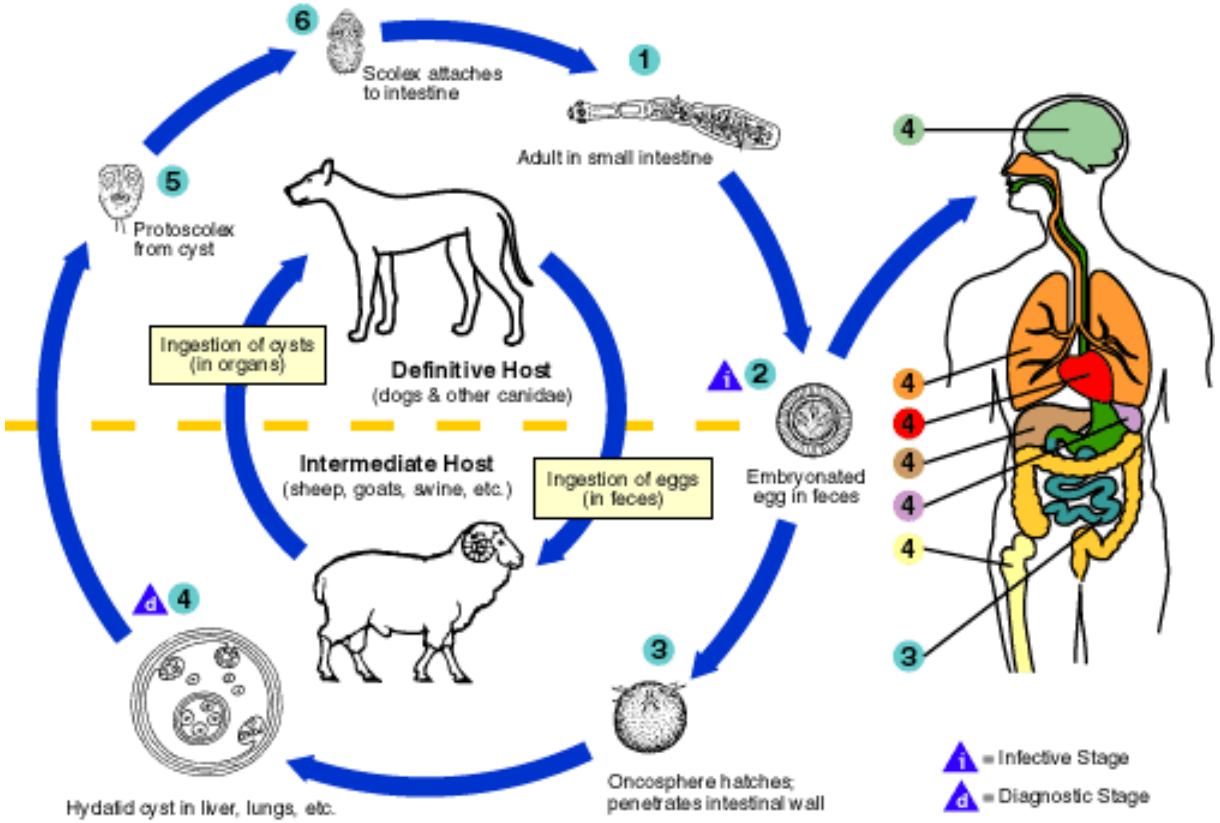
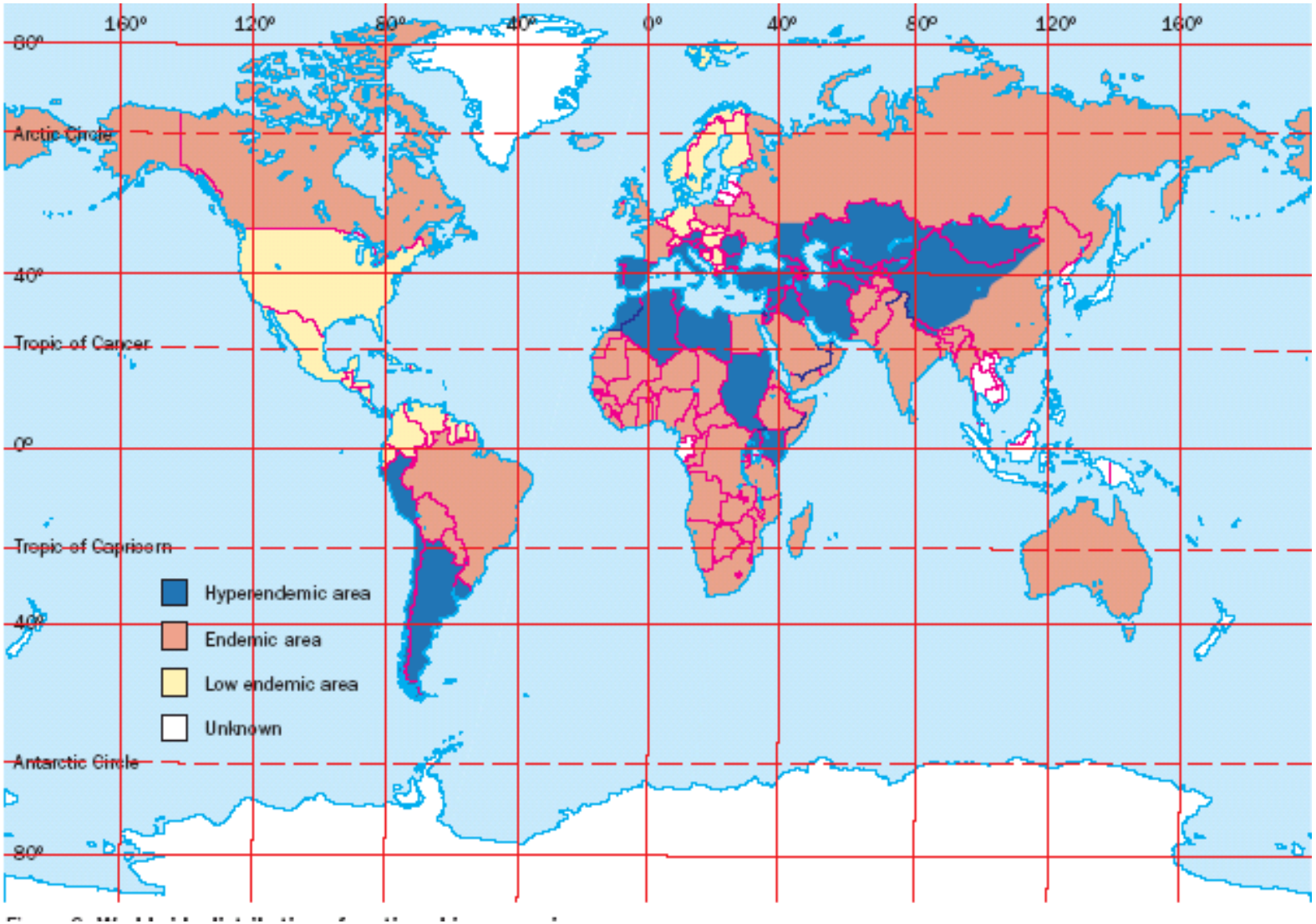
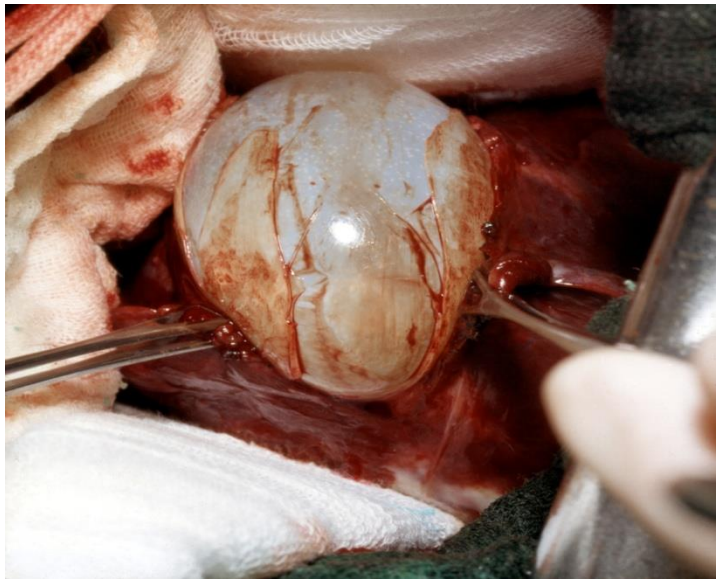
Hepatic Cysts

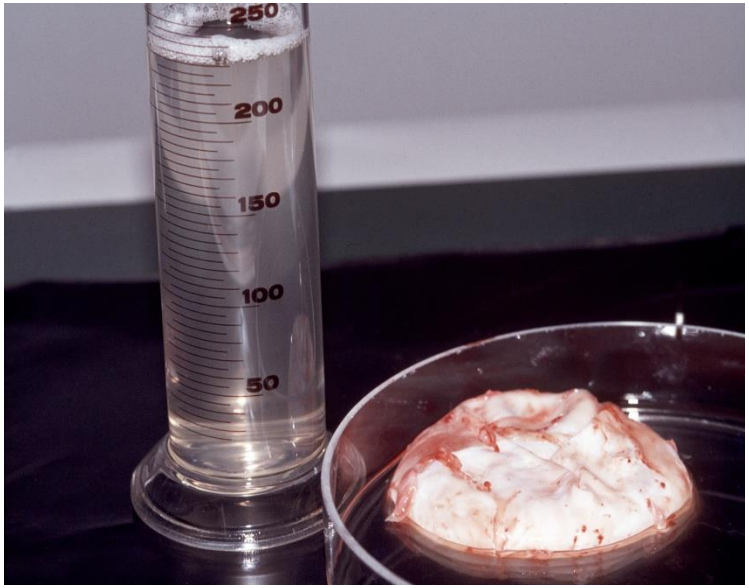
Div.of Infectious and Tropical Diseases
IRCCS S.Matteo –Pavia University
Pavia, Italy

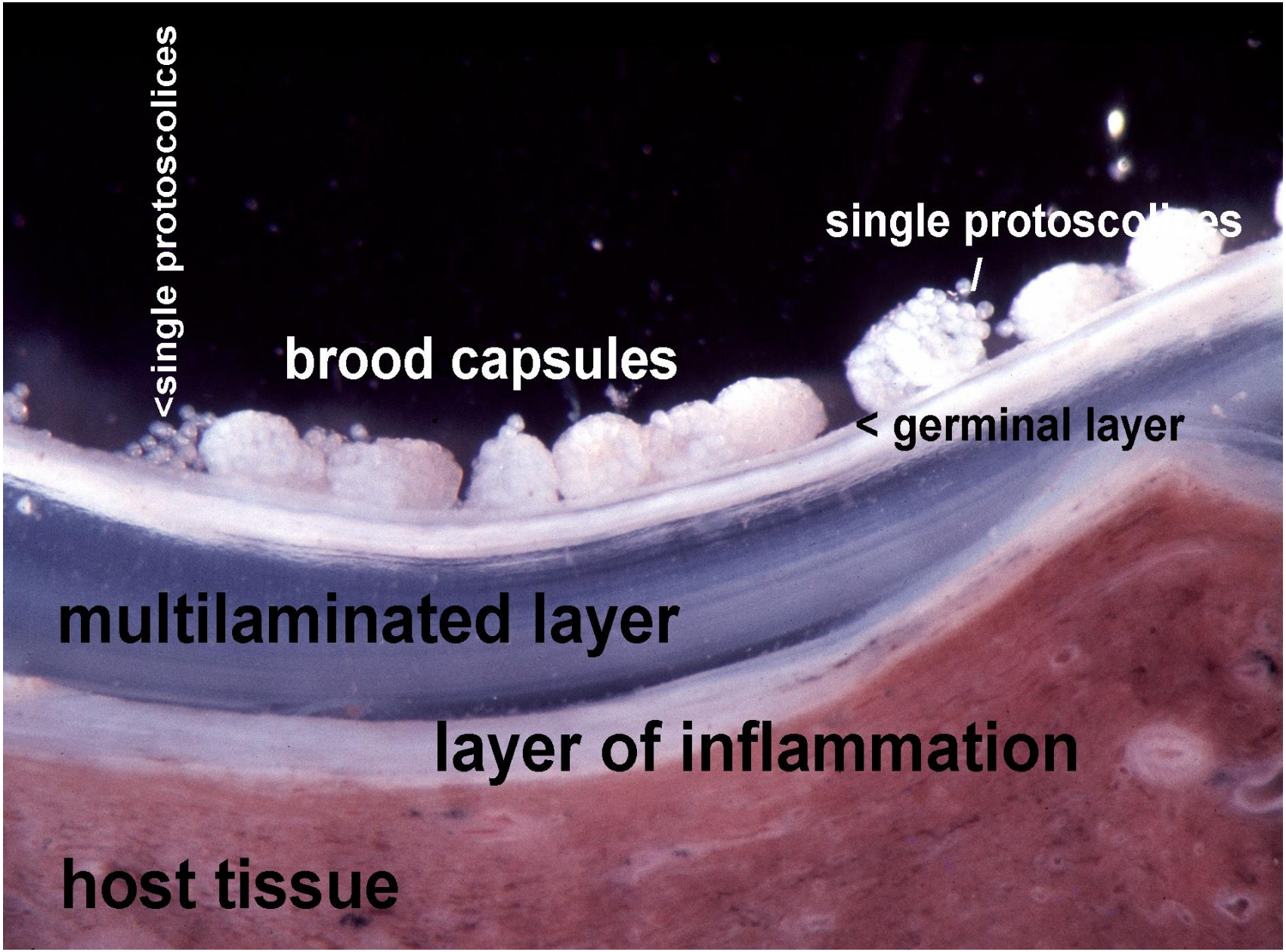

6
Scolex attaches to intestine
1
Adult in small intestine
5
Protoscolex from cyst
Ingestion of cysts (in organs)
Definitive Host
(dogs & other canidae)
i 2
Embryonated egg in feces
Intermediate Host
(sheep, goats, swine, etc.)
Ingestion of eggs (in feces)
d 4
Hydatid cyst in liver, lungs, etc.
3
Oncosphere hatches; penetrates intestinal wall
4
4
4
4
4
4
3
i = Infective Stage
d = Diagnostic Stage


