

# HYDATID CYST OF THE LIVER

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DEPARTMENT OF GENERAL  
SURGERY

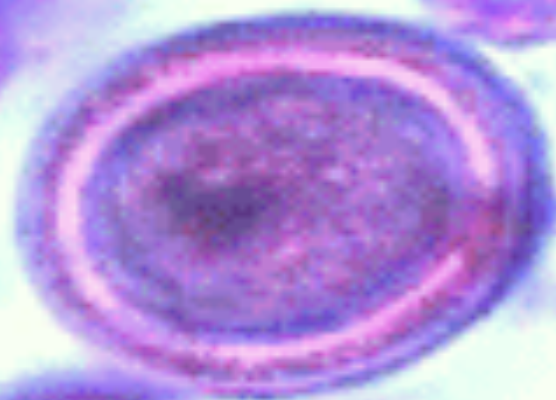


*Echinococcus granulosus*  
adult



(By P.W. Pappas and S.M. Wardrop; original by P. Darben)

# ***Echinococcus granulosus*** **egg**



**(By P.W. Pappas and S.M. Wardrop;  
original by P. Darben)**



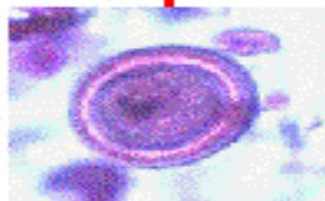
# protoscoleces (hydatid sand)



(by P.W. Pappas and S.M. Wardrop)



The adult tapeworm is found in the small intestine of the canine (definitive) host.



Eggs are passed in the host's feces.

The eggs are ingested by an intermediate host. Many species of warm blooded vertebrates can be infected.



The protoscolex attaches to the host's intestine and develops into a tapeworm.



The definitive host is infected when it ingests the hydatid cyst (protoscoleces).



The larva develops into a hydatid cyst.





## CLINICAL FEATURES

- ◆ **LATENCY**( Asymptomatic,Abdominal pain).
- ◆ **SUPPURATION:** 11%-27%. E.COLI
- ◆ **PRESSURE EFFECTS:** LIVER TISSUE, HILUM,HEPATIC VEINS .....etc.



# Clinical Features

## ◆ RUPTURE:

- **Obscure:** rupture of the endocyst.
- **Communicant Rupture:** biliary tree, bronchial tree.

- **Free Rupture:** free body cavities or adjacent organs.(1-4%)



## DIAGNOSIS- IMAGING

◆ PLAIN X-RAY: CALCIFICATION.

◆ ULTRASONOGRAPHY: H.Gharby 1981  
classification:

1- simple hydatid cyst.(budding + h.sand)

2- fluid collection with a split wall(Water-lily)

