

Società Italiana di Ecografia
in Medicina e Chirurgia

II CORSO NAZIONALE E
SEMINARI DI
ECOGRAFIA CLINICA
SIEMC



RIMINI,
4 - 7 OTTOBRE 2015
AQUA HOTEL + ARIA HOTEL

- **Prof. A. Giorgio**
 - Director
 - Interventional US Units
 - Athena ,S.Rita
 - Clinical Institutes
 - *Italy*

L'ecografia interventistica dell'addome

Corso di prima formazione in ecografia clinica

Rimini 6-9 ottobre 2014

**Ecografia interventistica:
Quando ,dove, come e perchè**

Prof. A. Giorgio

**Direttore Servizio di Ecografia ed Eointerventistica
Ospedale Camilliani , Casoria-Napoli**

ECOGRAFIA INTERVENTISTICA

DIAGNOSTICA

TERAPEUTICA

Aghi sottili

$\emptyset < 1\text{mm}$

Aghi grossi

$\emptyset > 1\text{mm}$

Aghi elettrodi

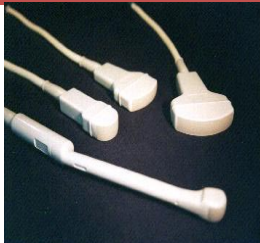
RF

Antenne

MWs



ECOGRAFIA INTERVENTISTICA



SONDA

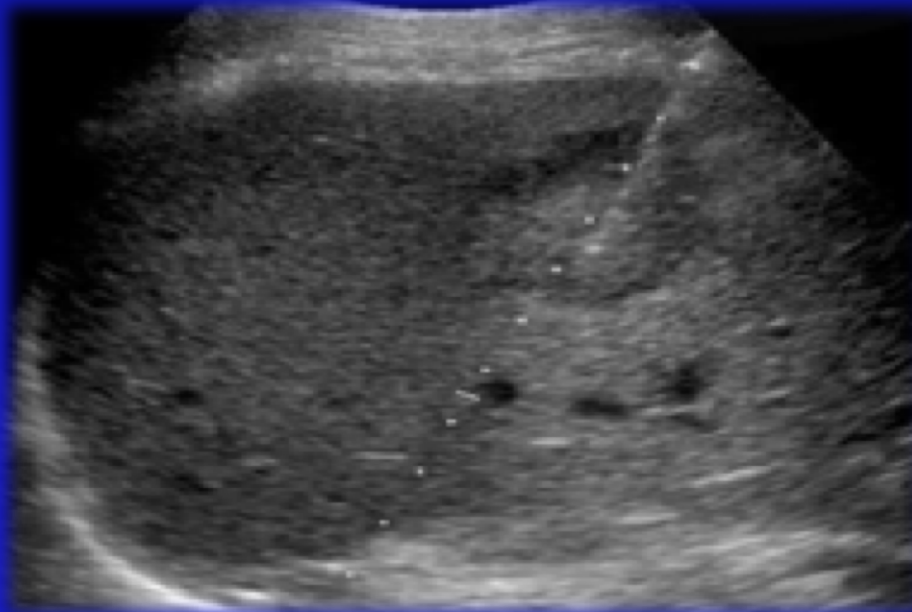
AGO



BERSAGLIO



CARATTERIZZAZIONE



ECOGRAFIA INTERVENTISTICA

Caratterizzazione mediante Biopsia Percutanea Eco-guidata

Citologia : aghi sottili 22-21-20 G. Punta a “becco di flauto”

Tutti gli organi o visceri tranne il cuore

Fegato , milza, pancreas, reni , ghiandole salivari, tiroide
mammella , linfonodi superficiali o profondi



ECOGRAFIA INTERVENTISTICA

Caratterizzazione mediante Biopsia Percutanea Eco-guidata

CITOLOGIA

FNB: fine needle biopsy

FNAB: fine needle aspiration biopsy

Aghi sottili da 22-21 G

Per aspirazione

Per capillarità

Striscio di materiale su vetrino e lettura mediante colorazione



针管外径 O.D.	Pipe outside diameter Gauge	色标 Colour	Colour code	针管长度 Pipe Length
0.4	27G	中灰	Grey	5/8"
0.45	26G	褐	Brown	5/8"
0.5	25G	橙	Orange	3/4"
0.55	24G	中紫	Purple	1"
0.6	23G	深蓝	Blue	1", 1 1/4"
0.7	22G	黑	Black	1 1/8", 1 1/4"
0.8	21G	深绿	Dark Green	1 3/8", 1 1/2"
0.9	20G	黄	Yellow	1 1/2"
1.2	18G	粉红	Pink	1 1/8", 1 1/2"
1.6	16G	白	White	1 1/2"

ECOGRAFIA INTERVENTISTICA

Caratterizzazione mediante
Biopsia Percutanea Eco-guidata

MICROISTOLOGIA



AGO TRANCIANTE PUNTA TRAPEZOIDALE “MENGHINI MODIFICATO”

Ø 21-18-16 Gauge

Si ottiene un frustolo

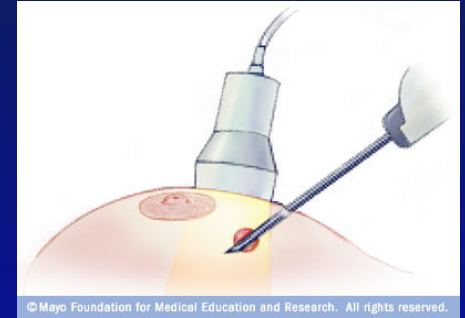
Lettura come istologia



ECOGRAFIA INTERVENTISTICA

Caratterizzazione mediante
Biopsia Percutanea Eco-guidata

Tecnica a “mano libera”



Guida mediante adattatori

Sonde forate



ECOGRAFIA INTERVENTISTICA

Caratterizzazione mediante
Biopsia Percutanea Eco-guidata

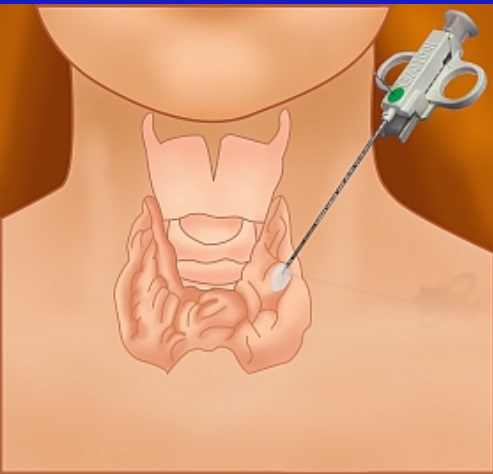
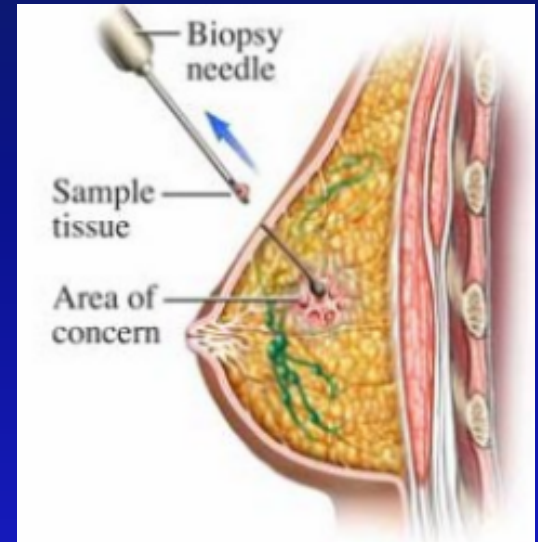
DIAGNOSI LESIONI ORGANI SUPERFICIALI

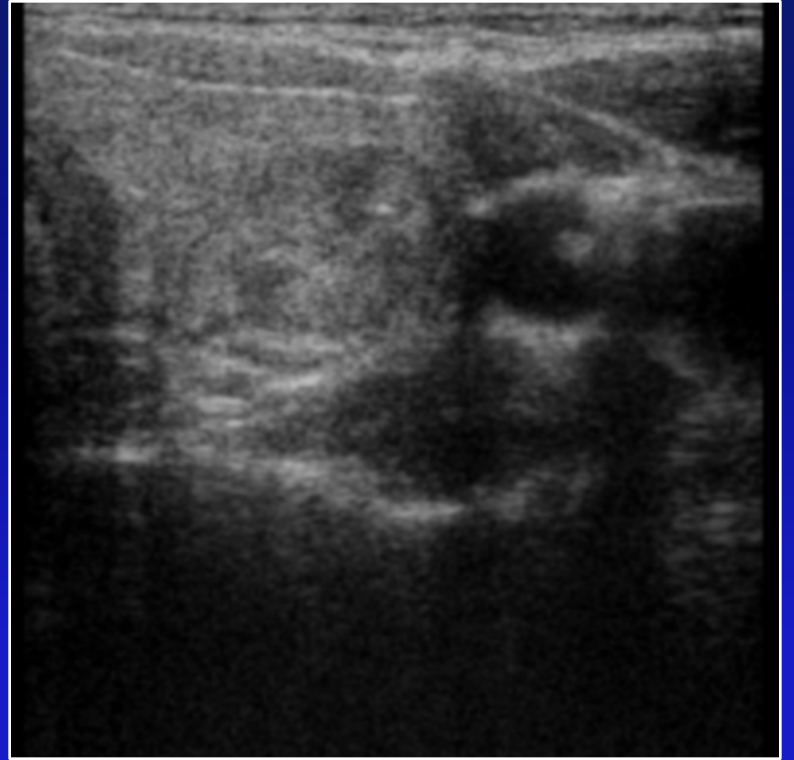
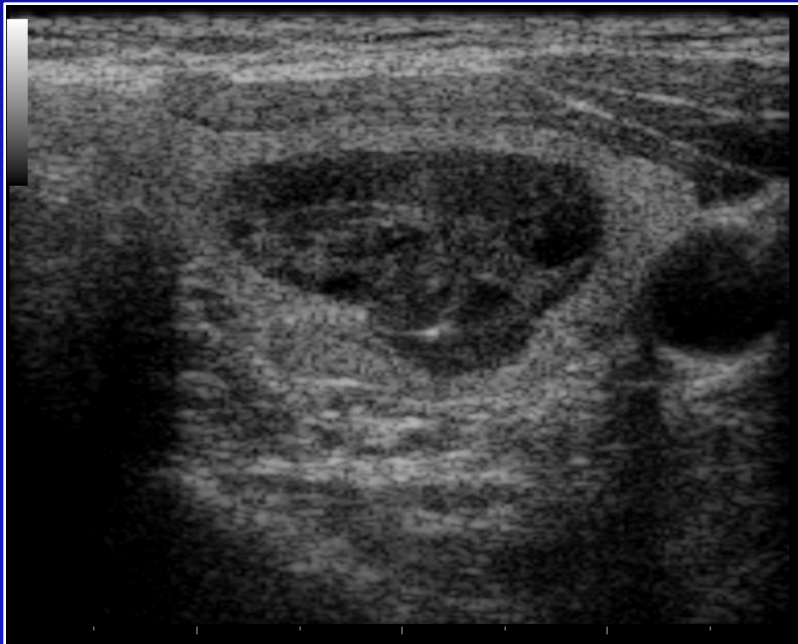
TIROIDE

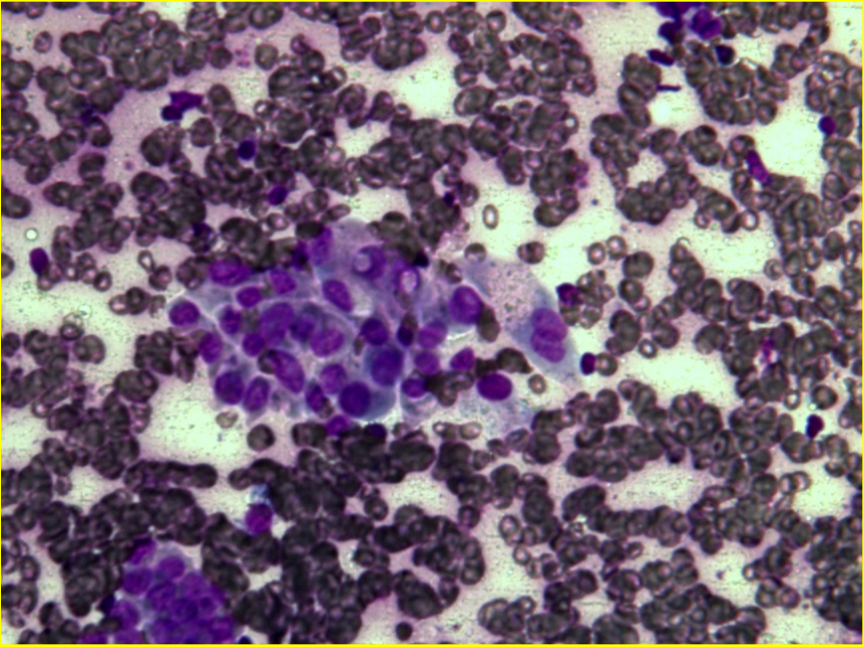
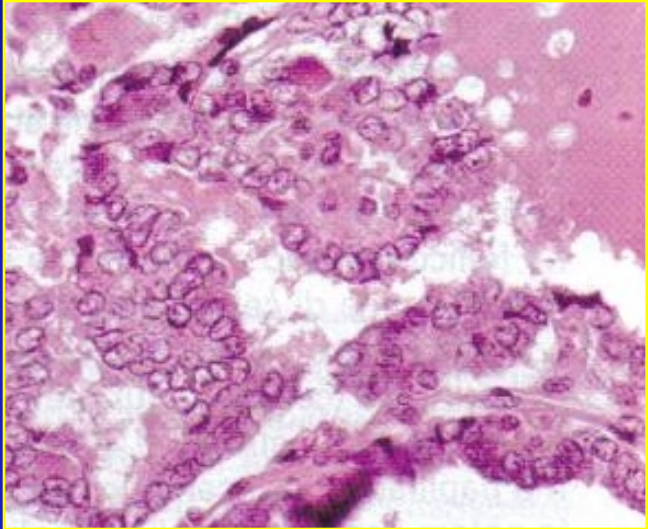
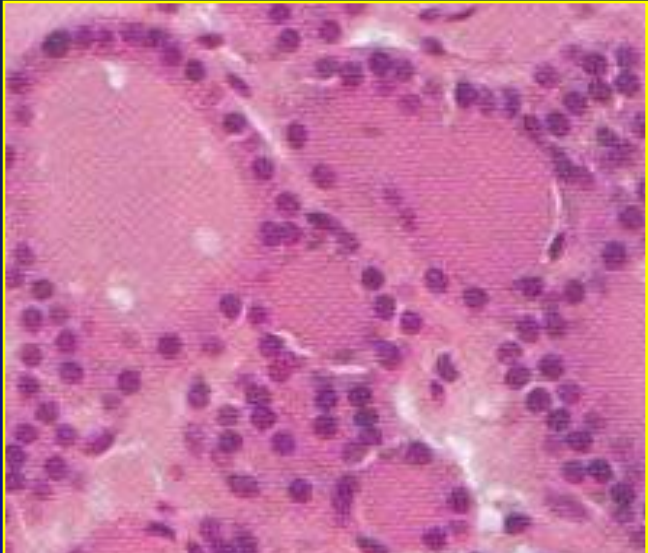
MAMMELLA

LINFONODI SUPERFICIALI

MASSE SUPERFICIALI (es. lesioni pleuriche superficiali)







Summary Characteristics for Thyroid Fine-Needle Aspiration: Results of Literature Survey

Feature, %	Mean	Range	Definition
Sensitivity	83	65-98	Likelihood that patient with disease has positive test results
Specificity	92	72-100	Likelihood that patient without disease has negative test results
Positive predictive value	75	50-96	Fraction of patients with positive test results who have disease
False-negative rate	5	1-11	Fine-needle aspiration negative; histology positive for cancer
False-positive rate	5	0-7	Fine-needle aspiration positive; histology negative for cancer

Adapted from Gharib H, Papini E, Valcavi R, et al; AACE/AME Task Force on Thyroid Nodules. American Association of Clinical Endocrinologists and Associazione Medici Endocrinologi medical guidelines for clinical practice for the diagnosis and management of thyroid nodules. *Endocr Pract.* 2006;12:63-102. Used with permission.

