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CASE IMAGE

Non-nodal mantle cell lymphoma mimicking hairy cell leukemia

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Key Clinical Message

This case of non-nodal mantle cell lymphoma (MCL) showcases atypical hairy cell-like features, distinguishing it via next-generation sequencing. Despite a TP53 mutation indicating poor prognosis, our case followed an indolent course, highlighting the importance of genetic testing and phenotypical examination in MCL.

KEYWORDS
clinical hematology, hairy cytoplasmic projections, NGS, non-nodal mantle cell lymphoma

Mantle cell lymphoma (MCL) is a mature B-cell neoplasm characterized by a translocation involving chromosomes 11 and 14, leading to the fusion of the cyclin D1 (CCND1) oncogene and the immunoglobulin heavy chain (IGH) gene.[1] This genetic alteration causes increased production of the CCND1 protein, promoting the growth of cancer cells. Although, most cases are diagnosed at an advanced stage and the overall survival rate is 3–5 years. In contrast, the leukemic variant of MCL cases is less aggressive and can remain stable without immediate treatment. This indolent type of MCL was newly defined as leukemic non-nodal-type MCL (non-nodal MCL) in the 2017 WHO classification. The tumor cells are positive for CCND1 and negative for SOX11. Here, we describe an atypical hairy cell-like morphological presentation of MCL.

A 63-year-old man presented with lymphocytosis (20.0×10^9/L) over a year ago. A complete blood cell count performed by an XN-3100 (Sysmex, Kobe, Japan) showed high white blood cell count of 26.3×10^9/L, with 8.0% neutrophils, 78% lymphocytes, 13% monocytes, a hemoglobin of 14.5 g/dL, and platelet count of 317×10^3/μL. Peripheral blood smears and bone marrow aspiration showed abnormal small-sized cells with irregular and indented nuclei with hairy cytoplasmic projections (Figure 1A; May–Giemsa stain, original magnification ×1000). Flow cytometry demonstrated an abnormal population of CD5, CD19, CD20, and CD25-positive cells with κ light-chain restriction and CD10, CD23, and CD103-negative cells (Figure 1B). These lymphocytes were positive for cyclin D1 and negative for SOX11 using immunohistochemistry. Fluorescence in situ hybridization study detected *immunoglobulin heavy locus-CCND1* rearrangement (Figure 1C). G-band analysis revealed the complex karyotype of 45,X,-Y,t(11;14)(q13;q32), der(16)add(16)(p13.1)add(16)(q12-13), add(17)(p11.2)[10] 45,X,-Y,t(11;14)(q13;q32), add(15)(q22), der(16)

