Brain Hydatidosis surgical outcome

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Abstract

Background: Brain Hydatidosis is one of common parasitic brain diseases accounted in Iraq. This is prospective study done in mosul teaching hospital in Iraq during 2007-2020.

Material and Method: All patient data had collected from the records of 19 patients admitted to Mosul center with hydatidosis, including clinical features and imaging investigation in addition to operative record .Follow up of all included patient was achieved.

Results: Ninteen patients were included, twelve male and seven female . Eighteen patients were of intracerebral hydatidosis while one was extradural. Eight patients in parietal lobe, five patients in frontoprietal lobe,,three patients in occipital lobe, two in cerebellum and one patient in frontal. Age ranged 3-45 years where sixteen patients were children. Three patients get multiple cysts while the other sixteen get solitary hydatid cyst. All patients were treated by craniotomy and total excision (delivery) of hydatid cyste(s) while rupture occurred on one case and albendazole had given for all of patients postoperativly. All patients except two get retune to normal neurological function while one still in deficit the other one died due to postoperative infection. No recurrence was seen.

Conclusion: Brain hydatidosis is still seen in our country and early surgery provide good treatment in addition to use of albendazole while mortality and morbidity are not uncommon postoperative events.

Keywords: *Hydatid cyst, Brain infestations, Iraq.*

Introduction

hydatid disease is a chronic zoonotichelminthic infection caused by larval stage of the dog tapeworm called *Echinococcus granulosus*. Hydatidosis is endemic throughout Middle East[1,2]. This disease is usual in areas that cattle, sheep, and dogs arekept. Liver and lungs are common involvedorgans but in other organs of body such asbones, brain and heart may be found[3,4,5]. Human infestation may take one of the three forms:unilocular hydatid disease caused by *Echinococcus granulosus*, multilocularor alveolar disease caused by *Echinococcus multilocularis* and polycystic hydatid disease caused by *Echinococcus vogeli* . Members of the dog family are definitive hosts for these minute tapeworms. Eggs are passed in the stools and ingested by the intermediate hosts, which include sheep, cattle, pigs, rodents and other herbivorous animals. Humans,especially children are infected. Following the accidental ingestion of eggs from environment, the eggs hatch in the intestine and the embryo penetrate the intestinal wall and then enter the blood stream. Although most hydatids develop in the liver, some disseminated to other sites. These may even reach the brain [6]. Larval stage of the cesto can involve the brain via the choroid plexus.[7] Cerebral hydatid cyst are usually localised within the watershed zone of the middle cerebral arteries, often in the parietal lobe.[8,9] Cerebral hydatid cysts are usually single, spherical and unilocular[10,11]

Its incidence is 1–2% of all cases with hydatid disease. Brain hydatidosis is an important differential diagnosis of intracranial cystic lesions in endemic regions, for example, the Middle-Eastern countries.

Subjects and Method

Study method include that retrospectively reviewing the clinical features (neurological symptoms and signs), radiological manifestations (X-ray, computerized tomography (CT) scan or magnetic resonance imaging (MRI)) and surgical outcome of 19

patients with intracranial hydatid cysts whom received surgicaltreatment at the Neurosurgical Department of Ibn Sina hospital from January 2007 to January 2020. The patients records were retrospectively reviewed all the clinical, radiological data of all patients who were diagnosed as harboring an intracranial hydatid cyst during the period of study and subsequently underwent surgery at the Department of Neurosurgery, Ibn Sina hospital. Follow up of patients was done by clinical and radiological evaluation for a minimum period of 6 months up to 2 years .

Surgical therapy was adopted for all patients and Craniatomy with big osteoplastic flap and use of Dowling-Orlando's technique for delivery of hydatid cyst was the only type of surgery for all patients. Medical thereapy: albendazol as chemotherapy for 28 days had been standard way of medical treatment after surgery.

Results

The current study has included nineteen patients of them twelve male (63-%) and seven female (37%) .

