Subcutaneous Panniculitis-like T Cell Lymphoma Diagnosed with a Slowly Progressive Course: A Case Report

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Panniculitis is an inflammation that occurs in subcutaneous adipose tissue. Panniculitis includes physical panniculitis (e.g., traumatic) and infectious panniculitis (e.g., bacterial, fungal, subcutaneous panniculitis-like T cell lymphoma [SPCTL], etc.). Accurate diagnosis is crucial due to similar clinical presentation of all types of panniculitis. Here, we report a case of SPCTL which was initially diagnosed with traumatic panniculitis. A 15-year-old male patient was admitted to a previous hospital due to a progressively enlarged right flank and inguinal mass after an abdominal bruise. He was initially diagnosed with traumatic panniculitis, but the mass expanded throughout the chest and abdomen accompanied by a fever of over 11 months. Computed tomography (CT) revealed a subcutaneous mass in the anterior chest and abdominal wall. Fludeoxyglucose F18 (FDG) uptake was observed at those lesions using FDG-positron emission tomography (PET). A biopsy of the mass lesion was performed, during which SPCTL was diagnosed based on pathological examination. He was initially treated with prednisolone and cyclosporine A for two weeks. His fever went down, but subcutaneous mass in the chest and abdominal wall persisted. Therefore, he received a cyclophosphamide, doxorubicin, vincristine, and prednisone (CHOP) regimen. After 6 courses of CHOP, CT revealed no disease evidence. He remained in complete remission at 30 months of therapy.

Key words: subcutaneous panniculitis-like T cell lymphoma, Immunohistochemistry, Immunosuppressive therapy, CHOP

INTRODUCTION

Subcutaneous panniculitis-like T cell lymphoma (SPCTL) is a rare mature cytotoxic T cell lymphoma, accounting for < 1% of all cutaneous T cell lymphomas [1]. Subcutaneous nodules preferentially involved the lower extremities and the trunk [1, 2]. Most patients with SPCTL demonstrated a slow disease course, with a median time to diagnosis of 7 months [2]. SPCTL diagnosis is relatively difficult due to the similar clinical course of the other benign panniculitis and slow disease course. Herein, we present the case of a patient suffering from SPCTL who was initially diagnosed with traumatic panniculitis due to an abdominal bruise and a slowly progressive course.

CASE

A 15-year-old male patient was admitted to a previous hospital due to a progressively enlarged right flank and inguinal mass after an abdominal bruise. He was initially diagnosed with traumatic panniculitis and observed. However, the mass lesion was gradually expanded throughout the chest and abdomen accompanied by a fever over 11 months and he admitted to our hospital. Physical examination revealed that the mass lesion was tough and bulged the entire circumference of the chest and abdomen with partial pigmentation (Fig. 1). Further, both inguinal lymph nodes were swelled. He had developed B symptoms (high fever and night sweats) except for weight loss. Laboratory results revealed mild leukopenia (white blood cell count of 1,700/μL), elevated lactate dehydrogenase of 792 U/L, and soluble interleukin-2 receptor of 2,710 U/mL.

Antinuclear antibody was negative (Table 1). Soft tissue ultrasound demonstrated subcutaneous mass lesion with cobblestone appearance at the anterior chest and abdominal wall (Fig. 2A). Computed tomography (CT) scans revealed swelling subcutaneous fat tissue with increased concentration in the anterior chest and abdominal wall (Fig. 2B). Hepatosplenomegaly was not seen. Fludeoxyglucose F18-positron emission tomography (FDG-PET) revealed evidence of FDG uptake at subcutaneous fat tissue in the anterior chest and abdominal wall (Fig. 3). Biopsy was performed on subcutaneous mass lesion. Histopathology revealed infiltration of heterogeneous-size lymphocytes in subcutaneous fat lobules (Fig. 4A, 4B). Immunohistochemistry stains revealed the phenotype cluster of differentiation (CD)3, CD7, CD8, T-cell intracellular antigen-1 (TIA-1), and Granzyme B. Further, the αβ T-cell receptor (TCR) was positive.

