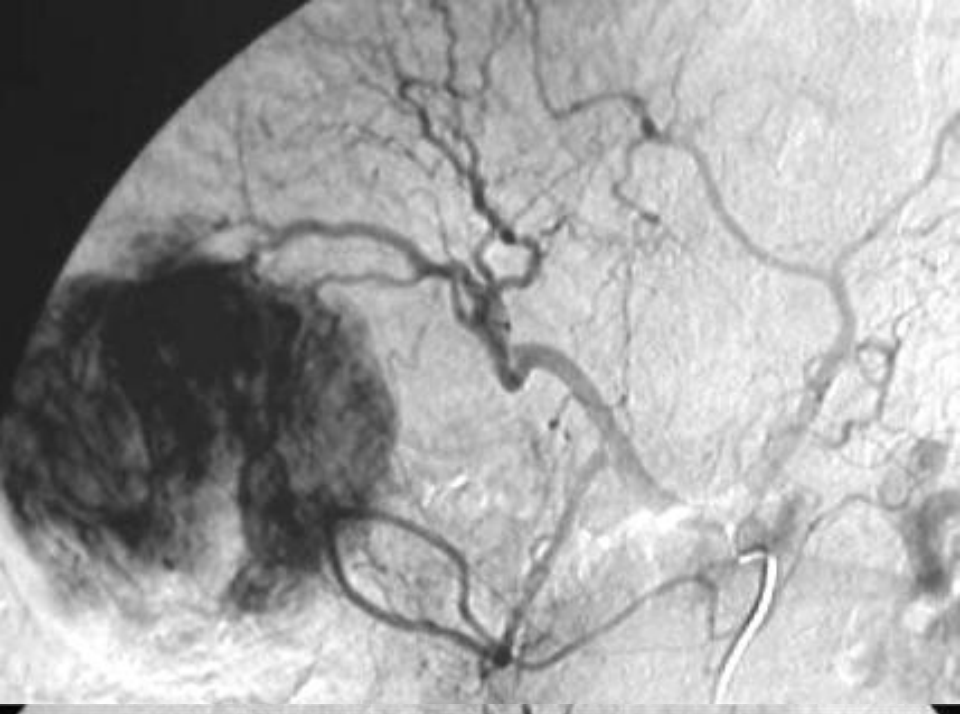
AGENTI EMBOLIZZANTI

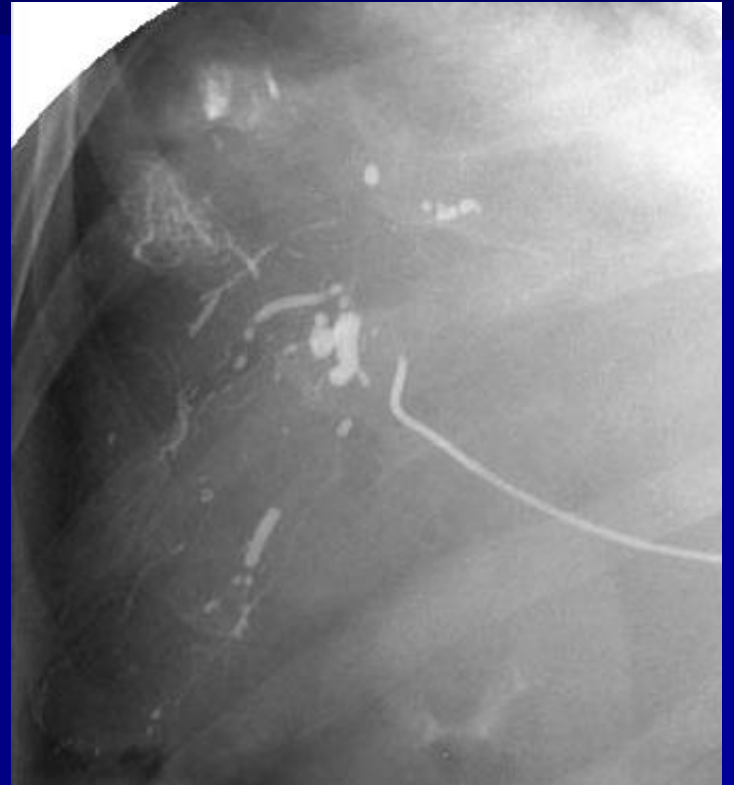
- GELFOAM, SPONGOSTAN
- PVA
- EMBOSFERE
- LIPIODOL UF
- SPIRALI
- COLLE (CIANOACRILATO)



Embolization Particles







TECNICA TRADIZIONALE VS. SEGMENTARIA

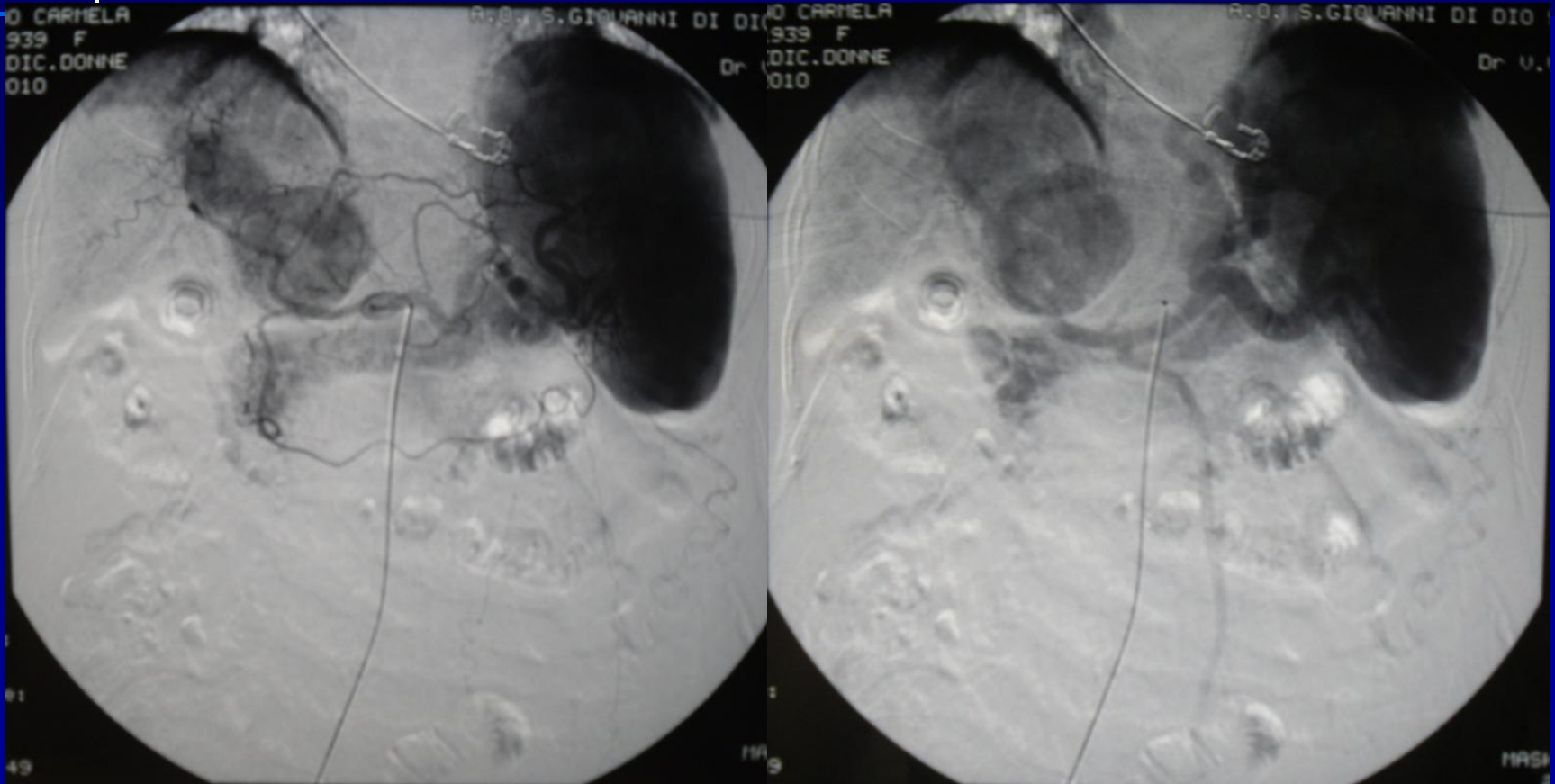
N. PAZIENTI	TECNICA	% SOPRAVV. 1 ANNO	% SOPRAVV. 3 ANNI
184	TRADIZIONALE	68	23
184	SEGMENTARIA	78	41