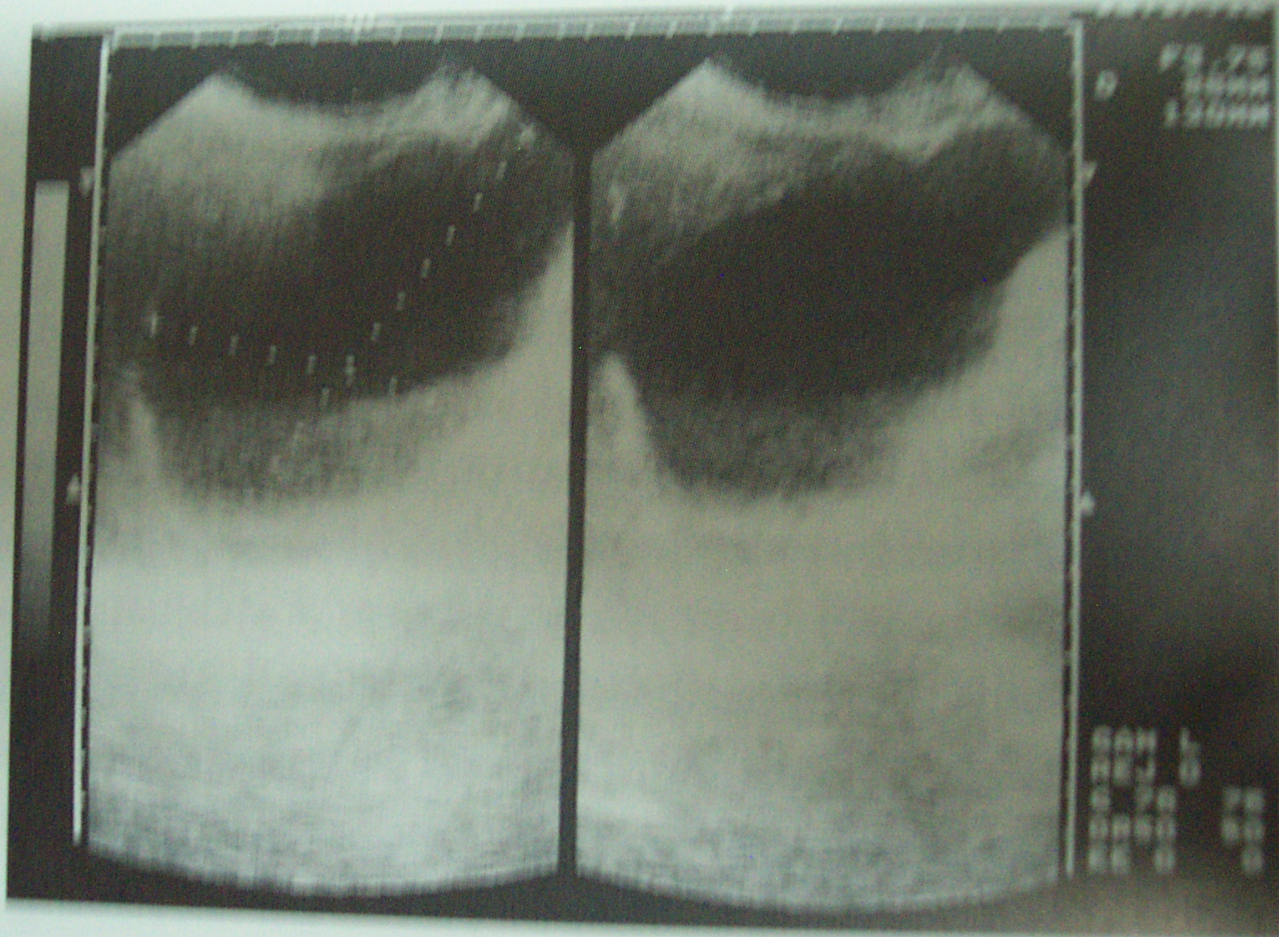
3- fluid collection with septa(Honeycomb).

4- heterogeneous appearance.

5- reflecting thick wall.



(A)





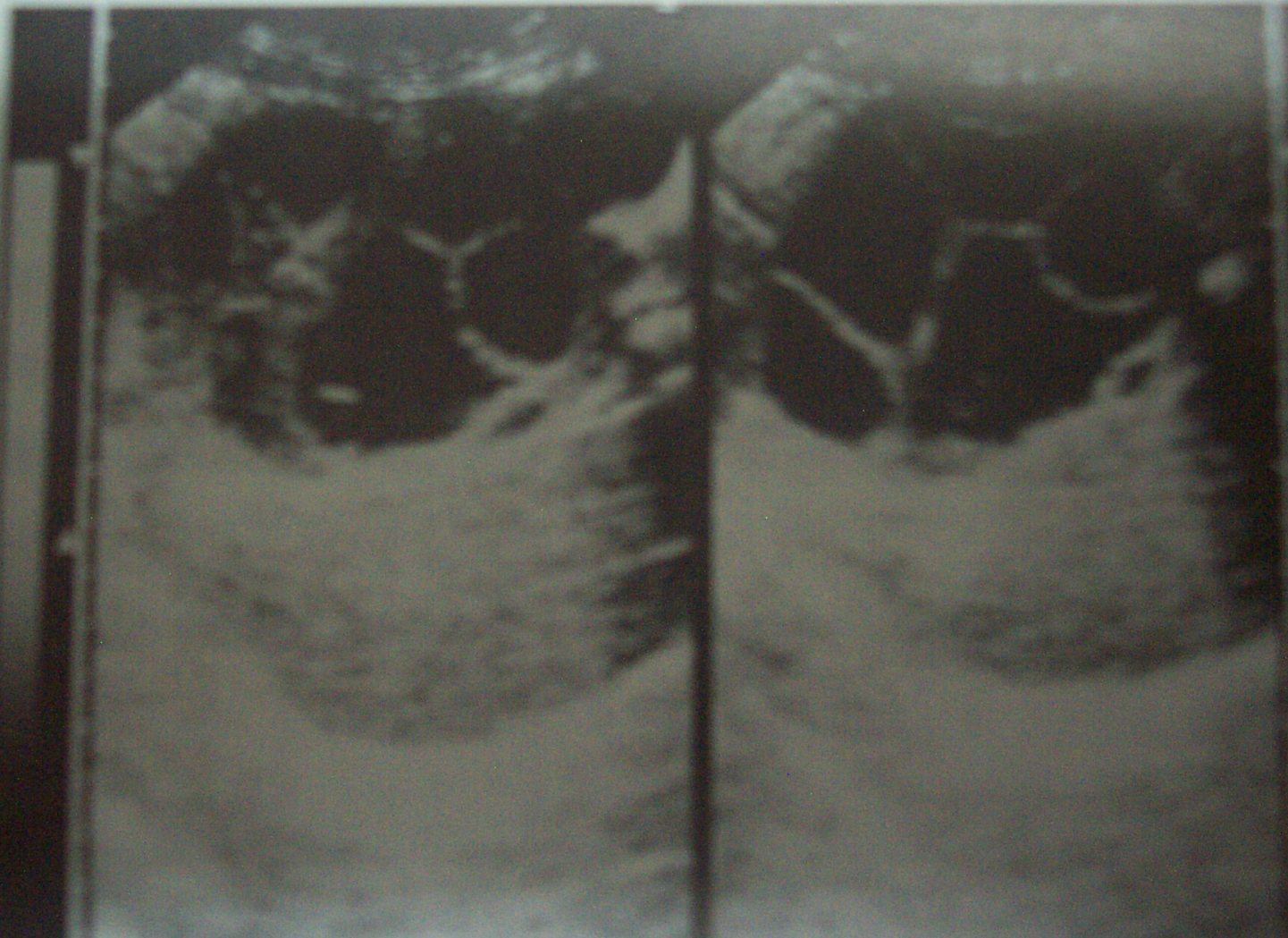
(B)







