

# Embolization of Ruptured Hepatic Hydatid Cyst to Pulmonary Artery in an Elderly Patient

## Multidetector computed tomography findings

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## عملية تسديد تكيس عداري كبدي متمزق إلى الشريان الرئوي في مريض

مسن

نتائج التصوير المقطعي المحوسب

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الانسداد الرئوي بسبب مرض العدارية هو عرض غير عادي ناتج عن تمزق تكيس عداري في القلب أو فتح عداري الكبد إلى الدورة الدموية الوريدية. دخل المريض البالغ من العمر 78 عاماً إلى قسم الطوارئ لدينا وهو يشكو من ضيق التنفس والسعال وآلام شديدة في الصدر. كشف فحص التصوير المقطعي المحوسب (MDCT) للصدر وجود عقيدات متعددة في كلتا الرئتين، مع غلبة في اليسار. أيضاً وجد خلال متكرر في الشريان الرئوي الأيسر الرئيسي وفروعه يظهر كتعبئه منخفضة السماكة. وبالإضافة إلى ذلك فإن صور MDCT أظهرت كتلتين من التكيسات منخفضة السماكة على الفص الأيسر من الكبد مع صمة كيسية في الأذين الأيمن. يجب أن نبقى في الاعتبار لدينا احتمال الانسداد الرئوي في المرضى الذين لديهم العداري الكبدية إذا فاجأهم ألم في الصدر وضيق التنفس، وخاصة في المناطق التي يكثر فيها مرض العداري.

مفتاح الكلمات: الانسداد الرئوي، تمزق، مرض الأكياس المائية الكبدية، التصوير المقطعي المحوسب، كبار السن، تقرير حال.

**ABSTRACT:** Pulmonary embolism due to hydatid disease is an unusual condition resulting from the rupture of a hydatid heart cyst or the opening of liver hydatidosis into the venous circulation. A 78-year old male patient complaining of dyspnea, cough and severe chest pain was admitted to our emergency department. A multidetector computed tomography of the chest revealed the presence of multiple nodules in both lungs especially in left and multiple hypodense filling defect in left main pulmonary artery and its branches. In addition, coronal reformatted multidetector computed tomography images also showed two hypodense cystic parenchymal masses on the left lobe of the liver with a cystic embolus in the right atrium. Pulmonary embolism should be kept in mind in patients who have hepatic hydatidosis if suddenly chest pain and dyspnoea occurs, especially in regions where hydatidosis is endemic.

**Keywords:** Pulmonary embolism; Rupture; Echinococcosis; Hepatic; Multidetector computed tomography; Aged people; Case report; Turkey.

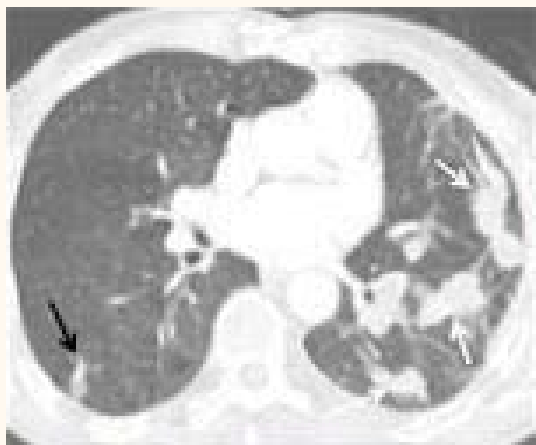
**H**YDATID DISEASE IS STILL AN important worldwide health problem. Although more dominant in definite sheep-raising countries, worldwide travel has made hydatid liver disease much more prevalent in previously unaffected regions such as Northern Europe or North America. Hydatidosis is a parasitic infection produced by the larvae of *Echinococcus granulosus*. Humans may contact the infection either by direct contact with a dog, which is the definitive host, or by ingestion of foods or fluids contaminated by the *E. granulosus* eggs, which

can be present in dog faeces.<sup>1-3</sup> After ingestion, the embryos in the eggs release and migrate, most commonly to the liver and lungs; however, other organs can also become involved.<sup>2,3</sup> The hydatid cyst of *E. granulosus* tends to develop in liver (50–70%), lungs (20–30%), or, less frequently, in other parts of the body, such as the brain, heart, and bones.<sup>1,4</sup> Hydatid pulmonary embolism is an uncommon condition. It is usually seen in cardiac hydatidosis but it can be also due to inferior vena cava (IVC) or hepatic vein invasion in liver hydatidosis.<sup>5</sup> We present multidetector computed

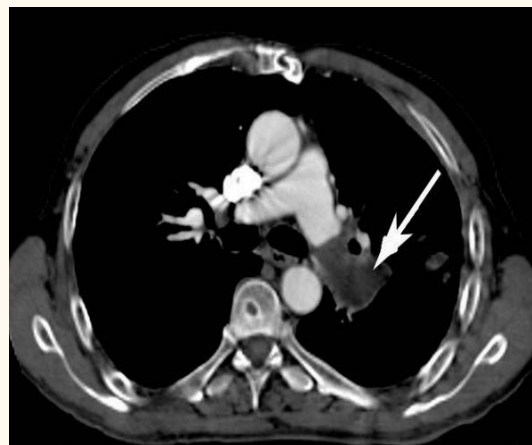
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**Figure 1:** Multidetector computed tomography scan showing irregular, defined patchy lesions (black arrow in right, white arrows in left) in bilateral lung parenchyma, especially in the left on lung window.



**Figure 2:** Multidetector computed tomography angiography shows hypodense masses located in the left main pulmonary artery (white arrow) and in the left distal pulmonary artery to the segmentary branches of the upper lobe.

tomography(MDCT) findings of a case of with liver hydatidosis causing massive pulmonary emboli.