AGOBIOPSIA MAMMARIA



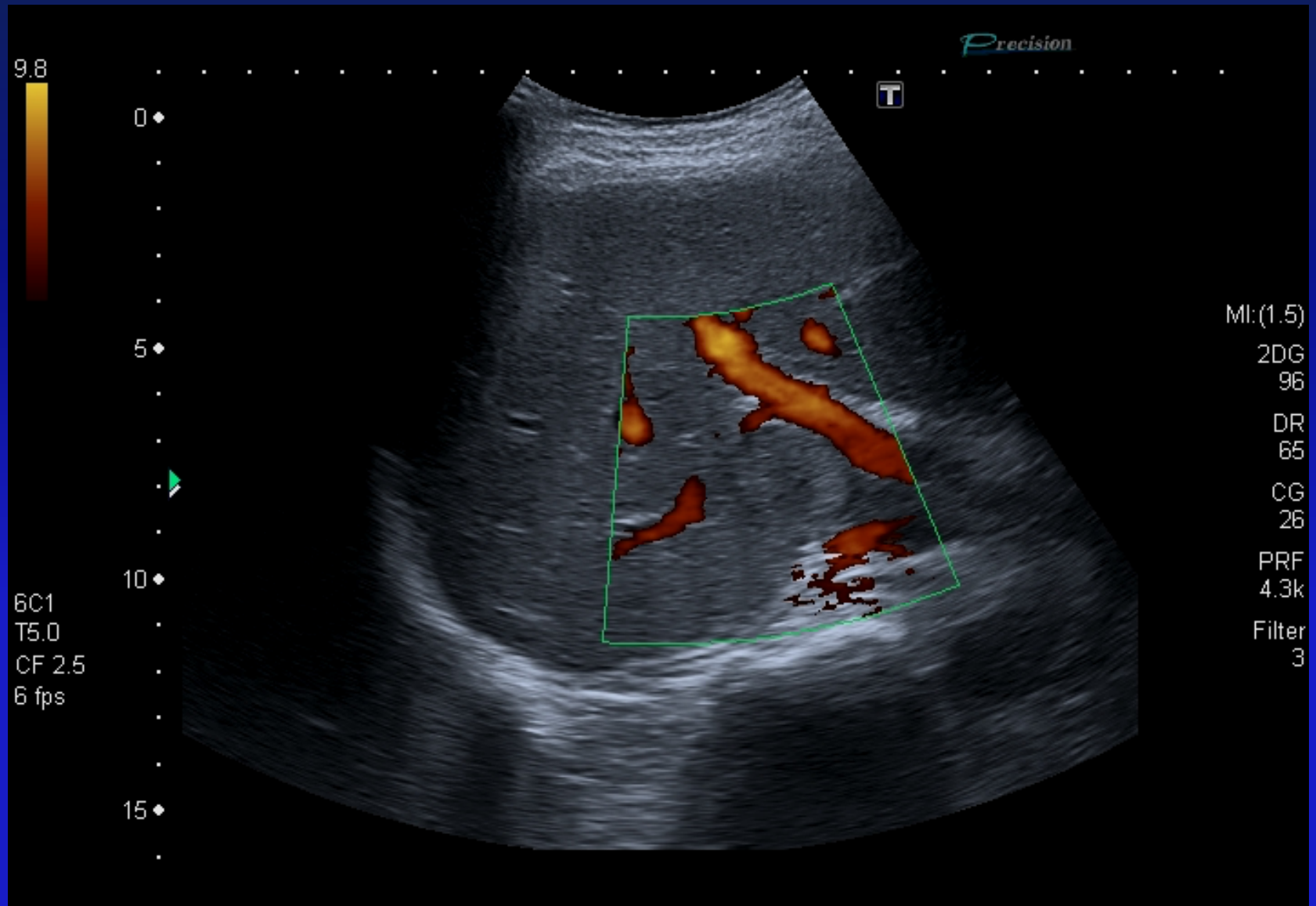
Affidabilità diagnostica della FNAC: confronto con valori di riferimento

(*European guidelines for quality assurance in breast cancer screening and diagnosis 4th Ed. 2006*)

	Citologia	Valori di Riferimento
Falsi Negativi (FN)	4.3%	< 4-6%
Falsi Positivi (FP)	0,8%	< 1-0.5%
Sensibilità	88%	> 80-90%
Specificità	49.2%	> 55-65%
Valore Predittivo Positivo (VPP)	C5 98,8%	> 98-99%
	C4 74,3%	
	C3 14%	
Valore Predittivo Negativo (VPN)	C2 96,7%	

**BIOPSIA PERCUTANEA
ECOGUIDATA DI LESIONI
FOCALI ADDOMINALI**

HCC CENTRO LOBO DESTRO



HCC CENTRO LOBO DESTRO

TOSHIBA

20121003.115132.TSB_Hosp.ID:20121003.11... O
CDC ATHENA 'V. dei Pini' - OPE - Abdomen

03.10.2012
11:54:19

Precision

9.8



0

5

10

15

6C1
T5.0
CF 2.5
6 fps



MI:1.5
2DG
96
DR
65
CG
26
PRF
4.3k
Filter
3

IP5

HDD:91% Free



FNB: HCC CENTRO LOBO DESTRO

TOSHIBA

20121003.115132.TSB_Hosp.ID:20121003.11... O
CDC ATHENA 'V. dei Pini' - OPE - Abdomen

03.10.2012
12:10:24

Precision



0 ◆
5 ◆
10 ◆
15 ◆

6C1
T5.0
21 fps



MI:1.5
2DG
96
DR
65

IP5

Storing HDD:89% Free



FNB: Complementare all' US.

**Fornari et al. Am J Gastroenterol, 1994.
Herszenyi et al. Ital J Gastroenterol, 1995.**

FNB

Costi: 115.000 Lire

Busilacchi et al, 1997.

VALUE OF ULTRASONOGRAPHY –GUIDED FINE NEEDLE ASPIRATION CYTOLOGY IN THE INVESTIGATIVE SEQUENCE OF HEPATIC LESIONS WITH AN EMPHASIS ON HEPATOCELLULAR CARCINOMA

Swamy MC et Al J-Cytol 2011 oct

72 cases

HCC 36.12%

MTS 19.45%

Cirrhosis 8.34%

Overall diagnostic accuracy :97.82%

Sensitivity :96.87

Specificity :100%

Conclusions

US guided FNAC of the liver is the safe simple cost effective and accurate method for cytological diagnosis of hepatic diffuse and nodular lesions

COMPARISON OF NEEDLE ASPIRATION CYTOLOGY AND NEEDLE CORE BIOPSY IN THE DIAGNOSIS OF RADIOLOGICALLY DETECTED ABDOMINAL LESIONS.

Stewart CJ J Clin Pathol 2002 ,feb

CONCLUSIONS :

FNA CYTOLOGY IS MORE SENSITIVE AND ACCURATE THAN NCB IN THE DIAGNOSIS OF ABDOMINAL LESIONS AND ALSO OFFERS MORE RAPID DIAGNOSIS .HOWEVER, THE COMBINATION OF THE TWO TECHNIQUES INCREASES THE DIAGNOSTIC SENSITIVITY

Complicanze dopo FNB

- **Mortalità:** 0.031% (5 morti su 16381 biopsie)
 - 16/21 morti FNB fegato per emorragie
 - 5/6 morti FNB pancreas per pancreatite
- **Seeding:** 0.003%

Smith, Radiology 1991.

US-GUIDED INTERVENTIONAL PROCEDURES

N° patients	Type and number of lesions			Kind of needle	
			%	FNB (22G)	CNB (19G)
12962	Total 13397				
	HCC	9780	73	10915	965
	Metastases	1128	8.4	1101	524
	Cholangiocarcin.	187	1.4	138	95
	Small absc. <2cm	90	0.6	93	-
	Hydatid liver cysts	97	0.7	97	-
	Mycotic abscess	111	0.8	121	-
	Focal steatosis	688	5.1	416	538
	Hemangiomas	429	3.2	453	4
	Cirrhotic rig. nod.	187	1.4	236	194
	Biliary cysts	658	4.9	693	-
	Other	42	0.3	65	-
				14328	2320

Giorgio et al, Radiology 2000.

DIAGNOSTIC INTERVENTIONAL PROCEDURES

- **No death occurred after diagnostic procedures.**
- **The only major complication observed after FNB was a self-limiting mild hemoperitoneum detectable at US five minutes after the puncture in one patient (36% PT)**
- **It didn't require blood transfusion.**

Giorgio et al : Radiology , 2000

Giorgio et al: J Ultrasound Med , 2003

ECOINTERVENTISTICA TERAPEUTICA

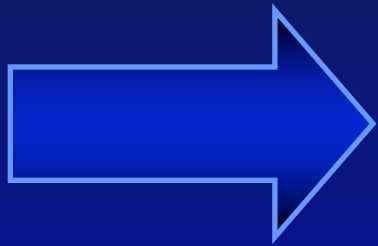
ascessi

**cisti
idatidee**

**ablazione HCC
su cirrosi da
HCV/HBV**

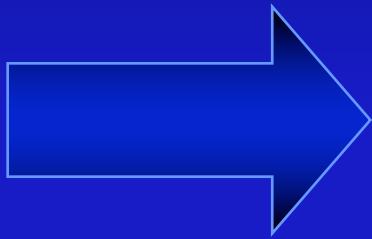
Pyogenic liver abscesses

Sharara Al et al, Curr Treat Options Gastroenterol 2002; 5 (6):437-442

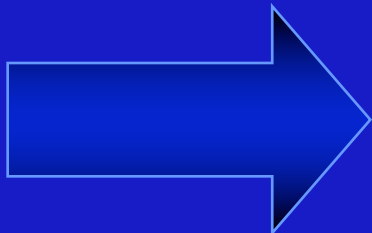


The optimal treatment of pyogenic liver abscess is percutaneous drainage (PD) and intravenous broad-spectrum antibiotics with activity against enteric aerobic and anaerobic bacteria

Success rate 76-100%



Blood and abscess cultures should be obtained and amebic liver abscess carefully eliminated when the diagnosis is in doubt



Surgical laparoscopic drainage is reserved for patients with complicated abscesses or after failure of response to initial medical therapy

Hepatic abscesses (HA) in immunocompromised patients ultrasonically guided percutaneous drainage
Gastrointestinal Radiol 1992 Spring;17(2):175-8

Civardi G, Filice C, Caremani M, Giorgio A.

US-PD must be considered the therapy of choice for hepatic abscess (except the fungal lesions) in severely immunocompromised pts

Clinical efficacy of ultrasound guided percutaneous drainage of abscesses in patients with leukaemia and lymphoma

Eur J Cancer 1998 Mar;34(4):580-3

Civardi G, Filice C, Caremani M, Giorgio A,
Vallisa D, Berte L, Cavanna L.

