

CASE REPORT

Giant Hydatid Cyst of Lungs

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ABSTRACT

Introduction: Hydatid disease in humans is caused by zoonotic parasites, after accidental ingestion of food contaminated by ova of *Echinococcus granulosus*. Giant hydatid cyst of the lung is most commonly seen in children, but it is rare in human adults. The lung is the second most common organ affected by hydatid diseases after the liver in humans. History and radiological findings are usually helpful in diagnosing hydatid cysts, but serology can add to the diagnosis. A small pulmonary cyst may be asymptomatic; however, giant or ruptured cysts may develop fatal complications. The surgical intervention followed by pharmacological therapy is the treatment of choice for giant hydatid cysts of the lungs.

Case description: Here, we present a case of giant right-side hydatid cysts, presented with complaints of dyspnea, fever, and hemoptysis. The patient was successfully managed by right thoracotomy with an uneventful postoperative course.

Conclusion: Giant hydatid lung cysts can present with any respiratory symptoms with fatal outcomes. Surgery followed by pharmacotherapy is the treatment of choice for giant pulmonary hydatid cysts.

Keywords: *Echinococcus*, Hemoptysis, Hydatid cysts, Pulmonary.

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ABBREVIATION USED IN THIS ARTICLE

CECT = Contrast-enhanced computed tomography.

INTRODUCTION

Hydatid disease is caused by the larva of zoonotic parasite infestation by tapeworms belonging to the family Taeniidae of the genus *E. granulosus*.¹ Humans are accidental hosts, and dogs are definitive hosts in the life cycle of *Echinococcus*.¹ Domestic and wild animals are intermediate hosts. Dogs harbor the adult tapeworms in their small intestine, and eggs are excreted into feces, which is ingested by the intermediate host and goes to the liver via portal circulation where it further develops into cysts.² Humans accidentally ingest water or vegetables contaminated with echinococcal ova leading to hydatid cysts.²

Worldwide hydatid disease is endemic in sheep-raising areas like Mediterranean countries, the Middle East, South America, China, and India, especially, in Andhra Pradesh and Tamil Nadu.^{3,4} In one of the recent Indian studies in Rajasthan, 155 patients of hydration disease were found during 1 year time period, out of which 96 were men (61.93%) and 59 women (38.06%), and most of the patients were in their third decade. The liver was the most common (62.23%) organ followed by lung (27.74%).⁵

The majority (80%) of patients with hydrated disease are from rural backgrounds and have close contact with domestic animals.⁶ However, significant exposure to infected animals may not be present, and a high index of clinical and radiological suspicion combined with laboratory investigations are key for its early diagnosis.

The surgical intervention combined with chemotherapy albendazole and/or mebendazole is the treatment of choice for giant hydatid lung cysts (>6 cm) with mass effect.^{1,7} The rural population in developing countries like India is at higher risk for hydatid disease, due to poor hand hygiene and close contact with

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animals. Poor health-seeking behavior and lack of awareness of this disease lead the patients to take local remedies, leading to poor treatment outcomes. Disease awareness among the population and health-care workers are the key parts to prevent timely diagnosis and manage its fatal complications.

CASE DESCRIPTION

A 65-year-old male farmer, resident of Bijnor District, Uttar Pradesh, North India, visited our institute in July 2020 with chief complaints of progressive difficulty in breathing, intermittent low-grade fevers, right-sided chest pain, and cough with recurrent blood in sputum for the past 3 years. He had been consuming local traditional medicine with occasional relief, but he had no significant improvements. He was a buffalo shepherd for 40 years. He is vegetarian and had no significant past medical history and no history of a tuberculosis contact.

On his first visit, he was conscious, oriented, maintaining a saturation of 97% on room air. On examination, no pallor, cyanosis,

lymphadenopathy, edema, and icterus were found. His pulse rate was 106 beats per minute regular; the axillary temperature was 38.6°C; the respiratory rate was 20 per minute; and his blood pressure was 130/84 mm Hg. His chest examination revealed reduced air entry on the right side. His abdomen was flat with no tenderness, and the finding of the neurologic examination was unremarkable.

His hemoglobin level was 10.4 gm/dL; total leukocyte counts were 13,000 per microliter; procalcitonin was 1.8 ng/mL; and hydatid serology for *E. granulosus* was negative. His creatinine level was 0.84 mg/dL; serum urea was 28 mg/dL; and serum electrolytes and liver function test were within normal range.

His chest X-ray revealed multiple well-defined round cystic opacity in right upper and lower zones (Fig. 1). Contrast-enhanced computed tomography (CECT) thorax was ordered, which showed ill-defined nonenhancing lesions with enhancing peripheral wall in the right lower lobe largest measuring 10.2 × 7.4 × 8 cm (Fig. 2). His ultrasound thorax showed unilocular rounded well-defined hypochoic lesions (Fig. 3).