SPTCL was definitively diagnosed based on these results. Bone marrow examination revealed mild hemophagocytic syndrome (HPS) but no evidence of

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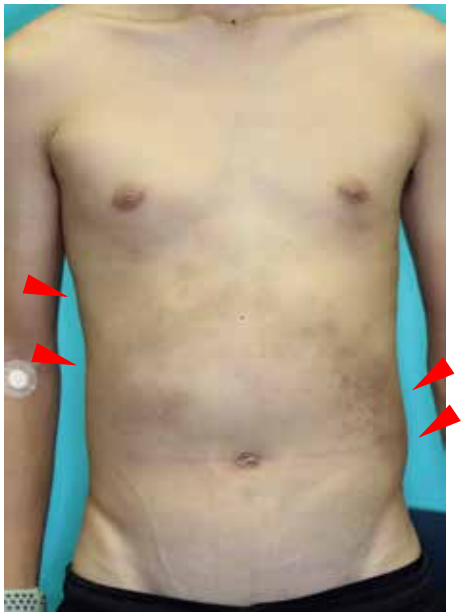

Fig. 1 Chest and abdominal subcutaneous mass lesion with partial pigmentation

Table 1 Peripheral blood and urinary test

WBC	1,700/μl	TP	6.6/g/dl	IgG	906mg/dl
Seg	34.0%	Alb	3.5/g/dl	IgA	181mg/dl
Stab	0.0%	Glu	91mg/dl	IgM	60mg/dl
Lymph	63.0%	BUN	7mg/dl	CH50	48mg/dl
Mono	3.0%	UA	5.4mg/dl	C3	131mg/dl
Eosino	0.0%	Cre	0.75mg/dl	C4	28mg/dl
Blast	0.0%	Na	138mg/dl		
RBC	470 × 10^4/μl	Cl	104mg/dl	sIL-2R	2,710U/ml
Hb	13.2g/dl	K	4.3mg/dl	Antinuclear antibody	< 40
Plt	17.6 × 10^4/μl	Ca	8.7mg/dl		
		P	3.1mg/dl	Urinary test	
PT	71%	T-Bil	0.4mg/dl	specific gavity	1.028
PT-INR	1.2	AST	33U/l	pH	6.1
APTT	24sec	ALT	22U/l	protein	(-)
Fibrinogen	304mg/dl	LDH	792U/l	suger	(-)
D-dimer	3.4μg/ml				
		CRP	1.39mg/dl		

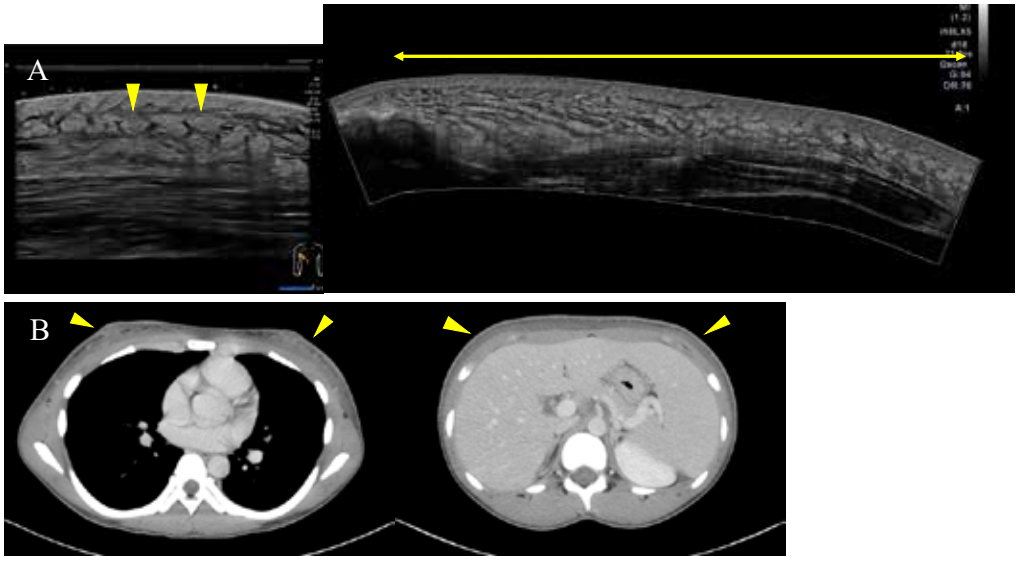

Fig. 2 Soft tissue ultrasound and computed tomography (CT) findings on admission
A. Soft tissue ultrasound showed a subcutaneous mass lesion with a cobblestone appearance at the anterior chest and abdominal wall
B. CT scans revealed swelling subcutaneous fat tissue with increased concentration in the anterior chest and abdominal wall.

