TURKISH JOURNAL OF INTERNAL MEDICINE

ISSN:2687-4245

Hematology

Isolated Langerhans Cell Histiocytosis of the Thyroid: A very rare case report

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ABSTRACT

Langerhans cell histiocytosis (LCH) is a group of diseases that cause damage by local or widespread accumulation of atypical histiocytes in various tissues such as skin, bone, lung, liver, lymph nodes, mucocutaneous tissues, and endocrine organs. LCH was detected as a result of a total thyroidectomy biopsy performed on a 43-year-old female patient with a solitary euthyroid nodule following weight loss and an increase in the size of the thyroid nodule during outpatient clinic checks. Patient's whole body positron emission tomography. The case of LCH with isolated thyroid involvement is very rare, and a limited number of cases have been presented on this subject. In addition, it will contribute to the literature since there are fewer than ten LCH cases with thyroid involvement.

Turk J Int Med 2024;6(4):163-166
DOI: 10.46310/tjim.1528707
Case Report

Keywords: *Langerhans cell histiocytosis, thyroid, fine needle aspiration biopsy*

INTRODUCTION

Langerhans cell histiocytosis (LCH) is a rare malignancy resulting from the monoclonal proliferation of Langerhans cells in the bone marrow. It is seen at a rate of approximately 4.0-5.4 per 1,000,000 people per year.[1] The World Health Organization has divided LCH into three groups according to its clinical presentation: unifocal disease (solitary eosinophilic granuloma), multifocal disease with single system involvement, and multifocal disease with multisystem involvement (Letterer-Siwe syndrome)[2] Zhang et al.[3] identified 49 cases of LCH with thyroid involvement between 2010 and 2020, excluding 22 cases with incomplete information about their clinical characteristics and treatment, and the number of thyroid involvement alone in LCH was less than ten. Our current literature review determined that thyroid involvement in LCH was seen in fewer than 75 cases, and the majority were part of the multisystem disease. A case study on LCH was presented to contribute to the literature.

CASE REPORT

A 43-year-old female patient, who was followed up with a euthyroid solitary nodule in the endocrinology outpatient clinic, was diagnosed with a 45 mm thyroid nodule in the left lobe by thyroid ultrasonography during her follow-up four years ago, and the fine needle aspiration biopsy was reported as benign cytology.

Received: *August 6, 2024;* ***Accepted:****October 15, 2024;* ***Published Online:*** *October 29, 2024*

How to cite this article: *Erol A, Gözden HE, Koç S, Kuzular H. Isolated Langerhans cell histiocytosis of the thyroid: A very rare case report.Turk J Int Med 2024;6(4):163-166. DOI: 10.46310/tjim.1528707*

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The patient, who had no active complaints at that time, continued to be followed without medication. She applied to the endocrinology outpatient clinic with complaints about increasing swelling in the neck in the last year, difficulty in swallowing, burning in the hands and feet, and losing approximately 20 kilograms in the previous two years. Vital signs were temperature 98 °F, pulse 95/min, blood pressure 110/65 mmHg, respiratory rate 18/min, and saturation 99%. During the physical examination, grade 3 thyroid tissue was palpated, visible by inspection, soft on palpation, with regular boundaries, fixed to the tissue, and extended from left to right. No lymphadenopathy was detected. In laboratory values, free T3 was 2.83 pg/mL, free T4 was 0.89 ng/dL, and TSH was 2.03 mIU/L. The results of liver and kidney function tests, hemogram tests, and infection parameters were normal. In thyroid ultrasonography, a hypoechoic nodule measuring 66x42 mm and showing cystic degeneration was observed in the left lobe. Septa were seen within the cyst. The posterior-anterior chest radiograph determined that the trachea was pushed to the right by the thyroid nodule (Figure 1).

