Primary Isolated extraluminal Hydatid Cyst of Left Pulmonary Artery Mimicking COVID-19 Infection

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Abstract

Hydatid cyst of pulmonary artery is extremely rare. There were few reports of intramural involvement of pulmonary artery secondary to cardiac or lung hydatic cyst in literature. To the best of our knowledge there was no report of primary isolated extraluminal hydatid cyst of left pulmonary artery. A twenty-eight–year-old female presented to the hospital with complaint of progressive dyspnea. The patients had no common COVID-19 infection symptoms. The RT-PCR for COVID-19 RNA was negative. Spiral chest CT-scan demonstrated a cystic mass sized 83×34 in middle mediastinum. Intraoperatively, the intrapericardial mass arising from left pulmonary artery and extended to the hilum of left atrium. The mass was resected and pathology report noted a hydatid cyst. The postoperative course was uneventful and the patient was discharged with administration of albendazol for 3 months. However hydatid cyst primary isolated extraluminal hydatid cyst of pulmonary artery are extremely rare, in cases with pulmonary artery stenos or hypertension manifestation should be considered as a probable differential diagnoses. Regarding to ongoing COVID-19 pandemic the present case misdiagnosed with coronavirus infection.

Introduction:

Cystic echinocccosis also known as hydatid cyst is caused by tapeworm of the echinococcus type; The cysts most commonly found in liver (70%), lung (20%) and in other organs such as spleen and kidney (10-15%).[1, 2] Cardiac and cerebral involvements by the hydatid disease are rarely reported. Regarding pulmonary artery, there are few reports on intramural involvement of pulmonary artery, with subsequent obstructive symptoms such as chronic exertional dyspnea.[1] These cysts are the result of disseminated larvae of the parasite from other primary sites such as lung that enter bloodstream (secondary echinococcosis). To our knowledge in the previous literature no reports of primary extra luminal hydatic cyst with signs and symptoms of pulmonary artery compression and stenos have been made.

Case Presentation:

The patient is a twenty-eight-year-old woman with a history of dyspnea and shortness of breath for the last month. During this period, she experienced shortness of breath when engaged in routine activities, chest discomfort and fatigue. She did not mention any symptoms of cough, nausea, vomiting, diarrhea and fever, and no direct contact with a coronavirus-infected person. Additionally, in the last two weeks, she went to a hospital in her city of residence and echocardiography was conducted for her which, according to her, did not have any remarkable findings. However, after two weeks, not only the symptoms did not improve, but they deteriorated. She presented to our hospital for more investigations. She had no history of previous surgery or hospitalization, though she was on Losartan for controlling her chronic hypertension since five months ago. In primary examinations, heart and lung auscultation were normal and the vital signs included respiratory

rate = 22 per minute, pulse rate = 102 per minute, blood pressure 150/100 mm Hg, O2 saturation = 97%, and temperature = 36.8°C.

Regarding to ongoing COVID-19 outbreak, the COVID-19 RT-PCR test was requested for her and the result was negative.

Spiral chest computed tomography demonstrated 83×34 mm cystic lesion in middle mediastinal juxta pericardial with thick wall anterior to the left pulmonary artery. (Figure 1, LPA) In Interaoperative observation, the cystic mass arising from left pulmonary artery extended to left atrium hilum and caused compression on left pulmonary artery were observed (Video1, LPA). The mass was resected and sent to laboratory for culture and pathology investigations. The histopathological assessment demonstrated a hydatid cyst.

The postoperative course was uneventful and the patient was discharged with administration of albendazol for 3 months. Three month later in the postoperative follow-up visit, the patient stated no complaints.

Discussion:

Hydatic cysts of the heart are extremely rare with an incidence of 0.02-2% and these cysts are barely affect pulmonary arteries.[1] Despite being rare, the sequences of pulmonary artery involvement such a pulmonary embolism a pulmonary hypertension, rupture and anaphylaxis or cardiac arrest are life-threatening.[3] Several explanation has been described to contribute to the involvement of pulmonary artries: 1.migration of the larvae into the artery wall through "vasa vasarum", 2.larvae entering the lumen as a result of direct damage from lung parenchyma, 3.blood dissemination through liver or other organs.

