Tehran University of Medical Sciences Publication
http://tums.ac.ir

Iran J Parasitol

Open access Journal at
http://ijpa.tums.ac.ir

Iranian Society of Parasitology
http://isp.tums.ac.ir

Case Report

Lung Cyst Hydatid Extracted via Bronchoscopy and the Necessity of Surgery: A Case Report

***Oguz Karcioglu [1], Ayşen Kara [1], Olcay Kurtulan [2], Serkan Uysal [3], Ziya Toros Selçuk [1]**

1. *Department of Chest Diseases, School of Medicine, Hacettepe University, Ankara, Turkey*
2. *Department of Pathology, School of Medicine, Hacettepe University, Ankara, Turkey*
3. *Department of Thoracic Surgery, School of Medicine, Hacettepe University, Ankara, Turkey*

Received 12 Jul 2024
Accepted 09 Oct 2024

Keywords:
Parasites;
Echinococcus granulosus;
Pulmonary infection;
Hemoptysis;
Hydatid cyst

***Correspondence Email:**
oguzkarcioglu@gmail.com

Abstract

Echinococcus granulosus remains a global public health issue. Although predominantly affecting the liver, the lungs are the second most affected organ and often undergo surgical intervention. Here, a case managed by bronchoscopy and medical therapy is presented. A 26-year-old woman was presented with a cough, hemoptysis, and a 5 kg weight loss in the last two months. Chest imaging identified a 4 cm centrally cystic mass lesion in the middle lobe of the right lung, which was suspicious of lung cancer. Bronchoscopy revealed a whitish, plastic-like object that was difficult to extricate and obstructed the middle lobe bronchus. We removed the material and purulent secretions covering it and opened the middle lobe bronchus totally. The histopathological study verified its consistency with hydatid cyst. There was no evidence of a hydatid cyst on computerized thomography after bronchoscopy. The lesion in the left lobe of the liver, confirmed to be suggestive of a hydatid cyst via ultrasonography, was treated using the PAIR technique. We administered oral albendazole to continue the treatment. It may be a reasonable approach to postpone surgery in order to preserve lung tissue in patients who have undergone complete removal of hydatid cyst material via bronchoscope.

Introduction

The lungs are the second most commonly affected organ after the liver in humans who are incidental intermediate hosts of *Echinococcus Granulosus* (1). The disease is endemic in Southeast Europe, Asia, South America, and sub-Saharan Africa and

acknowledged as a global public health issue (1, 2).

Although the majority of patients are asymptomatic, the most prevalent symptoms include dyspnea, chest pain, hemoptysis, cough, and malaise. Typical radiologic images and positive serologic tests supported by anamnesis are usually sufficient for diagnosis. The ruptured cyst material can be removed directly by coughing or during a bronchoscopy performed for differential diagnosis.

The use of bronchoscopy in the diagnosis and treatment of lung cyst hydatid remains controversial. We herein report a patient whose ruptured cyst hydatid was totally extracted during diagnostic bronchoscopy and who was subsequently treated medically instead of surgically.

Case Presentation

A 26-year-old woman with no relevant medical history from a rural village of Yozgat, a city in central Anatolia, Turkey was admitted to our chest clinic with cough and hemoptysis. She described hemoptysis as intermittent staining of napkins with blood following coughing for two weeks. She also complained about malaise, right sided chest pain due to coughing, and a 5 kg loss in the last 2 months.

Informed consent was taken from the patinent before the study.

She appeared pale and had mild tachypnea, with a respiratory rate of 22 breaths per minute. Vital signs revealed a blood pressure of 100/60 mmHg, a heart rate of 120/per min, an oxygen saturation of 96%, and a body temperature of 37.1 ℃. Crackles were heard on the right axilla and lower zone of the right lung. There was a local dullness on the right axilla with percussion. She also had a slight tremor in her hands, thought to be due to tachycardia. The remainder of the physical examination was unremarkable.

Laboratory examinations revealed a hemoglobin of 9.4 g/dL, a leucocyte count of $7.7x10^3$ /μL, neutrophils of 75.9%, lymphocytes of 16.3%, eosinophils of 1.4%, monocytes of 5.8%, and a platelet count of $395x10^3$ /μL. All other laboratory examinations were within normal limits.

An anteroposterior (AP) chest radiograph demonstrated a well-defined opacity obscuring the right heart border, suggesting the involvement of the right middle lobe (Fig. 1). A thoracic computed tomography (CT) examination revealed a mass lesion in the middle lobe of the right lung, measuring about 4 cm in diameter, with a central cystic necrotic character (Fig. 2a and 2b). A thick-walled cystic lesion with a diameter of approximately 4 cm at the lateral segment level in the left lobe of the liver was also reported (Fig. 2c). We questioned the patient about symptoms such as abdominal pain and nausea, which could suggest a liver hydatid cyst, but she denied it.