CORNALBA, 7th European Congr. Of Video Surgery, 2000

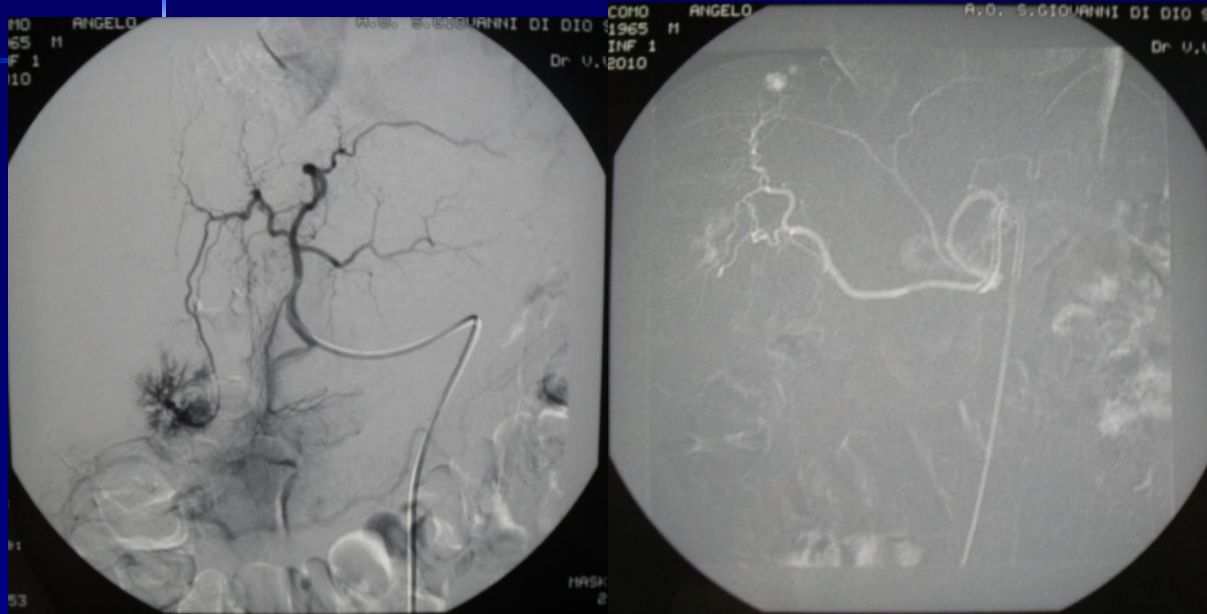
HCC MULTIFOCALE

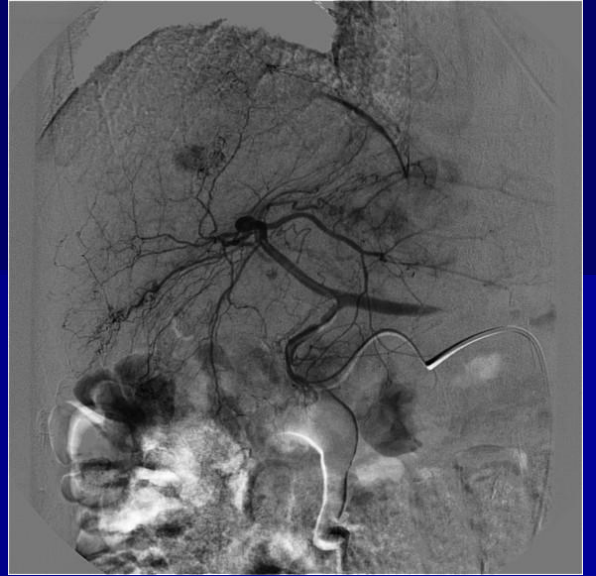


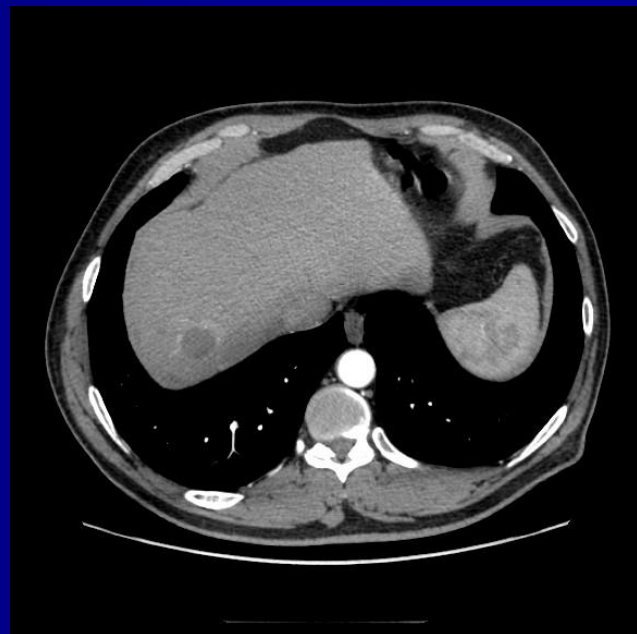
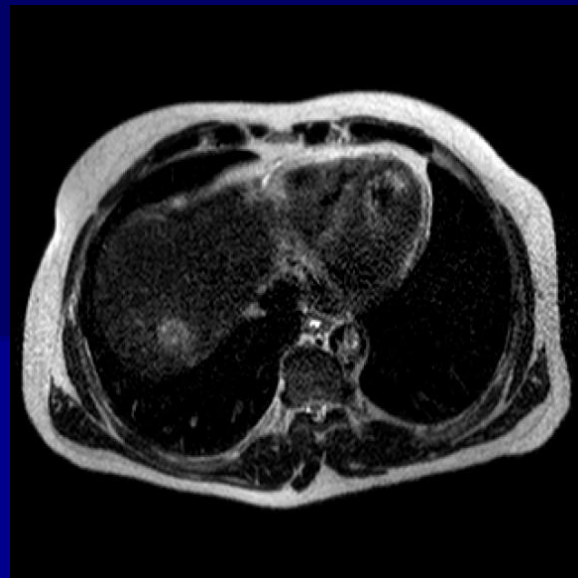
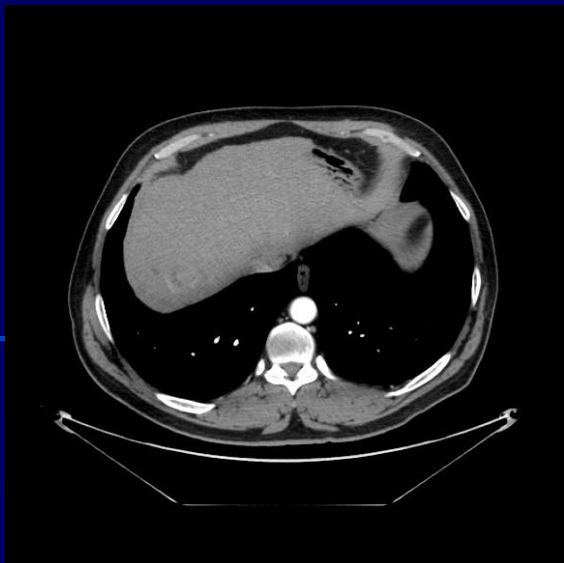
HCC MULTIFOCALE

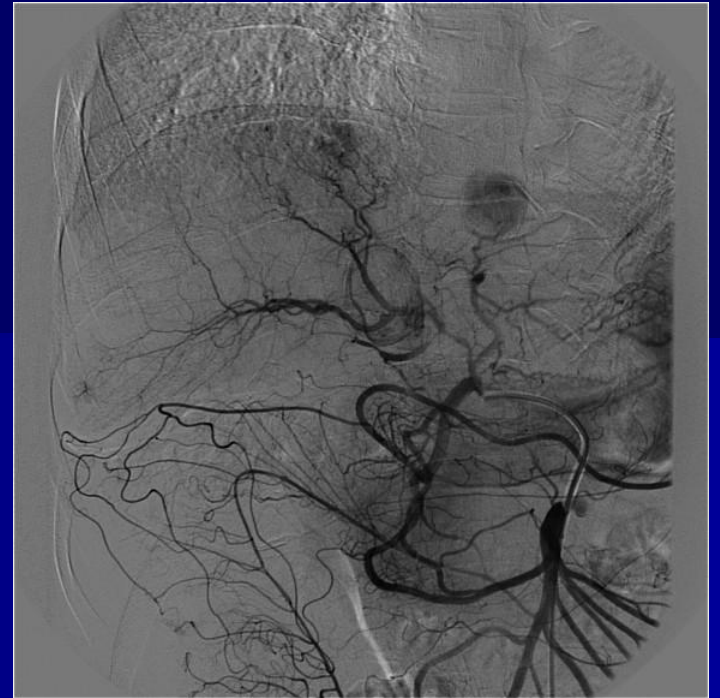


ARTERIA EPATICA ACCESSORIA









CRITERI DI ESCLUSIONE

- GRAVI TURBE DELLA COAGULAZIONE
- PAZIENTI C DI CHILD
- TROMBOSI COMPLETA DELLA VENA PORTA
- INVASIONE DEL FEGATO > 50 %
- GRAVI CONDIZIONI CLINICHE GENERALI
- ETA' > 75 ANNI
- ENCEFALOPATIA PORTO-SISTEMICA
- SHUNT ARTERO-PORTALE

