Giant Hydatid Cyst in the Posterior Fossa of a Child: a Case Report

CR KAYAOGLU
Department of Neurosurgery, Medical School, Ataturk University, Erzurum, Turkey

A 10-year-old boy was admitted with a 4-month history of ataxic gait, headache, vomiting and diplopia. The headaches had worsened in month 4 and were associated with vomiting during head movement. Cranial computed tomography (CT) and magnetic resonance imaging (MRI) scans revealed a hydatid cyst located in the posterior fossa. The patient underwent suboccipital craniotomy and a cerebellar hydatid cyst (approximately 5 cm in diameter) was removed using Dowling’s technique. The diagnosis was confirmed during surgery and by histological examination of a tissue sample from the cyst. The patient was treated with the antihelmintic agent albendazole in combination with antibiotics. The post-operative course was uneventful and the patient was discharged after 1 week. In conclusion, when a cystic lesion is detected on CT or MRI scans, hydatid disease should be taken into consideration in countries where hydatid infestation is endemic.

KEY WORDS: ALBENDAZOLE; ANTIHELMINTICS; HYDATID CYST; CHILDREN; CEREBELLUM; POSTERIOR FOSSA

Introduction
Hydatid infestation is endemic in many parts of the world including the Mediterranean region, Middle East, southern Asia, Latin America and Australia.1 – 3 This disease is now also seen in western countries because of travel and migration.4 An intracranial hydatid cyst is a relatively rare entity, accounting for only 1 – 2% of all intracranial space-occupying lesions.1,2,5,6 Cerebral hydatid cysts are most frequently supratentorial, involving the territory of the middle cerebral artery, especially the parietal lobe. Hydatid cysts located in the posterior fossa are very uncommon.1,7,8

Cerebral hydatid cysts are more commonly found in children than in adults and the clinical symptoms are very progressive. The disease is frequently diagnosed several months after the onset of symptoms, which are usually headaches and vomiting.2 – 4,9 Here, a child with a massive hydatid cyst located in the posterior fossa is presented. The patient’s symptoms gradually disappeared following total cyst extraction.

Case report
A 10-year-old boy presented with a 4-month history of headache, vomiting, ataxic gait and diplopia. The headaches had worsened during month 4 and were associated with vomiting during head movement.

The results of a physical examination were normal. On neurological examination, left VI nerve palsy, papilloedema, positive Babinski’s sign and cerebellar ataxia were
found. Routine blood analysis, plain cranial radiography and abdominal ultrasonography were all within normal limits. Cranial computed tomography (CT) revealed a large cystic lesion in the posterior fossa. The lateral and third ventricles were dilated and the fourth ventricle was compressed by the cystic lesion (Fig. 1).

Cranial magnetic resonance imaging (MRI) showed a spheroid cystic lesion in the posterior fossa that was hypointense on T1-weighted sequences and hyperintense on T2-weighted sequences, non-enhancing with contrast. There was no evidence of calcification or surrounding oedema (Fig. 2).

The patient underwent suboccipital

FIGURE 1: This axial non-contrast enhanced computed tomography scan shows a hypodense cystic lesion in the posterior interhemispheric area within the cerebellar hemispheres of a 10-year-old boy presenting with headache, vomiting, ataxic gait and diplopia during the previous 4 months

FIGURE 2: (A) Turbo spin-echo T1-weighted axial magnetic resonance image showing a well-circumscribed hypodense lesion within the cerebellar hemispheres. (B) Fluid-attenuated inversion recovery T2-weighted magnetic resonance image showing the same signal intensities at the lesion. (C) Contrast-enhanced T1-weighted magnetic resonance image showing no enhancement at the lesion
A cyst approximately 5 cm in diameter was excised using Dowling’s technique (Fig. 3). Histopathology confirmed that this was a hydatid cyst. The patient was treated with the antihelmintic agent, albendazole, in combination with antibiotics. The patient’s symptoms improved post-operatively and he was discharged after 1 week.

**Discussion**

Hydatidosis is an important member of a group of diseases that are naturally transmitted between animals and humans, and is widespread throughout the world. The hydatid cyst is the larval form of the tapeworm *Echinococcus granulosus*. Humans accidentally become the intermediary hosts in the parasite’s life cycle. Hydatid disease is transferred to human adults by ingestion of the scolex, or eggs, which can be present in food, whereas in children infection commonly takes place via accidental contamination by direct contact with dog faeces. The hydatid cyst reaches the brain after passing through the liver and the lungs. However, the majority of such cysts (30 – 60%) remain in the liver and lungs; only 1 – 2% of the cysts reach the brain.

