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ROTH SPOTS IN THE DIAGNOSIS OF ACUTE MYELOID LEUKEMIA IN YOUNG ADULTS

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ABSTRACT

Acute myeloid leukemia (AML) is a malignant disease of stem cell precursors of the myeloid lineage. AML remains a rare malignancy, accounting for only 1.2% of all new cancer diagnoses in the United States each year. AML is most common in adults with an incidence of more than 20,000 cases per year in the country. It is a highly heterogeneous disease with cases being stratified into risk groups based on their cytogenetic profile. When there is ocular involvement, the retina and choroid are the most commonly affected areas, with several clinical manifestations. Despite great advances in understanding its pathophysiology, treatment options have not significantly changed in the last three decades. Allogeneic hematopoietic stem cell transplantation remains the best chance for a cure.

KEYWORDS: Acute myeloid leucemia; Bone Marrow; Stem Cell Transplantation; Roth Spots; Dyscrasia.

INTRODUCTION

Acute myeloid leukemia (AML) is a neoplasm originating in the bone marrow, characterized by the abnormal proliferation of myeloid precursors. This exacerbated proliferation suppresses normal hematopoietic activity so as to prevent adequate production of mature blood cells. Initially, there is proliferation of the leukemic clone that infiltrates the bone marrow culminating in pancytopenia. The blasts can proceed to the circulation, promoting leukocytosis. Some patients may also evolve with infiltration of leukemic cells in several systemic tissues.[1,2,3,4]

AML is the most common acute leukemia in adults, accounting for about 80% of leukemia cases in this population. Its incidence increases with increasing age.[2,4,5]

The clinical manifestations of the disease are attributed to the infiltration of leukemic cell masses into soft tissues and to the alteration of the red, white and platelet series. Failure to produce red blood cells can lead to fatigue, pallor, dyspnea, and tachycardia. Thrombocytopenia can manifest with petechiae, bruising, and hemorrhage.[1,3,5,6]

Ocular manifestations occur in 28 - 80% of patients with leukemia, mainly in those with the acute form, and generally affect the retina and choroid. In the retina, the most common finding is called leukemic retinopathy, which is characterized by dilatation and increased venous tortuositya that can take on a “sausage” appearance.[4,5,6,7] Vascular sheathing is also frequently described, in addition to intraretinal hemorrhages, platelet and fibrin aggregates, or accumulation of leukemic cells and cotton wool exudates in the retina.[6,7,8,9,10]

The choroid is the ocular tissue most affected by leukemic infiltration, and there may be an increase in thickness, hyperplasia and hypertrophy of the uveal tissues. In addition, there may be involvement of the optic nerve, iris, ciliary body and anterior chamber.[3,4,6,10,11]

CASE REPORT

HFN, male, brown, 25 years old, student, started with asthenia, myalgia, arthralgia, daily fever and prostration 3 months ago. There was a sudden worsening that took the patient to the emergency room of the Hospital Universitário Antônio Pedro, Brazil, due to exacerbation of pain, onset of blurred vision and dyspnea. The patient was hospitalized for investigation and the laboratory tests performed showed:

Hematimetry: 1.88 106/mm3, hemoglobin: 6.4 g/dL, hematocrit: 17.8%, mean corpuscular volume: 94.7 µm3, mean corpuscular hemoglobin: 34.2 pg, mean corpuscular hemoglobin concentration: 36 .1 g/dL, red blood cell anisocytosis index: 18.1%; Platelets: 23,000 mm3, mean platelet volume: 9.4 µm3; Global leukometry: 68,900 mm3 (segmented: 32%, lymphocytes: 20%, eosinophils: 2.0%, basophils: 1.0%, monocytes: 0.0%, rods: 5.0%, metamyelocytes: 1.0%, myelocytes: 1.0%, promyelocytes: 1.0%, blasts: 1.0%).

On hematoscopy, there were 36% of cells of the monocytic lineage, with various stages of maturation, elongated red blood cells, hypochromia, hypochromia and polychromatophilia.

After clinical analysis and laboratory tests, the main diagnostic hypothesis considered was AML. During hospitalization, the patient develops a sudden reduction in visual acuity in both eyes (BE). He denies trauma, pain or association with other symptoms. He denies previous similar episodes, as well as daily use of eye drops, history of glaucoma or other eye diseases. She denies other systemic comorbidities.

Ophthalmologic evaluation revealed visual acuity (VA) of 20/200 in the right eye and counting fingers at 1 meter in the left eye, with no improvement with the best correction.

Biomicroscopy showed no relevant changes.

Tonometry: 11/13 mmHg at 10:00 am.

Retinography revealed regular optic discs, cup/disc ratio of 0.6 x 0.6 BE, presence of diffuse intra and preretinal hemorrhages in the posterior pole, with a white center (Roth spots), which extended to the middle retinal periphery. Macules covered by hemorrhagic foci. Retinas applied to the posterior pole.
Figures 1 and 2.