DOPO LA TACE

SINDROME POST-EMBOLIZZAZIONE

- **FEBBRE**
- **DOLORE**
- **ITTERO**
- **COMPLICAZIONI:**
 - INSUFFICIENZA EPATICA
 - ASCESSO EPATICO – SPLENICO (2 %)
 - DANNO VIE BILIARI (0.5 %)
 - COLECISTITE ACUTA
 - PANCREATITE ACUTA
 - ULCERA GASTRO-DUODENALE (3 – 5 %)
 - MORTALITA' (1 – 2 %)

RISULTATI - TACE

- NECROSI PARZIALE O TOTALE: DAL 22 AL 75 %
- SOPRAVVIVENZA:
 - 24 – 88 % 1 ANNO
 - 4 – 64 % 2 ANNI
 - 12 – 51 % 3 ANNI
- **26 – 29 % a 3 ANNI** (Lencioni, Endovascular Today 2010)

TRIALS CONTROLLATI TACE Vs. TERAPIA CONSERVATIVA

- PELLETIER, 1990
- VETTER, 1991
- BRONOWICKI 1994
- TRINCHET, 1995
- **MIGLIORE SOPRAVVIVENZA NEI
PAZIENTI TRATTATI CON TACE**

Sopravvivenza a due anni dei pazienti con epatocarcinoma non resecabile trattati con embolizzazione transcateretere arterioso

Autore (anno)	Rx	Pazienti No.	Sopravvivenza		p
			<i>Trattati</i>	<i>Controlli</i>	
Trinchet (1995)	TACE	96	38 %	26 %	ns
Bruix (1998)	TAE	80	49 %	50 %	ns
Pelletier (1998)	TACE	73	24 %	25 %	ns
Lo (2002)	TACE	80	31 %	11 %	=0.002
Llovet (2002)	TACE	75	63 %	27 %	=0.009

META-ANALYSIS OF 18 RANDOMIZED TRIALS

- LA CHEMIOEMBOLIZZAZIONE MIGLIORA IN MANIERA SIGNIFICATIVA LA SOPRAVVIVENZA A 2 ANNI PARAGONATA A TRATTAMENTI MENO AGGRESSIVI

PARTICELLE PRECARICATE DEB-TACE

- **PARTICELLE EMBOLIZZANTI
PRECARICATE CON CHEMIOTERAPICO
CHE VIENE RILASCIATO IN SITU.**
- **IL CHEMIOTERAPICO AGISCE A LIVELLO
LOCO-REGIONALE. IL SUO RILASCIO
AVVIENE IN UN TEMPO DI 15 GG. CIRCA**

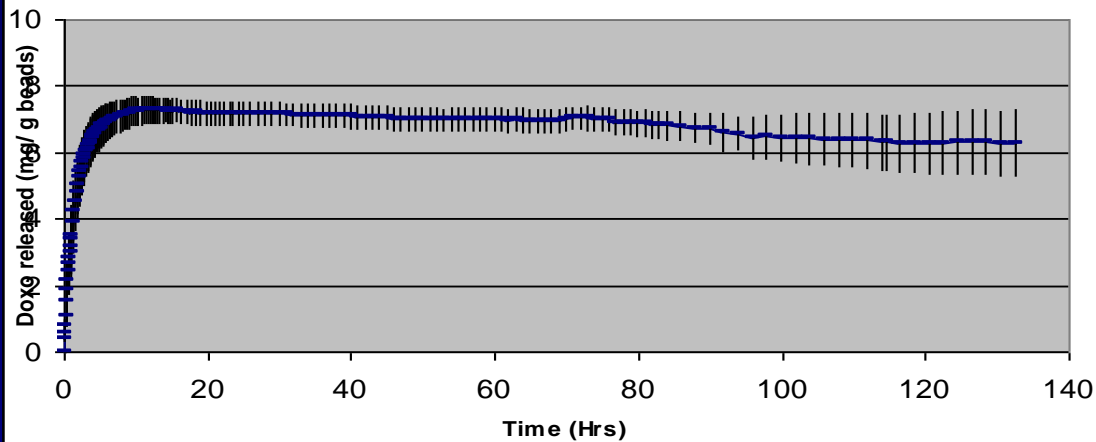
DC Bead



- **SCHEDA TECNICA**
- **Interventional Systems**
- DC Bead
- **Idrosfere per embolizzazioni in idrogel N-Fil Sulfonato, non riassorbibili, idrofiliche, precalibrate, in grado di assorbire e rilasciare in modo controllato i chemioterapici Doxorubicina e Irinotecan**
- Le idrosfere Dc Bead sono destinate al caricamento di Doxorubicina e **Irinotecan con lo scopo di embolizzare i vasi che alimentano** tumori maligni ipervascolarizzati somministrando una dose locale, controllata e costante del chemioterapico nel sito tumorale per una durata variabile dai 7 gg (Irinotecan) ai 14 gg. (Doxorubicina).
- Biocompatibles UK Ltd. – Farnham Business Park,
Weydon Lane, Farnham, Surrey GU9 8QL, UK.
- Dispositivo Medico classe IIb, CE Dir. 93/42/EEC – D.Lgs. 46/97

Doxorubicine release

DC-Dox 3



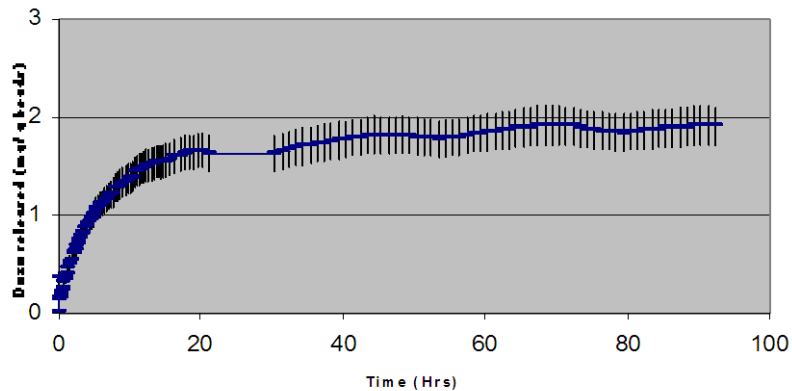
DC Beads

Drug load = 98%

Drug release = 33%

$t_{1/2} = 0.67$ hrs

Hepa-dox 3



Hepasheres

Drug load = 100%

Drug release = 7% ??

$t_{1/2} = 3.2$ hrs

cTACE Vs. DEB-TACE

QUALE E' LA PROCEDURA PIU' EFFICACE ?

- cTACE: Lipiodol, effetti collaterali
- DEB: meglio tollerata

CLINICAL INVESTIGATION

Prospective Randomized Study of Doxorubicin-Eluting-Bead Embolization in the Treatment of Hepatocellular Carcinoma: Results of the PRECISION V Study

Johannes Lammer • Katarina Malagari • Thomas Vogl • Frank Pilleul • Alban Denys • Anthony Watkinson • Michael Pitton • Geraldine Sergent • Thomas Pfammatter • Sylvain Terraz • Yves Benhamou • Yves Avajon • Thomas Gruenberger • Maria Pomoni • Herbert Langenberger • Marcus Schuchmann • Jerome Dumortier • Christian Mueller • Patrick Chevallier • Riccardo Lencioni • On Behalf of the PRECISION V Investigators

- 19 CENTRI EUROPEI, 212 PAZIENTI, CHILD-PUGH A/B
- TOSSICITA' EPATICA, MANIFESTAZIONI SISTEMICHE (alopecia, soppressione midollare) E DOLORE: **< DEB**
- PRIMARY ENDPOINT: TUMOUR RESPONSE (EASL) a 6 m. con RMN: 51.6% DEB; 43.5% cTACE (n.s.)
- SOPRAVVIVENZA: **cTACE = DEB**

Dhanasekaran et al: Comparison of TACE and DEB for unresectable HCC. J Surg Oncol 2010

- the advantage of drug-eluting beads result in a statistically improvement in overall survival.
- 71 pazienti (45 DEB; 26 cTACE)

ENDOVASCULAR TODAY April 2012

Classic TACE Versus Drug-Eluting Beads.

Lipiodol or drug-eluting beads in the treatment of hepatocellular carcinoma? An old question revisited.

