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Letter to Editor

Cutaneous mastocytosis with abundant eosinophilic infiltration: a case report with review of the literature

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Mastocytosis is a clonal proliferation of mast cells that accumulates in one or more organs [1]. This disorder is heterogenous, ranging from skin lesion that may spontaneously regress to multiple organ lesions that show a highly aggressive course, and a recent World Health Organization Classification divides it into 7 subtypes: cutaneous mastocytosis, indolent systemic mastocytosis, systemic mastocytosis with associated clonal hematological non-mast-cell lineage disease, aggressive systemic mastocytosis, mast cell leukemia, mast cell sarcoma, and extracutaneous mastocytoma [1]. Cutaneous mastocytosis, also referred to as urticarial pigmentosa, is the most common subtype of mastocytosis, which shows mast cell infiltration confined to the skin [1]. Cutaneous mastocytosis is histopathologically characterized by aggregates of mast cells filling the papillary dermis and extending as sheets and aggregates into the reticular dermis [1]. Eosinophilic infiltration is an uncommon finding of cutaneous mastocytosis, and only limited cases of cutaneous mastocytosis with abundant eosinophilic infiltration have been reported in the English literature [2-4]. Herein, we describe an additional case of cutaneous mastocytosis with abundant eosinophilic infiltration and discuss the clinicopathological features and differential diagnostic considerations.

A 4-month-old Japanese female infant presented with a persistent brownish macule in the left hip, which had been noticed approximately 3 months earlier. Physical examination revealed a relatively well-circumscribed brownish macule, measuring 2 x 1 cm in diameter, in the left hip. Darier's sign was positive. No other organ lesions were detected. Laboratory test demonstrated no hypereosinophilia (5.5% of white blood cells). Accordingly, a skin biopsy from the hip was performed under a clinical diagnosis of cutaneous mastocytosis.

Histopathological study revealed diffuse infiltration of mononuclear cells in the papillary dermis and superficial reticular dermis accompanied by abundant eosinophilic infiltration (**Figure 1A**, **1B**). No epidermal involvement was noted (**Figure 1A**). These mononuclear cells had relatively rich basophilic granular cytoplasm and oval nuclei without conspicuous nucleoli (**Figure 1B**). Neither nuclear atypia nor mitotic figures were noted (**Figure 1B**). No granuloma formation was noted.

Immunohistochemical studies were performed using an autostainer (Ventana) by the same method as previously reported [5-9]. These mononuclear cells were diffusely positive for c-kit (**Figure 2**), but negative for CD1a and langerin.

Accordingly, an ultimate diagnosis of cutaneous mastocytosis with abundant eosinophilic infiltration was made.

Cutaneous mastocytosis usually has no or only a small number of eosinophils within the lesion. Albeit extremely rare, a few cases of cutaneous mastocytosis with abundant eosinophilic infiltration have been documented [2-4]. **Table 1** summarizes the clinicopathological features of the 3 previously reported cases of cutaneous mastocytosis with abundant eosinophilic infil-

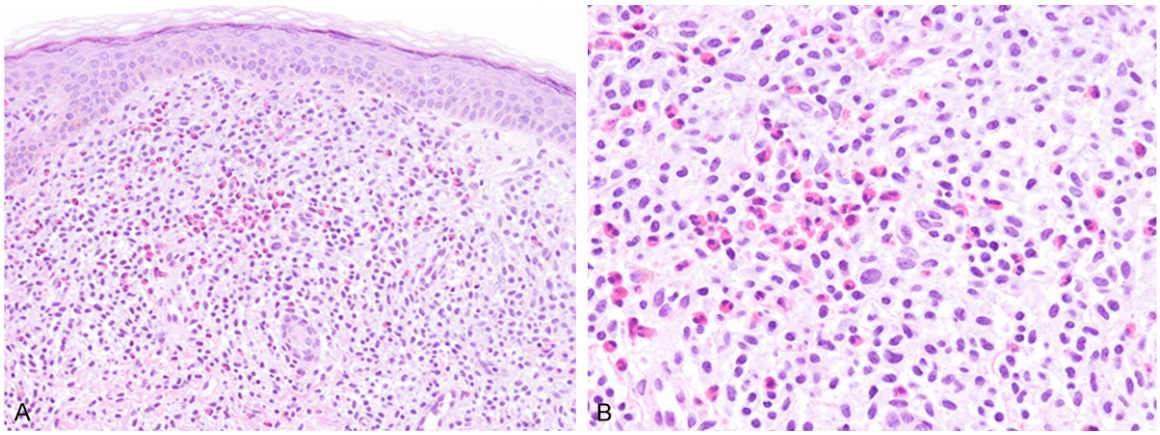

Figure 1. Histopathological features of the hip macule. A: Diffuse infiltration of mononuclear cells accompanied by abundant eosinophilic infiltration in the papillary and reticular dermis. HE, x 100. B: These mononuclear cells have relatively rich granular basophilic cytoplasm and small nuclei. Abundant eosinophilic infiltration is also noted. HE, x 400.