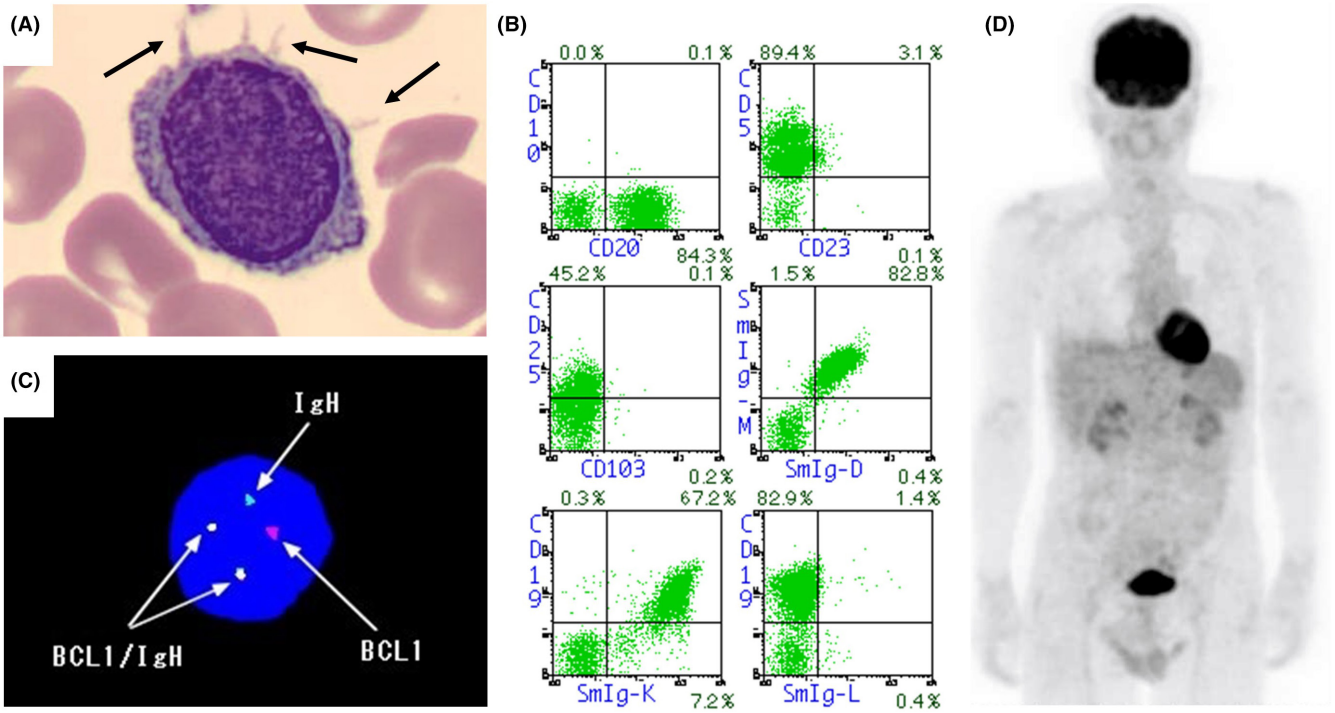

FIGURE 1 (A) Peripheral blood smears stained by Wright–Giemsa staining. (B) Flow cytometry analysis of current case. (C) FISH analysis for IgH (green) and BCL1 (red). (D) Positron emission tomography showed no accumulation.

add(16)(p13.1)add(16)(q12-13), add(17)(p11.2) [3]. Next-generation sequencing revealed *TP53* mutation but not *BRAF*V600 mutation. Though computed tomography showed splenomegaly, fluorodeoxyglucose positron emission tomography/computed tomography showed no evidence of lymphoma (Figure 1D). These features were consistent with non-nodal MCL.[1] Given the indolent clinical course and adverse effects of chemotherapy, the patient opted for watchful waiting. Two years after diagnosis, he has remained asymptomatic despite the typically poor prognosis of MCL at an advanced stage and with a *TP53* mutation.

Literature review revealed cases of "hairy cell leukemia" mimicking MCL,[2] and a concurrent case of MCL and hairy cell leukemia.[3] Distinguishing our case as either atypical MCL or a co-occurrence with hairy cell leukemia was challenging. However, as *BRAF* mutation is present in almost all classical cases of hairy cell leukemia, we diagnosed him as MCL without evidence of hairy cell leukemia by utilizing NGS. TP53 mutations, a frequent genetic abnormality in MCL, are a poor prognostic factor, but their prognostic impact in non-nodal MCL remains unknown. The reason for the phenotypic change in current case is elusive; however, the accumulation of cases will reveal the exact mechanisms responsible for the morphological character in non-nodal MCL. Through this case, we report that non-nodal MCL can have a hairy cytoplasmic projection.

AUTHOR CONTRIBUTIONS

Yuma Nato: Resources; writing – original draft. **Keiki Nagaharu:** Investigation; supervision; writing – original draft. **Hiroshi Imai:** Data curation; investigation; methodology. **Hiroyuki Miyashita:** Supervision.

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CONFLICT OF INTEREST STATEMENT

The authors state that they have no conflict of interest.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

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