160°
120°
80°
40°
0°
40°
80°
120°
160°
80°
Arctic Circle
40°
Tropic of Cancer
0°
Tropic of Capricorn
40°
Antarctic Circle
80°
Hyperendemic area
Endemic area
Low endemic area
Unknown




6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


250
200
150
100
50


<single protoscolices
single protoscolices
brood capsules
< germinal layer
multilaminated layer
layer of inflammation
host tissue

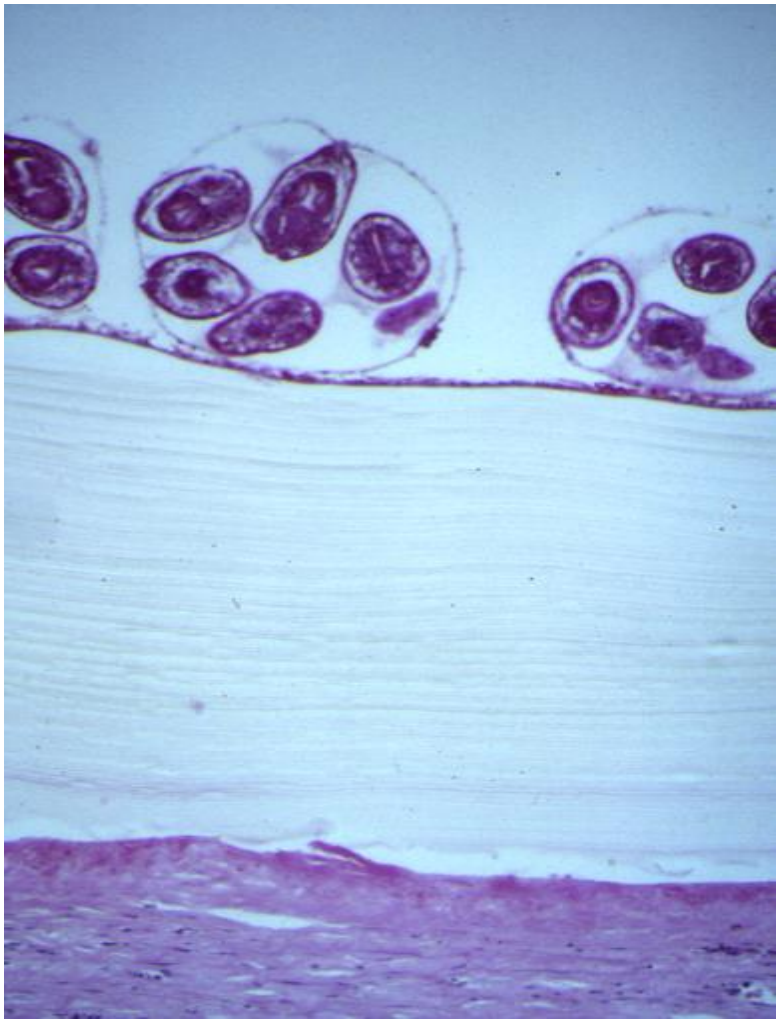
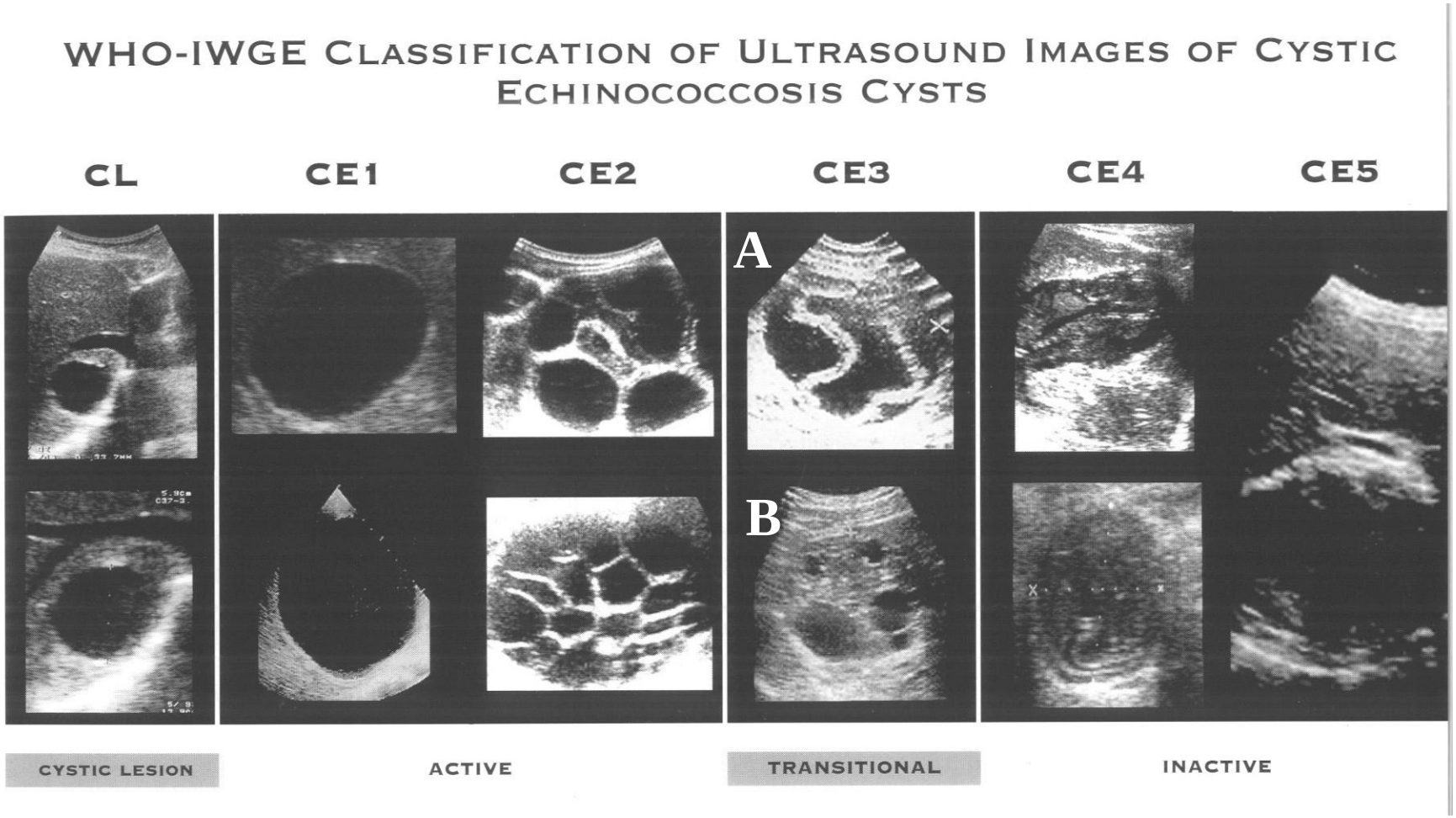


Photo courtesy Prof.H. Seitz

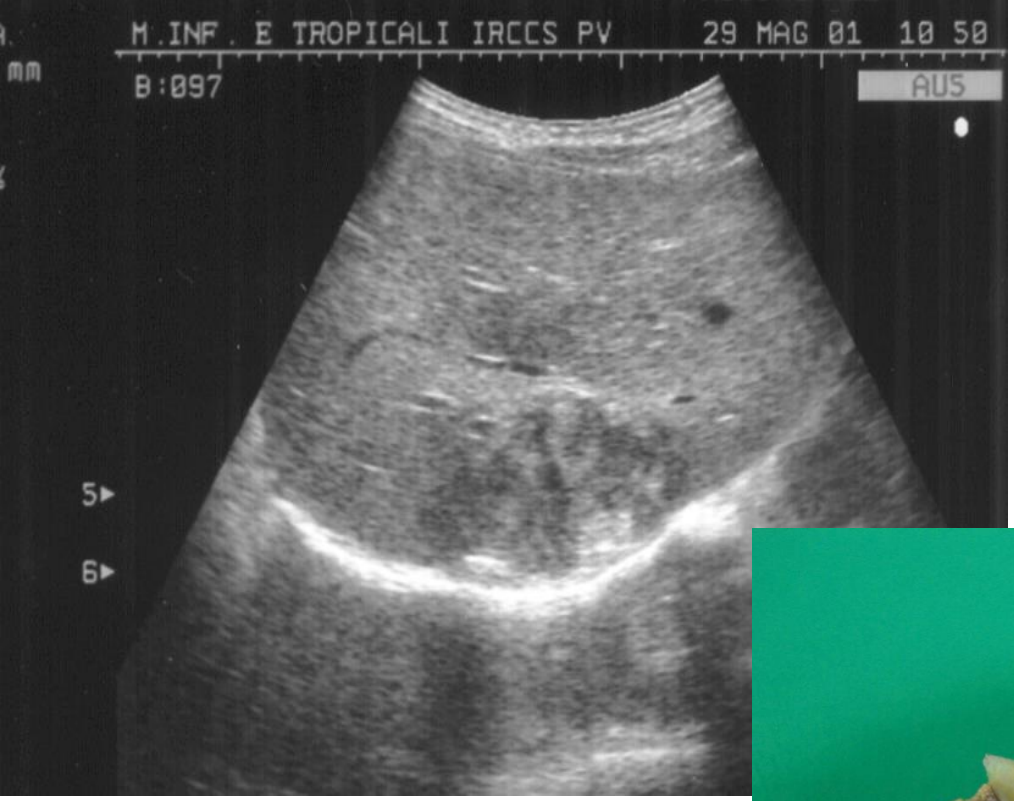
ARE WE SINGING FROM THE SAME HYMN SHEET?




