Peri-Operative Diagnosis of Isolated CNS Echinococcus Presenting as Seizure and Headache

Nicole Rebusi MD¹ and Sophie Woolston MD²

Department of Internal Medicine¹ and Department of Infectious Disease²

Introduction

- Echinococcus is a zoonotic parasitic disease with a unique life cycle (Figure 1) that can infect humans via fecal-oral transmission.
- Eggs passed into feces become ingested by an intermediate host (livestock or sometimes, humans) and penetrate into the small intestine, thus migrating to other systems via blood with development into cysts.
- The greatest prevalence is found in the countries of temperate climate zones.
- In humans, infection primarily presents as cysts that are most commonly found in the liver (~65%), rarely are those infections observed in other organ systems.
- If left untreated, infected patients are at risk of developing organ dysfunction, as well as anaphylaxis from cyst rupture.
- Isolated intracerebral cystic echinococcosis lesions are extremely rare and represent only 1-2% of all cases.

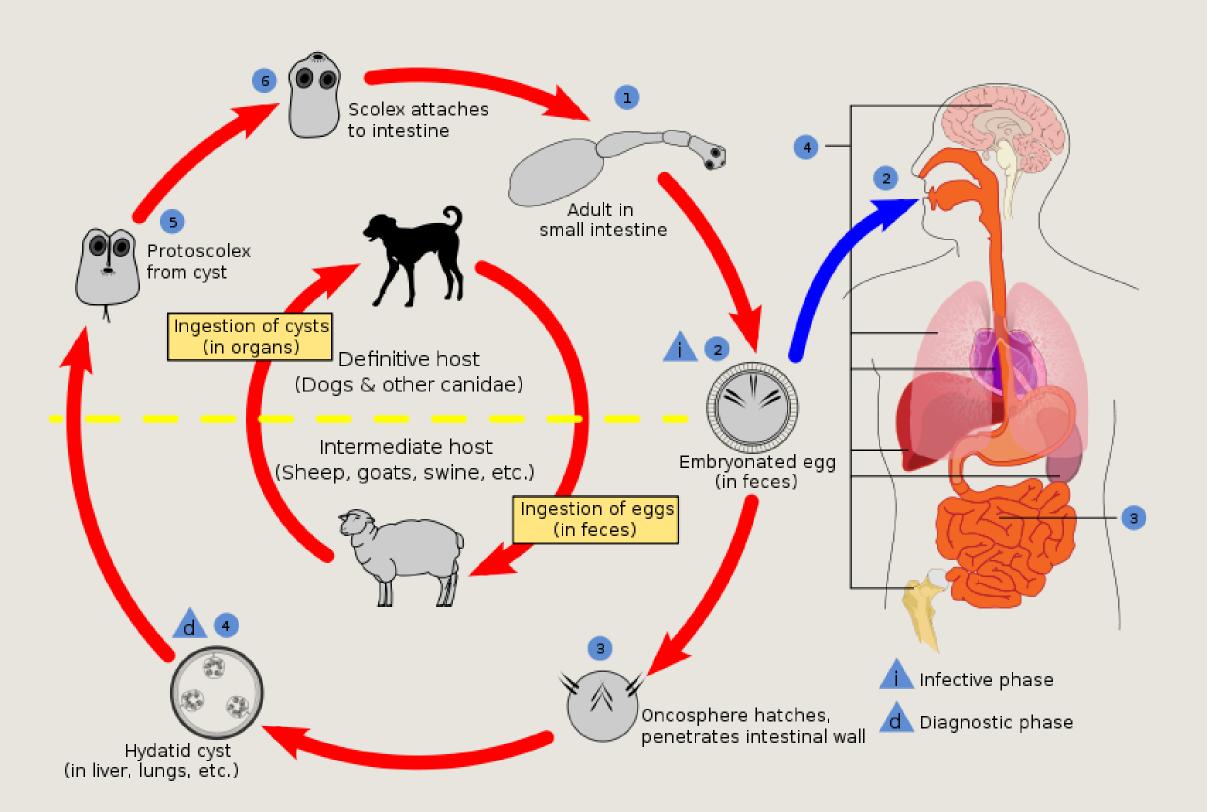
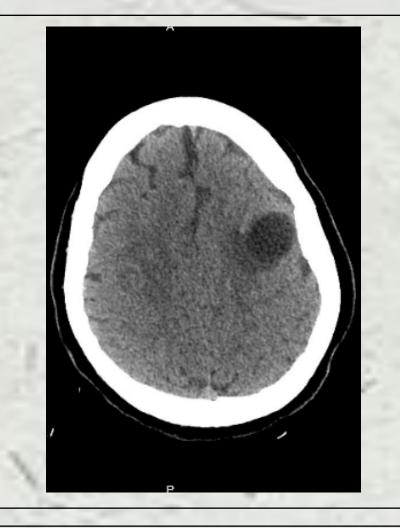


