Splenic αβ T-cell Lymphoma: One Case Report and Review

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ABSTRACT **Objective** To describe the clinical and pathological features, diagnosis and treatment of splenic αβ T-cell lymphoma. **Methods** The author reports one case of splenic αβ T-cell lymphoma and reviews its clinical manifestation, laboratory examination, pathologic character, diagnosis, antidiastole and treatment. **Results** It is the main character of splenic αβ T-cell lymphoma that it has fever, megalosplenia, blood cytopenia. Pathological diagnosis of splenic was T-cell lymphoma. with positive CD3,CD8,CD43,CD45 RO and CD56. TCRβ gene rearrangement was detected by PCR. Two cycles of chemotherapy (including CHOP and FCM) were administered, but the disease progressed. This patient died 5 months after diagnosis. **Conclusion** Splenic αβ T-cell lymphoma is a group of very rare lymphoma. The prognosis of most patients is poor.

Key words Lymphoma; Alphabeta T-cell; Splenic

Primary splenic T-cell lymphoma is rare in clinical practice. Only individual case was reported or small sample pathologic reports were seen in china, most of which were splenic γδ-Tcell lymphoma, with less primary splenic αβ Tcell lymphoma, the total number of which reported worldwide was less than 30 cases. Here we report one case of splenic primary αβ T cell lymphoma treated in our hospital and have a review of relative literature.

CASE REPORT

A 52-year-old woman presented with fatigue and low fever for over one month and was admitted into our hospital on April 9th, 2007. Clinical examination revealed cervical lymphadenopathy at both sides(1×1cm) and splenomegaly(2 cm below the costal margin). Blood routine test showed pancytopenia (Hb71g/L,WBC1.2×109, N0.42, L0.50, M0.08, PLT38×109). The result of serum biochemical examination was as follows: lactate dehydrogenase 312U/L, total protein 59.3g/L, albumin 33.4g/L, alkaline phosphatase 240U/L, ferritin 1396ng/ml, β2-MG 2.44ug/ml. The bone marrow examination showed active proliferation. All three lineages of granulocytes, erythrocytes and megakaryocytes proliferated well, with coarse plasma granules and some phagocytes seen in the granulocytic lineage.

The patient had irregularly high fever (>39℃) from April 11th, 2007. Treatment with anti-virus drug and several antibiotics showed no obvious effect, and splenomegaly was progressing. Further laboratory work-up displayed negative results of PPD test, HAV/HBV/HCV/ HEV-antibodies, EBV-antibodies,Widal's test, and blood culture. Abdominal computed tomography(CT)(Fig. 1) performed on April 16th, 2007 showed splenomegaly with a low-density shadow which indicated infarction, while the thoracic CT showed a small nodular density in the right lower lung field and little pleural effusion at both sides. The pathology of the right cervical lymph node showed reactive hyperplasia primarily in T zone and high proliferation of lymphatic tissues (Fig.2). Immunohistochemical staining had a result of CD3(++), CD45RO(++), CD79a(+), CD20(+), CD68 (+), S-100 (+), Pax-5 (+). Tumor glucose metabolism 18F-FDG imaging (Fig. 3) performed on April 26th showed abnormal increase of spleen glucose metabolism. The patient was transferred to surgical department to have splenectomy on April 26th, 2007. As the post-operation pathology indicated splenic diffuse T-cell lymphoma, two cycles of chemotherapy(CHOP and FCM) were administered, but the disease still progressed and the patient died in August 2007.

The spleen biopsy specimen was obtained after splenectomy and embedded in paraffin and sectioned for immunohistochemical study, chromosomal study(FISH),