M.INF. E TROPICALI IRCCS PV 17 GIU 99 08 22
B:100
AUS
6
7


ADDOMINALE
M.INF. E TROPICALI IRCCS PV 11 APR 00 16:20
B:082
AUS

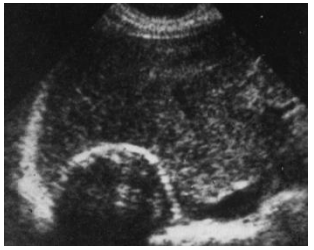

M.INF. E TROPICALI IRCCS PV 29 MAG 01 10 50
B:097
AUS
5
8

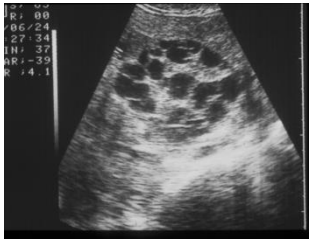

M.INF. E TROPICALI IRCCS PV
29 MAG 01 10 50
B:097
AU5
5
6

CE1 CE3a CE4

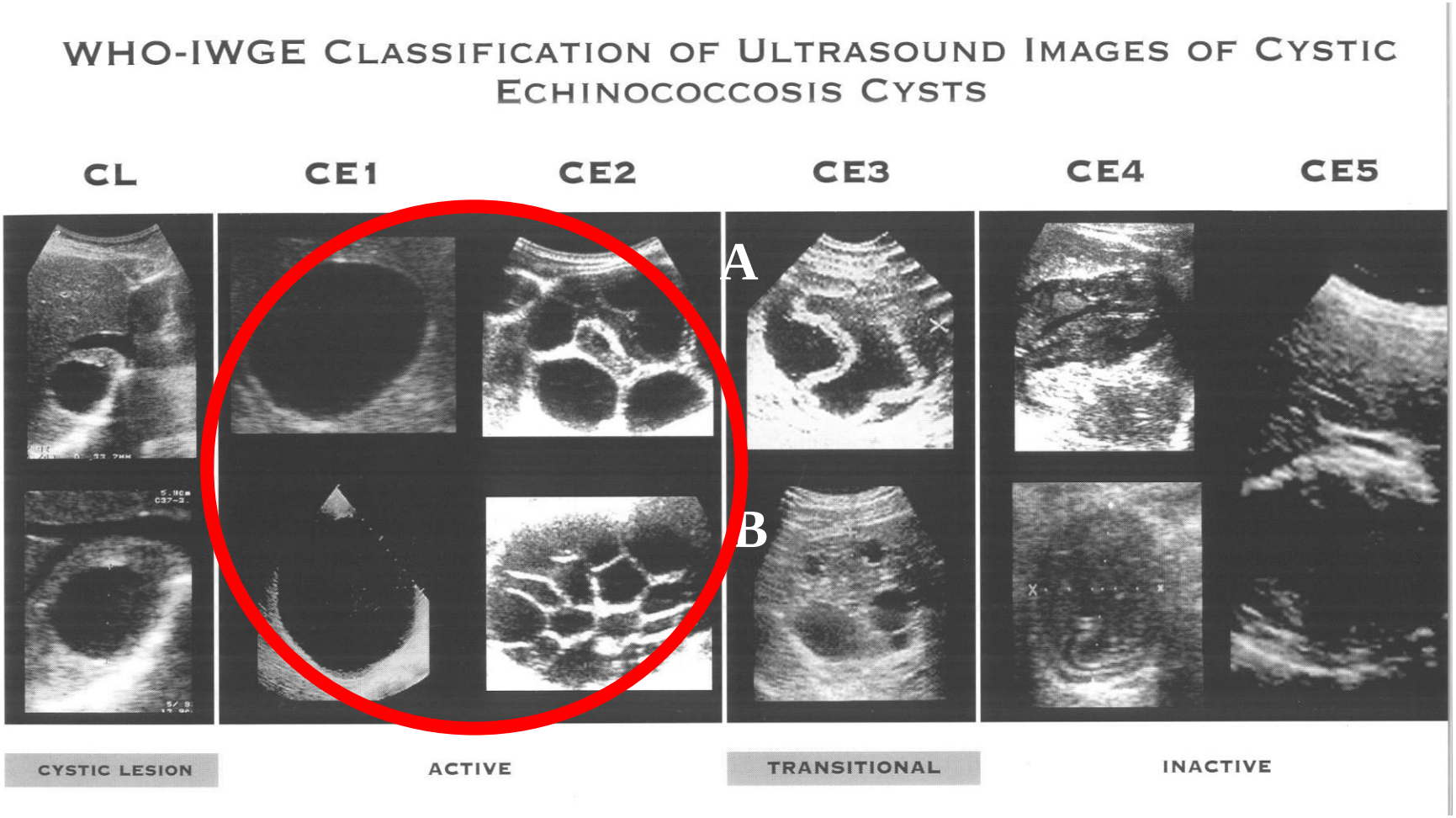

M.INF. E TROPICALI IRCCS PV 17 GIU 99 08.22
B:100


M.INF. E TROPICALI IRCCS PV 29 MAG 01 10.58
B:097

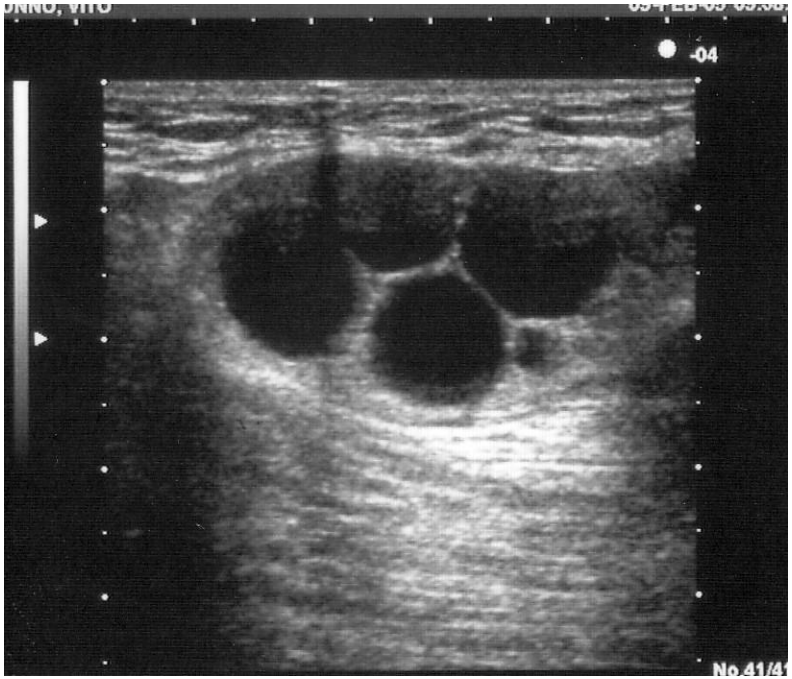


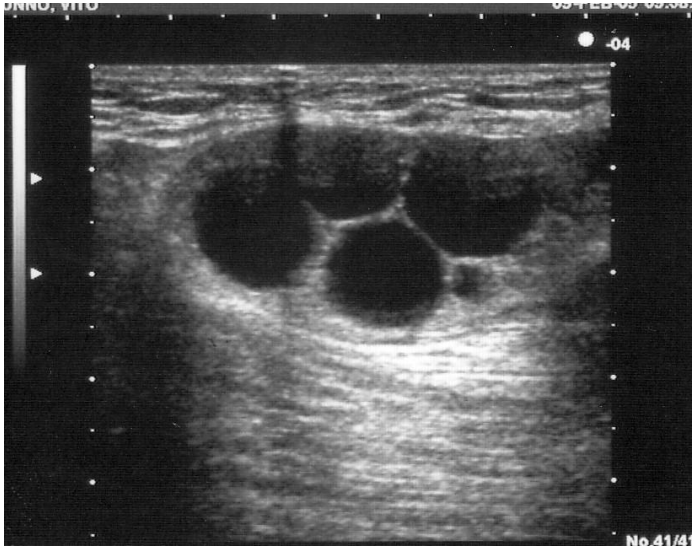


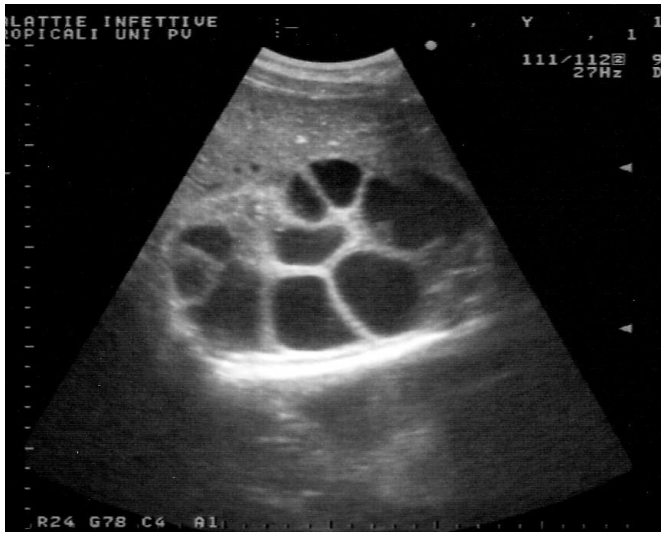
DD with NON-PARASITIC

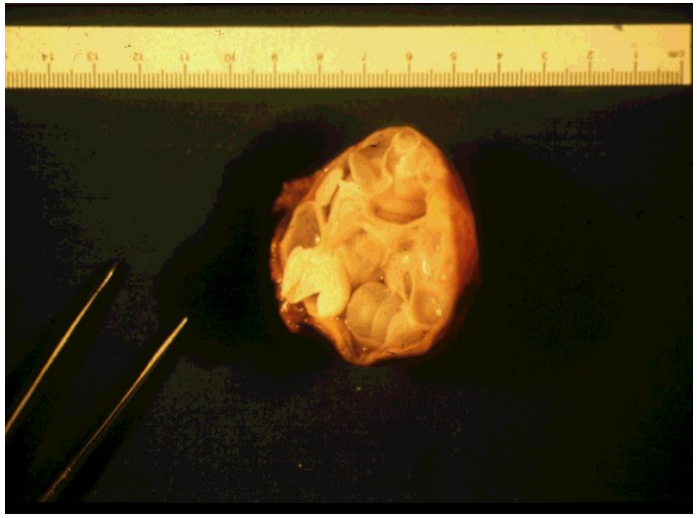


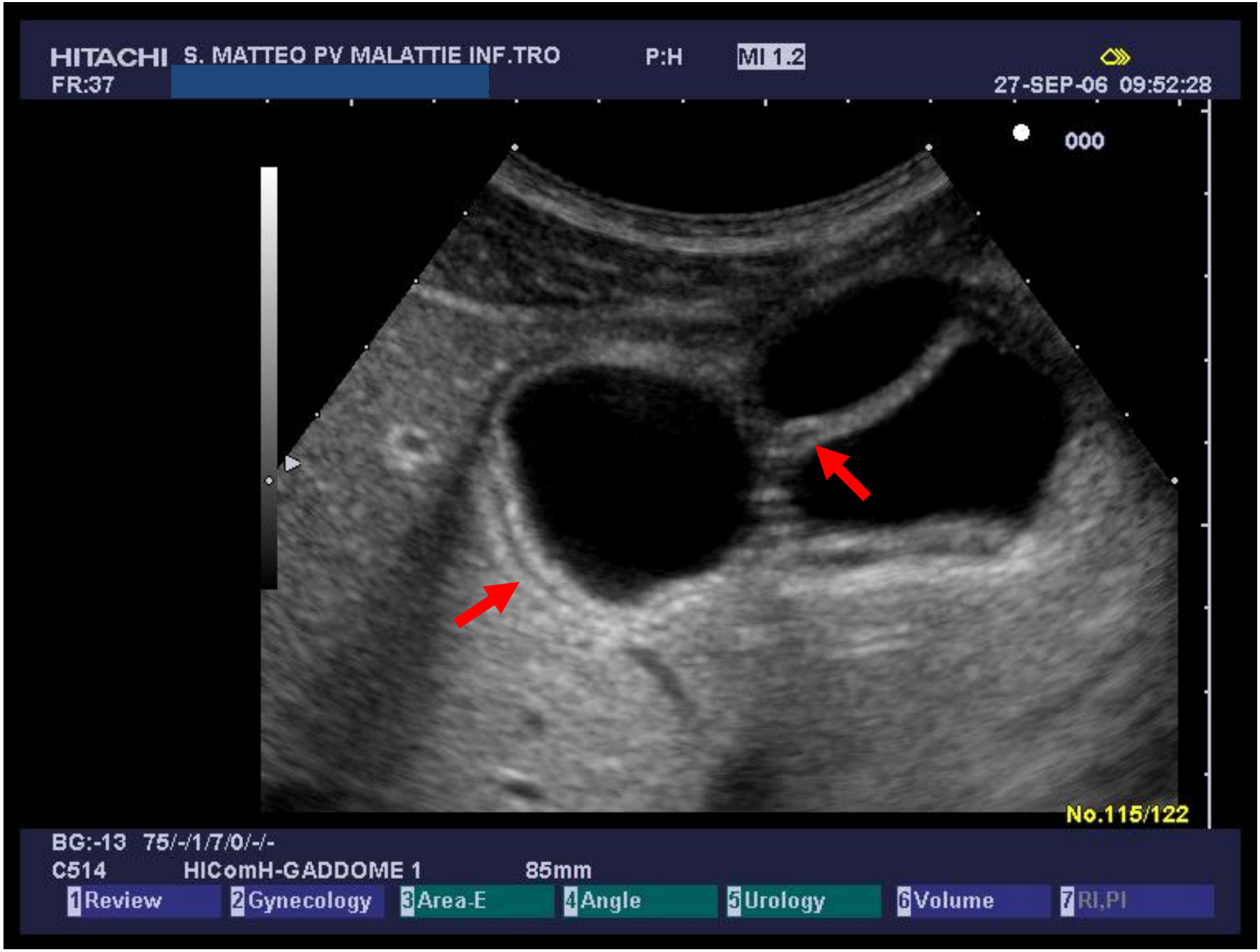
SEPTA

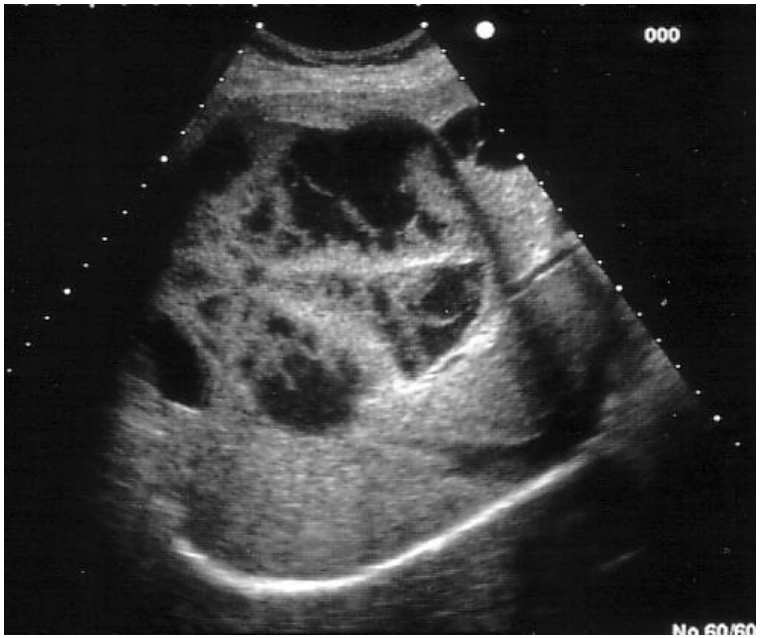



-04


LATTIE INFETTIVE
OPICALI UNI PV
111/112@
27Hz
R24 G78 C4 A1




HITACHI
S. MATTEO PV MALATTIE INF.TRO
P:H
MI 1.2
FR:37
27-SEP-06 09:52:28
000
No.115/122
BG:-13 75/-/1/7/0/-/-
C514
HIComH-GADDOME 1
85mm
1 Review
2 Gynecology
3 Area-E
4 Angle
5 Urology
6 Volume
7 RI,PI