(A)





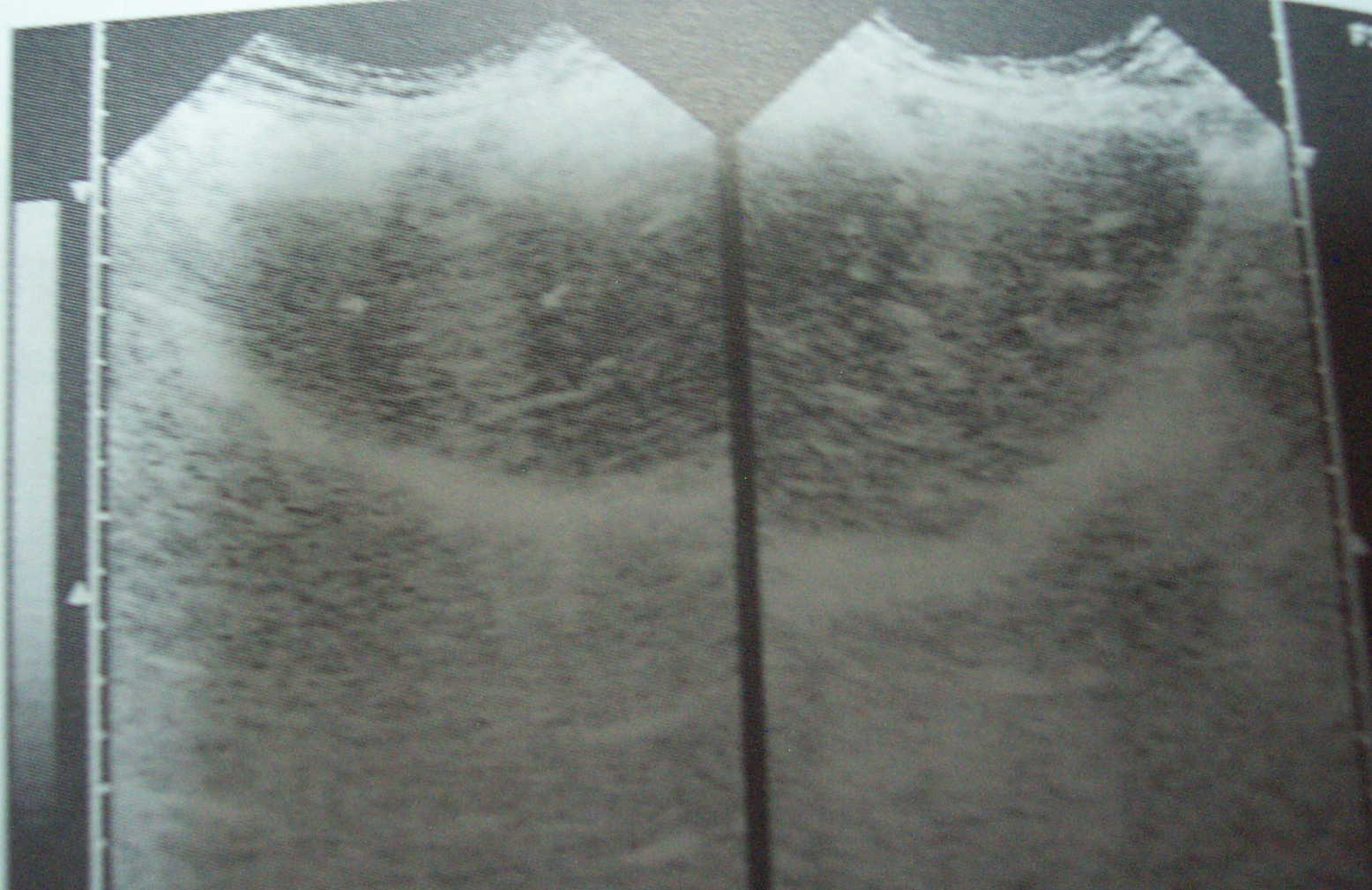








(D)





# Diagnosis-Imaging

- ◆ CT SCAN:
- ◆ MRI.
- ◆ ERCP.
- ◆ PTC.