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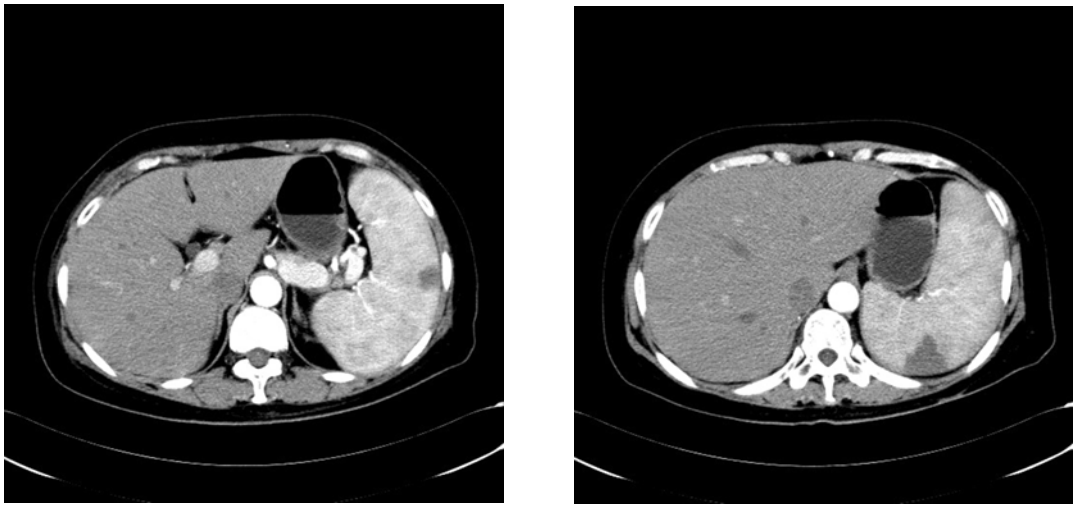

Fig. 1 Abdominal CT

and TCR β and TCRγgene rearrangement detection.

RESULTS

Spleen pathology and immunohistochemistry

The spleen was enlarged (20cm ×15cm ×4cm), weighed 1650g, and two areas of infarction(3×4cm and 1.5×2.5cm) were seen in gross specimen. The pathological section was showed as figure 4. The result of immunohistochemistry was CD20(−), Pax-5(−), CD3(+), CD8(+), CD43(+), CD45RO(+), CD56(+), TdT(−), CyclinD1(−), CD5(−), CD10(−), MPO(−), CD68(−), which indicated diffuse T-cell lymphoma.

Gene rearrangement detection

A TCRβ chain, not TCRγ chain, gene rearrangement was detected using the polymerase chain reaction (PCR)analysis.

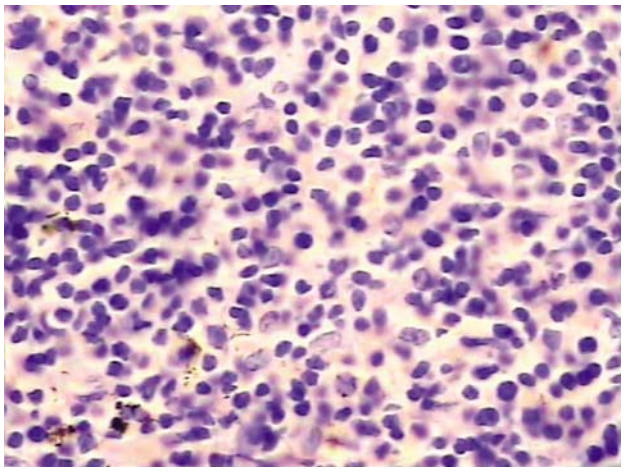

Fig.2 Cervical lymph node pathological section HE × 400

FISH study

No abnormal chromosome was found.

DISCUSSION

Hepatosplenic γδ T-cell lymphoma was recognized as a distinct lymphoma entity since two cases were described by Farcet et al. in 1990[1]. In 1994, it was incorporated as a provisional entity in the revised European-American lymphoma classification and as a distinct lymphoma in the new World Health Organization classification of hematopoietic disorders [2]. Then several cases of hepatosplenic αβ T-cell lymphoma were reported[3-5], which displayed similar clinical pathological features as hepatosplenic γδ T-cell lymphoma, except that neoplastic cells of the former expressed TCR-αβ rather than TCR-γδ. Normal T cells are classified as αβ T-cell and γδ T-cell according to their different phenotype of T cell receptor. Most of αβ T-cells are CD4 or CD8 positive, presenting as CD4+CD8- or CD4-CD8+ single positive cells, while γδ T-cells are CD4 and CD8 double negative.

