Case report

A case of Weber–Christian disease with later development of rheumatoid arthritis

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Summary

Weber–Christian disease (WCD) is a syndrome characterized by recurrent subcutaneous nodules, fever, occasional lipoatrophy, fatigue, arthralgia, and myalgia. We report a case of WCD associated with rheumatoid arthritis. A 65-year-old woman consulted our outpatient clinic because of bilateral hand swelling. The patient had presented with fever and subcutaneous nodules in her trunk and upper and lower extremities in 1983. At that time, the dermatology department diagnosed this patient as having WCD after biopsy of the nodules demonstrated lobular panniculitis. She has been treated with corticosteroid (5-15 mg/day) since then. The patient continued to have recurrent episodes of transient inflammatory arthritis in the small joints of the fingers and fever, and was initially assessed at our institution in October 2007. Finally, in November 2007, she was diagnosed as having both WCD and rheumatoid arthritis (RA) and treated with corticosteroid (5 mg/day) and methotrexate (MTX) (7.5 mg/week). Thereafter, her clinical symptoms gradually improved. This is the second case of WCD showing the subsequent development of RA, successfully treated with MTX, in the English literature. This case may provide clinical insight into WCD and RA.

Key words—Weber–Christian disease (WCD); panniculitis; rheumatoid arthritis; collagen disease

Introduction

Weber–Christian disease (WCD) was first described in German by Pfeifer in 1892. Weber reported a case of relapsing nonsuppurative panniculitis showing phagocytosis of the subcutaneous fat cells by macrophages in 1925, while Christian reported relapsing febrile nodular nonsuppurative panniculitis in 1928. Thereafter, Baily reported relapsing febrile nodular nonsuppurative panniculitis as WCD in JAMA in 1937. WCD is a syndrome characterized by recurrent subcutaneous nodules, fever, occasional lipoatrophy, fatigue, arthralgia, and myalgia. Biopsy of the nodules demonstrates lobular panniculitis. The prognosis is variable, but that of lobular panniculitis associated with prominent visceral involvement may eventually be poor.

Rheumatoid arthritis (RA) is a chronic inflammatory disease and involves the joint. It can cause synovitis and progressive joint destruction. However, the association of WCD showing subsequent development of RA has not previously been described in English reports. Here, we describe the first case, which may provide clinical insight into WCD and RA.

Case

In December 2007, a 65-year-old woman consulted our outpatient clinic because of bilateral hand swelling. The patient had demonstrated fever and subcutaneous nodules in her trunk and upper and lower extremities in 1983. Physical examination at the Department of Dermatology demonstrated multiple, tender, finger–tip–sized nodules on both lower extremities, both forearms, the abdomen and buttocks, and the formation of skin depressions on the both upper arms. She was diagnosed as having WCD by biopsy of the nodules, which showed degeneration of fat cells, and predominantly lymphocytic infiltrations with histiocytes and plasma cells in the fat lobules (Figure 1). She has been treated with corticosteroid (5-15 mg/day) since 1983 and remained free of symptoms over the next few years. In 2007, the patient developed recurrent episodes of transient inflammatory arthritis involving the PIP and MTP joints of the fingers accompanied by fever. Despite treatment with corticosteroid (10 mg/day) by the dermatology department, serum C-reactive protein (CRP) gradually became elevated to 2 mg/dl and ANA increased a serum dilution of 1:160. She was initially assessed at our institution in October 2007. On admission, her temperature was 36°C. There were no subcutaneous erythematous tender nodules. She complained of
Degeneration of fat cells, and predominantly lymphocytic infiltration with histiocytes and plasma cells in the fat lobules.

Lipoatrophy of the forearms and swelling of the wrists and fingers were seen in the bilateral extremities.

Laboratory data were as follows: WBC 8700/µL (neutrophils 78.4%, lymphocytes 16.2%, monocytes 4.7%), Hb 12.2 g/dl, PLT $30.9 \times 10^4/\mu L$, and CRP 2.26 mg/dl. Urinalysis did not demonstrate any protein on dipstick. KL-6 was 326 U/ml. Renal and liver functions were normal.

