Rare disease

Pulmonary lymphangioleiomyomatosis associated with retroperitoneal lymphangioleiomyomas

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Summary

A 36-year-old woman presented with worsening symptoms of abdominal pain, diarrhoea, low fever, dyspnoea on exertion and bilateral leg during the last 2 months. Chest radiograph showed mild diffuse reticular pattern with preserved lung volumes. Lung high resolution CT disclosed multiple thin-walled lung cysts throughout the lungs bilaterally with no zonal predominance and with normal intervening parenchyma and abdominal CT revealed bilateral retrocaval and retroperitoneal hypodense masses. Imaging findings were consistent with lymphangioleiomyomatosis.

BACKGROUND

Pulmonary lymphangioleiomyomatosis (LAM) is a very rare interstitial lung disease and it is even rarer to be associated with intra-abdominal pathology such as retroperitoneal tumours – lymphangioleiomyomas. Both pulmonary LAM and retroperitoneal lymphangioleiomyomas have characteristic high resolution CT (HRCT) and CT findings accordingly. Pulmonary LAM can be confidently diagnosed by HRCT findings obviating lung biopsy.

In this context – retroperitoneal cystic masses in patients with pulmonary LAM – are assumed to be lymphangioleiomyomas, unless there are clinical indications of abscess or tumour. However in the rare case of sole abdominal lymphangioleiomyomatosis, biopsy is needed to confirm diagnosis.

CASE PRESENTATION

A 36-year-old woman presented with worsening symptoms of abdominal pain, diarrhoea, low fever, dyspnoea on exertion and bilateral leg weakness during the last 2 months.

INVESTIGATIONS

Chest radiograph showed mild diffuse reticular pattern with preserved lung volumes. Pulmonary function tests revealed reversible airflow obstruction. Lung HRCT disclosed multiple thin-walled lung cysts throughout the lungs bilaterally with no zonal predominance and with normal intervening parenchyma consistent with pulmonary LAM (figure 1a,b). Abdominal CT (figure 2a,b) revealed bilateral retrocaval and retroperitoneal hypodense masses consistent with lymphangioleiomyomas. According to the ERS Guideleines 2010, a definite diagnosis of LAM was established.¹

DIFFERENTIAL DIAGNOSIS

Langerhans cell histiocytosis, lymphocytic interstitial pneumonitis, centrilobular emphysema and Birt-Hogg-Dubé syndrome.

TREATMENT

The patient was started on oral progestins and bronchodilators. Sirolimus was not administered as the patient was not enrolled in a clinical study.

OUTCOME AND FOLLOW-UP

One year follow-up showed mild increase of forced expiratory volume in 1 s and improvement of patient's dyspnoea.

DISCUSSION

LAM is a rare disease of unknown origin that almost exclusively affects women in childbearing age. It is characterised by cystic destruction of lungs and proliferation by abnormal smooth-muscle-like cells of lymph nodes, lymphatics, blood vessels, alveoli, mediastinum and retroperitoneum. LAM occurs in 30–40% of women with tuberous sclerosis complex (TSC); when LAM is seen independently of TSC, is called sporadic (S LAM)^{1 2} and has a reported prevalence of 3.4 to 7.8/million women in seven countries included in a recent epidemiological study.³ Recently it has been found that inherited mutations of the TSC-1 or TSC-2 genes cause TSC, while acquired (somatic) mutations of either gene are associated with sporadic LAM resulting in constitutive activation of the kinase mammalian target of rapamycin (mTOR). This has led to trials of mTOR inhibitors including sirolimus.^{4 5}

Pulmonary manifestations of LAM usually predominate consisting of thin-walled lung cysts throughout the lungs

Figure 1 High resolution CT scans at the level of the middle lobe and lingula (a) and lower lobes (b) demonstrate multiple thin walled lung cysts of variable size, with no zonal predominance and with normal intervening lung parenchyma.

Figure 2 Contrast-enhanced CT of the abdomen. a) Bilateral retrocrural masses of low density are seen. b) Two hypodense masses retroperitoneally to the left of the abdominal aorta are disclosed.

with no zonal predominance on HRCT, recurrent pneumothoraces and chylous effusions. In 50% of cases LAM presents abdominal pathology including renal angiomyolipomas, abdominal lymphadenopathy, lymphangioleiomyomas and chylous ascites. Abdominal manifestations occasionally precede the diagnosis of pulmonary LAM, while in rare cases the disease presents exclusively in the abdomen with no associated pulmonary involvement mimicking lymphoma, metastatic lymphadenopathy, ovarian cancer or other retroperitoneal tumours.

Lymphangioleiomyomas are cystic masses – or cystic collections of chylous material – formed by lymphatic obstruction and dilatation of lymph vessels as a result of proliferation of smooth muscle cells in the lymph vessels. They occur in up to 20% of patients with LAM. They may increase in size during the day (reported change in volume ranging from 4 to 564%). Diurnal variation has been attributed to either to diet, gravitational or physical activity factors. At CT the lymphangioleiomyomas may have either thin or thick walls and may contain material low in attenuation ranging from fatty to watery content. Lymphangioleiomyomas are differentiated by the lymphangiomas by the fact that the latter ones are endothelium-lined lymphatic spaces that lack the characteristic smooth muscle LAM cells in their walls.⁶

The radiologist is in a position to be the first to suggest the diagnosis of LAM. Pulmonary LAM can be confidently diagnosed in most cases by characteristic lung HRCT

findings obviating the need for open lung biopsy, if it is accompanied by retroperitoneal cystic masses or definite or probable TSC.¹ In this context retroperitoneal cystic masses in patients with pulmonary LAM – are assumed to be lymphangioleiomyomas, unless there are clinical indications of abscess or tumour. In the rare case of sole abdominal lymphangioleiomyomatosis, biopsy is needed to confirm diagnosis.⁷

Learning points

- HRCT of the lung can confidently suggest pulmonary LAM in most cases characterised by the presence of multiple thin-walled lung cysts throughout the lungs bilaterally with no zonal predominance and with normal intervening parenchyma obviating the need for lung biopsy. However in atypical cases, lung biopsy may be indicated to confirm the diagnosis of LAM.
- In 50% of cases LAM presents associated abdominal pathology including renal angiomyolipomas, lymphadenopathy, lymphangioleiomyomas and chylous ascites. Very rarely LAM presents exclusively intra-abdominal pathology.
- Lymphangioleiomyomas are cystic collections of chyle, manifested on CT as thin or thick-walled masses containing hypodense material.

Competing interests None.

Patient consent Obtained.

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Please cite this article as follows (you will need to access the article online to obtain the date of publication).

Oikonomou A, Tzouvelekis A, Zeros P, Bouras D, Prassopoulos P. Pulmonary lymphangioleiomyomatosis associated with retroperitoneal lymphangioleiomyomas. *BMJ Case Reports* 2012;10.1136/bcr.09.2011.4808, Published XXX

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