- ◆ ANGIOGRAPHY.



IMA 15  
SPI 4

R

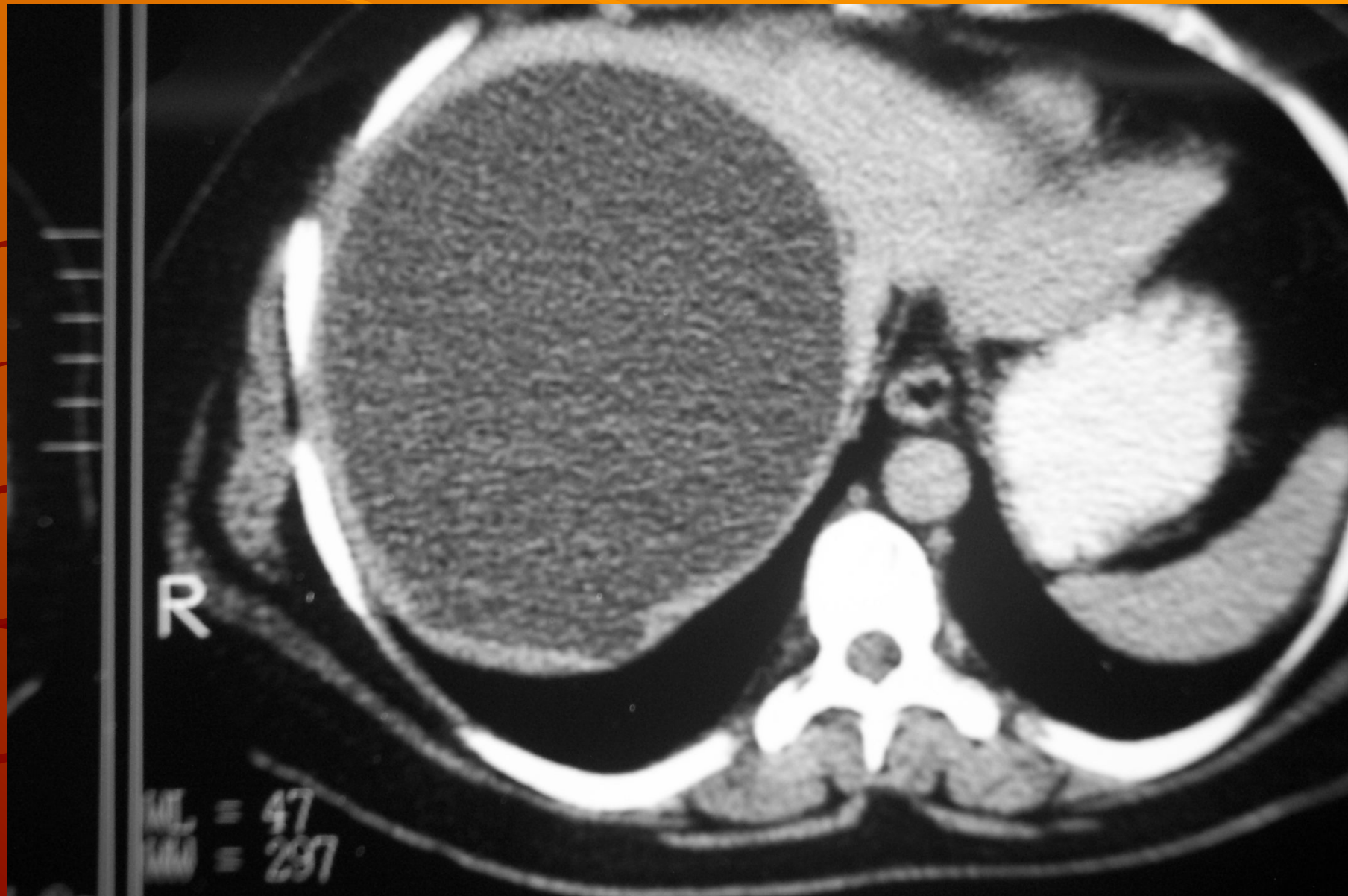
kV 140  
mA 222  
TI 0.75  
GT 0.0  
SL 8.0/8.0