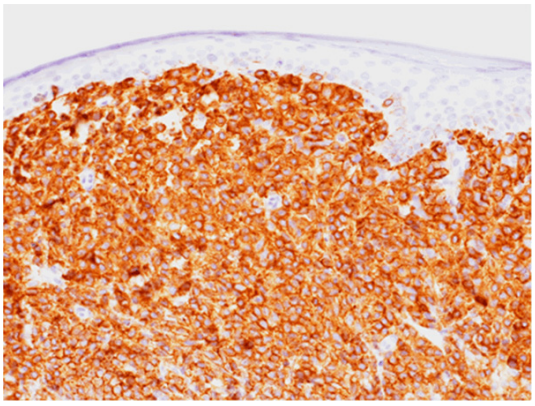

Figure 2. Immunohistochemical feature of the hip macule. c-kit is diffusely expressed, x 100.

tration as well as the present one. All cases were infant or child, and clinical features were not different from those of conventional cutaneous mastocytosis. Although abundant eosinophilic infiltration was observed in the present case, the recognition of mast cells was not difficult. However, Ueng and Kuo reported a case of cutaneous mastocytosis with massive eosinophilic infiltration, which almost masked the neoplastic mast cells [2]. Abundant eosinophilic infiltration in the dermis is observed in a variety of cutaneous conditions, such as allergic reaction, arthropod reaction, parasite infection, eosinophilic cellulitis, bullous pemphigoid, and Langerhans cell histiocytosis. Therefore, albeit extremely rare, cutaneous mastocytosis should be included in the differential diagnostic consideration of abundant eosinophilic infiltration in the dermis, and immunostaining for c-kit is useful for diagnosis of cutaneous mastocytosis.

Moreover, abundant eosinophilic infiltration is sometimes observed in the cases of systemic mastocytosis [10]. Kirsch *et al*. analyzed the clinicopathological features of systemic mastocytosis involving the gastrointestinal tract, and they reported that four of five cases had a dense eosinophilic infiltrate in the lamina propria of the gastrointestinal mucosa, which may obscure the mast cell infiltrate and led to an erroneous diagnosis of eosinophilic colitis in one case [10]. Although the frequency of abundant eosinophilic infiltration within the lesion between systemic and cutaneous mastocytosis is different, it is important to recognize that abundant eosinophilic infiltration can occur in mastocytosis.

In the case of cutaneous mastocytosis with abundant eosinophilic infiltration reported by Hunt and Santa Cruz, tiny granuloma was also present within the lesion [4], although none was detected in the other 3 cases including the present one. Recently, Tran *et al*. reported a very interesting case of histiocyte-rich pleomorphic mastocytoma of the skin [11]. The neoplastic mastocytes, which had large pleomorphic nuclei with irregular contour or multiple lobes, were intermingled with vacuolated histiocytes, and moreover, eosinophilic infiltration was also identified throughout the lesion and was present in small focal clusters in their case

Table 1. Clinicopathological features of cutaneous mastocytosis with abundant eosinophilic infiltration

Case No.	Age/Gender	Location	Clinical characteristics	Reference
1	6 months/Male	Flank	Brown macule, clinical diagnosis was dermatofibroma	[2]
2	11 months/Female	Upper chest	Slowly enlarged nodule present since birth	[3]
3	4 years/Male	Thigh	Tan papule	[4]
Present Case	4 months/Female	Hip	Persistent brownish macule. Positive Darier's sign.	

[11]. Therefore, histiocyte- or histiocyte-like cell-rich lesions, such as juvenile xanthogranuloma and Langerhans cell histiocytosis should also be included in the differential diagnostic consideration of cutaneous mastocytosis.

The mechanism of eosinophilic infiltration in mastocytosis is thought to be due to the secretion of eosinophilic chemotactic factor by the neoplastic mast cells [2]. Accumulation of histiocytes in mastocytosis may also be caused by histiocyte chemotactic factor produced by neoplastic cells.

Disclosure of conflict of interest

None.

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