Sweet's syndrome after splenic irradiation for chronic myelogenous leukemia

RAYMOND M. PERTUSI, DO
MITCHELL D. FORMAN, DO
ANDREW C. BROWN, DO

Sweet's syndrome is defined as acute febrile neutrophilic dermatosis. Characteristic features are fever; peripheral neutrophilia; and painful cutaneous nodules and plaques on the face, neck, trunk, and limbs. Biopsy specimens of these lesions show a mature neutrophilic infiltrate of the dermis. Vasculitis is absent. Sweet's syndrome is associated with malignancy in approximately 20% of reported cases. The pathogenesis is unknown. The authors describe Sweet's syndrome in a 39-year-old man 5 weeks after splenic irradiation for chronic myelogenous leukemia. Treatment with parenteral corticosteroids resulted in dramatic improvement of the patient's condition. The authors discuss the diagnosis of Sweet's syndrome and the fact that it is thought to be cytokine-induced.

(Key words: Sweet's syndrome, splenic irradiation, leukemia)

Acute febrile neutrophilic dermatosis (Sweet's syndrome) is characterized by fever; peripheral neutrophilia; and painful cutaneous nodules and plaques on the face, neck, trunk, and limbs.[1] Biopsy specimens of the skin lesions reveal a mature neutrophilic infiltrate of the dermis without vasculitis.[2] About 400 reports of Sweet's syndrome have appeared in the world literature.[3] Twenty percent are associated with a malignancy, acute myelogenous leukemia being the most common one.[4] Eleven cases of Sweet's syndrome have been reported in association with chronic myelogenous leukemia (CML). Among these cases, one occurred after splenic irradiation and splenectomy.[5] We describe a patient with CML in whom Sweet's syndrome developed after splenic irradiation alone.

Report of case

A 39-year-old man was seen with the abrupt onset of painful cutaneous lesions, fever, and arthralgia 5 weeks after receiving splenic irradiation for CML. His condition worsened after a short trial of oral corticosteroids and subsequent intravenous antibiotics.

Physical examination revealed an oral temperature of 102.4°F. Tender erythematous and indurated cutaneous plaques covered large portions of the anterior aspect of the patient's thorax (*Figure 1*) and extremities. Range of motion was painful in joints approximating involved skin, but neither synovitis nor effusions were palpable. The findings of the rest of the physical examination were unremarkable.

Laboratory evaluation revealed a white blood cell count of 3.1×10^3 cells/mm^3, with 65% neutrophils. The hemoglobin level and hematocrit were 13 g/dL and 38%, respectively. The platelet count was 216×10^3/mm^3. His erythrocyte sedimentation rate was 112 mm/h. Blood cultures, chest x-ray studies, and urinalysis showed no abnormalities. Biopsy of the cutaneous lesions revealed a diffuse infiltrate of mature neutrophils in the dermis with papillary and dermal edema (*Figure*). Vasculitis was absent. Treatment with parenteral corticosteroids resulted in dramatic improvement of the patient's condition.

Discussion

The diagnosis of Sweet's syndrome requires the abrupt onset of tender erythematous or violaceous cutaneous plaques or nodules with predominantly neutrophilic infiltration of the dermis without vasculitis.[6,7] Additionally, two or more of the following are necessary: preceding fever or infection; accompanying fever, arthralgia, conjunctivitis, or malignancy; leukocytosis; a good response to corticosteroids but not antibiotics; and an erythrocyte sedimentation rate greater than 50 mm/h (Westergren's method).

Sweet's syndrome is associated with malignancy in approximately 20% of reported cases.[3] The association with malignancy may be exaggerated because of underreporting of the idiopathic variety seen primarily in middle-aged women. Malignancy-associated Sweet's syndrome shows neither age nor gender bias. Both types respond dramatically to systemic corticosteroid therapy; however, relapses are more common in the malignancy-associated than the idiopathic variety (70% vs 30%).

Eighty-five percent of cases of malignancy-associated Sweet's syndrome are hematologic, with acute myelogenous leukemia being the most common. Solid tumors are usually genitourinary in origin.[3] Cutaneous lesions may precede malignancy and are generally more severe. Extracutaneous involvement, particularly of the musculoskeletal system, is

From the Department of Medicine, University of North Texas Health Science Center at Fort Worth–Texas College of Osteopathic Medicine, where Dr Pertusi is an associate professor of medicine, and Drs Forman and Brown are assistant professors of medicine.

