

Imaging of the Cerebral Hydatid Cyst in Children: About 3 Cases and Literature Review

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ABSTRACT

Hydatid disease is a parasitic infestation that is a public health problem in many countries of traditional livestock breeding where it is endemic. Frequently encountered localizations are of hepatic and pulmonary sites, whereas cerebral localization is rare. CT is the test of choice for the diagnosis and postoperative follow-up of cerebral hydatid cyst. MRI is useful for atypical or complicated forms and allows for adequate surgical planning. We report three observations, two of which have an atypical appearance in imaging.

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Introduction

The cerebral hydatid cyst is rare (1%), and essentially affects the child. It is secondary to the infestation of the body by the hexacanth embryo of *Echinococcus granulosus*. We report three cases of cerebral hydatid cyst. The clinical symptomatology was dominated by headache and vomiting.

Methods

We conducted a retrospective study, extended over 02 years, on the medical records of 3 cases of cerebral cystic lesions operated in the neurosurgery department at the Mohamed VI Oujda-Morocco University Hospital since January 2015 until January 2017.

Results

The average age was 6.6 years, with extremes ranging from 2 to 14 years, 2 boys and 1 girl. The clinical symptomatology was dominated by the syndrome of intracranial hypertension in 2 cases, a disorder of consciousness in one case. Cerebral CT made the diagnosis in one patient, objectifying a single lesion with a typical radiological appearance: hypodense image well limited without edema, contrast enhancement at the periphery (Figure 1 and 2). The Ct scan and cerebral MRI were performed in the other two patients presenting an atypical appearance: a patient had presented with peri-lesional edema in glove finger (Figure 3 and 4) and a discreet parietal contrast enhancement suggestive of abscess or tumor lesion as for exemple cystic astrocytoma. In the second patient, CT showed a multi lobulated lesion, which contained thick septa that increased after injection of contrast (Figure 5). The hydatid serology was positive in both patients with great help in diagnosis.

All our patients were operated and the surgical procedure consisted in the delivery of the cyst by hydrodissection using the hypertonic saline serum according to the technique of Arana Iniguez (Figure 6) with simple suites.

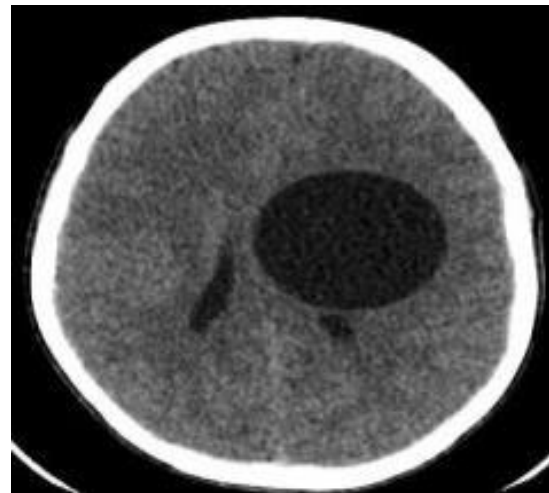


Figure 1. Cerebral CT before injection of contrast product: left parietal cystic lesion well limited without edema.



Figure 2. Cerebral CT after injection: showing no contrast enhancement.

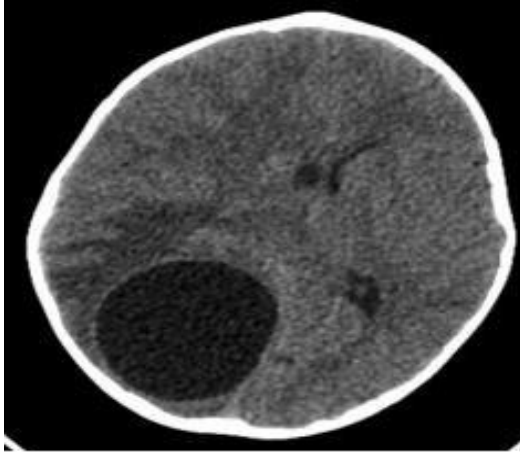


Figure 3. CT scan without injection of contrast : cystic lesion well limited with peri-lesional edema.

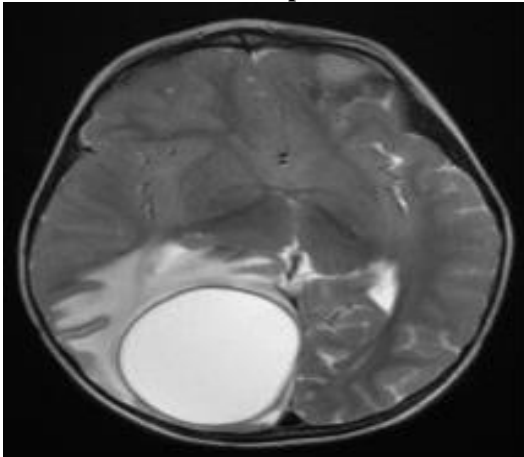


Figure 4. Brain MRI; T2 sequence: right parietal cystic lesion with peri-lesional edema.

