Wells' Syndrome Associated with Chronic Myeloid Leukaemia

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Wells' syndrome is characterized by recurrent cellulitis with eosinophilic infiltration. It can be associated with haematological diseases, such as chronic lymphoid leukaemia, malignant lymphoma and polycythemia vera (1). We report here the first case of Wells' syndrome accompanying chronic myeloid leukaemia (CML). The skin lesion resolved soon after administration of nilotinib hydrochloride hydrate (nilotinib).

CASE REPORT

A 57-year-old Japanese man presented with itchy eruptions with tenderness on his right lower leg, which recurred for 2 months. Initial diagnosis, at a previous hospital, was thrombophlebitis, and administration of oral antibiotics did not result in notable improvement. Laboratory examination revealed eosinophilia (1,060/μl) and the presence of blastocytes, and he was referred to our department. Reddish papules on a background of diffuse erythema, typical of Wells' syndrome, were visible on the medial side of the right lower leg (Fig. 1A). Infiltrative erythematous plaques were observed from the left lateral malleolus to the Achilles tendon area. Histopathologically, numerous eosinophils were infiltrated around vessels and appendages throughout the upper dermis and into the subcutaneous tissue (Fig. 1B and C). Neither "flame figures" nor leukocytoclastic vasculitis was found, although direct immunofluorescence microscopy revealed deposition of immunoglobulin (Ig)M, C1q and C3 around the blood vessels. The patient had no asthma, paraesthesia, arthropathy or renal dysfunction and was negative for myeloperoxidase-anti-neutrophil cytoplasmic antibodies. Bone marrow aspiration revealed the presence of CML. Fluorescence in situ hybridization (FISH) analysis from a skin biopsy revealed large mononuclear cells with *BCR-ABL* fused gene, and eosinophils without gene fusion (Fig. 2). We diagnosed the skin lesions as Wells' syndrome in combination with CML. Nilotinib (800 mg/day) was administered for the CML, and the skin lesions improved immediately without dermatological treatment (Fig. 3).

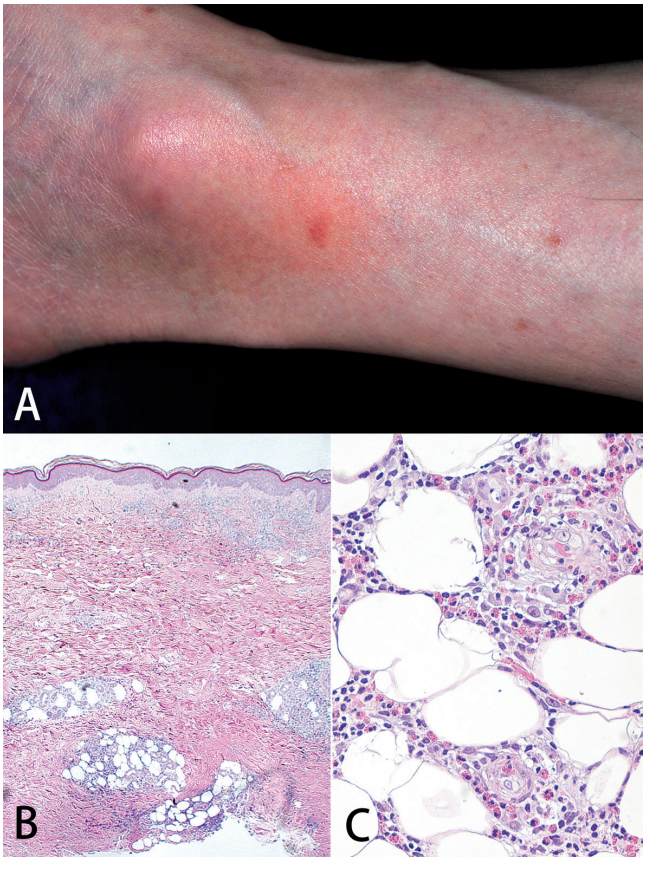

Fig. 1. (A) Diffuse erythema on the right lower leg. (B) Inflammatory infiltrates throughout the dermis and the subcutaneous fat tissue (haematoxylin and eosin stain (H&E), original magnification ×20). (C) Eosinophilic lobular panniculitis (H&E, original magnification ×200).

