Surgical Management Of Cerebral Hydatid Cyst

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ABSTRACT :

The cerebral location of the hydatid cyst represents, according to the literature, 2% of brain lesions. This parasitosis, after having crossed the two hepatic and pulmonary barriers, can be localized in any superficial or deep cerebral zone, hemispherical or subtentorial.

The clinical presentation is represented by an intracranial hypertension and a topographical syndrome and in rare cases by a deterioration of the state of consciousness, the neuro-radiological image is pathognomonic of the hydatid cyst.

We report a series of 18 patients of different ages operated on for cerebral hydatid cyst at the Annaba neurosurgery department over a period of 24 years.

Brain cyst surgery is special because it uses a hydro-dissection technique in order to remove the cyst in its entirety and try to avoid causing it to rupture at all costs and thus avoid recurrences.

The prognosis of these cysts depends on the number, location and quality of surgical excision.

Key words: *cyst – hydatid – cerebral – surgery – hydro dissection.*

RÉSUMÉ :

La localisation cérébrale du kyste hydatique représente selon la littérature 2% des lésions cérébrales, cette parasitose après avoir franchi les deux barrières hépatique et pulmonaire se localise dans n'importe quelle zone cérébrale superficielle ou profonde, hémisphérique ou en sous tentorielle.

Le tableau clinique est représenté par un syndrome d'hypertension intracrânienne et un syndrome topographique et dans de rare cas par une dégradation de l'état de conscience, l'image neuroradiologique est pathognomonique du kyste hydatique.

Nous rapportons une série de 18 malades d'âge différents opérés pour kyste hydatique cérébrale au service de neurochirurgie Annaba sur une période de 24 ans.

La chirurgie du kyste cérébrale est particulière car elle fait appelle à une technique d'hydro-dissection afin d'extirper le kyste en totalité et essayer d'éviter à tout prix de le faire rompre et ainsi d'éviter les récidives.

Le pronostic de ces kystes dépend du nombre, de la localisation et de la qualité d'exérèse chirurgicale.

Mots clés : kyste – hydatique – cérébral- chirurgie – hydro dissection.

1.INTRODUCTION:

The hydatid cyst is a cosmopolitan anthropozoonosis common to humans and herbivorous mammals, caused by the presence and development within the body of larval vesicles of a small cestode called Taenia Echinococcus Granulosus [1-2].It is a public health problem, as it is still endemic in Algeria and Mediterranean countries. Hydatid cysts in humans, considered as accidental intermediate hosts, are mostly found in the liver, followed by the lung, while the brain accounts for only 2% of all hydatid localizations [3-4].

2.MATERIALS AND METHODS:

We identified 18 patients in the neurosurgery department of CHU Ibn rochd Annaba (Algeria) who had undergone surgery for cerebral hydatid cysts over a period of 24 years. The majority were male, their age ranged from 3 to 56 years, and eight of them (44.44%) were under 16 years of age.

The clinical examination on admission was dominated by intracranial hypertension:headache, visual disturbance and jet vomiting, while only three were admitted for motor deficit and 01 for cerebellar syndrome.

On examination, three of these patients had undergone surgery for hydatid cysts of the liver, and a 17-year-old patient had undergone surgery for hydatid cysts of the heart and left iliac artery.

The patients' consultation times were variable, with extremes ranging from 04 to 06 months.

The sedimentation rate was accelerated in only one patient.

All our patients underwent a cerebral CT scan, which revealed a supra tentorial hydatid cyst in 17 patients and 01 patient aged 08 with a hydatid cyst in the posterior cerebral fossa.

The hydatid cyst was multiple in one case and in both hemispheres in the patient who underwent open surgery for cardiac and left iliac artery hydatid cysts.

The average size of the hydatid cyst in these patients on imaging was 7 cm.

These patients were operated on using the hydrodissection technique, which resulted in complete exeresis in 16 patients, with rupture of the hydatid cyst occurring intra operatively in two patients (11.11%).