Pyogenic Liver Abscesses: 13 Years of Experience in Percutaneous Needle Aspiration With Us Guidance

A. Giorgio et al, , Radiology, 1995

❖ 115 pts/140 abscesses (range: 3-16 cm)

❖ hospitalization

❖ puncture & aspiration with needles with varying
caliber (16-21G)

Results

- ❖ Success rate: 97.8%
- ❖ No complications were observed

Methods (since 1991)

- ❖ Only one aspiration
- ❖ Short hospitalization (3 days)
- ❖ Outpatients if good condition

SEVA SCOPPIO-ENTRO - DENTR C
R. S. COLOMO - NAPOLI

ALTA
1 30
2 45
3 15
4 15
5 15
6 15
7 15
8 15
9 15
10 15
11 15
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29 15
30 15



217 211 CS - RI
L: 211mm

US Guided Percutaneous Aspiration of Pyogenic Liver Abscesses is:

❖ Efficient

quick defervescence, high cure rate, no relapses

❖ Safe

no major complications or deaths

❖ Low-cost procedure

needles cheaper than sump catheters short hospitalization

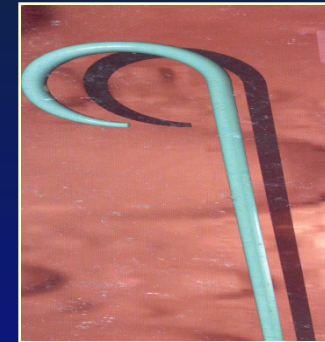


Treatment of pyogenic liver abscesses: prospective randomized comparison of catheter drainage and needle aspiration

YU SC et al, *Hepatology* 2004, 39 (4):932-8

Aim

To compare the therapeutic effectiveness of continuous catheter drainage (CD) versus intermittent needle aspiration (NA) in the treatment of pyogenic liver abscesses



Materials & Methods

Over a 5-year period 64 consecutive pts with PLA were treated with intravenous antibiotics and randomized into 2 percutaneous groups: continuous CD and intermittent NA

Conclusi

on

Due to the additional advantages of procedure simplicity, patients comfort and reduced price, NA deserves to be considered as a first-line drainage approach



Percutaneous needle aspiration of multiple pyogenic abscesses of the liver:
13-year single-center experience **A. Giorgio et al. AJR DEC 2006**

patients/methods

39 pts/ 118 PLA, all pts had been treated with antibiotics alone (16 days), in all 39: persistence of fever. US/ CT: liver abscesses were increasing in size or number

RESULTS

36 pts (92.3%) underwent a single aspiration in a single session

no pt needed percutaneous catheter drainage or open surgical drainage

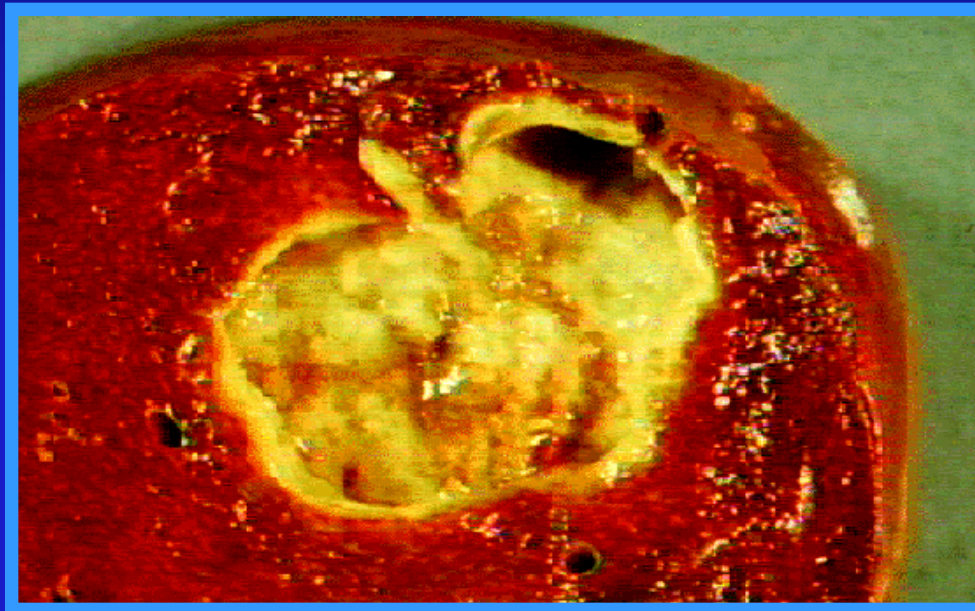
CONCLUSION

no abscesses recurred during the follow-up

PNA of PLA is a safe, effective and was acceptable to pts.
Our data suggest that PNA should always be undertaken before catheter drainage or surgery

Echo-Guided Percutaneous Puncture: A Safe and Valuable Therapeutic Tool for Amebic Liver Abscess

Antonio Giorgio, Pietro Amoroso, Giampiero Francica, Giorgio de Stefano, Paolo Fico,
Gennaro Lettieri, Luciano Tarantino, Livio Finelli, Flavio Fiorentino, and Paola Pierri
5th Division, "D. Cotugno" Hospital for Infectious Diseases, Naples, Italy



Amebic liver abscesses: a new epidemiological trend in a non-endemic area

A. Giorgio et al In vivo; 2009

✓ 20 pazienti osservati dal 1979 al 1987

mortalità 0%
successo 100%

28 pazienti osservati dal 1988 al 2007

2 pts deceduti per
meningite amebica (nuovo trend in epidemiologia ?)

Percutaneous Treatment of Hydatid Liver Cysts : An Update

Giorgio A. et al

Recent Patents on Anti-Infective Drug Discovery ,2012- Dec

Percutaneous Treatment of Hydatid Liver Cysts : An Update

Liver hydatidosis is the most common clinical presentation of cystic echinococcosis . Although liver cystic hydatidosis is considered a benign disease and many patients do not develop symptoms for years, its complications can be severe and life threatening , thus treatment is recommended for all available and active cysts . Among the therapeutic options available for this disease , such as open and laparoscopic surgery and chemotherapy, percutaneous treatment have gained considerable interest over the last decades , due to their efficacy safety and high patients acceptability

Giorgio A. et al

Recent Patents on Anti-Infective Drug Discovery ,2012- Dec

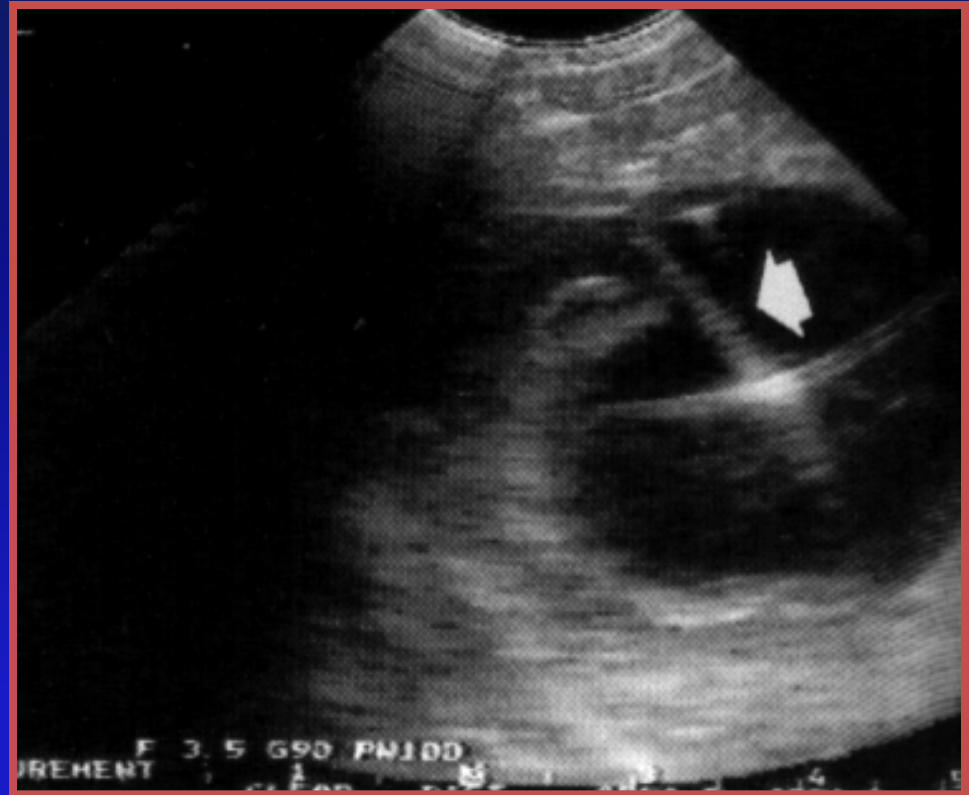
Hydatid liver cyst

Percutaneous

Aspiration

Injection

Re - aspiration




Treatment of hydatid cyst of the liver: where is the evidence?

Dziri C et al. 2004 World J Surg 28 (8):731-6


Treatment of hydatid cyst of the liver



chemotherapy is not the ideal treatment when used alone (level II evidence, grade B recommendation)



the level of evidence was too low to help decide between radical or conservative treatment (level IV evidence, grade C recommendation). The laparoscopic approach is safe (level IV evidence, grade C recommendation)



percutaneous drainage associated with albendazole therapy is safe and efficient in selected patients (level II evidence, grade B recommendation)

Treatment options for hepatic cystic echinococcosis

Smego RA Jr et al. 2005 Int J Infect Dis 9 (2):69-76

✓ PAIR appears to have greater clinical efficacy (i.e. a higher incidence of cure), lower rates of major and minor complications, mortality, and disease recurrence, and fewer days of hospitalization compared to pts treated surgically

Unilocular Hydatid Liver Cysts:
treatment with US-guided, double
percutaneous aspiration
and alcohol injection (D-PAI)

Giorgio A. et al. Radiology 1992



the ethanol is **not re-aspirated** and left in situ
the **procedure is repeated** 3/7 days later

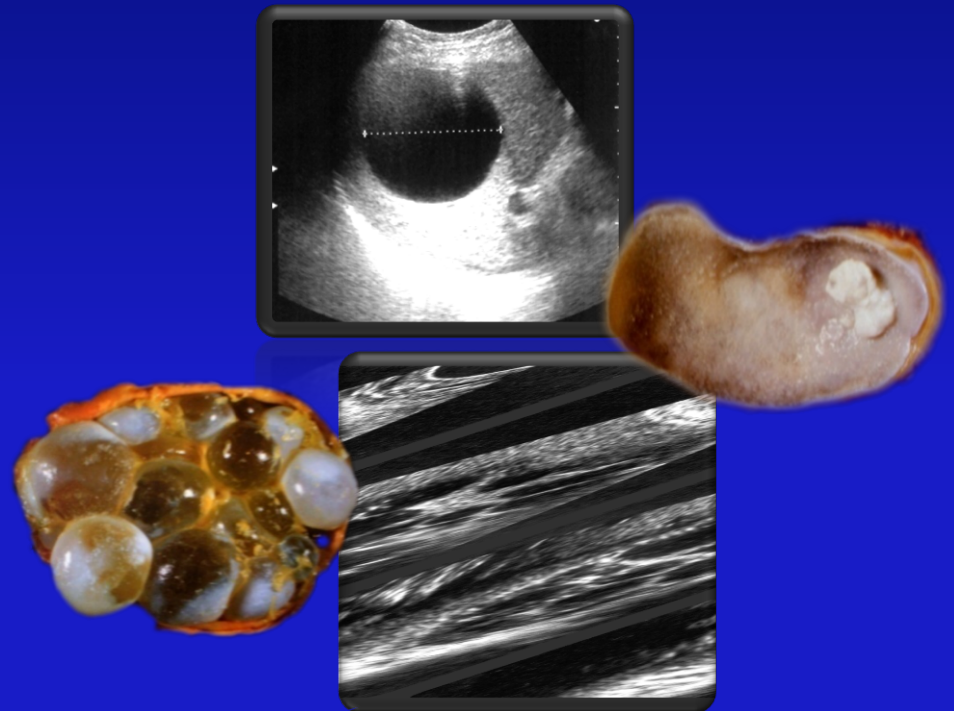
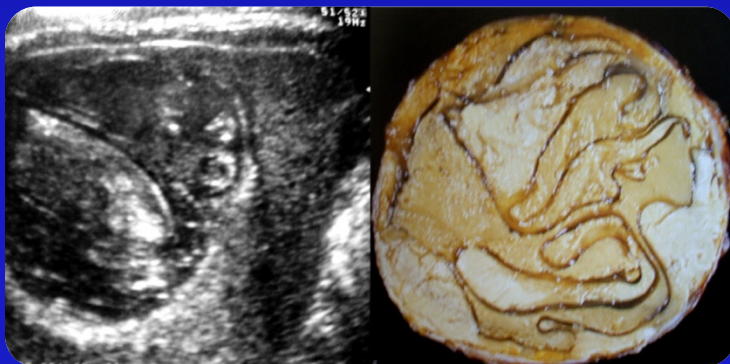
Long-term results of percutaneous treatment of hydatid liver cysts: a single centre 17 years experience

January 1988-January 2005

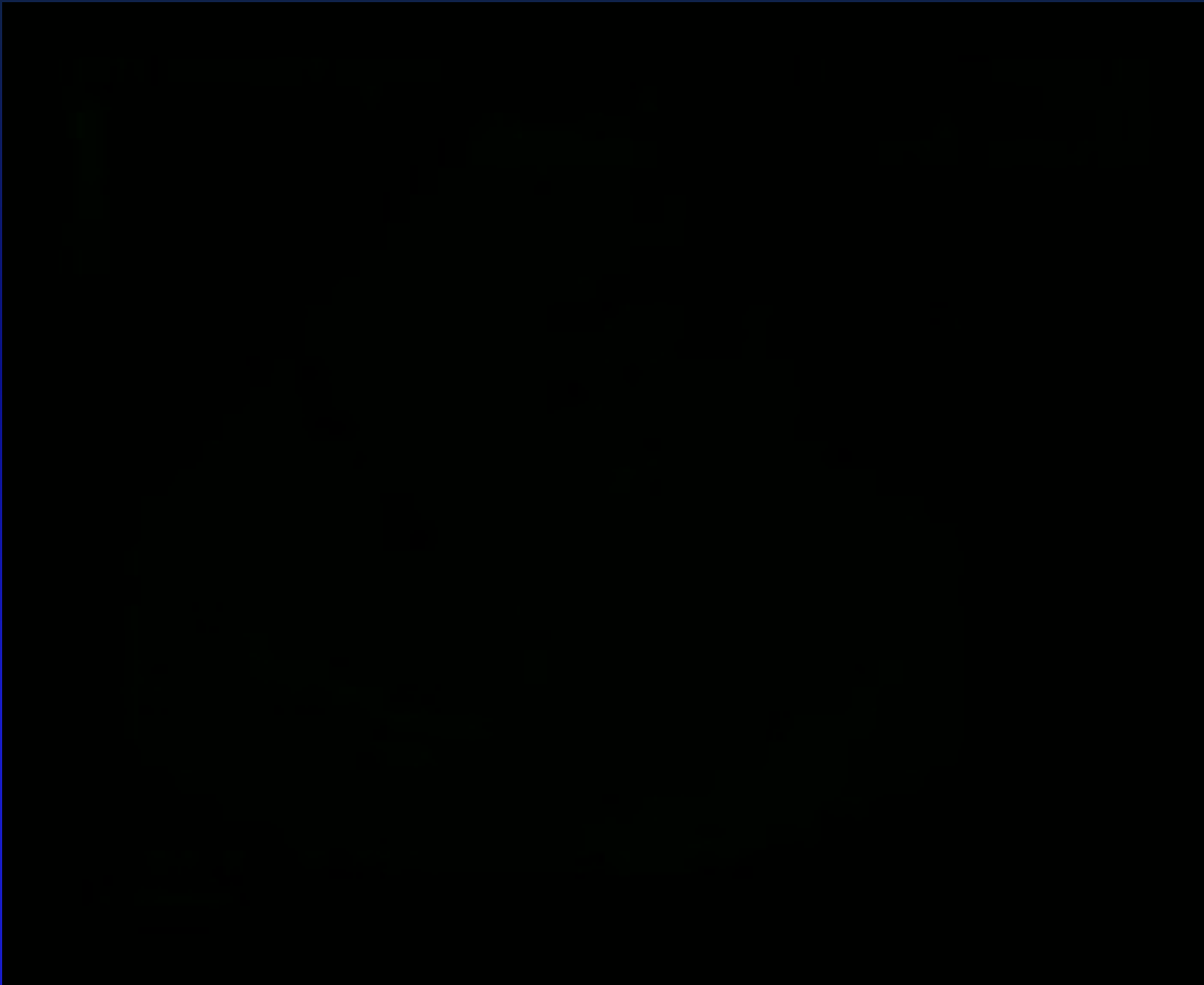
Study population

168 pts (108 males, age range 13-80 yrs, mean 42 yrs)

