

INVESTIGATIONS AND LAB DIAGNOSIS OF SPLENOMEGALY



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CAUSES OF SPLENOMEGALY

- ❑ LYMPHOHEMATOGENOUS DISORDERS
- ❑ PORTAL HYPERTENSION RELATED STATES
- ❑ INFECTIONS AND INFESTATIONS
- ❑ METABOLIC DISEASES
- ❑ IMMUNOLOGICAL-INFLAMMATORY CONDITIONS
- ❑ NEOPLASMS & CYSTS
- ❑ HYPERSPLENISM

Diagnosis of Splenomegaly

Diagnosis of splenomegaly and the underlying cause is based on

- HISTORY
- CLINICAL EXAMINATION
- RADIOLOGICAL IMAGING
- LABORATORY INVESTIGATIONS

INVESTIGATIONS

- RADIOLOGICAL INVESTIGATIONS
- BLOOD
- MICROBIOLOGICAL INVESTIGATIONS
- OTHER TESTS

RADIOLOGICAL INVESTIGATIONS

- Plain Radiograph
- Ultrasonography
- CT Scan

PLAIN RADIOGRAPH

Rarely used in investigation of splenomegaly.

The following are observed on a plain radiograph :

- Miliary lung patterns can be seen in a case of Miliary Tuberculosis.
- Well defined calcifications of parenchyma of spleen can be seen in Granulomas.
- **Curvilinear or oval calcifications** are typically seen in **Splenic Cysts**.

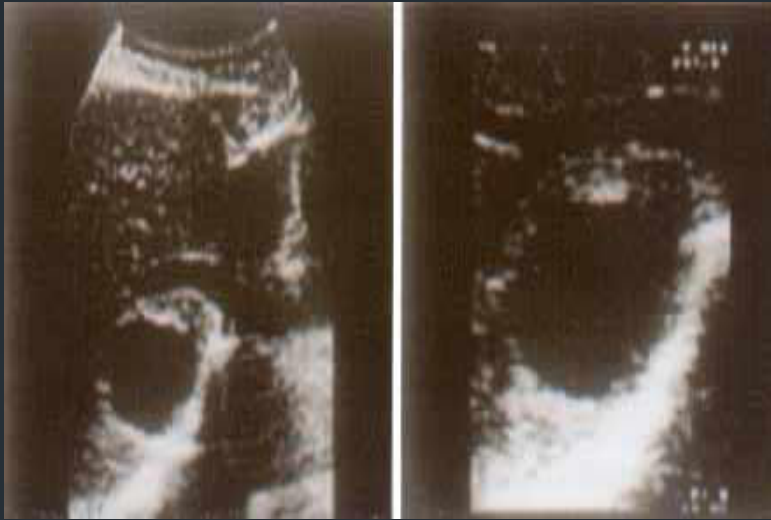


PLAIN RADIOGRAPH
SHOWING A
CALCIFICATION –
SPLENIC HYDATID
CYST.

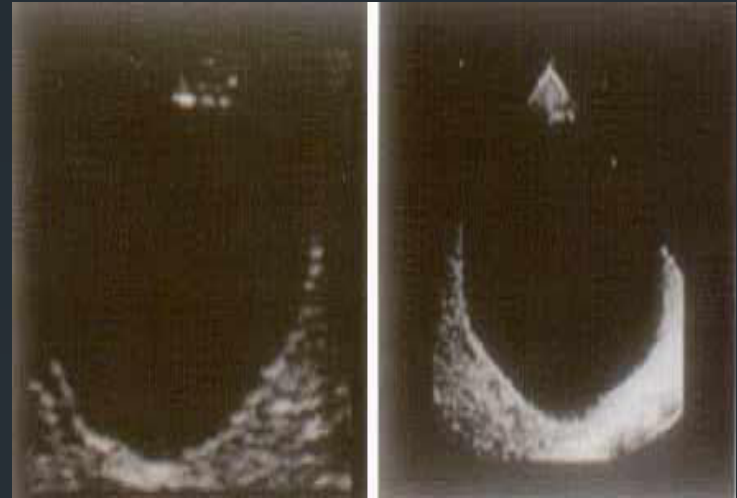
Ultrasound

- Parenchyma exhibits diffusely increased reflectivity in Leukemias, Polycythemia, Tuberculosis, Malaria, Brucellosis, Sarcoidosis.
- Cysts : Splenic cysts present as Anechoic, well defined structures with well rounded margin and posterior acoustic attachment.
- Both true as well as false cysts may have some low level internal echoes.
- WHO classifies Echinococcal cysts from CL to CE5.