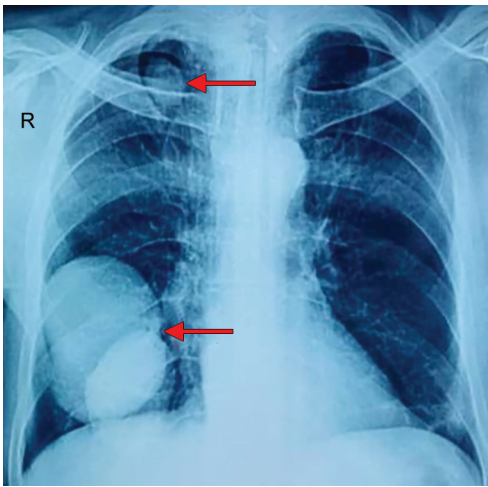


Fig. 1: Chest X-ray (PA view) showing multiple well-defined round cystic opacity (red arrow) in right upper and lower zones

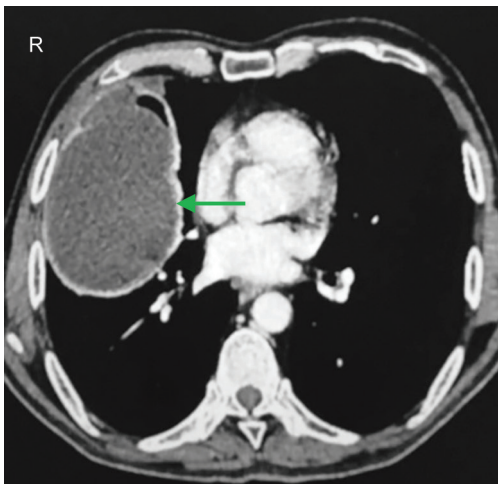


Fig. 2: CECT chest (mediastinal window, axial section) showing ill-defined nonenhancing lesion with enhancing peripheral wall in right lower lobe measuring 10.2 × 7.4 × 8 cm

His sputum smear for acid-fast bacilli, GeneXpert testing for *Mycobacterium tuberculosis*, was negative and the bacterial culture was sterile. He was started on intravenous ceftriaxone (1 gm) for 12 hours, metronidazole (250 mg) for 8 hours, and other supportive management.

In view of recurrent hemoptysis after taking surgical consent from the patient, the right thoracotomy was performed without any postoperative pulmonary complications. The histological report confirmed the hydatid cyst of the lung (Fig. 4). Patient was extubated on day 2 and started on oral albendazole (400 mg) daily and was discharged on day 15 after chest drain removal and advised to follow-up at the surgical outpatient clinic. Two weeks after discharge, he was found to be clinically stable with a healed chest wound, and chest X-ray showed minimal right-sided pleural effusion with lower zone opacity (Fig. 5). He was advised to continue albendazole (400 mg) daily to prevent recurrence of hydatid cyst and advised to follow-up within 3–6 months.

DISCUSSION

Hydatid disease is a parasitic infection caused by the larval form of *E. granulosus*. Out of four species (*E. multilocularis*, *E. vogeli*, *E. oligarthrus*, and *E. granulosus*), *E. granulosus* is the most common cause of hydatid cysts, and *E. multilocularis* is rare but more virulent

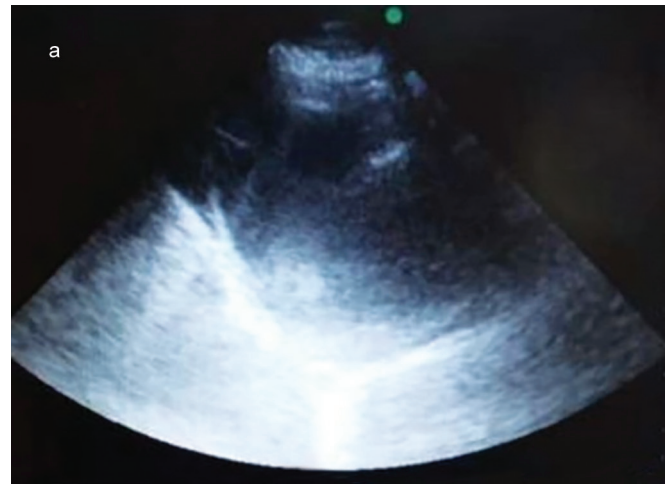


Fig. 3: Ultrasound thorax showed a unilocular rounded well-defined hypochoic lesion on normal breathing

