



Islamic Republic of Iran  
Ministry of Health and Medical Education



## WHO - IWGE recommendation

WHO Informal Working Group on  
Echinococcosis

Quick  
Look

# Ultrasound Classification of Hydatid Disease

Liver is the most common site for hydatid cysts. Ultrasound (US) findings in hepatic Cystic Echinococcosis (CE) are essential for therapeutic approach to the disease. An international consensus US classification of hepatic CE has been proposed by World Health Organization.



### WHO Classification:

- CE1** unilocular, simple cysts with uniform anechoic content.
- CE2** multivesicular, multiseptated cyst.
- CE3** anechoic content with a floating membrane/daughter cyst (s).
- CE4** heterogeneous degenerative contents -no daughter cysts.
- CE5** characterized by a thick calcified wall.

CL

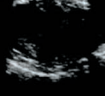
CE1

CE2

CE3

CE4

CE5

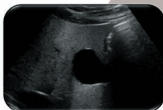


CYSTIC LESION

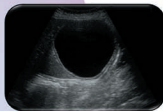
ACTIVE

TRANSITIONAL

INACTIVE



CL) Unilocular, cystic lesion (s) with uniform anechoic content, not clearly delimited by a hyperechoic rim (= cyst wall not visible). Normally round but may be oval. Size: variable but usually small.  $CL_u$  (< 5.0 cm),  $CL_m$  (5 – 10 cm),  $CL_l$  (> 10cm). \*Status: If CE – active.



CE1) Unilocular, simple cyst with uniform anechoic content. Cyst may exhibit fine echoes due to shifting of brood capsules which is often called hydatid sand ("snow flake sign"). Cyst wall is visible. Normally round or oval. Size variable:  $CE1_u$  (< 5.0 cm),  $CE1_m$  (5 – 10 cm),  $CE1_l$  (> 10cm).

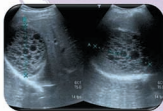
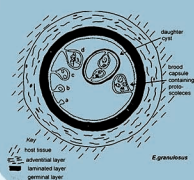


CE3a) Unilocular cyst which may contain daughter cysts. Anechoic content with detachment of laminated membrane from the cyst wall visible as floating membrane or as "water-lily sign" which is indicative of wavy membranes floating on top of remaining cyst fluid. Cyst form may be less rounded because of decrease of intra-cystic fluid pressure. Size variable:  $CE3a_u$  (< 5.0 cm),  $CE3a_m$  (5 – 10 cm),  $CE3a_l$  (> 10cm).



CE4) Heterogenous hypoechoic or hyperechoic degenerative contents. No daughter cysts. May show a "ball of wool" sign which is indicative of degenerating membranes. Size variable:  $CE4_u$  (< 5.0 cm),  $CE4_m$  (5 – 10 cm),  $CE4_l$  (> 10cm).

# "Every Picture Tells a Story!"



CE2) Multivesicular, multiseptated cysts; cysts septations produce "wheel-like" structures, and presence of daughter cysts is indicated by "rosette-like" or "honeycomb-like" structures. Daughter cysts may partly or completely fill the unilocular mother cyst. Cyst wall normally visible. Normally round or oval. Size variable:  $CE2_u$  (< 5.0 cm),  $CE2_m$  (5 – 10 cm),  $CE2_l$  (> 10cm).



CE3b) predominantly solid with daughter vesicles. Cyst form may be less rounded because of decrease of intra-cystic fluid pressure. Size variable:  $CE3b_u$  (< 5.0 cm),  $CE3b_m$  (5 – 10 cm),  $CE3b_l$  (> 10cm).



CE5) Cysts characterized by thick calcified wall that is arch shaped, producing a cone shaped shadow. Degree of calcification varies from partial to complete. Size variable:  $CE5_u$  (< 5.0 cm),  $CE5_m$  (5 – 10 cm),  $CE5_l$  (> 10cm).

"The standardized classification scheme is intended to promote uniform standards of diagnosis and treatment and may be applied to the clinical treatment of patients as well as to field diagnostic surveys"

**Possible case.** Any patient with a clinical or epidemiological history, and imaging findings or serology positive for CE.

**Probable case.** Any patient with the combination of clinical history, epidemiological history, imaging findings and serology positive for CE on two tests.

**Confirmed case.** The above, plus either

- demonstration of protoscolices or their components, using direct microscopy or molecular biology, in the cyst contents aspirated by percutaneous puncture or at surgery
- changes in US appearance, e. g. detachment of the endocyst in a CE1 cyst, thus moving to a CE3a stage, or solidification of a CE2 or CE3b, thus changing to a CE4 stage, after administration of ABZ (at least 3 months) or spontaneous.

#### References:

- Brunetti E, Kern P, Walton DA. Expert consensus for the diagnosis and treatment of cystic and alveolar echinococcosis in humans. *Acta Tropica*. 2010;114(1):1-6.
- Brunetti E, Tamarozzi F, Macpherson C, Filice C, Schindler-pietrowski M, Kabaalighi A, et al. *Ultrasound and Cyst Echinococcosis*. *Ultrasound Int open*. 2018;4(03): E70-8.
- Rogan MT, Hai WY, Richardson R, Zeyhle E, Craig PS. Hydatid cysts: does every picture tell a story? *Trends in Parasitology*. 2006;1,22(9):431-8.

#### Further information:

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