WHO CLASSIFICATION OF ECHINOCOCCAL CYST ON ULTRASOUND

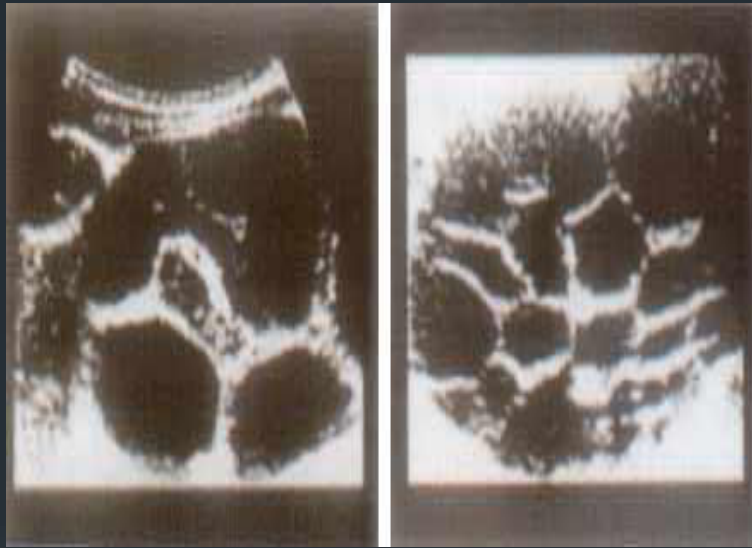


CYSTIC LESION -CL

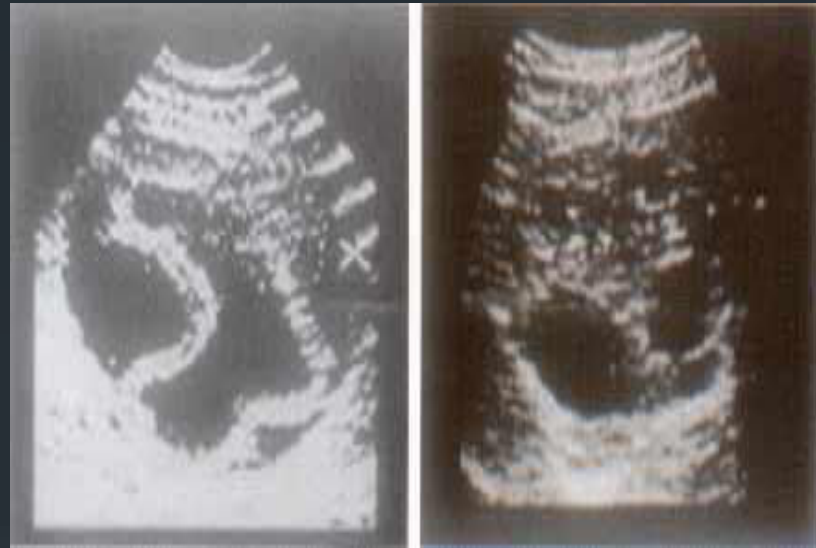


**CYSTIC ECHINOCOCCOSIS-1
(CE 1)**

Continued...