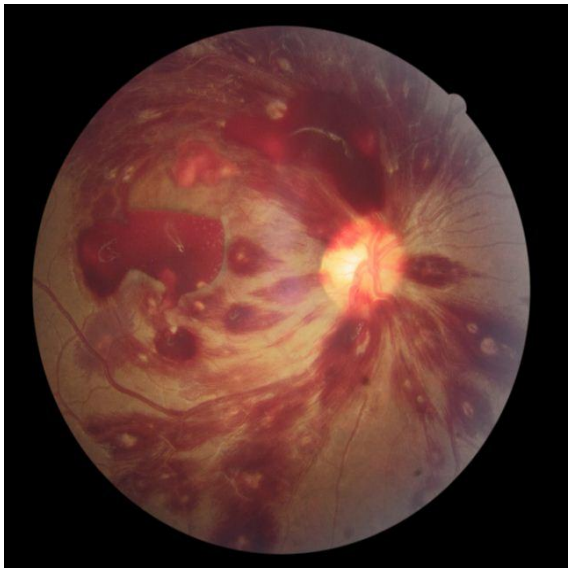

Figure 1: Retinography revealed regular optic discs, cup/disc ratio of 0.6 x 0.6 BE, presence of diffuse intra and preretinal hemorrhages in the posterior pole, with a white center (Roth spots), which extended to the middle retinal periphery. Macules covered by hemorrhagic foci.

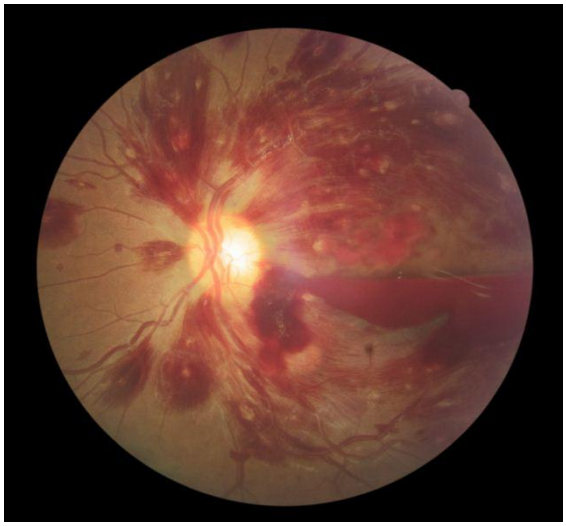

Figure 2: Retinography revealed regular optic discs, cup/disc ratio of 0.6 x 0.6 BE, presence of diffuse intra and preretinal hemorrhages in the posterior pole, with a white center (Roth spots), which extended to the middle retinal periphery. Macules covered by hemorrhagic foci.

After elucidating the diagnostic hypothesis, blood transfusion was indicated with follow-up of the patient by the ophthalmology sector and the hematology and oncology team for chemotherapy treatment.

DISCUSSION

Leukemias can be classified as acute or chronic according to the speed of their clinical course and, depending on the cell lineage affected, as lymphoid or myeloid. Origin is determined when at least 20% of all nucleated marrow cells are blasts.[9.11-13]

The patient in the case reported had 36% of cells of the monocytic lineage on hematoscopy, which reinforces the diagnostic suspicion of leukemia.

The ocular manifestations of leukemia can be primary, due to direct leukemic infiltration or secondary, with indirect ocular involvement due to hematological alterations, secondary to antileukemic treatment and opportunistic infections.[8,10,14-17]

Direct leukemic infiltration is rare and may be related to a lower survival rate. It occurs mainly in areas with greater blood supply, such as the retina, optic nerve and choroid, which is the ocular tissue most affected by anomalous cell infiltration.[13,15,17-19] It can present in different ways: uveal infiltration, orbital infiltration and neuro-ophthalmological signs of Central Nervous System involvement, which include optic nerve infiltration, cranial nerve palsy and papilledema.[9,14,18.20]

Secondary changes due to hematologic abnormalities are a result of anemia, thrombocytopenia, and hyperviscosity. The first manifestation is usually increased vascular tortuosity and venous dilation. Hemorrhages can occur at all retinal levels, but are usually concentrated in the posterior pole.[6,12,13,18] Cotton-wool spots occur mainly in patients with extreme hyperleukocytosis as a result of retinal ischemia. Roth spots are retinal hemorrhages with a central whitish halo, consisting of a nonspecific sign of retinal capillary rupture, followed by aggregation of fibrin and platelets.[11,16,19,20] These findings were present in the patient in the described report, which guided the diagnostic possibilities.

The patient had Roth spots. They usually arise when hemoglobin drops below 8 g/dL or if platelets are below 50,000. The patient had hemoglobin of 6.4 g/dL and 23,000 platelets, which corroborates the diagnostic suspicion raised.

There are a variety of clinical conditions associated with the appearance of Roth spots: bacterial endocarditis, pernicious anemia, HIV, diabetes, systemic arterial hypertension and vasculitis. Such pathologies were not present in the patient.[5,9,12,15]

The intraocular manifestations of leukemia typically resolve after improvement in hematologic parameters. Treatment begins with chemotherapy and aims to eradicate the greatest amount of pathological altered cells in the bone marrow. Bone marrow transplantation may also be necessary. Until adequate control, general support measures must be adopted.[7-9,14,16] In the case reported here, the fundus examination, visual symptoms and clinical picture made it evident the need for blood transfusions to control dyscrasia, thus preventing a worsening of the systemic condition.

CONCLUSION

AML can cause several systemic and ophthalmological changes. Its early recognition is essential as it signals the existence of an underlying systemic pathological condition. As a result, the rapid initiation of systemic chemotherapy therapy becomes imperative, as it directly influences the prognosis of patients affected by this pathology.

Therefore, an accurate ophthalmological examination is extremely important to corroborate and accelerate the diagnosis and treatment of systemic diseases that present ocular manifestations, such as leukemia and other dyscrasias that, in addition to affecting the quality of life of patients, can culminate in definitive sequelae to the eyes. same.

Competing Interests

Authors have declared that no competing interests exist.

Consent

All authors declare that ‘written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal.

Ethical Approval

Not applicable

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