CASE STUDY

Giant Hydatid Cyst in a 2-Year-Old Infant

Jihad Echnin1,2*, Abdel Hamid Jehri1, Nahla Zaari1, Said Hilmani1,2, Khadija Ibahioin1,2, Abdessamad Naja1,2, and Abdelhakim Lakhdar1,2

ABSTRACT

Background: Infantile cerebral hydatidosis is a serious infection and represents a major problem of public health that threatens the economy of countries in which it is endemic. It imposes a large-scale prophylaxis based on the interruption of the parasite cycle.

Case description: We present a case of a 2-year-old girl with no medical history living in a rural region (Sidi Ifni), where contact with dogs, sheep, and cattle is not uncommon. One month before her admission, increased intracranial pressure (ICP) symptoms appeared made of headaches, vomiting, and visual disturbances. 15 days later, motor deficits and impaired consciousness were installed. The clinical examination found a sleepy infant with a Glasgow Coma Scale at 14, left hemiparesis at 2/5 (Medical Research Council score), and bilateral 6th nerve palsy. A brain CT scan was performed, showing a round hypodense intraparenchymal lesion at the right frontal lobe. The intervention was performed to remove the giant hydatid cyst according to the Dowling-Orlando technique. Postoperatively the patient had no motor deficit. The histopathological exam confirmed the diagnosis of an echinococcus granulosis cyst.

Conclusion: Presentation of such a giant cyst in a 2-year-old infant is very rare. In such cases, genotype analysis of the parasite should be performed. The surveillance of dogs and periodic testing of their stools, with treatment if they are found to be infected, and preventing their access to raw offal at slaughterhouses and farms, will be effective in controlling the menace of hydatidosis.

Keywords: Albendazole, Brain hydatidosis, prognostic, surgical remove.

1. Introduction

Echinococcus granulosis is a parasitic organism primarily found in the intestines of animals such as dogs. However, its larvae can cause a disease known as hydatid cyst disease in humans, as well as cattle and sheep. Following ingestion, the parasite's eggs hatch in the small intestine, giving rise to larvae that penetrate the intestinal wall and blood vessels. These larvae then migrate to the liver or lungs, and in rare cases, they can enter the systemic circulation, potentially affecting other organs, including the brain. Hydatid cysts are most commonly observed in the liver (>65%) and lungs (25%) [1]. While the growth rate of cerebral hydatid cysts is typically around 1 cm per year [2], it’s important to highlight that cerebral involvement is relatively infrequent. The majority of cases of cystic hydatid disease are observed in children [3], [4]. In this article, we present a unique case of a giant hydatid cyst in a 2-year-old infant, highlighting its rarity and discussing the clinical implications. We also discuss the diagnostic challenges, treatment options, and the importance of early detection in such cases.

2. Patients and Methods

We present the case of a 2-year-old girl with no previous medical history, residing in a rural region (Sidi Ifni), where contact with dogs, sheep, and cattle is common. Approximately one month before her admission to the hospital, she started experiencing symptoms indicative of increased intracranial pressure (ICP), including headaches, vomiting, and visual disturbances. Around 15 days later, she developed motor deficits and a deterioration in consciousness.

Upon clinical examination, the infant appeared drowsy, with a Glasgow Coma Scale score of 14 out of 15. Left hemiparesis was observed, graded as 2 out of 5 on the Medical Research Council scale, along with bilateral 6th nerve...
palsy. Additionally, an abdominal examination revealed hepatomegaly. A brain CT scan was conducted, revealing a round hypodense intraparenchymal lesion measuring 78 × 82 × 70 mm in the right frontal lobe, exerting a significant mass effect on the midline (Fig. 1). An additional hepatic cyst was detected, through abdominal sonography.

Surgical intervention was performed under general anesthesia. A wide frontoparietal craniotomy was carried out, along with minimal corticotomy (Fig. 2). Utilizing the Dowling-Orlando technique, a flexible probe was inserted between the brain tissue and the cyst for hydropulsion. The entire surgical field was then irrigated with hypertonic saline solution (10%), known for its scolicidal properties. The cyst was successfully removed without any complications. Fig. 3 displays the postoperative CT image of the patient's brain. The image reveals the right frontal lobe where the hydatid cyst was located before surgical intervention. The CT scan demonstrates the successful removal of the cyst, with no evidence of residual lesions or complications. The postoperative CT image confirms the restoration of normal brain tissue and supports the effectiveness of the surgical procedure.