Immunological tests demonstrated immunoglobulin (Ig) G, IgA and IgM were 1602, 141 and 175 mg/dl, respectively. Rheumatoid factor was 68 IU/ml. Anticyclic citrullinated peptide antibody was $>100$ U/ml. Matrix metalloproteinase (MMP)−3 was 122.6 ng/ml. Antinuclear antibody was 1:320 (speckled, nucleolar). Both anti SS−A antibody and anti SS−B antibody were negative. Anti–RNP−antibody was 1 index. Anti–Topo1 antibody was negative. CH 50, 41.4 U/ml; C3, 120 mg/d and C4, 33 mg/dl. Chest morning stiffness that lasted for half a day. In the past, she had not shown Raynaud's phenomenon. There was no palpable lymphadenopathy or hepatosplenomegaly. In both lower lung fields, fine crackle was audible.
CT demonstrated honeycombing change in the bilateral lower lung fields and SPO$_2$ was 96%. ECG was within normal limits. X–P of the hands and feet showed periarticular osteoporosis, but there were no erosive changes. Although anti–RNP antibody was weakly positive, she did not satisfy the criteria for other collagen diseases such as mixed connective tissue disease.

In November 2007, finally, she was diagnosed as having WCD, interstitial pneumonia and RA and treated with corticosteroid (5 mg/day) and MTX (7.5 mg/week) at our outpatient clinic. Thereafter, CRP and hand swelling gradually decreased. Arthritis was seen in both wrists and lipoatrophy was seen in both upper extremities (Figure 2). X–P of the hands showed erosive changes and narrowing of the joint spaces in February 2010 (Figure 3).

**Discussion**

Here, we present a case of WCD associated with RA. Biopsy of the nodules demonstrates lobular panniculitis. The present case satisfied WCD’s criteria.

Rehman et al$^7$ reported a patient with WCD who demonstrated polyarthritis. The patient showed recurrent episodes of transient inflammatory arthritis involving the ankles, knees, shoulders, elbows and small joints of the hands, resulting in significant joint damage. Radiographs of the knees demonstrated evidence of significant periostitis. Magnetic resonance image scans of both knees showed bilateral femoral lesions characteristic of multifocal bone infarcts and extensive inflammatory change within the subcutaneous tissue of both the thighs and knees. Since fat necrosis is an important component of WCD, Rehman et al. considered that polyarthritis in that case was secondary to periarticular and intraarticular fat necrosis. The osteolytic bone lesions seen in WCD are also thought to be secondary to medullary fat necrosis. The patient in their report finally became wheelchair bound.

Yamamoto et al$^8$ also reported a case showing osteoarthropathy associated with WCD. The patient developed pain in the left knee and right ankle 13 months after onset of WCD. The left distal femur and the right distal tibia showed cortical hyperostosis with periosteal reaction in radiographs. T1–weighted magnetic resonance (MRI) images demonstrated an irregularly thickened cortex with hypointensity, while T2–weighted MR images showed inhomogeneous hyperintensity in the bone medulla. The patient underwent open biopsy and specimens from the left femoral bone marrow showed an admixture of fat necrosis and scattered chronic inflammatory cells.

In WCD, acute and chronic arthritis and periartritis predominantly affect the ankles and knees. Radiographs of the affected bones may demonstrate diffuse osteolysis, endosteal scalloping, and mild cortical hyperostosis$^9$–$^{11}$. In this case, radiological findings in the hands demonstrated periarticular osteoporosis, erosions and clinical synovitis. She complained of morning stiffness that persisted for half a day. Anticyclic citrullinated peptide antibody was $> 100$ U/ml and MMP–3 was 122.6 ng/ml. Based on these data, arthropathy in the current case was associated with RA. Taken together, our patient was diagnosed as having WCD and RA.

While we were preparing the current manuscript, Pongratz et al$^2$ reported a patient with RA who was diagnosed as having WCD during immunosuppressive therapy. A biopsy from a painful subcutaneous nodule demonstrated lobular panniculitis compatible with WCD. Thus, contrary to the course shown in our case, WCD developed subsequent to RA in their patient.

Iwasaki et al$^3$ reported a patient with WCD showing increased serum levels of soluble IL–2 receptor, IFN–γ, IL–6, IL–4 and IL–10, who was successfully treated with cyclosporine A. Hojo et al$^4$ also reported a patient with WCD associated with myelodysplastic syndrome, in whom the levels of soluble IL–2 receptor, IFN–γ, IL–1β, IL–6 and tumor necrosis factor–α were elevated during the active state and then returned to normal after prednisolone therapy. Pongratz et al$^2$ reported a patient with WCD successfully treated with cyclosporine A. T–cell immune response may be involved in the pathogenesis of WCD.

**Conclusion**

We described herein a case of WCD associated with RA. This is the second reported case of WCD showing subsequent development of RA, successfully treated with MTX, providing clinical insight into WCD and RA.

**References**

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