The T cell phenotype of the patient we reported here is CD8(+)CD4(−)CD56(+)CD45RO(+) and B-cell markers are negative, which corresponds with αβ T-cell lymphoma. Moreover, TCRβ chain, but no TCRγ chain, gene rearrangement was detected by

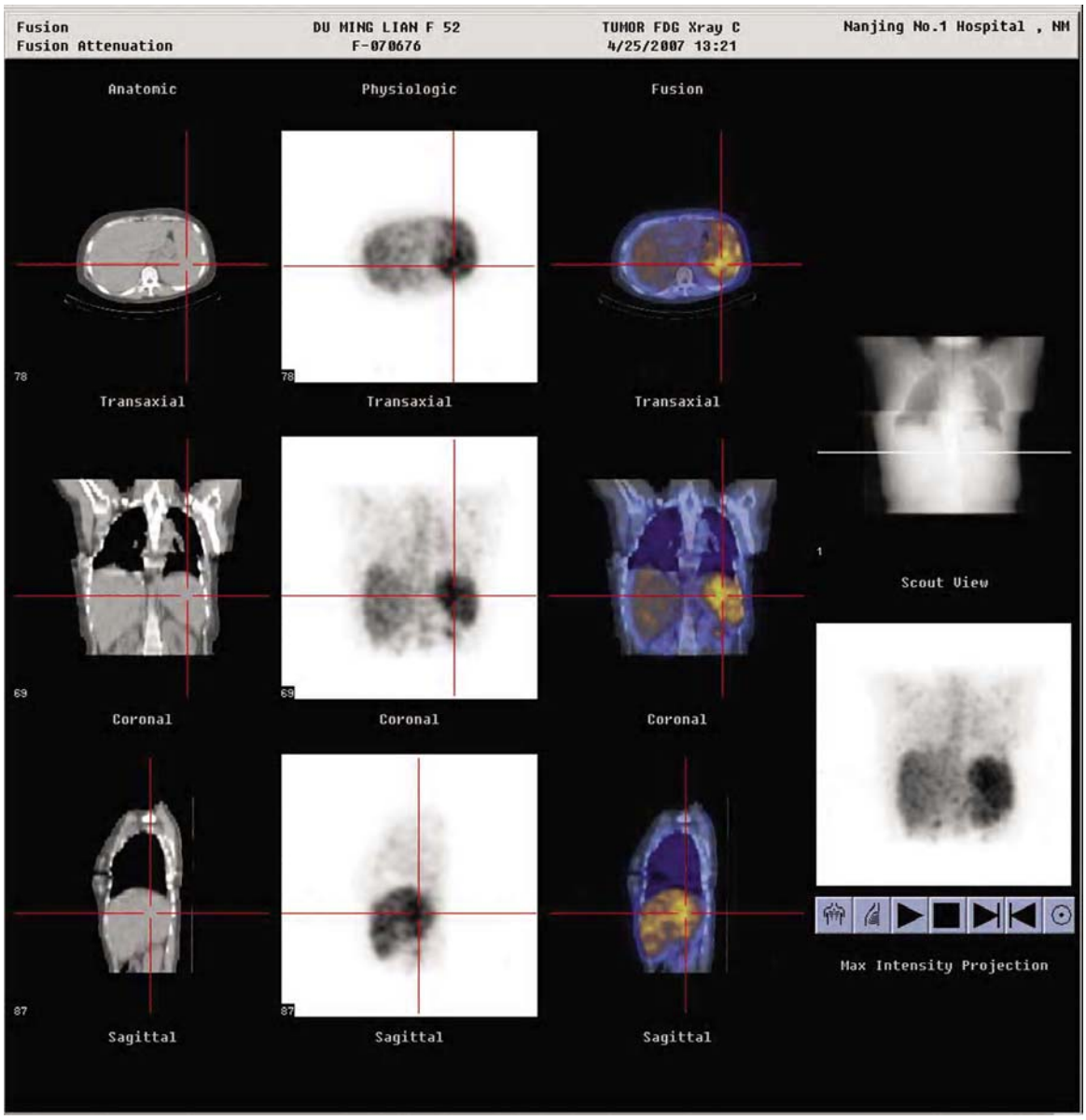

Fig. 3 Tumor glucose metabolism image(PET-CT)