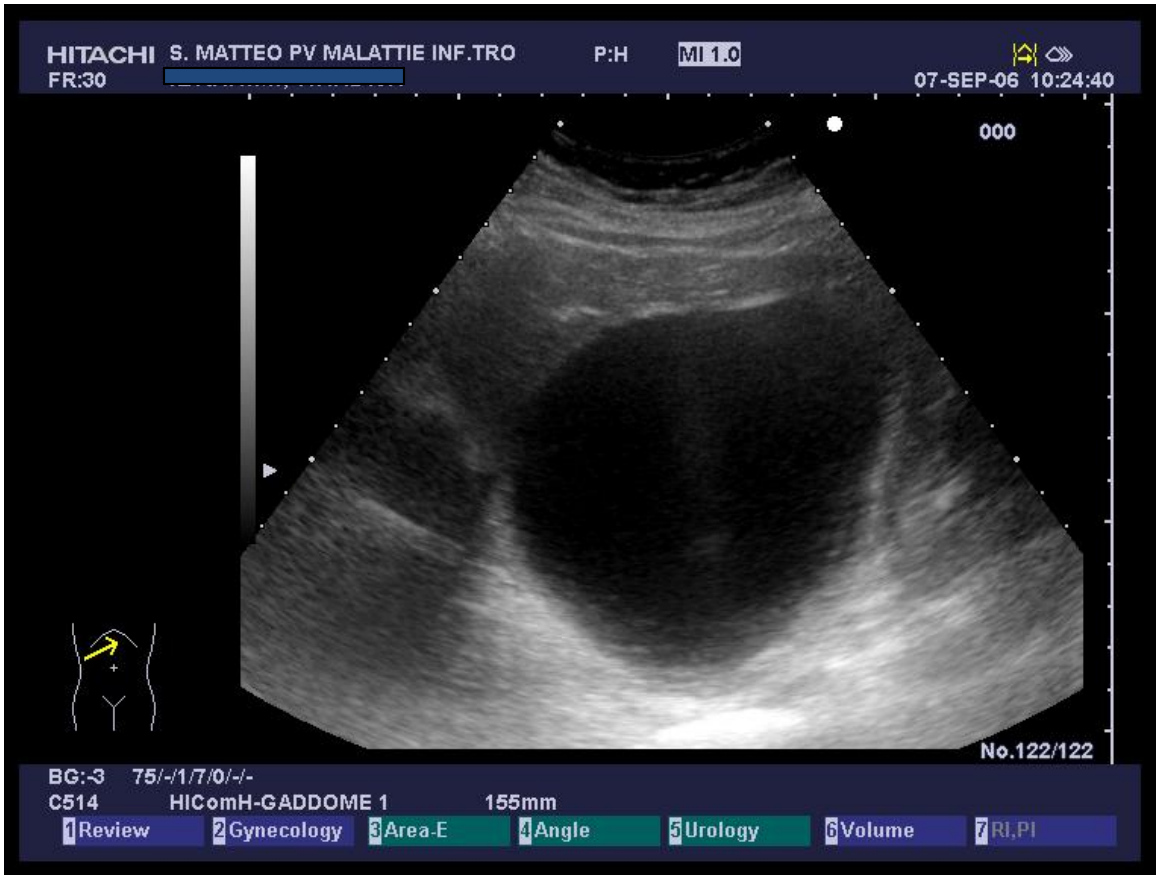
- IMMUNOBLOTTING : NEGATIVE


M.INF. E TROPICALI IRCCS PV 19 NOV 99 09 37
B:100
AUS
4
5

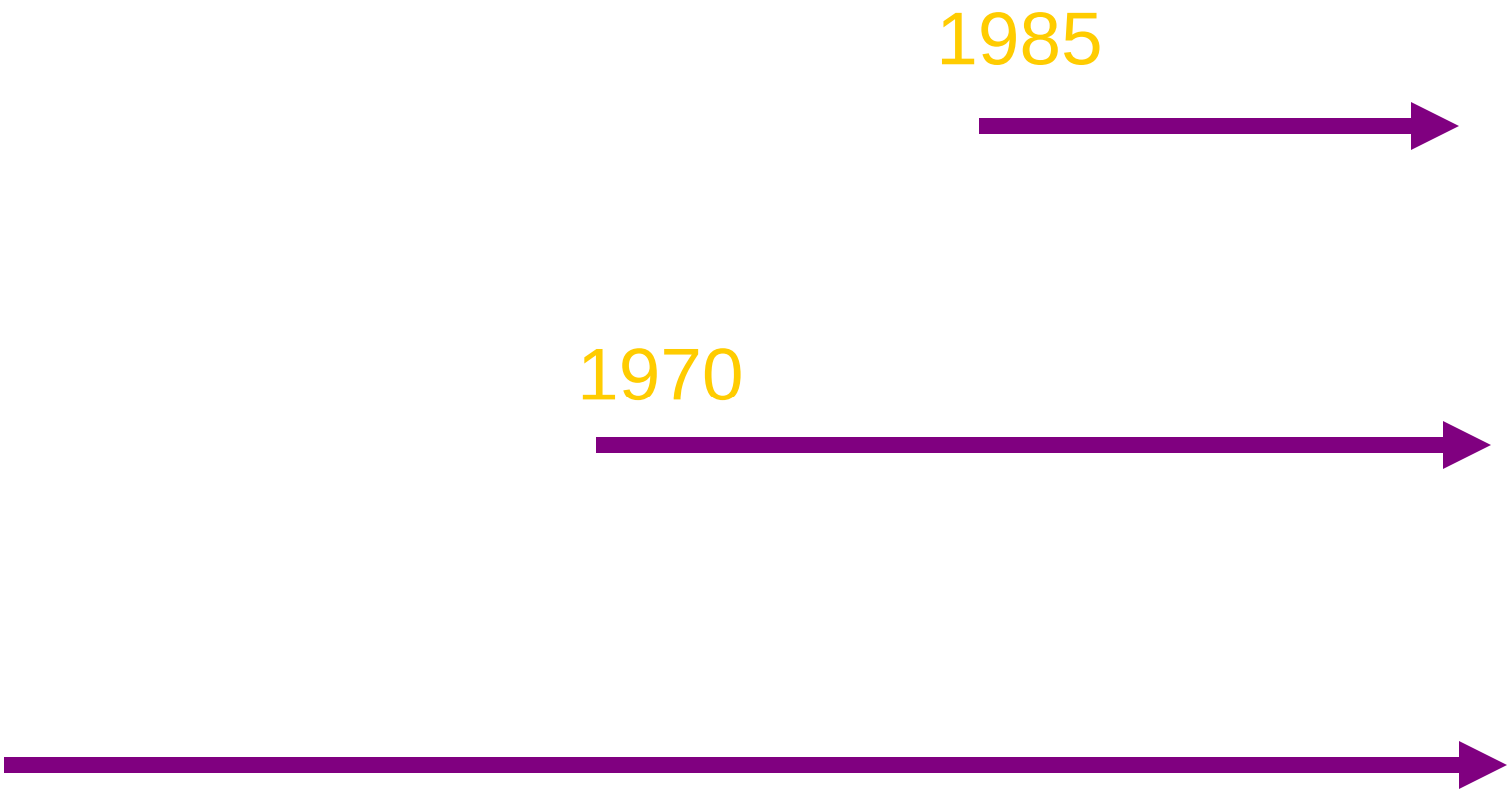

M.INF. E TROPICALI IRCCS PV 27 FEB 02 11:32
B:068
AUS
536/536


000
No.60/60

Positive serology
BUT post-surgical cavities !
FNA : negative for protoscolices



TREATMENT


1985
1970

COMPLICATED

PERCUTANEOUS TREATMENTS

Inactivation of Germinal layer

Evacuation of endocyst

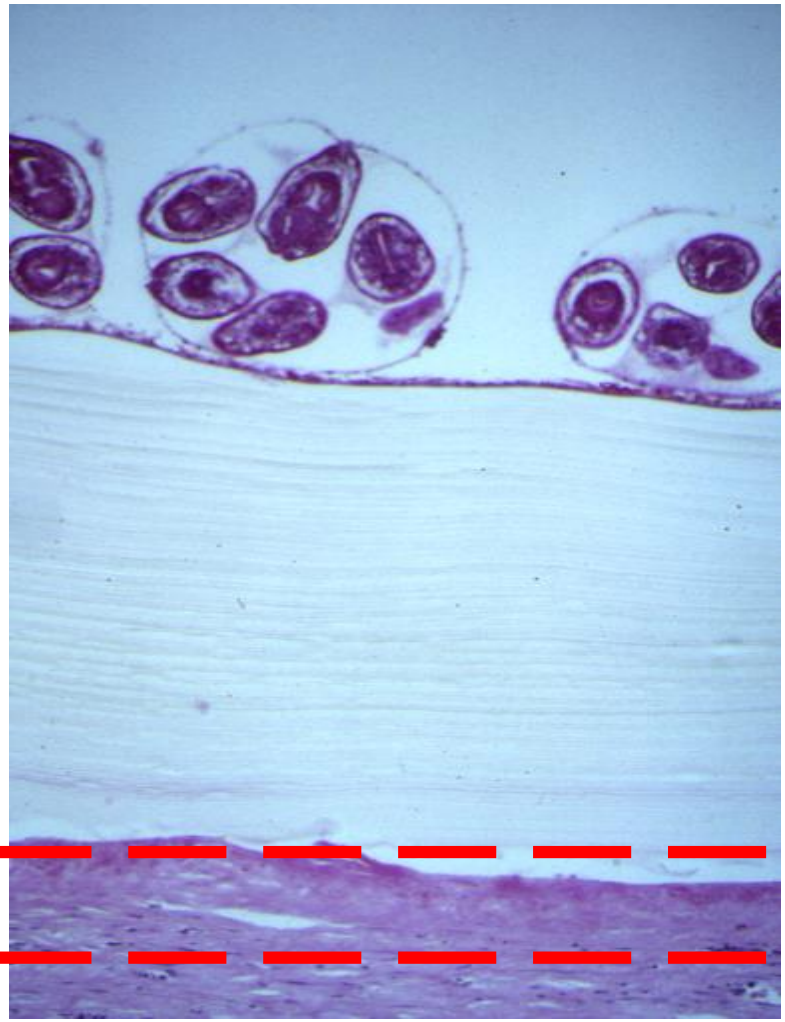
PAIR

RF Thermal Ablation

- Large bore catheter
- PEVAC
- Dilatable Multi Function Trocar
- Percutaneous Puncture Drainage and Curettage
- Others

PAIR

ABZ



OTHER PERCUTANEOUS TREATMENTS

Photo courtesy Prof.H. Seitz

WHO/CDS/CSR/APH/2001.6
Distr: General
Original: English

PAIR

Puncture
Aspiration
Injection
Re-Aspiration

An Option for the Treatment of Cystic Echinococcosis

WHO-Informal Working Group on Echinococcosis
(WHO-IWGE)