20









30-JUN-2003  
10:35:10.53

30-JUN-2003  
10:35:10.53

R

R

10 cm

10 cm

TP -43.5

350  
50

TP -5  
IMA 3  
SPI 4  
10110

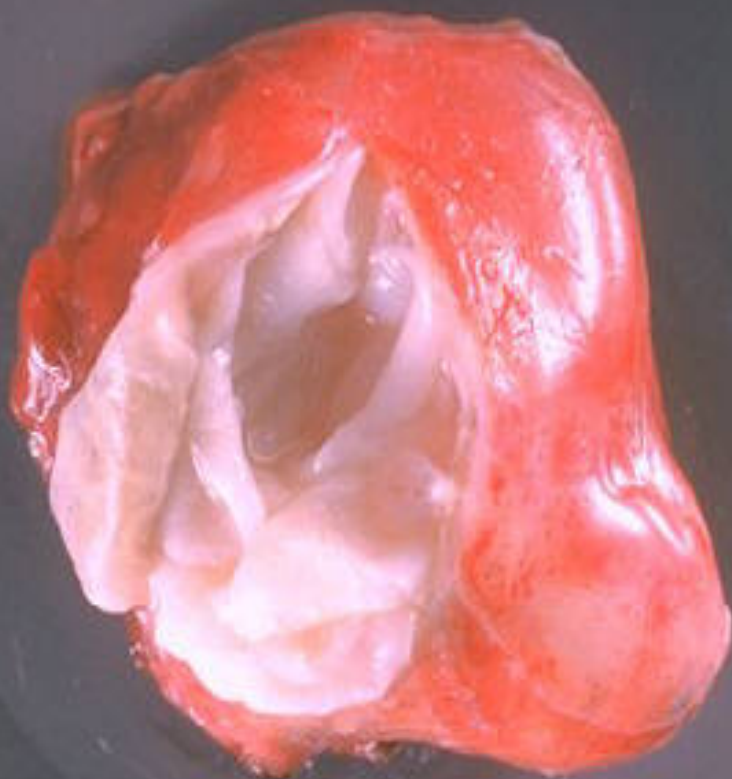




# DIAGNOSIS- IMMUNOLOGY

- ◆ IHA.
  - ◆ CFT.
  - ◆ LA.
  - ◆ IEF.
  - ◆ CIE.
  - ◆ ELISA.
- 





# Treatment of Hydatid Disease



```
graph TD; A[Treatment of Hydatid Disease] --> B[Medical  
Ideal: not yet completely efficient]; A --> C[Radiological  
Selective  
PAIRS]; A --> D[SURGICAL]; D --> E[Attractive  
Laparoscopic]; D --> F[Radical  
conventional];
```

The diagram is a flowchart titled "Treatment of Hydatid Disease". It branches into three main categories: Medical, Radiological, and SURGICAL. The Medical category includes the note "Ideal: not yet completely efficient". The Radiological category includes "Selective" and "PAIRS". The SURGICAL category further branches into "Attractive Laparoscopic" and "Radical conventional". The background features a silhouette of a sprinter in a starting block on a track.

## Medical

Ideal: not yet completely efficient

## Radiological Selective PAIRS

## SURGICAL

Attractive  
Laparoscopic

Radical  
conventional



## Medical treatment

- ◆ Antimony, Arsenic, Thymol derivatives, Iodides & Mercury.
- ◆ Mebendazole.
- ◆ Albendazole: 10-14mg/kg/day, three 28 courses separated by 2 weeks rest.
- ◆ Praziquantel.