DISCUSSION

Wells' syndrome is a rare recurrent inflammatory disorder characterized by cellulitis-like urticarial erythema

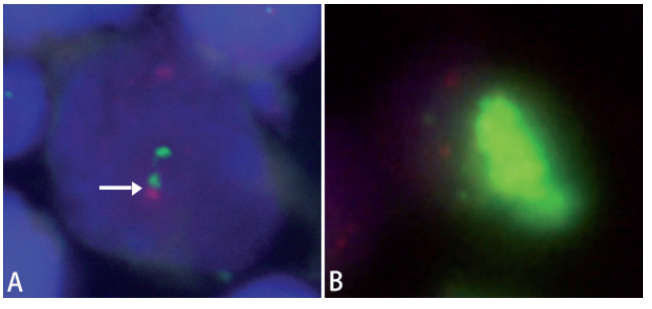

Fig. 2. Fluorescence *in situ* hybridization (FISH) analysis was performed with the formalin-fixed, paraffin-embedded skin sample using the LSI-BCR/ABL dual colour probe (Vysis Inc., Downers Grove, IL, USA). Two sets of *BCR* (*red*) and *ABL* (*green*) genes are visualized in normal cells. Nuclear staining (*blue*) was also performed using 4',6-diamidino-2-phenylindole. (A) Large mononuclear cells with fusion of *BCR/ABL* genes were observed (*arrow*). (B) Infiltrated eosinophils with bi-lobed nuclei showed independent gene signals, which indicated no *BCR/ABL* rearrangement. Note that eosinophil granules were stained non-specifically.

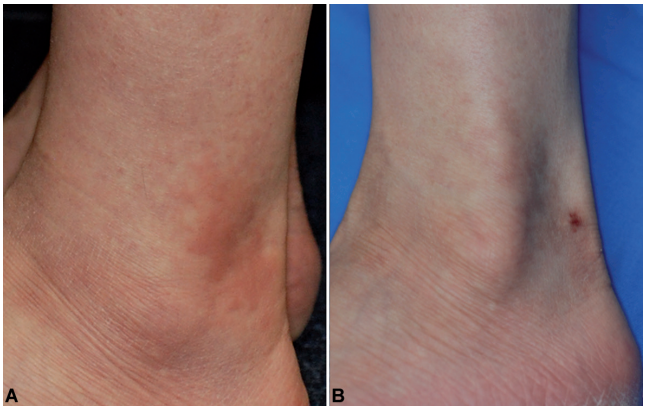

Fig. 3. Clinical course of the skin lesion on the left lower leg. (A) Reddish erythematous papules with palpable infiltration were noted before treatment. (B) The eruptions disappeared dramatically soon after administration of nilotinib hydrochloride hydrate.

with eosinophilic infiltration. Several haematological disorders have been reported in association with Wells' syndrome, such as chronic lymphocytic leukaemia, non-Hodgkin's lymphoma and polycythemia vera (1). To our knowledge, this is the first published case of Wells' syndrome associated with CML.

In our case, the eruption improved successfully with oral nilotinib. Nilotinib is a tyrosine kinase inhibitor that affects BCR-ABL kinase in Philadelphia chromosome (Ph) translocation t(9;22)(q34;q11) and thereby interferes with the signalling pathway that causes CML (2). Kaune et al. (3) reported the successful treatment of CML-associated Sweet's syndrome with nilotinib, in which numerous Ph-translocated cells were observed in the dermis. Since nilotinib has a higher binding affinity and selectivity for the ABL kinase than does imatinib mesilate, the dermal eosinophils in our case may also have undergone BCR-ABL translocation (4).

On the other hand, imatinib mesilate has been used to treat idiopathic hypereosinophilic syndrome without BCR-ABL rearrangement (5, 6). In light of the above, 3 therapeutic mechanisms are supposed in our case: (*i*) suppression of humoral stimuli to eosinophils such as interleukin-5 by the treatment of CML with nilotinib, (*ii*) possible direct inhibition by benign reactive eosinophils by tyrosine kinase inhibitors, and (*iii*) BCR-ABL rearrangement of some eosinophils, with nilotinib possibly having directly affected the tumorous eosinophils (leukaemia cutis). Since no BCR-ABL-fused eosinophils were observed by FISH analysis as far as we investigated, we ruled out leukaemia cutis in our case. However, there is still the possibility that a small number of eosinophils might have *BCR-ABL* gene fusion, and that nilotinib directly affected these cells, as previously reported (3).

The authors declare no conflicts of interest.

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