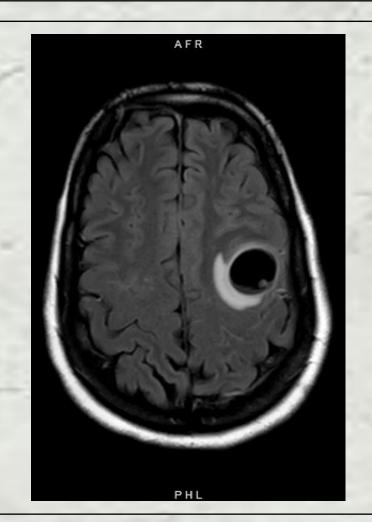
Figure 1. The life cycle of Echinococcus.

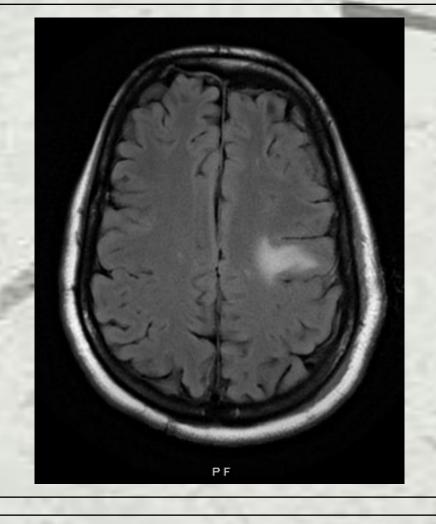
A case of isolate intracerebral echinococcosis in an adult female in Portland, Maine.

- A 41-year old immuno-competent female from Rwanda with one-year history of recurrent headache is evaluated in the emergency department for new-onset grand-mal seizures.
- She denied any contact with animals or recent travel, except for a 10-month trip to Rwanda two years prior where she recalls that she consumed meat that was prepared by other people.
- Laboratory findings were unremarkable.
- Physical exam did not reveal any focal neurological deficits.

Imaging







Hospital Course

- Despite a lack of clear preoperative diagnosis, it was decided to proceed with surgery given the patient's recurrent seizures and the lesion's accessible location.
- Intraoperatively, the neurosurgeon was suspicious of a parasitic infection given the resemblance of the observed mass to a hydatid cyst.
- The cyst was successfully resected however, with accidental rupture.
- The specimen was sent to pathology, with confirmatory identification of dead larvae, prompting the concern for parasitic infection without clear specific etiology.
- Infectious Disease was consulted for concern for management.

Diagnosis & Management

- The solitary, non-calcified, and anechoic nature of the cystic mass on imaging, as well as the report of gross inspection in the OR was highly suspicious for Echinococcus infection versus the more common Neurocysticercocosis.
- Empiric treatment was initiated with oral albendazole 15mg/kg/day for a minimum of 3 months to cover both organisms.
- Serologic studies were sent and returned positive for Echinococcal IgG antibodies a week later, confirming the diagnosis of Echinococcus.
- At two-week follow-up, she denied recurrent seizures and successfully resumed all activities of daily living.
- Follow-up imaging with MRI at 1- and 2-months revealed resolving postsurgical changes at the site of resection without evidence of recurrence.

Discussion

- Although rare in the United States, this case illustrates the importance of considering Echinococcus in the differential diagnosis of a cystic brain mass, especially in areas with large immigrant populations whom have traveled from countries with increased prevalence of parasitic disease.
- This case illustrates the rare possibility of non-hepatic cystic lesions as the causal representative finding of Echinococcus infection.
- Early recognition via history and radiologic findings may help guide management with early induction of anti-helminthic therapy, as well as increased preparedness to avoid cyst rupture during surgery.

References

- "CDC Echinococcosis Biology." Centers for Disease Control and Prevention, Centers for Disease Control and Prevention, 16 July 2019, www.cdc.gov/parasites/echinococcosis/biology.html.
- Moro, Pedro, and Peter M. Schantz. "Echinococcosis: a Review." *International Journal of Infectious Diseases*, vol. 13, no. 2, 2009, pp. 125–133., doi:10.1016/j.ijid.2008.03.037.
- Pandey, Sharad, et al. "Cerebral Intraventricular Echinococcosis in an Adult." Surgical Neurology International, vol. 6, no. 1, 2015, p. 138., doi:10.4103/2152-7806.163177.