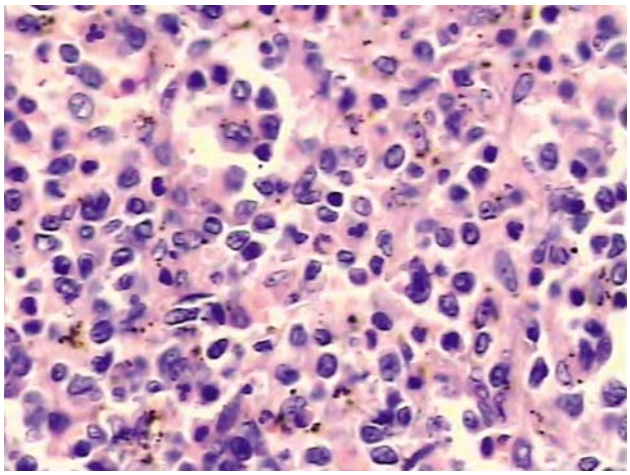

Fig. 4 Spleen pathological section HE × 400

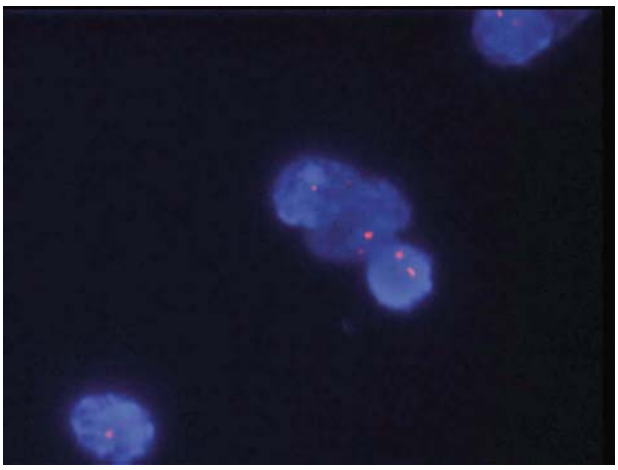

Fig. 5 FISH study × 1000

PCR, and no abnormal chromosome was found by FISH study. Here we review the current reports of individual case and generalize the common features of the disease and the similarity and difference with γδ T-cell lymphoma.

Most of the patients present with B symptoms, such as fever, enlarged spleen and liver, anemia, thrombocytopenia and leucocytopenia, together with possible jaundice and increased lactate dehydrogenase [3-4]. Pathologically, the cover of the spleen is intact, and the cut surface is homogeneously red and purple and free of nodules. The neoplastic cells are infiltrated in the cords and tend to form clusters within the sinuses, with complete disappearance or marked atrophy of the white pulp. The tumor cells are small to medium-sized with round or oval nuclei, not apparent nucleolus, and moderately abundant or rare cytoplasm. When the bone marrow is involved, tumor cells infiltrated into the stroma or sinuses, abnormal erythrocytic hematopoiesis, and hemophagocytosis are present. The immunological phenotype is TCRαβ positive, and CD2+,CD3+,CD4-, CD5-,CD7-,CD8+/-, with most of the patients CD56 and CD57 positive, and sometimes S-100(+)[6]. Clonal β chain gene rearrangement can be detected. The most frequent cytogenetic abnormality is isochromosome 7q and trisomy 8[2-4]. Most researchers insist on splenectomy with subsequent chemotherapy and biotherapy as treatment, but no universal protocol of chemotherapy is attained and the average survival time is 6.6 months [5]. Allogeneic hematopoietic stem cell transplant(Allo-HSCT) may have better efficacy[7-8]. Islam et al.[9] reported one case treated with CD52 monoclonal antibody combined with Allo-HSCT and donor lymphocyte infusion(DLI) who acquired long-term survival.

The main difference of hepatosplenic αβ and γδT-cell lymphoma is the expression of TCR, according to which the lymphoma is classified. The study of TCRβ, δ and γ chain gene rearrangement can be performed with Southern blot for fresh tissue or with PCR for paraffin-embedded tissue. The sex composition of the two diseases is significantly different, with hepatosplenic αβ T-cell lymphoma mainly involved in female population (65%) while hepatosplenic γδ T-cell lymphoma primarily found in male population (81%). Apart from the above-mentioned differences, more similarities are observed. Clinically, patients of both diseases present with B symptoms such as enlarged spleen and liver, anemia, thrombocytopenia, bone marrow involvement and no lymph nodal disease. Most patients die one year after diagnosis. Neoplastic cells of both diseases display abnormal T-cell immunological phenotype such as CD5 and/or CD7 negative. Though CD4 is negative in both groups, the expression rate of CD8 is higher in hepatosplenic αβT-cell lymphoma than in hepatosplenic γδT-cell lymphoma. The expression of NK cell related antigen such as CD56 is similar in both groups, while the expression rate of CD57 is higher in hepatosplenic αβT-cell lymphoma group. High expression of TIA-1 is observed in both groups[10]. The genetic characters are also extremely similar, with isochromosome 7q and trisomy 8 found in both groups[11]. On account of so many similarities, it is suggested that hepatosplenic γδT-cell lymphoma be renamed as hepatosplenic T-cell lymphoma to include hepatosplenic αβT-cell lymphoma.

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