Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Dermatology

Neonatal acute Myeloblastic Leukemia Revealed by Blueberry Muffin Baby Syndrome: A Case Report

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DOI: https://doi.org/10.36347/sjmcr.2025.v13i11.050 | **Received:** 10.09.2025 | **Accepted:** 01.11.2025 | **Published:** 26.11.2025

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1. Abstract **Case Report**

Acute leukemia is the most common hematologic malignancy in children, although neonatal forms remain rare. In about two thirds of cases, the disease presents as acute myeloid leukemia, with a severe prognosis. We report a case of neonatal acute myeloblastic leukemia, occurring at birth and revealed by respiratory distress associated with "Blueberry Muffin Baby" syndrome. The biological assessment revealed hyperleukocytosis accompanied by *with bicytopenia*, with a blast rate of 92% strongly positive for myeloperoxidase (MPO) on blood smear. This situation required treatment in neonatal intensive care, associated with reduced dose curative chemotherapy, including cytarabine. *The clinical course was marked* by worsening respiratory distress, leading to the death of the newborn on day 13 of life. Neonatal leukemia remains rare, difficult to manage and requires a multidisciplinary approach. The prognosis remains generally guarded.

Keywords: Blueberry Muffin Baby, Myeloid Leukemia, Newborn.

2. INTRODUCTION

Neonatal acute leukemias are rare entities, representing less than 1% of all pediatric leukemias, and manifest either at birth or during the first weeks of life. Their prognosis remains severe and significantly less favorable than that observed in older children [1]. We present a case of neonatal acute myeloblastic leukemia, revealed by a "Blueberry Muffin" syndrome associated with respiratory distress from birth. This situation required management *in a neonatal intensive care unit (NICU)* during the first two weeks of life, including supportive care and the administration of appropriate chemotherapy.

3. OBSERVATION

This was a newborn female, the first child of a 23-year-old mother, born to non-consanguineous parents by vaginal delivery, following a pregnancy followed up to term, with no family history of tumor pathologies. It was noted that the mother had intermittently taken paracetamol during the last weeks of pregnancy for *with lower back pain*, the mother was immune to toxoplasmosis and rubella.

From birth, diffuse ecchymotic *papulo-nodular* skin lesions, 5 to 10 mm in diameter, were observed, associated with respiratory distress, the clinical examination did not reveal either hepatosplenomegaly or malformation syndrome (Figure 1), the biological assessment revealed hyperleukocytosis at 38,160 elements/mm³, with lymphocytic predominance (30,261 lymphocytes/mm³), with red blood cells at 5.1 M/mm³, hemoglobin at 18.7 g/dl, platelets at 200,000/mm³, urea at 0.36 g/dl, creatinine at 7.32 mg/l, ASAT at 241 U/L, ALAT at 67 U/L, CPK at 911 U/L, TP at 39%, LDH at 3,386 IU/L and uric acid at 87 mg/l. CRP was at 6.20 mg/l. Viral serologies (toxoplasmosis, rubella, HIV, syphilis) were negative in both the newborn and the mother. The newborn was blood group A rhesus positive, while the mother was blood group O rhesus positive, a skin biopsy with immunohistochemical study showed, *dermo-hypodermal* infiltration by a malignant round cell tumor proliferation, the immunohistochemical profile of which suggested acute myeloid leukemia.

The newborn was hospitalized in the neonatology department, where further assessment was performed. Chest X-ray did not show mediastinal widening or signs of leukostasis. Abdominal ultrasound

and echocardiography were normal. She received oxygen therapy at 3 L/min, hyperhydration, and chemotherapy with rasburicase and cytarabine, at a dose of 10 mg every 12 hours for 10 days, adjusted according to weight. The evolution was marked by worsening respiratory distress, leading to death on day 13 of life.

