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Research Paper

Acute myelomonocytic leukemia with eosinophilic component revealed by skin involvement

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Abstract: *Acute myelomonocytic leukemia with eosinophilic component (AML4E0) is a rare form of acute myelomonocytic leukemia characterized by abnormal proliferation of immature bone marrow cells. This pathology manifests itself as the presence of myeloid blasts accompanied by a component of abnormal monocytes and eosinophils in the bone marrow.*
Chromosome inversion specific to chromosome (16) (p13q22) is most often observed in LAM4E0, and more rarely translocation (16 ;16) (p13; q22), are generally associated with a favorable prognosis.
In acute myeloid leukemia (AML), cutaneous localizations are not uncommon but are exceptionally revelatory.
In this article, we report a case of AML4E0 in a child, discovered during a clinical and paraclinical work-up of a febrile skin rash, and compare it with the literature.

Keywords: *myelomonocytic leukemia , AML4 E0 , médullogram .*

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I. Introduction

Acute myelomonocytic leukemia (AML-M4) is a hematological malignancy characterized by monocytic and granulocytic differentiation.
AML4 E0 is an eosinophilic variant of acute myelomonocytic leukemia.
A rare hematological malignancy characterized by myeloid blast proliferation associated with monocytosis and dysplastic eosinophils, it accounts for around 10% of AMLs and can occur at any age.
AML 4E0 is a cytogenetic group associated with a good response to chemotherapy, with a remission rate of around 70% to 80%.
We report a case of eosinophilic variant AML4 in an 11-year-old child, revealed by a rash of diffuse, non-pruritic psoriasiform lesions associated with fever.
The aim of this work is to establish a causal link between acute myelomonocytic leukemia with an eosinophilic component and cutaneous manifestations..

II. Observation

This is an 11-year-old child with a history of recurrent angina more than four times a year.
He was admitted to the emergency department with diffuse psoriatic lesions and anemia.
The history of his illness dates back four months, with the onset of a diffuse cutaneous rash that prompted his consultation. Local treatment with corticosteroids was prescribed, but with no clinical improvement. Symptomatology worsened with the onset of an anemic syndrome and weight loss.
On reassessment, the child was found to be in reasonably good general conscious condition, hemodynamically and respiratorily stable, pale, febrile 38.3degrees, with multiple annular plaques confluent in places, with achromic centers and erythematosquamous, nonpruritic margins. The plaques were mainly located on the abdomen and scalp, and their appearance suggested psoriasis. A tumor syndrome was also found, with splenomegaly, hepatomegaly and firm, painless bilateral cervical adenopathies. The rest of the somatic examination was unremarkable.

Biological workup revealed normochromic normocytic regenerative anaemia (HB 8.2 g/dl), thrombocytopenia 95000G/L and hyperleukocytosis 15600 elements/mm3 with monocytosis 10100 elements/mm3.
The blood smear showed 25% circulating blasts, 20% monocytosis, and 5% normal and dystrophic eosinophils (monolobed eosinophils with immature granulations and cytoplasmic vacuoles). (Figure 1 and 2).

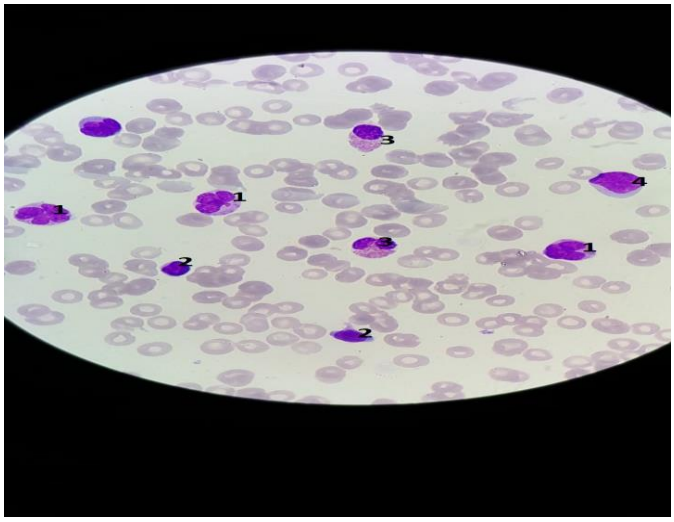

Figure1: Blood smear stained with May -Grunwald-giemsa and read with objective 100 at MO showingthree monocytes 1, two mature lymphocytes 2, single-lobed dystrophic eosinophil 3 and one myeloblast4.
Carried out in the Hematology Laboratory -LCAM -CHU Hassan II, Fez.