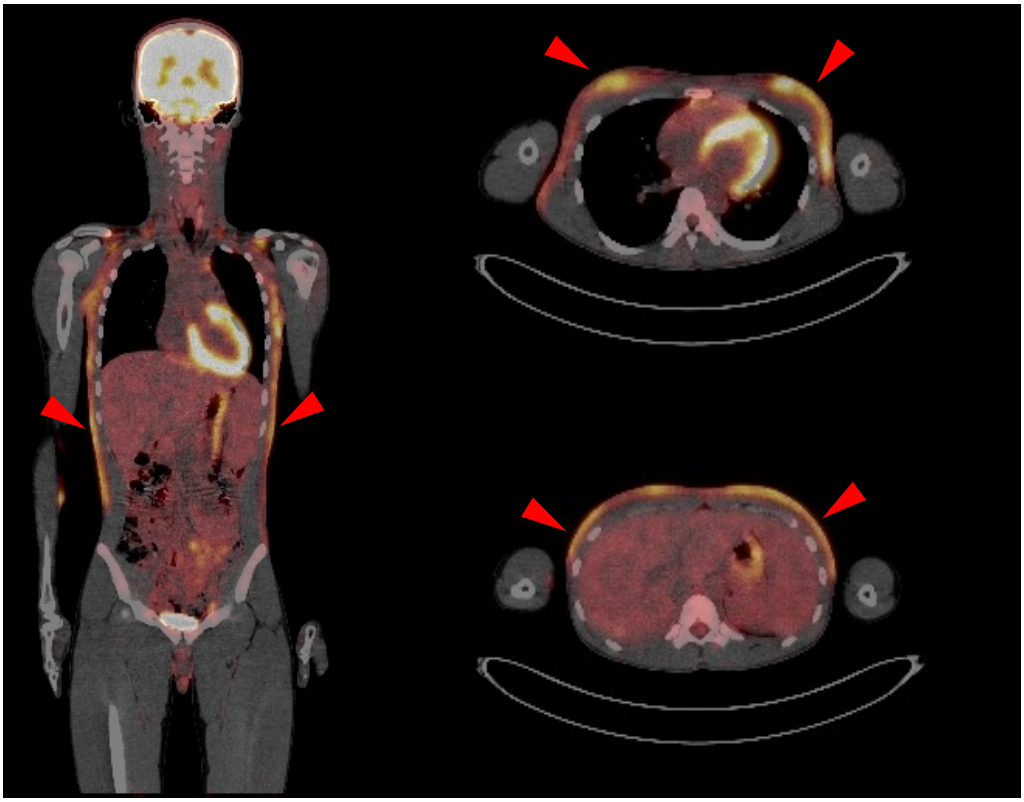

Fig. 3 Fludeoxyglucose F18-positron emission tomography (FDG-PET) revealed evidence of FDG uptake at subcutaneous fat tissue in the anterior chest and abdominal wall.

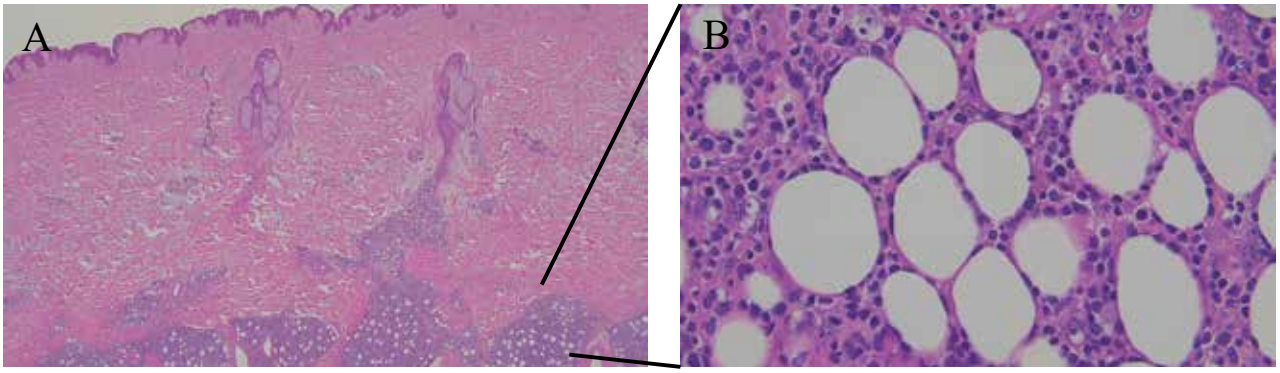

Fig. 4 Histopathological findings of the abdominal mass lesion
A. Tumor cells located in the subcutaneous tissue (hematoxylin and eosin [H&E], × 40)
B. Infiltration of heterogeneous size lymphocytes in subcutaneous fat lobules (H&E, × 400)