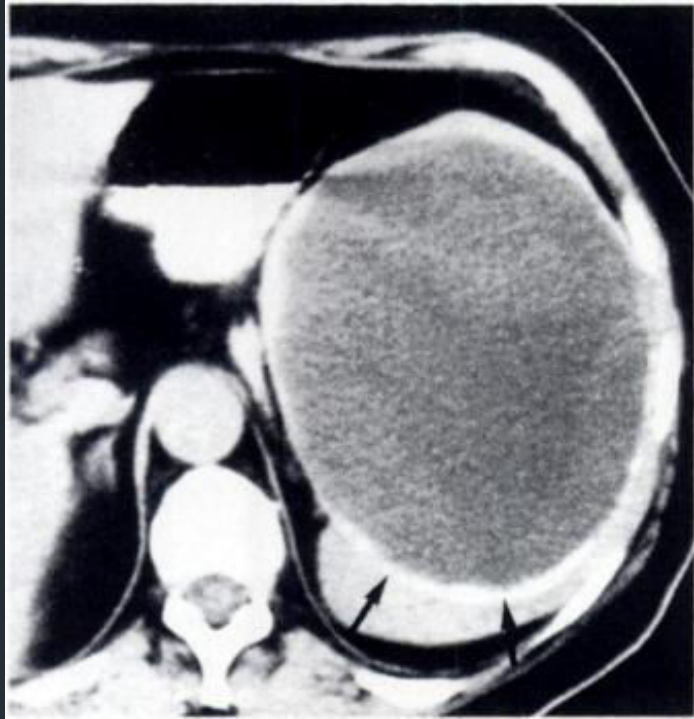
**CYSTIC ECHINOCOCCOSIS
2(CE 2)**



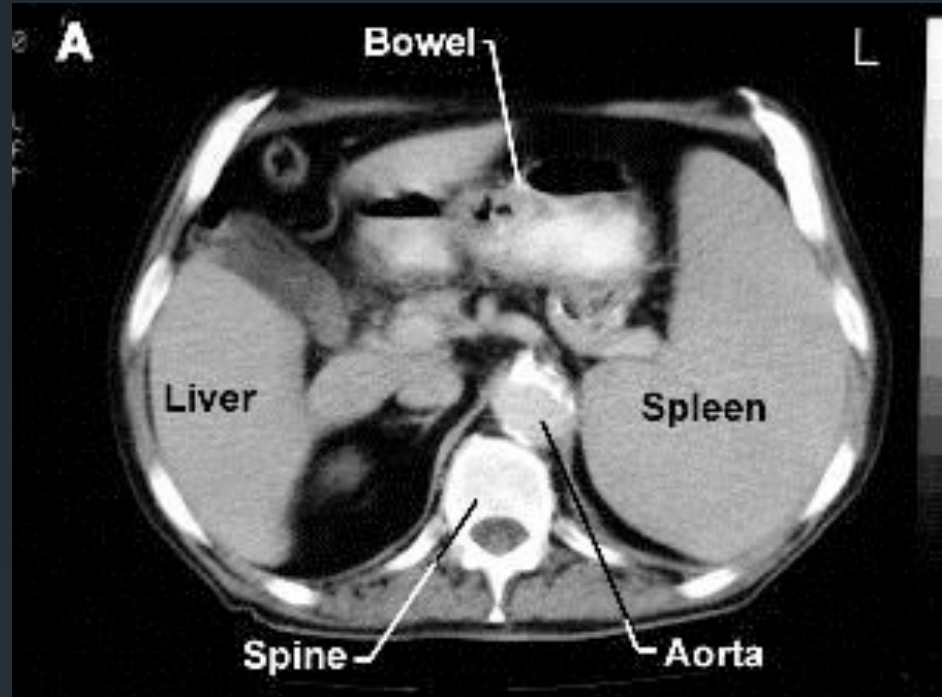
**Cystic Echinococcosis 3 (CE3-
Transitional)**

COMPUTERISED TOMOGRAPHY

- Splenic abscess appears as rounded area of low density within splenic tissue.
- Cysts show well defined margins and are of uniform water density.
- Large cysts may be multi loculated with thin internal septa



Hypodense splenic mass with discontinuous peripheral rim calcification



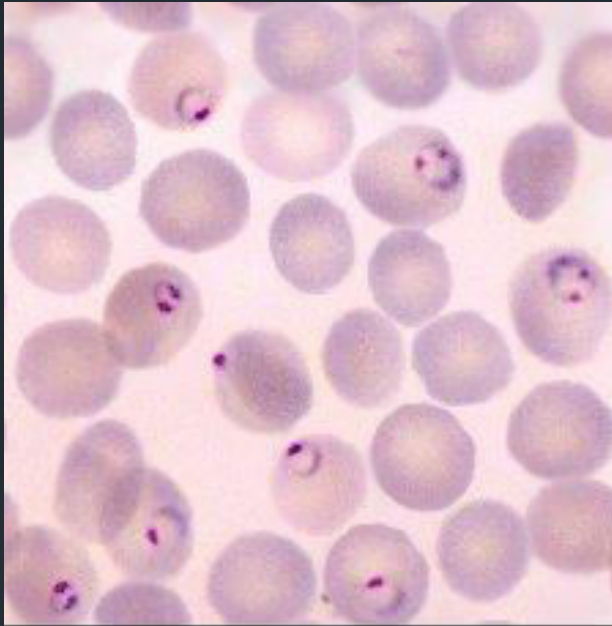
CT scans of the abdomen in a case of splenomegaly. Patient showing moderate enlargement of the spleen