# Albendazole Tx of hydatid diasease

author	yr.	no.	duration (mo)	cure	'success'
Nahmias	'94	68	4	41	57
Horton	89	253	1-12	29	
Davis	89	46	1-3	--	39
DeRosa	90	46	3	9	--
Todorov	92	35	4	--	43

success = marked improvement



# **albendazole Tx of hydatid disease (Italy)**

**Franchi, CID, 1999;29:304-9**

- ◆ **n = 323 patients**
- ◆ **Tx: 440 liver, 57 abdom., 143 lung cysts**
- ◆ **albendazole 10 mg/kg/d x 3-6 mo.**
- ◆ **assessment: degeneration by CXR, U/S, CT, MRI q 6-12 mo.**
- ◆ **f/u: 2 yrs. (1-14 yrs)**

# Long-term evaluation of albendazole Tx of hydatid disease: results (Franchi)

- Post Tx degeneration in:
  - 82% liver, 67%, abd. 88% lung
- long-term: + 22%
- 25% relapsed
- 78% relapses occurred < 2 yrs

CID 1999;29:304-9



# **albendazole + praziquantel vs. alb. alone**

**Cobo et al. Trop Med Int H 1998;3:462-66**

◆ **RT pre-op in Spain, x 1 month (no controls)**

◆ **groups: I (12) albendazole 10 mg/kg/d**

**II (14) albendazole 10 mg/kg/d**

**III (21) alb. (10 mg/kg) + praz. 25 mg/kg**

◆ **viability: supravital staining,**

Table2. Cyst response to  
Albendazol(Adrien,MD)  
World J.Surg.25(1)2001.

Data source	Evalua ble cysts	Cure	Improv ed	No change	Worse
Europe an data	435	160(35. 2%)	187(41 %)	102(22. 4%)	6(1.3%)
Publica tion	2912	663(22. 8%)	1418(48 .7%)	831(28. 5%)	
Total	3347	823(24. 6%)	1605(48 %)	919	



# Table1. Clinical response to Albendazol(Adrien G.Saimot MD)

## World J.Surg.25(1)2001

Data source	No of patients	Cured	Improv ed	No change	Worse
Europe an data	253	72(28.5 %)	129(51 %)	46(18%)	6(2.4%)
publica tion	1116	372(33.5%)	469(42 %)	275(24.6%)	
Total	1369	444(32.4%)	598(43.7%)	327(23.9%)	

# Techniques used for PAIR

## 1. Percutaneous puncture:

- 18 g Seldinger needle
- aspirate 25-35% est. volume
- 15-25% NaCl = ~10% aspirated vol. injected. (kill in 5 min,)
- wait (10 min.) for pericyst separation
- reaspirate





# Techniques used for PAIR

## 2. Catheterization:

- as above
- 6F catheter inserted
- wash out with hypertonic saline
- drain x 24 hrs. (<10 cc/24 hr = no bile connection)
- cystogram
- 95% alcohol (25-35% vol.)
- reaspirate & withdraw catheter

# Percutaneous (PAIR) Tx of liver cysts

Akhan, Eur J Radiol 1999;32:76-85

## 1. Hydatid liver disease: 14 studies

- 13 studies (641 cysts) 1 Chinese study (996 cysts)
- 1,637 cysts in 1,000 pts
- instillation of alcohol or hypertonic saline
- f/u 1-3 years ( 1 yr )



# 1. Liver hydatid disease: results

- cure or significant change: 90-100%
- recurrence 0 - 4%
- complications: ~ 10%
  - ▣ biliary fistula: ~ 5-10% (7 studies)
  - ▣ fever, urticaria: 10-20%
  - ▣ cyst cavity infection: ~ 3%
  - ▣ death: 0.1 - 0.2%



# **PAIR: In a literature review**

**Table3: review of recent experience(1994-1998).(Iskende Sayek)**

<b>Finding</b>	<b>Surgically treated</b>	<b>Percutaneously drained</b>
<b>Total</b>	<b>46(37%)</b>	<b>79(63%)</b>
<b>Solitary cysts</b>	<b>29</b>	<b>55</b>
<b>Types</b>	<b>III-V:34(74%)</b>	<b>I-III:65(82%)</b>
<b>Complications:</b>	<b>2</b>	<b>11</b>
<b>Minor</b>		
<b>Complications:</b>	<b>6</b>	<b>9</b>
<b>Major</b>		
<b>Cavity infection</b>	<b>5</b>	<b>8</b>



## Table 3..... continue

<b>Finding</b>	<b>Surgically treated</b>	<b>Percutaneously drained</b>
<b>Biliary drainage</b>	1	1
<b>Wound infection</b>	2	-
<b>Patients requiring surgery</b>	-	2

# Laparoscopic

- ◆ Minimal invasive.
- ◆ Stands in the midway between PAIR&conventional surgery.
- ◆ Risk of spillage.
- ◆ Radicality?
- ◆ No enough randomized studies to come up with a conclusion.