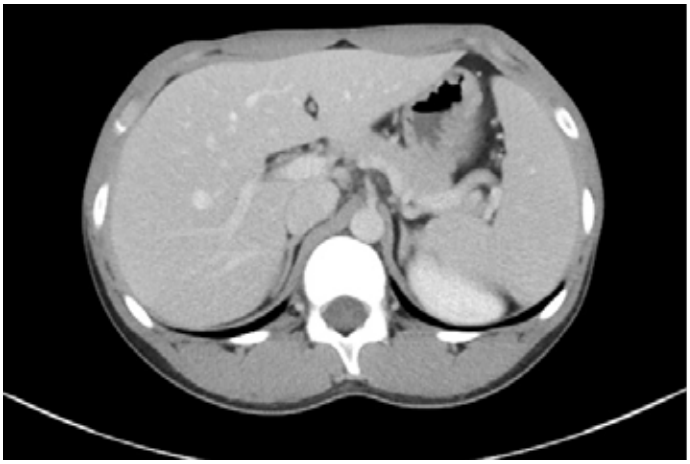

Fig. 5 CT findings after 6 courses of CHOP
The mass lesion had almost completely subsided.

lymphoma. The patient commenced therapy with oral prednisone (PSL) of 1 mg/kg and cyclosporine A (CyA) of 5 mg/kg. His fever went down after treatment initiation, but the chest and abdominal wall subcutaneous mass lesion persisted and was not changed after two weeks. Therefore, he received a cyclophosphamide, doxorubicin, vincristine, and PSL (CHOP) regimen. The mass gradually shrank. The mass lesion had almost completely subsided after 6 courses of CHOP (Fig. 5). He remains in complete remission at 30 months of therapy.

DISCUSSION

SPCTL is a rare mature cytotoxic T cell lymphoma [1–4]. In 2005, the World Health Organization-European Organization for Research and Treatment of Cancer classification defined SPCTL as a tumor that expresses αβ TCR gene rearrangement. Tumors expressing γδ TCR are categorized as primary cutaneous γδ T cell lymphoma [5].

The median age at diagnosis of SPCTL was 31–46 years [1–4]. Approximately 20% of patients were aged ≤ 20 years [1, 3]. SPTCL generally manifests as one or more painless subcutaneous nodules that affect the lower extremities (75%), trunk (69%), and arm (38%) [2]. SPCTL is frequently accompanied by fever, night sweats, weight loss, and bone marrow abnormalities [3]. The most prominent bone marrow abnormality is HPS.

Approximately 20% of patients had a history of autoimmune disorders such as systemic lupus erythematous (SLE) [1, 2]. Ohtsuka *et al.* reviewed 16 Japanese patients with SPTCL and revealed a higher incidence of B symptoms (81%), HPS (45%), and a lower incidence of autoimmune disease (13%) [3]. Most patients with SPCTL demonstrated a slow disease course which takes 7 months (median) to diagnose [2].

Diagnosing SPTCL is relatively difficult because its clinical manifestations are similar to those of some cases of patients with SLE and its slow disease course [6]. Although our patient was ruled out SLE due to the result of antinuclear antibody, he was initially diagnosed with traumatic panniculitis due to a history of abdominal bruises. The mass lesion gradually expanded accompanied by fever, and it SPCTL diagnosis took 11 months.

FDG-PET is increasingly being used and is indicated useful in assessing the extent of disease and treatment response in SPTCL [7]. López-Lerma *et al.* revealed that PET images showed hypermetabolism in multiple subcutaneous nodular lesions in patients with SPTCL [2]. They recommended biopsy when extracutaneous FDG uptake is observed. Our patient demonstrated FDG uptake at subcutaneous fat tissue in the anterior chest and abdominal wall. Malignant disease was suspected and a biopsy of the subcutaneous mass lesion was performed based on these results.

Infiltration of pleomorphic malignant T cells in the subcutaneous adipose tissue accompanied by a large number of macrophages characterizes the histology of SPCTL.

The arrangement of malignant T cells around a single fat cell helps in diagnosis.

Immunohistochemically, most SPTCL cases are positive for TCR αβ, CD3, CD8, and TIA-1 [8].

A standardized therapeutic approach has not been developed for SPTCL due to rarity, but immunosuppressive drugs, such as PSL and CyA, may be effective [9–11]. The reported time to respond to CyA was within 2 weeks in most cases [11] and that to corticosteroid alone was within 4 weeks [9]. Bairagi *et al.* revealed that dual immunosuppressive treatment (PSL and CyA) was effective for childhood SPTCL [12]. The prognosis of SPTCL is generally good and the disease-specific survival is > 80% [1, 2, 8], but combined HPS might be poor prognostic. Willemze *et al.* revealed HPS in 17% of their cases and 63% of those patients died [1]. Further, approximately half of the patients received multiple chemotherapeutic regimens such as CHOP [1]. CHOP may be effective, especially for those with poor prognostic factors and poor response to initial therapy.

