

HYDATID CYSTS OF THE BRAIN

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Background: Brain involvement with hydatid disease occurs in 1–2% of all *Echinococcus granulosus* infections. Cerebral hydatid cysts are usually supratentorial, whereas infratentorial lesions are quite rare. Objective of the study was to determine the clinical presentation and surgical outcome of cranial hydatidosis. **Methods:** This retrospective study was performed in the department of neurosurgery LRH Peshawar from December 2000 to Oct 2007. Twenty one cases with intracranial hydatidosis were operated. The patients were either admitted through OPD or referred from other units. CT and/or MRI were the imaging modalities to reach the diagnosis in addition to serological and haematological tests. Surgery was the only treatment option used. Pericystic hydraulic method was the technique used for the excision of the hydatid cyst of brain. **Results:** There were 9 males and 12 females with male to female ratio of 1:1.3. All patients belonged to paediatric age group with age range of 3–14 years and mean age of 7.42 ± 3.2 years. Headache, vomiting, papilloedema were present in all the patients while seizures were the present in 16 patients. The lesion was removed surgically by adopting pericystic hydraulic method during craniotomy in all cases. There was no intra-operative morbidity except that the cyst ruptured in one case. No postoperative complications were noted and there was no mortality. **Conclusion:** Hydatid cyst of the brain presents clinically as intracranial space occupying lesion and is more common in children. Surgery is the treatment option with affordable morbidity and low mortality. **Keywords:** Cerebral hydatid cyst, Echinococcosis, Intracranial hydatidosis

INTRODUCTION

Brain involvement with hydatid disease occurs in 1–2% of all *Echinococcus granulosus* infections. Cerebral hydatid cysts are usually supratentorial, whereas infratentorial lesions are quite rare.¹ The definite hosts of echinococcus are various carnivores, the common being the dog. All mammals (more often being sheep and cattle) are intermittent hosts. Humans get infected through the faeco-oral route by ingestion of food or milk contaminated by dog faeces containing ova of the parasite or by direct contact with dogs. The eggs loose their enveloping layer in the stomach, releasing the embryos. The embryos pass through the wall of the gut into the portal system and are carried to the liver where most larvae get entrapped and encysted. Some may reach the lungs and occasionally, some may pass through the capillary filter of the liver and lungs and get entry into the systemic circulation. These may even reach the brain.^{2,3} Intracranial hydatid cysts are commonly solitary. Multiple intracranial cysts are rare.^{2,3} It is a world wide problem. Due to insidious onset of clinical symptoms, patients are diagnosed late. Intracranial hydatid cyst may also be classified as primary or secondary. The primary cysts are formed as a result of direct infestation of the larvae in the brain without demonstrable involvement of other organs. Intracranial hydatid cyst may also be classified as primary or secondary. The primary cysts are formed as a result of direct infestation of the larvae in the brain without demonstrable involvement of other organs. The secondary multiple cysts results from spontaneous, traumatic or surgical rupture of the primary intracranial hydatid cyst and they lack brood capsule and scolices.²

The patients with intracranial hydatid cysts usually present with focal neurological deficit and features of raised intracranial pressure; the latter may be due to the large size or due to interference with pathway of CSF flow.³

Surgically intact cyst excision is the ideal treatment. Medical treatment with albendazole seems to be beneficial both pre- and post-operatively. Pericystic hydraulic method (Dowling-Orlando technique) gives better results in removing these cysts intact.¹⁻³ Present study was designed as to determine the clinical presentation and surgical outcome of cranial hydatidosis.

MATERIAL AND METHODS

We operated 21 cases of cranial hydatid cyst in our department of neurosurgery, Lady Reading Hospital Peshawar in the last 7 years December 2000 to October 2007. Most of these patients were referred to OPD while few were reported to private clinics and admitted. Detailed history, record of clinical features and related studies were done and documented. Chest X-Ray, abdominal ultrasound, differential leucocyte count to see eosinophilia and other serological tests were advised in patients with suspicion of Hydatid Cyst on CT/MRI of the brain. Patients with strong suspicion of other mimicking disorders like porencephalic cyst, arachnoid cyst, cystic glioma and brain abscess were excluded from the study. All these patients were operated in elective morning list by senior consultants with all precautions taken not to allow the cyst to rupture. The procedure was discussed with anaesthetist before induction and their possible role was explained to them.

For pericystic hydraulic method, after anaesthetic and surgical consent, the patient is anesthetized and position is made. Large craniotomy flap is made depending on the size and site of the lesion. Bone is extremely thin in these cases. Careful osteoplastic bone flap is made and dura opened in a wide cruciate incision. Cyst is dissected below cortex by doing small corticotomy. With the help of Foley's catheter, irrigation is started to the cleavage line in the brain-cyst interface. Patient is brought down the heart level and the anaesthetist is asked to perform valsalva manoeuvre. Surgery area of brain is covered with normal saline soaked cottonoid to prevent spillage in case of rupture. Cyst is removed and dura is closed water tight. Bone flap is put back and patient is dressed after wound closure.

The data was analysed using SPSS-11.