225 HLCs (2.8-20 cm, type CL/CE5, WHO/OIE 2001 Classification)



A. Giorgio, et al Infection, 2008



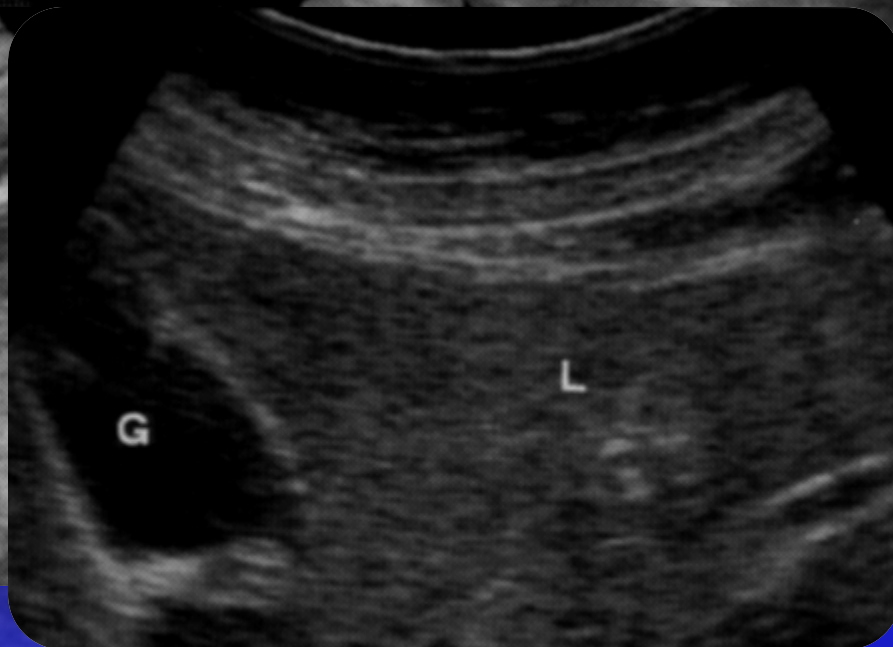
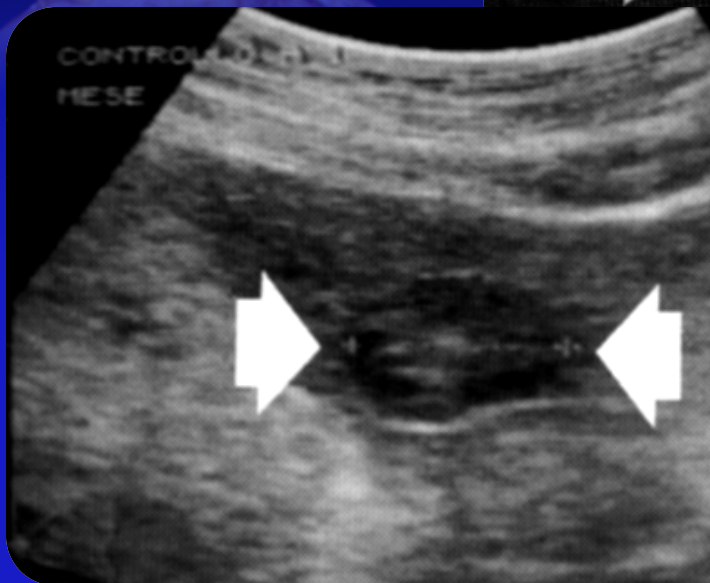
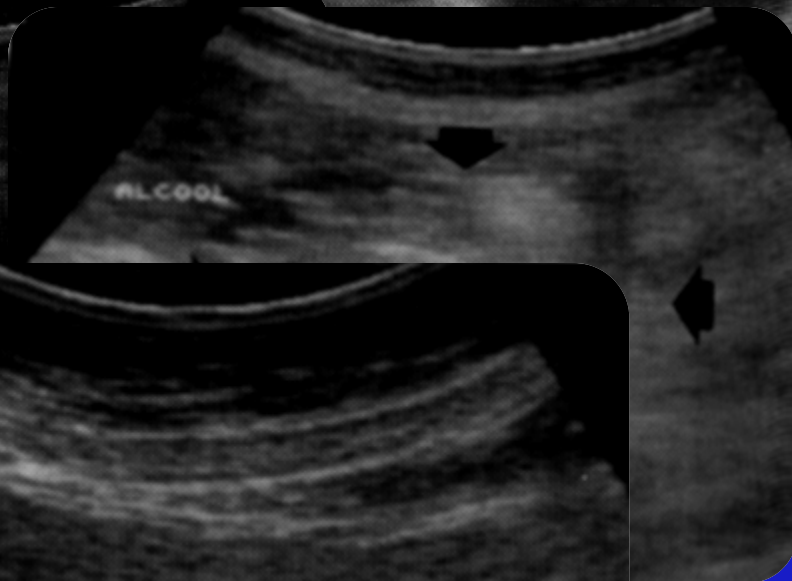
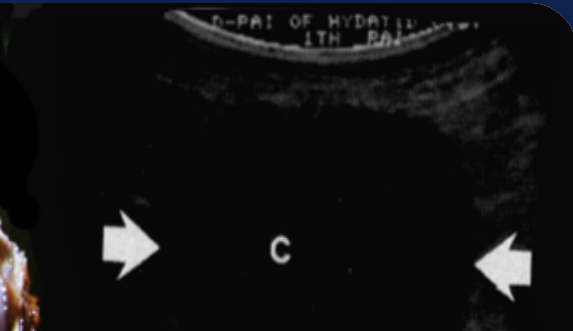
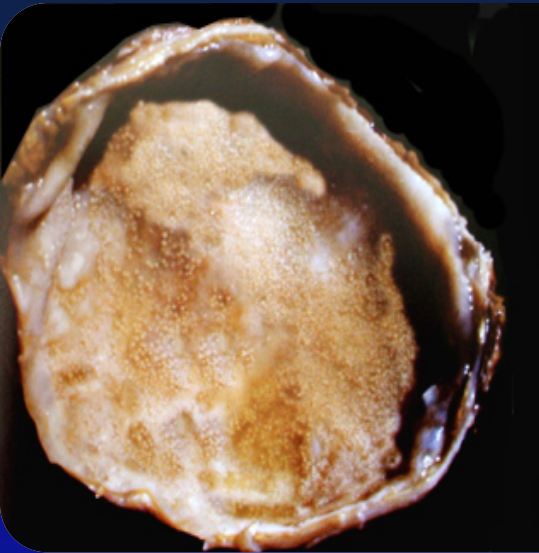
Results

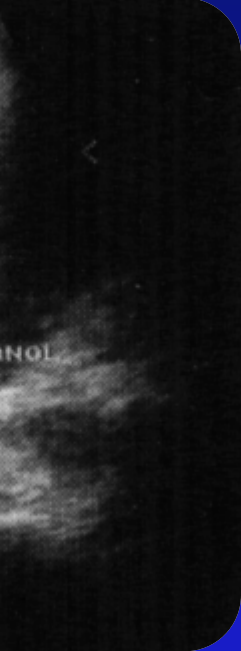
US patterns at last examination



50-80% decreased
volume

100% parasitologic cure





Complications

mortality rate 0.9% (1 case)

