

Cerebral hydatid cysts: CT findings

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Summary. The CT features of cerebral hydatid cysts are divided into two groups. In the unilocular cases, the cyst is large, spherical in shape with sharply defined borders. One side of the cyst wall is very close to the calvarium. The cyst may calcify and may have septae inside. There is no enhancement with contrast media and also no edema surrounding the cyst. In the second group there are multiple and small multilocular cysts. These cysts are in ovoid or polygonal forms like a bunch of grapes, with perifocal edema. After contrast media administration, there is enhancement in the cyst wall. In one case there were numerous cysts in both hemispheres.

Key words: Cerebral hydatid cyst – CT

The cerebral localization of hydatid cyst is extremely rare, forming only 2% of all intracranial space-occupying lesions even in the countries where the disease is endemic [1, 2]. Therefore the diagnostic criteria for computed tomography (CT) are not widely enough known. Preoperative diagnosis is difficult to establish in the developed countries, in which the disease is very rare, and some undesirable results such as rupture of the cyst or acute anaphylactic reactions can be seen. In this study, the CT findings of 13 cases of cerebral hydatid cyst were evaluated retrospectively.

Material and methods

Only 13 cases of hydatid cysts had been diagnosed among the patients who underwent cerebral CT with the initial diagnosis of intracranial space-occupying lesion from 9th of September 1981 until 31th of December 1989. Three of these 13 patients were examined with a second generation CGR ND 8000 head scanner, and the others with third generation 256 × 256 matrix Siemens Somatom 2 and 512 × 512 matrix DRH 2 whole body CT scanners. The examinations were made with and without intravenous

contrast media. The diagnoses of all cases were confirmed with serological tests and from surgical results.

Results

Of the 13 cases, 8 were female and 5 were male, the youngest was 9 and the oldest was 60 years old. The mean age was 26.5. The cranial X-ray films of all cases were normal. In 9 cases, only one large unilocular hydatid cyst was found on CT. In these cases the radii of the cysts ranged from 5–10 cm. The cysts were round and had well defined contours, but the membranes of the cysts were not seen. One side of each lay adjacent to the calvarium. The density of the cysts was similar to that of water or cerebrospinal fluid. They exerted mass effect on the ventricles and the sulci. No enhancement was noted with intravenous contrast media. There was no perifocal oedema (Fig. 1). The internal table of the skull which was very near to two of the unilocular cysts, was found to be thinned (Fig. 2). 3 of the unilocular cysts contained septae. In three cases the cyst walls and the septae were calcified (Figs. 3, 4).

In 4 cases, the cysts were multiple and smaller than the unilocular cysts. In two cases the cysts were multilocular like a bunch of grapes, but ovoid or polygonal in shape. Contrast enhancement was found in their attached membranes. There was perifocal oedema (Fig. 5). In one case multiple cysts of various dimensions were scattered separately in both hemispheres (Fig. 6). In one unilocular cyst case, we found a number of attached new cysts, because of rupture during operation (Fig. 7). These cysts showed neither perifocal oedema nor contrast enhancement.

Discussion

Hydatid disease is caused by *echinococcus granulosus*. The definitive host is dog and the intermediate host usually sheep but occasionally human. The hydatid cysts are found in unilocular and multilocular forms in the human brain.