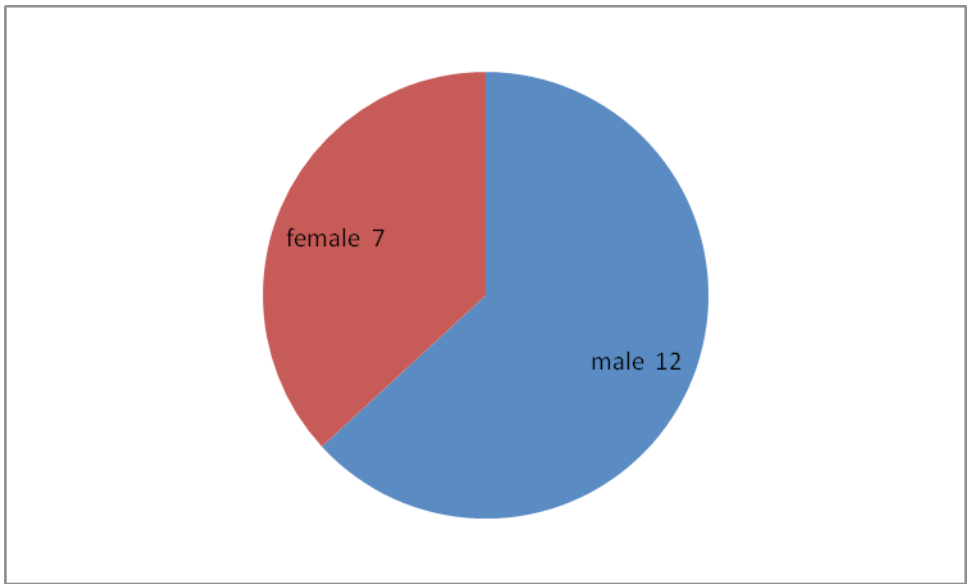

Figure (1): Sex distribution

The age distribution was 16 patients in childhood age (below 18 years) and three were adults.

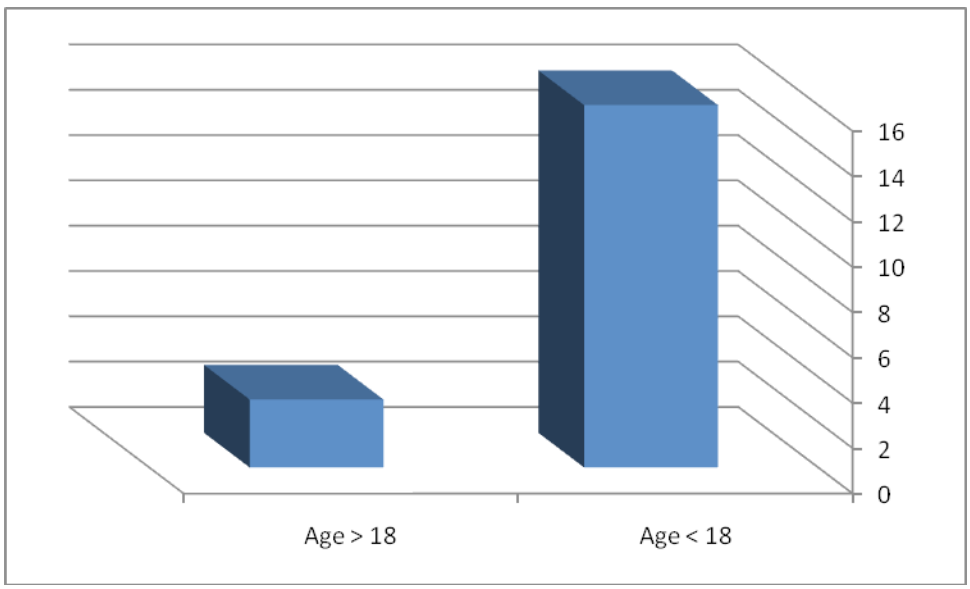

Figure (2): Age distribution

All patients in this study were from rural area except one,two adult patients were from one family. The clinical features at time of patients presentation was headache in 17 of cases, seizure in 4 cases, motor weakness in 17 cases, vomiting in 4 cases and altered level of consciousness in 5 cases. Behavior changes were in one patient .

