

Conference Case

Intestinal T-cell lymphoma, NOS, presenting with sole peritoneal and mucosal lymphomatosis throughout abdominal cavity

Keywords: intestinal T-cell lymphoma NOS, peritoneum, peritoneal lymphomatosis, intestinal mucosa, lymphoepithelial lesion

CASE REPORT

A 54-year-old man without a history of enteropathy developed fever, nausea, anorexia, and abdominal pain one month prior to his initial hospital visit. He was tentatively diagnosed with peritonitis carcinomatosa, and emergent laparotomy was performed in a regional hospital. Intraoperatively, the abdominal cavity was filled with diffusely thickened serous membranes and mesenteries. No identifiable mass, lymph node swelling, or hepatosplenomegaly was noted. Pathological examination of a peritoneal specimen revealed

malignant lymphoma of the diffuse small-cell type with inconclusive immunophenotyping.

After the operation, he was transferred to our hospital. Although the abdomen was taut and distended, abdominal pain was moderate without rebound tenderness or signs of intestinal obstruction on admission. Superficial lymphadenopathy was not noted. His consciousness was alert without neurological abnormalities. Abdominal CT showed diffusely thickened serous membranes, and it was difficult to identify the intestinal configuration (Figure 1).

The white cell count was $20 \times 10^9 / L$ with 4% myelocytes,

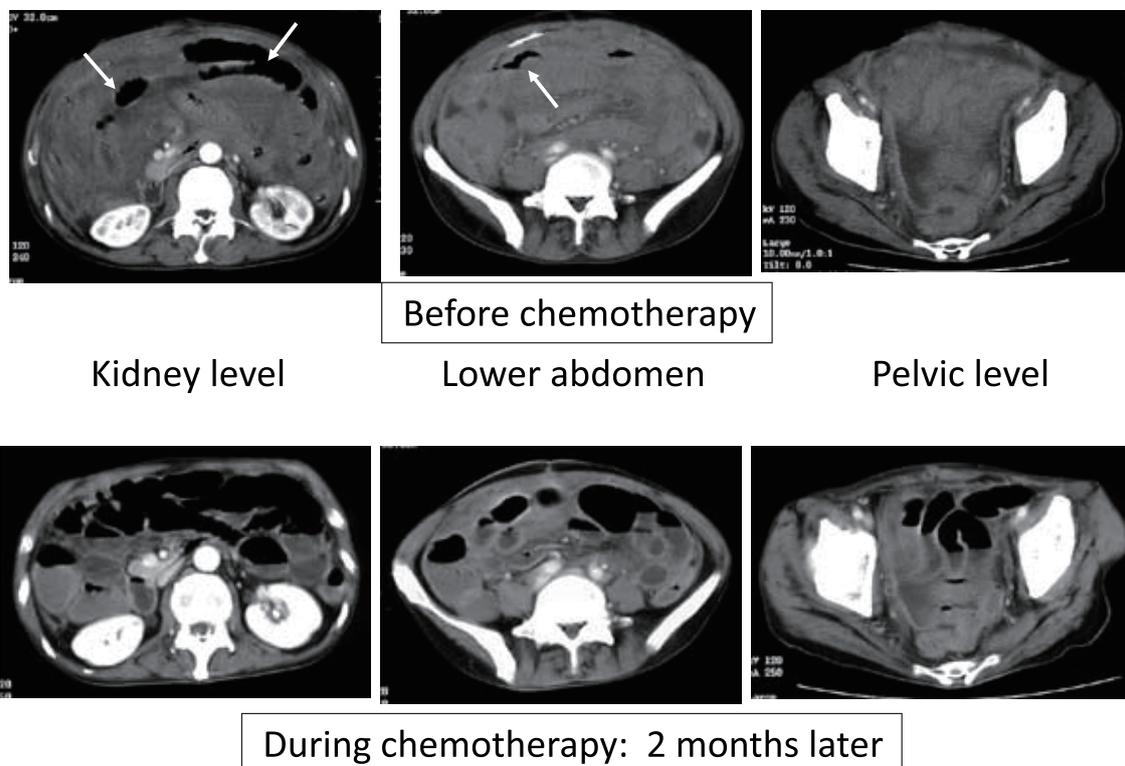


Fig. 1. Contrast CT of the abdomen before and after chemotherapy. Upper column: Imaging before chemotherapy. The abdominal cavity was filled with thickened serous membranes and mesenteries, and all intestines were embedded in these membranes with an unclear intestinal configuration. Tumor formation was not noted. Arrows indicate markedly enlarged intestines filled with air (not free air). The amount of ascites was modest. Lower column: Imaging after chemotherapy. The thickening of the serous membranes was reduced and the outlines of individual intestines could be visualized with slightly thickened intestinal walls.

77% neutrophils, 1% basophils, 5% lymphocytes, and 13% monocytes, a hemoglobin concentration of 11.1 g/dL, and a platelet count of 471×10^9 /L. Abnormal lymphocytes were not observed in the peripheral blood or bone marrow. Serum LDH was as high as 609 IU/L (normally below 450), CRP was also elevated to 4.2 mg/dL (normally below 0.5), and soluble interleukin-2 receptor was as high as 8,210 U/mL (normally 135-483). Serum tumor markers including CEA, CA19-9, and α -fetoprotein were all within normal limits. Serologic tests for HBV, HCV, HTLV-1, and HIV yielded negative results. Serologic tests for EBV showed a previous infection pattern. Plasma PCR analysis for HHV-8 gave a negative result. We could not perform colonoscopy to obtain a biopsy specimen because of his poor condition.