Our patient received dual immunosuppressive treatment (PSL and CyA) as initial therapy and the high fever promptly resolved after therapy initiation. However, the indurated mass lesion in the chest and abdominal wall did not change afterward. We decided that not only immunosuppressive treatment but CHOP treatment was needed since the initial treatment response was inadequate and the patient was complicated with HPS as a poor prognostic factor. The mass gradually shrank after CHOP treatment.

Complete remission was achieved after the six courses of CHOP. The best treatment strategies for SPTCL are unknown. Further clinical trials are required to define standard therapy.

CONCLUSION

Diagnosing SPTCL is difficult due to clinical manifestations and its slow disease course. The differential diagnosis for panniculitis should include benign and neoplastic etiologies, such as SPTCL, and early histopathological diagnosis is vital if there are persistent subcutaneous mass lesions. Immunosuppressive therapy should be selected for SPTCT, but some cases with poor treatment response may require multiple chemotherapeutic treatments such as CHOP. Clinical trials are required to define standard therapy in the future.

DECLARATION OF CONFLICTING INTERESTS

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

ETHICAL APPROVAL

Our institution does not require ethical approval for reporting individual cases or case series.

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INFORMED CONSENT

Written informed consent was obtained from the patient for their anonymized information to be published in this article.

REFERENCES

1) Willemze R, Jansen PM, Cerroni L, Berti E, Santucci M, Assaf C, *et al.* Subcutaneous panniculitis-like T-cell lymphoma: definition, classification, and prognostic factors: an EORTC cutaneous

lymphoma group study of 83 cases. Blood. 2008; 111: 838–845.
2) López-Lerma I, Peñate Y, Gallardo F, Martí RM, Mitxelena J, Bielsa I, *et al*. Subcutaneous panniculitis-like T-cell lymphoma: clinical features, therapeutic approach, and outcome in a case series of 16 patients. J Am Acad Dermatol. 2018; 79: 892–898.
3) Ohtsuka M, Miura T, Yamamoto T. Clinical characteristics, differential diagnosis, and treatment outcome of subcutaneous panniculitis-like T-cell lymphoma: a literature review of published Japanese cases. Eur J Dermatol. 2017; 27: 34–41.
4) Michonneau D, Petrella T, Ortonne N, Ingen-Housz-Oro S, Frank N, Barete S, *et al*. Subcutaneous panniculitis- like T-cell lymphoma: immunosuppressive drugs induce better response than polychemotherapy. Acta Derm Venereol 2017; 97: 358–364.
5) Willemze R, Jaffe ES, Burg G, Cerroni L, Berti E, Swerdlow SH, *et al*. WHO-EORTC classification for cutaneous lymphomas. Blood. 2005; 105: 3768–3785.
6) Wu X, Subtil A, Craiglow B, Watsly K, Marks A, Ko C. The coexistence of lupus erythematosus panniculitis and subcutaneous panniculitis-like T-cell lymphoma in the same patient. JAAD Case Rep. 2018; 4: 179–184.
7) Kim JS, Jeong YJ, Sohn MH, Jeong HJ, Lim ST, Kim DW, *et al*. Usefulness of F-18 FDG PET/CT in subcutaneous panniculitis-like T cell lymphoma: disease extent and treatment response evaluation. Radiol Oncol. 2012; 46: 279–283.
8) Willemze R, Cerroni L, Kempf W, Berti E, Facchetti F, Swerdlow SH, *et al*. The 2018 update of the WHO-EORTC classification for primary cutaneous lymphomas. Blood 2019; 133: 1703–1714.
9) Guenova E, Schanz S, Hoetzenecker W, DeSimone JA, Mehra T, Voykov B, *et al*. Systemic corticosteroids for subcutaneous panniculitis-like T-cell lymphoma. Br J Dermatol. 2014; 171: 891–894.
10) Rojnuckarin P, Nakorn TN, Assanasen T, Wannakrairot P, Intragumtornchai T. Cyclosporin in subcutaneous panniculitis-like T-cell lymphoma. Leuk Lymphoma. 2007; 48: 560–563.
11) Mizutani S, Kuroda J, Shimura Y, Kobayashi T, Tsutsumi Y, Yamashita M, *et al*. Cyclosporine A for chemotherapy-resistant subcutaneous panniculitis-like T cell lymphoma with hemophagocytic syndrome. Acta Haematol. 2011; 126: 8–12.
12) Bairagi A, Whyte M, Kimble R. Subcutaneous panniculitis- like T-cell lymphoma in a child presenting as an abdominal wall mass. J Pediatr Surg Case Rep. 2020; 60: 101556.