By Nassir Rostambeigi, MD, MPH; Erik Cressman, MD, PhD; and Jafar Golzarian, MD

Drug-eluting beads are considered by many to be a significant advancement in technology, and with further improvement, they may indeed represent the future of tumor therapy. However, at this point, there is a role for both cTACE as well as drug-eluting beads in the treatment of unresectable HCC. We believe that lipiodol is still an important embolic/career agent that can be used in the treatment of carefully selected patients. cTACE remains the best adjunctive therapy, especially in lesions with very small feeders that are anatomically located in adjacent segments and when there is an angiographically occult HCC.

Safety and effectiveness of chemoembolization with drug-eluting beads for advanced-stage hepatocellular carcinoma

S.P. Kalva et al. – Cardiovasc Interv Radiology 2014 – 37:381-387

- ... chemoembolization with drug-eluting beads (DEB-TACE) has been shown to be safe in high-risk patients.
- Multiple DEB-TACE procedures (> 2 procedures) were associated with **improved survival (26.8 months)** compared with patients with one or two procedures (11.4 months).

FOLLOW UP

- **ESAME TC TRIFASICA A 30 GIORNI, 6 MESI, 1 ANNO**
- **ECOGRAFIA (CEUS)**
- **RMN**

LA **TACE** PUO' ESSERE RIPETUTA **OGNI 3 – 4 MESI PER 3 – 4 VOLTE**, COMPATIBILMENTE CON LE CONDIZIONI CLINICHE DEL PAZIENTE, OPPURE ESEGUITA **SOLO QUANDO NECESSARIO**

OBIETTIVO DELL'IMAGING

- ✓ **Valutare l'efficacia ablativa (necrosi)**
- ✓ **Identificare quote di residuo tumorale**
- ✓ **Escludere complicanze del trattamento**
- ✓ **Identificare precocemente le recidive locali (omosegmentarie)**
- ✓ **Individuare nuovi noduli (eterotopi)**

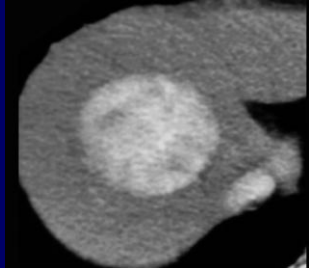
CRITERI DI VALUTAZIONE

- **RECIST** : misurazione dei diametri della lesione prima e dopo il trattamento
- **EASL** : riduzione del tessuto vitale (non-enhanced areas)

- COMPLETE RESPONSE (CR)
- PARTIAL RESPONSE (PR)
- PROGRESSIVE DISEASE (PD)
- STABLE DISEASE



LA NECROSI



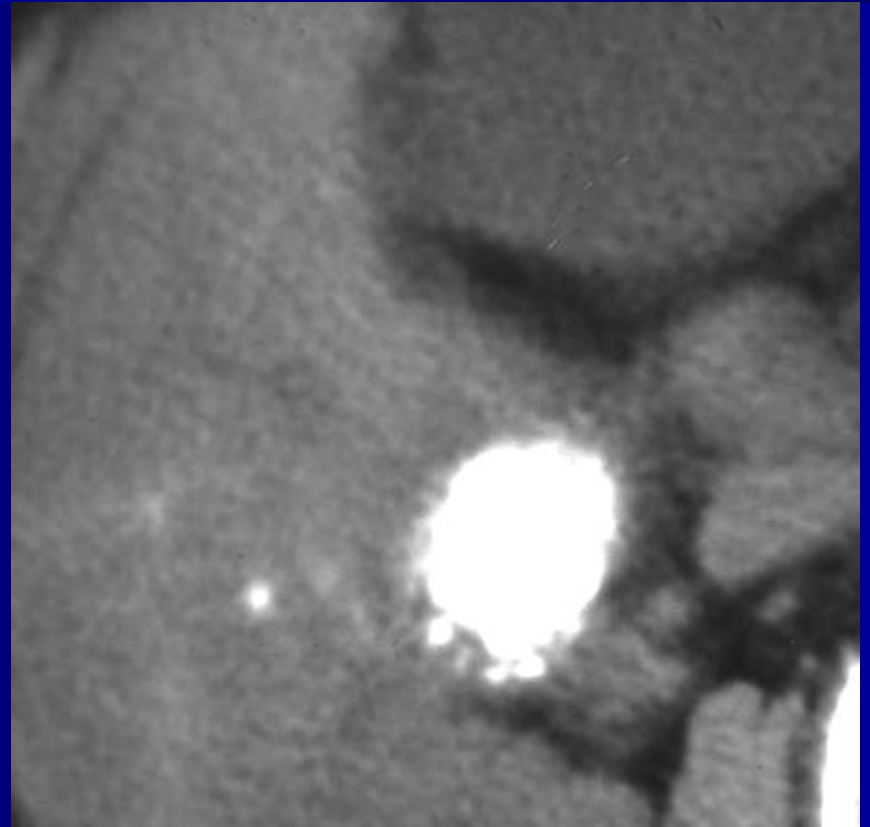
- ✓ Assenza di vascolarizzazione in fase arteriosa= assenza di tessuto vitale residuo= necrosi completa



VALUTAZIONE DELLA RISPOSTA TERAPEUTICA ALLA LIPIODOL-TC DOPO TACE

TIPO DI RITENZIONE DI LIPIODOL	% NECROSI (ISTOLOGIA)
DENSO ED UNIFORME	90 – 100
DENSO CON DIFETTO	70 – 90
SFUMATO/PARZIALE	50 – 70
A SPOT/ASSENTE	< 50

NECROSI COMPLETA



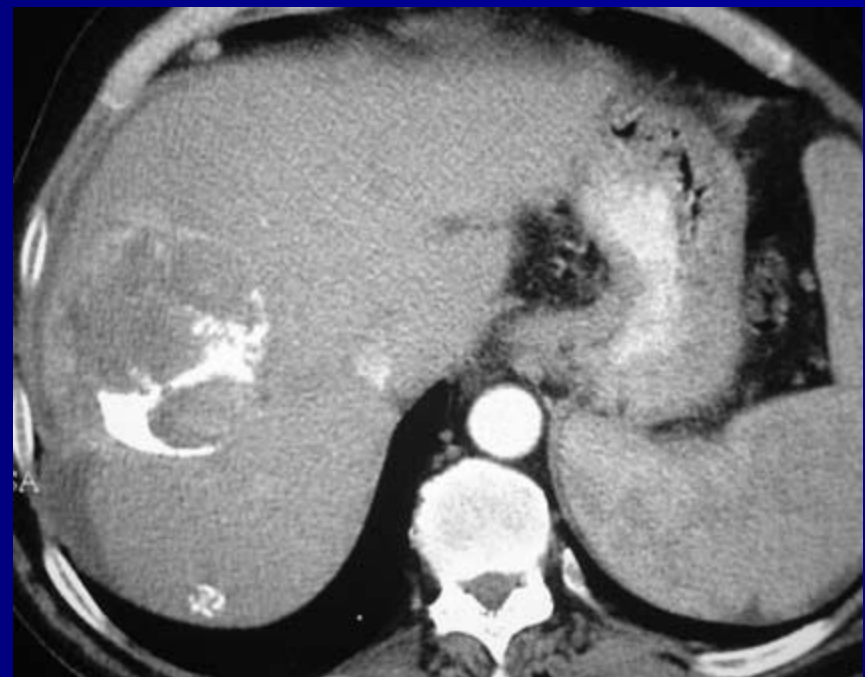
LIPIODOL-TC

NECROSI PARZIALE

Le scansioni senza mdc evidenziano deposito incompleto del Lipiodol somministrato nella precedente chemioembolizzazione