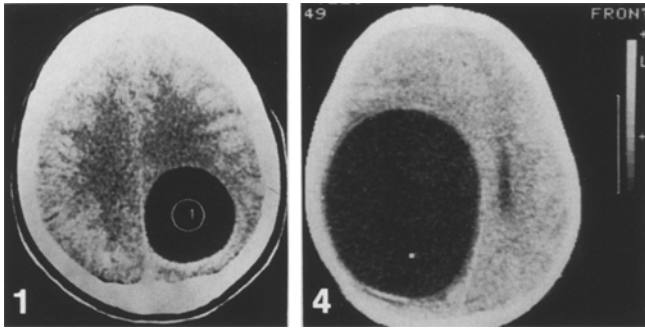
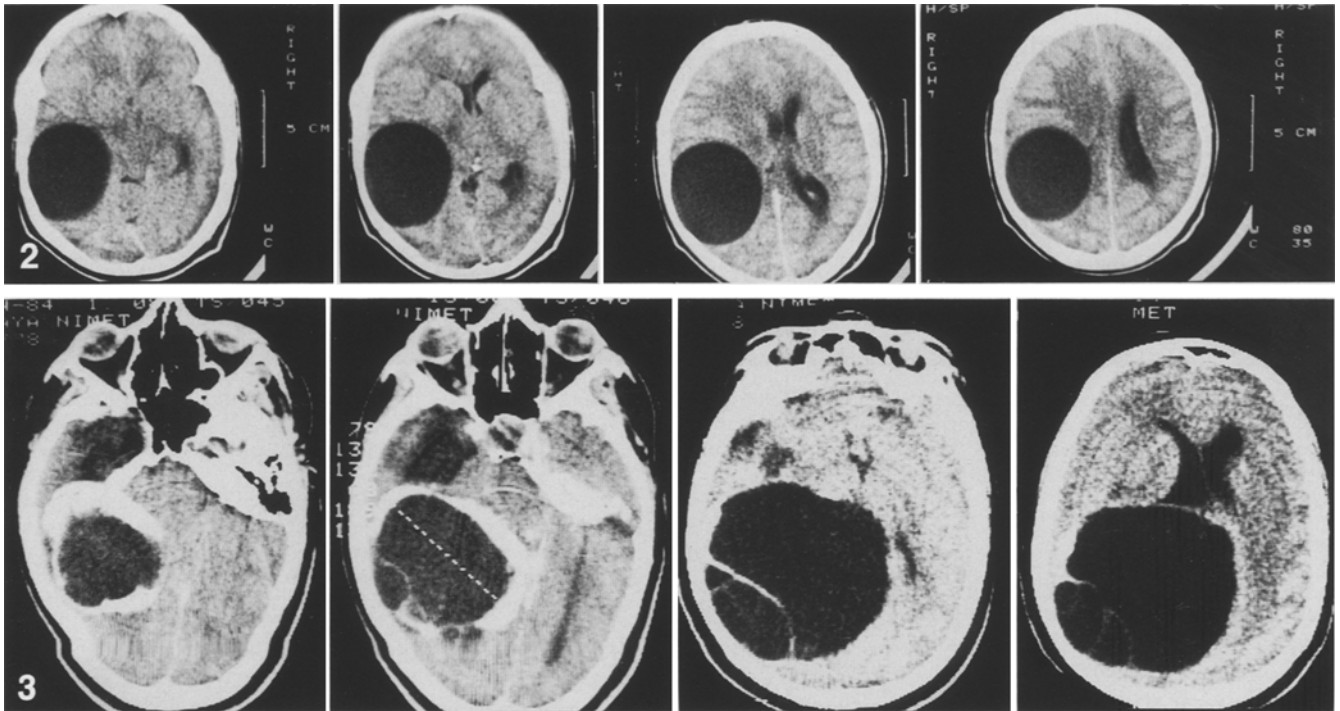


Fig. 1. Typical appearance of cerebral hydatid cysts. CT scan demonstrating a spherical, well defined unilocular cystic mass in the parietal lobe

Fig. 2. CT scans of a typical cerebral hydatid cyst which is very close to the calvarium. There is thinning of the internal table of the skull

Fig. 3. CT scans showing a large spherical hydatid cyst in the right temporo-occipital region with wide, broad calcifications in the wall. There are also calcified septae inside. Ventricular distortion occurs because of mass effect

Fig. 4. CT scan of huge unilocular hydatid cyst in the right cerebral hemisphere with calcification in the posterior margin



Plain films and angiography have lost their importance since the introduction of CT, but densely calcified cysts can be recognized without CT [3, 4]. CT is also superior in the detection of calcification in septae. The changes that result from the increase in intracranial pressure and the asymmetrical hypertrophy of a hemicranium with thinning of the internal table mean the cyst can also be seen in plain films [5–7]. Although the cranial X-ray films of our cases were normal, in two cases CT demonstrated the thinning of the internal table, but these findings in the calvarium could accompany arachnoidal and leptomeningeal cysts and differential diagnosis must be made (Fig. 8). All the features of the unilocular cerebral cysts in our cases are typical of those mentioned in previous reports [2, 4, 8]. They attach to the calvarium with one side of their wall, and have mass effect. Unless calcified, the cyst membranes cannot be seen, because they are very thin and have the same density as brain tissue.

There may be more than one hydatid cyst in the brain. This may happen either spontaneously or as a result of surgical or traumatic rupture of a unilocular cyst [6, 9, 10]. They can be seen as attached multilocular cysts or scattered diffusely in both hemispheres. The polygonal form of the multilocular cysts is because of the pressure flatten-

ing of the attached membranes. The circular contrast enhancement and perifocal oedema seen in multilocular cysts may result from the still active inflammation and must be differentiated from brain abscess. Peripheral rim of enhancement is also reported by previous researchers [11, 12].