morbidity rate 8.6%



✓ 6/151 (4%) local recurrences

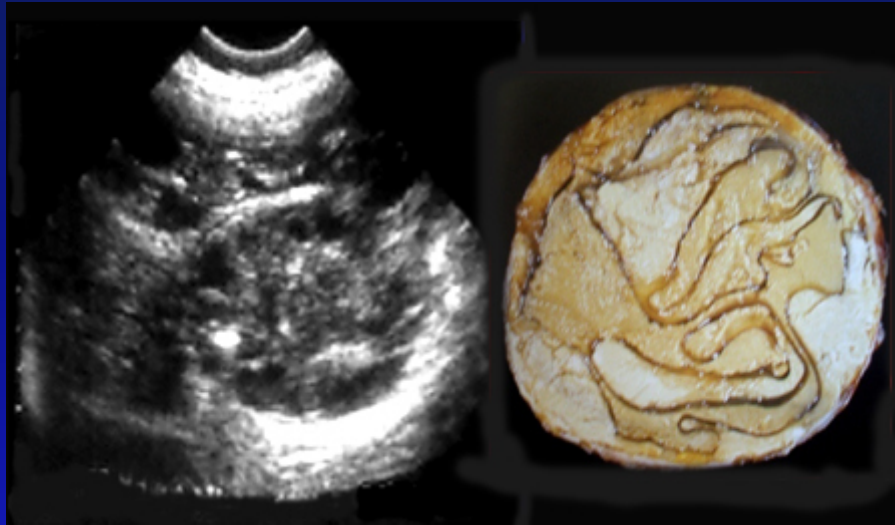
multiloculated cysts

✓ No recurrence in the distant areas of the liver, and other organs

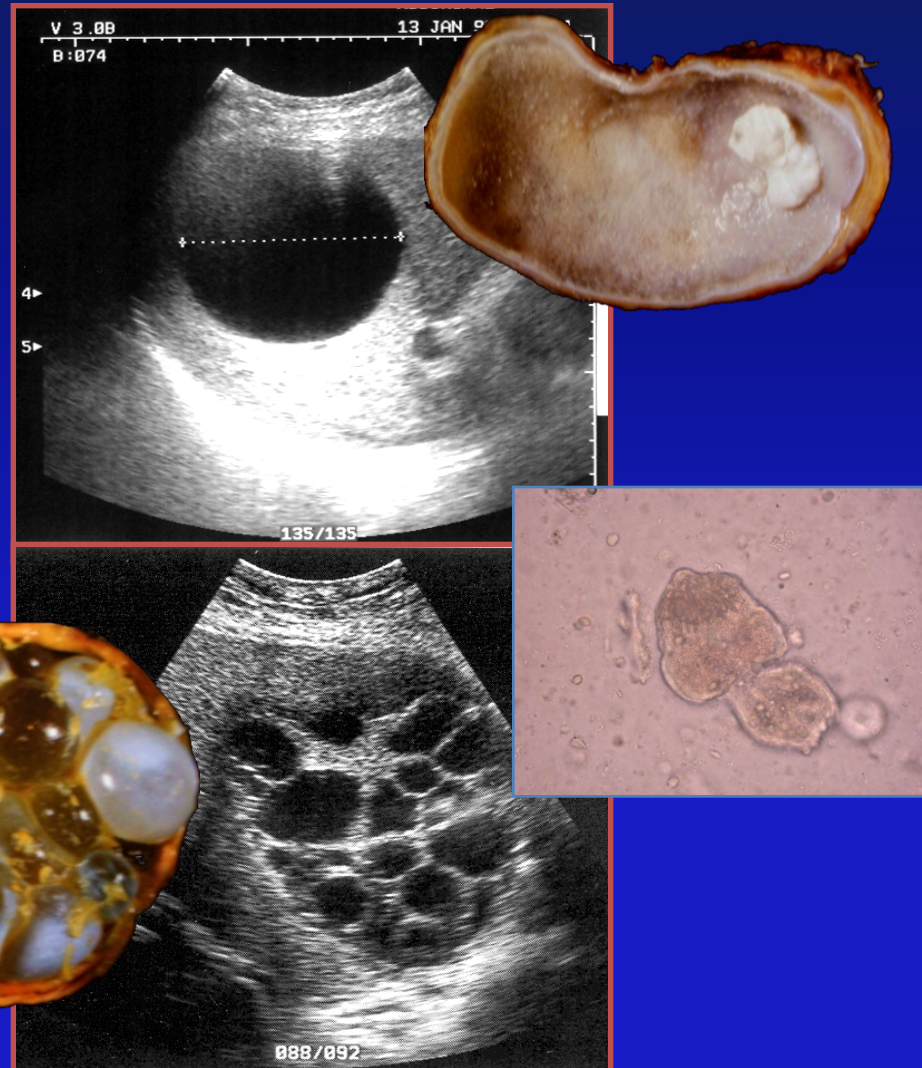


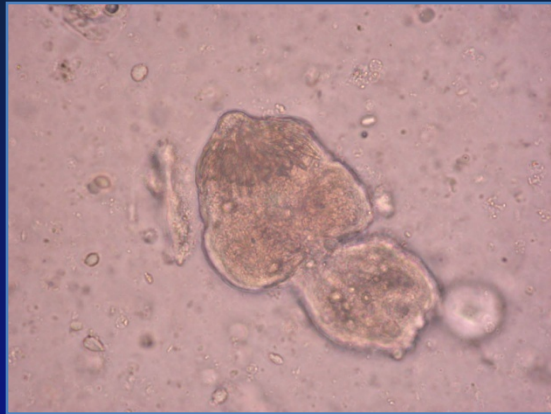
HLC: WHO viability classification

inactive



active





US



**HL
C**

**active cyst
(type CL; CE1,2,3)**

3 days before the
D-PAI

**inactive cyst
(type CE4,5)**

albendazole 800mg/ die +
bethametason 1.5 mg/ die

US-guided fine
needle puncture and
aspiration

no viable scolices

D-PAI

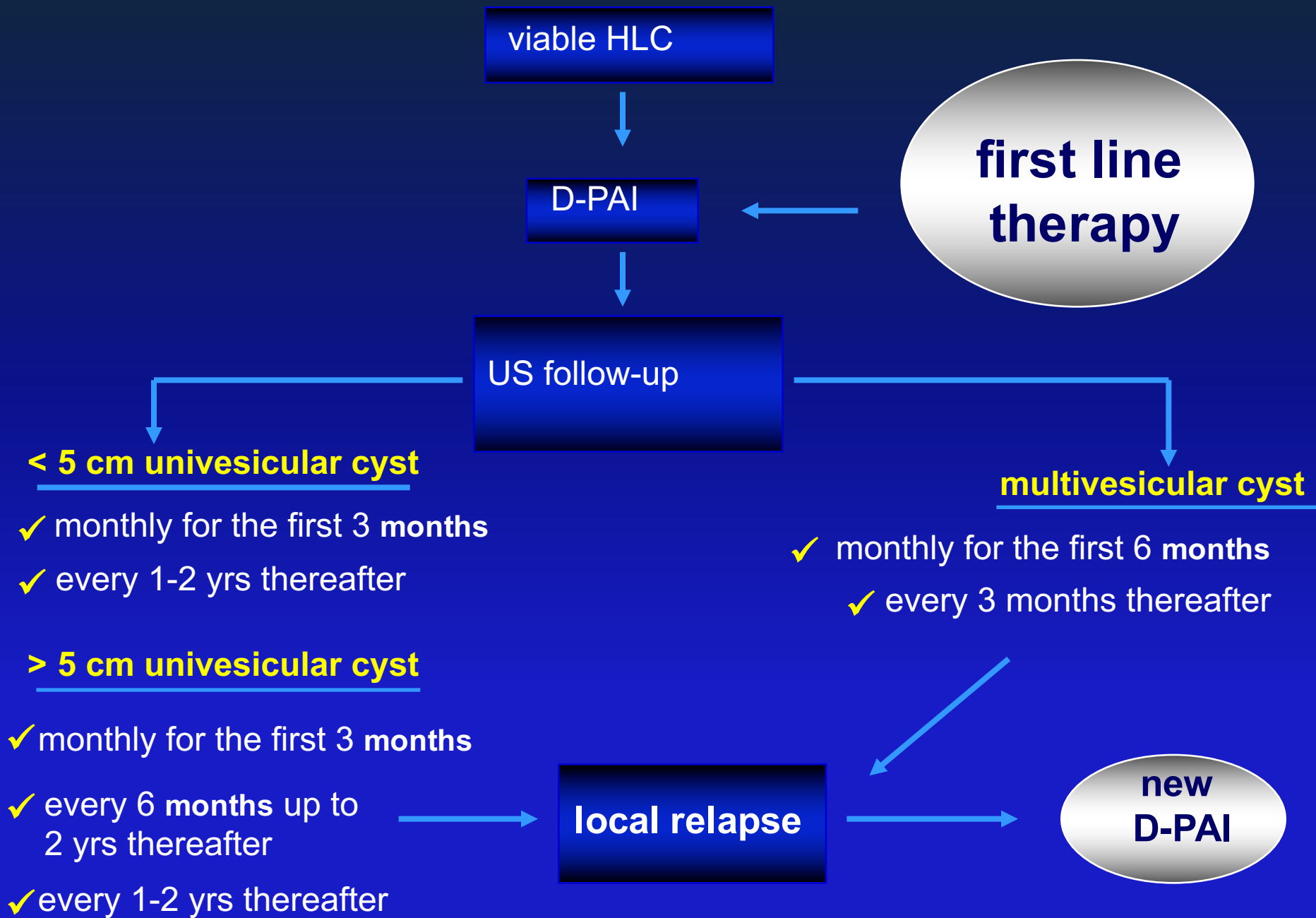
follow-up

stop

A. Giorgio, et al Infection, 2008

Sonographic and clinical outcome of viable hydatid liver cysts treated with Double Percutaneous Aspiration and ethanol Injection as first line therapy: efficacy and long term follow-up

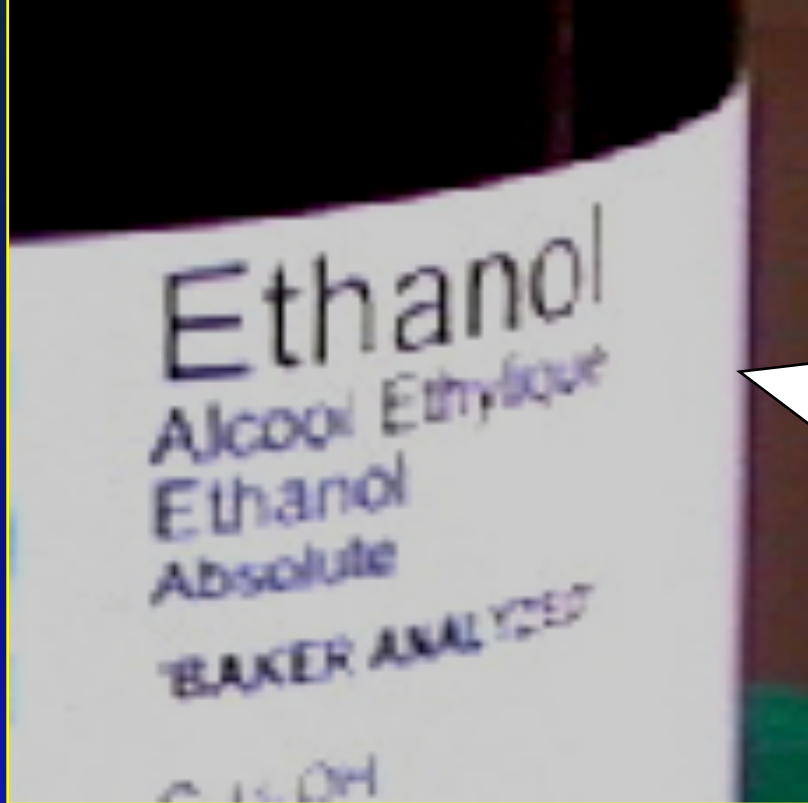
A. Giorgio et al, AJR September 2009



ABLAZIONE PERCUTANEA DEI TUMORI DEL FEGATO

PEI - RF

Laser – Microwave - Focused US - Hot water



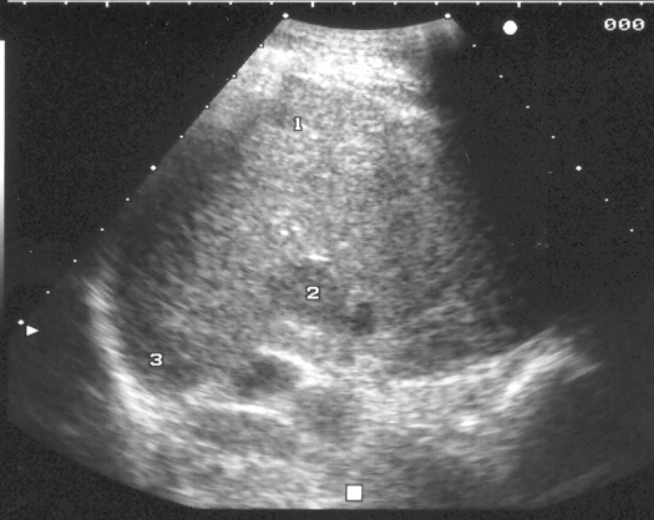
BASSO
COSTO
ELEVATA
EFFICACIA

ETHANOL'S ACTION

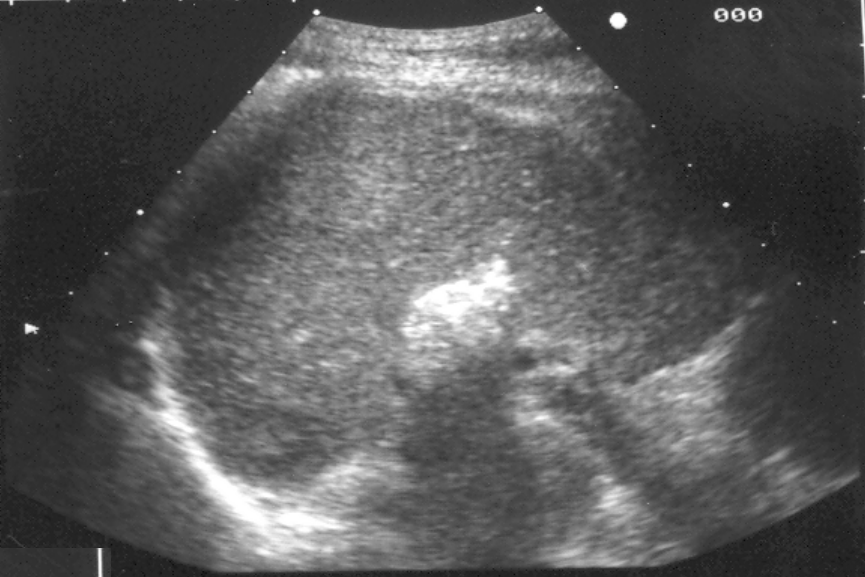
1)COAGULATIVE NECROSIS

**2)TRHOMBOSIS OF SMALL
VESSELS OF THE TUMOR**

000



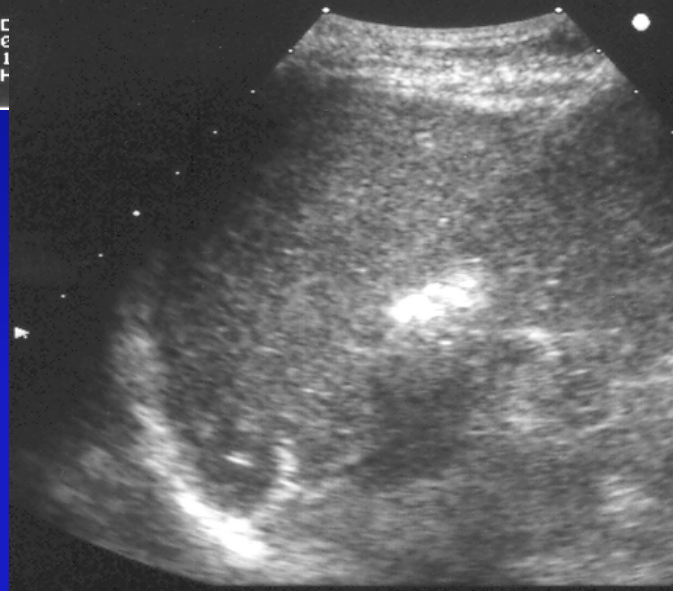
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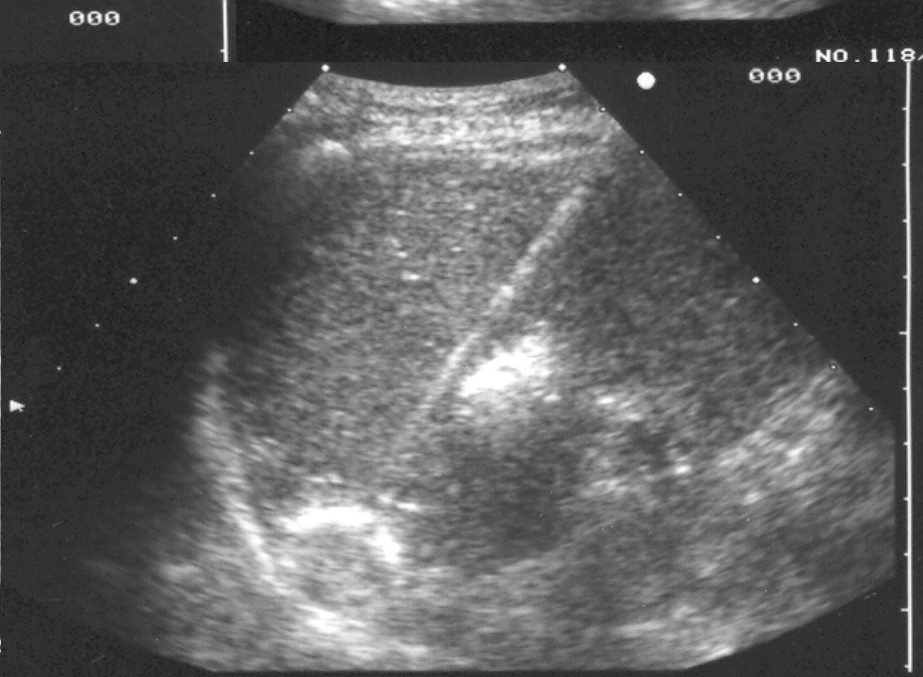