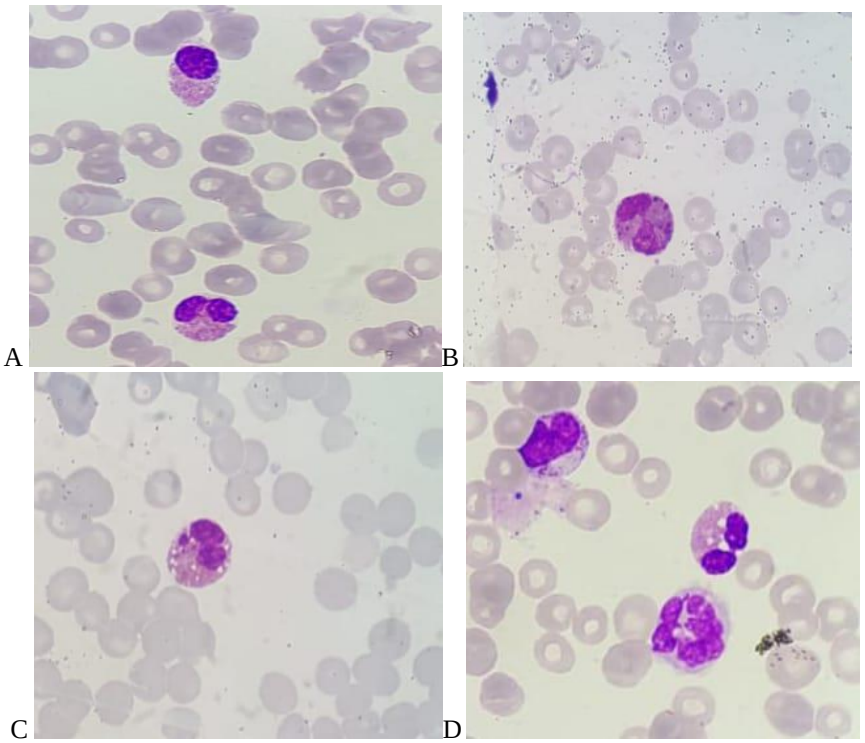

Figure 2 :Blood smear stained with May-Grunwald-giemsa and read with objective 100 at MO showing dystrophies of the eosinophilic lineage A - eosinophil with a monolobed nucleus B- eosinophil with immature basophilic granulations This D - eosinophils with vacuolated cytoplasm.
Performed at the Hematology Laboratory -LCAM -CHU Hassan II, Fez

The diagnosis of type 4 acute myelomonocytic leukemia was confirmed by bone marrow analysis. A myelogram revealed a hypercellular, heterogeneous bone marrow infiltrated by around 30% myeloblasts with Auer bodies and undifferentiated monocyte-like blasts (figure 3).

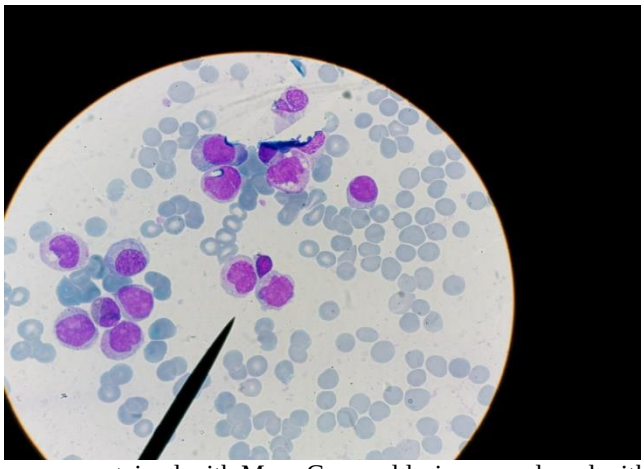

Figure3: Medullary smear stained with May -Grunwald-giemsa and read with objective 100 at MOshowing myeloblasts, monoblasts and undifferentiated blasts.
Performed in the hematology laboratory -LCAM -CHU Hassan II, Fez.

Cytochemical staining with lamyeloperoxydase confirmed the presence of myeloblasts (figure 4).