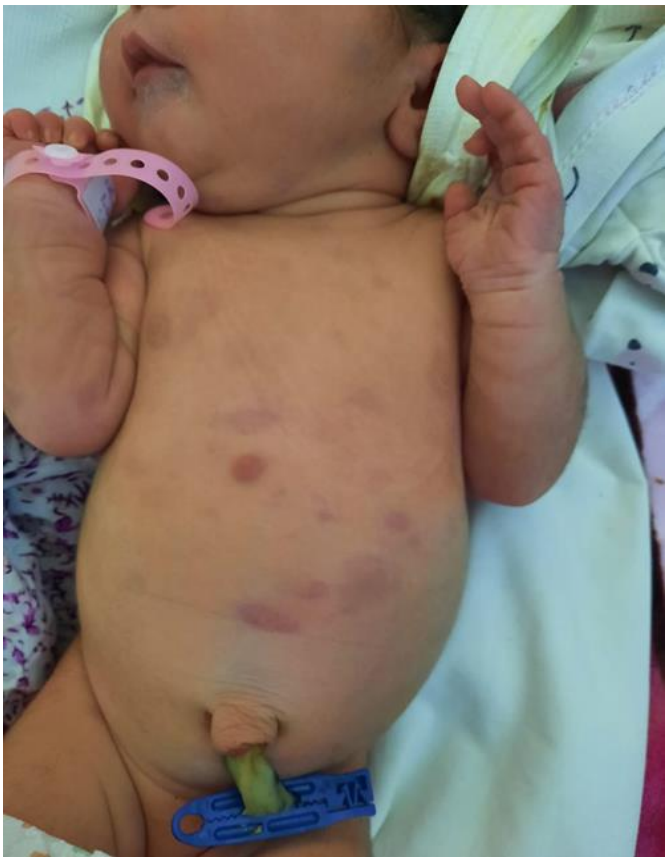

Figure 1: Papulo-ecchymotic cutaneous nodules on the trunk observed at birth.

4. DISCUSSION

Neonatal acute leukemias are extremely rare conditions, occurring at a rate of one case per approximately five million births. They represent less than 1% of all pediatric leukemias and manifest either at birth or during the first weeks of life [2]. The criteria defining neonatal leukemia vary according to authors, some considering the first week of life, others the first six months; however, the majority agree on the appearance of clinical symptoms during the first four to six weeks, whereas in our observation, these were present from birth [3].

Before diagnosing congenital leukemia, it is important to exclude pathologies that can induce a " leukemoid" reaction, including fetal-maternal incompatibility and intrauterine infections, which can lead to persistent cutaneous hematopoiesis, as well as conditions associated with "unstable hematopoiesis", such as trisomy 21 [4]. During this neonatal period, acute myeloblastic leukemias (AML) are the most frequent (56% of cases), with a predominance of monoblastic forms of type M5 (41.6 %) according to the FAB classification [5]. Cutaneous involvement, resulting in the "Blueberry Muffin Baby" syndrome, constitutes a diagnostic challenge due to the numerous differential diagnoses with acute myeloblastic leukemia [6].

These neonatal leukemias are characterized by specific biological presentations, including frequent hyper leukocyte forms, by an association with MLL gene rearrangements (68% of cases) and by the high frequency of associated cytogenetic abnormalities (up to 93% in certain series) [7]. The rarity of this pathology in the neonatal age makes establishing a prognosis difficult, particularly due to the need for supportive care adapted to this age group, such as the difficulty of venous access and the specific needs of the newborn [8]. It is therefore crucial not to systematically expose the newborn to the risks of chemotherapy, which remains indicated only in the event of disease progression, lesions directly threatening life prognosis or recurrence after spontaneous remission [9].

In our case of neonatal acute myeloid leukemia, skin lesions were the major warning sign that led to the diagnosis. Clinical examination revealed purplish *papulo -nodules* disseminated over the entire body, associated with respiratory distress, thus *with representing the classic presentation* of a “Blueberry Muffin Baby” syndrome, frequently observed in AML [10].

5. CONCLUSION

Neonatal acute leukemia is an extremely rare condition, requiring treatment in a specialized setting, combining expertise in neonatology and pediatric hematology. The prognosis for this pathology remains *punctuation: generally poor regardless* of the form of neonatal leukemia.

6. Consent to Publish

with from the patient's parents for publication of the clinical details and/or images included in this manuscript. A copy of the written consent is available for review by the Editor of this journal upon request.

7. Conflict of Interest

The authors declare that they have no conflicts of interest.

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