Cardiovascular radiology

CT and MRI findings of cardiac echinococcosis

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Abstract. Fifteen patients (8 males and 7 females, 15-56 years old) with primary or secondary hydatid disease involving the heart were examined by radiography. CT and/or MRI. MRI was done with a 1.5 T machine (Picker) in 11 cases and a 0.5 T machine (Philips) in 4 cases using ECG-gated T1 and T2-weighted spin-echo pulse sequences. Transaxial sections were combined with at least one more plane (coronal and/or sagittal) and intermediate views if the need for further information was anticipated. In 4 patients primary cardiac echinococcal cysts were found, localised to the left ventricle/pericardium/interventricular septum in 2 cases and to the left atrium/pericardium and right atrium/pericardium in 1 case each. In 11 of 15 cases there was secondary involvement of the heart by echinococcal cysts primarily arising in the lung parenchyma (n = 6), mediastinum (n = 3) and by transdiaphragmatic extension from the liver and abdomen (n = 2). CT was superior to MRI in visualising calcifications. However, ECG-gated MRI of cardiac hydatid disease appears to be the method of choice for specific diagnosis and exact assessment of hydatid cysts and their correlation with cardiac structures.

Key words: Cardiac - CT - Heart - Echinococcus - Hydatid disease - MRI

Introduction

Hydatid disease is a parasitic infestation caused by larvae of the tapeworm Echinococcus. Although several species may infect humans, E. granulosus is the most common, occurring in many parts of the world. It is endemic in most sheep and cattle-raising countries of the five continents. All human tissues and organs may be affected. The liver is most frequently involved (60-75%), followed by the lung (15-25%) and the tissues and organs of the systemic circulation (10-15%) [1, 2].

Localisation of hydatid cysts corresponds well with the frequency with which the larvae are filtered out by the hepatic and pulmonary capillary net. Once in the systemic circulation, larvae may be embolised anywhere in the body.

Cardiac hydatid disease is rare, occurring in up to 2% of all human cases of echinococcosis [3-8]. Undiagnosed, these patients are exposed to an increased risk of morbidity and mortality [4, 5, 9]. Early diagnosis is therefore crucial for avoiding life-threatening complications.

Primary involvement of the heart usually occurs via the coronary arteries. The possibilities for cardiac embolisation of echinococcus larvae that have arrived in the systemic circulation are: (1) via the left coronary artery, reaching the left ventricular wall (70%); (2) in the interventricular septum (7%); and (3) in the rest of the heart (23%). Secondary involvement of the pericardium or heart muscle occurs by expanded growth from hydatid disease of the lung or other parts of the mediastinum, and from the dome of the liver or abdominal cysts prolapsing through the diaphragm.

Today, surgical excision of hydatid cysts of the heart, using cardiopulmonary bypass, is relatively safe, having few complications and a minimal mortality rate [1]. If surgery is not possible or desired, or in combination with surgery (where spill has occurred, or in disseminated disease), chemotherapy with powerful benzimidazole compounds may improve the prognosis [2]. New techniques of cardiac imaging such as MRI, in addition to CT, have greatly facilitated detection of hydatid disease and its precise assessment [9-13].

The MRI findings of echinococcal cysts have only recently been published and their developmental stage analysed [14-21]. CT and MRI findings in 15 patients with primary or secondary hydatid disease of the heart are presented here.

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Methods

Eight males and 7 females, 15–56 years old, with primary or secondary cardiac echinococcosis, were examined.

Primary or secondary cardiac hydatid cysts

Primary involvement was assumed to be present if localised within the heart without evidence of other cysts in the body. Secondary involvement was assumed if the hydatid cyst arose primarily in the vicinity of the heart, secondarily affecting or growing towards the heart. Multiple primary lesions within the heart without the presence of extracardiac cysts, were regarded as being caused by primary embolisation of several embryos within the heart. In none of the cases of primary cardiac location were hydatid cysts present in other organs; there was, therefore, no evidence for extracardiac cysts from which secondary embolisation of embryos to the heart may have occurred.

Technique

In all patients, CT and/or MRI was performed and the diagnosis confirmed by pathology and/or serology [Indirect HemAgglutinin test (IHA) > 32]. CT scans were obtained with bolus and/or drip infusions, and if necessary, dynamic studies using a Siemens Somatom DR3. MRI was done with a 1.5 T machine (Picker) in 11 cases and a 0.5 T machine (Philips) in 4 cases using ECG-gated T1- and T2-weighted spin-echo pulse sequences with a slice thickness of 8 mm and a 2 mm inter-slice gap, using the following parameters: In T1-weighted images, TR was equal to the R-R interval using...