BLOOD INVESTIGATIONS

- Erythrocyte count is decreased in Thalassemia major, SLE, Cirrhosis with portal hypertension and increased in Polycythemia vera
- Granulocyte count is increased in Polycythemia vera and decreased in Felty's syndrome, congestive splenomegaly .
- Eosinophil count : Increases in parasitic infections, Hodgkin's disease etc.
- Platelet count is decreased in ITP.

BLOOD INVESTIGATIONS

- Complete blood counts with **Cytopenia of one or more cell types with splenomegaly**-suggestive of **Hypersplenism**.
- **Increased Total Leukocyte Count** is seen in CML and other leukemias.
- **Hemoparasites**: Peripheral smear is standard for diagnosis of Malaria, Kala azar.
- **RBC Fragility test** shows increased fragility of red cells in case of hemolytic anemias.
- Blood culture is done in cases where history and clinical finding give rise to suspicion of Typhoid fever.



Parasitised red blood cells:
P. falciparum trophozoites

Peripheral blood smear-
Malaria



Blood Smear : Kala azar

OTHER TESTS..

- **Liver function tests** in cases suspected of portal hypertension are useful.
- In case of lymphadenopathy, or suspected lymphoid malignancies, **Lymph node biopsy** will be required.
- Rapid diagnostic test specific for *P.falciparum* is **Parasight F test** to detect **Histidine Rich Protein 2**(antigen) and **OptiMAL test** for both *Plasmodium falciparum* and *P. vivax* malaria infections.(Immuno diagnosis.)
- Bone marrow aspiration and staining is the technique used for diagnosis of Lympho hematogenous disorders.

SPECIFIC INVESTIGATIONS FOR HYDATID CYST

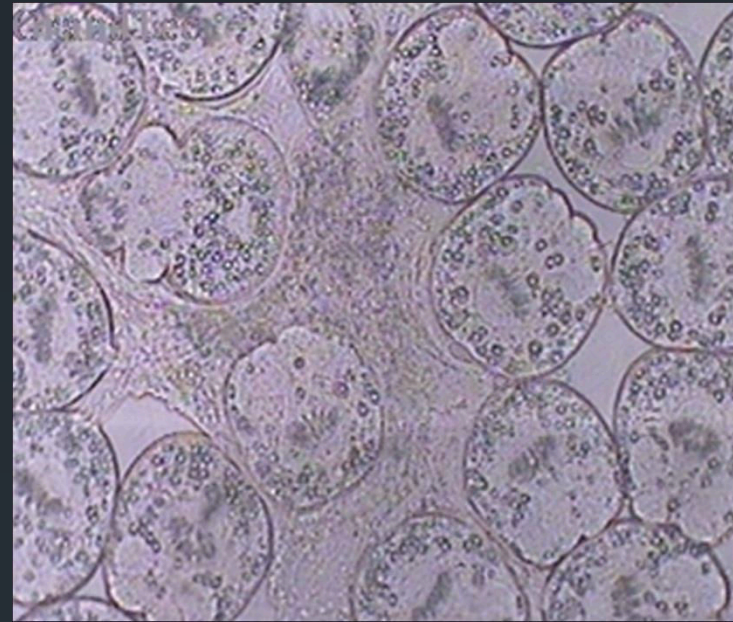
- MICROSCOPY
- IMMUNO DIAGNOSIS
- CASONI's TEST
- MOLECULAR METHODS

Microscopic findings

- Diagnostic puncture of the cyst is not recommended since the fluid spill on adjacent structures may cause anaphylactic shock.
- Hence, fluid aspirated from surgically excised cyst is used for a specific diagnosis.
- On examining under microscope either by Wet Mount or Lacto-phenol-Cotton Blue mount, the cyst fluid shows –Scolices, Brood capsules and hooklets.
- On Acid-fast stain , Scolices and protoscolices appear Purple or Pink.