The evacuation of cysts in one patient, who had several in both cerebral hemispheres, was performed in several stages, with total extirpation.

Figure N°01: Pre surgical cerebral CT axial section of a right temporo-parietal hydatid cyst.

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Figure N° :02 Intraoperative image with complete evacuation of the hydatid cyst measuring 09cm.

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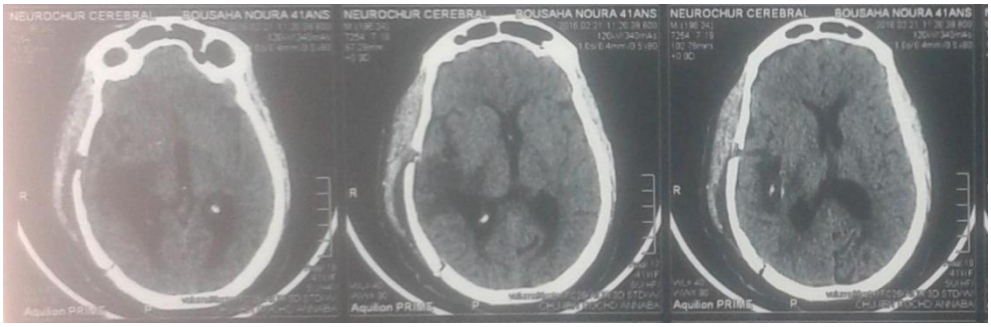

Figure N :03: Post-operative cerebral CT scan; total excision of hydatid cyst.

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3.RESULTS:

Post-operative follow-up was marked by clinical improvement in the intracranial hypertension syndrome, motor deficit and cinetic cerebellar syndrome. A cerebral CT scan was ordered, showing a cephalic poren cavity in almost all patients, except in one case where the patient had other cysts of different location, notably in the contralateral hemisphere.

The evolution of these patients was marked by recurrence in one of the two patients in whom the cyst ruptured intraoperatively, and she was operated on three times for recurrence, with an interval of one year between each operation.

All these patients were put on albendazol for a period of 30 days, except for one patient who had undergone surgery for a cardiac and iliac hydatid cyst and had been admitted to our department for several cerebral localizations,radiological examination of this patient revealed splenic, intestinal and renal localizations.

We found no recurrence in the other patients, who were followed clinically and radiologically for a period of three years.

4.DISCUSSION :

Echinococcosis is rife in countries renowned for their sheep farming and represents a real public health problem.

Humans become infected either directly by stroking infected dogs without washing their hands, or indirectly by ingesting water or food contaminated with the eggs of parasitized dogs or sheep.

Once these eggs have entered the stomach and duodenum, the embryo undergoes the action of the enzymes secreted by these organs. Once it reaches the jejuno-ileal part of the body, the hexacanth embryo breaks out of its shell and, using its hooks, penetrates the mucous chorion, which is richly vascularized, it continues its crossed through the human body, either via the exceptional lymphatic circulation, or via the blood, taking the portal route to the first barrier, the liver; via the supra-hepatic veins, it reaches the vena cava, the right heart and the lung, the second barrier.

Once it has crossed the hepatic and pulmonary barriers, the exacanthe embryo enters the general circulation via the left heart, and can then localize in any part of the human body, particularly in the central nervous system, the cerebral hemispheres in 2% of cases, mainly in the middle cerebral artery territory [5-6-7] .

According to the literature, it takes an average of 07 months for clinical signs to appear, and the clinical picture depends on the patient's age, cerebral location and number of cysts.

Symptomatology is dominated by intracranial hypertension syndrome, a topographical syndrome depending on the location of the hydatid cyst, an irritative syndrome, a motor deficit and, in extreme cases, a deterioration in the state of consciousness, which represents a decompensation of the intracranial hypertension syndrome [8-9-10-11-12].