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7
1
CH



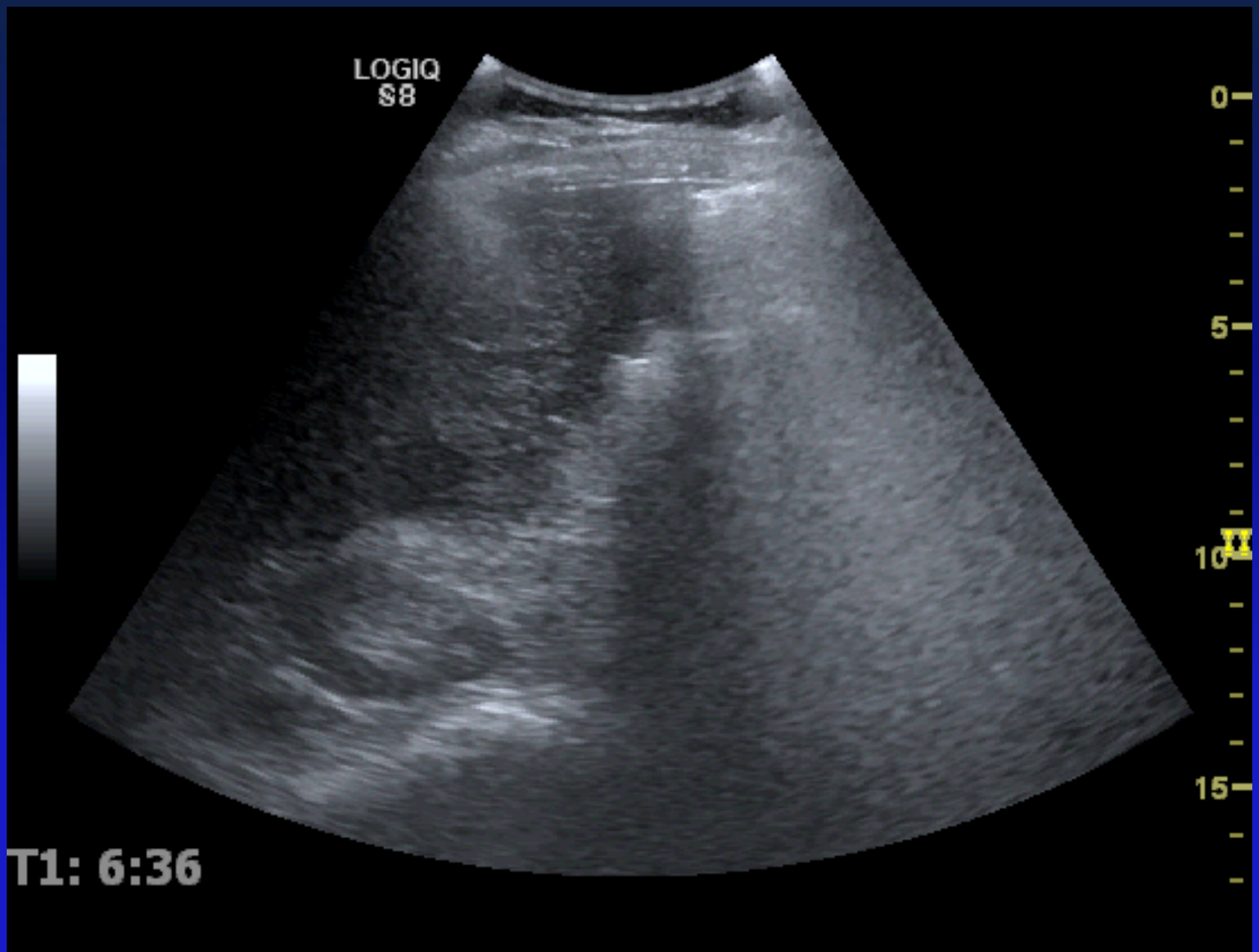
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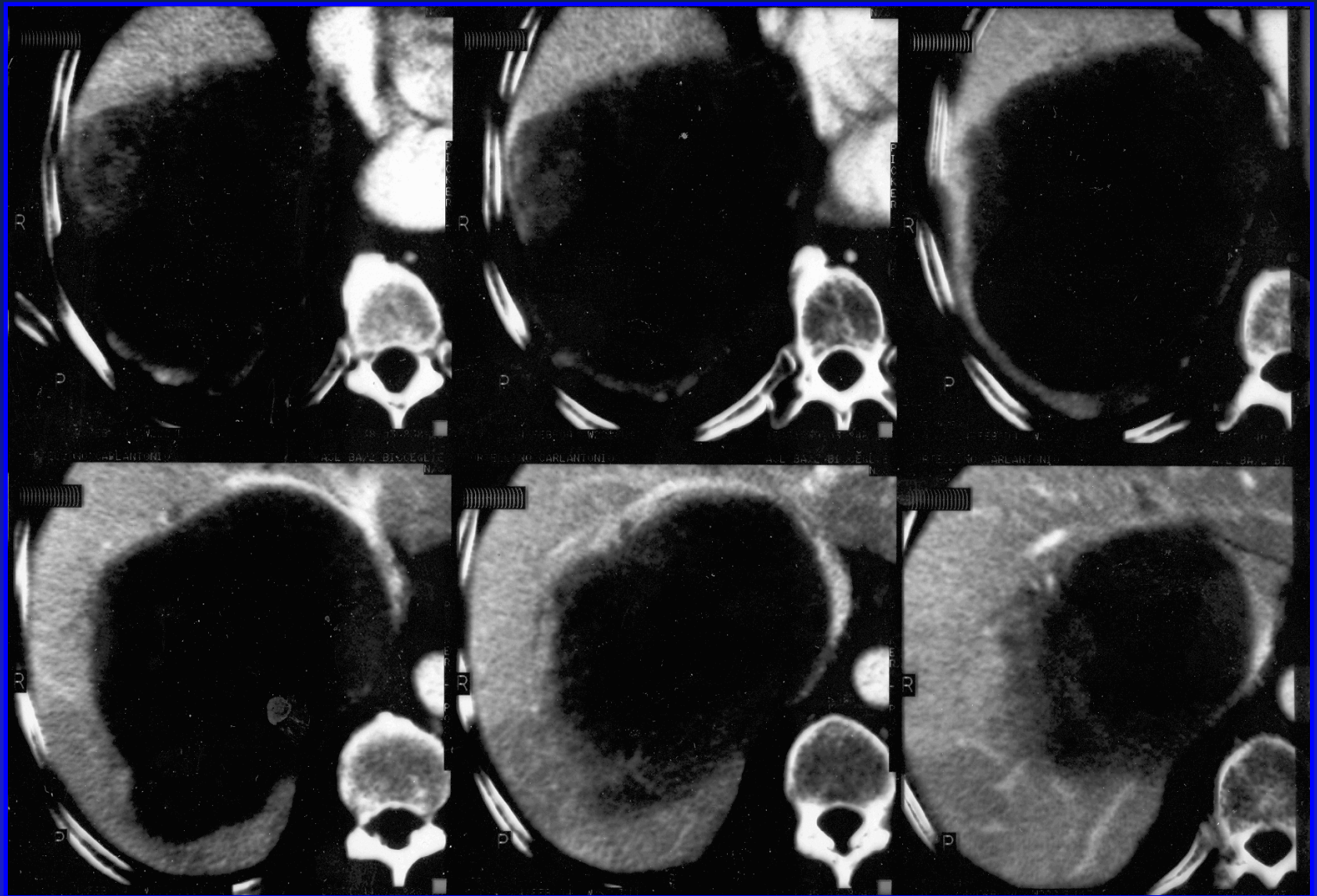
NO.118/118
O NA



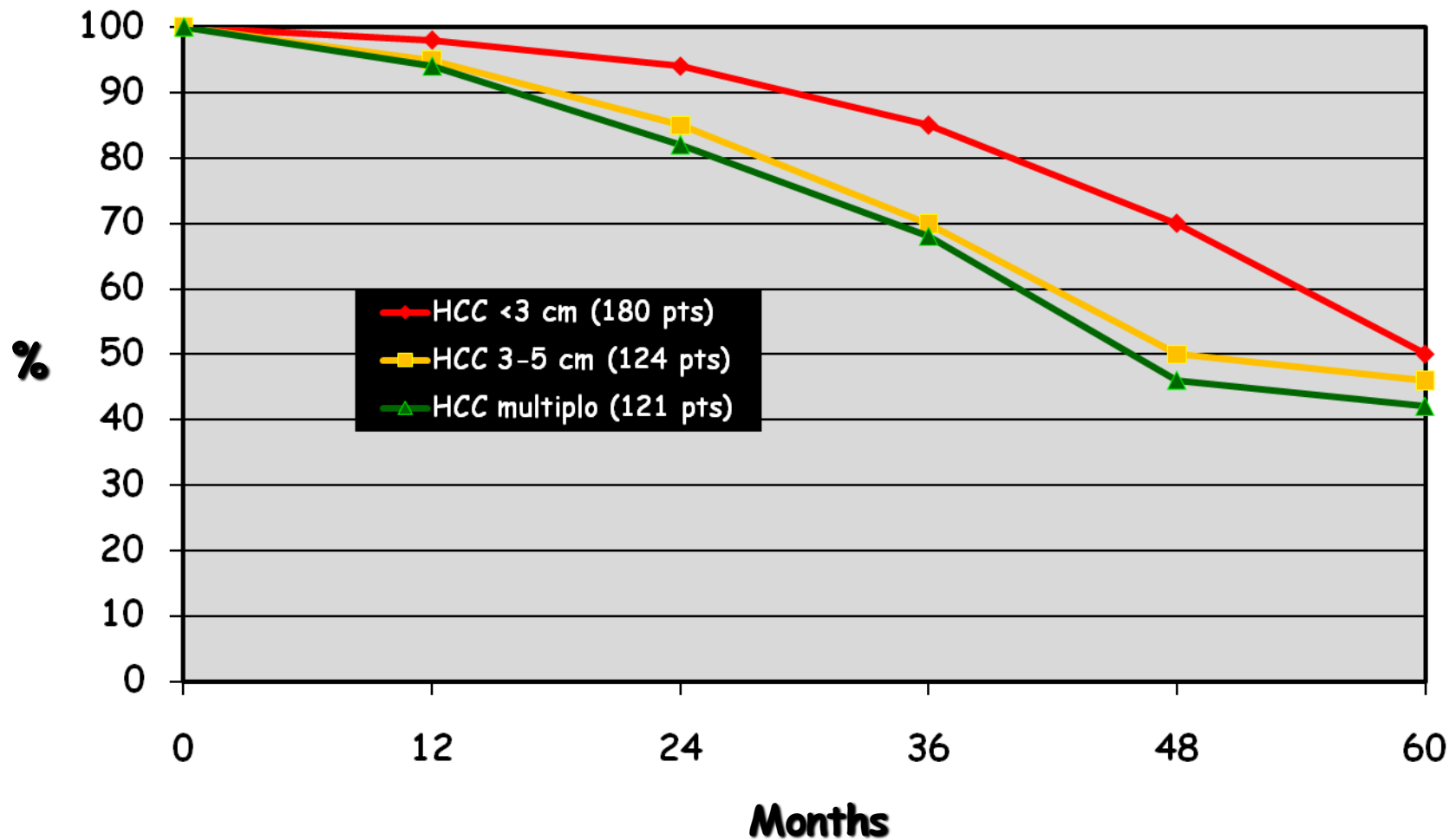
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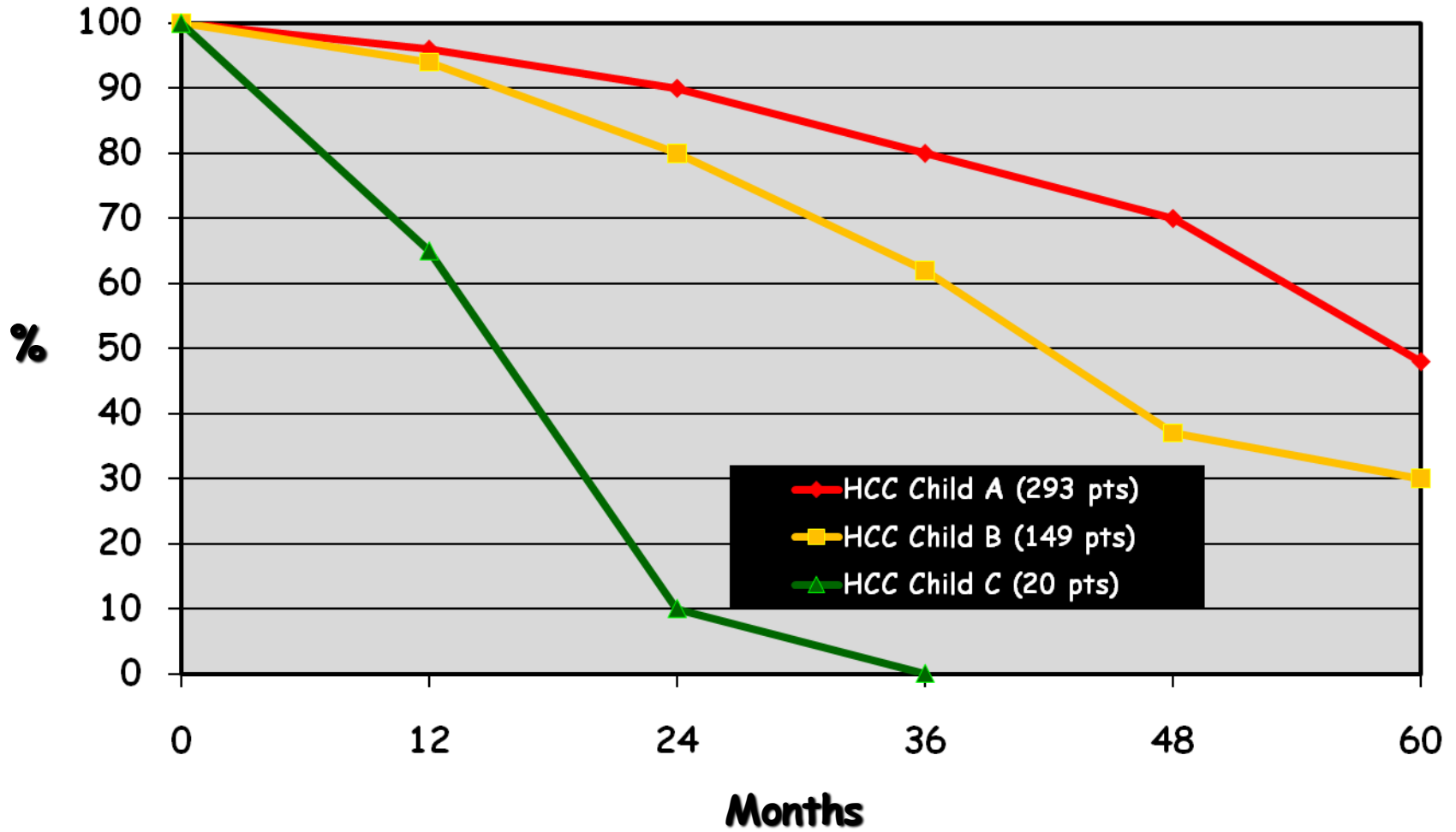


Hepatocellular Carcinoma and Cirrhosis in 746 Patients: Long-term Results of Percutaneous Ethanol Injection



Livraghi T, Giorgio A. Radiology 1995

Hepatocellular Carcinoma and Cirrhosis in 746 Patients: Long-term Results of Percutaneous Ethanol Injection



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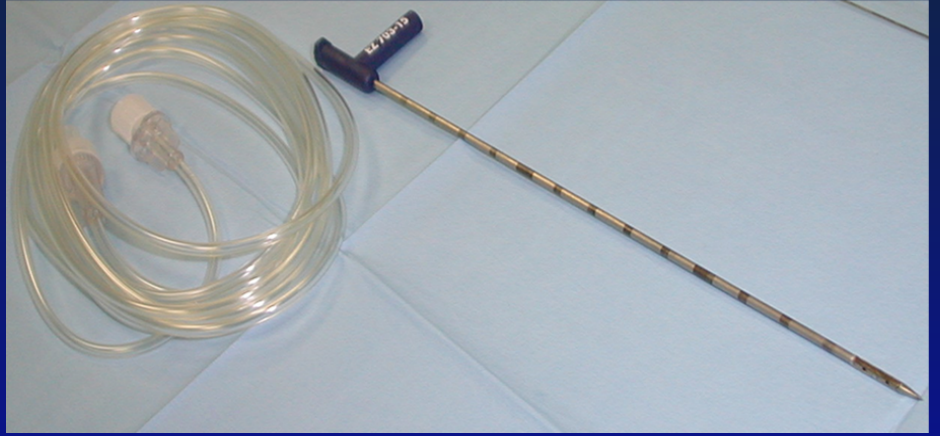
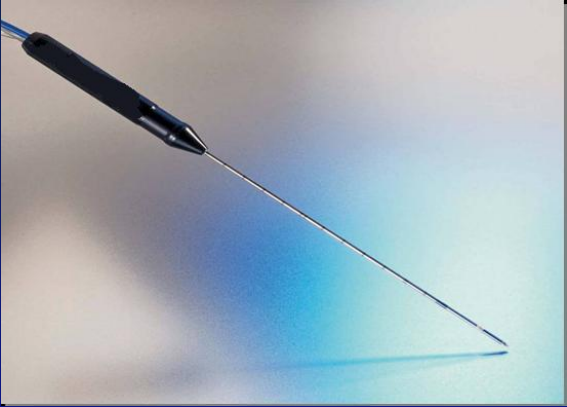
PEI in the treatment of hepatocellular carcinoma: a multicenter survey of evaluation practices and complication rates

