Hydatid Cyst of the Brain
Report of a Case

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Hydatid infestation of the brain is an unusual manifestation of a disease which in any anatomical location is rare. Katz and Pan, in a collective review of 541 instances of echinococcosis diagnosed in the United States between 1892 and 1956, report that only 5 new cases were found annually. The majority of these individuals acquired the disease outside the borders of the continental United States. Incidence of the cerebral form in this series was 1 per cent contrasted with 70 per cent hepatic and 10 per cent pulmonary infections. A comparable figure of 2 per cent cerebral infections is quoted by Arañainiguez and San Julián from Uruguay, where the frequency of echinococcosis is considerably higher. Statistics regarding association of cerebral cysts with infection in other organs vary widely. As can be surmised, familiarity with the treatment of the intracranial form of hydatid disease has been most extensive in countries where sheep raising is common, yet, even in Roumania, intracranial hydatidosis represents only 1.6 per cent of 2,260 intracranial mass lesions.

Consistent with the rarity of intracranial hydatid cyst formation, the number of reports of operated cases in North America is small. Only 4 have been published. The first by Mudd in 1892 is of considerable historical interest representing, possibly, the first successful removal of an intracranial hydatid cyst. Another patient was reported by Craig and Kernohan in 1934 and a third instance was recently published by Ayres et al. A brief abstract concerning a patient found at operation to have a multilocular cerebral cyst was included in a study of the ecology of hydatidosis in the Northwest by Rausch and Schiller.

Another instance of cerebral hydatid cyst is presented here. Preoperatively, it was erroneously diagnosed as an avascular neoplasm on the basis of carotid angiography. A greater awareness of the possibility of echinococcosis might have led to a better planned operative approach with consequent avoidance of rupture of the cyst and spilling of its contents. The cyst was, however, successfully resected and the patient has returned to her usual activities.

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Case Report

Mrs. D.A. (Los Angeles County General Hospital PF322-34/42) was born in Mexico in 1910. Except for a month-long visit to her birthplace in 1957, she had lived in Los Angeles since 1922.

In March 1961 her right arm suddenly became weak and speech was noted to be slurred. This disturbance cleared within 3 days. The patient made a brief stay at a psychiatric hospital where a diagnosis of involutorial depression was recorded. Similar episodes recurred twice during the next 18 months. Beginning in August, 1962, the right upper and lower extremities became progressively weaker. The paresis was accompanied by right parieto-occipital headaches. Her right arm was burned in September, 1962, but no pain was experienced. Repeated questioning of the patient and her family failed to reveal any history of related prior illness. She had been pregnant 3 times and delivered without complications in 1930, 1936 and 1946.

Examination. When seen at the Los Angeles General Hospital on October 24, 1962, she seemed a well-developed and well-nourished woman with a blood pressure of 130/80, and a pulse of 80. The left parieto-occipital region of the skull was tender but no exostoses were palpable nor were any bruits audible.

The patient was oriented as to person and place but not as to time. Although bilingual, she had considerable trouble with word selection even in Spanish. There was equivocal blurring of the temporal margins of both optic discs. Right homonymous hemianopia was demonstrated by confrontation testing. There was hypesthesia in the right trigeminal distribution. The right lower facial muscles were weak. Paresis was also demonstrated in the right arm and to a lesser extent in the right leg. There was apraxia in the right hand. Sensory examination revealed right hemihypesthesia and hypesthesia as well as extinction of simultaneously applied tactile stimuli on the right side. Proprioceptive and vibratory sensibilities were diminished in the right leg. There were hyperactive tendon reflexes on the right side, normal abdominal reflexes and upgoing plantar responses bilaterally.

Laboratory examination. The hemoglobin was 14 gm. and urinalysis was normal. The lumbar cerebrospinal fluid pressure was 200 mm. of water. The fluid was clear, colorless and without cells; protein content was 53 mg. per cent, sugar 61 mg. per cent and chloride 121 mg. per cent. Roentgenogram of the chest was normal. Bilateral carotid arteriography revealed an avascular left frontoparietal and parietal lesion with a square shift of the anterior cerebral and pericallosal arteries to the right as well as a shift of the internal cerebral vein (Fig. 1a, b).

Operation. On October 27, 1962, a left parietotemporal
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Fig. 1. A. Left carotid arteriogram antero-posterior projection with shift of pericallosal vessels to the right under the falx and outline of a superficial avascular lesion by posterior middle cerebral branches. B. Lateral projection of carotid arteriogram with outline of avascular mass by branches of the middle cerebral artery.

craniotomy was performed. The bone appeared irregular and thin; atrophic dura was adherent to the bone in the mid-parietotemporal region. Immediately subdurally, a cyst was observed which ruptured at the time of reflection of the dural flap. Approximately 50 to 60 ml. of clear fluid escaped. This thin-walled cyst occupied the mid-portion of the left side of the calvarium and extended into the Sylvian fissure spreading it to expose the posterior insula. In the midst of the cyst, a 1/2 cm. yellow nubbin of firm tissue was found. The cyst wall was totally removed with the exception of a few adherent strands about the Sylvian vessels. The subdural space was drained with a #14 catheter. The dura was incompletely closed due to its extreme thinness and friability. An epidural drain was also placed because of persistent oozing of the dural surface in the vicinity of the lesion.

Postoperative Course. The patient awoke immediately postoperatively but a deepening comatose state and the appearance of a speech disturbance 3 days later led to reopening the craniotomy; a 2 cm. thick epidural hematoma was found and evacuated. Following the 2nd operation the patient's postoperative recovery was gratifying with progressive clearing of the weakness in the right hand and the speech disturbance. Sensory findings and hemianopisa soon disappeared and she returned to work as a seamstress. At her most recent examination in April, 1964, 18 months after surgery, the only residual was minimal weakness of the right hand. Focal motor seizures involving the right thumb had occurred 3 times. Two of the seizures were preceded by an ill-defined visual aura. Lumbar puncture performed 16 months following operation revealed fluid under pressure of 75 mm. of water, protein 69 mg. per cent and normal sugar and chloride contents. No cells were seen in the fluid.

Histological examination of the cyst wall revealed a layer of fibrous tissue investing a laminated, acellular membrane to which were attached germinal cells. Scolecites were numerous within the inner membrane and fluid (Fig. 2).

Discussion

Coincident with the increasing population of Western Canada and Alaska and the improvement of medical service to the native population, echinococcosis may become a more frequently encountered disease entity in North America. In one region of the Northwestern territory, 28 per cent of dogs were found to carry the tapeworm, E. granulosus. In addition to the dog, definitive hosts of the adult tapeworm may be other carnivores such as wolves, foxes and coyotes. Sweatman reports that 36 of 58 wolf carcasses were found infected. The herbivorous wildlife such as the deer, moose, caribou and rodents in addition to domestic hogs and cattle may serve as intermediate hosts. Cross infections may occur within these groups and the disease is widely spread by migratory species of wildlife. In other climates the usual intermediate host is the sheep. Certain of the wildlife may be specifically infected by E. multilocularis or sibiricensis which cause alveolar hydatidosis, a variant of the disease which may also lead to cerebral infection.

Man enters the cycle when food contaminated by the excreta of infected carnivores, usually canines, is ingested. The high frequency of this disease in children in localities where sheep raising is common is probably explained by intimate contact with pet sheep dogs. The ova which are excreted in huge numbers by the infected dog hatch in the duodenum of the intermediate host and are then spread hematogenously. The first barrier, and the most common site of infection, is the liver. The lung forms a second possible sieve. Primary cerebral infection is caused by hexancanth embryos which have bypassed both