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CLINICAL CASE REPORT

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Primary Indeterminate Dendritic Cell Tumor of Skin Correlated to Mosquito Bite

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Abstract: Primary indeterminate dendritic cell tumor (IDCT) is an extremely neoplastic dendritic cell disorder. Little is known about its pathogenesis, etiology, and prognostic factors because of its rarity. Herein, we present a case report of a skin IDCT that arose in mosquito bite and discuss the correlation between hypersensitivity to mosquito bites and leukemia/lymphoma.

A 28-year old man presented with multiple widespread cutaneous plaques and nodules 8 months after being bitten by a mosquito on his back. Dermatological examination revealed multiple skin-colored, well-demarcated plaques and nodules measuring approximately 0.5 to 1.8 cm in diameter all over the body. A biopsy of the skin lesion was taken. Morphologically, the dermis was effaced by round or polygonal cells with oval nuclei and abundant eosinophilic cytoplasm, arranged in nests and in some areas in a sheet-like pattern. The tumor cells were positive for CD68, CD1a, and S-100, whereas negative for Langerin and lack Birbeck granules ultrastructurally. A diagnosis of IDCT was made. No treatment was given. The patient was alive with spontaneous disease regression after 17 months of follow-up.

IDCT is an extremely rare disease and may be associated with mosquito bite.

(*Medicine* 94(34):e1443)

Abbreviations: HMBs = hypersensitivity to mosquito bites, IDCT = indeterminate dendritic cell tumor.

INTRODUCTION

Indeterminate dendritic cell tumor (IDCT) is an extraordinary rare disease. The morphological and immunophenotypic features are similar to those of normal indeterminate cells.[1] It is characterized by the proliferation of dendritic cells, which express CD1a and S-100 protein but lack Langerin expression and Birbeck granules.[2,3] Little is known about its pathogenesis, etiology, and prognostic factors. Here we report a patient with skin IDCT associated with a mosquito bite that showed spontaneous regression after 17 months of follow-up. Literature review reveals this to be the first case of IDCT associated with a mosquito bite.

CASE REPORT

A 28-year-old man presented with an 8-month history of multiple cutaneous plaques and nodules without systemic symptoms. He gave a history of a mosquito bite on his back after which a nodule developed at bite site after 4 weeks. Plaques and nodules spread all over the body within 2 months. He gave no history of hypersensitivity to mosquito bites (HMBs) in general. Dermatological examination revealed multiple skin-colored plaques and nodules measuring approximately 0.5 to 1.8 cm in diameter over the body (Figure 1). Extensive serological laboratory investigations and imaging evaluation were normal. A clinical diagnosis of cutaneous elastic fibers rhabdomyolysis was made and a biopsy of skin lesion was taken.

Histopathologically, the dermis was effaced by round or polygonal cells with oval nuclei and abundant eosinophilic cytoplasm. The tumor cells were formed in nests and in a sheet-like pattern. Some tumor cells had nuclear grooves. Few multinucleated giant cells were observed. The mitotic rates were arranged in 0 to 3 per 10 high power fields. There were clustered small lymphocytes and scattered histiocytes in the background. No eosinophils were seen (Figure 2). Epidermis and subcutaneous were not effaced by tumor cells. Immunohistochemical studies showed that the tumor cells were positive for CD68, CD1a, and S-100, but negative for Langerin, CD3, CD20, CD21, CD23, CD35, CD163, CD123, HMB45, myeloperoxidase, and factor XIIIa. The proliferation index (Ki-67) was about 30%. Epstein-Barr Virus (EBV)-encoded RNA was negative by in situ hybridization. Ultrastructurally, the nuclear of the tumor cells were irregular and showed infolding. There were many dense granules in the cytoplasm. Birbeck granules were absent. This patient was diagnosed as having primary IDCT based on the histologic, immunohistochemical, and ultrastructural features. No treatment was given. The patient was alive with spontaneous disease regression after 17 months of follow-up. Informed consent was given by the patient.

DISCUSSION

WHO classification of tumors of hematopoietic and lymphoid tissues categorizes the dendritic cell neoplasm into 4 groups: tumors derived from Langerhans cells, interdigitating dendritic cell sarcoma, follicular dendritic cell sarcoma, and other rare dendritic cell tumors including IDCT and fibroblastic reticular cell tumor.[1] IDCT is an extremely rare neoplasm and can occur in any age, predominantly in adult.[2–5] The etiology of IDCT is unclear, although they may be associated with exogenous stimulations or with low-grade B-cell lymphoma.[6,7]

Editor: Ismael Maatouk.
Received: May 29, 2015; revised: July 24, 2015; accepted: August 2, 2015.
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This study was approved by the Ethics Committee of People's Hospital of Guangxi Province (No.: 2013-002).
This study was supported by the research grant from the National Natural Science Foundation of China (81360355).
The authors have no conflicts of interest to disclose.

