Hydatid cyst of the chest: Imaging features

Poster No.: P-0052
Congress: ESTI 2014
Type: Educational Poster
Authors: W. Mnari, M. Maatouk, A. Zrig, B. Hmida, R. Salem, M. Golli; Monastir/TN
Keywords: Lung, Thorax, Vascular, CT, MR, Ultrasound-Colour Doppler, Education, Cysts, Infection, Parasites
DOI: 10.1594/esti2014/P-0052

Any information contained in this pdf file is automatically generated from digital material submitted to EPOS by third parties in the form of scientific presentations. References to any names, marks, products, or services of third parties or hypertext links to third-party sites or information are provided solely as a convenience to you and do not in any way constitute or imply ECR's endorsement, sponsorship or recommendation of the third party, information, product or service. ECR is not responsible for the content of these pages and does not make any representations regarding the content or accuracy of material in this file.
As per copyright regulations, any unauthorised use of the material or parts thereof as well as commercial reproduction or multiple distribution by any traditional or electronically based reproduction/publication method is strictly prohibited.
You agree to defend, indemnify, and hold ECR harmless from and against any and all claims, damages, costs, and expenses, including attorneys' fees, arising from or related to your use of these pages.
Please note: Links to movies, ppt slideshows and any other multimedia files are not available in the pdf version of presentations.
www.myESR.org
Learning objectives

To describe and illustrate the common imaging features of various types of thoracic hydatid cysts including pulmonary and extrapulmonary location.

To describe and illustrate the common imaging features of complicated hydatid cyst in the lung.

Background

- Hydatid disease is caused by the larval form of the tape worm cestode "echinococcus granulosus". It remains endemic in the Mediterranean region and other countries.
- The lung is the second most common site of involvement in adults after the liver and the most common site in children.
- Thoracic extra pulmonary location is uncommon. It may be involved through rupture of a pulmonary or liver (with diaphragm invasion) cyst into the pleural space.
- Hematogenic spread may also lead to chest involvement.
- There are a variety of radiographic images.

Imaging findings OR Procedure details

General aspect of the hydatid cyst:

**Type I:** Simple Cyst. It is the initial stage in the development of the parasite (Fig1).

Ultrasound and CT finding: well-defined homogenous fluid mass.

**Type II:** cyst with floating membranes or detachment of internal membrane (Fig1).

**Type III:** Cyst with daughter cyst (vesicles) and matrix (hydatid sand). Multiple vesicles give the "racemose" aspect.

**Type IV:** tumor like cyst.

**Type V:** calcified cyst. It is the last stage or the "inert cyst". (Fig3)

Multiple dauhter cyst within the mother cyst and detached membrane are quasi pathognomonic of hydatid cyst whatever the location. For pulmonary ecchinococciosis,
ultrasonography is unhelpful in most cases unless the cysts are close to the pleural surface.

**Extra pulmonary locations:**

**Chest wall:**

**Bone hydatid disease (HD): (image 3)**

Bone involvement is rare (1%). The most commonly involved bone structures are the spine. Ribs are affected in 6% of cases. In the bone, the cyst had a thinner wall; it cannot assume its typical shape (sphere). The cyst can destroy the bone and then spreads to surrounding tissue such as muscle and fat. Ct scan showed a lytic lesion in the bone with fluid attenuated contain. Ultrasound of chest wall can demonstrate cystic lesion with small daughter vesicles which are pathognomonic for the diagnosis. MR signal intensity depend of the fluid contain of the lesion but it is often heterogeneous.

**Soft tissue HD:**

Primary soft tissue HD is exceptional. HD in the soft tissues may have various appearances. The "rim sign" at MRI image (low T2 signal intensity around the cyst wall) are characteristic but not constant.

**Diaphragm HD: (image 4)**

Diaphragmatic localization is usually associated with direct spread from an adjacent site. The cyst occurs often in periphery and it cannot growth because of the contractility of the diaphragm.

**Pleural HD: (image 5)**

Pleural HD is generally secondary to lung involvement and may be due to an HC that arises in the liver and prolapses into the chest.

**HD of the mediastinum: (image 6)**

It may be primary (unique) or can spread through the mediastinum (multiple) during the rupture of lung hydatid cyst. Tumor like cyst should be differentiated from thymoma or lymphoma.