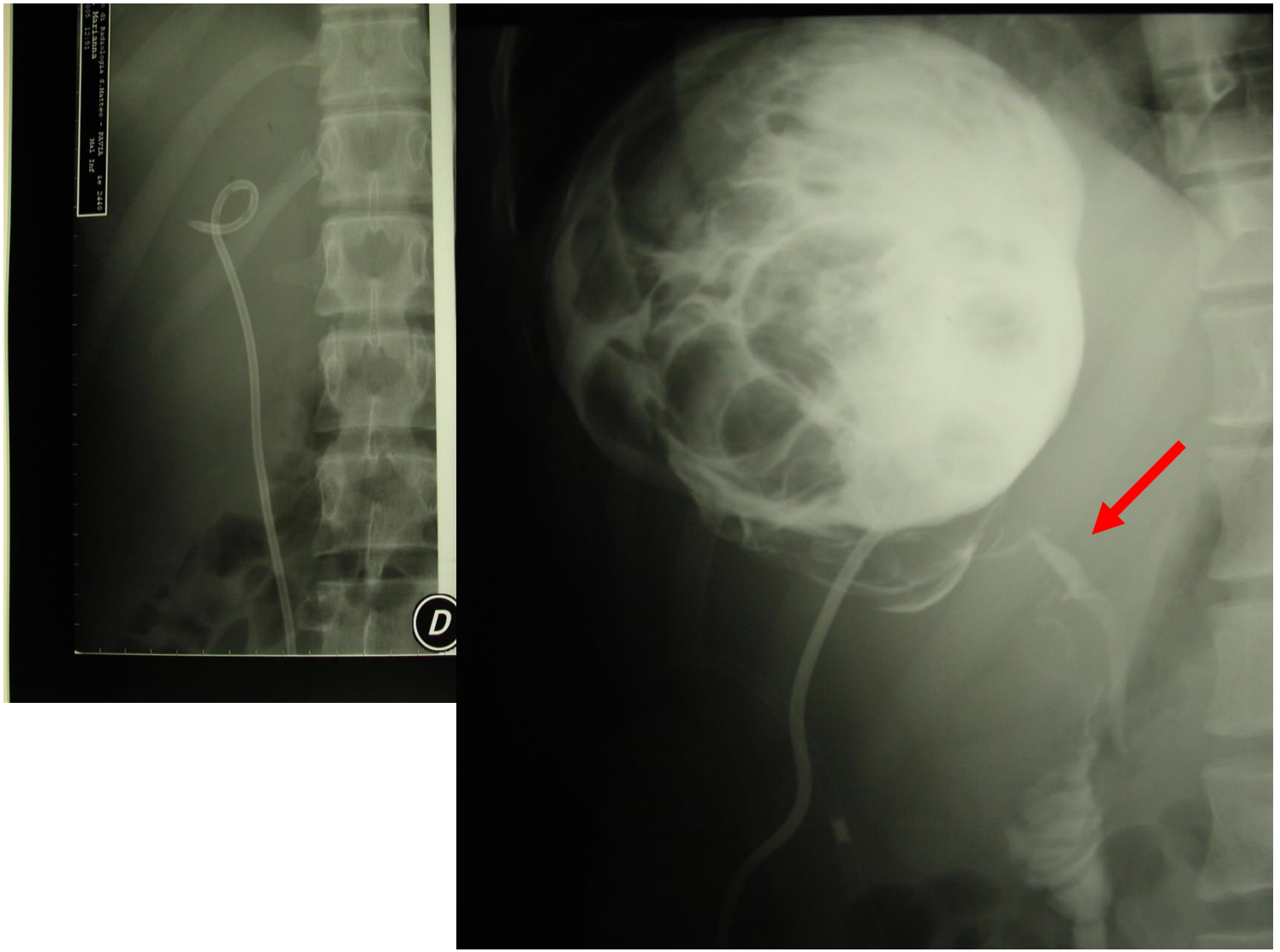
Complications and recurrences of percutaneous treatments

1983-2004

	No. punctured cysts	No. of events	% Complications
Deaths due to Anaphylactic shock	4209	2	0.047
Major complications	4209	16	0.38
Minor complications	4043	268	6.62
Recurrence	3830	49	1.27

Avoiding major complications

Spillage	Prophylaxis with ABZ
Anaphylactic shock	Anesthesiologist
Communication w/ biliary tree	Cystography
Chemical cholangitis	NO INJECTION if communications w/biliary tree are found



Can biliary-cyst communication be predicted before surgery for hepatic hydatid disease: does size matter?

Mehmet Kilic, M.D., Omer Yoldas, M.D.*, Mahmut Koc, M.D., Mehmet Keskek, M.D., Nazile Karakose, M.D., Tamer Ertan, M.D., Erdal Gocmen, M.D., Mesut Tez, M.D.

Fifth Department of Surgery, Ankara Numune Training and Research Hospital, Cagri Sokak 26/4, Aydinlikevler/Ankara, 06130, Ankara, Turkey

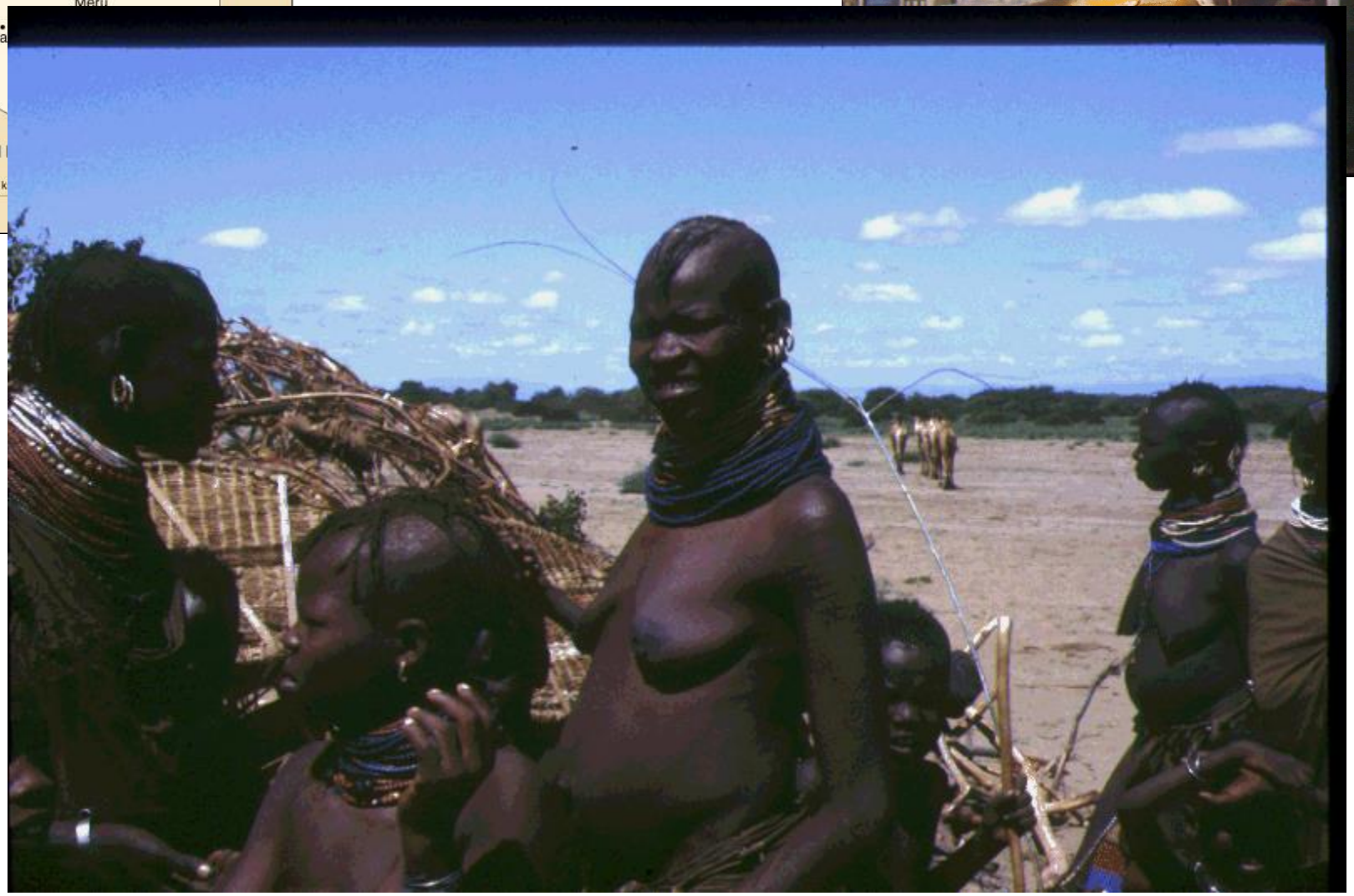
Am J Surg 2008, e-pub

- Cyst size greater than 7.5 cm is a risk factor for intraoperative bile leakage and postoperative biliary fistula.

Benefits of PAIR WHO 1996

- Alternative treatment with immediate relief
- No general anesthesia needed
- No particular contraindication except for communication with biliary tree
- Less expensive than surgery and chemotherapy
- Immediate degeneration of the parasite can be monitored
- Compared to surgery much less post-treatment management
- Larger number of patients can be treated in a given time period


SUDAN
ETHIOPIA
Lodwar
Moyale
Marsabit
UGANDA
Great Rift Valley
Wajir
SOMALIA
Eldoret
Kisumu
Lake Victoria
0 100 200
0 100



Turkana 1993 -1994

- parasitic cysts : 141 in 85 pts (in 2 weeks)
- anaphylactic shock : 0
- pregnant women : 6 (1 close to delivery w/ 10 cm cyst)
- children < 5 yo : 5
- 1 patient with 23 abdominal cysts - 6 catheters used

Turkana 1993-2000
by AMREF local teams (unpublished)

- 162 cysts in 160 patients

- 8 infections
- 3 anaphylactic shocks
- 8 non parasitical cysts
- 1 surgical intervention

Experience (Pavia) 1987-2004

67 patients

72 cysts

85 punctures

SAFETY

Hypotensive Shock	**1**	**1,1 %**
Sclerosing Cholangitis	**0**	**0 %**
Secondary Echinococcosis	**0**	**0 %**
Minor complications	**18**	**21,1 %**

OUTCOME

SUCCESS 84,5 %

OUTCOME

FAILURES 15,5 %

- CE2 with many daughter cysts
- CE3b predominantly solid with daughter cysts

CONCLUSIONS

PAIR safe and efficacious.

First choice in CE1 and CE3a

> 5 cm in diameter

CE1,CE3a

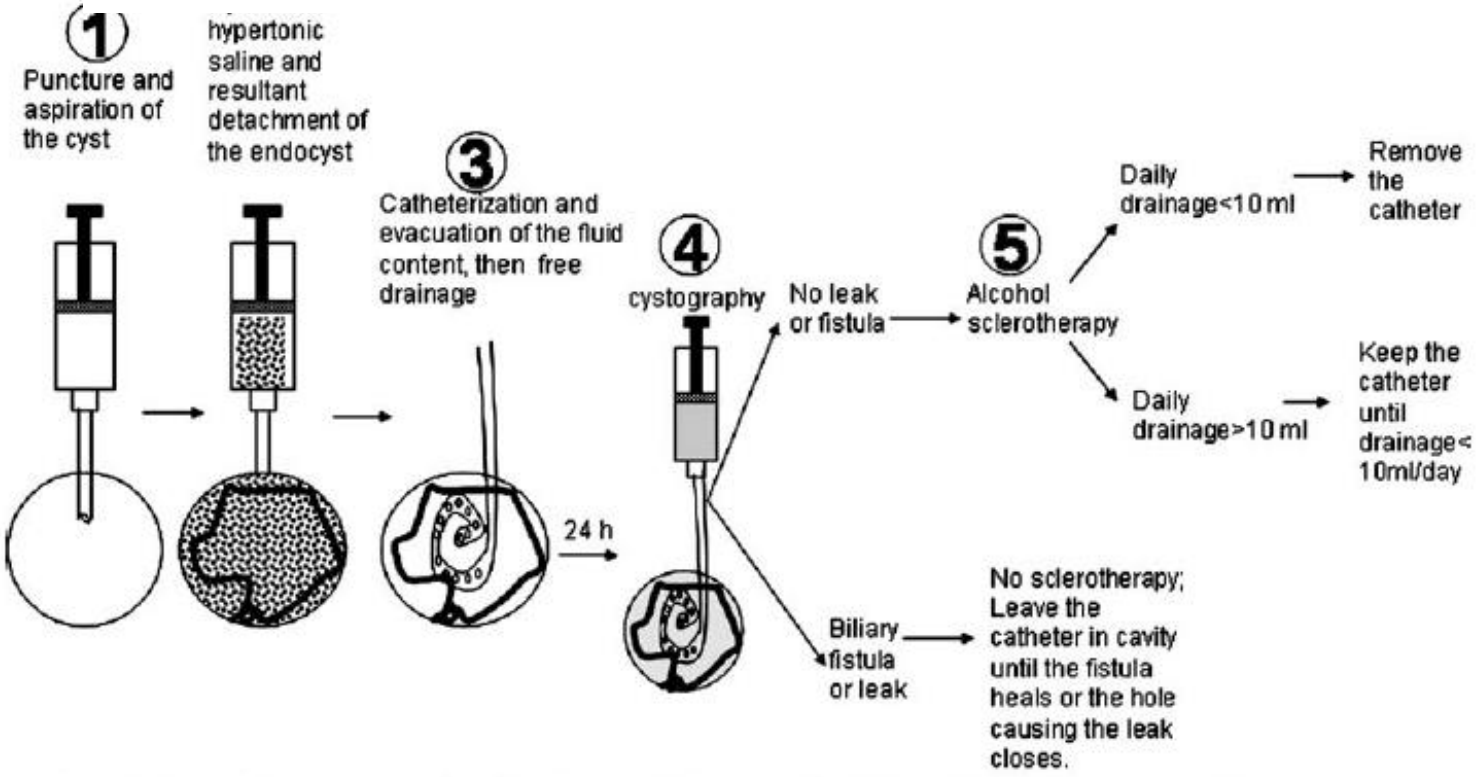
< 5 cm	**ABZ**
5-10 cm	**PAIR + ABZ**
> 10 cm	**Catheter (continuous drainage)**