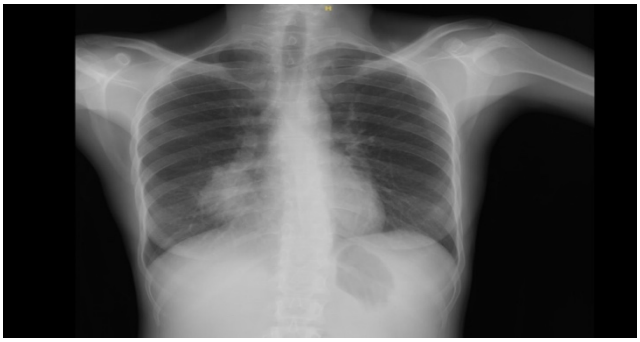

Fig. 1: Chest x-ray demonstrating opacity at right middle zone

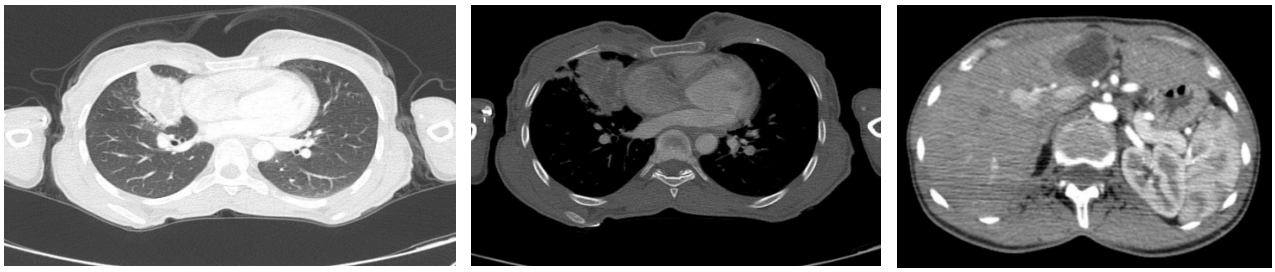

Fig. 2: Mass lesion in middle lobe. a) parencyme window, b) mediastinal window c) Thick-walled cystic lesion in liver

Since the middle lobe bronchus seemed to be obstructed on CT, fiberoptic bronchoscopy was performed. A highly viscous, cream-colored, plastic-looking material, which was originally thought to be a foreign body (burst white balloon) at first glance, was extracted from the middle lobe bronchus (Fig. 3). Afterward, we observed the middle lobe bronchus opening completely, and there was no residual material. We also sampled the enlarged lymph node at the subcarinal, right lower paratracheal, and right inferior interlobar stations via endobronchial ultrasonography (EBUS). Macroscopic examination of the excised specimen showed an 8.5x6.5x0.4 cm tan to white membranous material. Histopathologically, an eosinophilic laminated membrane with a germinal layer was seen, consistent with the wall of the hydatid cyst (Fig. 4). A fine needle aspiration of lymph nodes showed polymorphic lymphocytes, indicating reactive enlargement. The IgG ELISA value measured for follow-up was 3.5 (0-1.1).

Fig. 3: Balloon-like material extracted from middle lobe bronchus

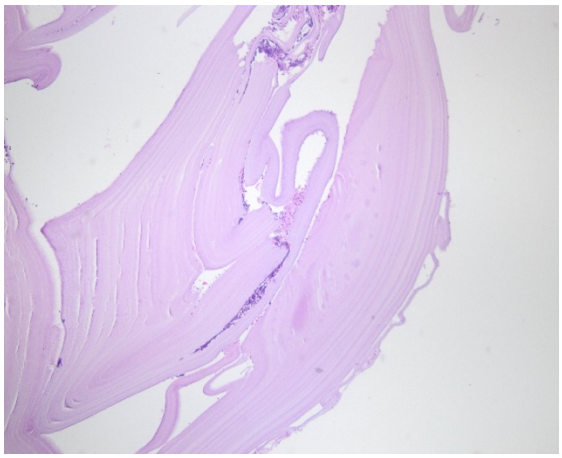

Fig 4: The hydatid cyst wall, which was extracted from the bronchi, is made up of a germinal layer and a laminated membrane (H&E stain 100)."

The thick-walled cystic lesion on the left lobe of the liver was confirmed by ultrasonography to be a cyst hydatid. The puncture-aspiration-injection-reaspiration (PAIR) was done successfully under fluroscopy. She was discharged on albendazole 2x400 mg/d. At the end of the first month, she was symptom-free except for malaise. The current CT scan showed no pathologic findings other than atelectasis accompanied by mild bronchiectasis in the right middle lobe (Fig. 5).

Fig. 5: Last CT image showing atelectasis and bronchiechtasiw wtih but no cyst or mass

Discussion

Humans are an incidental intermediate host in the *E. granulsous* life cycle. Found in the feces of main hosts such as foxes, wolves, and often dogs, proglottids, which contain large numbers of eggs, are transmitted to humans mostly through the ingestion of fecally contaminated food. Following ingestion, the eggs develop oncospheres that invade the intestinal mucosa, from where the oncospheres travel to their first destination, the liver (3, 4).

