

Ki-1 Lymphoma In a Young Adult

Jae Seog Yang, M.D., Joo Young Rho, M.D*.,
Young Chul Kye, M.D., Soo Nam Kim, M.D.

*Department of Dermatology, Korea University College of Medicine, Seoul, Korea and
Hallym University College of Medicine, Chuncheon, Korea**

Ki-1 lymphoma is a rare, large cell anaplastic non Hodgkin's lymphoma. It expresses the CD30 antigen and is recognized by the antibodies Ki-1. This Ki-1 positive anaplastic lymphoma was first described in 1985 as a new histological subtype and was added to the updated Kiel classification in 1988. Morphological and immunological features of this lymphoma have been well described, but clinical studies have been limited and follow up has been short.

**The authors report a case of Ki-1 lymphoma of the skin without systemic involvement in a young adult based on clinical, pathological and immunological features.
(Ann Dermatol 9:(1)31~35, 1997).**

Key words : Ki-1 antibody, Anaplastic large cell lymphoma

Recently, a group of large cell non Hodgkin's lymphoma has been recognized because of immunoreactivity with Ki-1 (CD 30) antibody, and the introduction in the course of the 1980s of a monoclonal antibody (Ki-1) marking the lymphocytic antigen CD 30 has permitted the individualization of a new immuno-histo-clinical entity, Ki-1 lymphoma. Since its description and characterization in the mid-1980s, this form of lymphoma has gained significant attention in the pathology literature. However, while the morphological and immunological features of this lymphoma have been well described, clinical studies have been limited and follow-up has been short.

The accurate diagnosis of Ki-1 lymphoma is important because of its relatively good prognosis, and the diagnosis can be substantiated immunohistochemically using a simple panel of antibodies reactive in formalin fixed, paraffin wax embedded tissues¹². Based on clinical presentation and pathological, immunohistochemical features, we de-

scribe a patient with Ki-1 positive anaplastic large cell lymphoma.

CASE REPORT

A 16-year-old man attended our dermatology department with a month's history of a violaceous growing mass on the lateral aspect of his right thigh. The skin lesion had enlarged gradually and an oozing discharge had developed on the lesion surface. He had no subjective symptoms such as pain or itching. His general health was good and there was no previous history of trauma or drug addiction.

The skin lesion was a 4 cm x 2 cm sized violaceous colored, indurated tumor with an oozing discharge (Fig. 1). Systemic examination revealed no abnormalities such as hepatomegaly and splenomegaly in the patient.

The family and past medical history was non-contributory.

Routine laboratory tests showed that the lymphocytes were slightly increased in the peripheral blood. LFT, urinalysis, lipid profile, LDH, CPK, C3, C4, IgG, IgM, IgA were within the normal ranges. In addition, there were no abnormal findings in a chest PA, abdominal CT and pelvic CT. A bone marrow biopsy showed that there was no infiltrated malignant lymphoma and it demonstrated

Received July 11, 1996.

Accepted for publication November 1, 1996.

Reprint request to : Jae Seog Yang, M.D., Department of Dermatology, Korea University College of Medicine, Seoul, Korea and Hallym University College of Medicine, Chuncheon, Korea*.

Fig. 1. 4×2 cm sized violaceous colored, indurated tumor with oozing discharge on the lateral aspect of the right thigh.

Fig. 2. A low power view of a biopsy specimen, showing diffuse tumor cell infiltration in the dermis (H & E, $\times 40$).

Fig. 3. Infiltrated tumor cells were composed of large cells with clear cytoplasm and central or eccentric nuclei with conspicuous mitotic figures (H & E, $\times 200$).

Fig. 4. On Ki-1 antigen staining, the infiltrated neoplastic cells stained positive ($\times 200$).

Fig. 5. The neoplastic cells were stained positive weakly in leukocyte common antigen stain ($\times 100$).

Fig. 6. On vimentin staining, the neoplastic cells stained positive ($\times 100$).

Table 1. Result of immunohistochemical studies in our case

Antigen	Distribution	Result
Ki-1 (CD 30)	Hodgkin and Reed-Sternberg cells Ki-1 lymphoma Lymphomatoid papulosis	+
Leukocyte common antigen	Lymphoma	+
Vimentin	Mesenchymal cell melanocyte, lymphoma, sarcoma	+
UCHL-1 (CD 45R)	T-cell	-
L26 (CD 45)	B-cell	-
CD 68	Histiocyte	-
Lysozyme	Macrophage with active phagocytosis Granulocyte	-
S-100 protein	Melanocyte, Langerhans cell, etc.	-

normocellular bone marrow.