Percutaneous treatment of giant abdominal hydatid cysts: long-term results

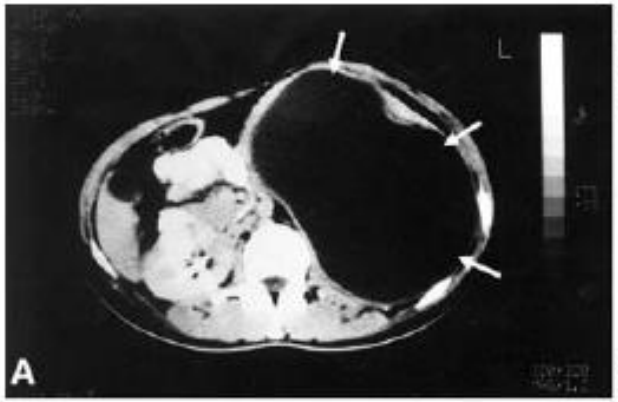
S. Men,[1] C. Yücesoy,[2] T. R. Edgüer,[2] B. Hekimoğlu[2]

[1] Department of Radiology, Dokuz Eylül University, Medical School, Inciralti Izmir, TR-35340, Turkey
[2] Department of Radiology, SSK Ankara Hastanesi (Social Security Ankara Hospital), TR-06110 Dışkapı Ankara, Turkey

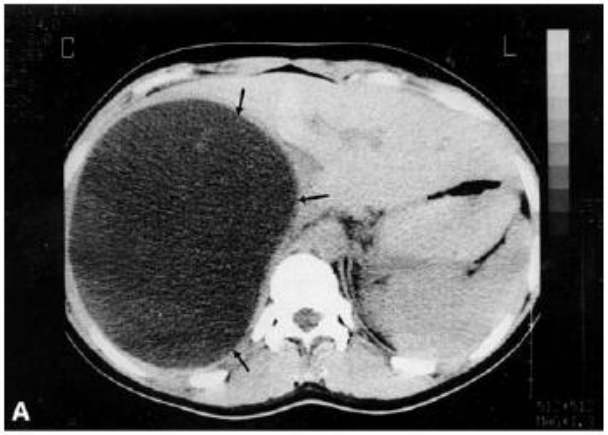
Received: 11 September 2005/Accepted: 8 March 2006/Online publication: 3 July 2006

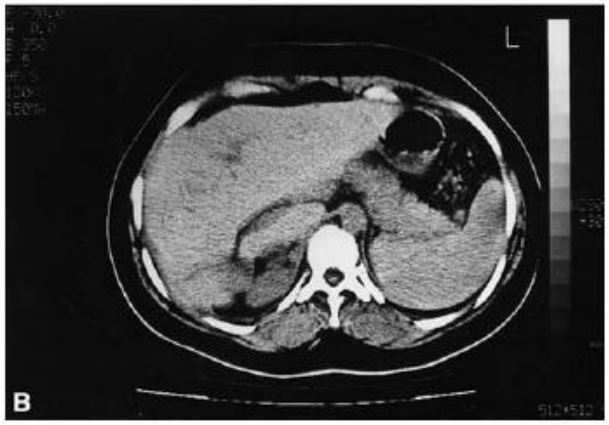


Steps 1, 2, and 3 are done on the first day, and the steps 4 and 5 are done on the second day.


L
A


C
L
C


C
L
A


L
B

FAILURES of PAIR in CE2/CE3b

30 % requiring further PAIRs (up to 4)

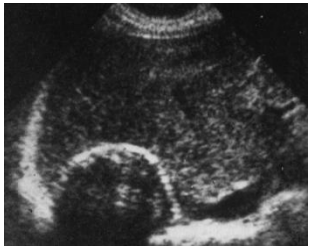
Giorgio et al J Ultras Med 2001

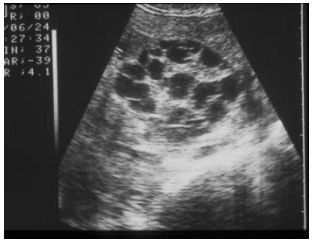
61 %

Kabaalioglu Eur J Radiol 2006

CE1 CE3a CE4

Th 1





NMR IN BIOMEDICINE
NMR Biomed. 2008; **21**: 734–754
Published online 3 April 2008 in Wiley InterScience
(www.interscience.wiley.com) DOI:10.1002/nbm.1252

Metabolic viability assessment of cystic echinococcosis using high-field ^{1}H MRS of cyst contents

Waldemar Hosch,[1] Thomas Junghanss,[2] Marija Stojkovic,[2] Enrico Brunetti,[3] Tobias Heye,[1] Günter W. Kauffmann[1] and William E. Hull[4]*

[1]Department of Radiodiagnostics, University Hospital, Heidelberg, Germany
[2]Clinical Tropical Medicine Section, University Hospital, Heidelberg, Germany
[3]Division of Infectious and Tropical Diseases, IRCCS San Matteo Foundation, Pavia University, Pavia, Italy
[4]Core Facility: Molecular Structure Analysis, German Cancer Research Center (DKFZ), Heidelberg, Germany

- CE3a cysts have about equal probability of being viable or nonviable, whereas CE3b cysts are usually viable.

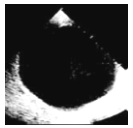
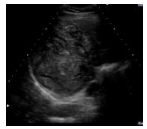
- This difference provides impetus for the diagnostic use of the subclass designations;

- Host's immune response is skewed towards Th2 in cysts relapsing after treatment,

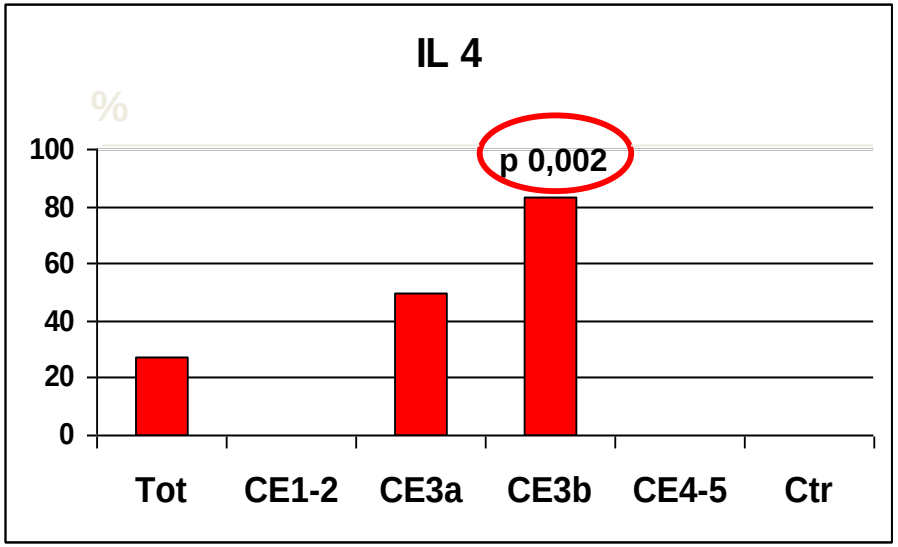
  possibly as a result of immunomodulation by the parasite

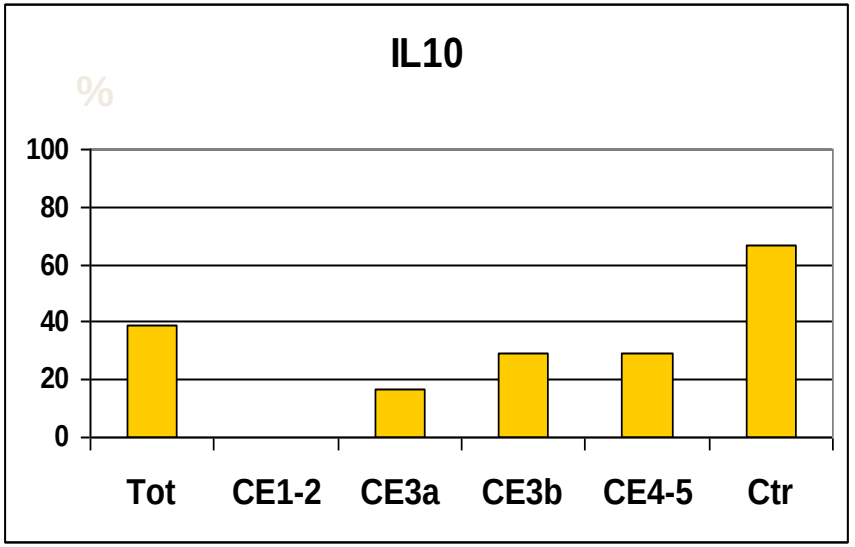
Riganò et al, Parasite Immunology, 2004

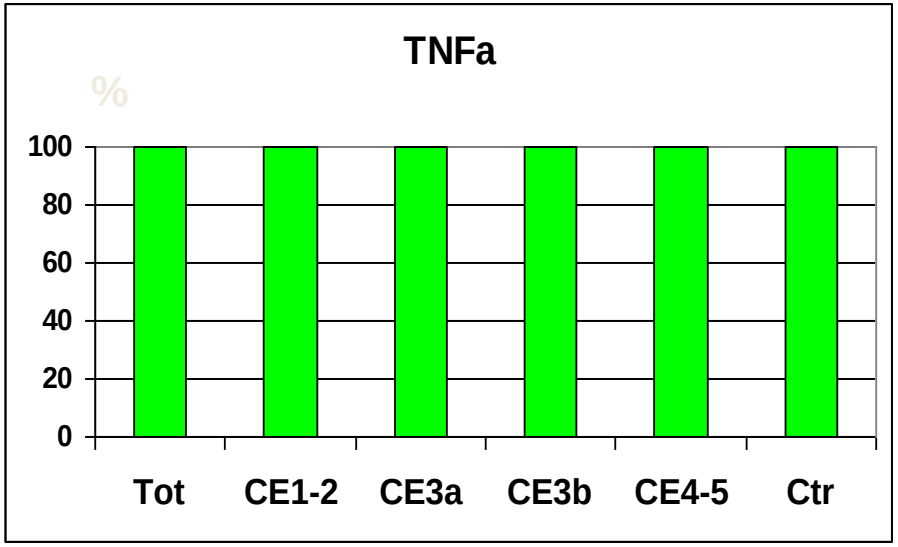
PATIENTS

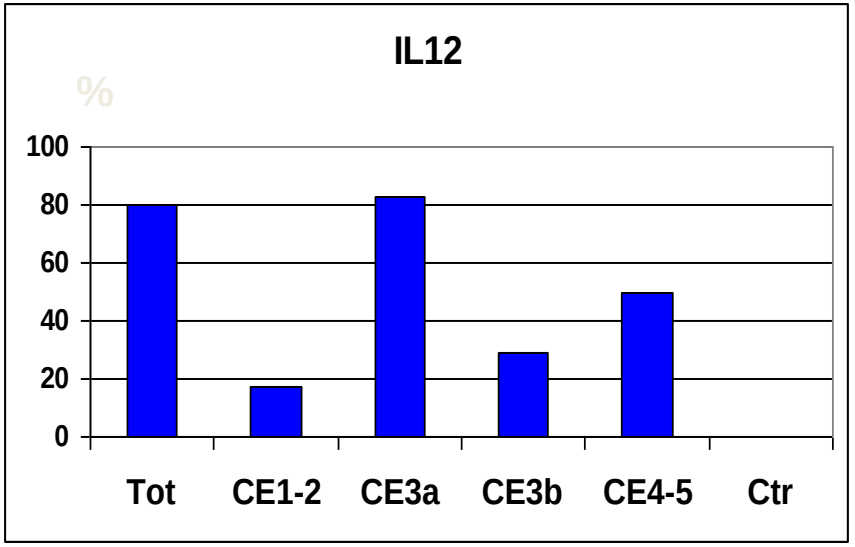
Stage	N°	IgG ELISA	IHA
CE1-2  	7	7/7	7/7
CE3a 	6	6/6	6/6
CE3b 	7	5/7	7/7
CE4-5  	7	3/7	5/7
CONTROLS	3	-	-