Protoscolices being released from hydatid cyst



Microscopy of aspirated fluid showing scolices of Echinococcus granulosus

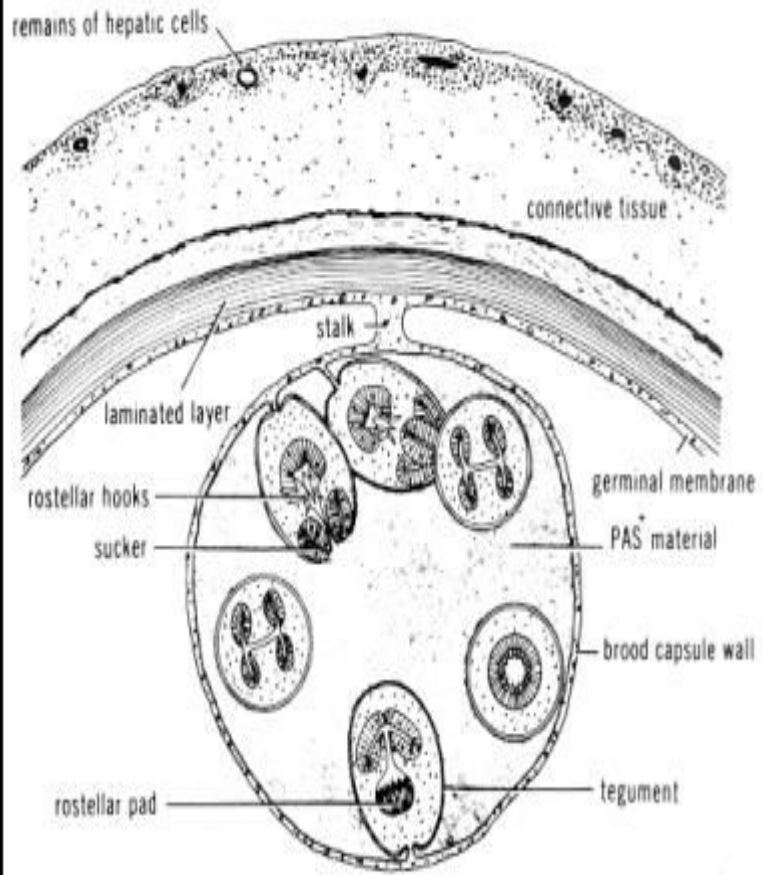


Fig. 22.19

IMMUNO-DIAGNOSIS –HYDATID CYST

Antigen detection

- ❖ Detection of Antigen is more reliable than that of Antibody.

- ❖ Sample : Serum

- ❖ Tests: ELISA, Counter immune electrophoresis (CIEP),

Bacterial Co-agglutination and latex agglutination and Enzyme linked Electro Immuno Transfer Blot(EITB) tests.

- ❖ Sample :Urine

- ❖ Tests : CIEP or Co-agglutination.



Antibody detection

- Indirect hemagglutination (IHA).
- Indirect fluorescent antibody (IFA) tests.
- Enzyme immunoassays (EIA).
- Enzyme Linked electro Immuno Transfer Blot (EITB)

Disadvantages of Antibody detection :

- Low sensitivity
- High number of false negatives
- Previously antibodies against Capron's Arc 5 Antigen were detected by CIEP but now Cross reactivity with neurocysticercosis has been observed .

CASONI's TEST

- Immediate Hypersensitivity skin test introduced by **Tomaso Casoni** in **1911**.
- Sterile Hydatid fluid from unilocular hydatid cysts from sheep, pig, cattle or man is used as Antigen.
- Positive test : Test site develops a large wheal around 5cm in diameter with multiple pseudopodia within 30 minutes of injection.

Drawbacks:

- Low sensitivity (55-70%)
- False positive results are common in patients with other cestode infections.

CASONI's TEST IS NO LONGER USED .



MOLECULAR METHODS



- Recombinant Echinococcus Antigens.
- DNA Hybridization Techniques – by developing DNA probes for hybridization to DNA from diagnostic samples
- Polymerase Chain Reaction (Diagnostic PCR)
- Southern Blot Hybridization



REFERENCES

- Robbins & Cotran Pathology
- Parasitology by S.C.Parija
- Radiopedia.org
- Bailey & Love Short Practice of Surgery



Thank you!