While the clinical signs revealed papilledema in 12 cases, sixth cranial nerve pulsy in 3 cases .

Table 1: Clinical presentation distributions

	Number of cases
Headache	17
Vomitting	4
Seizure	4
Motor weakness	17
Disturbe level of consciousness	5
Behavior changes	1
Papilledema	12
Sixth nerve pulsy	3

All patients had investigated by CT and MRI, with three patient harbor multiple cyst while the others diagnosed as single cerebral hydatidosis.

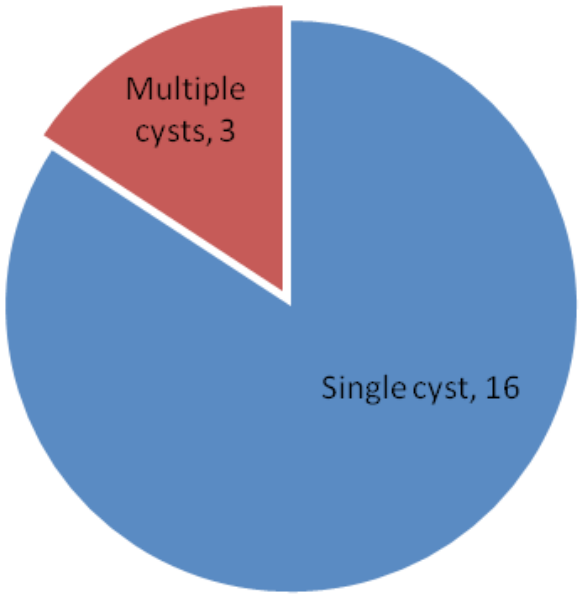

Figure (3): Multiplicity of cyst distribution

The anatomical distribution of cysts were eight patients in parietal lobe, five patients in frontoprietal lobe,,three patients in occipital lobe, two in cerebellum and one patient in frontal.

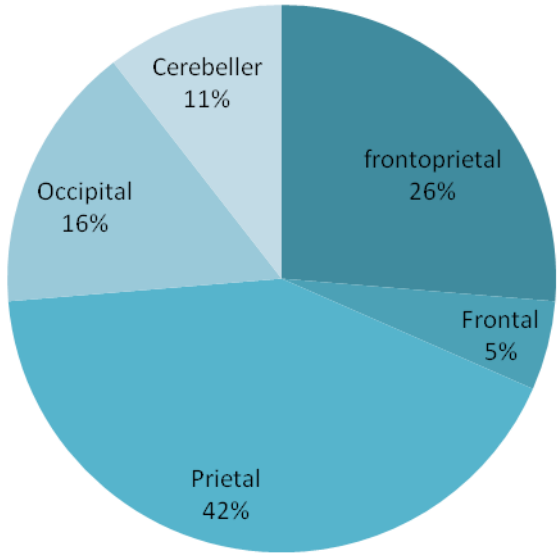

Figure (4): Anatomical location distributions

All patients were underwent craniatomy within 24-48 hours after establishment of diagnosis and successfully intact delivery of cyst(s) achieved in eighteen patients while rupture of multiple extradural cysts had occur .

All patients were kept in hospital 5-14 days and then discharge home.