CYTOKINE POSITIVES by cyst stage

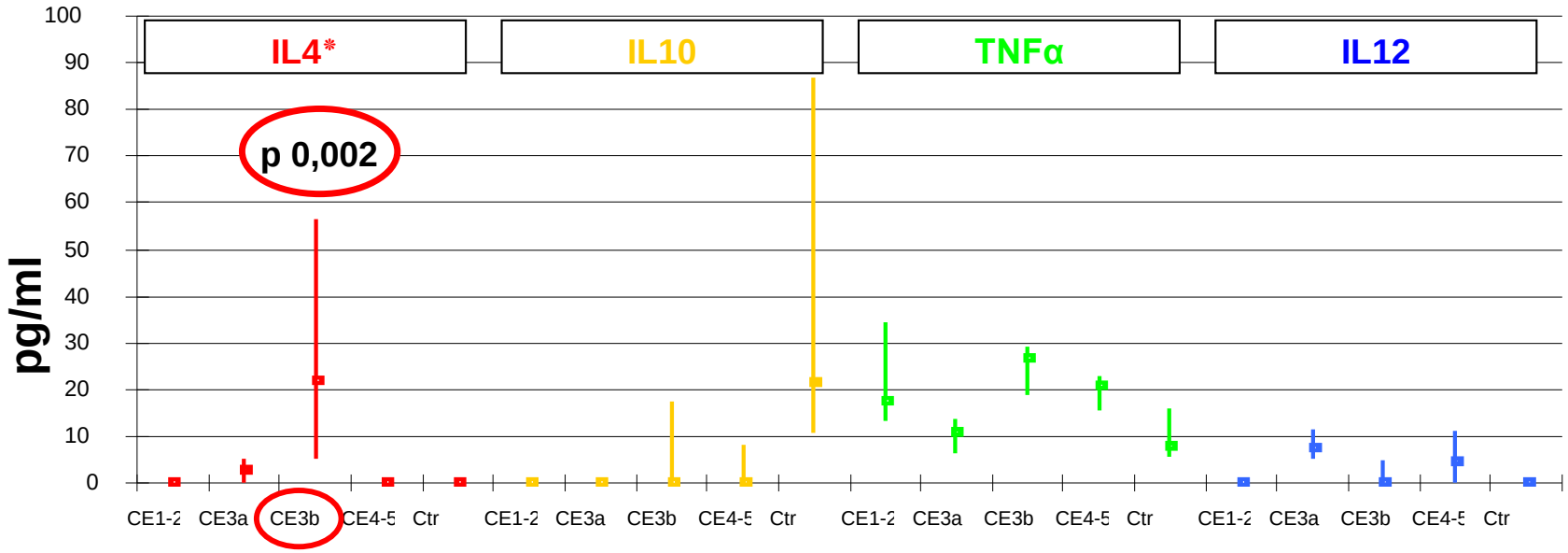








SERUM CYTOKINES
amount by cyst stage

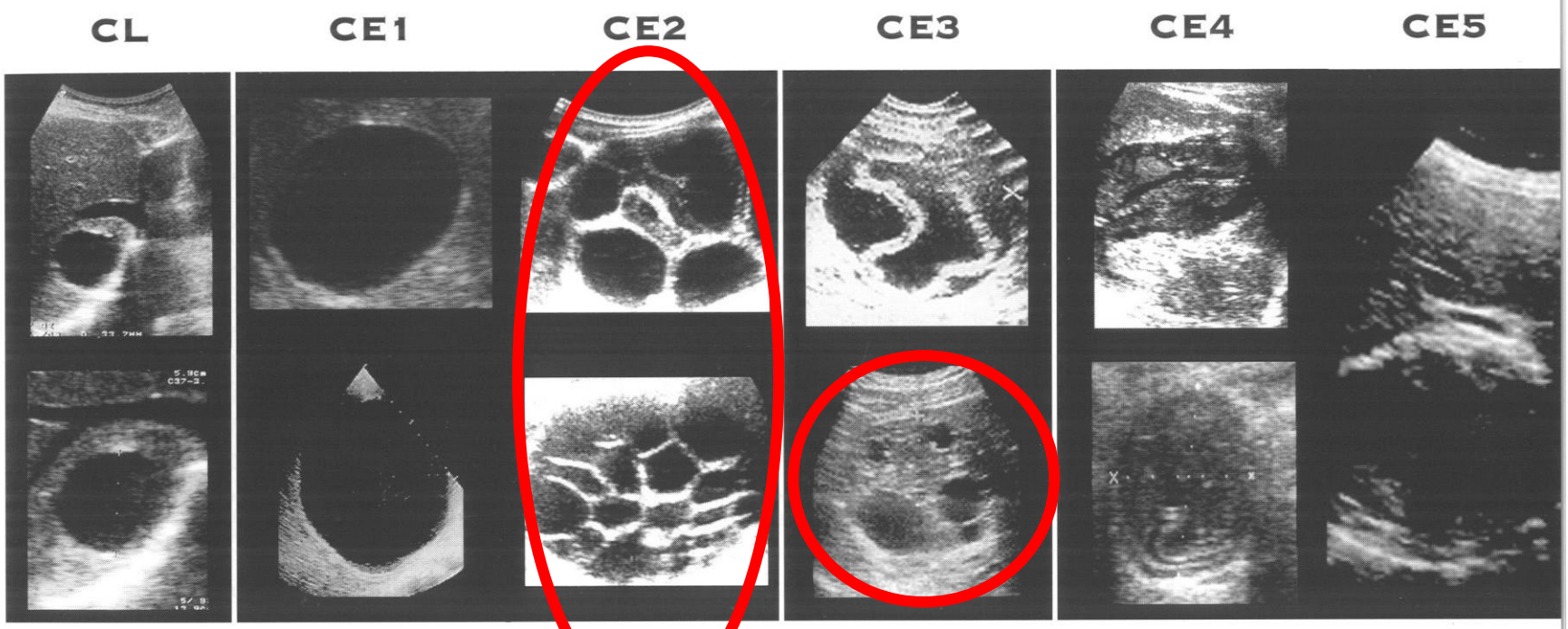


mediana ■

25° e 75° percentile |

- **Marker Th2**
- **Th0 → Th2**
- **MØ → Depression AAMØ**

WHO-IWGE Classification of Ultrasound Images of Cystic Echinococcosis Cysts



PERCUTANEOUS TREATMENTS

Inactivation of Germinal layer

Evacuation of endocyst

PAIR

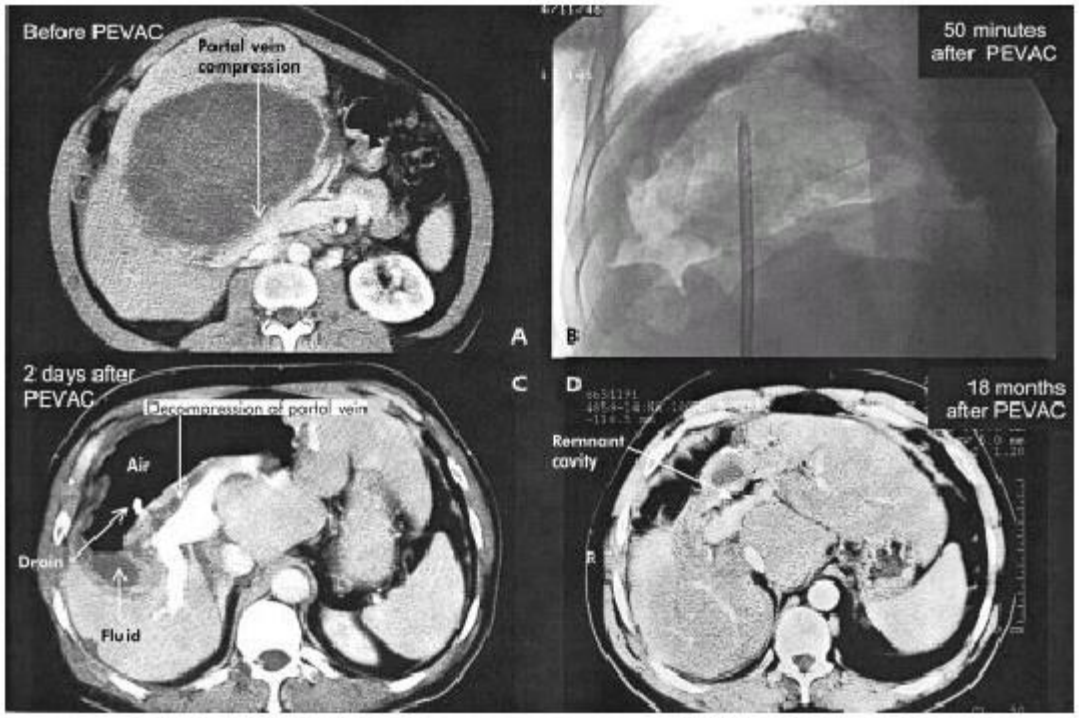
~~RF Thermal Ablation~~

- Large bore catheter
- PEVAC
- Dilatable Multi Function Trocar
- Percutaneous Puncture Drainage and Curettage
- Others

Percutaneous evacuation (PEVAC) of multivesicular echinococcal cysts with or without cystobiliary fistulas which contain non-drainable material: first results of a modified PAIR method

H G Schipper, J S Laméris, O M van Delden, E A Rauws, P A Kager

Gut 2002;50:718–723



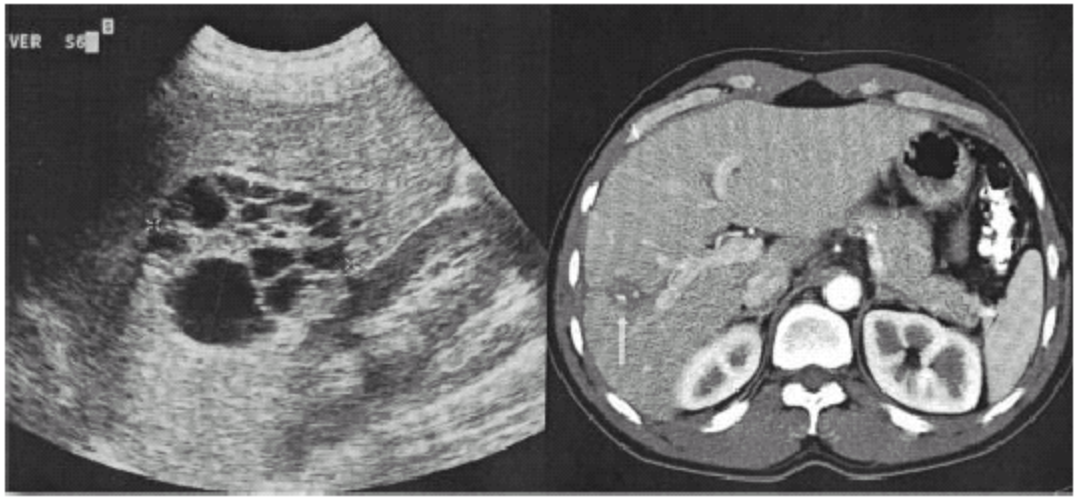


Figure 5 Ultrasound before percutaneous evacuation (PEVAC) of multivesicular cyst which had spontaneously ruptured into the biliary tree (left). Computed tomography scan 13 months after PEVAC shows (arrow) partially calcified cyst remnant (right).

PEVAC

12 patients follow up 17.9 (4–30) months after PEVAC, 7 cysts had disappeared and 5 cysts had decreased in size.

In 8 patients with multivesicular cysts, a cystobiliary fistula, and infection, cyst size was 12.5 (6–20) cm, catheter time 72.3 (28–128) days, and hospital stay 38.1 (20–55) days.

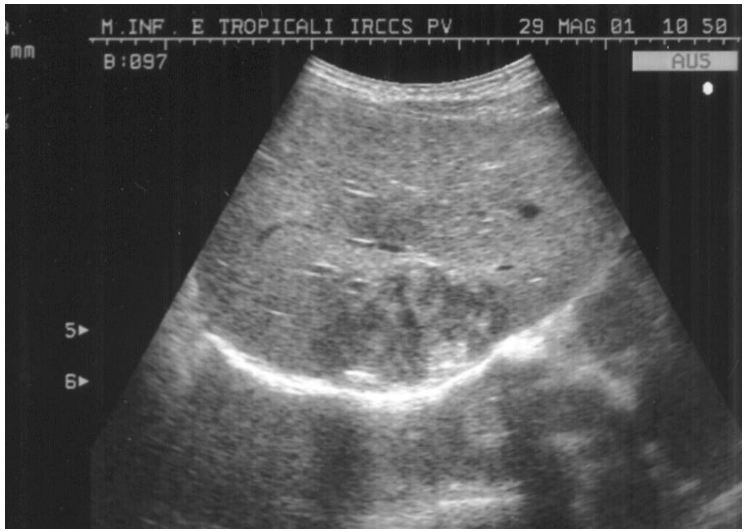
At 17.3 (4–28) months of follow up, six cysts had disappeared and in two cysts residual size was 1 and 2.9 cm, respectively.

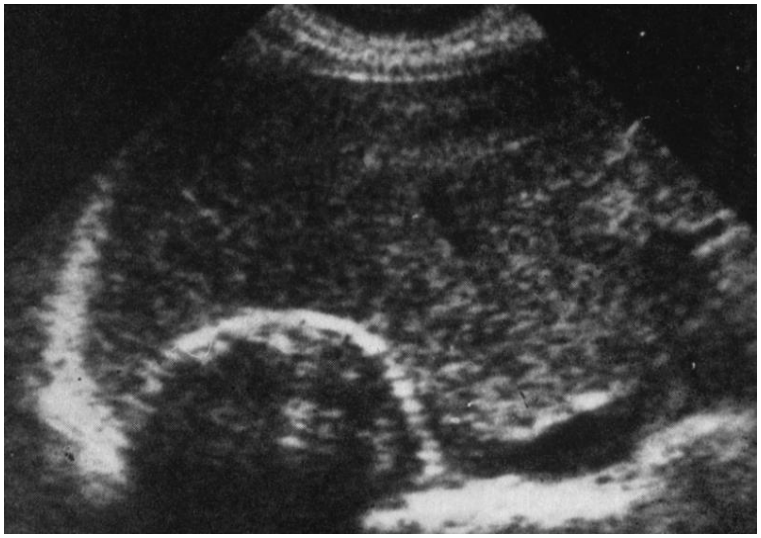
In 4 patients without a cystobiliary fistula, cyst size was 14.4 (12.7–16) cm, catheter time 8.8 (3–13) days, and hospital stay 11.5 (8–14) days.

