

## Commentary

Hydatid cyst is now a rare disease due to improvements in health and epidemic prevention. Human echinococcus, the genesis of the cyst, comes from a tapeworm called *Echinococcus granulosus*, which forms larval cysts in human tissue. The usual locations of hydatid cysts are the liver and lungs—an intracranial hydatid cyst is very rare. This case report by the authors is well written,<sup>[1]</sup> and it is one of the reports of a successful surgical intervention that is not performed routinely in developed countries. From the perspective of the neurosurgeon, there are two important questions that should be considered carefully:

- How to make a correct diagnosis before surgical intervention, either a hydatid cyst or an arachnoidal cyst?
- How to remove hydatid cysts unruptured?

These are the most difficult aspects of dealing with this disease.

For the first question regarding the differential diagnosis, advanced CT and MR imaging studies are crucial.<sup>[2]</sup> Generally speaking, hydatid cysts appear spherically-shaped, but arachnoidal cysts are not round in shape. In addition, arachnoidal cysts may be in communication with other CSF spaces and cisterns, but hydatid cysts are usually not. The density of the content of both cysts is similar to CSF, meaning isodense or slightly hyperdense compared to CSF. Peri-cystic edema and rim enhancement are not present in either cyst. Before surgical intervention, all surgeons should have an impression of which cysts it is, because surgical policy for the two is totally different. For a simple arachnoidal cyst, cystic fenestration is sufficient. However, preparations should be made for a more complicated procedure.

For the second question, the removal of a hydatid cyst should be complete and unruptured. Dowling's technique<sup>[3]</sup> seems safe and easy, but actually some pitfalls should be considered, especially cystic locations and surgical approaches.<sup>[4]</sup> The standard Dowling's procedures includes incising the cortex more than three-quarters of the diameter of the hydatid cyst, lowering the head to facilitate the cyst to fall, flushing the space between the cysts and surrounding brain tissues with warm saline, and then delivering it as an infant. However, some important factors should be taken into considerations:

- Cortical incisions have to be large enough, and over-retraction avoided.
- The bipolar cautery should be gently applied, monopolar cautery avoided, and especially, the adhesion between the hydatid cyst and the surrounding brain tissue dissected. Sometimes, a sharp dissection is better than a blunt dissection.
- The periventricular region is a dangerous location for hydatid cysts if the fluid within a hydatid cyst enters the ventricular system. Anaphylactic shock may occur consequently. Gelfoam pads can help to protect the opening of the ventricle, and avoid cystic content gushing into the ventricular system.
- Cottonoid strips can be placed between the plane of the cyst and brain tissue to prevent accidental rupture.

However, this “hydatid birth” method has many risks if a hydatid cyst is located in an eloquent area of the brain. Therefore, for these eloquent hydatid cysts, another method is the PAIR technique, which is used to avoid further neurological deficits. The PAIR procedure involves puncturing the hydatid cyst with a fine needle followed by aspiration, irrigation (3% saline), and resection. The cyst cavity is washed with saline for at least 3-5 minutes. Remember, this technique is reserved for cysts with a deep-seated and eloquent location in which a difficult delivery may cause deficits, because it carries the risk of contamination if contents are spilled.

Last but not least, although surgical resection of a hydatid cyst is the first-line treatment, perioperative administration of albendazole actually helps to sterilize the cyst. It may decrease the possibility of anaphylactic shock, and reduce the recurrence rate.<sup>[5-7]</sup> Corticosteroid is sometimes necessary to reduce the brain edema caused by manipulations. Successful treatment of intracranial hydatid cysts can be achieved with meticulous surgical and medical attention and technique.

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