

Denouement and Comment

Ruptured Hydatid Lung Cyst

The child was taken to the operating room and underwent a left lateral thoracotomy. The pleural cavity contained yellowish gelatinous matter. The parietal and visceral pleura were thickened, and the left lung was completely collapsed and displaced superiorly and medially. A bronchopleural fistula in the left lower lobe was actively discharging air. After decortication and resection of the inflamed parietal pleura, the lung was re-expanded and the fistula hole in the lower lobe was widened, thereby exposing a cavity. The cavity contained typical remnants of a pulmonary hydatid cyst capsule as well as multiple bronchial fistulas. As the disease had destroyed most of the lobe parenchyma, a left lower lobectomy was performed. Histopathological examination revealed typical structures of an *Echinococcus granulosus* cyst with calcified scolices indicative of an aged cyst (**Figure 3**).

Hydatid lung cysts are caused by the larva of the tapeworm, *E granulosus*, which is endemic to Africa, the Middle East, Latin America, the southwestern United States, and southern Europe.¹ The adult *E granulosus* tapeworm uses its scolex (head containing hooklets) to attach itself to the intestinal mucosa of its definitive host, the dog, and sheds eggs into the dog's stool. Intermediate hosts, namely livestock, become infected while grazing on contaminated soil, leading to the release of embryos into the duodenum. The embryos then travel into the portal circulation, where they complete the life cycle of the tapeworm and develop into cystic metacystodes.^{1,2} Humans may become intermediate hosts by in-

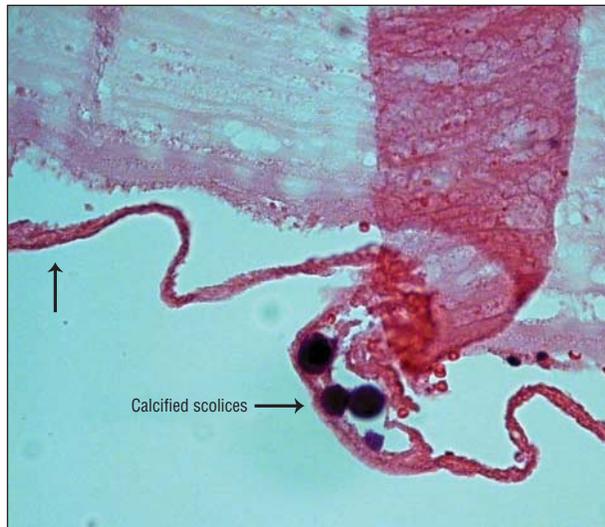


Figure 3. Cross-section of the patient's *Echinococcus granulosus* pulmonary cyst. The thin nucleated inner cyst layer produces protoscolices. Four calcified scolices, indicative of an aged cyst, are visible along the edge of the cyst wall. The cyst wall is composed of an acellular laminated external layer (horizontal arrow) and a thin, germinal (nucleated) inner layer (vertical arrow) (stained with hematoxylin-eosin, original magnification $\times 40$).

gesting the worm's eggs from contaminated water or soil or from contact with infected dogs. In this case, the child most likely became infected from his pet dog or from one of the numerous neighborhood dogs.

Infected individuals are always asymptomatic after primary infection and may become symptomatic if a cyst ruptures or from cyst mass effect. The typical incubation period ranges from months to years.³ Hydatid cysts typically occur in the liver (70%) and lung (20%), though the kidney, spleen, peritoneal cavity, skin, muscle, heart, vertebrae, and ovaries are occasionally affected.^{3,4} This child initially had chest pain due to pleural irritation from the large cyst and after its rupture had severe respiratory distress necessitating immediate surgical intervention.

Definitive diagnosis of cystic echinococcosis or hydatid disease is accomplished using imaging, including computed axial tomography. Serologic diagnosis may be helpful initially and for follow-up after surgical or medical treatment of the cyst. Enzyme-linked immunosorbent assay, indirect hemagglutination or immunofluorescence assay, radioallergosorbent testing, and latex fixation are sensitive but nonspecific methods of diagnosing echinococcosis. The immunoassays are compromised by the cross-reactivity of other helminths.^{1,3}

Surgical resection is the mainstay of therapy for lung cysts, in particular for large cysts compressing vital organs. Medical therapy with albendazole is beneficial; however, there is no uniform recommendation for duration of therapy. Percutaneous cyst puncture has been reported to cause anaphylactic reactions in a minority of cases. The relapse rate after removal of a lung cyst is 11.3%.⁴ Complications such as tension pneumothorax, pleural perforation, and bronchial perforation are rarely associated with echinococcal lung cysts.

The differential diagnosis of the child's initial presentation includes community-acquired pneumonia, lung abscess; cavitary tuberculosis; and less commonly, a cystic tumor. The radiological finding of a liver cyst on abdominal computed tomography together with the presence of an encapsulated structure in the lung prompted consideration of echinococcus. The child was discharged with a prescription for a 3-month course of albendazole and with plans for an elective liver cystectomy.

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Announcement

Submissions. The Editors welcome contributions to Picture of the Month. Submissions should describe common problems presenting uncommonly, rather than total zebras. Cases should be of interest to practicing pediatricians, highlighting problems that they are likely to at least occasionally encounter in the office or hospital setting. High-quality clinical images (in either 35-mm slide or electronic format) along with parent or patient permission to use these images must accompany the submission. The entire discussion should comprise no more than 750 words. Articles and photographs accepted for publication will bear the contributor's name. There is no charge for reproduction and printing of color illustrations. For details regarding electronic submission, please see: <http://archpedi.ama-assn.org>.