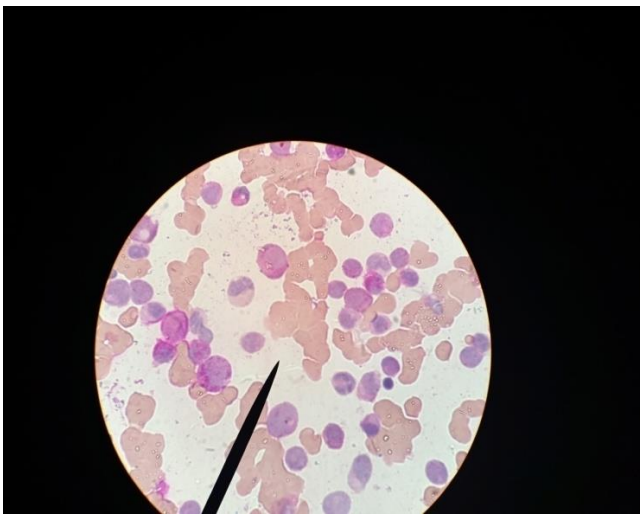

Figure 4: Myeloperoxidase bone marrow smear showing the presence of myeloblasts
Performed at the Hematology Laboratory -LCAM -CHU Hassan II, Fez

Immunophenotyping by flow cytometry carried out at the hematology laboratory -LCAM -CHU Hassan II in Fez showed the existence of predominant blasts expressing the antigens CD33, CD13, CD65 characteristic of myeloblasts, and some of the blasts were positive for CD14, CD4, CD11c characteristic of monoblasts.

However, a biopsy of the skin lesions was not performed. The cytogenetic study showed no chromosomal abnormalities.

The patient was managed by the pediatric oncology department and subjected to a therapeutic protocol named AML-MA211, which achieved complete remission in both hematology and skin.

A re-evaluation medullogram after induction and consolidation revealed the presence of 4% blasts, indicating a good response to treatment. In addition, a corticosteroid-based dermatological treatment was administered to treat skin lesions.

III. Discussion

Acute myeloid leukemia (AML) is considered to be the product of genetic and epigenetic changes within a multipotent myeloid stem cell that generate and amplify a clone capable of arresting differentiation and proliferating uncontrollably [13]

This clone, completely disconnected from the genetic mechanism and stromal signalling that would normally regulate its maturation and expansion, spreads incessantly, choking the bone marrow and compromising the production of functional blood cells.

Acute "myelomonocytic" leukemia with medullary eosinophilia (M4Eo), a typical form of AML with a monocytic component associated with abnormal maturation of medullary eosinophils, whose rate is variable (3-30%), accounts for 20% of AML4.

AML4 with abnormal eosinophilia according to the old FAB classification has been associated with chromosome 16 (16) inversion (p13; q22) and translocation t (16 ;16) (p13; q22) [1 ,2].

Chromosome 16 inversion or translocation are recurrent chromosomal rearrangements commonly associated with the M4Eo subtype of AML, and account for 8-12% of cytogenetic abnormalities in adolescent and young adult AML[7,8]. This inversion induces fusion of the Smouth Muscle Myosin Heavy Chain (MYH11) gene encoding the smooth muscle myosin heavy chain, located at 16p13 to the Core Binding Factor gene (CBFB b located at 16q22) [1 ,2, 6]. This fusion would have two major consequences: sequestration of the protein encoded by the AML1 gene, which would be involved in the control of hematopoietic differentiation, and repression of the transcription of factors involved in normal hematopoiesis, resulting in a block in differentiation [3 ,5]. The presence of this genetic rearrangement appears to improve the prognosis of patients, and enables this hemopathy to be classified in group 1 of the WHO 2008 classification (with favorable cytogenetic anomaly Inv. [4].

The presence of inv16 is associated with a good prognosis, with 10-year survival in 55% of patients [9-10].

AML4 E0 is a hemopathy that can potentially be cured with intensive courses of chemotherapy. The treatment protocol generally comprises three conventional phases: the induction phase, in which Aracytin is commonly used, followed by a consolidation phase. The latter involves the administration of high-dose chemotherapy, always based on Aracytin, combined with antracycline. [11]. Finally, for younger patients, intensification is envisaged, which may take the form of an allograft, autograft, or several cycles of chemotherapy similar to consolidation.

Eosinophilia is uncommon as a predominant manifestation of AML. It has been reported in rare patients with AML associated with the (16) (p13.1q22) or t (16 ;16) (p13.1; q22) inversion [14-15].