Correspondence to Raymond M. Pertusi, DO, Department of Medicine, Division of Rheumatology, University of North Texas Health Science Center at Fort Worth–Texas College of Osteopathic Medicine, 3500 Camp Bowie Blvd, Fort Worth, TX 76107-2699.

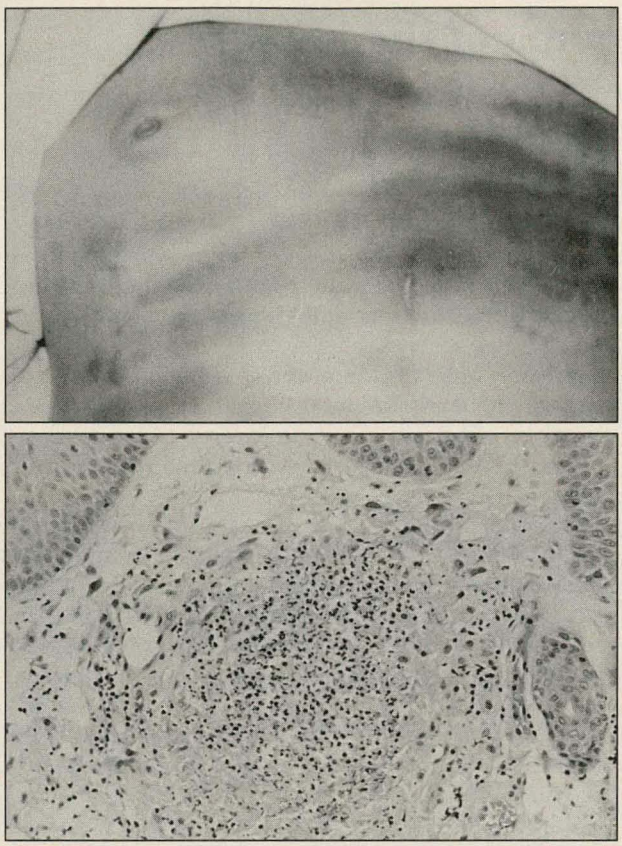

Figure. *Gross and histologic appearance of lesion.* Top: *Indurated erythematous plaques on anterior thorax.* Bottom: *Light microscopic view of dense polymorphonucleocyte infiltration of the dermis (hematoxylen-eosin stain; original magnification ×40).*

common (50%). Neutrophilia may be absent (50%), and anemia and platelet abnormalities are frequently reported.

Chronic myelogenous leukemia accounts for less than 10% of all cases of hematologic malignancy-associated Sweet's syndrome.[4,5] All CML-associated cases reported note cutaneous lesions on the upper extremities. Pyrexia and neutrophilia are commonly reported.

A single case of Sweet's syndrome occurring 3 days postsplenectomy has been reported.[5] That patient received splenic irradiation before splenectomy, but the interval between this therapy and the development of Sweet's syndrome was not reported. Sweet's syndrome developed in our patient 5 weeks after splenic irradiation alone. The pathogenesis of Sweet's syndrome is unknown but is thought to be cytokine-induced by antigens of different origin.[8] The effect of splenic irradiation on cytokine release and antigen load is unclear, but it may account for the development of the syndrome after splenic irradiation in patients with CML.

References

1. Sweet RD: Acute febrile neutrophilic dermatosis. *Br J Dermatol* 1964;76:349-356.

2. Jordaan HF: Acute febrile neutrophilic dermatosis: A histopathological study of 37 patients and a review of the literature. *Am J Dermatopathol* 1989;11:99-111.

3. Cohen PR, Talpaz M, Kurzrock R: Malignancy-associated Sweet's syndrome: Review of the world literature. *J Clin Oncol* 1988;6:1887-1897.

4. Cohen PR, Kurzrock R: Chronic myelogenous leukemia and Sweet syndrome. *Am J Hematol* 1989;32:134-137.

5. Gonzalez-Castro U, Julia A, Pedragosa R, et al: Sweet syndrome in chronic myelogenous leukemia. *Int J Dermatol* 1991;30:648-650.

6. Su WPD, Liu HNH: Diagnostic criteria for Sweet's syndrome. *Cutis* March 1986;37(3):167-174.

7. von den Driesch P, Gomez RS, et al: Sweet's syndrome: Clinical spectrum and associated conditions. *Cutis* 1989:44 (9):193-200.

8. von den Driesch P: Sweet's syndrome: Pathogenesis and associated conditions. *J Am Acad Dermatol* 1991;25:577-578.