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Case Report

Pulmonary Langerhans cell histiocytosis with Skin involvement; an amazing case report

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Abstract

Introduction: Langerhans cell histiocytosis (LCH) is a rare disease characterized by infiltration of large mononuclear or dendritic cells in one or more organs. Lung can be involved alone or with other organs in this complication.

Case Report: We report a 33-year-old smoker man with LCH in whom both the lung and the skin were involved. He was referred to our department due to malodourous, crusted and scaly erythematous patches, plaques, and pustules involved scalp and flexural area. His medical problem started with pulmonary involvement. He experienced spontaneous pneumothorax, and was suffering progressive dyspnea for years. Cryo-transbronchial lung biopsy previously had been done. Pathology report was pulmonary LCH (PLCH). Weid skin biopsy. Histologic analysis of skin with haemotoxylin and eosin (H&E) staining and immunohistochemistry (IHC) exam with S100 and CDa1 confirmed the diagnosis of LCH.

Conclusion: It is important to consider PLCH in the setting of recurrent pneumothorax and progressive dyspnea in middle-aged smoker patient. PLCH may be associated with skin involvement.

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Introduction

Langerhans cell histiocytosis (LCH) characterized by the infiltration of large mononuclear cells in one or more organs, can develop among individuals of any age. Although the features of this disease are well described in children, they remain poorly defined in adults.[1] LCH comprises of three distinct clinical syndromes that demonstrate indistinguishable histology. These syndromes are eosinophilic granuloma, which is predominantly osseous or pulmonary; Hand-Schûller-Christian disease, which involves multiple organs and, most typically, the skull base; and Letterer-Siwe disease, the most severe disease type, which typically involves the abdominal viscera.[2] Pulmonary Langerhans cell histiocytosis (PLCH) is an uncommon interstitial lung disease (ILD) seen in smokers, and can often be misdiagnosed as other pulmonary diseases. This rare smoking related, diffuse lung disease predominantly affects men between the ages of 20-40 years. Clinical presentation varies from asymptomatic to rapidly progressive disease. Most common clinical features are cough, chest pain, weight loss, and fever.[3-5] Pneumothorax occurs in 25% of patients. The radiographic features include a combination of ill-defined nodular opacities and cystic lesions of middle and upper zone of lung sparing the costophrenic angle.[6]

Case Report

A 33-year-old male patient was referred to Dermatology Department, School of

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Medicine, Tabriz University of Medical Sciences, Tabriz, Iran, on February 2018 due to cutaneous eruption. Skin disease has started as scalp scaling since 2016. The skin disease gradually got worse. The scalp, concha, ear canal, and groin were involved with crusted and scaly erythematous patches, plaques, and pustules. The lesions were malodourous. Oozes and crusts had covered over the lesions (Figure 1).

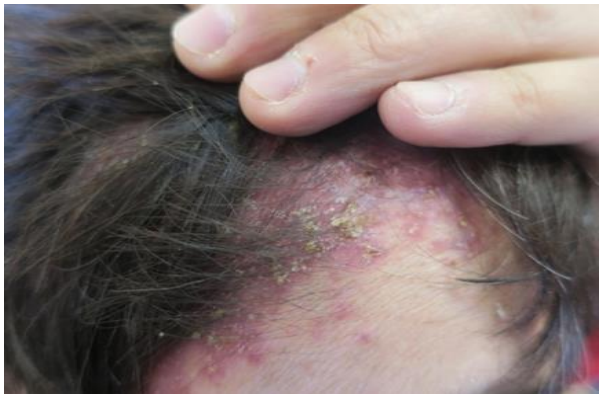

Figure 1. Crusted and scaly erythematous patches over the scalp

Lesions were not improved with systemic antibiotics. Patient's social relations were disrupted. His medical problem has started since 2007. At that time, he was admitted to surgery department with bilaterally hemopneumothorax due to direct trauma to his chest wall. The mechanism of his injury was graded as low-energy trauma. Multiple ribs were fractured bilaterally. Because of bilateral hemopneumothorax, chest tubes were exerted to each side.

