Skin-limited Langerhans cell histiocytosis presenting as crusted papules in an acneiform distribution in an adolescent man

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INTRODUCTION

Langerhans cell histiocytosis (LCH) is an inflammatory, neoplastic disease, most commonly of toddlers and young children, that can present as a skin-limited disease or as a systemic disease with or without cutaneous manifestations.[1] The pathogenetic basis of LCH is the accumulation of S100, CD1a, and langerin-positive ($CD207^{+}$) dendritic cells. BRAF V600E mutations are found in 60% of the cases.[1,2] In both the skin-limited and systemic forms, LCH has a vast range of possible presentations.[3] Particularly with skin-limited LCH, the disease may spontaneously resolve, leading to underdiagnosis.[4] While diagnosis of skin lesions of LCH has utility in detecting occult systemic LCH, which can be associated with significant morbidity, including acute lymphoblastic leukemia, the skin may be the only organ system involved.[1,5,6] In this report, we present a case of biopsy-confirmed LCH that initially presented as crusted papules in an acneiform distribution in a 15-year-old man.

CASE REPORT

A 15-year-old man presented for initial dermatologic consultation with a chief complaint of acne. The patient and his mother were most concerned about a papule on the left nasal ala that had been growing over the past few months (Fig 1, *A*). They had more recently noticed smaller papules inferior to the initial lesion. The papule bled when scratched, but was otherwise asymptomatic (lacking pruritus and pain). Otherwise, the patient had a history of type 1 diabetes mellitus on insulin and a remote history of thrombocytopenia that had resolved by the time of the consultation.

Abbreviation used:

LCH: Langerhans cell histiocytosis

On physical exam, a 4-mm pink-red papule was observed on the left nasal ala, with a few smaller 1-2-mm papules surrounding the larger papule. Given the eroded clinical appearance that had not resolved over 2 months, the decision was made to biopsy the left nasal papule. Biopsy findings included sheets of histiocytes in the dermis (Fig 2). The histiocyte nuclei were folded, grooved, or kidney-bean shaped. Staining was positive with S-100, langerin, and CD1a, and partially positive with CD68. Despite the polypoid configuration of the lesion, the histopathologic findings were compatible with a lesion of LCH. The patient was initially advised to apply hydrocortisone 2.5% to the lesions. He was referred to hematology for further workup, which revealed no evidence of systemic involvement. Complete metabolic panel, complete blood count, ferritin, erythrocyte sedimentation rate, prothrombin time and international normalized ratio, and urine osmolality were all within the normal ranges. The positron emission tomography-computed tomography scan revealed no evidence of hypermetabolic mass or lymphadenopathy, and chest x-ray was similarly unremarkable.

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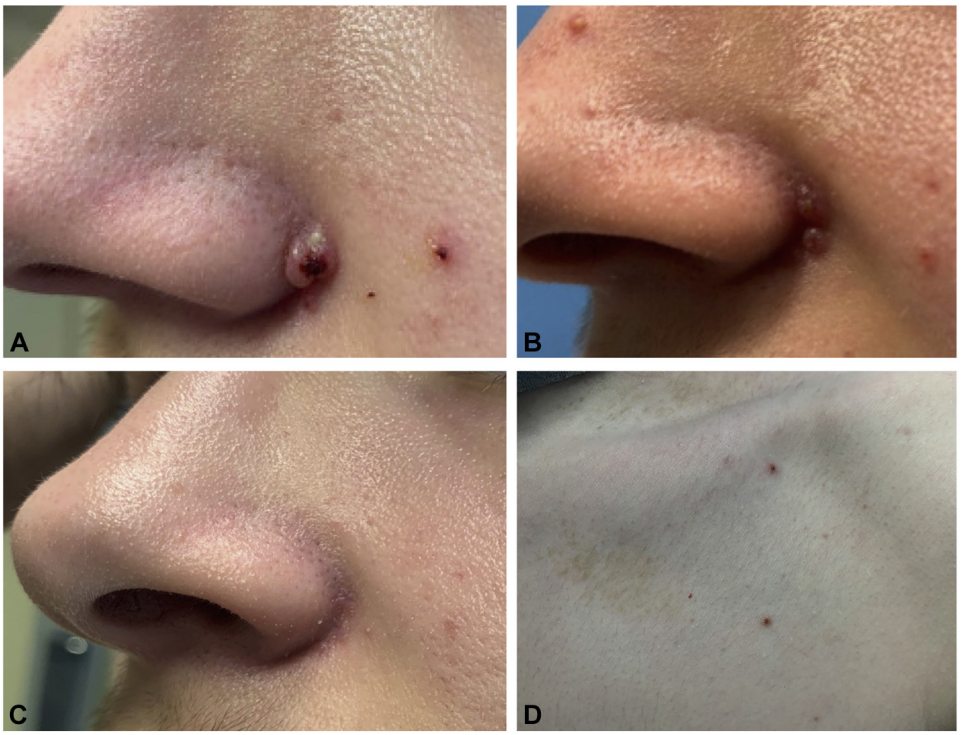

Fig 1. Clinical presentation of skin-limited Langerhans cell histiocytosis in an adolescent man. **A**, Papule on the left nasal ala at initial dermatologic consultation. **B**, Regrowth of the papule after biopsy. **C**, Complete resolution of the left nasal alar papule with clobetasol therapy as observed at the 3-month follow-up visit. **D**, Increase in the number of similar-looking lesions, presumed to be Langerhans cell histiocytosis, observed on left anterior aspect of the shoulder at the 3-month follow-up visit.