The growth of the lymphoma was rapid, and we treated him with intensity-reduced CHOP. After 3 courses of treatment that spanned 8 weeks, his abdomen became soft and flat. The outline of the individual intestines could be visualized on CT (Figure 1). However, the effect of treatment was transient, and he developed massive watery stools with a dark-green color. We treated him with salvage chemotherapy (etoposide and vincristine) without improvement, and he died 4 months after admission.

At autopsy, the intestines adhered together with thickening of the peritoneum and mesenteries throughout the abdominal cavity, and it was difficult to separate them. There were no mass lesions or enlarged lymph nodes. Haustra of the large intestine had completely disappeared. The macroscopic pathologic diagnosis was extensive neoplastic peritonitis without an identifiable primary lesion because of diffuse disease. Macroscopic features of the colon showed patchy fibrous thickening of serosal membranes and an edematous intestinal wall (Figure 2). Microscopically, marked infiltrations of lymphoma cells were observed in the peritoneum, mesenteries, mucosa of the small and large intestines, and pleural serous membrane, as shown in Figure 3 from the large intestine, in which the infiltration of abnormal lymphocytes was conspicuous in the mucosa and subserosa (Figure 3). This invasion was massive and space-occupying (Figure 4A/B). Lymphoma cells were small and some of them showed nuclear atypism (Figures 4A/5A). Immunohistochemical



Fig. 2. Macroscopic features of the colon at autopsy. The serosal membrane showed patchy fibrous thickening, and the intestinal wall was edematous.

examination demonstrated that these cells expressed CD45RA/RO, CD3, CD4 (faintly), CD5, and CD7 but not CD20, CD8, CD10, CD56, or perforin 1 (Figure 5; data not shown for CD45RA/RO, CD5, CD7, CD10, and perforin 1). Residual crypts were intact without epitheliotropism by lymphoma cells (Figure 4B). The lymphoma cells were negative for EBER (in situ hybridization), LMP-1, and HHV-8 (by PCR). Furthermore, PCR demonstrated monoclonal rearrangement of the TCR- β gene. Lymphomatous infiltration was not observed in the liver, spleen, kidney, pancreas, or bone marrow. Thus, the final pathologic diagnosis was intestinal T-cell lymphoma, NOS, extensively invading the peritoneum, mesenteries, and intestinal mucosa throughout the abdominal cavity.

