Intraventricular neurocysticercosis mimicking colloid cyst

Case report

ARTI GUPTA, M.D., SURYA PRakash RAO NADIMPALLI, M.D., AND ROBERT P. CAVALLINO, M.D.

Department of Radiology, Advocate Illinois Masonic Medical Center, Chicago, Illinois

The authors recently encountered a unique case of anterior third ventricular neurocysticercosis in which the cyst exhibited an unusually high signal on T₁-weighted magnetic resonance imaging. The lesion’s signal intensity and location made differentiation from colloid cyst difficult. Intraventricular neurocysticercosis should be included in the differential diagnosis of a colloid cyst.

KEY WORDS • neurocysticercosis • magnetic resonance imaging • colloid cyst

In the 21st century, cysticercosis remains a worldwide public health problem, not just in developing countries but in developed countries as well because of increasing travel from and to regions in which the disease is endemic. ⁴ Taenia solium larvae (cysticerci) cause cysticercosis. When the cysticerci are lodged in the CNS, the disease is known as neurocysticercosis; this is the most common and most widely disseminated human parasitosis. ¹³

Neurocysticercosis can be asymptomatic or it can cause widely varied clinical manifestations, such as seizures, increased intracranial pressure, ischemic cerebrovascular disease, dementia, and signs of spinal nerve root or cord compression. These protean manifestations are dependent on the following variables: 1) the number of lesions; 2) the location of the CNS lesions (intracerebral, intraventricular, subarachnoid, intramedullary); 3) the type of cysticercus (Cysticercus cellulosae, C. racemosus); 4) the stage of development and involution of the parasite (vesicular or viable, colloidal, granular nodular, or calcified phase); and 5) the intensity of host immune inflammatory response (no response, leptomenigitis, encephalitis, granular ependymitis, or arteritis). ¹³

It has been found that MR imaging is preferable to CT scanning for the demonstration of intraventricular and subarachnoid cysts, as well as the accompanying signs of cyst degeneration and pericystic inflammatory reaction. A CT scan is preferable for the demonstration of parenchymal calcification. ⁵,¹⁰,¹¹,¹⁴,¹⁶,¹⁹

Both CT and MR studies are useful for tracking the evolution of the cysticercus within the brain parenchyma. ²,¹¹ Evolution of cysticercosis in the subarachnoid space or ventricular system is different from the usual pathway. Surgical data indicate that parasites in this location usually remain in the vesicular state. ²³ Because they are immersed in CSF, these cysticerci can evolve into the racemose form.

Magnetic resonance imaging permits direct visualization of intraventricular cysticercosis by demonstrating the cyst wall, scolex, or both. ⁶,¹⁹ This modality demonstrates that the cyst is usually isointense to CSF in all phases (T₁- and T₂-weighted and proton-density images). In our case of intraventricular cysticercosis, however, a cyst located in the anterior third ventricle was hyperintense on T₁- and T₂-weighted MR images, thereby mimicking a typical colloid cyst.

Case Report

Examination. This 24-year-old, previously healthy man was referred to our emergency room from another institution after experiencing severe headache, nausea, vomiting, and altered sensorium. A CSF sample contained high protein levels, and the white cell count was indicative of infection. An MR image of the brain demonstrated a 7-mm lesion in the anterior third ventricle. This lesion was hyperintense on T₁-weighted and fluid-attenuated inversion-recovery sequences (Fig. 1). The right lateral ventricle was dilated, and there was transependymal resorption of CSF. These findings were consistent with a colloid cyst obstructing the right foramen of Monro.

Initial Treatment. A ventricular drain was placed, and because subsequent CSF cultures confirmed bacterial menin...
Neurocysticercosis mimicking colloid cyst

Fig. 1. Axial T₁-weighted MR image (left; TE 11.4 msec, TR 400 msec) and axial fluid-attenuated inversion-recovery MR image (right; TR 6000 msec, TI 2000 msec, TE 99 msec) of the head demonstrating a small hyperintense lesion in the region of the foramen of Monro (arrows), which is causing dilation of the right lateral ventricle and transependymal resorption of CSF (arrowhead).

Fig. 2. Axial noncontrast-enhanced CT scan (left) and axial proton-density MR image (right) of the head demonstrating an intravascular lesion in the right lateral ventricle; the lesion is isodense and hyperintense, respectively (arrows). Note the mobile nature of the lesion. (The dense artifact in the anterior aspect of the right frontal horn is the intraventricular drain.)

gels, the patient was treated with antibiotic drugs until his CSF was clear. An MR image of the brain obtained the day before elective surgery for removal of the cyst revealed that it had migrated into the body of the right lateral ventricle (Fig. 2). Closing the drain did not result in ventricular dilation; the intraventricular pressure remained normal, and hydrocephalus did not recur.

Operation. During surgery, the right lateral ventricle was entered through a right frontal craniotomy. A gray mass, which was untethered to any structure, was easily separated from the ventricular wall and eventually was aspirated. A second, larger, similar-appearing mass was removed transcortically. The ventricular wall appeared clear. Histopathological studies of sections of the large mass, which was most likely the one observed on MR imaging, revealed multiple interconnected vesicles filled with clear fluid. The lining of the mass was consistent with that of a cysticercosis cyst.

Discussion

The CNS is involved in 60 to 90% of patients with cysticercosis.¹ The location of involvement can be parenchymal, intraventricular, meningeal, spinal, or a combination of these sites.²⁻⁴ Parenchymal cysts are the most common forms of neurocysticercosis, followed by intraventricular and cisternal cysts;⁵⁻⁶ a mixed form occurs infrequently. Approximately 17% of patients with neurocysticercosis have intraventricular cysts.¹² In a series reported by Zee, et al.,¹⁹ intraventricular cysticercosis tended to occur in isolation in the majority of cases. When these cysts are viable, they do not adhere to the ependyma and can migrate through the ventricular system causing mechanical obstruction at the foramina. Although intraventricular cysts usually remain in the vesicular stage on degeneration or death of the parasite, intraventricular larvae may adhere to the ependyma, causing focal ependymitis and ventriculitis, and making surgical excision more difficult.⁶ In this final stage, the fluid component of the cyst becomes turbid and gels, probably because of debris and proteinaceous material within it. The hydrogen in water, bonding with small molecular entities, decreases spin relaxation time, which results in an increased signal on T₁-weighted imaging.⁶ A degenerating cysticercus cyst in the posterior third ventricle that was hyperintense on T₁-weighted MR imaging has been reported by Spickler, et al.¹⁵

In our case, the signal intensity and location of the lesion in the anterior third ventricle, which mimics features of a colloid cyst, have not been reported previously.

Conclusions

We present a unique finding of a neurocysticercosis cyst in the anterior third ventricle that was hyperintense on T₁-weighted MR images. This case demonstrates that intraventricular cysticercosis should be considered in the differential diagnosis of a colloid cyst.

References


Manuscript received August 9, 2001.
Accepted in final form April 9, 2002.
Address reprint requests to: Arti Gupta, M.D., Department of Radiology, Advocate Illinois Masonic Medical Center, 836 West Wellington Avenue, Chicago, Illinois 60657. email: artijoshi1@hotmail.com.