Death (Hemoperitoneum) 1/1066 patients (0.09%)

Complications: 34/1066 patients (3.2%)

Hemoperitoneum: 5
Hemobilia: 2
Subcapsular hematoma: 1
Parietal hematoma: 1
Intestinal perforation: 1
Acute cholangitis: 1
Early abscess: 2
Caval vein thrombosis: 1
Portal vein thrombosis: 3
Pneumothorax: 2
Right pleural effusion: 5
Hepatic infarction: 3
Tumor seeding: 7

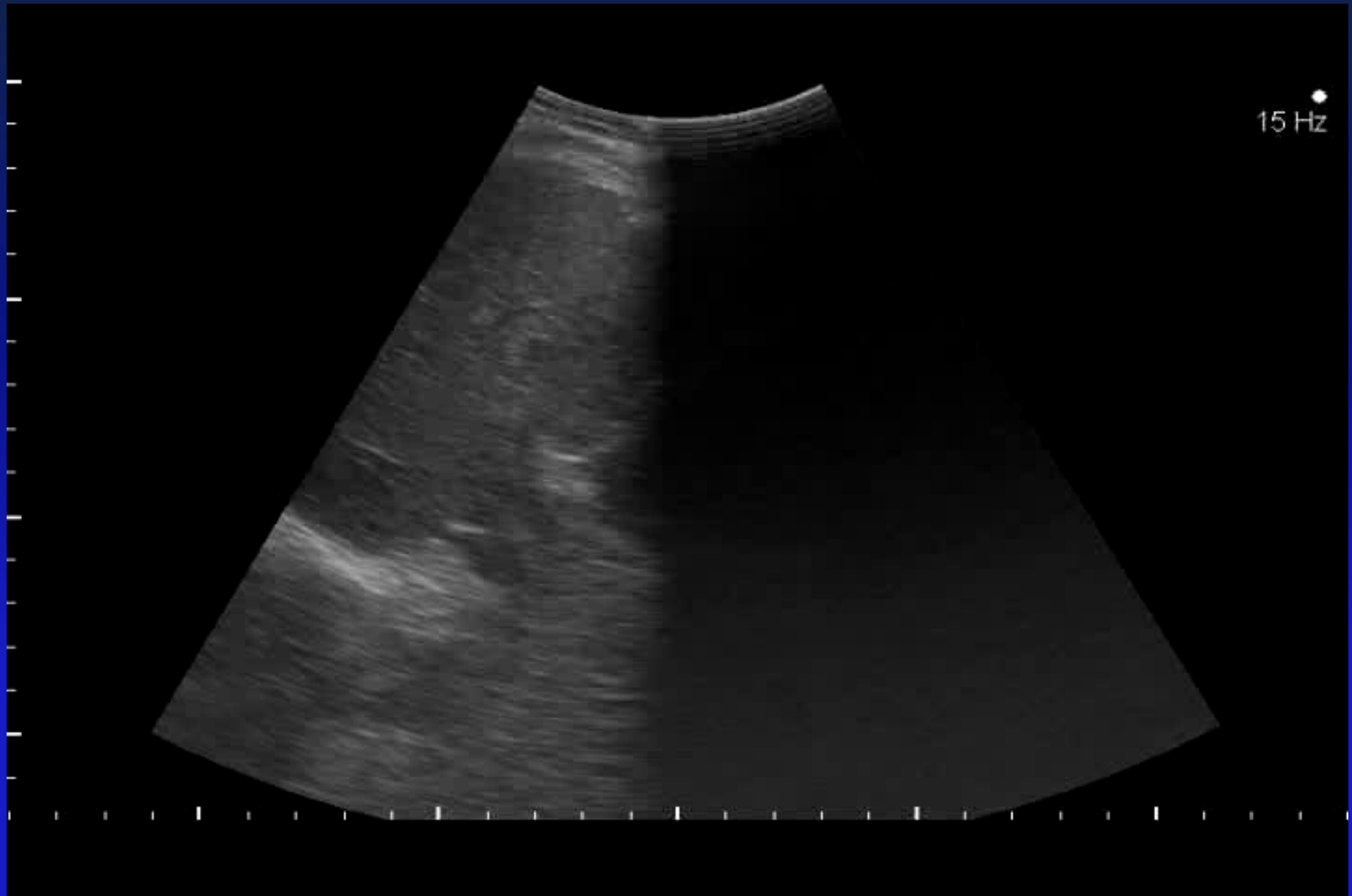
Di Stasi M et al. Scan J Gastroenterol 1997



RF'S ACTION

RF CAUSES FRICTION OF IONS IN THE TISSUE AND THE FRICTION PRODUCES HEAT.

THE PRODUCTION OF HEAT WILL BE LARGEST WHERE THE CURRENT DENSITY IS LARGEST, AND THIS IS AROUND THE ELECTRODE TIP.

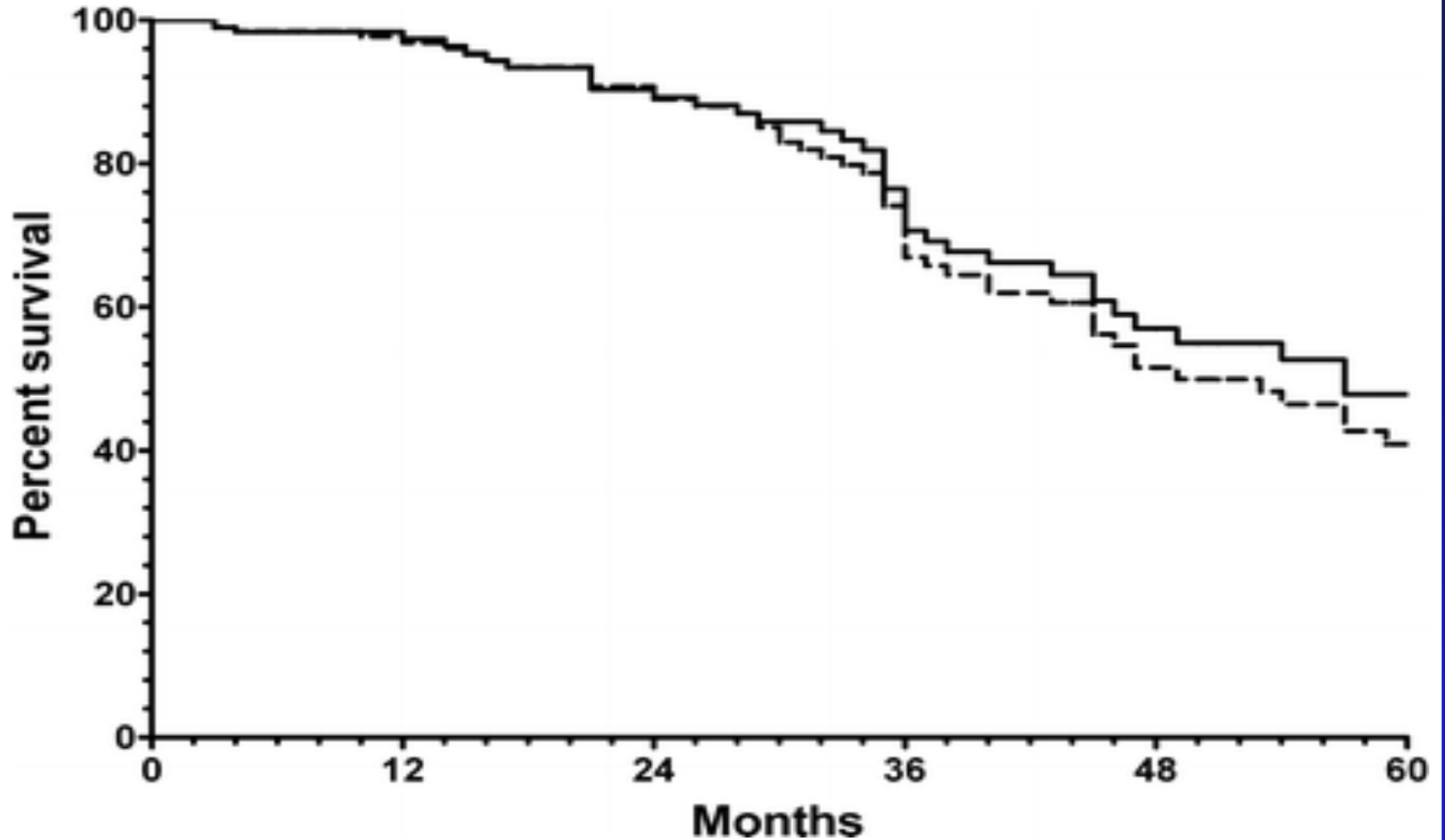


Percutaneous sonographically guided saline-enhanced radiofrequency ablation of hepatocellular carcinoma

Number of nodules	Size (cm)	Number of sessions	Number of insertion per session	Complete necrosis (%)	Partial necrosis (%)	Recurrences
42	≤ 3	1	1	95	5	1
30	3.1 - 4.0	1	1	83	17	3
15	4.1 - 5.0	1	2 - 3	47	53	3
8	5.1 - 8.5	2	3	12	88	6
Total 95	Range 1.5 - 8.5	-	-	Total 77	Total 23	Total 13

Giorgio A et al. AJR 2003

Early-stage HCC in patients with cirrhosis: long-term results of percutaneous image-guided RF ablation



Lencioni R et al. Radiology 2005

Complications after saline-enhanced RF ablation of HCC on cirrhosis: 3-year experience of a single center on 338 patients

Major complications

- ✓ 1 death (2 cm, Child B, 2 months after RF, decompensation of liver cirrhosis) 0,3%
- ✓ 1 liver abscess on segment VI 0,3%

Sustained complete response and complications rates after RF ablation of very early HCC in cirrhosis: is resection still the treatment of choice?

218 pts with single HCC \leq 2.0 cm (very early or T1 stage) underwent RFA.

After a median follow-up of 31 months, sustained complete response was observed in 216 patients (97.2%)

Peri-operative mortality rate	0%
Major complication rate	1,8%
5-year survival rate	68.5%

Compared with resection RFA is less invasive, with lower complication rate, lower costs and similar local control and survival

These data indicate that RFA can be considered the treatment of choice for patients with single HCC \leq 2.0 cm, even when surgical resection is possible

Percutaneous ethanol injection for small HCC therapeutic efficacy based on 20-year experience

270 pt with small HCC < 3 cm

no deaths

major complications 2.2%

complete necrosis 100%

local recurrence 10% at 3 years

- ✓ 3/5 years survival rates 81.6% and 60.35 %
- ✓ single nodule Child A < 2 cm 3 and 5 years survival rates 87.3% and 74.3%
 - ✓ survival was significantly influenced by liver function and AFP

Percutaneous RF ablation of HCC on cirrhosis: state of the art and future perspectives

A. Giorgio: Recent Pat Anti-Cancer Drug Discov, Jan 2010

- ✓ RF ablation has gained great popularity in the treatment of HCC on cirrhosis and it is replacing PEI in treating 3 cm or less HCC
- ✓ Its necrotic effect is more predictable than that of PEI and therefore RF can achieve a longer local tumor progression control and survival
- ✓ In the last 4 yrs many data on its efficacy have been added in the literature and long-term results on 3-5 yr survival are available

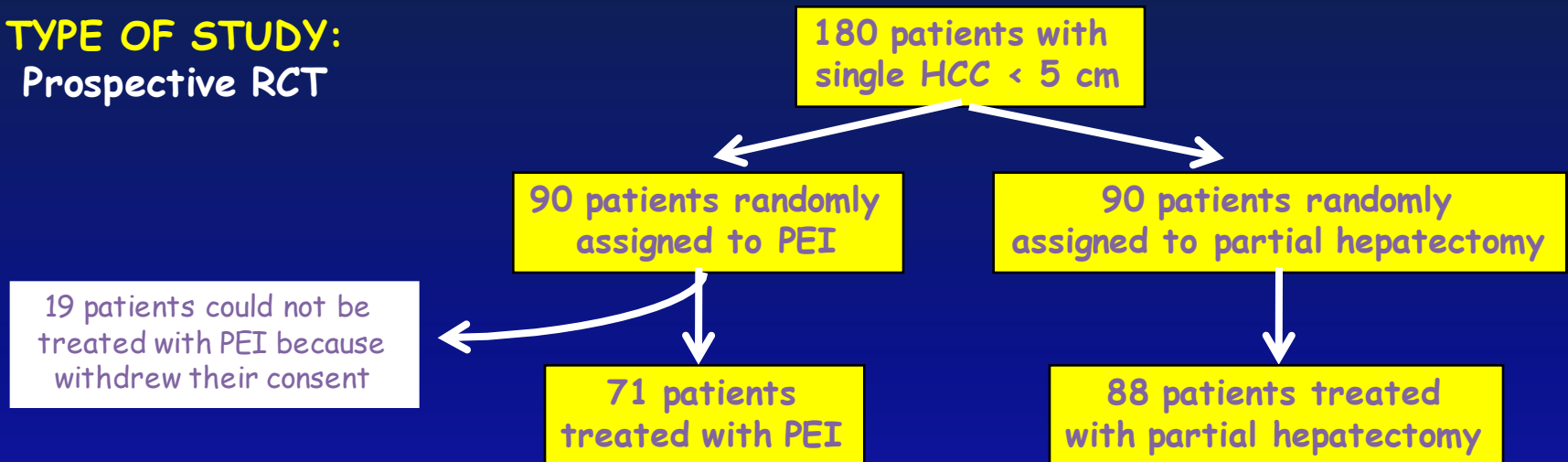
Recommendations

PEI and RF are equally effective for HCC <2 cm. The necrotic effect of RF is more predictable in all tumor sizes and its efficacy is clearly superior to that of PEI in larger tumours (level I)

- ✓ The main drawback of RF is its higher cost and the higher rate (up to 10%) of adverse events (pleural effusion and peritoneal bleeding)

A prospective randomized trial comparing percutaneous local ablative therapy and partial hepatectomy for small HCC

TYPE OF STUDY:
Prospective RCT



1-y survival rate	95,8%	No statistical differences	93,3%
1-y disease-free survival rate	85,9%		86,6%
4-y survival rate	67,9%		64%
4-y disease-free survival rate	46,4%		51,6%

PEI was as effective as surgical resection in the treatment of solitary and small HCC

Chen MS et al. Ann Surg 2006

RF ablation vs PEI for small HCC in cirrhosis:
meta-analysis of randomized controlled trials.