In addition to questioning, which helps to orientate the diagnosis, particularly with regard to the patient's lifestyle, and the clinical examination, neuro-radiological imaging is essential to support the diagnosis: first and foremost, cerebral computed tomography (CT), where the image is pathognomonic and highlights a large, spherical, compass-like image whose density is close to or slightly greater than that of the cerebrospinal fluid. This cystic image does not take up contrast and has no mass effect on the structures of the cerebrospinal fluid. Calcification of the cyst is rarely seen on cerebral CT.

The cystic lesion is more often located above the tentorial surface, either singly or in multiples, and is rarely found in the posterior cerebral fossa.

CT also reveals thinning of the cranial vault opposite the hydatid cyst.

Magnetic resonance imaging is used when there is diagnostic doubt or to make a differential diagnosis, where the intracystic fluid appears hypo-signal on T1-weighted sequences and hyper-signal on T2-weighted sequences, with a very thin wall (peri-cyst) [13].

The parenchyma has an intermediate signal in T1 and a hypo signal in T2 [14]. Signal cancellation on Flair sequences and frank hypo signal on diffusion also characterize hydatid cysts.

The relative hyper-signal of certain cystic contents in T1 is thought to be linked to the existence of hydatid sand [13], so MRI demonstrates the signal characteristics of hydatid cysts better than CT.

Several techniques have been described, but the most effective is that of Arana Iniguez and San Julian, described in 1951 [15]. After positioning the patient, a skin incision is made centred on the lesion, and a large bone flap is made opposite the cyst.

Extirpation of the cyst begins with a cortotomy, i.e. a crossing of the thinned cortical mantle opposite a large cyst, generally using microsurgical instruments.

Once the cystic wall has been exposed, 0.9% saline-impregnated cotton swabs are gently placed in the cleavage plane, the Arana-iniguez technique consists in introducing a soft rubber probe between the cyst wall and the brain parenchyma, and injecting simple or hypertonic saline into this probe to ensure hydrodissection of the cyst wall from the cerebral parenchyma

that shelters it, so that this cautious thrust allows delivery and enucleation of the cyst in its entirety. The same technique can be used if there are several cysts in the same region [15].

The use of 5% hypertonic saline protects the brain parenchyma in the event of accidental cyst rupture.

Hydatid cysts represent a challenge for the neurosurgeon, especially those located close to the ventricular wall or deep within it.

Cyst rupture in the cerebral parenchyma exposes the patient to dissemination and recurrence, and may even be the cause of anaphylactic shock, given that hydatid fluid can contain up to 400,000 scolex [16].

In our series of 18 patients, en bloc resection was carried out in 16 patients operated on for hydatid cysts. Two patients had an accidental rupture, one of whom did not recur after a radiological follow-up of 3 years, but this was not the case with the second patient, who recurred every year, practically at the same time and in the same location.

Medical treatment also plays a vital role in the management of hydatid cysts, such as Albendazol, which is used preoperatively to sterilize the cyst in the event of rupture and prevent recurrence. Postoperatively, Abendazol is given at a dose of 10mg twice daily for 3 months, with 15-day intervals between courses, at which time a liver test is requested [17-18-19-20].

This ovicide, Albendazol, was given to our patient with multiple cerebral hydatidosis, who had undergone surgery for cardiac and iliac hydatid cysts for 12 months. This long course of treatment stabilized the cysts in the intestine, spleen and kidney for years, without recurrence in the brain.

5.CONCLUSION:

In Algeria, hydatid disease represents a real economic and public health problem, as it is still rife in sheep-breeding areas, and its incidence remains high. The cerebral hydatid cyst represents a challenge for the neurosurgeon, as it must be extirpated in its entirety with its capsule, without traumatizing it, in order to avoid rupture.

Albendazole-based medical treatment plays an active role in improving the prognosis of this cosmopolitan disease.

Prevention is essentially based on compliance with the hydatid disease control program that has been set up, i.e. careful washing of hands and fruits and vegetables eaten raw, thorough leathering of meat and offal and the slaughter of infected sheep, as well as the implementation of awareness campaigns on this pathology.

Declaration :

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