H Alper et al. reported a patient with recurrent hydatic cysts involving several organs that undergone several operations. The patient's manifestation was chronic dyspnea that later was diagnosed via MR and CT-scan as occlusion of pulmonary artery due to rupture of an intramural cyst and thrombosis formation in the lumen; The thrombosis was removed by surgical intervention.[1] Another possible mechanism of thrombosis is the rupture of cysts locatedin the right heart chamber.[4] Arwa et al. reported a 86-year-old female with previous liver hydatic cyst; Four years later the patient presented with productive cough and dyspnea. The radiologic findings on MRI and CT demonstrated several multiseptate cysts in the lumen of right pulmonary artery besides several primary cysts in the lung parenchyma.[5] These cases showed the presence of secondary hydatic lesion in the lumen as a result of simultaneous cysts in other primary organs. Only Aysegul S et al. reported an intra-luminal cyst with obstructive effect on left pulmonary artery and its branches found onendobronchial US investigation which seemed to be a primary cyst.[3]

Diagnosis of hydatic cysts is based on radiologic and serologic findings.[4] Ultrasonography, plain radiographs, MRIs and CT-scans or a combination of these methods are used based on the clinical situation. Magnetic resonance features of hydatic cysts on T2 images include spherical shape, with hyposignal rim on the outside (host reaction) and central signal similar to cerebrospinal fluid.[1] Computed tomography studies also show cysts fluid attenuation with defined borders and enhanced contrast on the surrounding tissue.[6]

Symptoms of primary lung cysts might remain silent for years and the cysts might be the incidental findings of radiographic investigations. Symptomatic intact cysts in the lung parenchyma might represent with cough, hemoptysis and chest discomfort.[7] Due to cyst's slow growth and formation of collateral blood perfusion, hydatic cysts in the pulmonary artery remain asymptomatic until obstruction occurs—that obstruction could be due to mass effect or rupture and subsequent thrombosis.[5, 8] The decrease in the pulmonary flow due to obstruction or mass effect on bronchi explains the dyspnea.[3] Regarding to the current COVID-19, our case was initially misdiagnosed as SARS-COV2 infection. Several factor led to inaccurate initial COVID-19 diagnosis like the pandemic precautions, lack of previous hydatic cyst history, shorter duration of symptoms and clear initial assessments in the first hospital. However, negative RT-PCR and CT-scan findings ruled out COVID-19 infection.

Lack of sufficient evidence and standandardized protocols limits the options of treatment. It is suggested that the surgical removal is treatment of choice in cases with life threatening obstruction of vital vessels.[1, 5, 9]

The hydatic cysts of the pulmonary artery are rare—but life-threatening—and limited to case reports. Most of these cysts are secondary to cysts in the lung or the liver and found in the intramural or luminal space. In this case the patient with no history of hydatic cysts in the lung parenchymarepresented symptoms such as dyspnea and shortness of breath. Regarding to the pandemic and symptoms that mimicked COVID-19, the patient was misdiagnosed as COVID-19 infection. Our report shows that primary hydatic cyst with mass effect in the extra luminal surrounding of pulmonary artery is a possible diagnosis that should be considered and investigated through radiographic evaluations. The treatment choice is made based on patient situation to relieve symptoms which in this case were successful surgical removal.

Conclusion:

The pulmonary artery involvement by hydatid cyst was limited to case reports. In this case we reported a primary isolated extraluminal hydatid cyst arising from pulmonary artery with progressive dyspnea due to compression of cyst on pulmonary artery. Regarding the pandemic and symptoms that mimicked COVID-19, the patient was misdiagnosed as COVID-19 infection. However extraluminal hydatid cyst of pulmonary artery is extremely rare, it should be considered as a probable differential diagnoses in similar cases.

Abbreviations:

RT-PCR: Reverse transcription polymerase chain reaction

CT: Computed tomography

COVID-19: Coronavirus Disease 2019

RNA: Ribonucleic acid

SARS-COV2: Severe acute respiratory syndrome coronavirus 2

MRI: Magnetic resonance imaging

LPA: left pulmonary artery

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Figure and video legend:

Figure 1, LPA: axial view of chest CT- scan demonstrated 83×34 mm cystic lesion in middle mediastinal juxta pericardial with thick wall anterior to LPA; the mass is marked with a star in the photos.

Video 1, LPA: Intera-operatively, the cystic mass arising from LPA extended to left atrium hilum and caused compression on LPA were observed. The mass is under the surgeon's hand and the surgeon is dissecting the mass from the pulmonary vein.