In cases of hypereosinophilia, the skin is often involved, and more than 50% of patients present with skin lesions. These lesions fall into three categories: - angioedematous and urticarial lesions, - erythematous and pruritic papules and nodules, and mucosal ulcerations. These lesions are caused by the release of eosinophilic granule contents.

In patients with acute myelomonocytic leukemia with an eosinophilic component (AML4E0), cutaneous manifestations may occur in 2-20% of patients, with a higher incidence in those with the myelomonocytic form [12].Recognizing them may suggest the diagnosis of an underlying hemopathy, and certain cutaneous lesions may signify a prognostic turning point in the hemolytic malignancy.

IV. Conclusion

Acute myelomonocytic leukemia with an eosinophilic component (AML4eo) is a rare form of hematological malignancy. The cutaneous manifestations associated with blood cancers are highly varied. They can be useful in diagnosing certain unrecognized forms of blood cancer, and can also be an important prognostic indicator for these cancers.

Référence

[1]. **Byrd JC, Mrozek K, Dodge RK, Carroll AJ, Edwards CG, Arthur DC, et al**. Pre-treatment cytogenetic abnormalities are predictive of induction success, cumulative incidence of relapse and overall survival in adult patients with de novo acute myeloid leukaemia : results from CALGB 8461. Blood 2002 ; 100:4325-36.

[2]. **Hayashi Y**. The molecular genetics of recurring chromosome abnormalities in acute myeloid leukaemia. SeminHematol2000 ; 4:368-80

[3]. **Roumier C, Fenaux P, Lafage M**. New mechanisms of AML1 gene alteration in hematological malignes. Leukemia. 2003 Jan;17(1):9-16. [PubMed] [Google Scholar].

[4]. **Huret JL**. +22 ou trisomie 22 (uniquement ?). Atlas Genet Cytogenet Oncol Haematol2000 ; 4(1) : 19.

[5]. **Reilly JT**. Pathogenèse de la leucémie myéloïde aiguë et inv(16)(p13;q22) : un paradigme pour comprendre la leucémogenèse ? leukaemogenesis ? Br J Haematol. 2005 Jan;128(1):18-34. [PubMed] [Google Scholar].

[6]. **Heim S, Mitelman F.** Cancer Cytogenetics. 2e édition. New York : Wiley-Liss INC ; 1995.

[7]. [Arthur DC, Bloomfield CD. Partial deletion of the long arm of chromosome 16 and bone marrow eosinophilia in acute nonlymphocytic leukemia : A new association. Blood. 1983;61:994-998

[8]. **Le Beau MM, Larson RA, Bitter MA, Vardiman JW, et al**. Association of an inversion of chromosome 16 with abnormal marrow eosinophils in acute mye-lomonocytic leukemia. A unique cytogenetic-clinicopathological association. N Engl J Med. 1983 ; 309:630-636..

[9]. **Grimwade D, Hills RK, Moorman AV, et al**. Refinement of cytogenetic classification in acute myeloid leukemia : Determination of prognostic significance of rare recurring chromosomal abnormalities among 5876 younger adult patients treated in the United Kingdom Medical Research Council trials. Blood. 2010 ; 116:354-365.

[10]. **Larson RA, Williams SF, Le Beau MM, Bitter MA, Vardiman JW, Rowley JD.** Acute myelomonocytic leukemia with abnormal eosinophils and inv (16) or t (16;16) has a favorable prognosis. Blood. 1986 ; 68:1242-1249.

[11]. **NCCN. Directives de pratique clinique en oncologie** : Acute Myelogenous Leukemia ; Disponible sur http://www.nccn.org/

[12]. **Patel LM, Maghari A, Schwartz RA, Kapila R, Morgan AJ, Lambert WC**. Myeloid leukemia cutis in the setting of myelodysplastic syndrome : a crucial dermatological diagnosis. Int J Dermatol. 2012 ; 51:383-388.
[13]. **Steffen B, et al**. La pathogénie moléculaire de la leucémie myéloïde aiguë. Crit Rev Oncol Hematol. 2005;56(2):195-221
[14]. **Kaneko Y, Kimpara H, Kawai S, Fujimoto T**. 8;21 Chro-mosome translocation in eosinophilic leukemia. Cancer Genet Cytogenet. 1983 ; 9:181-183.
[15]. **Jacobsen RJ, Temple MJ, Sacher RA**. Acute myeloblastic leukaemia and t(8;21) translocation. Br J Haematol.1984;57:539-540