The tumoral invasion in the present patient as peritoneal lymphomatosis¹⁻⁴ is extremely rare in terms of infiltration of all the peritoneum and intestinal mucosa in the abdominal cavity without tumor formation or invasion to other organs. It should be emphasized that extensive disease was observed at the time of presentation of the patient but not in an advanced stage. To the best of our knowledge, there have been only 2 patients similar to ours reported in the literature: one with primary effusion lymphoma (B-cell lineage)⁵ and the other with Burkitt-like B-cell lymphoma.⁶ Therefore, T-cell lymphoma exhibiting this pattern of lymphoma invasion has not been reported. Indeed, B-cell lymphoma, especially DLBCL, has been most frequently reported in peritoneal lymphomatosis.^{3,4}

The 2017 WHO classification⁷ includes 4 subtypes of intestinal T-cell lymphoma. Regarding the lymphoma

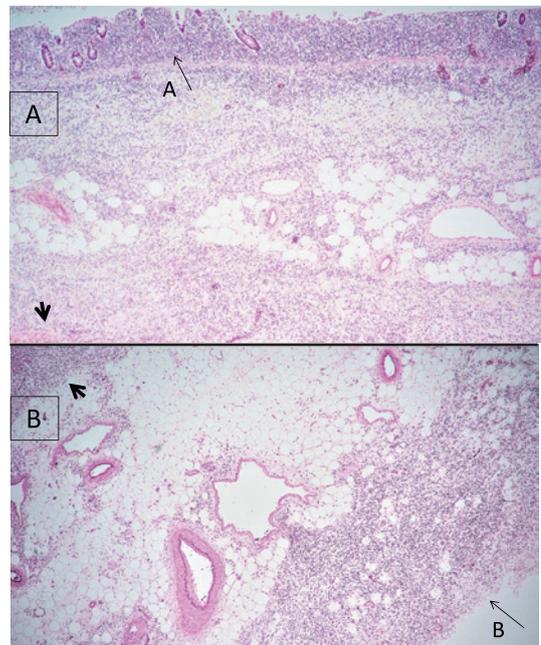


Fig. 3. Microscopic examinations at low magnification of the colon revealed that atypical lymphoid cells infiltrated the whole intestinal wall layer, particularly in the mucosa and subserosa. Arrows **A** and **B** indicate the mucosa and subserosa, respectively (H-E staining, $\times 20$). Arrowheads indicate the muscular layer.

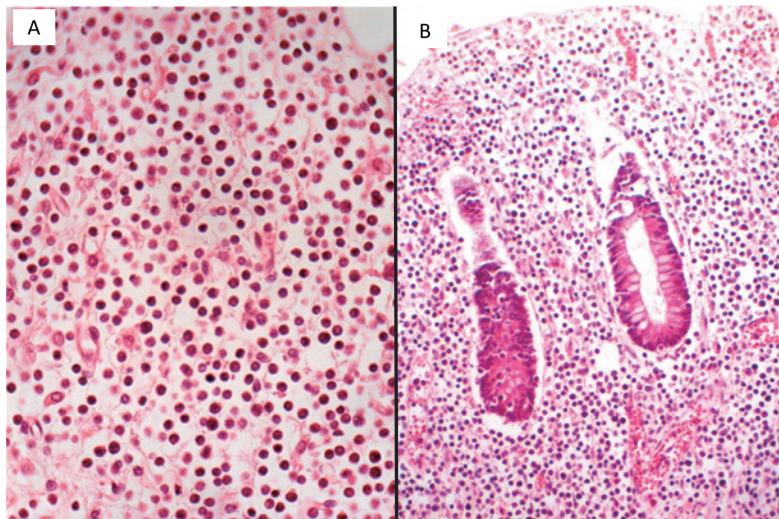


Fig. 4. Histopathological examination of the peritoneum and colonic mucosa at autopsy.
A: The peritoneum was diffusely infiltrated by small lymphoid cells. These cells had round nuclei with slight atypism and a high N/C ratio. H-E staining, $\times 400$.
B: The colonic mucosa was also densely infiltrated by the same small atypical lymphoid cells. Epitheliotropism of these lymphoid cells was not observed. H-E staining, $\times 200$.