**Heart and Pericardium HD. (image 7 and 8)**

Heart HD is very rare.

Because of cardiac motion artifacts, transthoracic US seems to be the perfect imaging tool to demonstrate the cystic nature of the lesion. Left ventricle is the most affected site.
The appearance of HCs located in the heart and pericardium may vary from type I to type V.

**Pulmonary hydatid cyst embolisation. (image 9)**

Usually it is a complication of heart HD. Spiral CT and MRI angiography clearly disclose cystic occlusion of the pulmonary artery and its branches.

**Pulmonary locations:**

The lung is the second most common site of hematogenous spread in adults and the most common site in children.

In the lung, hydatid cyst can growth so large because of the compressibility of the surrounding tissue.

**Uncomplicated cysts** (image 10 and 11)

Typical radiographic and CT appearances of uncomplicated pulmonary hydatid disease are one or more homogeneous round or oval cystic masses with smooth borders surrounded by normal lung tissue.

**Complicated cysts**

When cyst growth produces erosions in the bronchioles. Imaging aspects are:

*Meniscus sign or air crescent sign* (image 12): air included in the pericyst.

*Cumbo sign or onion peel sign*: air between the endocyst and pericyst.

If the ruptured cyst communicates with the tracheobronchial tree, evacuation of the contents of the cyst results in an air/fluid level.

After partial expectoration of the cyst fluid and scolices, the cyst empties and the collapsed membranes can be seen inside the cyst (*serpent sign*) (image 13). The collapsed and crumpled endocyst floats freely in the most dependent part of the pericyst cavity and produces the "*water lily sign*" (image 14 and 15).

For ruptured cyst CT scan demonstrate usually a pulmonary consolidation adjacent to the cyst (image 13).

**Infected cysts**

The cyst can become infected by other microorganisms. Bacterial infection of the cyst is the most serious complication commonly seen after rupture. Imaging findings are similar to a pulmonary abcess. (image16).
Fig. 1: Hydatid cyst type 1 Hydatid cyst type 2 (detached membrane within the cyst)
Fig. 2: HC of the liver type V.
Fig. 3: Large hydatid cyst of the chest wall involving the spine. It is multivesicular with the characteristic rim sign on T2W (arrow). The ribs are destroyed by the cyst.
Fig. 4: Hydatid cyst of the left diaphragmatic pillar. Bone and adjacent soft tissue are normal.
**Fig. 5:** Pleural hydatid cyst (arrow) formed from a complicated hydatid cyst of the lung (large arrow).

**Fig. 6:** Tumor like hydatid cyst of the left upper mediastinum. Note the fine calcification of the cyst wall suggesting the diagnosis.
**Fig. 7:** Echocardiography: myocardial hydatid cyst Type IV of the left ventricle (arrows). Note daughter vesicles within the tumor like lesion (HC).
Fig. 8: Calcified HC of the ventricular septum (arrow)
Fig. 9: Hydatid embolism of the left pulmonary artery (arrows).
Fig. 10: Chest radiography showing well-defined rounded opacities in the right lung of a patient with unruptured cystic echinococcosis
Fig. 11: CT scan of the chest: right basal small hydatid cyst of the lung.
Fig. 12: Chest radiography showing a crescent sign (arrows) in a patient with ruptured cystic hydatidosis
Fig. 13: Ruptured hydatid cyst: floated membrane within the cyst (serpent signs) and pulmonary consolidation adjacent to the cyst.
Fig. 14: Chest radiography showing the water lily sign within a ruptured cystic hydatidosis.
Fig. 15: Transthoracic US showing a coiled floated membrane within the hydatid cyst (arrows). Pathognomonic aspect.
Fig. 16: Ruptured and infected hydatid cyst of the right lung with wall thickening and fluid level. "Abcess like" formation.
Conclusion

A cystic mass located on the chest may represent a hydatid cyst, especially in endemic zone. Extrapulmonary location within the thorax is very rare. Ultrasonography, computed tomography, and magnetic resonance imaging can recognize easily the typical aspect and guide to diagnosis in the complicated forms. Treatment is essentially surgical.

References


Personal Information