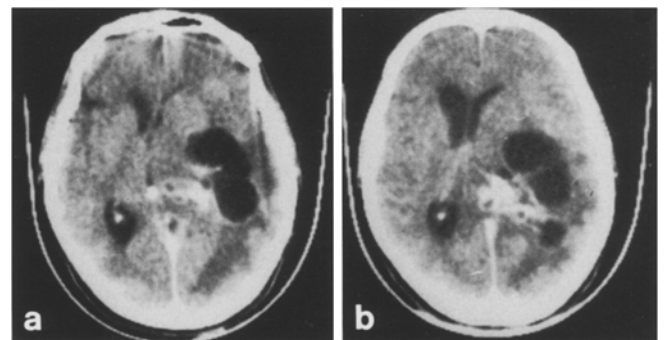


Fig. 5a, b. Enhanced CT scans showing multilocular hydatid cysts in the left temporo-occipital region. The cysts are polygonal in shape and like a bunch of grapes. Enhancement and perifocal oedema are seen

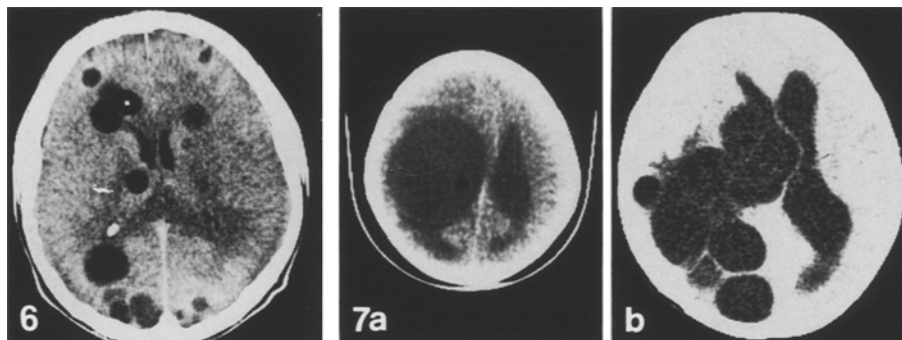


Fig. 6. Enhanced CT scan of multiple hydatid cysts in different regions of the cerebral hemispheres. No perifocal oedema or enhancement are seen. Although some of the cysts are very close of each other as if they were multilocular, some are unilocular small lesions

Fig. 7. **a** Preoperative CT scan demonstrating a large unilocular hydatid cyst in the right cerebral hemisphere. **b** 9 months postoperative CT scan demonstrating new and numerous multiple attached cysts, because of the rupture during operation

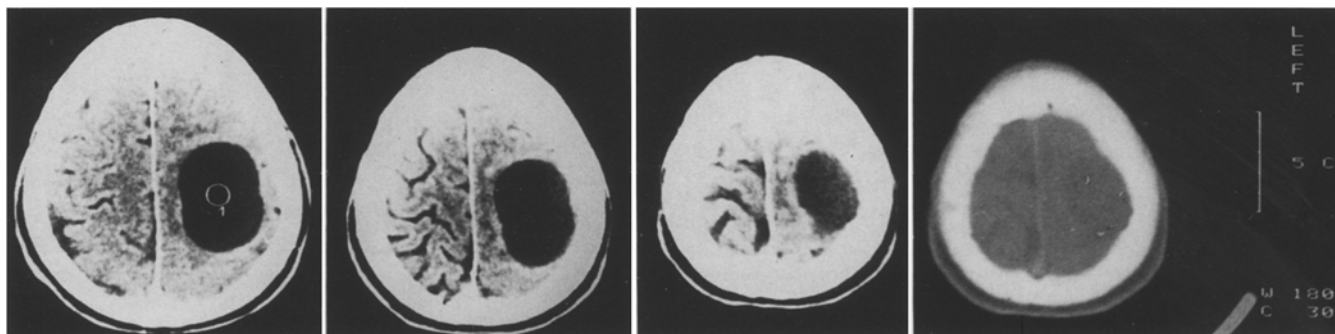


Fig. 8. A surgically verified leptomenigeal cyst in the left parietal lobe. Although the narrowing of the internal table is obvious in the axial CT scans, coronal sections are necessary to show the defect in the cranium in order to make precise differential diagnosis

Cerebral hydatid cysts have similar characteristic features to those localized in other parenchymal organs such as liver.

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