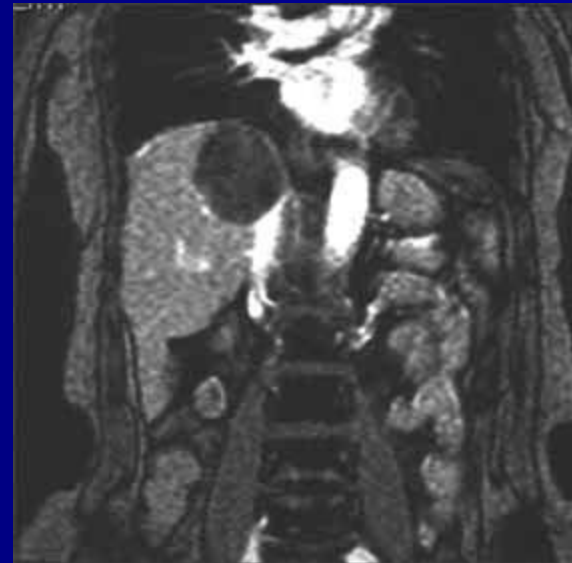
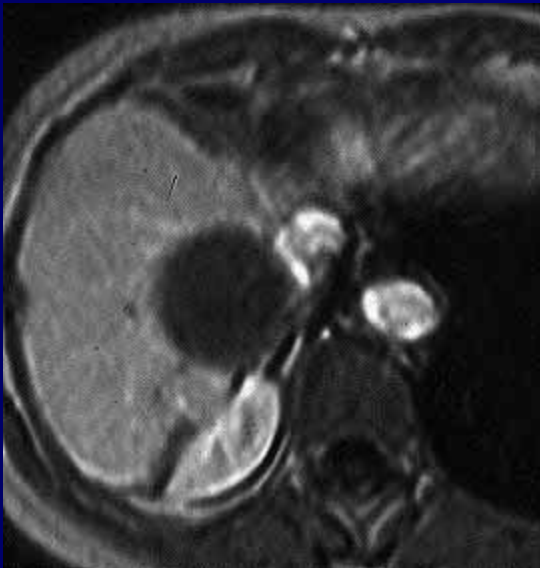


Dopo mdc l'enhancement in fase arteriosa conferma **la vitalità delle aree del nodulo** non impregnate dal Lipiodol



RMN

- **La RMN con gadolinio non presenta artefatti da Lipiodol**



TENDS IN UTILIZATION OF TRANSARTERIAL TREATMENTS FOR HCC: RESULTS OF A SURVEY BY THE ITALIAN SOCIETY OF INTERVENTIONAL RADIOLOGY

Bargellini et al. CVIR (2014) 37:438-444

- 87 C.R.I. (25.6 % C.R.I. in Ospedali con Liver Transplant Unit)
- 9.000 procedure/2011 (67 % trattamenti transarteriosi, 31 % ablazioni percutanee)
- 50 % NORD
- 24.4 % CENTRO
- 25.6 % SUD

TENDS IN UTILIZATION OF TRANSARTERIAL TREATMENTS FOR HCC: RESULTS OF A SURVEY BY THE ITALIAN SOCIETY OF INTERVENTIONAL RADIOLOGY

Bargellini et al. CVIR (2014) 37:438-444

TACE

- 59 % INTERMEDIATE STAGE (BCLC B)
 - 28 % EARLY STAGE (BCLC A)
 - 12.8 % ADVANCED STAGE (BCLC C)
-
- 52 % DRUG-ELUTING PARTICLES (DEB-TACE)
 - 32 % LIPIODOL, DRUG AND PARTICLES (c-TACE)
-
- 68 % CENTERS COMBINE TACE AND ABLATION
 - 35.9 % COMBINE SORAFENIB AND TACE

**TENDS IN UTILIZATION OF TRANSARTERIAL TREATMENTS
FOR HCC: RESULTS OF A SURVEY BY THE ITALIAN SOCIETY
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Bargellini et al. CVIR (2014) 37:438-444**

TARE - Y90

- 52 % ADVANCED STAGE (BCLC C)
- 46 % INTERMEDIATE STAGE (BCLC B)

- 62 % RESIN SPHERES
- 38 % GLASS SPHERES

**TENDS IN UTILIZATION OF TRANSARTERIAL TREATMENTS
FOR HCC: RESULTS OF A SURVEY BY THE ITALIAN
SOCIETY OF INTERVENTIONAL RADIOLOGY
Bargellini et al. CVIR (2014) 37:438-444**

STAGING SYSTEM FOR HCC PAT.

- 92.4 % BCLC

REPEAT TREATMENTS (FOLLOW UP)

- 95 % ON DEMAND

RADIOEMBOLIZZAZIONE

- Thera-Sphere – SIR-Spheres
- ISOTOPI RADIOATTIVI (I 131, Y 90) SONO VEICOLATI IN ARTERIA EPATICA ATTRAVERSO IL CATETERE
- I RISULTATI SONO CONTROVERSI NELL'HCC
- ANCORA POCHI DATI SULLA RISPOSTA DEL PARENCHIMA EPATICO ALLA RADIOEMBOLIZZAZIONE
- UTILIZZATA ANCHE NELLE META DA CA. COLORETTALE E T. NEUROENDOCRINI

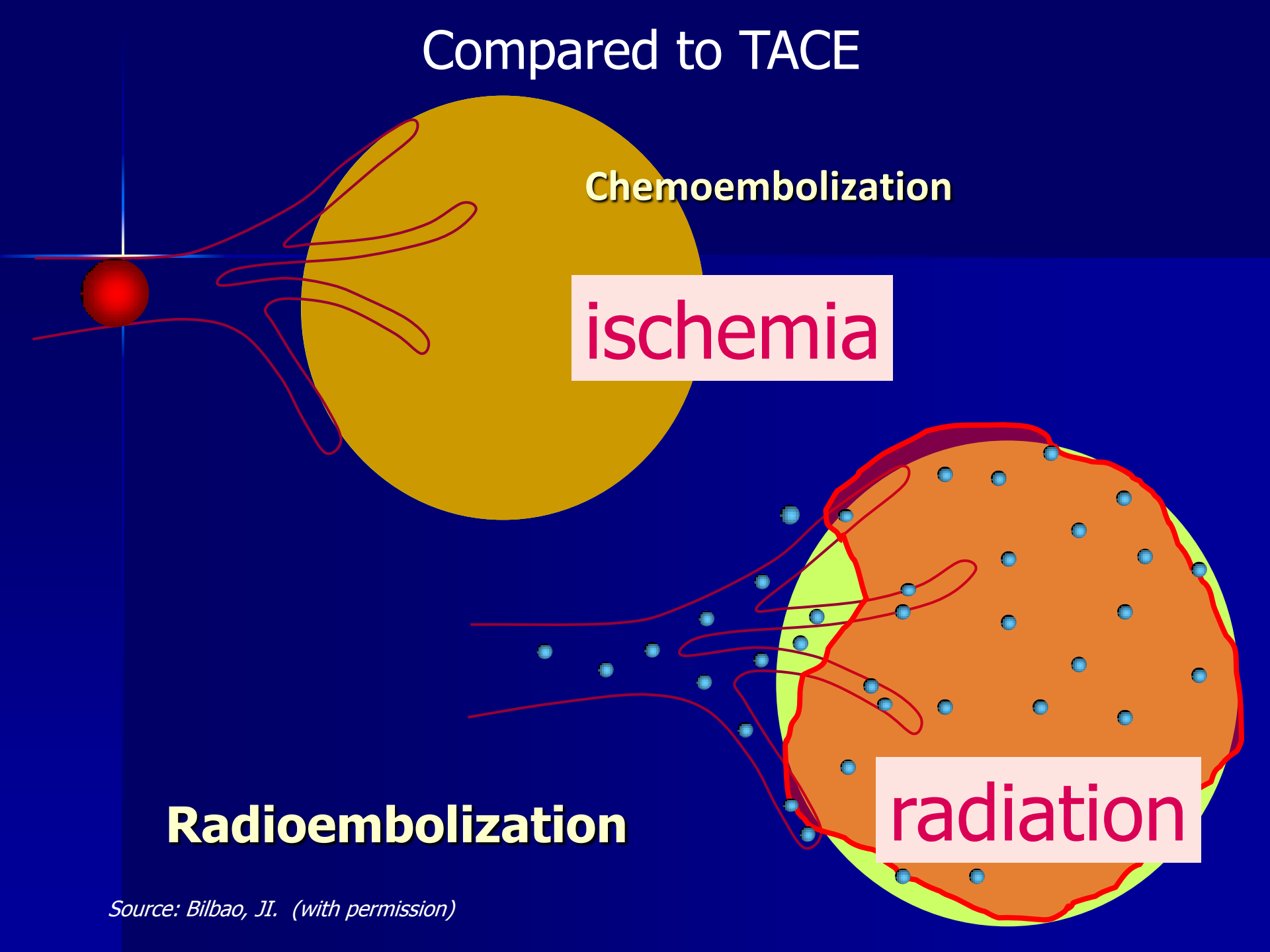
Compared to TACE

Chemoembolization

ischemia

Radioembolization

radiation



TheraSphere®
MDS Nordion, Canada

Glass
matrix



SIR-Spheres®
Sirtex Medical, Australia

Resin
surface

•1-8 million microspheres → low number →
Microscopic embolization (mainly radiation
dose effect)

- Half-life 64.2 h
- Particle Ø 20-30 µm
- Time to near complete decay 13 days
- 1,2-8 mil. spheres per dose
- 2500 Bq per sphere
- 6 Doses: 3-20 GBq/pts
- Embolic effect: mild
- Shunt hep/polm <10%
- No dose variation with tumor volume