He experienced three-fold chest tube exchanging in each hemithorax for complicated hemopneumothorax during 2-month hospitalization. Two years later, he experienced spontaneous pneumothorax and was admitted to the surgery department one more time. During the following years, he was suffering progressive dyspnea in routine activities [FC II dyspnea According to New York Heart Association (NYHA)]. The disease was progressive and unresponsive to treatment, so he was admitted to the respiratory department in 2015. He was examined comprehensively. He had previously smoked for 10 years (10 pack years), but he had quitted smoking since the worsening of breath shortness. He was working as a taxi driver, denied alcohol or opium addiction, and had no special toxic substance exposure history. His wife and his child were healthy. He had no previous history of diabetes mellitus (DM), hypertension, or ischemic heart disease. Examination for tuberculosis (TB) was negative. Liver and renal function tests were normal. White blood cell (WBC) count, hemoglobin, and platelet count were normal. Erythrocyte sedimentation rate (ESR) was slightly high (ESR = 28). Alpha-1-antitrypsin or α1-antitrypsin (A1AT) was normal. Cardiac exam and echocardiography (ECG) did not show any abnormal finding. The thoracic high-resolution computed tomography (HRCT) showed a bilateral diffuse cyst, especially in upper and middle lobes (Figure 2). Bone densitometry of his femur and lumbar spine revealed osteoporosis in femur (T-Score: -4.11, Z-Score: -3.77) and osteopenia in lumbar spine (T-Score: -2.14, Z-Score: -2.01). Cryo-transbronchial lung biopsy (cryo-TBB) was performed. Pathology report was PLCH. Corticosteroids and montelukast were prescribed to him and smoking was forbidden for him.

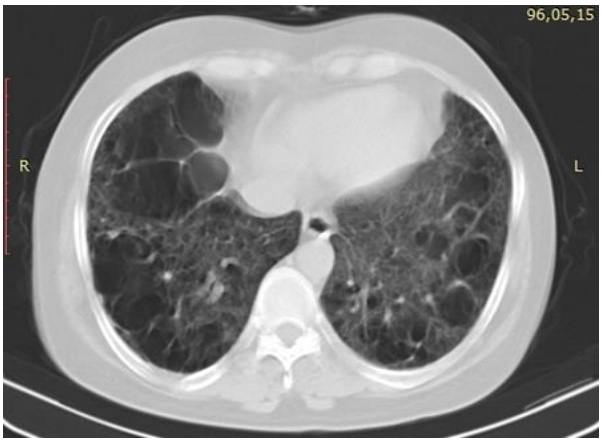

Figure 2. High-resolution computed tomography (HRCT) of chest showing multiple thin walled cysts and nodules of varying size

Skin biopsy was performed. Histologic analysis of skin eruption with haemotoxylin and eosin (H&E) staining demonstrated

infiltration of LCH admixed with eosinophils, neutrophils, lymphocytes, mast cells, and plasma cells in the epidermis and papillary dermis (Figures 3 and 4).

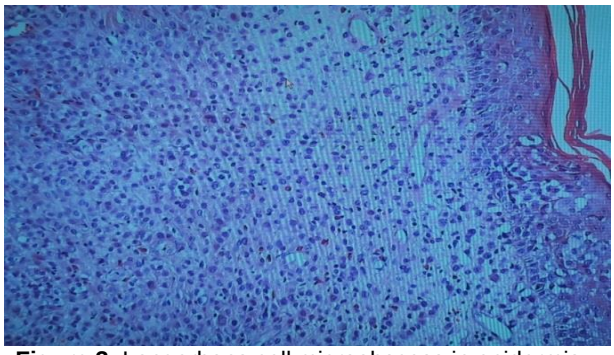

Figure 3. Langerhans cell microabscess in epidermis, dermal polymorphous inflammatory infiltration, and infiltrate of Langerhans cells

Direct immunofluorescence (IF) was negative. Immunohistochemistry (IHC) exam was positive for S100 (Figure 5) and CDa_1 (Figure 6).

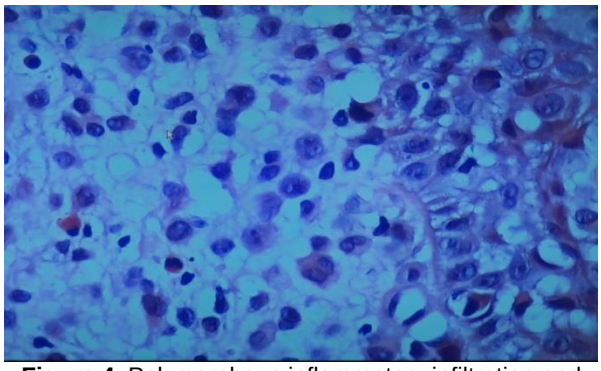

Figure 4. Polymorphous inflammatory infiltration and infiltrate of Langerhans cells

These findings were compatible with the diagnosis of LCH.