# Types of surgery

- ◆ Marsupialization.

- ◆ Cystectomy plus.

- Pericystectomy- partial
- Pericystectomy- subtotal.
- Pericystectomy- Total.

Resection: segmental, lobar,  
total+transplantation.





## Remaining cavity

- ◆ Primary closure.
- ◆ Simple drainage.
- ◆ Capitonage.
- ◆ Introflection.
- ◆ Omentoplasty.



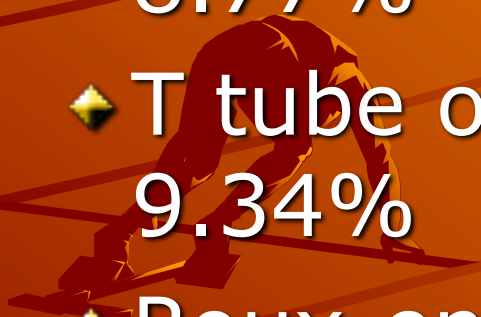
Ahmet et al in a study of 304 cases concluded that: "For management of hydatid cyst of the liver . Capitonnage , omentoplasty, cyst excision, cystenterostomy are all superior to tube drainage."

Source: *Arch.Surg.vol 134 Feb.1999.*

N.B:However 35/122 patients with tube drainage had infected cysts.



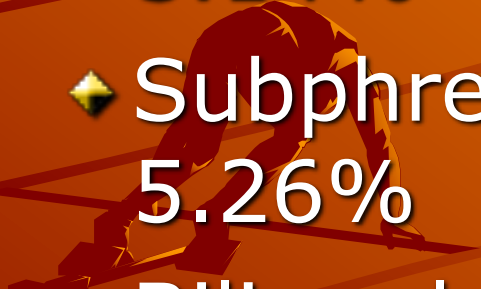
## Cysto-Biliary Communication: 171 cases Milicevic



◆ Suture	115
67.25%	
◆ Suture+T-tube	15
8.77%	
◆ T tube only	16
9.34%	
◆ Roux-en-y jej.	4
2.34%	
◆ Intracavitary reconstruction	2
1.17%	



## Post-operative complications



◆ Wound infection	111
13.5%	
◆ Chest problems	42
5.14%	
◆ Subphrenic abscess	43
5.26%	
◆ Biliary leakage	40
4.89%	
◆ Liver abscess	20
2.45%	

## Results of surgical treatment

- ◆ Def.of recurrence: controversy.
- ◆ Amir Jahed 1975: 0.9%
- ◆ Dugalic 1982: 1.7%
- ◆ Pitt 1986: 10%
- ◆ Magistrelli 1991: 10.8%
- ◆ Little 1988 : 22%

# Table4. Postoperative morbidity & mortality in a series of 298 patients.(Anaceleto Cirenei,MD, Innocenzo Bertoldi MD)

<b>Treatment</b>	<b>No.</b>	<b>Morbidity</b>	<b>Mortality</b>
<b>Conservative methods</b>	<b>134</b>	<b>12(12.6%)*</b>	<b>8(5.9%)**</b>
<b>Marsupialization</b>	<b>20</b>	<b>8(40%)</b>	<b>6(30%)</b>
<b>Partial cystopericystectomy</b>	<b>114</b>	<b>9(7.9%)</b>	<b>2(1.7%)</b>
<b>Resection of pericyst &amp; subtotal pericystectomy</b>	<b>85</b>	<b>6(7.1%)</b>	<b>2(2.3%)</b>
<b>By peeling the pericystium</b>	<b>29</b>	<b>3(10.3%)</b>	<b>--</b>





**Table4. .... Continue**  
**World J.Surg25(1) 2001.**

Treatment	No	Morbidity	Mortality
<b>Radical methods</b>	164	9(5.5%)	3(1.8%)
<b>Total pericystectomy</b>	132	5(3.7%)	3(2.2%)
<b>Liver resection</b>	32	4(12.5%)	--
<b>Total</b>	298	26(8.7%)	11(3.6%)

**P\*<0.05,**  
**P\*\*=NS.**

hydatid cyst of the liver with a large biliocystic  
fistula.(Abeljelil Zaouche et al)  
World J.Surg 25 (1)2001.