During the follow-up period, the patient exhibited complete recovery with no residual motor deficits. The histopathological examination confirmed the diagnosis of an Echinococcus granulosis cyst, and no signs of bacterial infection were found during bacteriological testing (although suspected based on post-operative imaging).

The patient was prescribed Albendazole (10 mg/kg) for a period of 3 months. She was discharged from the hospital on the fifth day following the surgical intervention. A subsequent surgery was planned to address the hepatic cyst.

3. DISCUSSION

Cerebral hydatid cysts, involve the intracerebral development of the *Echinococcus granulosus* parasite. While dogs serve as the usual definitive host, humans, sheep, and cattle act as accidental hosts. The duration required for the development of protoscolices is not precisely known, but
animal studies estimate it to be at least 10 months after infection. The growth rate of echinococcal cysts remains poorly understood. Limited ultrasound studies, such as an observational study conducted in Kenya, have reported that 43% of cysts showed growth rates between 6 and 15 mm per year, 30% exhibited growth rates of 1 to 5 mm per year, while approximately 16% either showed no growth or experienced collapse. These cysts can vary in size, ranging from a few centimeters in diameter to larger cysts containing up to 48 liters of fluid, known as giant cysts [5]. The presentation of a giant cyst measuring 70 mm in a 2-year-old infant, as observed in our case, is extremely uncommon. It has been suggested that the size of a hydatid cyst may be influenced by the parasite genotype. For instance, a recent study demonstrated that the average diameter of liver cysts caused by E. canadensis G7 was 5.9 cm (range, 3 to 10 cm) compared to 10.7 cm (range, 5 to 21 cm) for E. granulosus [6].

Intracranial hydatid cysts are rare, and their clinical presentation can vary widely. Common symptoms include progressive installation of increased intracranial pressure, with or without focal neurological signs, as observed in our patient. Seizures and visual disturbances are also reported [7]. The neurological examination can range from asymptomatic to extremely severe states, involving behavioral disorders and unconsciousness [7].

Serological tests such as enzyme-linked immunosorbent assay or indirect hemagglutination may yield positive results in 85% of patients. On CT scan, hydatid cysts typically appear as well-circumscribed, spherical or ovoid, hypodense, non-enhancing cystic lesions without pericystic edema. On MRI, they exhibit hypointensity on T1-weighted images and hyperintensity with a hypointense halo on T2-weighted images [1]. Occasionally, fine peripheral enhancement and perilesional edema indicative of active inflammation may be observed. While imaging can be useful for diagnosis and postoperative monitoring, it is not highly sensitive. The definitive diagnosis is histological, revealing the germinal membrane of the cyst [1].

The treatment of cerebral hydatid cysts involves a combination of medical and surgical approaches. Surgical treatment is recommended whenever possible. The Dowling-Orland technique, involving a large craniotomy and careful separation of the cyst from the brain tissue through irrigation with hypertonic saline solution, is a preferred method for cyst removal. This technique allows for complete removal of the cyst without rupture and minimal damage to the cerebral parenchyma. Aspiration puncture, although less frequently employed, may be considered for cysts at high risk of rupture, such as those located in the fourth ventricle, brainstem, or thalamus [7]. Antiparasitic treatment, typically with Albendazole, is administered at a dose of 10 mg/kg/day for 3 months [1]. Its use is contraindicated during the first trimester of pregnancy. The prognosis is generally favorable if the diagnosis is made promptly, leading to early treatment and the prevention of neurological sequelae. In addition to surgical intervention and drug therapy, preventive measures play a crucial role, necessitating the formulation of targeted public health policies to minimize the occurrence and impact of hydatid cysts [7].

4. Conclusion

In conclusion, we presented a rare case of a giant hydatid cyst in a 2-year-old girl. Cerebral hydatid cysts caused by Echinococcus granulosus are infrequent and predominantly affect children. Prompt diagnosis and appropriate treatment, including surgical intervention and medical therapy, are crucial for achieving a favorable prognosis and preventing neurological complications.

References