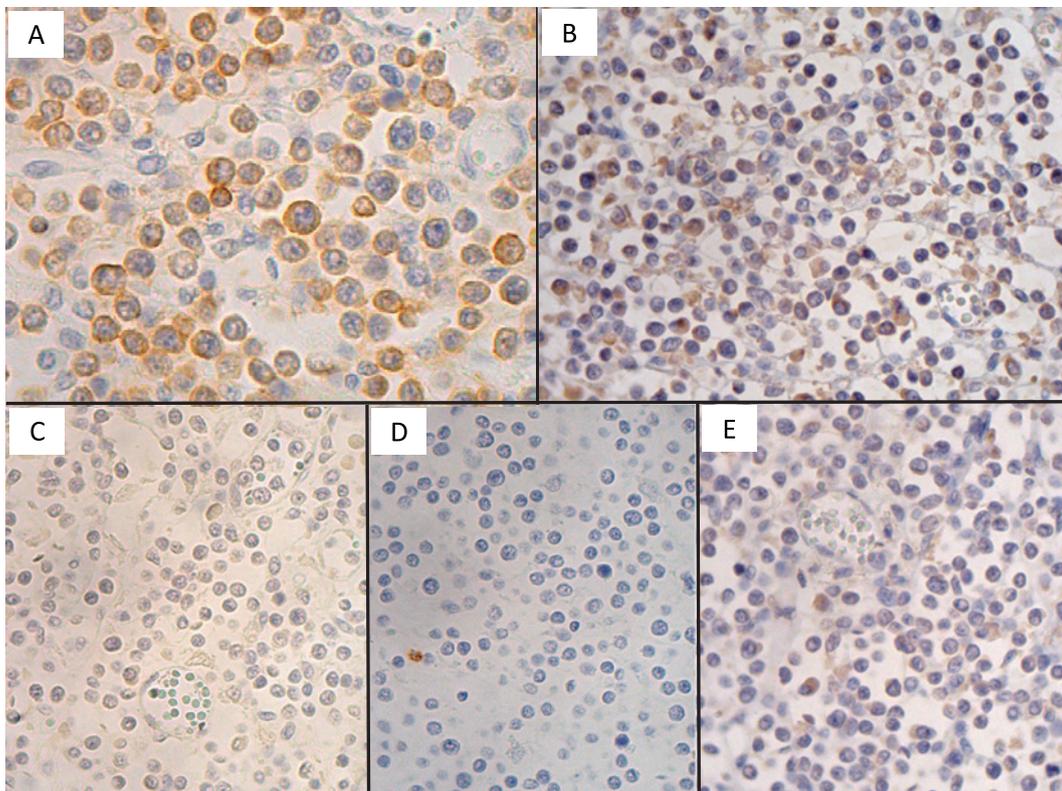


Fig. 5. Immunohistochemical examination of the peritoneum and colonic mucosa at autopsy. These abnormal lymphoid cells were positive for CD3 (*A*) and CD4 (faintly) (*B*) but negative for CD20 (*C*), CD8 (*D*), and CD56 (*E*) ($\times 400$ for CD3 and $\times 200$ for the rest).

subtype of the present patient, intestinal T-cell lymphoma, NOS, may be reasonable, considering the absence of a history of enteropathy, aggressive clinical course, small-sized lymphoma cells, no epitheliotropism, and immunophenotype of lymphoma cells (CD3⁺, CD4⁺, CD5⁺, CD7⁺, CD8⁻, CD56⁻, LMP-1⁻).⁷

We also searched for whether sole peritoneal invasion similar to ours has been described in the literature focusing on intestinal T-cell lymphoma.⁷⁻¹⁵ Consequently, the localization of intestinal T-cell lymphoma at presentation was revealed to be generally regional⁷⁻¹⁵ and cases with extensive disease like the present case could not be found even in this way. Because intestinal T-cell lymphoma, NOS, is currently not considered a specific disease entity,⁷ it is difficult to distinguish the present type of lymphoma from peripheral T-cell lymphoma, NOS, arising in the peritoneum; however, the cellular origin of this type of lymphoma will be clarified in the future because of the marked affinity of the tumor for the peritoneum and mucosa.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding this study.

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