CE Mark 2006 for liver tumors

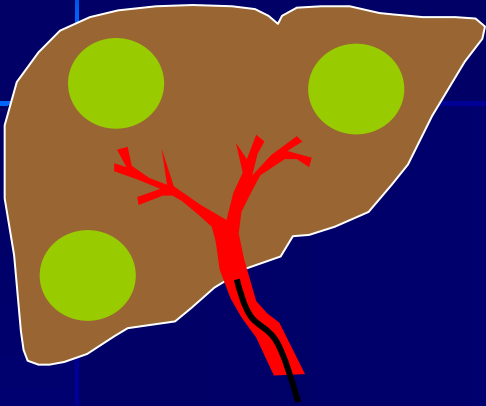
•40-80 million microspheres → high number
→ Macroscopic embolization (ischemia +
radiation dose effect)

- Half-life 64.2 h
- Particle Ø 20-60 µm
- Time to near complete decay 13 days
- 40-80 mil. sphere per dose
- 50 Bq per sphere
- 1 Dose: 3 GBq/pts
- Embolic effect: moderate
- Shunt hep/polm <20%
- Dose variation with tumor volume

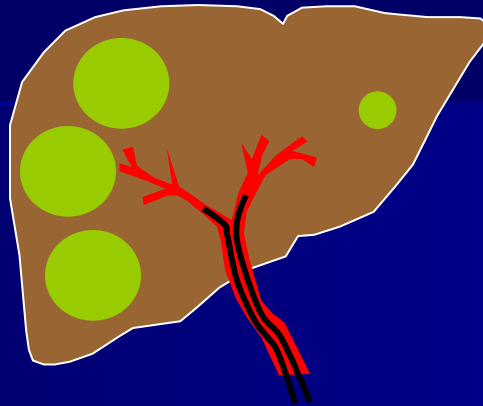
CE Mark 2002 for liver tumors

TARE Treatment Strategies

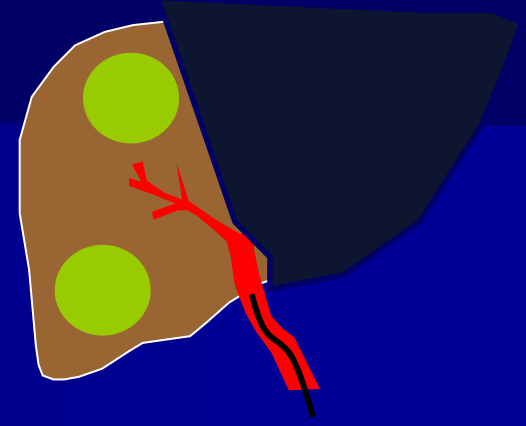
dictated by tumour burden and presence/severity of any underlying concomitant disorders such as cirrhosis, and can also be influenced by intent, i.e. radiation segmentectomy.



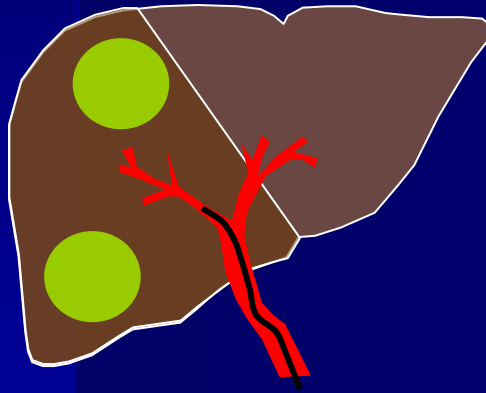
whole-liver



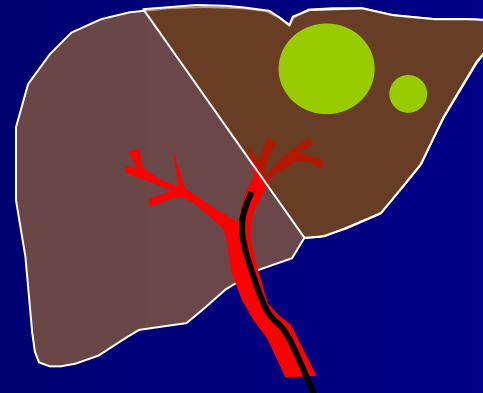
bilobar



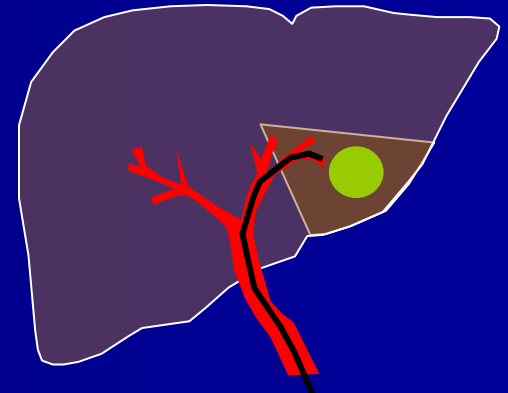
Whole-remnant



right lobe



left lobe



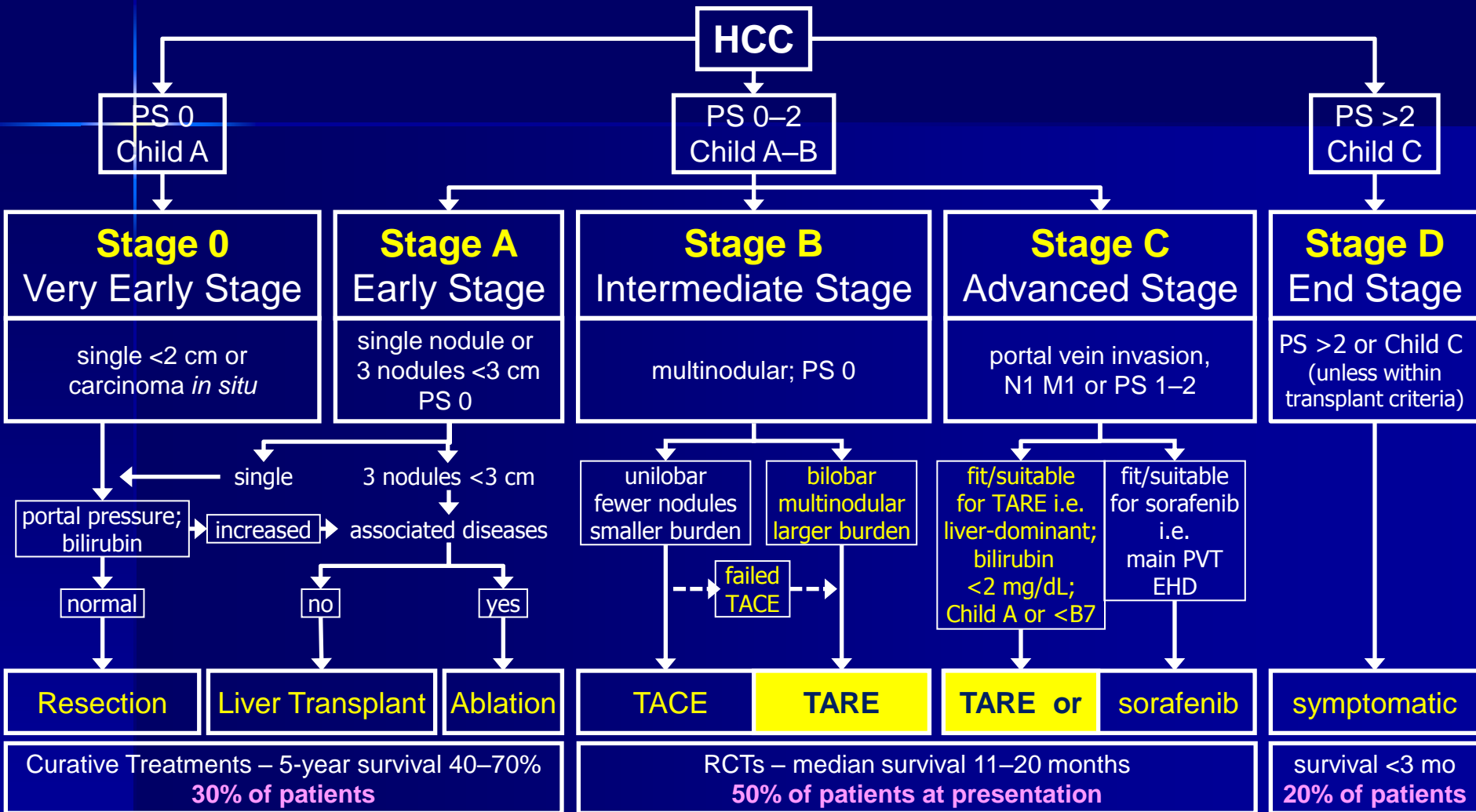
sub/segmental

TARE: indications



- **treatment option for patients not amenable to TACE**
 - poor candidates for TACE i.e. BCLC stage B with bilobar disease and/or a large n. of nodules (>5)
 - have previously failed TACE/TAE
 - are not indicated for TACE according to BCLC, i.e. BCLC stage C
- **greater likelihood of down-staging** patients to radical therapy (liver transplant)

Integration of TARE in the BCLC treatment algorithm



Andreana L, Isgrò G, Marelli L *et al.* Treatment of hepatocellular carcinoma (HCC) by intra-arterial infusion of radio-emitter compounds: Trans-arterial radio-embolisation of HCC. *Cancer Treat Rev* 2011 Dec 12; ePub doi: 10.1016/j.ctrv.2011.11.004.

