**CASE REPORT**

Langerhans cell histiocytosis in sequential discordant lymphoma

K Adu-Poku, D W Thomas, M K Khan, C S Holgate, M E F Smith

A 52 year old white woman first presented with right inguinal lymphadenopathy. There was no peripheral lymphadenopathy nor hepatosplenomegaly were detected. Throat examination revealed a hard, smooth, rounded nasopharyngeal swelling, which was thought clinically to be nasopharyngeal carcinoma or recurrent lymphoma. Four months later, an ultrasound examination revealed a left intramammary lesion measuring 9 mm in diameter. Bone marrow aspirate and trephine biopsies were normal. Computed tomography imaging of thorax, abdomen, and pelvis showed no soft tissue or bony abnormalities. The nasopharyngeal and breast masses were biopsied.

**PATHOLOGICAL FINDINGS**

A review of the previous inguinal lymph node haematoxylin and eosin and immunocytochemical slides confirmed the diagnosis of mixed cellularity Hodgkin lymphoma with tumour cells coexpressing CD15 and CD30 (fig 1A–C). In addition, a well defined nodule of Langerhans cells, with scattered eosinophils and central necrosis, measuring 4 mm across, was identified (fig 1D–E). The Langerhans cells showed pale clefted nuclei, inconspicuous nucleoli, abundant pale eosinophilic cytoplasm, and indistinct cell borders. Immunohistochemistry demonstrated strong S100 and CD1a (fig 1F) expression, thereby confirming Langerhans cell histiocytosis.

The nasopharyngeal biopsies consisted of three irregular tissue fragments, together measuring 17 × 15 × 10 mm. The breast biopsy was fatty tissue measuring 30 × 20 × 10 mm, containing a nodule 10 mm in diameter. Both the nasopharyngeal and breast biopsies showed the histological and immunocytochemical features of B cell non-Hodgkin lymphoma of follicular subtype (grade 3/3), with a follicular pattern (fig 2A) and associated nodules of Langerhans cell histiocytosis (fig 2B). No lymph node architecture was identified. The follicle centre cells of the nasopharyngeal lymphoma showed weak BCL2 expression and κ immunoglobulin light chain restriction. Both biopsies contained nodules (6 mm in the nasopharynx; 4 mm in the breast) of CD1a (fig 2C) and S100 positive Langerhans cells, indicating Langerhans cell histiocytosis.

Epstein-Barr virus was not detected within the tumour cells of the nasopharyngeal and breast non-Hodgkin lymphoma in Epstein-Barr virus encoded RNA in situ hybridisation preparations. The control probes demonstrated RNA preservation in all the samples except for the Hodgkin lymphoma tissue. The Hodgkin lymphoma tissue was therefore not assessable.

**DISCUSSION**

Langerhans cell histiocytosis has a complex association with malignant lymphoma: it may precede, occur with, or follow it. Most commonly, and as was the circumstance in the initial clinical presentation of the patient reported here, the diagnoses are concurrent, with the lymphoma being of Hodgkin type. This association is rare, and has been estimated to be 0.3% for Hodgkin lymphoma.
The small size of the initial Langerhans cell histiocytosis focus in the biopsied Hodgkin lymphoma node suggests that the Langerhans cell histiocytosis may represent an abnormal (although possibly neoplastic) stromal response to the Hodgkin lymphoma microenvironment. The identification, four years later, of Langerhans cell histiocytosis within non-Hodgkin lymphoma indicates that the Hodgkin directed radiotherapy and chemotherapy had not eradicated the Langerhans cell histiocytosis, and that the Langerhans cell histiocytosis cells had dispersed far beyond their presumed site of origin within the groin node. In situ hybridisation analysis showed no evidence of Epstein-Barr virus in the two lymphomas.

“This case suggests a degree of interdependence in the growth of Langerhans cell histiocytosis and the non-Hodgkin lymphoma.”

The relative risk of secondary non-Hodgkin lymphoma after treatment of Hodgkin lymphoma ranges from 31.5 to 56.8 times for radiotherapy and radiotherapy with chemotherapy, respectively. There does not appear to be a significant increase with chemotherapy alone. Given this, no assumption should be made that the Langerhans cell histiocytosis necessarily predisposed to the development of non-Hodgkin lymphoma in our case. However, it should be noted that the distribution of the follicular non-Hodgkin lymphoma (two extranodal sites, oropharynx and breast, without lymph node involvement) is distinctly unusual. In this circumstance, it is reasonable to think that the local environment (that is, the presence of Langerhans cell histiocytosis) may well have had a role in the distribution, and therefore the development, of the non-Hodgkin lymphoma. With regard to the development of the Langerhans cell histiocytosis, its presence in the non-Hodgkin lymphoma biopsies, despite the absence of other clinically detectable Langerhans cell histiocytosis, suggests that the non-Hodgkin lymphoma microenvironment was conducive to Langerhans cell histiocytosis growth. Therefore, this case suggests a degree of interdependence in the growth of Langerhans cell histiocytosis and the non-Hodgkin lymphoma.

In conclusion, we present a case of sequential discordant malignant lymphoma. The presence of Langerhans cell histiocytosis in both types of lymphoma and the patterns of

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**Figure 1** The Hodgkin lymphoma. (A) Reed-Sternberg and Hodgkin cells positive for (B) CD15 and (C) CD30 immunostaining. (D, E) Nodule of Langerhans cells with eosinophils showing central necrosis (haematoxylin and eosin stain). (F) Langerhans cells with strong CD1a expression.
disease illuminate some of the complex relations between these disease processes.

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