The general surgery department consulted the patient, and they underwent a total thyroidectomy. The pathological examination of the thyroidectomy material was reported as LCH (Figure 2). Since it was a rare diagnosis, it was evaluated in a second center, and the diagnosis was confirmed. In the postoperative follow-up of the patient, levothyroxine replacement was started, and a hematology outpatient clinic check-up was recommended. Computed tomography (CT) of the neck, thorax, abdomen, and pelvis was performed to check for multisystemic involvement. No significant pathology was detected in CT scans. Whole-body positron emission tomography (PET/CT) was performed. As a result of PET/CT, no significant F-18 fluorodeoxyglucose (FDG) retention was detected outside the thyroid. A bone marrow biopsy was performed to check for bone marrow involvement. LCH was not detected in the bone marrow material. No staining was observed with CD-1a and S100 dyes. It was decided that the patient, who had no involvement other than the thyroid, would be followed up without treatment for LCH.

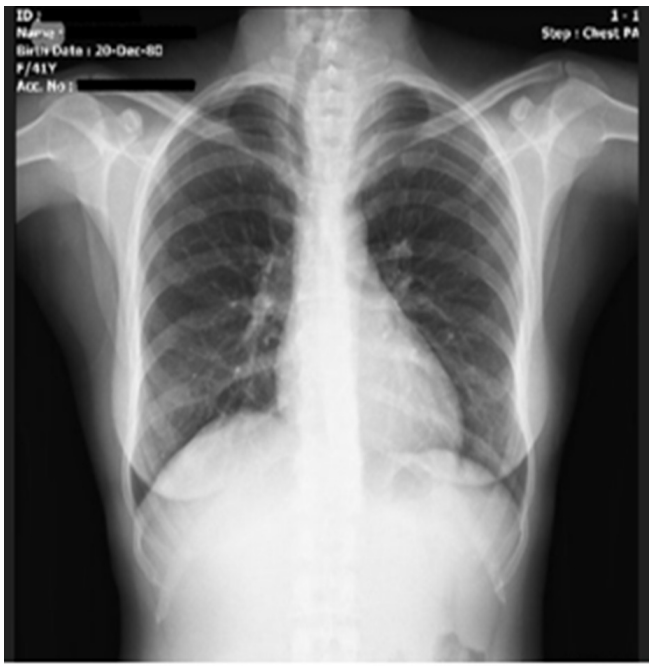

Figure 1: Thyroid nodule causing tracheal deviation

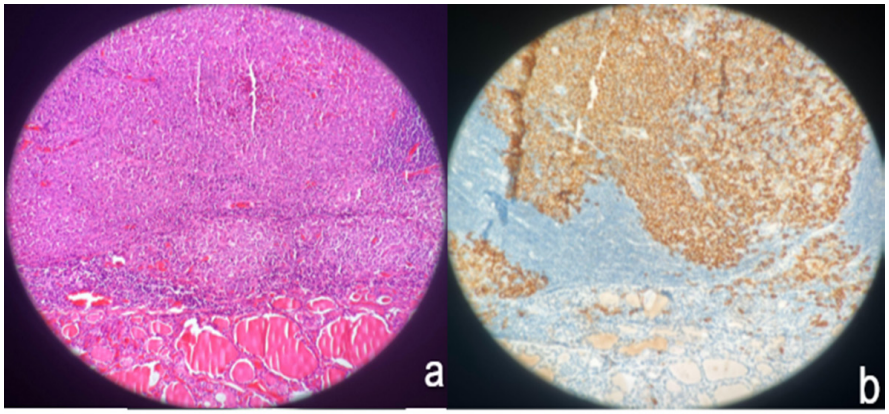

Figure 2: a. Infiltration of Langerhans cells with vesiculated nuclei and pale eosinophilic cytoplasm, containing nuclear groove structures mixed with eosinophils in the thyroid parenchyma (H&E stain, x100). **b.** Cell block preparations showing immunoreactivity for CD1a (Immunohistochemistry x100).

