Cerebral Hydatidosis
Clinical Case Report with a Review of Pathogenesis

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Cerebral hydatidosis or echinococcal cyst of the brain, uncommon even in endemic areas, is a rarity in North America. However, the prevalence of echinococcosis in the new state of Alaska increases the possibility of diffusion of this condition in the United States. The following case represents the third report of cerebral hydatidosis operated upon in the United States and the only one with metastatic cerebral localization. In this case there was a delay of 11 years between the onset of cerebral symptoms and their correct diagnosis. In our opinion this delay may have been caused by the sparse knowledge of cerebral hydatidosis in this country. To help supply such information this paper will include a review of the pathogenesis, parasitology, diagnosis, prophylaxis, and the treatment of echinococcosis.

Case Report

N.H.H. #A80996. J.P., born in Italy in 1898, arrived in this country in 1914, and never thereafter left the United States. His health apparently was good up to 1937 when he had precordial pain; he was admitted to the New Haven Hospital, where roentgenograms of the chest revealed three large cysts in the precordium, diagnosed as "calcified echinococcus cysts of the pericardium." Surgical removal of the cysts, recommended by the hospital staff, was refused by the patient. This part of the history has been reported by Tracy.48

In 1940, J.P. fell unconscious twice during a period of 4 months and was treated with Dilantin. Thereafter he suffered from sleeplessness, severe pounding headaches, and grand mal seizures, which recurred two or three times per month. In 1946 right hemiparesis and dysphasia developed, which persisted to the end of the patient's life. In 1948 he suffered from symptoms of acute intestinal obstruction, requiring emergency laparotomy, which revealed three cysts in the jejunal mesentery. Pathological sections of the cysts showed "a dense acellular fibrous tissue plus a layer of looser, more cellular fibrous tissue showing infiltration of a small number of small round cells and eosinophils. Neither these sections nor the preparations of the cystic fluid showed any evidence of parasites. Diagnosis: Multilocular cysts of mesentery with calcification" (see Postmortem Diagnosis below). The patient recovered uneventfully.

On June 18, 1951, J.P. was examined at the Out-patient Clinic of the Connecticut Valley Hospital† by one of the authors (C.M.A.). The patient complained of feelings of depression and persecution superimposed on his long-standing cardiac, gastrointestinal, and neurological symptoms. He had been free of epileptic seizures for about 6 months on an increased dosage of Dilantin.

Psychiatric examination showed unsystematized paranoid delusions and marked depression. However, on the basis of the symptoms of headache and hemiparesis with a history of cardiac echinococcosis, it was firmly believed that a condition of metastatic cerebral hydatidosis was present. The patient therefore was referred to the Neurosurgical Service of the New Haven Hospital with the diagnosis of "cystic infestation of the brain," and was admitted there on June 19, 1951.

Examination. Rate of pulse was 60, temperature was normal, and respiratory rate was 38. Blood pressure was 140/100. He had mild dysphasia, slight cardiac enlargement, systolic precordial murmur, weakness, hyperreflexia, and Babinski's sign on the right.

Laboratory Tests. Counts of red and white blood cells were normal; differential was not recorded. Spinal-fluid pressure was 120 mm. of water. The fluid contained 35 mg. per cent protein, Kahn reaction was negative, and colloidal gold curve was normal.

Electroencephalogram showed a focus of slow waves in the left occipital region extending to the left central leads. Flat roentgenograms of the skull were uninformative, but a pneumoencephalogram revealed a large mass in the left posterior parietal

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region with atrophy of the right hemisphere. An arteriogram showed this mass to be relatively avascular.

**Operation.** On July 5, 1951, under local anesthesia, a left parieto-occipital craniotomy was performed. Upon elevation of the dura mater a cystic mass was disclosed in the left posterior parietal region and was enucleated intact. No other superficial cysts could be detected.

**Postoperative Course.** Immediately following the operation the patient's dysphasia improved and his right hemiparesis disappeared totally. The next day, however, these symptoms reappeared and became more severe during the following 2 days. On July 10 and 11 the symptoms again subsided partially, but on July 12 the patient's general condition became critical, and he lapsed into coma. Epidural hemorrhage being suspected, the operative flap was reelevated, but only 10 ml of blood were found and removed. Probing of the brain for deep-seated hydatid cysts was not done because of the risk of death from anaphylactic shock. The patient failed to regain consciousness and expired on July 14, 1951.

**Surgical Pathology.** The operative specimen consisted of a globular viteline cyst, approximately 4 cm. in diameter, having two daughter-cysts, each 1 cm. in diameter attached to one of its edges. Microscopic sections showed that the wall of the cyst was composed of a thick outer amorphous keratinous layer separated by a well-defined basement membrane from a central epithelial layer of granular germinal cells. No brood capsules, scoleces, or hooklets were found in the cystic cavity. The cerebral tissue attached to the cyst showed chronic inflammatory reaction with marked fibrocytic and lymphocytic infiltration and moderate glial proliferation. More peripherally the cortex appeared normal with moderate vascular congestion. Diagnosis: "Parasitic cyst."

**Necropsy.** The surfaces of both hemispheres showed flattening of the gyri, without pressure cones. The left occipital lobe was occupied by a large cystic mass covered by 2-3 mm. of cortex and separated from the posterior two-thirds of the left lateral ventricle by a thin membranous layer (Fig. 1). The cystic cavity was lined by a membranous wall that contained several small cysts, grossly typical of echinococcal daughter-cysts. The left lateral ventricle was greatly enlarged. The brain stem showed an area of hemorrhage extending from the pons to the left lateral surface at the level of the mammillary bodies.

The left cardiac ventricular wall contained three cystic areas, each approximately 6 cm. in diameter, confluent at their common junction. One of these cysts had a calcified wall. The remaining cysts were lined by a fibrous wall and their cavities contained numerous small transparent cysts grossly typical of echinococcal daughter-cysts (Fig. 2). The myocardium was white and fibrous in the areas surrounding the cysts but elsewhere of normal color and consistency.

The mesentery of the first part of the jejunum contained several hydatid cysts, each approximately 2 cm. in diameter. No other pathological signs were found.

**Postmortem Diagnosis.** Echinococcal cysts of the mesentery, heart, and brain; probable cause of death, cardiorespiratory paralysis from bulbar hemorrhage.

**Review of Pathogenesis**

**Splanchnic Hydatidosis.** The echinococcal embryo burrows its way through the mucous and muscular layers of the intestinal wall and