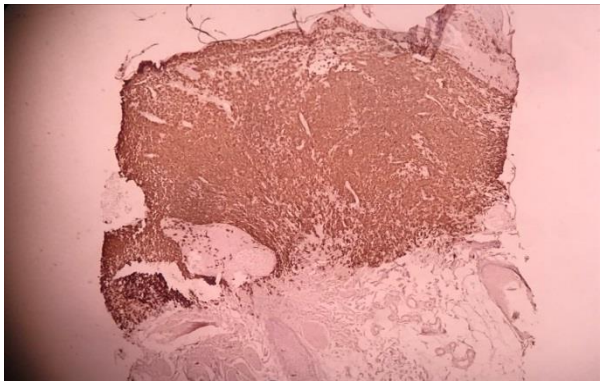

Figure 5. Langerhans cell histiocytosis (LCH); Positive immunostaining for S100

Patient was referred to oncologist and treated with thalidomide. At last, the patient became candidate for lung transplantation due to severe respiratory failure.

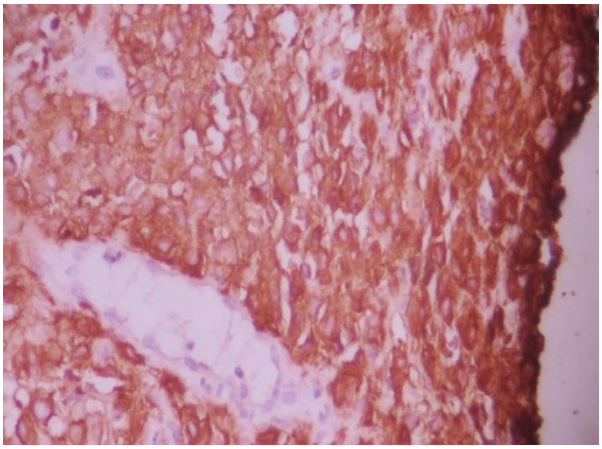

Figure 5. Langerhans cell histiocytosis (LCH); Positive immunostaining for CDa_1

Discussion

Despite children, adults rarely develop LCH, but, when in case of incidence, the most commonly involved sites are the skin, lung, and bone. Diabetes insipidus (DI) can also develop. LCH can be a progressive disease among adults, especially when both bone and extra skeletal sites are involved. Because of association of LCH with solid tumors and leukemia, these patients need to be followed closely.[7] The most remarkable characteristics on HRCT of the patient in this study was bilateral diffuse cystic changes. Cystic lung disease usually includes chronic obstructive pulmonary disease, Lymphangioleiomyomatosis (LAM), Birt-Hogg-Dubé syndrome (BHD), and PLCH.[8] PLCH is an uncommon but important cause of ILD occurring predominantly in adult smokers. Pathogenesis of PLCH has been attributed to the dendritic cell colonization in lungs. In PLCH, production of tumor necrosis factor-α (TNFα), Granulocyte-macrophage colony-stimulating factor (GM-CSF), and transforming growth factor beta (TGF-β) increase. Patients with PLCH commonly present with non-specific respiratory symptoms such as cough and exertional dyspnea.[3,9]

The physical examination including auscultation of lungs is normal but if cysts

appear in lungs, fine vesicular sound can be heard. Diagnosing of the disease was based on his HRCT features and completed with pathologic study. IHC staining is a key step in definitive diagnosis of the PLCH. IHC of histiocytosis deals with three components of S100, CDa_1, and Langerin.[7] There is no specific treatment for PLCH. Smoking cessation is advised for all individuals as it is known to stabilize the clinical course of the disease. In patients who demonstrate progressive decline of lung function, corticosteroid therapy is often used. Retrospective case series suggests that corticosteroid therapy in PLCH is associated with stabilization of disease and symptomatic improvement. Various chemotherapeutic agents such as 2-chlorodeoxyadenosine (Cladribine), vinblastine, methotrexate, cyclophosphamide (CP), etoposide, and etanercept have been tried in patients with progressive PLCH unresponsive to steroid therapy.[4,5]

Pneumothorax, a well-recognized complication of PLCH, is managed with chest tube and often with pleurodesis to prevent recurrence. Patients with progressive PLCH with severe respiratory failure should be evaluated for lung transplantation though there are reports from PLCH recurrence in transplanted lungs.[9,10] For mild skin disease, topical corticosteroids, topical antimicrobials, nitrogen mustard, imiquimod, and phototherapy are effective. For more extensive cutaneous disease, thalidomide, azathioprine or methotrexate and vemurafenib (in patients with the BRAF V600E mutation) may be effective.[5]

Conclusion

Recurrent pneumothorax and dyspnea are typical signs of PLCH. In cases of recurrent pneumothorax among patients with a history of smoking, PLCH should be considered. PLCH may be associated with skin involvement particularly scalp and flexural area.

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Authors' Contribution

All authors contributed to the writing of the manuscript equally.

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Conflict of Interest

Authors have no conflict of interest.

Ethical Approval

The authors received written and signed informed consent from the patient to publish his information and image.

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