RESULTS

Twenty-one patients with intracraial hydatid cysts were operated within 7 years from November 1999 to October 2006. There were 9 (42.85%) males and 12 (57.14%) females with male to female ratio of 1:1.3. Age range of these patients was between 3 to 14 years with Mean age of 7.43 ± 3.2 years. Duration of symptoms was from 2 to 9 months (4.38 ± 2.03 month). Most of the patients belonged to Afghanistan and Northern areas of Pakistan. Headache, vomiting and papilloedema were present in all patients while seizures in 16 patients. CT and/or MRI were the radiological investigations used to confirm the diagnosis. The size of the cyst ranged from 5–9 cm (7.71 ± 1.30 cm). Most of the patients had cyst in the frontal and parietal regions (7 and 5 patients each), followed by 4 each in frontoparietal and occipital regions, one case with cyst in posterior fossa (Table-1). The operative findings were in consistence with the radiological findings. Craniotomy followed by pericystic hydraulic method was performed for the safe excision of the cyst. Average postoperative hospital stay was between 4 and 5 days.

Table-1: Site of involvement of the cyst

Site of involvement		Sex		Total	%
		Male	Female		
Supra-tentorial	Frontal	6	7	7	33.3
	Parietal	2	5	5	23.8
	Fronto-parietal	1	5	5	23.8
	Occipetal		3	3	14.3
Infra-tentorial			1	1	4.8
Total		9	12	21	100

DISCUSSION

Although hydatid cyst can occur in any organ or tissue of the body including brain and orbit, the bone and brain are the fourth common site of involvement after liver, lungs and peritoneum.¹⁻³ The disease has endemic prevalence, more common in Turkey with incidence of 1:2000.⁴ Cerebral hydatid cyst is seen in 0.5–3% of

cases with or without associated cyst in other organs of the body.⁵ It is caused by the larval stages of *ecchinococcus granulosus*. Paediatric age group of 7–14 years is the common age period. Eighty percent of reported cases were children of 8–10 years.^{2,3} Cerebral hydatid cyst commonly occurs in children and young adults.^{6,7} We operated 21 cases of paediatric age group. Male were dominant as compared to females. Paşaoğlu *et al* have published five cases with mean age of 13.4 years.^{2,3} Single and two case reports of paediatric age group have been published by different authors.^{2,8,9} Probably the common reason is close association of children with sheep, dogs and pet animals, lack of health education and carelessness. We reported three cases in children with brain hydatid cyst in 1998.

The symptomatology was that of brain tumour with both focal and global signs of brain compression. Disturbed sensorium and features of raised intra cranial pressure was noted in all the cases while seizures in 16 cases. Clinical features of raised ICP have been reported by many authors in their case reports. We noted optic atrophy in one patient who was labelled as side effect of anti-malarial by paediatrician but in fact, it was long standing effects of papilloedema.

There is no consensus on the growth rate of the hydatid cyst of the brain and has been variably reported between 1.5–10 cm per year.¹⁰⁻¹² Due to slow growing rate, patients present late, when the cyst has become large in size.¹³ We observed average size of cyst of 7.71 cm which shows that the disease is more neglected in our setup. Two cysts were seen in the orbit as a cause of proptosis, 18 in supratentorial region and one cyst in posterior fossa infratentorially. Supratentorial cysts are common in parietal lobe due to major blood supply by middle cerebral artery. Infra tentorial hydatid cyst has been reported by Dhiman DS *et al*¹⁴ as well defined rounded hyperdense mass in right lobe of cerebrum of a 10 year old child. Common location in parietal lobe has been reported by Gupta S¹⁵ and by also Abu-Eshy SA¹⁶ in their cases.

Intracranial cysts are commonly single. Multiple intracranial cysts raise a suspicion that they arise as an embolisation from hydatid cyst located with in the heart. cases with 'primary' multiple intracranial hydatid cyst have been reported in the literature, in addition to 'secondary' ones owing to embolisation from different sources such as heart.¹⁷ Intact cyst removal is a challenging job and can be made easy by adopting peri-cystic hydraulic method.

Onal *et al*¹⁸ found only two cases of multiple hydatid cysts in their series of 33 paediatric cases and Lunardi *et al*¹⁹ in 2 cases. We did not observe any case of multiple cysts in our series.

Clinical features of raised intracranial pressure, focal lobe symptoms and seizures are common features. We observed headache, vomiting, seizures and

papilloedema in all cases while seizures in 16 cases. Two patients had proptosis while one patient was blind before surgery. Ersahin Y *et al*²⁰ have observed 18 out of 19 cases with raised intracranial pressure. All cases of Gupta *et al* presented with raised ICP. Aydin DN²¹ has reported a case of intracranial hydatid cyst with raised intracranial pressure.

We operated all our cases on elective operation days. Pericystic hydraulic method was adopted. Only in one of our cases the cyst ruptured during delivery due to injecting saline with brain cannula, which punctured the cyst wall. The cyst wall in brain hydatid is extremely thin and transparent and one can see the opposite brain matter in it. No mortality or morbidity was noted except that one patient with bilateral optic atrophy remained blind postoperatively.

CONCLUSION

We concluded that hydatid disease is not uncommon, affects paediatric age group and is usually located supratentorially. The clinical features are those of intracranial space occupying lesion. It can safely be enucleated intact with pericystic hydraulic method.

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