Sangro B, Salem R, Kennedy A *et al.* Radioembolization for hepatocellular carcinoma: a review of the evidence and treatment recommendations. *Am J Clin Oncol* 2011; **34**: 422-431.

RECOMMENDATIONS FOR RADIOEMBOLIZATION OF HEPATIC MALIGNANCIES USING YTTRIUM-90 MICROSPHERE BRACHYTHERAPY: A CONSENSUS PANEL REPORT FROM THE RADIOEMBOLIZATION BRACHYTHERAPY ONCOLOGY CONSORTIUM

ANDREW KENNEDY, M.D., F.A.C.R.O.,* SUBIR NAG, M.D., F.A.C.R., F.A.C.R.O.,† RIAD SALEM, M.D., M.B.A., F.S.I.R.,‡ RAVI MURTHY, M.D., F.A.C.P.,§ ALEXANDER J. MCEWAN, M.D., CHARLES NUTTING, D.O.,¶ AL BENSON, III, M.D., F.A.C.P.,‡ JOSEPH ESPAT, M.D., M.S., F.A.C.S.,# JOSE IGNACIO BILBAO, M.D.,** RICKY A. SHARMA, M.D., PH.D.,†† JAMES P. THOMAS, M.D., PH.D.,† AND DOUGLAS COLDWELL, M.D., PH.D.‡‡

-14 RACCOMANDAZIONI

-INDICAZIONI: TUMORI PRIMITIVI O SECONDARI NON RESECABILI

-TUMORI INTRAEPATICI NON ESTESI

-ASPETTATIVA DI VITA > 3 MESI

-CONTROINDICAZIONI: ECCESSIVA ESTENSIONE DEL TUMORE

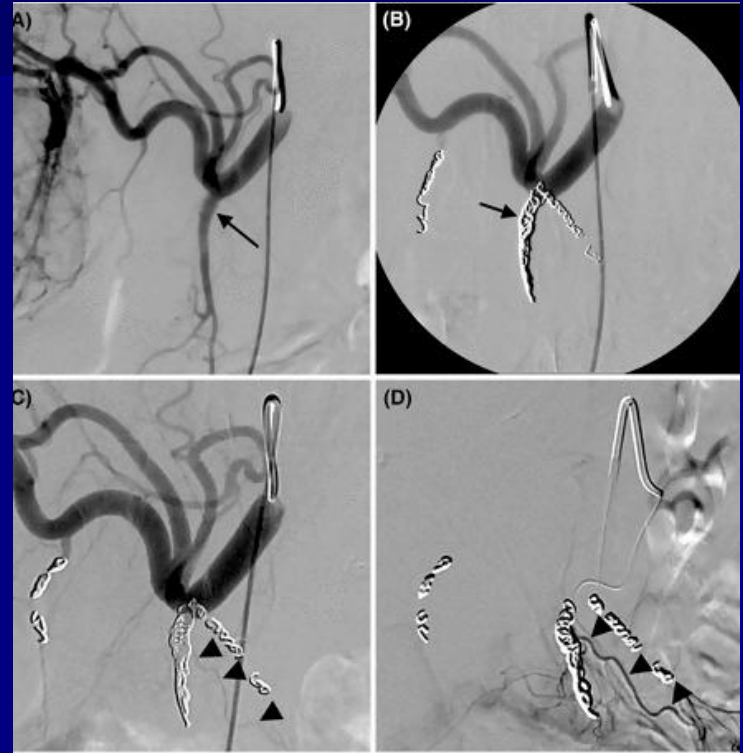
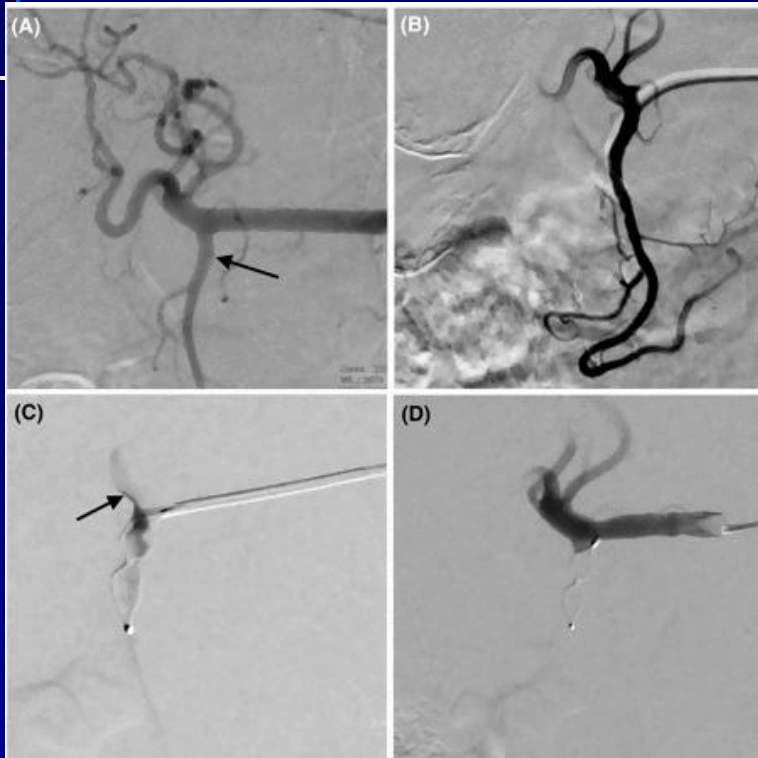
-BILIRUBINEMIA >2 mg/dl O INVASIONE DELLA VENA PORTA

-ACCUMULO EXTRAEPATICO DI Tc99

-PROTOCOLLO: msTC e/o angioRMN, PET

-ANGIOGRAFIA con scintigrafia Tc99 (shunt epato-polmonare)

-EMBOLIZZAZIONE PROFILATTICA DEI RAMI EXTRAEPATICI



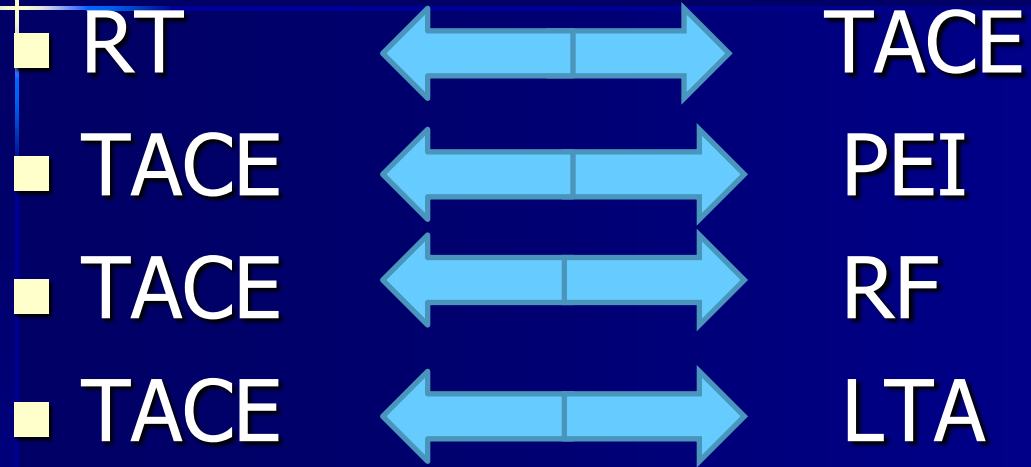
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-RADIATION-INDUCED LIVER DISEASE

- Performance of clinical trials and creation of a treatment registry with uniform reporting criteria are essential for determining the safety and role of Y90 microspheres in the context of currently available therapies.