DISCUSSION

LCH is most commonly seen in the first three years of life. Exophthalmos, diabetes insipidus (DI), and bone lesions are the classic triad. The male-female ratio is 3.7:1.4 The skeletal system, especially the skull, is the most common site. There may be no significant symptoms other than pain and swelling. In the endocrine system, the pituitary is the most common site. Polyuria and polydipsia are suspicious clinical features for LCH. DI is the most common endocrinopathy in LCH. It may be seen as part of a multisystem disease involving the skull. It may occur as the first sign of the disease.[5]

Most cases of LCH involving the thyroid gland have presented clinically with enlargement of the thyroid nodule. Approximately one-third of the cases present with a single thyroid nodule, as in our case.[6] Again, in one-third of our cases, thyroid function tests are euthyroid, as in our case. Still, subclinical hyperthyroidism, subclinical hypothyroidism and overt hypothyroidism can also be observed.[7] Fine needle aspiration biopsy (FNAB) is used to investigate thyroid involvement of LCH. Diagnosis is made by infiltration of lymphocytes and eosinophils with large cytoplasm in the thyroid gland, S100 and CD1a immunohistochemical positivity, and Birbeck granules.[8]

LCH with thyroid involvement may be associated with other thyroid diseases, such as chronic lymphocytic thyroiditis and papillary thyroid cancer. Therefore, it should be distinguished from carcinoma and lymphoma. There are also cases of simultaneous carcinoma and LCH in the literature.[9]

In the case report by Pandyaraj et al.[7], the FNAC result came back as anaplastic carcinoma, and since it was incompatible with the previous biopsy results, a total thyroidectomy was performed, and the patient was diagnosed with LCH.

Weight loss was considered a non-specific symptom of the disease. The group with no disease symptoms was found to be 20%, and weight loss was seen in 33%.[10] Other histiocytosis should be considered in the differential diagnosis of LCH. Juvenile xanthogranuloma is a benign type of histiocytosis usually seen in childhood. Histiocytes usually accumulate in the skin, connective tissues or sometimes in internal organs and form lesions. The most common symptom is yellowish or orange nodular skin lesions.[11] Erdheim-Chester disease is a rare type of histiocytosis. It is usually seen in adults and is considered to have systemic involvement.[12] It causes involvement in the eye and heart. Therefore, systemic questioning should be done in diagnosing LCH, and skin, eye and cardiac examinations and screening should consider systemic involvement.

Treatment for LCH varies depending on lung involvement, the number and location of bone involvement, susceptibility to central nervous system infection, and skin involvement, including immunosuppressants, radiotherapy, surgery, and chemotherapeutics. In LCH with lung involvement, chemotherapeutics are used due to respiratory limitations.[13] In our case, no additional treatment was applied since there was no PET-CT and bone marrow biopsy involvement.

Definitive treatment of thyroid LCH remains controversial due to the need for prospective randomized studies. It may be challenging to distinguish thyroid LCH involvement alone from other thyroid diseases, especially if it presents as a large, painless nodule. Only surgical intervention was performed in LCH cases with isolated thyroid involvement. These included hemithyroidectomy, subtotal thyroidectomy, and, as in our case, total thyroidectomy. There is insufficient evidence that adjuvant chemotherapy or radiotherapy after surgical resection improves the outcome of primary thyroid LCH.[14]

CONCLUSIONS

When current cases in the literature are examined, there is a need for a clear consensus on the diagnosis and treatment of LCH cases with isolated thyroid involvement, as there are difficulties in the treatment and follow-up of patients. In addition, since less than ten cases of isolated LCH have thyroid involvement, our case report will contribute to the literature.

Conflict of Interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding Sources

This manuscript received no specific grant from any funding agency in the public, commercial, or non-profit sectors.

Consent

The authors thanked the patient, who was glad to collaborate with the study.

Authors' Contribution

Study Conception: AE, HEG, SK; Study Design: AE; SK; Literature Review: AE, HEG; Critical Review: AE, HEG, SK; Data Collection and/or Processing: AE, SK; Analysis and/or Data Interpretation: AE, HEG, SK; Manuscript preparing: AE, SK.

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