



PULMONARY HYDATID DISEASE:- ULTRASONOGRAPHIC AND COMPUTED TOMOGRAPHIC APPEARANCES

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ABSTRACT

BACKGROUND: Hydatid disease is one of the most geographically widespread zoonoses. Lungs are next most frequent sites involved by echinococcosis followed first by liver. Radiologic approach to the intact, complicated, or ruptured pulmonary hydatid cysts includes a computed tomography (CT) scan following the chest radiograph. Ultrasound (US) is used in clarifying a peripherally located hydatid cyst as extrapleural, pleural, or parenchymal. **AIM:** The study was done to describe the imaging features of pulmonary hydatid on ultrasonography and computed tomography. **METHOD:** A total number of seven patients of pulmonary hydatid were evaluated with ultrasonography and computed tomography with screening of the abdomen to look for other sites of hydatid cysts. **CONCLUSION:** The clinical features of pulmonary hydatid is very non-specific and hence imaging plays a key role in its diagnosis which is very well depicted on ultrasonography and computed tomography and therefore aids in the early diagnosis and treatment of the disease.

KEYWORDS : Hydatid Cyst, Lung, Ultrasound, Computed Tomography

INTRODUCTION:

Hydatid disease is one of the most geographically widespread zoonoses. The two most important forms seen in humans are cystic echinococcosis and alveolar echinococcosis. It can involve almost any organ in the human body except hair, teeth, and fingernails. Lungs are the second most common site of human echinococcosis (the first common site being liver) in adults and the most common site in children. Thoracic involvement may occur via a transdiaphragmatic route (0.6%-16% of cases of hepatic disease) or by means of hematogenous spread. The hydatid cyst has three layers: (a) the outer pericyst, composed of modified host cells that form a dense and fibrous protective zone; (b) the middle laminated membrane, which is acellular and allows the passage of nutrients; and (c) the inner germinal layer, where the scolices and the laminated membrane are produced. The middle laminated membrane and the germinal layer form the true wall of the cyst, usually referred to as the endocyst, although the acellular laminated membrane is occasionally referred to as the ectocyst^(1,2). Daughter vesicles (brood capsules) are small spheres that contain the protoscolices and are formed from rests of the germinal layer. Before becoming daughter cysts, these daughter vesicles are attached by a pedicle to the germinal layer of the mother cyst.

CLINICAL PRESENTATION OF PULMONARY HYDATID:

Uncomplicated hydatid cysts of the lungs are usually asymptomatic, while complicated cysts present with nonspecific clinical features like coughing, chest pain, and hemoptysis. Imaging thus plays a pivotal role in the diagnosis of the disease as clinical features are often nonspecific. Compressible organs such as the lung or brain facilitate the growth of the cyst, and this has been proposed as a reason for the high prevalence of the disease in childhood. Most cysts are acquired in childhood, remain asymptomatic for a long period of time, and are later diagnosed incidentally at chest radiography. Cysts are multiple in 30% of cases, bilateral in 20%, and located in the lower lobes in 60%^(3,4). Sudden coughing attacks, hemoptysis, and chest pain are the most common clinical symptoms^(4,5).

Calcification is extremely rare in cases of pulmonary hydatid although pericardial, pleural and mediastinal cysts may demonstrate it. Rupture of the cyst may occur into the pleural cavity. The most serious complication after rupture is secondary bacterial infection. The rate of growth of cyst in lung is progressive in children as compared to adults and hence explains the high incidence of

pulmonary hydatid in children.

IMAGING FEATURES:

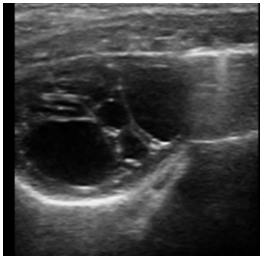
Uncomplicated hydatid cysts are seen as well-defined masses. Centrally located cysts are usually round, although more peripheral cysts may be oval or polycyclic⁽⁶⁾. The size of Pulmonary hydatid cysts may vary from 1 to 20 cm⁽⁷⁾. The air collection within the layers appears as a thin, radiolucent crescent in the upper part of the cyst and is known as the crescent sign or meniscus sign⁽⁸⁾. As air continues to enter this space, the two layers separate completely and the cyst shrinks and ruptures with resultant passage of air into the endocyst. An air-fluid level inside the endocyst and air between the pericyst and the endocyst is known as the Cumbo sign. When the cyst gets completely collapsed, the crumpled endocyst floats freely in the cyst fluid and is referred to as the water lily sign.

Computed tomography (CT) shows simple cysts to have smooth walls of variable thickness and homogenous internal contents of water or near-water density. CT is superior to chest radiography in the cystic characterization of the parenchymal abnormality. Furthermore, determination of wall thickness is more accurate with CT, as compared with chest radiography. However, in endemic regions the CT demonstration of the cystic nature of a lung mass provides collaborative evidence in clinically suspected cases⁽⁹⁾.

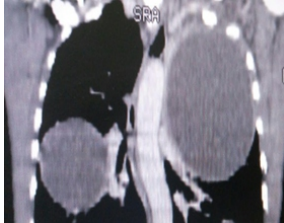
Hydatid cyst is manifested sonographically in several different fashions, depending on the stage of evolution and maturity; a well defined anechoic cyst; an anechoic cyst except for hydatid sand; a multiseptate cyst with daughter cysts and echogenic material between the cysts with a floating, undulating membrane with a detached endocyst, the characteristic "water lily sign"^(2,7)



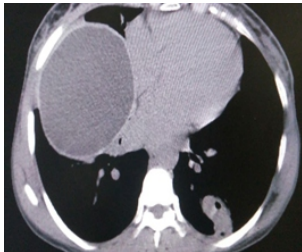
USG scanning of left hemithorax in a 52 yr old woman reveals a well defined heteroechoic lesion with echogenic serpentine like structures within suggesting the collapsed membranes



USG scanning of right hemithorax in 32 yr old male reveals a well defined multi-vesicular cystic lesion with daughter cysts within



CECT Thorax coronal section in a 25 yr old male reveals two well defined peripherally enhancing lesions in bilateral lungs



RESULTS:

A total of seven patients who presented with clinical and radiographic suspicion of pulmonary hydatid were included in the study. The findings of chest radiograph were evaluated with USG thorax and CT scan. The abdomen was screened to look for involvement by hydatid in other location.

The findings were analysed and different imaging features were appreciated and described on USG and CT scan.

CONCLUSION:

Chest Radiography remains the initial modality in suspected cases of pulmonary hydatid. This method is helpful for the diagnosis of intact cysts, but it may be inadequate for the assessment of complicated cyst morphology. Computed tomography depicts certain details of the lesions and can detect others that are not visible by chest radiograph. CT examination can elucidate the cystic nature of the pulmonary lesion and provide accurate localization for planning of surgical treatment of complicated cysts. Ultrasonography aids in the diagnosis of peripherally located intrapulmonary or extrapulmonary hydatid cysts and explains any involvement of chest wall and pleura. Ultrasound is also used to monitor the efficacy of medical anti-hydatid therapy with findings suggestive of positive response being reduction in cyst size, membrane detachment, progressive increase in cyst echogenicity and mural calcification.

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