Rapidly Progressing, Diffuse Violaceous Nodules as a Presenting Symptom for Aggressive Acute Myeloid Leukemia

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Case Presentation:

History of Present Illness: The patient was initially seen at our acute care clinic in May 2010 for evaluation of diffuse lumps that started three or four weeks prior. Patient noticed the lumps, which began on his chest and arms, after cutting maple trees in his backyard. Over several weeks, he noticed rapid progression and development of numerous nodules all over his body, but denied symptoms including pain, pruritus, bleeding, or changes in color. Patient reported mild shortness of breath, which he attributed to physical activites during that time. Review of systems for fever, chills, night sweats, weight loss, hemoptysis, nausea, vomiting, diarrhea, constipation, melena, or hematuria was unremarkable.

Medical History/Surgical History: Peptic ulcer disease, eczema, allergies, urinary blockage repair

Family History: Lung cancer, prostate cancer

Medications: None

Physical Examination: There are numerous pink to violaceous subcutaneous nodules measuring about 1-2cm on neck, arms, chest, abdomen, back, legs, and groin (figure 1). There was no palpable cervical, supraclavicular, axillary, or inguinal adenopathy. There was no hepatosplenomegaly.

Laboratory Data: CBC with diff (05/14/10) is WNL except elevated neutrophils of 72% (40-70%). CMP is WNL (05/14/10). Lactate dehydrogenase (06/15/10) is 1.5mmol/L (0.5-2.1mmol/L).

Studies: CT chest (5/26/10): "large right-sided pleural effusion with mediastinal shift…large anterior mediastinal mass with significant adenopathy concerning for lymphoma."

Biopsy:

CBLPath **(D10NY1-0175157)** 1. Left medial clavicle, 2. Left shoulder: "Dermal infiltration by a monomorphous population of medium-sized atypical cells with blast features partially effacing the normal architecture…positive staining of the atypical cells for CD56, CD43, CD23, CD117, and bcl-2, in majority of them positive staining for myeloperoxidase." (Figure 2)

Health Network Laboratories **(SM10-2582)** Bone marrow aspirate smear, clot section and core biopsy, right posterior iliac crest: "normocellular marrow with trilineage hematopoiesis involved by an acute myeloid leukemia."

Cytogenics by FISH revealed: negative NPMI and FLT3-ITD mutation, trisomies 5 and 7 consistent with an AML, and partial deletions of the long arms of chromosomes 5,7, and 20.

Diagnosis: Aleukemic leukemia cutis

Disease Course: Twelve days after the initial presentation, patient developed rapid progression of shortness breath and was admitted to the hospital with a malignant pleural effusion. At that time, cytology of pleural effusion and bone marrow biopsy were done and revealed the diagnosis of acute myeloid leukemia. Patient rapidly deteriorated with multi-organ metastasis and died of fungal pneumonia thirty-seven days after the initial presentation.

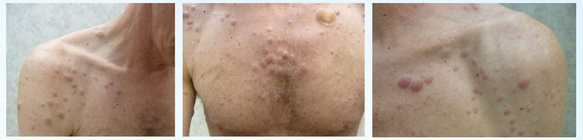

Figure 1:
Diffusely distributed numerous pink to violaceous subcutaneous nodules.

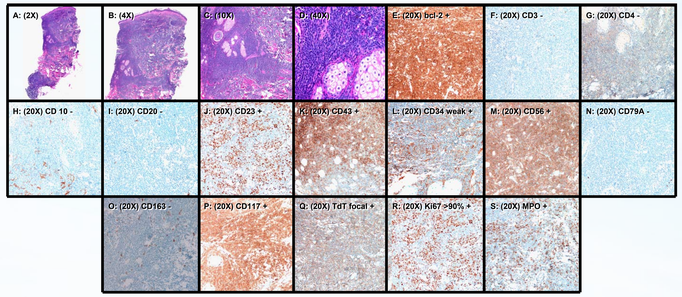

Figure 2:
(A-D) H&E histopathologic findings: A(2X), B(4X), C(10X)- Diffuse dense infiltrate involving the dermis and subcutis with sparing of the upper papillary dermis; D(40X)- At high-power magnification, large hyperchromatic cells and mitotic figures are seen.
(E-S) Immunohistochemical findings.

