

Unruptured Removal of Giant Intracranial Hydatid Cyst in a 6 Year Old Child

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Abstract

Hydatid disease is caused by the Tapeworm *Taenia Echinococcus*. Dogs are the most common definite hosts while sheep, goats and cattle are intermediate hosts. Humans being the accidental intermediate host, it is seen throughout the world mainly affecting the children and young adults. Hydatid cyst most commonly affects liver followed by lungs, spleen and rarely brain, spine or orbit. Hydatid cyst is mostly unilocular, slow growing and attain a large size in liver, lung and spleen. Intracranial hydatid cysts are smaller in sizes and rarely attain a giant size. Intracranial hydatid cyst commonly presents with focal neurological deficits in adult while in children it presents with raised intracranial pressure (ICP). We report a rare case of giant intracranial hydatid cyst in 6 year old child with features of raised ICP and focal neurological deficits; successfully managed with surgery and antihelminthic medications.

Keywords: Hydatid disease; Giant intracranial hydatid cyst

Case Report

A 6 year old girl presented with history of holocranial headache since 3 months. Since 2 months she complained of intermittent nausea and vomiting. She developed left sided weakness before 1 month. Before 1 week of presentation she developed left focal seizures with secondary generalization. On clinical examination she was conscious alert and following commands. Her higher mental functions were normal and she had no cranial nerve deficits. Tone was normal in all 4 limbs with reduced power of 3/5 in left upper limb and lower limb. She had no sensory deficits and her plantar were flexors in both limbs. Fundoscopy revealed bilateral papilloedema. Laboratory investigations were normal. Chest x-ray and abdominal ultrasonography were normal. Magnetic Resonance Imaging showed a 10 x 8 cm lesion in the right frontoparietal region. Lesion was hypointense on T1, hyperintense on T2 with no enhancement on contrast (Figure 1). The lesion caused displacement of midline structures towards left side, compressing left lateral ventricles leading to hydrocephalus with subfalcine and transtentorial herniation. She underwent right fronto-temporo-parietal craniotomy with osteoplastic bony flap. On opening dura brain was tense and bulging. Dowlings technique of hydrodissection was used to remove the hydatid cyst intact without the spillage of its contents. After the removal of cyst brain was lax and pulsatile. Watertight dural closure was done, bone flap was replaced and skin was closed in layers. Pathological examination confirmed hydatid cyst (Figure 2). Antibiotics and anti-epileptics were given in the post-operative period. Her post-operative stay in the hospital was uneventful and was discharged after 7 days. Post operatively she was started on albendazole 15 mg/kg/day for 4 weeks. At 3 months follow up she has no complaints and no neurological deficits (Figure 3).



Figure 1: MRI T2 image showing a giant cyst in frontoparietal region with signal intensity same as CSF.

Discussion

Hydatid cyst is an anthrozoönotic disease caused by *Echinococcus Granulosis*. Humans are intermediate hosts caused by the larval stage of echinococcus tapeworm. This parasite is incidentally ingested through contaminated food or beverages from faeces of infected animals. The eggs hatch inside the intestines, penetrate the walls; enter the hepatic capillaries via portal and mesenteric venous system. It reaches the liver to form cysts or progress further towards the lungs. Once in systemic circulation it can penetrate the pulmonary filter and end up forming cysts in any part of body including brain, heart, orbit or bones. It is endemic to many regions worldwide like

Australia, New Zealand, South America, Middle East, Central and South Europe.



Figure 2: Unruptured removal of hydatid cyst.

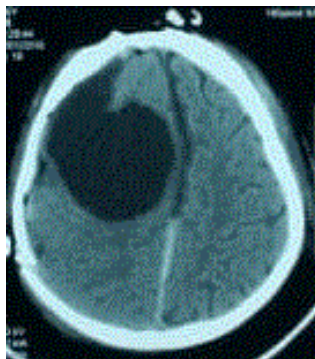


Figure 3: Post-operative CT showing complete removal of Hydatid cyst.

Brain cysts are uncommon and accounts for 1-2% of all hydatid cysts infection [1]. Primary brain cysts are solitary while secondary cyst due to rupture of cardiac cysts or iatrogenic rupture in brain; are multiple. 90% of intracranial cysts are solitary mainly localised to middle cerebral artery territory in supratentorial region although it can be seen in intraventricular or infratentorial region. Hydatid cyst mainly affects children but is presented in adulthood. The growth rate of cyst is believed to be 1.5 to 10 cms per year [2].

Serological tests like enzyme-linked immunosorbent assay or indirect hemagglutination can be used to diagnose Hydatid Cyst. False

negative rates are higher in these serological tests due to minimal tissue response by brain parenchyma. Computed Tomography (CT) and Magnetic resonance imaging (MRI) are preferred diagnostic tools for detection of intracranial Hydatid cyst. CT and MRI imaging demonstrate a thin walled well defined oval or cystic mass with signal intensity or attenuation similar to that of cerebrospinal fluid. Wall enhancement is absent after IV administration of contrast and calcification is rare. The cyst may cause compression of the ventricular system leading to hydrocephalus and cerebral herniation. Hydatid cyst lacks surrounding oedema seen particularly with abscesses and cystic tumors [3]. Differential diagnosis includes arachnoid cysts, epidermoid cyst, porencephalic cysts, neurological cysts and expanded perivascular spaces [4].

Main treatment consists of entire removal of cyst without rupture. Hydrodissection technique by Dowling Orlando is used for cyst removal in which head of the operating table is lowered and cyst is delivered by passing saline between the cyst and surrounding brain tissue [5]. Modified Dowling technique by Arana-Iniguez involves valsalva maneuver and counter pressure to surrounding brain tissue. Complications associated with this surgery are due to rupture of cysts causing anaphylactic reactions, meningitis or possible recurrences of multiple cysts due to spillage. 1 ml of hydatid sand contains 400,000 scolices hence even minimal spillage can lead to catastrophic events. Adhesions to brain parenchyma, thin cyst wall and periventricular locations can be real challenges to the operating surgeon. When large cysts are removed it can lead to subdural collections, cortical collapse and porencephalic cysts. Mass effects from these lesions may require a low pressure shunt.

Albendazole alone or in combination with agents like Praziquantal for 4 weeks or more is the preferred adjuvant therapy or in certain circumstances primary mode of treatment for hydatid cyst. Some authors also recommend these agents for longer periods however its benefit over 4 weeks yet remains to be established.

Conclusion

Treatment of hydatid cyst depends upon the location, number of cysts, size of cyst and neurological deficits due to mass effect of cysts. Unruptured removal of cyst and adjuvant therapy with albendazole holds the key for elimination of Hydatid cyst.

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