

A Boulder in the Brain

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A 43-year-old man presented to the casualty department with history of spontaneous fall while working in the fields. He had headache and few episodes of vomiting. He reported history of repeated such falls in the past 3 years but had never consulted a physician. The patient was irritable but coherent and scored 14 on Glasgow coma scale (eye opening-spontaneous- 4, verbal response- oriented-5, motor response-localises pain-5). The neurologist referred the patient for computed tomography of the head. Non-contrast axial computed tomography of the head [Table/Fig-1] revealed haemorrhagic contusions in both frontal lobes (a) and a well-defined, densely calcified, round lesion in the right parieto-occipital region. The lesion shows undulating membranes (b) which are attached to the choroid plexus (c).



[Table/Fig-1]: Non-contrast axial computed tomography of the head showing haemorrhagic contusions in both frontal lobes (a) and a well-defined, densely calcified, round lesion in the right parieto-occipital region. The lesion shows undulating membranes (b) which are attached to the choroid plexus (c)

morrhagic contusions in both frontal lobes (a) and a well-defined, densely calcified, round lesion in the right parieto-occipital region. Calcification was peripheral as well as central curvilinear. The lesion shows undulating membranes (b) which is almost diagnostic for hydatid cyst. Calcified membranes were attached to the choroid plexus (c). Coronal CT revealed the peripheral calcification and floating membranes. Intraoperatively, the cyst was attached to the choroid plexus. It was excised in toto without rupture and sent for histopathology which confirmed the diagnosis of hydatid. Hydatid cyst of the brain accounts for 1-2 % of all Echinococcal infections [1]. Usually these are seen in the paediatric population [2] and in the supratentorial compartment [1]. It is extremely rare for hydatid cysts to occur at intraventricular site [3]. Hydatid disease produced by the larval stage of the Echinococcus tapeworm is a worldwide zoono-

sis. Among the many carnivorous definite hosts of *Echinococcus*, the most common is the dog. The intermittent hosts are all mammals (often sheep and cattle). Humans get infected secondarily through the faeco-oral route by ingestion of contaminated food or milk. The contamination occurs by dog faeces containing ova of the parasite or by direct contact with dogs. The eggs are digested in the stomach, releasing the embryos. The embryos pass through the wall of the intestinal mucosa into the portal system and are carried to the liver where most larvae get lodged in the hepatic capillaries. Some may reach the lungs and occasionally, some may get entry into the systemic circulation, at times reaching the brain. The wall of Echinococcal cyst is composed of 3 layers: the outermost pericyst, the middle laminated layer and the inner germinal layer. Calcification of hydatid cysts usually manifests with a curvilinear or ring-like pattern representing calcification of the pericyst [4]. During the natural evolution towards healing, dense calcification of all components of the cyst occurs. The undulating membrane sign seen at computed tomography in our case is due to contained rupture of the endocyst. The hydatid fluid escapes into the potential space between the pericyst and endocyst; and the endocyst collapses. On CT and MR imaging, hydatid cysts are well-defined cystic lesion with signal intensity similar to that of cerebrospinal fluid. There is no associated oedema, the lesion does not enhance after intravenous administration of contrast material, and calcification is extremely rare [5]. A recent classification based on MRI findings classifies the cysts on the basis of their fertility activity and imaging morphology. Type 1 cystic echinococcosis (CE₁) are fertile active cysts and appear as unilocular cysts with or without any visible wall. Type 2 cysts (CE₂) are active and seen as a unilocular cyst containing multiple vesicles arranged peripherally. Type 3 (CE₃) is a transitional form containing scolices and are seen as cysts filled by multiple daughter cysts. CE₄ cysts show detached membranes and CE₅ are calcified lesions. CE₄ and CE₅ are inactive forms of hydatid cysts that have lost their fertility [6].

Differential diagnosis may include arachnoid cysts, porencephalic cysts and epidermoid tumors. Arachnoid cysts and porencephalic cysts are neither spheric nor are they entirely surrounded by brain tissue. The absence of significant rim enhancement, perifocal edema and mural nodules differentiates hydatid cysts from brain abscess and cystic astrocytoma [7]. The differential leukocyte count shows eosinophilia in many cases. Exploratory cyst puncture is dangerous as accidental rupture may cause anaphylaxis or secondary seeding. Stool, sputum or vomit samples can be studied for scolex if the cyst has ruptured into intestine, bronchus or bile duct. In routine laboratory diagnosis, the Enzyme-Linked Immunosorbent Assay (ELISA), the indirect immunofluorescence antibody test, immunoelectrophoresis (IEP) and immunoblotting (IB) are used [8].

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