Orlando A et al. Am J Gastroenterol 2009

"RF improves 3-year survival"

Systematic review of randomized trials for HCC
treated with percutaneous ablation therapies

Cho YK et al. Hepatology 2009

"nevertheless there is no evidence favoring RFA for lesions < 2cm"

Meta-analysis of percutaneous radiofrequency ablation
versus ethanol injection in HCC

Bouza C et al. BMC Gastroenterology 2009

"overall cost-effectiveness of RFA needs further evaluation"

Clinical outcome of RF, PEI and acetic acid for HCC: a meta-analysis

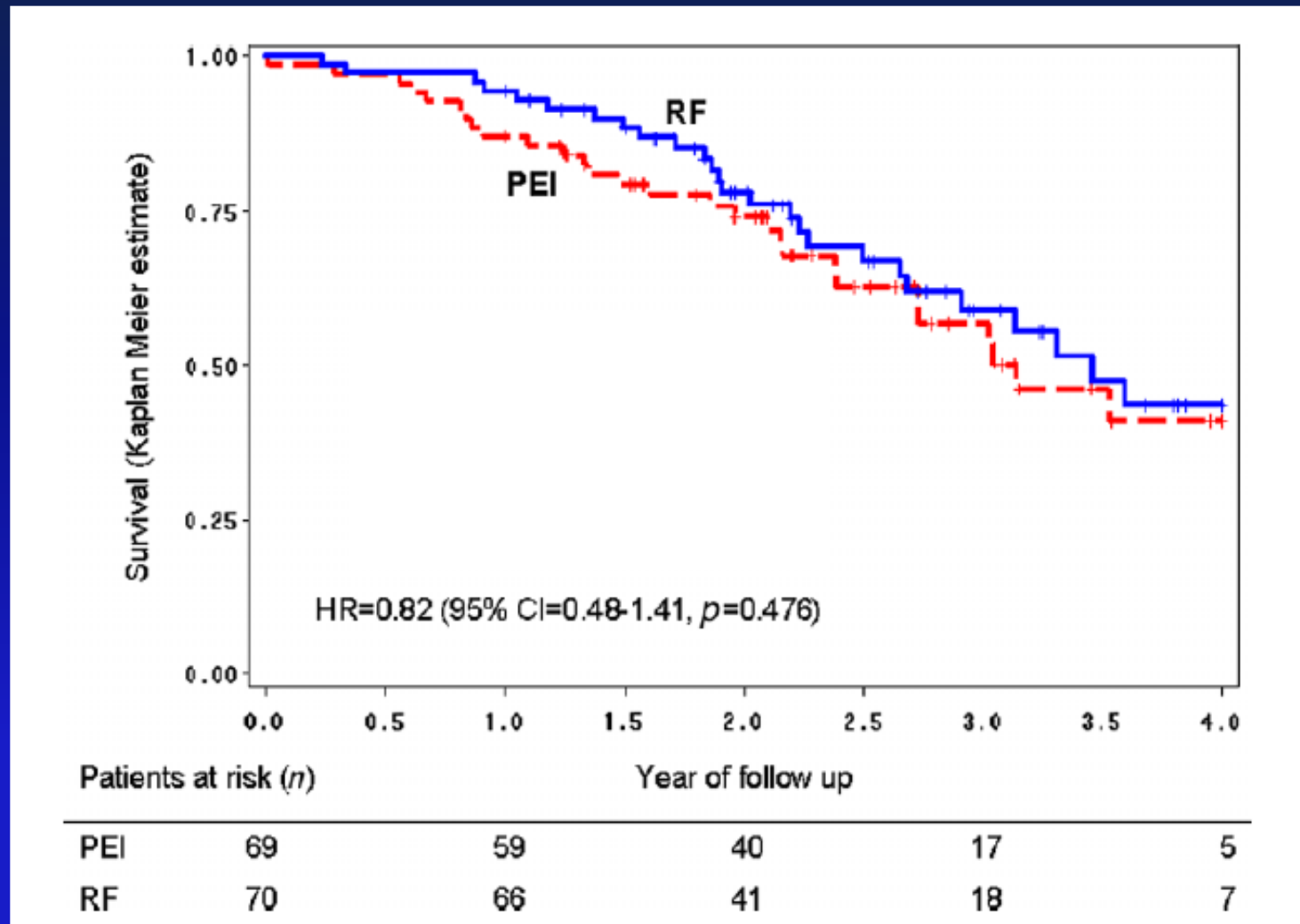
Germani G et al. J Hepatol 2010

RF > PEI > 2 cm (seems)

PEI=RF < 2cm

"emerging economies"

Radiofrequency ablation versus ethanol injection for early HCC: a randomized controlled trial



Brunello F et al. Scan J Gastroenterol 2008

Percutaneous radiofrequency ablation of hepatocellular carcinoma compared to percutaneous ethanol injection in treatment of cirrhotic patients:

An italian randomized controlled trial.

Giorgio A et al.

Anticancer Research june 2011

to compare 5 year survival in cirrhotic pts treated with PEI or RF for single HCC (= or < 3 cm)

aim

primary endpoints

- ✓ overall cumulative survival
- ✓ local/distant recurrences

secondary endpoints

- 5 year survival in HCC \leq 2 cm
- feasibility for segmental location

patients and methods

RF

**132 pts/132 HCC (≤ 3 cm) (87m/45f; age range 70-85 yrs)
63 in Child A, 69 in Child B
111 with cirrhosis HCV correlated
21 with cirrhosis HBV correlated**

PEI

**147 pts/147 HCC (≤ 3 cm) (92m/55f; age range 68-82 yrs)
72 in Child A, 75 in Child B
118 with cirrhosis HCV correlated
29 with cirrhosis HBV correlated**

One shot PEI - RF under general anaesthesia

results

feasibility in relation to segmental hepatic localization

14 pts with 14 HCC nodules

4 pts: caudate lobe

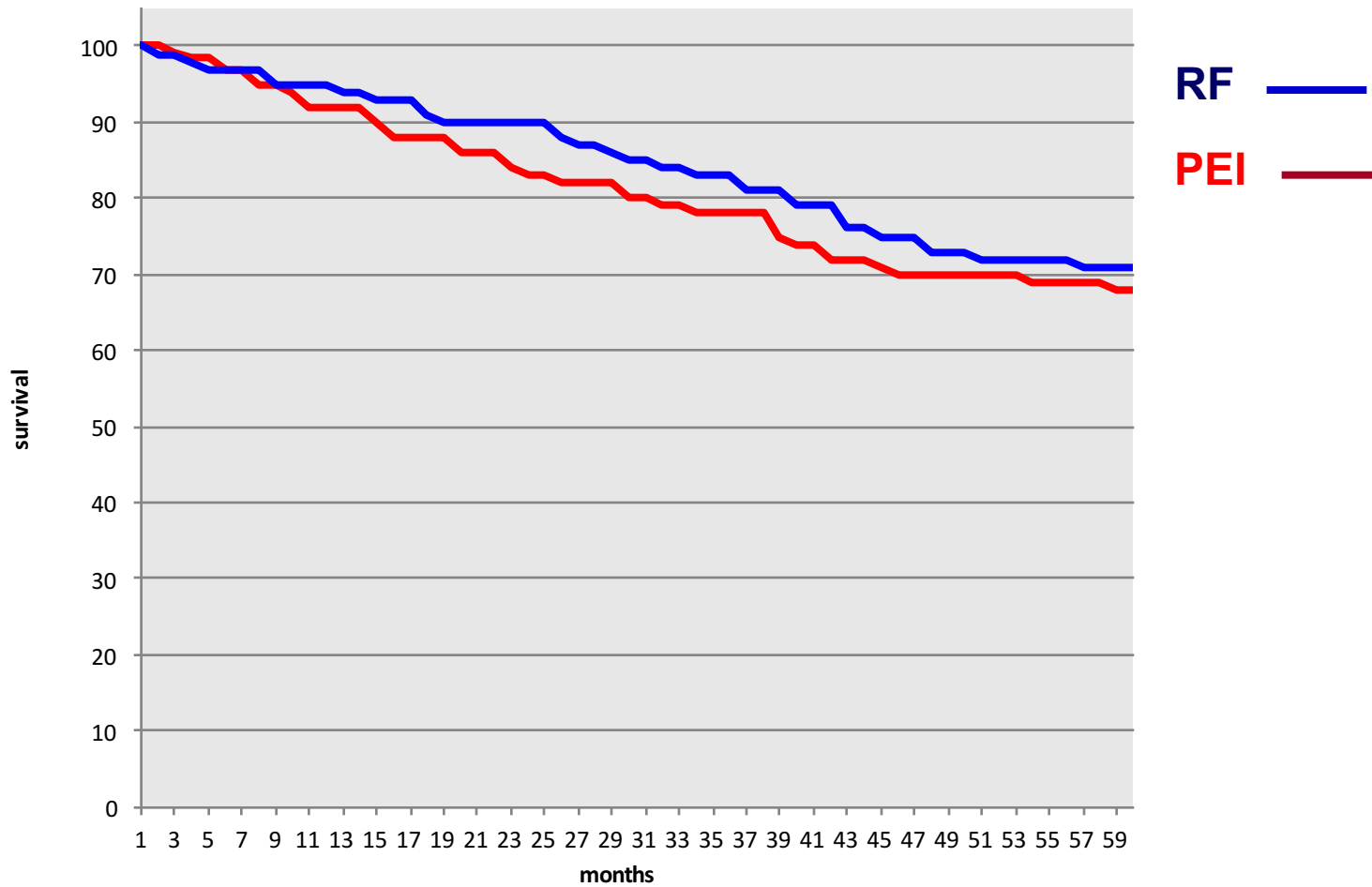
3 pts: II

5 pts: VIII

2 pts: VII

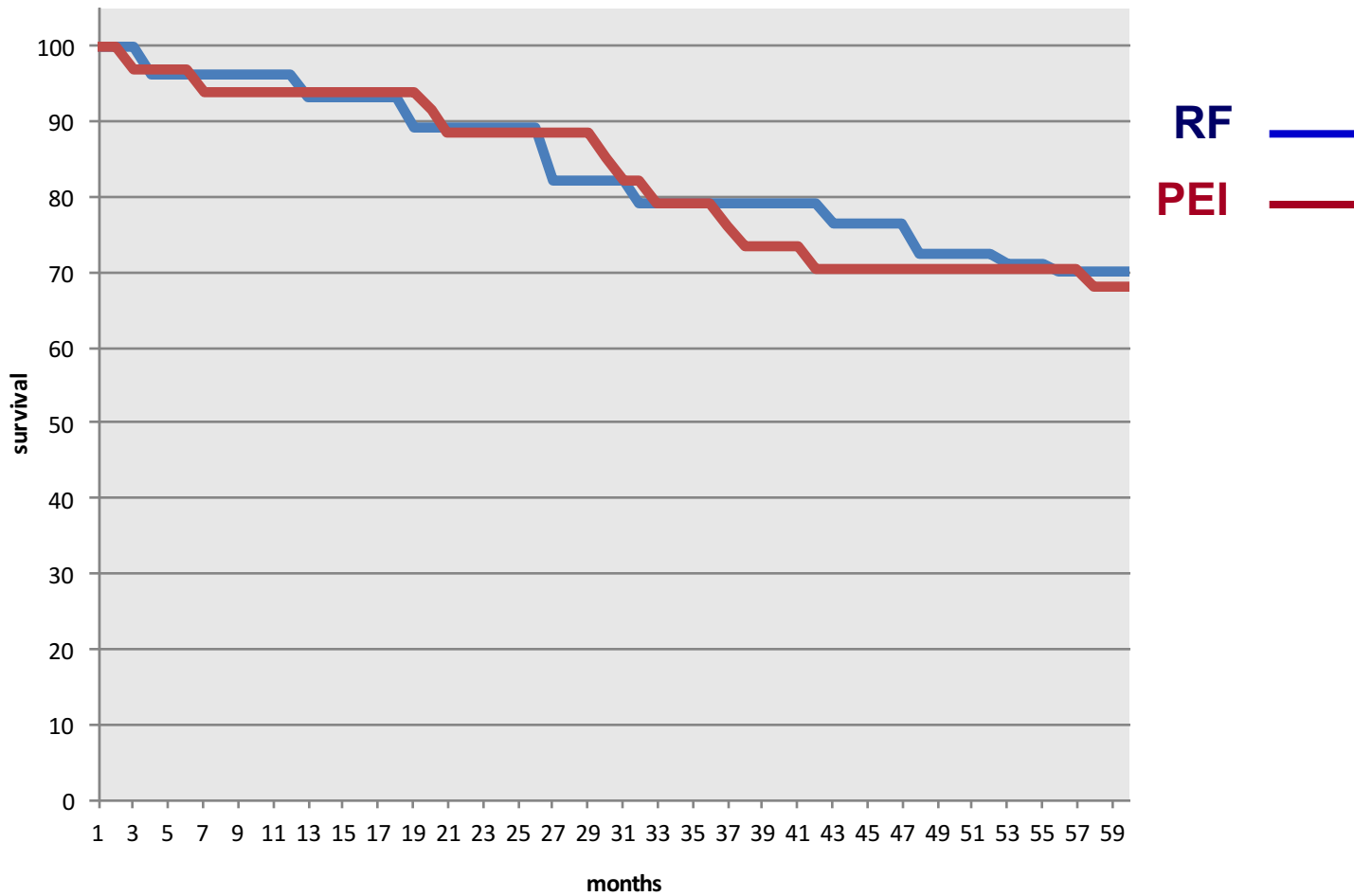
results

HCC \leq 3 cm



results

HCC \leq 2 cm



Costs of PEI/RF procedures

PEI: 7 Euro + vat

RF: 450,45/555,75 Euro + vat

Are physicians and collaborators expensive in Italy?

conclusion

- ✓ in this study PEI and RF showed same results in terms of cumulative 4 years survival rate and absence of major complications
 - ✓ feasibility, even in expert hands is not the same for both procedures,
 - ✓ rate of complete necrosis is not different in both treatments
- ✓ PEI obviously is less expensive than RF

Ablation for hepatocellular carcinoma: is there a need to have a winning technique?

Nevertheless it appears that the assumption of RF as the first line technique is not incorrect, but this not means that ethanol injection is to be dismissed

**Does this mean that ethanol injection is not useful?
NOT AT ALL !**

In HCC < 2 cm both ethanol injection and RFA are highly effective. Some tumors are located at risk sites and RFA treatment can incur severe complications. In addition, in tumors larger than 2 cm in size, initial RF may leave a tiny nest of viable tissue that can be ablated by ethanol with a relevant saving of resources.

Forner A, Bruix J. J Hepatol 2010