TRATTAMENTI COMBINATI LARGE HCC



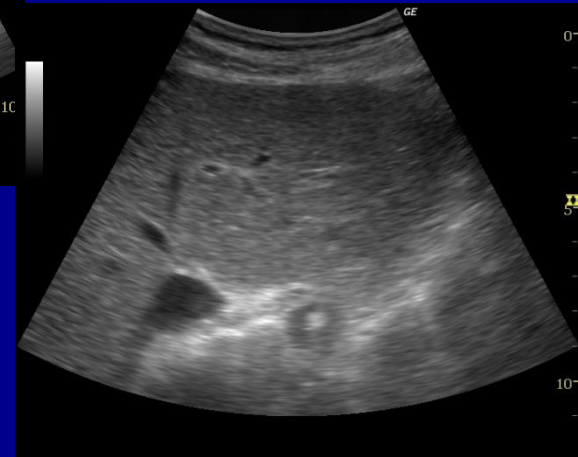
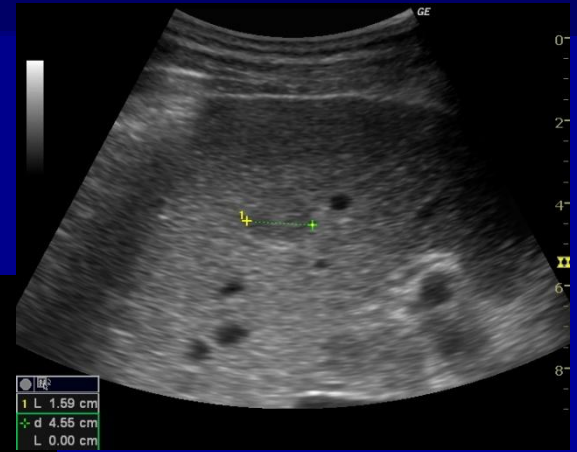
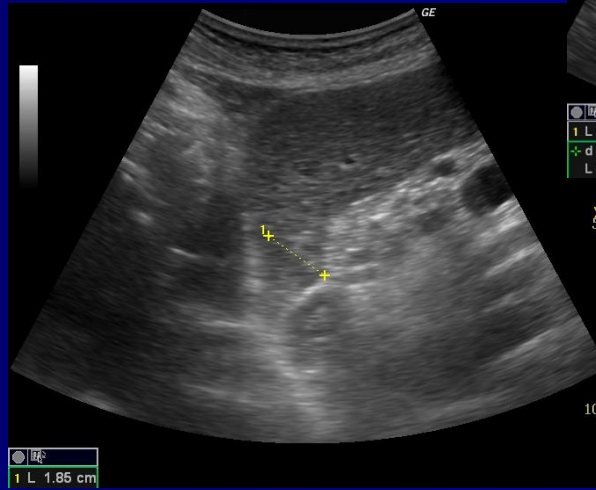
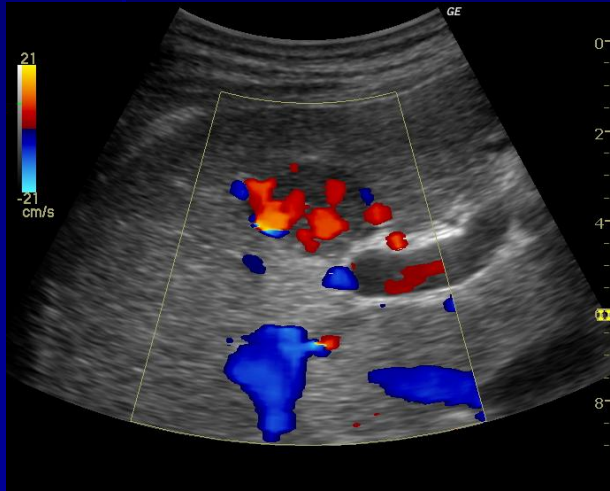
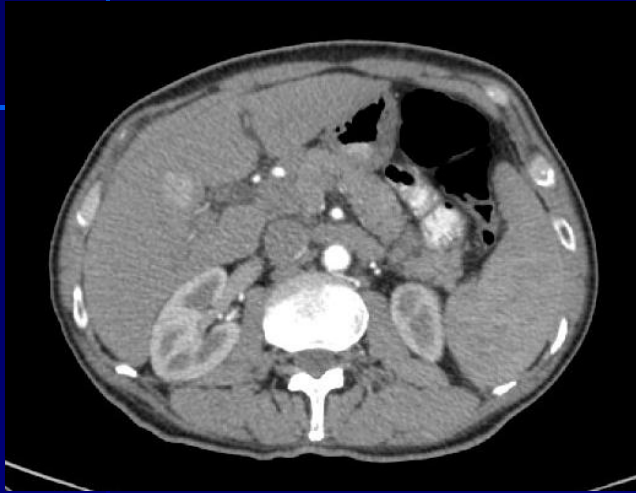
TRATTAMENTI COMBINATI RATIONALE ?

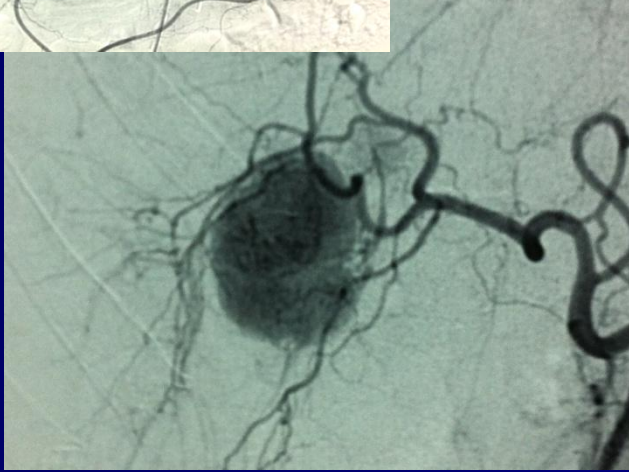
- TACE: MAGGIORE EFFICACIA ALLA PERIFERIA DEL NODULO (IPERVASCOLARE)
- TECNICHE PERCUTANEE: INDUCONO NECROSI CENTRALE

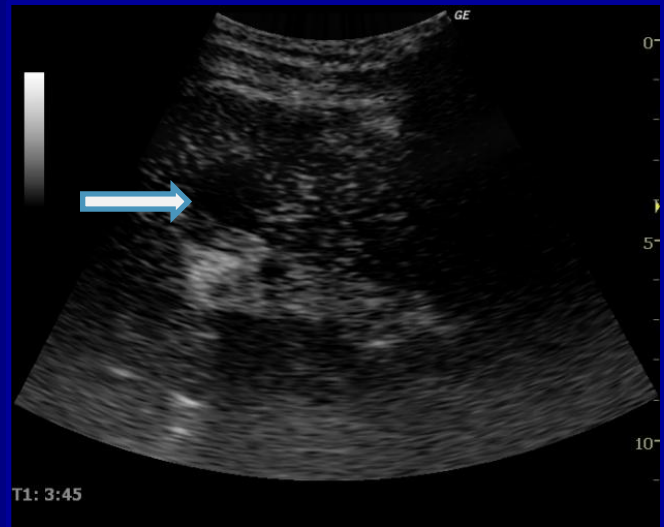
TRATTAMENTI COMBINATI

- PRIMA LA TACE O PRIMA LA TECNICA PERCUTANEA ?

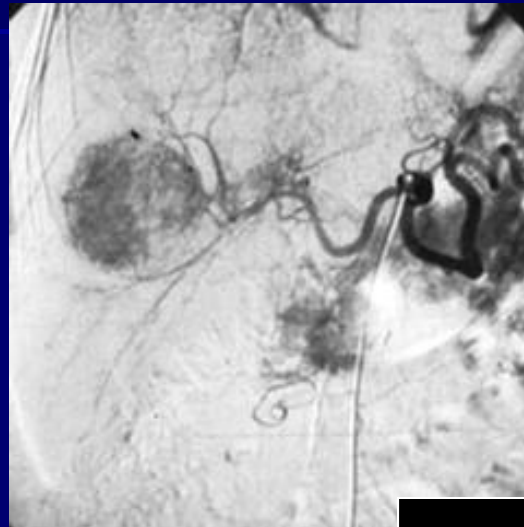
HCC MULTIFOCALE







TACE + RF



CONCLUSIONI



LA CHEMIOEMBOLIZZAZIONE

- Terapia locoregionale efficace nei pazienti con HCC non resecabile, se il tumore è grande o multifocale
- E' necessario che la vena porta sia pervia e che la funzionalità epatica sia relativamente buona
- La TAE e la c-TACE (doxorubicina) sono sovrapponibili
- Le DEBs sono meglio tollerate della cTACE (BCLC C ?)

- La chemioembolizzazione con DEB non sostituisce la cTACE (= sopravvivenza)
- La radioembolizzazione è limitata a casi particolari e non ci sono ancora risultati definitivi
- L'associazione TACE + terapie locoregionali migliora l'efficacia terapeutica

**GRAZIE A TUTTI PER
L'ATTENZIONE E GRAZIE A
MAURIZIO !**