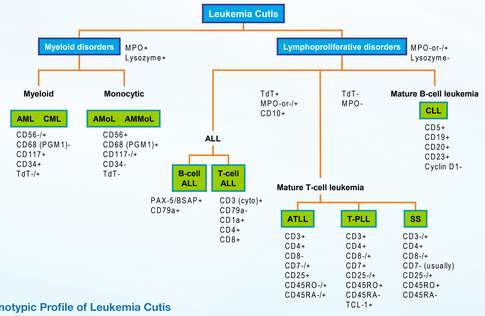

Figure 3:
Diagnostic Immunophenotypic Profile of Leukemia Cutis
ALL-acute lymphoblastic leukemia; AML-acute myeloid leukemia; AMoL-acute monocytic leukemia; AMMoL-acute myelomonocytic leukemia; ATLL- adult-Tcell leukemia/lymphoma; CLL-chronic lymphocytic leukemia; CML-chronic myeloid leukemia; MPO-myeloperoxidase; SS-Sezary syndrome; TdT-terminal deoxynucleotidyl transferase; T-PLL-T-cell prolymphocytic leukemia (adopted from: Cho-Vega JH, Medeiros LJ, Prieto VG, Vega F. Leukemia Cutis. Anatomic Pathology 2008;129:130-142.)

Discussion:

Leukemia cutis (LC) is defined as cutaneous infiltration by malignant leukocytes of myeloid or lymphoid lineage, resulting in clinical skin lesions. LC has been reported in patients with acute myeloid leukemia (AML), chronic myeloproliferative disease, including chronic myelogenous leukemia (CML), myelodysplastic syndrome, and myelodysplatic/lymphoproliferative diseases. Overall, LC occurs in 10-15% of patients with AML. In the majority of cases, LC presents concomitantly or after a diagnosis of systemic leukemia has been made. Rarely, in less than 10% of cases, LC has been reported to occur in the absence of systemic symptoms before bone marrow or peripheral blood involvement. The term "aleukemic leukemia cutis" or "primary extramedullary leukemia" has been used to describe this rare phenomenon, which has been shown to occur predominately in patients with AML.

Clinically, LC can cause non-specific reactive skin lesions or present with single or multiple lesions of violaceous, red-brown, or hemorrhagic papules, nodules, and plaques. LC lesions present most commonly on the head, neck, and trunk. It also favors sites of previous or existing inflammation. Aleukemic LC lesions are usually papulonodular and diffusely distributed. Histopathologically, findings of LC vary with the type of leukemia, but typically show diffuse infiltrate or tumor nodules of leukemic cells in the dermis. Frequently, there are dense peri-vascular and peri-eccrine infiltrates and lining of single cells through the interstitial collagen in the superficial and deep dermis. More importantly, immunophenotype assessment is essential in diagnosing the specific type of leukemia (figure 3). Furthermore, specific chromosomal abnormalities have been shown to be associated with certain types of LC. For example, abnormalities of chromosome 8 have been detected more frequently in LC patients with AML.

Development or presence of LC does not provide relevant epidemiologic, and or, clinical data regarding sex, age, WBC count, hemoglobin concentration, platelet count, and fibrinogen level. However, higher serum levels of lactate dehydrogenase and or β2-microglobulin, which correlate to the negative prognostic factors, have been associated in patients with LC than in patients without LC. In general, the development of leukemia cutis suggests a poor prognosis. Recent study suggested that chronic myelomonocytic leukemia in the presence of LC have significantly increased risk of transformation to AML and intensive extramedullary involvement with shortened survival. It has been reported that about 88% of patients with leukemia cutis die within one year of the diagnosis. In contrast to adult leukemic patients, LC does not portend a worse prognosis in patients with congenital leukemia.

References:

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