Cerebral hydatid cysts are more common in the paediatric population; 50 – 75% of cerebral hydatid cysts occur in children and they are more frequently located in the supratentorial region. The parietal lobe is the most popular site for such cysts, because the parasites are usually distributed in the watershed of the middle cerebral artery.

The clinical presentation of an intracranial hydatid cyst is related to the site that it occupies. A hydatid cyst usually presents as a cystic mass, associated with slowly developing neurosurgical involvement. Headache, nausea, vomiting, weakness in the extremities, seizure, visual disturbances and cranial nerve involvement are the most common presenting symptoms. When a hydatid cyst locates in the posterior fossa,
cerebellar symptoms such as ataxia, dysmetry and dysdiadokokinesia emerge.\textsuperscript{7}

The diagnosis of a hydatid cyst can be readily made by CT and MRI scans. CT scans reveal a spherical and occasionally ovoid lesion with clearly defined borders, containing a low-attenuation fluid similar to cerebrospinal fluid in density and without perifocal oedema or contrast enhancement. Perifocal oedema and rim enhancement are not present unless the hydatid cyst is infected.\textsuperscript{15} MRI is now becoming widely used to diagnose intracranial hydatid cysts: such investigations show detail that remains unseen on CT scans. MRI usually reveals the hydatid cyst to have a thin regular margin containing cyst fluid, which is hypointense on T1-weighted images and hyperintense on T2-weighted images.\textsuperscript{16}

Occasionally, intracranial hydatid cysts are confused with other cystic lesions, such as other cystic parasites, tumours or abscesses. Cerebral hydatid cysts can be differentiated from brain abscesses and cystic astrocytoma by the absence of significant rim enhancement, perifocal oedema and mural nodule.\textsuperscript{10} Other cystic lesions, such as arachnoid, leptomeningeal and porencephalic cysts, are not spherical and are not entirely surrounded by brain tissue.\textsuperscript{2} Laboratory diagnosis using enzyme-linked immunosorbent assay (ELISA), immunoblot and indirect immunofluorescence to detect the antigen and immunocomplexes can assist in the diagnosis of hydatid disease, however, negative serological tests do not rule out the disease.\textsuperscript{7}

The principal treatment of hydatid cysts is surgery and the primary goal of the surgical procedure is total cyst extirpation without rupture. Although there are numerous different techniques for cyst removal, Dowling’s technique is very effective for the total extirpation of hydatid cysts.\textsuperscript{10} The hydatid cyst can be aspirated when it is not feasible to use Dowling’s technique, however, if the cyst is aspirated, care must be taken to avoid spillage of the parasites from inside the cyst. The results from cyst aspiration are not as good as those obtained when the cyst is removed without rupture.\textsuperscript{17} On rare occasions, hydatid cysts may become infected and suppurate. Infected cysts have rim enhancement and perifocal oedema on CT scans and are so adherent to the surrounding brain tissue that it is almost impossible to remove them without rupture.\textsuperscript{17} In addition, albendazole or mebendazole must be given pre-operatively and post-operatively to sterilize the cyst, to decrease the chance of anaphylaxis, to reduce the tension in the cyst wall and to reduce the risk of post-operative recurrence.\textsuperscript{18,19}

There are various complications associated with the surgical removal of hydatid cysts which depend on several factors, including the localization, size and multiplicity of the cysts as well as the presence of infection. Intra-operative cyst rupture is the most common and serious complication that can lead to widespread parasite dissemination followed by severe inflammatory or anaphylactic responses. In addition, the patient might experience post-operative seizure, subdural effusion, porencephalic cyst, haemorrhage, pneumocephalus, hydrocephalus and transient neurological deficits.\textsuperscript{2,20}

In conclusion, the majority of intracranial hydatid cysts are seen in the paediatric population – mostly during the first decade of life – and in the parietal lobe. Intracranial hydatid cysts are rarely located within the posterior fossa. Dowling’s technique is the most effective method of surgical removal of the cysts and recovery depends on successful cyst extraction without rupture. When a cystic lesion is detected on CT or MRI scans,
Hydatid disease should be taken into consideration in countries where hydatid infestation is endemic.

Conflicts of interest
No conflicts of interest were declared in relation to this paper.

References

Author’s address for correspondence
Dr Cetin Refik Kayaoglu
Department of Neurosurgery, Medical School, Aziziye Research Hospital, Ataturk University, 25070 Yenisehir, Erzurum, Turkey.
E-mail: crefik@atauni.edu.tr