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Nonhealing Crusted Scalp Lesions in a 4-Year-Old Boy

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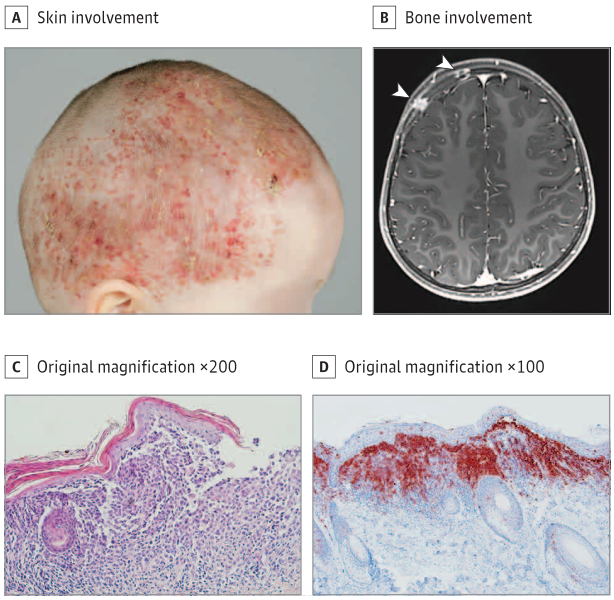

Figure. A, Clinical photograph shows multiple disseminated erythematous papules, petechial hemorrhages and yellowish crusts on the scalp. B, Contrast-enhanced T1-weighted axial magnetic resonance image shows osteolytic lesions in the frontotemporal skull. C, Histopathological analysis of a punch biopsy of the scalp demonstrates a subepidermal infiltrate consisting of large cells with kidney-shaped nuclei, solitary lymphocytes, and eosinophilic granulocytes. D, The infiltrate stained positively for CD1A.

A 4-year-old boy presented to our department of dermatology with a 3-year history of nonhealing crusted scalp lesions. He had previously been treated with various topical glucocorticosteroids and antibiotics without improvement. The physical examination revealed multiple disseminated erythematous papules, petechial hemorrhages, and yellowish crusts on the scalp (**Figure**, A). The remaining skin and mucosal surfaces, as well as neck, axillary, and inguinal lymph nodes, were unremarkable. The patient did not show any other obvious abnormalities, but his mother reported occasional otitis media. The family history was negative for skin disease. Routine blood examinations revealed no pathological findings. A whole-body magnetic resonance imaging (MRI) scan showed 2 osteolytic lesions on the right frontoparietal skull (Figure, B). A punch biopsy specimen of an erythematous papule on the scalp was obtained and stained with hematoxylin-eosin for histopathological analysis (Figure, C). In addition, immunohistochemical stainings were performed (Figure, D).

WHAT IS YOUR DIAGNOSIS

- **A.** Seborrheic dermatitis
- **B.** Multisystem Langerhans cell histiocytosis
- **C.** Crusted scabies
- **D.** Psoriasis vulgaris

Diagnosis

B. Multisystem Langerhans cell histiocytosis

Microscopic Findings and Clinical Course

The histopathological evaluation of the punch biopsy specimen revealed a subepidermal infiltrate consisting of large cells with kidney-shaped nuclei, solitary lymphocytes, and eosinophilic granulocytes (Figure, C). In immunohistochemistry, the infiltrate stained positively for CD1A (Figure, D). These histopathological and immunohistochemical findings were suggestive for Langerhans cell histiocytosis (LCH). Further workup including ultrasonography of the abdomen and lymph nodes and serum electrophoresis was normal. Whole-body MRI showed 2 osteolytic lesions in the right frontoparietal skull (Figure, B). Based on these findings, the diagnosis of multisystem (MS) LCH was made. Treatment was initiated using systemic chemotherapy with vinblastine and prednisone according to the LCH-IV registry therapy recommendations (course IC-1 and IC-2, continuation therapy until treatment week 52) (NCT02205762).

After the IC-1 course, a complete clinical remission was observed with regression of the bone lesions. However, during the last months of maintenance therapy, small crusted scalp lesions reappeared and worsened after cessation of therapy. Hence, the patient was started on LCH-IV second-line initial therapy course consisting of prednisolone, cytarabine, and vincristine.

Discussion

Langerhans cell histiocytosis is a rare clonal disorder that usually affects infants and children at the ages of 0 to 3 years.[1] It is characterized by the clonal proliferation of CD1A-positive immature dendritic cells with subsequent accumulation in different organs (eg, in the bones [80% of cases], skin [33% of cases], and pituitary gland [25% of cases]).[1,2] The clinical spectrum of LCH ranges from single-system disease (eg, with bone or skin involvement) to multisystem disease (eg, with skin, liver, spleen, and bone marrow involvement) with increased mortality.[3] In pediatric patients, the skull is the most often affected bone location and this can lead to hearing loss or otorrhea due to mastoid antrum lesions.[4] External otitis was seen in patients who developed MS LCH and even cutaneous involvement is more common in MS LCH than in single-system LCH.[5] The spectrum of skin lesions includes erythema, papules, nodules, petechiae, vesicles, and crusted plaques.[1] Skin lesions frequently resemble seborrheic dermatitis or eczema and are predominantly found on the scalp or face.[6] Often histopathology leads to the diagnosis with positive immunohistochemical staining for CD1A and/or CD207 (Langerin).[1] Classification of the disease type further requires complete physical examination, laboratory tests, and radiological examinations. Treatment of LCH depends on the extent of organ involvement. In MS LCH, the most frequently used regime is systemic chemotherapy with vinblastine and prednisone administered for 6 to 12 weeks followed by maintenance therapy in case of clinical response. The maintenance therapy usually consists of prednisone and vinblastine.[3,7] In patients who do not respond to first-line therapy, more aggressive salvage therapy may be used, consisting of chemotherapy combinations including vincristine, cytarabine, methotrexate, 6-mercaptopurine, and 2-chlorodeoxyadenosine. Haematopoietic stem cell transplantation has a very limited indication these days.[7] Recently, somatic BRAF V600E mutations have been described in 60% of patients with LCH.[8] In a recent study,[9] patients with severe and refractory *BRAF* V600E–positive LCH were treated with the specific mutant BRAF inhibitor vemurafenib and showed rapid clinical improvement without severe toxic effects or adverse events.[9]

The 5-year survival rate in children with LCH without involvement of risk organs is well above 90%.[10] However, regular follow-up investigations are necessary because 50% of patients with MS LCH develop a relapse within the first 2 years. Long-term morbidities such as central diabetes insipidus, orthopedic and neurological problems, as well as growth-hormone deficiency, should be identified and treated as early as possible.[1]

Cutaneous manifestations of LCH may be misdiagnosed as more common skin diseases such as psoriasis, seborrheic eczema, or atopic eczema. The median time from onset of the symptoms to diagnosis of LCH is often more than 3 months and may even reach years, as in our case.[10] Dermatologists should be familiar with the broad clinical spectrum of the LCH as the chronic course of skin lesions and the onset after the third month of life can be potential risk factors for a multisystem disease. Early biopsy of skin lesions resistant to therapy is necessary.

ARTICLE INFORMATION

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