The lungs are the second most common site affected by hydatid cysts (20-30%) after the liver (70-80%) (1, 5). Approximately 20-35% of patients with pulmonary hydatid cysts also have liver disease (6, 7). Around 60% of cases of pulmonary hydatid disease mainly target the right lung and lower lobes (7).

Hydatid cysts usually develop throughout childhood but are frequently not diagnosed until adulthood since there is increased elasticity of the lungs during growing ages. Incidental identification of round-shaped opacities with well-defined borders on chest X-rays in asymptomatic individuals is the most common presentation (1). Typical symptoms include cough, dyspnea, hemoptysis, malaise, and chest pain, which is usually caused by tissue compression or complications such as rupture or pneumonia. Moreover, the absence of precise diagnostic laboratory tests makes hydatid cyst an imitator disease that is often confused with other diseases such as cancer and tuberculosis (8).

Although puncture is often not recommended for diagnosis or treatment purposes, the role of the endobronchial approach is not well studied. In a few case reports, the removal of the laminated membrane of a ruptured hydatid cyst was reported (9-11). In almost all cases, patients underwent surgery to completely remove the cysts. In a study analyzing 45 patients, patients were treated surgically after the diagnosis was confirmed (12). Ruptured cystic material could be completely removed by using a Fogarty balloon and saline injection (13).

Considering that rupture may lead to hypersensitivity reactions and even anaphylaxis, we believe that trying to manage the cystic material in a narrow space using a bronchoscope and saline may increase the risk of hypersensitivity reactions. Nevertheless, since the ruptured material may have been completely removed during diagnostic bronchoscopy, it may be advisable to wait for surgery and followed by medical therapy. Given that hydatid

cysts can recur in other parts of the lung, this approach may provide a chance to avoid early surgery.

Conclusion

The hydatid cyst of the lung remains challenging both diagnostically due to its mimicking nature and in terms of management. If the bronchoscopist feels confident that the ruptured cyst has been completely removed and the affected bronchus is fully patent, postponing surgery to preserve the lungs may be an option.

Acknowledgements

No financial support was received for this study.

Conflict of Interest

Authors declare no conflict of interest

References

1. Weber TF, Junghanss T, Stojković M. Pulmonary cystic echinococcosis. Curr Opin Infect Dis. 2023;36:318-325.
2. Paternoster G, Boo G, Wang C, et al. Epidemic cystic and alveolar echinococcosis in kyrgyzstan: An analysis of national surveillance data. Lancet Glob Health. 2020;8:e603-e611.
3. Gessese AT. Review on epidemiology and public health significance of hydatidosis. Vet Med Int. 2020;2020:8859116.
4. Rokni M. The present status of human helminthic diseases in iran. Ann Trop Med Parasitol. 2008;102:283-295.
5. Brunetti E, Kern P, Vuitton DA. Expert consensus for the diagnosis and treatment of cystic and alveolar echinococcosis in humans. Acta Trop. 2010;114:1-16.
6. Baden LR, Elliott DD. Case 4-2003: A 42-year-old woman with cough, fever, and abnormalities on thoracoabdominal computed tomography. N Engl J Med. 2003;348:447-455.
7. Santivañez SJ, Sotomayor AE, Vasquez JC, et al Absence of brain involvement and factors related to positive serology in a prospective series of 61 cases with pulmonary hydatid disease. Am J Trop Med Hyg. 2008;79(1):84-8.
8. Rawat S, Kumar R, Raja J, Singh RS, Thingnam SKS. Pulmonary hydatid cyst: Review of literature. J Family Med Prim Care. 2019;8:2774-2778.
9. Yasar Z, Acat M, Turgut E, Onaran H, Dincer HE, Arda N, Çetinkaya E. Diagnosis of pulmonary hydatid cyst by bronchoscopy. J Bronchology Interv Pulmonol. 2015;22:343-346.
10. Madan K, Singh N. Bronchoscopic diagnosis of pulmonary hydatid cyst. CMAJ. 2012;184:E158.
11. Yilmaz A, Tuncer LY, Damadoglu E, Sulu E, Takir HB, Selvi UB. Pulmonary hydatid disease diagnosed by bronchoscopy: A report of three cases. Respirology. 2009;14:141-143.
12. Ulaş AB, Eroğlu A, Aydın Y, Araz Ö, Ahmed A. The diagnostic value of fiberoptic bronchoscopy in ruptured lung hydatid cysts. Turk Gogus Kalp Damar Cerrahisi Derg. 2019;27:350-354.
13. Hejazi ME, Tekantapeh ST, Maddahi S. Bronchoscope saline injection method (me hejazi method) in ruptured peripheral and central pulmonary hydatid cysts: A case series. Universa Medicina. 2018;37:159-164.