A skin biopsy was performed and on H and E staining, the infiltrated cells tended to be cohesive, dense and diffuse on the dermis (Fig. 2). The neoplastic components of the cutaneous infiltrates were composed of large cells with clear cytoplasm and central or eccentric, convoluted nuclei with one or more prominent nucleoli (Fig. 3). Mitotic figures were conspicuous. There were variable accompanying infiltrates of lymphocytes, eosinophils and histiocytes. On immunohistochemical staining, the Ki-1, leukocyte common antigen, vimentin stain showed a positive reaction towards the tumor cells (Fig. 4,5,6) and S-100 protein, lysozyme, melanoma associated antigen, UCHL-1, L26, CD 68 showed a negative reaction (Table 1).

On the basis of the above studies, combined with the appropriate tumor cell morphological features, the diagnosis of Ki-1 lymphoma of the skin without systemic involvement was established. For treatment, the skin lesion of the patient was totally excised, and we followed him up every three months for one year.

DISCUSSION

Ki-1 anaplastic large cell lymphoma is a recently described lymphoma for which clinical information is limited. In 1985 Stein et al.¹ described a group of large cell non-Hodgkin's lymphoma, of-

ten involving lymph node sinuses, that were confused with carcinoma and malignant histiocytosis. Subsequently, this group of lymphomas has been termed Ki-1 positive large cell lymphoma, Ki-1 positive large cell anaplastic lymphoma, or Ki-1 lymphoma because these lymphomas expressed the CD 30 antigen, recognized by the antibodies Ki-1 and Ber-H2. Although most Ki-1 positive large cell lymphomas are T cell neoplasms, B cell, mixed T/B cell and null cell phenotypes have also been described.

Clinically, most of the reported Ki-1 lymphomas presented with nodal disease.^{2,3} However, Ki-1 lymphoma of the skin is common and occurs in about 15% of the reported Ki-1 lymphoma cases.^{4,5} The cutaneous lesions consist of single or multiple nodules and infiltrated plaques.⁶ The male to female ratio of these cases is 2.2 : 1. Skin lesions appear to have a high incidence in children and the elderly. According to Kiel's classification, Ki-1 ALCL is a high grade lymphoma. Nevertheless, the isolated cutaneous form^{7,8} seems to have a good prognosis with, in very rare cases, spontaneous regressions.

Histologically, the neoplastic component of the cutaneous infiltrates are composed of large cells with abundant eosinophilic, basophilic, or clear cytoplasm and central or eccentric, indented, convoluted or multilobulated nuclei with one or more prominent nucleoli. Mitotic figures are conspicu-

ous. There is a variable accompanying infiltrate of lymphocytes, eosinophils, plasma cells and histiocytes.

The histological appearance of Ki-1 lymphoma is rather characteristic but requires immunohistochemical confirmation. Potential cases of Ki-1 lymphoma may be evaluated in paraffin sections using the following antibodies as a basic panel: T lymphocyte (UCHL-1), B lymphocyte (L26, LN-1, LN2, immunoglobulin), epithelial (cytokeratin, EMA), leukocyte (LCA), histiocyte (α 1-antitrypsin, α 1-antichymotrypsin), melanoma (S-100) and antibodies reactive with CD 30 antigen (Ber H2). LCA staining in paraffin sections is variable and may be negative in large cell lymphoma, including up to a third of Ki-1 lymphomas. EMA reactivity is a common feature of Ki-1 lymphomas. The non-lymphoid markers, cytokeratin, S-100, are negative. Our case showed a positive reaction in Ki-1, leukocyte common antigen, vimentin stain but a negative reaction in UCHL-1, L26, CD 68, S-100 protein, lysozyme, melanoma associated antigen. Therefore, it was believed that tumor cells in our case were of null cell immunophenotype.

Kadin⁹ has suggested that lymphomatoid papulosis, mycosis fungoides, some forms of Hodgkin's disease^{10,11} and Ki-1 lymphoma have a common histogenesis. Indeed, 5~20% of lymphomatoid papulosis patients develop a lymphoma. The morphological and immunophenotypical similarities between lymphomatoid papulosis and Ki-1 lymphomas led him to suggest that these entities are derived from the same cellular clone (the tumoral progression phenomenon).

Morphological and immunological characteristics of Ki-1 lymphomas have been well described, but reported clinical experience and follow-up with these lymphomas has been limited. Also, the clinical course and response to therapy have been quite variable.¹² Paul JK et al.¹³ reported that the only clinical or pathological feature with prognostic significance was multicentricity of the skin lesions and most of the patients with localized skin lesions had an indolent clinical course in cutaneous large cell lymphoma. Therefore, the treatment varies depending on the initial clinicopathological diagnosis and extent of the disease, but treatment of these localized cutaneous forms seems to be surgical resection or local radiotherapy.

Based on clinical presentation and pathological

and immunohistochemical features^{14,15,16}, our patient had a localized Ki-1 lymphoma of the skin without systemic involvement. Our case was treated successfully with total excision. To date it has not recurred and we are following him up every three months. We emphasize that the future study of more cases with longer follow-up will be necessary to evaluate therapy and outcome for Ki-1 lymphoma.

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