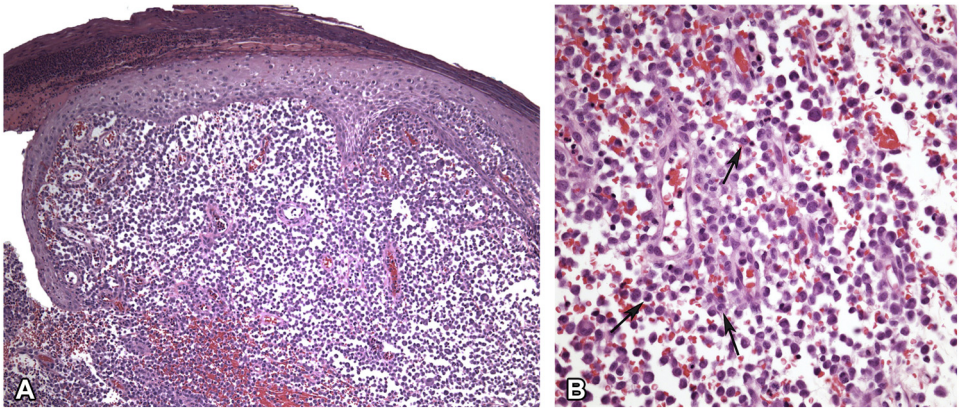

Fig 2. Langerhans cell histiocytosis. (**A** and **B**, Hematoxylin-eosin stain; original magnifications: **A**, ×10; **B**, ×40.) The epidermis is crusted with mostly histiocytes in the dermis. The histiocytes have nuclear grooves, with some nuclei shaped like kidney beans, as indicated by the *arrows*.

The nasal lesion regrew following biopsy (Fig 1, *B*), and the patient was instructed to start clobetasol 0.05% cream. At the 3-month follow-up visit, this lesion had completely resolved (Fig 1, *C*). However, the patient developed lesions of similar appearance on the left anterior aspect of the shoulder (Fig 1, *D*), upper portion of the back, and right nasal ala. He continues to be followed closely by hematology to ensure the lack of conversion to systemic LCH.

DISCUSSION

We present a case of skin-limited LCH presenting as several pink-red papules distributed on the face, chest, and back of a 15-year-old man. The case is

particularly unique given the patient's age at onset, color, and papular morphology, demonstrating the utility of a biopsy of persistent non-folliculocentric hemorrhagic papules and nodules.

The presentation of LCH, whether skin-limited or systemic, is rare in patients over the age of 5, and most research regarding the disease involves the neonatal population.[7] In early infancy, vesicles and bullae are the most common manifestation, and LCH lesions may look similar to erythema toxicum or herpes simplex, conditions that are common in this population.[8] Later in infancy, seborrheic dermatitis-like lesions are the most common presentation, encompassing 42.8% of LCH presentations according to one study.[7] Few case reports of LCH in adolescents exist in the literature. Of note, a case of skin-limited LCH presenting as an erythematous plaque with a lichenified appearance was reported in a 16-year-old male.[9] Given the various presentations, LCH may pose a diagnostic dilemma in any age group. In our case, the patient's pink-red papular lesion was thought to be acne in an adolescent man by the family and patient's pediatrician.

First-line management of skin-limited LCH involves watchful waiting, as lesions may spontaneously resolve, or treatment with topical corticosteroids.[10] It is imperative to establish a clear diagnosis of skin-limited versus systemic LCH at the time of diagnosis, as systemic LCH may involve significantly more morbidity. The most common manifestation of systemic LCH is the presence of bone lesions, and systemic LCH is classified as having "risk organ involvement" if the liver, spleen, or bone marrow is affected.[8] The recommended assessment at the time of diagnosis includes a thorough history and physical exam with focus on the skin, lymph nodes, bones, central nervous system, lungs, liver, and spleen, with basic laboratory tests (complete blood count, liver function tests, and complete metabolic panel) and assessment for endocrinopathy, such as growth hormone deficiency or diabetes insipidus.[10] Furthermore, routine monitoring is necessary for these patients, as there is a small risk of progression from skin-limited to systemic LCH.[5] The recommended follow-up guidelines for patients with skin-limited LCH are for every 2-4 weeks with active lesions, and for every 6 months for 5 years following regression of skin lesions.[10]

In summary, we present a unique case of skin-limited LCH in an adolescent man that initially presented as crusted papules in an acneiform distribution. Although LCH can be skin-limited and often is a benign disease, it is important to exclude internal involvement and monitor for any progression to systemic LCH over time.

Conflicts of interest

None disclosed.

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