Discussion

Echinococcosis (hydatid disease or hydatidosis), caused by the cestode Echinococcus granulosus is a widespread zoonotic illness and can involve brain in rare cases, They account for 1% to 5% of all intracranial masses in endemic areas[12, 13]The natural history of the cerebral hydatidosis is usually slow and presents late when they reach relatively large volume. There is no consensus on the growth rate of the hydatid cysts of the brain and has been variably reported between 1.5-10 cm/ year[14]

The dominance paediatric involvement by hyadatid cyst had proved in this series with the 86% of incidence who were less than 15 years age that stay one of the most agreed point in most of the published seriesas inIzci *et al* who reported a series of 17 patients with intracranial hydatid cysts and 13 (65%) of these patients were children adopting the patent ductus arteriosus or the direct contact with dogs or eating contaminated food and milk.[15, 16,17]

We founded in this study that pediatric cerebral hydatid disease involves all intracranial parts while cerebellum was immune in adult patients.Although

the paediatric predominance the male gender was predominant in paediatric group (3:1) while the reverse in adult group where female appeared to be more involved (2:1) . The cerebral hydatid cyst can be single (primary) or multiple (secondary) . In this series there were two multiple cysts cases in paediatric group and only one in adult, while all the crebeller hydatid cases were of single type.

In the view of intracranial compartment distribution the supratentorial distributon of cysts were observed in all cases except two, with high prevelance for parietal lobe as it involved in 12 patients (80 %) the same observation were reportedfor all four cases reported by Dharker et al [18] and three out of five cases of intracerebral hydatid cysts reported by Balasubramaniam et al[19] had parietal lobe involvement which reflect the distribution of middle cerebral artery supplement.

As any slowly growin brain space occupying mass the common presentations of patients in this series were symptoms and signs of raise intracranial pressure and/ or pressure effect. The vast majority were present with headache (90 %) and founded to get papilloedema in 12 patients (63%) which can be explained by the large size of the cyst as there was no hydrocephalus in all patients. The same proved by by Erashin et al[20] who observed that 18 out of 19 cases presented with raised intracranial pressure symptoms and signs,As the common site of cerebral hydatidosis was parietal, frontal and frontoprietal region (73 %) in this series the common local pressure feature was motor weakness observed in 90% of patients.

The adoptive surgical procedure (Dowling-Orlando's technique) had proved to yield high success rate in the delivery of intact brain hydatid cyst which achieved in 95 % of cases and hence the recurrence rate was very low compared with relatively significant recurrence in ruptured hydatid surgically treated by other procedures who showed 0.3–53%[21] while other writer had founded almost recurrence of all rupture cases as in El-Shamam et al. [22]

The adaptation of Dowling-Orlando's technique in this series with low rupture rate led to the absence of serious complication. Even the ruptured cysts had occurred in extradural case with good recovery. The potential for effective treatment is greater with intradural cysts, since they are often single and have thicker walls; then intact removal is more likely. measures should be adopted to reduce the likelihood of intraoperative rupture because it is not only associated with the recurrence of the lesion, but also causes various types of allergic reactions and even anaphylactic shock[23]

There were no difference in the delivery of intracerebral single or multiple cysts as rupture occurred in the extradural cysts only which may attributed to more adherernce between dura and cysts. The only one patient died after operation by two weeks from infection had occurred in 6 years age child harboring cerebellar single cyst,Most of all cases harbored giant cyste(s) with extension to the cortex and this made delivery of cyst more easy with less neural tissue injury.Adopting albindazol therapy for all patients after operation in doses for patients weighing more than 60 kg in a dose of 400 mg twice daily for 28 days. A dose of 15 mg/kg of body weight daily in 2 divided doses (not to exceed total daily dose of 800 mg) has been suggested for patients weighing less than 60 kg. There were no significant side effects observed from use of this drug among our patients

Conclusions

The hydatid cyst still not uncommon in the middle east countries and should not be under estimated,Early diagnosis at time being is feasible in the availability of imaging techniques and the unique feature of cyst. Adopting Dowling-Orlando's technique in the surgical management of brain hydatidosis proved to yield excellent results with low mortality and morbidity rate. We advise for Albindazole therapy for 28 days after surgery.

Conflict of Interest: None

Source of Findings: None

Ethical Clearance: None

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