Schipper HG et al, Gut 2002

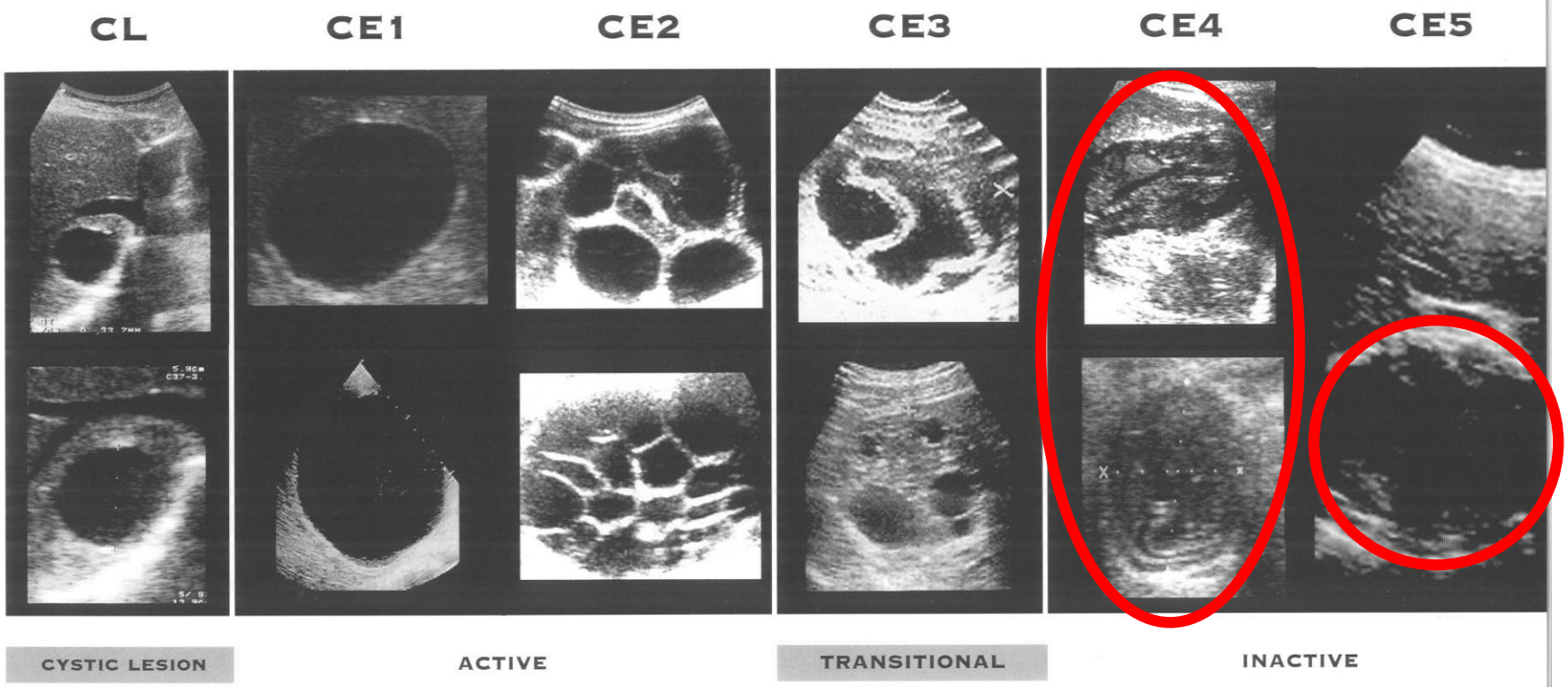
What Have We Learned ?

STAGE-SPECIFIC APPROACH


M.INF. E TROPICALI IRCCS PV
29 MAG 01 10 50
B:097
AU5
5
6



WHO-IWGE Classification of Ultrasound Images of Cystic Echinococcosis Cysts



Cystic Echinococcosis

- CHRONIC condition
- Natural history still unknown
- Three terapeutic options not yet compared properly

Areas where improvement is needed

- Signs of improving coordination (serology) but still a long way to go – serology / US classification
- Need to improve : evaluation of treatments
- Research is needed on: pathogenesis and natural history

Outcome criteria

- A: Size reduction > 50%, homogeneous and hypoechoic content, no daughter cysts, normalization or significant reduction of serology.
- B: Size reduction < 50%, heterogeneous (mixed) content, reduction of serological values.
- C: No morphological changes and/or new daughter cysts with increased serology.

Percutaneous Treatment of Liver Hydatid Cysts: Comparison of Direct Injection of Albendazole and Hypertonic Saline Solution

Yahya Paksoy[1]
Kemal Ödev[1]
Mustafa Şahin[2]
Ahmet Arslan[3]
Osman Koç[1]

OBJECTIVE. The purpose of this study was to compare the effect of intracystic injection of albendazole and hypertonic saline in patients with liver hydatid disease.

MATERIALS AND METHODS. Fifty-nine patients with a total of 109 hydatid cysts were treated percutaneously. In all cases, local anesthesia was applied. Twenty percent hypertonic saline was used in 31 patients (40 cysts, group 1) as the scolicidal agent, and albendazole solution was used in 28 patients (69 cysts, group 2). The PAIR (percutaneous puncture, aspiration, injection, reaspiration) method was applied in group 1. In group 2, we used a different procedure that could be called the PAI (percutaneous aspiration and injection) method. After this procedure, routine sonography and CT examinations were conducted. The results of both groups were compared.

RESULTS. Follow-up examinations showed that liver hydatids expanded approximately to their original size after a significant reduction during the first month. In the follow-up period, fluid contents totally disappeared; thickening and irregularities were also observed in the cyst walls and a solid, hyperechogenic, heterogeneous pseudotumor appearance representing a degenerated membrane was seen in all patients. Hypertonic saline solution inactivated the scolices from the beginning of the treatment. However, scolices were inactive in the cysts aspirated 1 month after the procedure in group 2. A significant correlation was noted between elapsed time after the treatment and the cyst size using Wilcoxon's signed rank test ($p = 0.000$). No difference was seen between two groups in the amount of cyst size reduction using the Mann-Whitney test ($p = 0.521$).

CONCLUSION. In addition to its oral use, albendazole may be injected intracystically as we did in our study. It sterilizes the cyst cavity and affects scolices as well.

AJR:185, September 2005

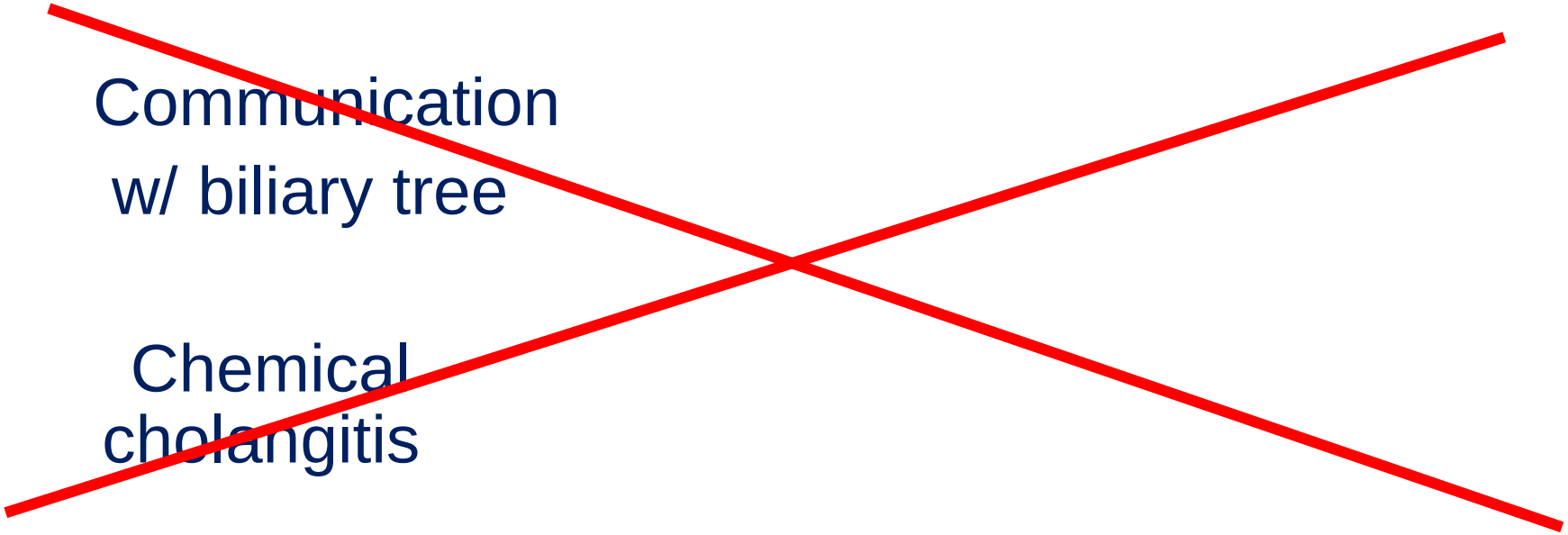
Avoiding major complications

Spillage

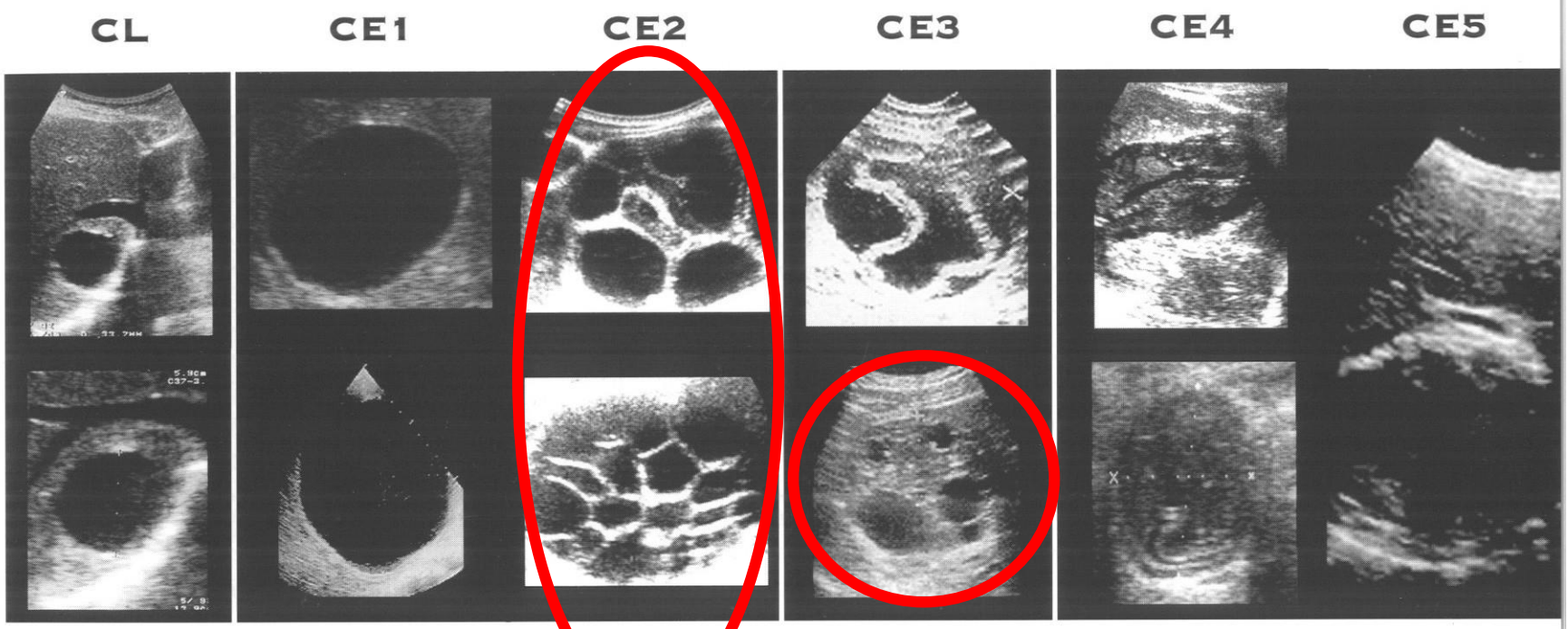
Anaphylactic shock

Communication w/ biliary tree

Chemical cholangitis



WHO-IWGE Classification of Ultrasound Images of Cystic Echinococcosis Cysts




M.INF. E TROPICALI IRCCS PV
19 NOV 99 09 37
B:100
AUS
4
5


M.INF. E TROPICALI IRCCS PV
27 FEB 02 11:32
B:068
AUS
536/536


M.INF. E TROPICALI IRCCS PV 27 GEN 03 17:40
B:069
AU5


E TROPICALI IRCCS PV 07 SET 00 11:09
AU5


000