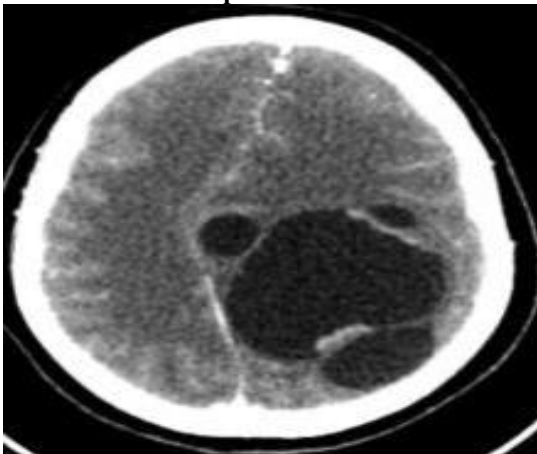


Figure 5. Cerebral CT after injection of contrast product: left parietal cystic lesion, lobulated, whose partitions are enhanced after injection.



Figure 6. Voluminous hydatid cyst intact and focally calcified.

Discussion

Hydatidosis is due to the visceral development of the larval form of *E. granulosus*. Frequently the most common sites are hepatic (48%) and pulmonary (36%), whereas cerebral localization is rare and does not exceed 2% of cases. It is more usual in children and young adults (50 to 70% of cases) and is most often unique. It is known that the distribution of hydatidosis in the world changes according to the intensity of sheep farming. The rarity of the cerebral localization of echinococcosis can be explained by the passage of the parasite through two filters (hepatic then pulmonary) before reaching the main circulation.

The cerebral localizations are generally hemispherical supratentorial and subcortical especially in the territory of the middle cerebral artery at the level of the parietal lobe [1]. Rare cases of intraventricular and posterior fossa localization have been reported [2, 3]. The clinical symptomatology is dominated by signs of intracranial hypertension. The clinical tolerance in the child explains the often observed diagnostic delay.

Serology is the only biological aid to preoperative diagnosis. The presence of circulating antibodies depends on the parasite contact with the tissues, and there very nature.

The presence of detectable antibodies varies a lot depending on the condition of the cyst: well isolated in its adventitious or even broken and superinfected, if it no longer contains parasitic material. it can be mute serologically.

In most cases, the CT appearance of the cerebral hydatid cyst is typical [4], a unique, spherical, large, thin-walled, cerebrospinal fluid density formation, located in the parenchyma, without contrast enhancement. nor edema. However, it is recalled that one of our patients had presented peri-lesional edema and a discreet parietal contrast enhancement.

Given these typical aspects, the differential diagnosis can arise with certain cystic lesions, in particular the arachnoid cyst, leptomeningeal, squamous cell, porencephalic cavity, cystic astrocytoma, craniopharyngioma and brain abscess, but in the endemic region, the diagnosis of hydatid cyst is mentioned immediately.

MRI currently offers not only additional diagnostic information for cerebral hydatid disease, but also allows for more appropriate therapeutic planning. It shows, in typical forms, a spherical fluid formation, of fine contours, containing a liquid with the same imaging characteristics as CSF; hypointense in T1 sequence and hyperintense in T2 sequence with a very thin wall (pericyst) in relative hypersignal T1 and hyposignal T2 characteristic. The cancellation of the signal on the Flair sequences and the hyposignal franc in diffusion also characterizes the hydatid cyst. The relative hypersignal of certain cystic contents in T1 would be related to the existence of hydatid sand. The absence of peri-lesional edema and enhancement of uncomplicated cysts is even more obvious in MRI. Thus, the MRI demonstrates the signal characteristics of the hydatid cyst and any adhesions that the pericyst may have with surrounding structures, a very important element in the planning of the surgical procedure to prevent accidental rupture. Magnetic resonance spectroscopic (MRS) studies of the hydatid cyst are very rare and show a different metabolic profile from other cystic lesions with the existence of lactate, alanine and pyruvate peaks in intra-cystic tissue. These same metabolites are also found in cysticercosis cysts with predominance of the pyruvate peak in the hydatid cyst. This metabolite appears as a marker for the parasitic etiology and may even be the viability of cysts.

Thus the SRM would provide a supplementary diagnostic argument very useful in case of differential diagnosis problems.

It would also play a role in the monitoring of residual lesions or recurrences under medical treatment. MRI is also better in the detection of multiple cerebral cysts that are very rare (no case in our series). They are the result of spontaneous, traumatic or perioperative rupture of a solitary hydatid cyst of the brain or rupture of a left intraventricular cardiac cyst. Multiple cysts are then smaller in size, multi or uni-vesicular and disseminated in both cerebral hemispheres [5]. Finally, the MRI better defines the relationship of the lesion with the surrounding structures, which also helps in surgical planning.

Treatment of cerebral hydatid cyst is surgical and involves removing the cyst without breaking it. By a wide craniotomy, the cyst is dissected by saline injection around, the detachment of the cyst is gradually to be delivered: this is the technique of Arana Inguiez. Puncture-aspiration of the cyst is rarely used in very deep seat cysts. Medical treatment with albendazol is indicated in case of rupture, or in case of multiple localizations [6].

Conclusion

The cerebral hydatid cyst is rare, it affects the child and adolescent, the clinical signs are dominated by intracranial hypertension. For typical forms the brain scan is usually sufficient in the diagnosis of cerebral hydatid cyst. Hydatid serology can be of great help for unusual forms in imaging.

Acknowledgments

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