Procedure	No
Radical treatment	24(9.8%)
<i>Left lobectomy</i>	7
<i>Pericystectomy</i>	17
Conservative treatment	220(90.2%)
<i>Internal transfistulary drainage</i>	52
<i>Deroofing procedure</i>	140

**Table 5.....continue**

<b>Procedure</b>	<b>No</b>
<i>Respected fistula</i>	20
<b>External drainage</b>	<b>10</b>
<i>External drainage +omentoplasty</i>	8
<i>External drainage +capitonnage</i>	2
<i>Sutured fistula</i>	93
<i>External drainage</i>	49



**Table 5. .... continue**

Procedure	No
<i>External drainage+omentoplasty</i>	28
<i>External drainage +capitonnage</i>	16
<b>Direct fistulization</b>	<b>27</b>
<b>Transcholedochal evacuation</b>	<b>28</b>

## Personal experience(1993-2000)

- ◆ Number of cases: 82
- ◆ males: 36(43.9%), Females:46(56.1%).
- ◆ **Anatomical distribution:**
- ◆ RT lobe: 35 (42.6%).
- ◆ LT lobe: 23 (28%).
- ◆ Both lobes: 22 (26.8%).
- ◆ Central : 2 (2.4%).
- ◆ Involvement of other organs: (12.1%).
- ◆ Associated pathology: Pregnancy(2), Cirrhosis(2).

## Technique

### Standard surgical principles were applied:

- ◆ Complete isolation of the operative field.
- ◆ Two powerful suctions.
- ◆ Aspiration- Suction(after stopping breathing )infusion-Reaspiration.
- ◆ Opening of the cyst, evacuation & Irrigation-suction.(scolicidal agent).
- ◆ Unfoldindg of the pericyst.
- ◆ Mobbing of the cavity.
- ◆ Dealing with cystobiliary communication if present.
- ◆ *Abdominal approach was exclusively used.Scolicidal agent:Sterimide0.5%-1%.*



## Surgical procedures Adopted

- ◆ The procedure of choice was: Cystectomy+(partial/subtotal ) pericystectomy+ Drainage of the remaining cavity: 69 cases(84.1%).
- ◆ Other procedure, Capitonage, Omentoplasty, Hepatectomy, Exploration of CBD, Transduodenal sphincteroplasty&total pericystectomy.
- ◆ Cholecystectomy performed in 22 patients(26.8%).

## Management of cysto-Biliary Communication:32/82(39%)

- ◆ **Simple fistula 22/32:** Respected+drainage, Cannulation with small tubes,Draining the cavity, direct suturing of the fistula.
- ◆ **Frank Rupture 10/32:** Daughter cyst in CBD 8/10, Preoperative **EPST**+intraoperative trans duodenal sphincteroplasty+ T-tube drainage of CBD. 5/10 , Internal transfistulary drainage of CBD+Postoperative **EPST**. 3/10.
- ◆ **Fistula> 5mm** - Internal transfistulary drainage. 2/10 . **Noticeably:** In the same patient- Multiple cysts tend to have communication with the biliary tree, regardless to their number or size.

## Results

- ◆ **Operative Mortality:**  
**0/82**
- ◆ **Mortality rate:**  
**2/82 (2.4%)** multiple infected cyst(1), biliary peritonitis(1)
- ◆ **Infection of the remaining 8 cavity:**  
**7/82(8.5%)**
- ◆ **Persistent bile leakage through the drain:**  
**3/82(3.6%)**
- ◆ **Encysted bile collection:**  
**1/82**
- ◆ **Simple liver cyst:**  
**1/82**



## Follow-up

- ◆ **Clinically : OPD.**
- ◆ **Radiological : U/S, CT Scan.**
- ◆ **Serological: ELISA, IHA.**



# CONCLUSION

- ◆ Treatment of liver hydatid cyst is not as simple as just draining a cysts.
- ◆ Calcified cysts(partially/Totally)should be approached very carefully.
- ◆ Central cysts(portahepatis) with biliary involvement more difficult to deal with.
- ◆ With more experience in liver & biliary surgery it's easier to deal with complicated hydatid cyst.
- ◆ Treatment of Hydatid cyst of the liver should be a multidisciplinary approach.  
(surgeon,gastroenterologist,radiologist,parasitologist,immunologist)