ISSN: 0025-7974
DOI: 10.1097/MD.0000000000001443

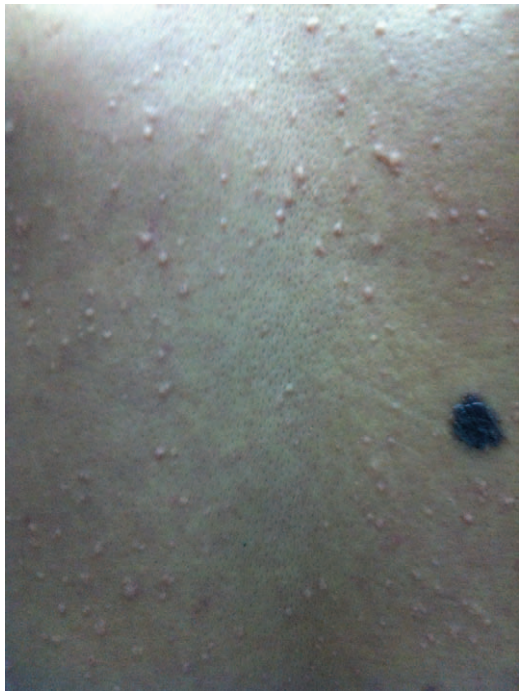

FIGURE 1. Multiple plaques and nodules on the back.

HMBs is characterized by intense local cutaneous symptoms including erythema, bullae, ulcers, and scar formation and by systemic symptoms such as fever, lymphadenopathy, and liver dysfunction .[8,9] The disease is more prevalent in Asians and is corrected with chronic EBV infection and nature killer (NK) cell leukemia/lymphoma.[10,11] Exceptionally, HMB in patients with mantle cell lymphoma,[12] nodal marginal zone lymphoma,[13] Hodgkin lymphoma,[14] chronic myeloid leukemia,[15] and primary systemic anaplastic lymphoma kinase-positive anaplastic large-cell lymphoma have been reported.[16]

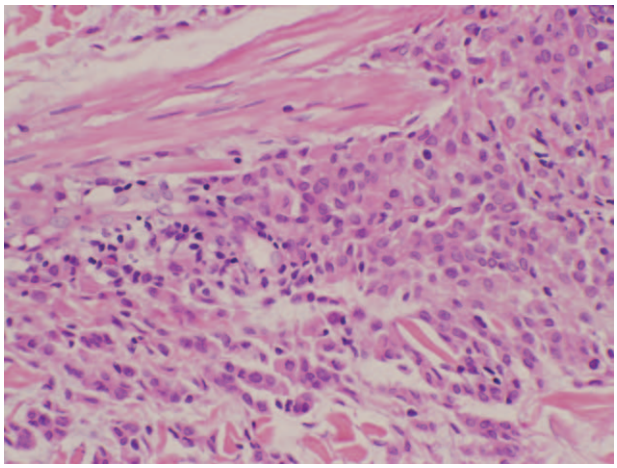

FIGURE 2. Morphology of indeterminate dendritic cell tumor. Histology shows the dermis was effaced by round or polygonal cells with oval nuclei and abundant eosinophilic cytoplasm (hematoxylin and eosin staining; original magnification: ×200).

The mechanism inducing lymphoma development following a mosquito bite is still not fully clarified. Previous studies have shown that mosquito salivary gland extracts promote CD4+ T cells proliferation, and induce expression of the viral oncogene latent membrane protein (LMP1) in NK cells via mosquito antigen-specific CD4+ T cells, which is involved in the oncogenesis of NK cells in vivo.[17] LMP1 is the most important EBV-transforming protein, suggesting that LMP1-expressed NK cell promote NK-cell proliferation, leading to NK-cell neoplasm in HMB patients. But in B-cell and T-cell neoplasms, the tumor cells are not associated with EBV infection; how mosquito bite may induce lymphoma remains to be elucidated. Herein, we present the first cases reported for IDCT associated with mosquito bite in the literature. However, we cannot provide enough data to confirm that it is the mosquito bite that triggers IDCT.

There are no standard treatment regiments in patients with IDCT. Single lesion can be totally removed by surgical approaches. Patients with multiple lesions may choose narrow-band ultraviolet, thalidomide, low-dose methotrexate, or electron beam therapy. The prognosis of IDCT is variable. Most of patients show an indolent or self-limited clinical course. Rare case may progress to leukemia. The patient we present here has been survived with spontaneous disease regressions after 17 months of follow-up.

CONCLUSION

IDCT is an extremely rare disease and may be associated with mosquito bite. Standardized therapy remains to be described.

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