Introduction

Pulmonary lymphangiomyomatosis (LAM) is a progressive lung disease that affects exclusively young women of child bearing age and is characterized by diffuse proliferation of abnormal smooth-muscle cells and cystic destruction of the lung parenchyma. Clinically, LAM is characterized by progressive dyspnea with exertion, fatigue, pneumothorax, chronic cough, wheezing and chest pain, chylothorax and an obstructive or mixed restrictive and obstructive pattern on pulmonary function tests. There are various therapeutic modalities for LAM with differing efficacy and lung transplantation remains the only therapeutic option for patients with advanced disease.

Case Report

A 36-year-old female, non-smoker, presented to us with acute onset breathlessness and sudden onset right sided chest pain. Clinically she had tachypnea, tachycardia and hyper-resonant percussion note with decreased breath sounds on the right side of the chest. There was no evidence of digital clubbing, lymphadenopathy, oral ulcers or skin lesions. Cardiovascular examination was unremarkable and no organomegaly, masses or ascites were detectable in the abdomen. An X-ray chest was done, which showed a right sided pneumothorax with the collapse of lung and an intercostal tube was inserted. After 72 h of Inter costal drain (ICD) insertion her lung showed complete expansion with no air leak and she was symptomatically better. A repeat chest X-ray was done, which showed fully expanded right lung with bilateral cystic changes [Figure 1a and b]. A high resolution computerised tomography of chest (HRCT) was planned but due to economic reasons it could not be done and patient was discharged with advice to follow-up.

After few days of discharge patient was readmitted with similar complaints of sudden onset breathlessness and right sided chest pain. Her examination findings were consistent with right sided pneumothorax, which was confirmed on X-ray chest [Figure 2a]. An ICD was reinserted. HRCT was done [Figure 3] which showed multiple well-defined diffusely distributed variable sized and irregular shaped cystic areas in bilateral lung fields present in both intraparenchymal and subpleural location with few nodules and increased linear interstitial markings with right pneumothorax, which were suggestive of cystic lung disease, probably LAM. Patient did not have evidence of any fluid in the pleural cavity. This time even after 72 h, patient did not have complete lung expansion and continued to have air leak [Figure 2b]. After 5 days, patient was referred to a Pulmonologist for further intervention.

Discussion

LAM is a rare cystic interstitial lung disease that exclusively affects women of child bearing age and is associated with

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**Abstract**

Lymphangiomyomatosis (LAM) is a rare cystic interstitial lung disease that exclusively affects women of child bearing age and is associated with vascular proliferation of smooth muscle cells in the lung. We report a case of young female with pulmonary LAM presenting with recurrent pneumothorax.

**Keywords:** Cystic disease, lymphangiomyomatosis, pneumothorax, pulmonary

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vascular proliferation of smooth muscle cells in lung and cystic destruction of lungs.\textsuperscript{1} LAM occurs in two main forms: Tuberous sclerosis complex (TSC)-associated LAM (TSC-LAM) and sporadic LAM (S-LAM). LAM occurs 30% in cases of TSC, but TSC-LAM constitute only 15% of patients of LAM.\textsuperscript{1}

Patients with TSC-LAM have features of tuberous sclerosis in the form of central nervous system hamartomas, developmental delay and cutaneous manifestations like ash-leaf macules, shagreen patches and seizures. S-LAM occurs in premenopausal women who present with progressive exertional dyspnea, chronic non-productive cough, spontaneous pneumothorax or chylothorax and is frequently associated with renal angiomyolipomas (AMLs).\textsuperscript{2} Breathlessness being the most common symptom (75%) followed by spontaneous pneumothorax in 50% patients and chylothorax in 20% patients. Less common presenting features include hemoptysis and chyloptysis. Proliferation of smooth muscle in pulmonary lymphatics usually results in obstruction thus leading to chylothoraces.\textsuperscript{1} Pneumothoraces occur in approximately 60-70% of LAM-patients with a recurrence rate of 70%, which is the highest among all chronic lung diseases.\textsuperscript{3} Our case most probably would have been a S-LAM presenting with spontaneous recurrent pneumothorax and breathlessness.

In a case of LAM, a plain X-ray chest usually shows a hyperinflated lung with reticular or reticulonodular pattern. Cysts and bullae can be seen on plain X-ray chest, but their anatomical detailing can only be done on HRCT.\textsuperscript{3-5} Various cystic lung disease can be clearly differentiated based on the type of cysts, pattern of distribution of cysts and other associated findings.\textsuperscript{6} It is a consensus that in presence of suitable clinical situation, HRCT finding suggestive of LAM is usually enough to clinch the diagnosis and a biopsy is not required for confirmation. Examples of such situations include patients who present with known TSC, recurrent pneumothorax, chylothorax or renal AML. Lung biopsy, generally through a video-assisted thoracoscopic approach, should be considered when there is doubt about the diagnosis or when there are one or more alternative diagnostic possibilities with different management.\textsuperscript{1} Even in our case HRCT clinched the diagnosis in presence of clinical scenario.

Immunostaining with HBM-45, specific for smooth muscle components namely actin and desmin can be employed to improve sensitivity and specificity.\textsuperscript{7}

LAM has been seen in premenopausal women, with oral contraceptive use,\textsuperscript{2,8} and incidence is increased in pregnancy.\textsuperscript{9,10} Hence estrogen has been implicated as having a role in its pathogenesis. In our case, the patient was a young women, pre-menopausal without a history of oral contraceptive use. Though in few reported cases of LAM in post-menopausal women the progression of disease has been slow,\textsuperscript{11} LAM registry concluded that progesterone, oophorectomy and even, a partial estrogen receptor antagonist also appears to worsen the disease.\textsuperscript{2}

According to the latest evidence even the first episode of pneumothorax in a case of LAM should be treated with pleurodesis, since it opens the possibility of recurrent pneumothoraces.\textsuperscript{2}

However, it has been found that in cases that had received pleurodesis with talc, had intraoperative technical difficulties.
during lung transplantation due to severe hemorrhage caused either by pleural adhesions or disease itself. However, there have been cases of successful lung transplantation after pleurodesis and it is no longer considered as an absolute contraindication.