## Case Report

A 78-year-old male patient was admitted to the emergency department of Kahramanmaraş Sutcu Imam University Hospital, Kahramanmaraş, Turkey, complaining of dyspnoea, cough and severe chest pain. The patient had undergone coronary artery bypass grafting 10 years before. On admission, the patient was dyspneic and mildly cyanotic. On examination, the respiration rate was 36 breaths/minute and chest auscultation revealed crackles in his lower left pulmonary fields. His blood pressure (BP) was 130/80 mmHg. The pulse rate was 96 beats/minute. The electrocardiogram was normal, there was no leg oedema, and a laboratory evaluation was within normal limits. The patient had no symptoms suggestive of an anaphylactic reaction.

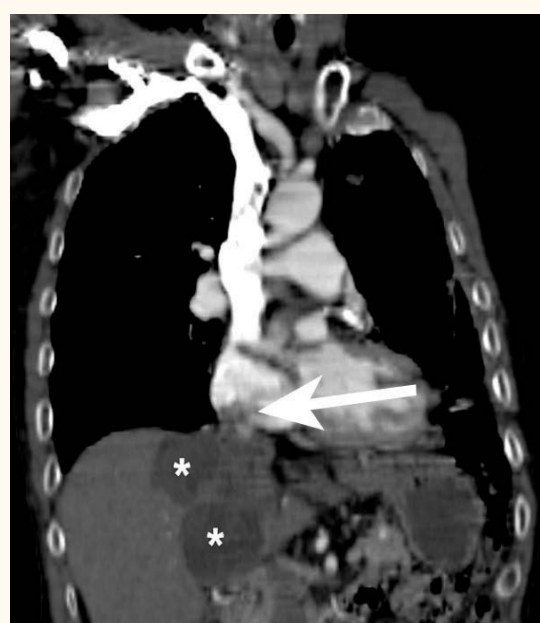
An MDCT pulmonary angiography was performed on suspicion of a pulmonary embolism. The MDCT of the chest with intravenous contrast administration showed multiple cysts in both lungs, with a predominance in the lower left lung [Figure 1], and a hypodense mass located in the left main pulmonary artery which was consistent with an intra-arterial hydatid cyst [Figure 2]. In addition, coronal reformatted MDCT images also showed two hypodense cystic parenchymal masses on the left lobe of the liver and a cystic embolus in

the right atrium [Figure 3]. The patient's clinical history and imaging findings, and the prevalence of hydatid cysts in Turkey led to the diagnosis of a pulmonary embolism complicating a liver hydatid cyst. The patient refused surgical intervention and so was treated with a 30-day course of albendazole (Andazol®) 10 mg/kg/day in two divided oral doses, and cetirizine hydrochloride (Zyrtec®), oral 10 mg tablet, once a day. After several days, the patient's dyspnea and chest pain resolved with medical treatment and was discharged with his consent.

## Discussion

The growth of hydatid cysts is usually slow and asymptomatic, and clinical manifestations are caused by compression of the involved organs. Additionally, if hydatid cysts are not detected in time, the cyst may become life-threatening and rupture.<sup>6</sup> Intrabiliary rupture is the most common and life-threatening complication but intracaval rupture of hydatid disease of the liver is a rare complication. Pulmonary artery embolism due to hydatid cyst is an extremely rare entity. There have been a few reports of embolisation following cyst rupture into the IVC or hepatic veins, but these reports have been made based mainly on post-mortem examinations.<sup>7-10</sup>

To the best of our knowledge, this is the first case in the literature where a ruptured liver echinococcal cyst resulted in pulmonary embolus in an elderly patient. In other studies, all patients were



**Figure 3:** Coronal reformatted multidetector computed tomography images show cystic embolus in the right atrium (white arrow), and hepatic hypodense cystic masses (\*).

younger than our patient. Being an elderly patient the possibility of a malignant disorder had to be excluded.<sup>11</sup>

Serology, laboratory studies, and skin tests are useful in the diagnosis of hydatid diseases but they lack prognostic value in the determination of intravenous rupture of the hydatid cyst.<sup>12</sup> The diagnosis of a hydatid pulmonary embolism is more effectively made through clinical and radiological findings.<sup>1</sup>

On enhanced CT, the intra-arterial cyst shows the typical hypodense appearance.<sup>1</sup> Coronal reformatted imaging can be a helpful diagnostic method in identifying the origin of the pulmonary hydatid emboli by showing the involvement in the IVC. Specifically, MDCT, which is non-invasive and easily available, is a very useful imaging modality for hydatidosis in the liver or other organs. Clinically, our case was not considered to be thromboembolic disease. Intra-arterial hypodense masses did not show contrast enhancement and that finding was interpreted as not in favour of an intra-arterial tumour.

Surgical intervention is the primary treatment for pulmonary artery hydatid embolus. Embolectomy and/or enucleation are often the preferred surgical options.<sup>13</sup> However, rupture of the artery and/or the cyst during surgical intervention may cause

dissemination of the disease, anaphylactic shock, embolism, and pseudoaneurysm formation.<sup>3</sup> The degree of the degenerative changes in the arterial wall, proximal or distal localisations of the pulmonary artery occlusion and irreversible parenchymal changes are factors influencing the selection of the operative procedure.<sup>3,4</sup> Some patients who refuse surgery should be treated with albendazole due to the disseminated nature of the hydatidosis.<sup>4,13</sup>

## Conclusion

A ruptured liver echinococcal cyst resulting in pulmonary embolus in an elderly patient is extremely rare. Pulmonary hydatid cyst emboli should always be one of the differential diagnoses of the hypodense and/or cystic intra-arterial pulmonary mass in a patient with hepatic hydatid cyst adjacent to the IVC or hepatic veins.

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