

Leukemia Cutis Mimicking Kerion Celsi: A challenging Diagnosis for Clinicians

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Introduction

Acute lymphoblastic leukemia (ALL) is an acute form of leukemia, characterized by the overproduction of immature white blood cell progenitors, known as lymphoblasts [1]. ALL is the most common form of malignancy in children with an incidence of 30%. The peak incidence occurs between two and five years of age.

Each year approximately 2500 to 3500 new cases of ALL are diagnosed in children in the United States. Nearly 70 to 80 percent of cases of childhood ALL are of B-precursor lineage (i.e., precursor B cell leukemia or early pre-B cell ALL). The most common presenting symptoms of ALL are nonspecific (e.g., bleeding, fever, lymphadenopathy, bone pain) [2,3]. Herein we report the case of a three year old girl with B cell ALL presenting with a nodule on the scalp skin, mimicking kerion celsi (tinea capitis profunda).

Case Report

A 3 year old girl presented to our dermatology outpatient clinic with a nodule on the scalp of 4 weeks duration. She used topical and oral antibiotics and antifungals, without any improvement. She was healthy otherwise. On examination, there was a 4 × 4 cm nodule on the parietal scalp with a yellow crust (**Figures 1 and 2**). The hair on the nodule came out in clumps with gentle tugging. She had also multiple swollen posterior cervical lymph nodes. A possible differential diagnosis for her presentation includes kerion celsi or dissecting cellulitis of the scalp. A native parate examination was made but no hyphae were seen. A fungal culture of the scale was sent.

Oral griseofulvin 12.5 mg/kg was given for 6 weeks and topical selenium sulfide shampoo was added. On review a month later, there was no improvement. The culture on Sabouraud dextrose agar did not show any growth. A skin biopsy was performed. Histopathologic examination showed malignant lymphoid infiltration.

She was referred to the pediatric hematology department. Her

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complete blood count was as follows: WBC: $41 \times 10^9/L$, Hb: 16.3, Plt: 375. Physical examination showed hepatosplenomegaly cervical lymphadenopathy in addition to the nodule. Bone marrow aspiration was performed and morphological and flow cytometric analysis was consistent with B cell ALL. The ALL-IC BFM chemotherapy protocol [4] was started. On the 8th day the peripheral smear blast count was $>1000/mm^3$ and on the 15th day bone marrow aspiration there were blasts $>25\%$ (non-remission). Therefore the patient was enrolled in the high risk group. The patient's general condition deteriorated. Vomiting, abdominal distension, constipation and fever were observed. On the abdominal tomography, images of typhlitis were obtained. Despite granulocyte suspension and intravenous immunoglobulin, antibiotherapy and plasma exchange, the patient did not improve and eventually died (**Figure 3**).

Discussion

Herein we describe a 3-year-old girl with a nodule on the scalp

resembling kerion celsi as a clinical presentation of leukemia cutis. Kerion is the inflammatory extreme form of dermatophyte infection, caused by a vigorous T-cell-mediated host response to the dermatophyte infection [5]. It manifests as painful and suppurative plaques or nodules, accompanied by purulent drainage. The most affected area is the scalp, and it may result in scarring alopecia if treatment is delayed. Common pathogens to trigger kerion include *Trichophyton mentagrophytes*,

Trichophyton verrucosum, *Microsporum canis*, *Trichophyton tonsurans* and *Microsporum gypseum* [6].

Leukemic skin infiltrates are a rare feature of ALL. A biopsy reveals a diffuse infiltrate of leukemic blasts around blood vessels and between collagen bundles [7]. In childhood, it is seen more commonly in congenital leukemia and acute myelogenous leukemia (10%) than in pediatric acute lymphoblastic leukemia (1%).

There are no preferred sites of involvement in leukemia cutis (LC). Until recently, there were few studies about leukemia cutis presentation in childhood. To date, the largest study with 1359 children (1259 children with ALL, 100 with LBL) was reported by Millot and colleagues [8]. Twenty four children had skin lesions at the time of diagnosis of the hematologic malignancy. The most commonly involved areas were the head. They described the lesions asymptomatic papules and nodules brown- red to violaceous without ulceration. Another study comprising seventy five children reported the nodule as the most common lesion and the extremities as the most frequent localization [9]. There have been many studies about B-cell proliferative disorders mimicking other dermatologic disorders (e.g., granuloma annulare, rosacea, rhinophyma) [10-12]. However there are no reports about B-cell proliferative disorders mimicking dermatophytosis in the literature.

Our patient presented with a solitary cutaneous nodule with a yellow crust. The native prepartate examination was negative. However due to the fact that she had used topical antifungals we accepted the nodule as dermatophytosis. One other fact which supported our diagnosis was that the hair on the nodule came out in clumps with gentle tugging, so we tried to treat our patient with a systemic antifungal. As we did not observe any improvement after one month with antifungal treatment, a skin biopsy was made. Histopathology showed neoplastic lymphoid infiltration. High grade B cell lymphoma was diagnosed. LC often has rapid disease progression and poor prognosis. The mean interval between diagnosis of LC and death was reported as 3.8 and 4.8 months respectively in different studies [13,14]. The interval time was 2 months for our patient. An early diagnosis is essential in LC. The dermatologist plays a pivotal role in determining these suspected patients and in referring them to a hematologist.



Figure 1 A 4 × 4 cm nodule on the parietal scalp with a yellow crust.



Figure 2 A 4 × 4 cm nodule on the parietal scalp with a yellow crust.

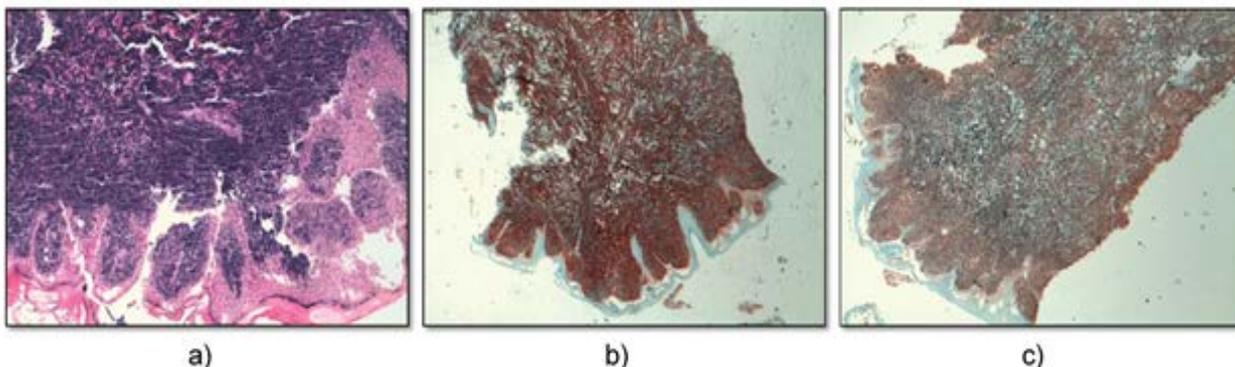


Figure 3 a) Dense and diffuse lymphoid infiltration (hematoxylin-eosin). b) Lymphoid cells were strongly positive for CD20 (brown areas were positive). c) Ki 67 proliferation of lymphoid infiltration was 90% (brown areas were positive).

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