Lung transplantation in patients of LAM is usually considered in view of recurrent refractory pneumothoraces, severe hypoxemia or declining lung function (FEV1 < 30% of predicted FEV1). Till date over 130 patients of LAM have received successful lung transplantation. Lung transplantation can be an effective treatment for end-stage LAM; however, LAM cell migration into the transplanted lung can result in recurrence. A recent study also showed that Sirolimus was an alternative drug for LAM. Sirolimus has made its way into the treatment modality for LAM based on its action of inhibition of mammalian target of rapamycin (mTOR) pathway. Though Sirolimus is an established treatment for end-stage LAM; however, LAM cell migration into the transplanted lung can result in recurrence. A recent study also showed that Sirolimus was an alternative drug for LAM. Sirolimus has made its way into the treatment modality for LAM based on its action of inhibition of mammalian target of rapamycin (mTOR) pathway. Though Sirolimus is an established treatment for LAM, it is no longer considered as an absolute contraindication.

LAM being a very rare disease and there are still many questions unanswered as to understanding the mechanism and progression of disease. But a case of recurrent spontaneous pneumothorax usually perplexes the primary care physician. Knowledge of LAM as a cause of recurrent spontaneous pneumothorax especially in young females would be helpful for primary care physician for diagnosis. It is also necessary to understand that early referral to Pulmonologist by primary care physician for pleurodesis may help the patient tremendously.

References

1. McCormack FX. Lymphangioleiomyomatosis: A clinical update. Chest 2008;133:507-16.
2. Ryu JH, Moss J, Beck GJ, Lee JC, Brown KK, Chapman JT, et al. The NHLBI lymphangioleiomyomatosis registry: Characteristics of 230 patients at enrollment. Am J Respir Crit Care Med 2006;173:105-11.
3. Spiliopoulos K, Tsantsarisidou A, Papamichali R, Kimpouri K, Salemis NS, Koukoulis GK, et al. Recurrent spontaneous pneumothorax in a 42 years old woman with pulmonary lymphangioleiomyomatosis: Insights and pitfalls of the surgical treatment. J Clin Med Res 2013;5:70-4.
4. Kirchner J, Stein A, Viel K, Dietrich CF, Thalhammer A, Schneider M, et al. Pulmonary lymphangioleiomyomatosis: High-resolution CT findings. Eur Radiol 1999;9:49-54.
5. Chu SC, Horiba K, Usuki J, Avila NA, Chen CC, Travis WD, et al. Comprehensive evaluation of 35 patients with lymphangioleiomyomatosis. Chest 1999;115:1041-52.
6. Hartmann TE. CT diagnosis of cystic lung diseases. Radiol Clin North Am 2001;39:1231-43.
7. Bonetti F, Chiodera PL, Pea M, Martignoni G, Bosi F, Zamboni G, et al. Transbronchial biopsy in lymphangioleiomyomatosis of the lung. HMB-45 for diagnosis. Am J Surg Pathol 1993;17:1092-102.
8. Yano S. Exacerbation of pulmonary lymphangioleiomyomatosis by exogenous oestrogen used for infertility treatment. Thorax 2002;57:1085-6.
9. Yockey CC, Riepe RE, Ryan K. Pulmonary lymphangioleiomyomatosis complicated by pregnancy. Kans Med 1986;87:277-8, 293.
10. Weinaus MJ, van Loon AJ. A diagnosis of lymphangioleiomyomatosis in a pregnant woman presenting with a retroperitoneal mass. Br J Obstet Gynaecol 1999;106:747-8.
11. Baldi S, Papotti M, Valente ML, Rapellino M, Scappaticci E, Corrin B. Pulmonary lymphangioleiomyomatosis in postmenopausal women: Report of two cases and review of the literature. Eur Respir J 1994;7:1013-6.
12. Boehler A, Speich R, Russi EW, Weder W. Lung transplantation for lymphangioleiomyomatosis. N Engl J Med 1996;335:1275-80.
13. O'Brien JD, Lium JH, Parosa JF, Deyoung BR, Wick MR, Trulock EP. Lymphangioleiomyomatosis recurrence in the allograft after single-lung transplantation. Am J Respir Crit Care Med 1995;151:2033-6.
14. Karbowniczek M, Astrinidis A, Balsara BR, Testa JR, Lium JH, Colby TV, et al. Recurrent lymphangioleiomyomatosis after transplantation: Genetic analyses reveal a metastatic mechanism. Am J Respir Crit Care Med 2003;167:976-82.
15. Chachaj A, Drozdz K, Chabowski M, Dziegiel P, Grzegorek I, Wojnar A, et al. Chyloroperitoneum, chylothorax and lower extremity lymphedema in woman with sporadic lymphangioleiomyomatosis successfully treated with sirolimus: A case report. Lymphology 2012;45:53-7.
16. Yakupoglu YK, Kahan BD. Sirolimus: A current perspective. Exp Clin Transplant 2003;1:8-18.
17. Garreau S, Massad MG, Tshibaka M, Hanhan Z, Caines AE, Benedetti E. Sirolimus-associated interstitial pneumonitis in solid organ transplant recipients. Clin Transplant 2005;19:698-703.

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