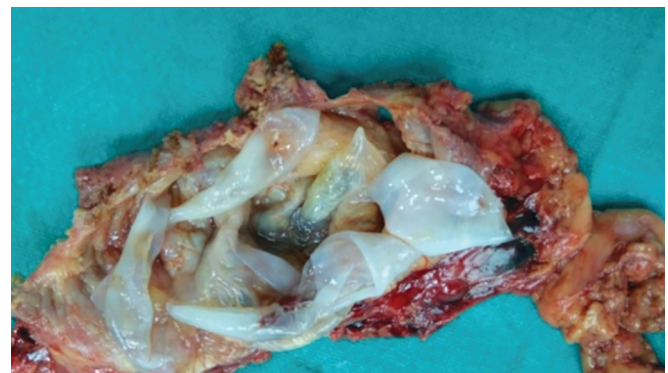


Fig. 4: Macroscopic view of giant hydatid cyst after removal with the greatest diameter measuring 10 cm



Fig. 5: Chest X-ray (PA view) at postoperative day 14 showing minimal right-sided pleural effusion with lower zone opacity

species, which causes alveolar echinococcosis.^{1,7} The incidence and prevalence of human infection are estimated to be more than 50 cases per 100,000 persons per year and 5–10%, respectively, in *Echinococcus* endemic areas.⁸

Clinical features depend on the site and size of the cyst and the presence of complications. Patients can present with hemoptysis, chest pain, dyspnea, fever, allergy, and sudden collapse. Hydatid cyst is suspected based on its clinical and radiological picture of cystic lesions with a background history of exposure to sheep and dogs. It can affect any organ but the liver is the most common organ (60%), followed by the lungs (20–30%) in adults.⁹ It can metastasize to the spleen and brain via the hematologic and lymphatic systems.

Giant hydatid cysts of the lung are rarely seen in adults. It is commonly seen in children, which is explained by the relatively higher elasticity of the lung tissue in children allowing the rapid growth of cysts.¹⁰ There is a higher chance of large cyst rupture in adults due to high resistance and low elasticity of lung tissue causing mass effect and/or rupture of cyst leading to anaphylaxis.¹¹ Peripheral blood eosinophilia (ruptured cysts), increased erythrocyte sedimentation rate, and procalcitonin and leukocytosis can be present in 25% of infected persons.^{11,12}

The chest X-ray film is the most important diagnostic tool in endemic areas with limited resources. There is no specific definition of a giant hydatid cyst, but the largest diameter of more than 6–10 cm occupying a part of the hemithorax or the entire hemithorax is considered in some literature.^{13,14} Giant pulmonary hydatid cysts can be located anywhere in the lungs, but the most commonly seen in the right lower lobe.^{13–15}

Contrast-enhanced computed tomography thorax may help in establishing the diagnosis, identifying the exact location of the cyst with size, and differentiating from malignant and pyogenic infections of the lungs. Magnetic resonance imaging of the thorax shows that high signal intensity on T2-weighted images can demonstrate different developmental stages of the cyst. The role of ultrasound in thoracic hydatid cysts is limited except when lesions are close to the thoracic wall and detect liver involvement.

Serological testing is useful in the primary diagnosis of hydatid cysts with sensitivity ranging from 50 to 60% in the pulmonary cyst.¹⁶

Bronchoscopy is usually not indicated for the diagnosis of hydatid cyst as it may provoke cyst rupture. The surgical intervention followed by albendazole (10 mg/kg for minimum of 6 months) is the treatment of choice for giant hydatid cysts. In a meta-analysis involving 4,255 patients with pulmonary hydatid disease, the surgical intervention showed mortality and morbidity rates of 1.45 and 0–17%, respectively, with excellent cure rates.¹⁷ In our case also, surgical intervention was done due to a giant cyst of the lung without any postoperative complications suggesting the key role of surgical treatment in such subsets of patients. Video-assisted thoracoscopic surgery can be useful for the removal of superficial and small hydatid cysts. In the case of multiple cysts, the priority of surgery should be given to the cyst based on their susceptibility to rupture, size, and the risk of dissemination. Aspiration is not recommended in pulmonary hydatid cysts due to the high risk of anaphylaxis.

CONCLUSION

Giant hydatid lung cysts can present with any respiratory symptoms most frequently encountered in children, but they can affect adults with fatal outcomes. Surgery followed by pharmacotherapy is the treatment of choice for giant pulmonary hydatid cysts. Pharmacotherapy can be considered in asymptomatic patients with small-sized hydatid lung cysts and surgical contraindications. Late presentation leading to fatal outcomes can be prevented by increasing awareness among healthcare workers and educating the community and implementing prevention and control strategies among the high-risk population.

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