Case report

Mesenchymal cystic hamartoma of the lung

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ABSTRACT

Mesenchymal cystic hamartoma, although first reported as early as 1980s, remains a very rare lung disease. There have been less than 20 cases reported to date. Mesenchymal cystic hamartoma usually has an indolent course, but it could potentially result in morbidity and mortality. Biopsy is needed to confirm the diagnosis because it is essential to rule out other possibilities including malignancy.

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1. Introduction

Mesenchymal cystic hamartoma of the lung (MCH) was first described in 1986. It is a very rare disease with an indolent clinical course that is predominantly comprised of immature mesenchymal cells that gradually leads to formation of multiple bilateral cysts and nodules [1]. The spectrum of clinical presentation varies from hemoptysis, pneumothorax, hemothorax, pleuritic chest pain, dyspnea to serious complications like sudden massive uncontrollable intra-cystic hemorrhage and rarely malignant transformation. Up until 2012, there have been only 15 cases of this disease reported in the literature [2]. We present a rare case of MCH in a 51-year-old female.

2. Case report

We present the case of a 51-year-old postmenopausal female, who was a lifelong nonsmoker with no known respiratory disorders who presented to our clinic for evaluation of multiple bilateral pulmonary nodules and cysts. The nodules and cysts were found incidentally on computer tomography (CT) scan of the abdomen during a work up for nephrolithiasis.

On presentation, she had no respiratory complaints. She had no significant environmental or drug exposures. She has two healthy children. Physical exam revealed normal lung findings.

Further workup included a dedicated CT scan of the chest, which showed multiple bilateral non calcified pulmonary nodules and cysts (Figs. 1 and 2).

The largest lesion was seen in the superior segment of the left lower lobe, measuring 1.1cm. Pulmonary function test showed mild obstructive defect unresponsive to bronchodilators, normal lung volumes with mildly decreased diffusion of carbon monoxide (DLCO). Rheumatologic and alpha-1-antitrypsin work up was negative. Genetic test for Birt-Hogg-Dube was negative.

The nodules were not positron emission tomography (PET) scan avid. However, Lymphangioleiomyomatosis (LAM) and malignancy remained on the differential.

Patient underwent elective video-assisted thoracoscopic surgery (VATS) and left lower lobe wedge resection which demonstrated a pulmonary hamartoma (Fig. 3). Pathology of the cystic lesions showed cysts lined with normal respiratory epithelium. No malignant component was found on biopsy.

Immunostains for human melanoma black 45 (HMB-45), melena-A, microphthalmia-associated transcription factor (MITF), anti-muscle actin (HHF-35) and beta catenin were performed on the tissue samples and were negative. This made the diagnosis of LAM, blastoma and myosarcoma unlikely.

MCH is a diagnosis of exclusion. However, based on the clinical presentation and imaging result combined with the histopathology, we believe this is MCH.

Her clinical course remained benign. At a follow up approximately 3 years later at our clinic, she remained asymptomatic.

3. Discussion

MCH is defined as the imbalance in growth of the endodermal respiratory epithelium and the mesodermal vascular elements, leading to the formation of nodules and cysts [1]. The theory is that the nodules and cysts represent different stages of the same disease with the nodules occurring first [1].

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Fig. 1. CT scan of the lung showing bilateral lower lobe cystic changes. Also demonstrated is the dominant left lower lobe nodule.

As the nodules become bigger, especially after reaching a diameter greater than 1 cm, the nodules transform into cysts [1]. It is also possible for the nodules to cavitate over time, broadening the differential diagnosis further [3].

These cyst and nodules are lined with normal respiratory epithelium [1]. The cysts and nodules are more commonly seen in a bilateral distribution, but the lesions may be unilateral at the earlier stages [1]. Although the disease may be detected in infancy, it progresses over a period of many years; three or four decades usually elapse before it comes to clinical attention [1].

The spectrum of clinical presentation varies from hemoptysis, pneumothorax, hemothorax, pleuritic chest pain, dyspnea to serious complications like sudden massive uncontrollable intracystic hemorrhage and rarely malignant transformation [2]. Patient could also be asymptomatic and found incidentally as in our case.

MCH of the lung should be included in the differential diagnosis for a patient with recurrent pneumothorax or hemoptysis and nodules or cysts on a chest imaging [4].

MCH can have different radiologic appearances, which may vary due to the amount of calcification, the nature of the cystic material, and the anatomic location of the mass.

MHC needs to be differentiated from the other conditions which have similar clinicoradiographic presentations like pleuropulmonary blastoma, cystic adenomatoid malformation (CAM) and

Fig. 3. Hamartoma (hematoxylin-eosin, original magnification $\times 20$).

lymphangiomyomatosis (LAM). Therefore, lung biopsy is needed to confirm the diagnosis.

Cystic hamartomas may resemble CAM radiologically and histologically. CAM differs in that histologically, it comprises of fibrous tissue and other mature elements, whereas the stroma in cystic hamartomas comprise of significant amount of primitive mesenchymal cells [5]. Also, it is unlikely to present with CAM at this age. LAM commonly occurs in women of reproductive age. Chest images are usually consistent with diffuse cystic lesions that are uniformly distributed in both lungs without a nodular component [2]. In addition, the immunostains in our case were negative for LAM.

There have been reported cases of malignant changes in mesenchymal cystic hamartoma to mesenchymal sarcoma [6]. This is another compelling reason to obtain a biopsy.

Molecular analysis has emerged as an essential component for an accurate diagnosis in mesenchymal tumors if available. This was demonstrated by a case of recurrent pneumothorax which was diagnosed as MCH [4]. However, the case was rejected after 23 years based on genetic analysis [7]. This further reinforces the fact that MCH is a diagnosis of exclusion.

The course is usually benign; however it could be fatal especially in cases of pulmonary hemorrhage [8].

While surgery might be necessary for complications like recurrent pneumothorax or malignancy, routine surgical resection

Fig. 2. CT scan of the lung showing bilateral nodules and cystic changes.

is not recommended due to the multicentric and usual benign nature of the disease [2].

Close surveillance is recommended due to the potential of malignant transformation [6].

4. Conclusion

Cystic hamartomas, although usually benign, could be fatal. It should be included in the differential diagnosis of an atypical cystic chest mass or nodule.

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