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

Ophthalmology

Bilateral Posterior Segment Features of Acute Myeloid Leukemia

Ouahib Hacht[1*], Fatima-Zahra Mabrouki[1], Asmae Maadane[1], Rachid Sekhsoukh[1]

[1]Department of Ophthalmology, Mohammed VI University Hospital of Oujda, Oujda, Morocco

DOI: https://doi.org/10.36347/sjmcr.2024.v12i11.032 | **Received:** 19.10.2024 | **Accepted:** 23.11.2024 | **Published:** 26.11.2024

***Corresponding author:** Ouahib Hacht
Department of Ophthalmology, Mohammed VI University Hospital of Oujda, Oujda, Morocco

Abstract **Original Research Article**

Acute myeloid leukemia (AML) is a hematological malignancy affecting different organ systems including the eye. The purpose of this review is to report the case of a 47-year-old patient, with no pathological history, who consulted for rapidly progressive loss of visual acuity in both eyes without associated pain or redness AML affects the ocular system through direct infiltration of tissues, secondary to hematological abnormalities, or in the form of chloroma or myeloid sarcoma in the brain or orbit consequently leading to a variety of manifestations depending on the ocular tissue involved. It is imperative for ophthalmologists to be aware of the early ophthalmological manifestations of AML which will allow for earlier diagnosis and treatment of this life-threatening disease.

Keywords: AML, Funduscopic examination, Roth spots.

INTRODUCTION

Ophthalmic manifestations of AML are essential because ocular involvement may be the only clinical sign revealing the disease or an indicator of leukemia recurrence.

Ocular manifestation is secondary either to oculo-orbital invasion by immature hematopoietic cells (blasts), or occurring by contiguity from the central nervous system, or also secondary to vasculopathy.

These manifestations can also be linked to the effects of local and systemic treatments.

MATERIAL AND METHODS

We report the case of a 47-year-old patient, with no pathological history, who consulted for rapidly progressive loss of visual acuity in both eyes without associated pain or redness.

RESULTS

Ophthalmological examination reveals a visual acuity at counting fingers in both eyes, anterior segment and ocular tone without abnormality.

Funduscopic examination shows the presence in both eyes of papilledema, multiple deep retinal hemorrhages with clear centers (Roth spots), superficial splinter hemorrhages, and vascular tortuosity.

OCT confirmed macular edema. Fluroscein angiography highlighted hemorrhages, disk swelling with no signs of ischemia.

Internal medicine screening (Blood cells count, bone marrow biopsy found acute myelogenous leukemia. We preconized chemotherapy emergently, rehydratation and follow up, to decide need of further treatments.

Within a month we had an improvement of visual acuity to 3/10 OU with regression of ocular signs. Patient is being followed up.

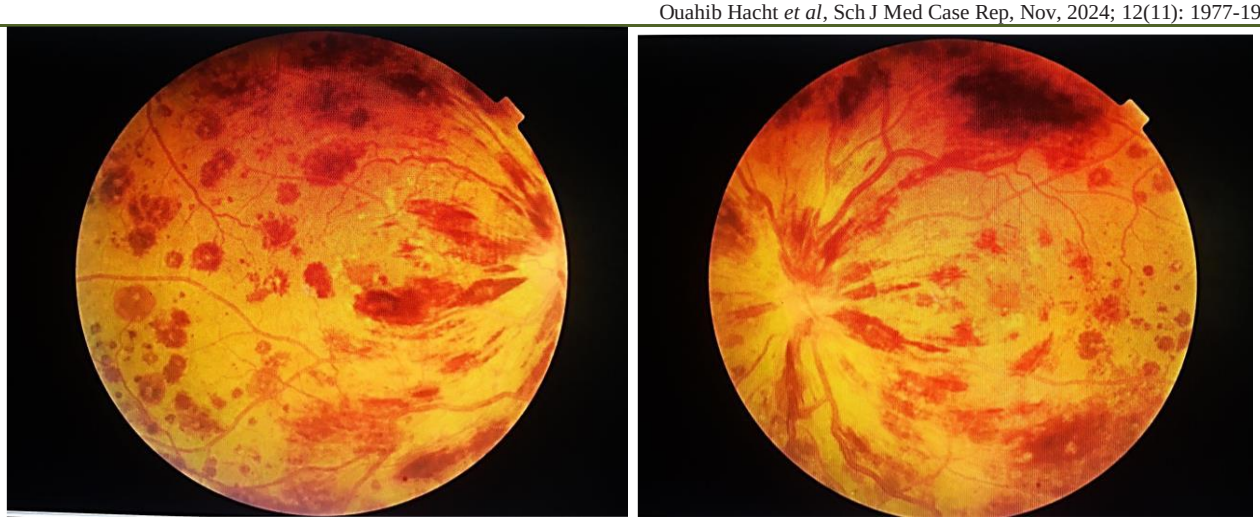

Figure 1: Fundus examination revealed the presence of bilateral papilledema, significant macular edema white centred hemorrhages Roth spots and multiple splinter hemorrhages with vascular tortuosity

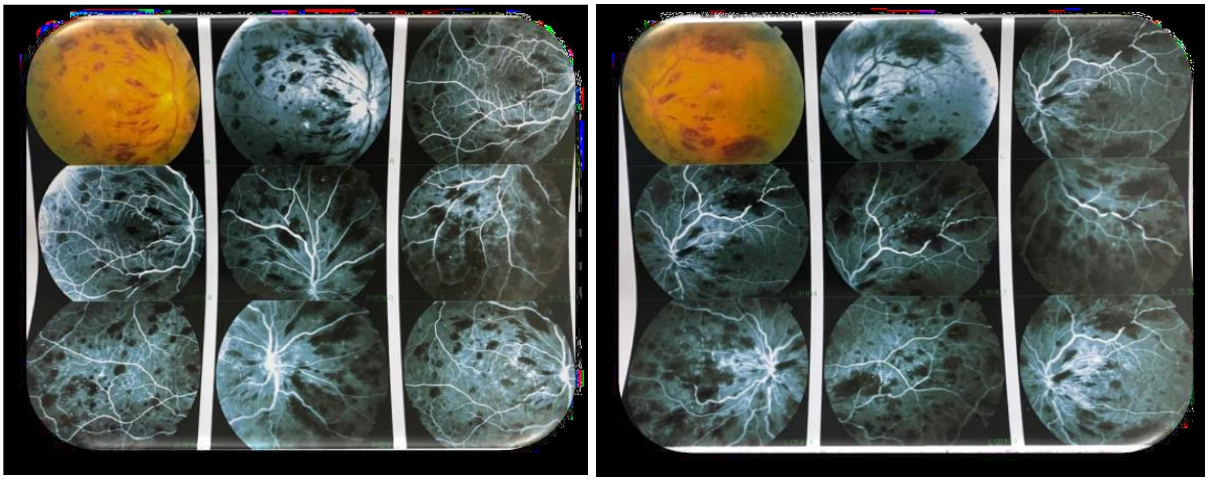

Figure 2: FA highlighted hemorrhages disk swelling with no signs of ischemia

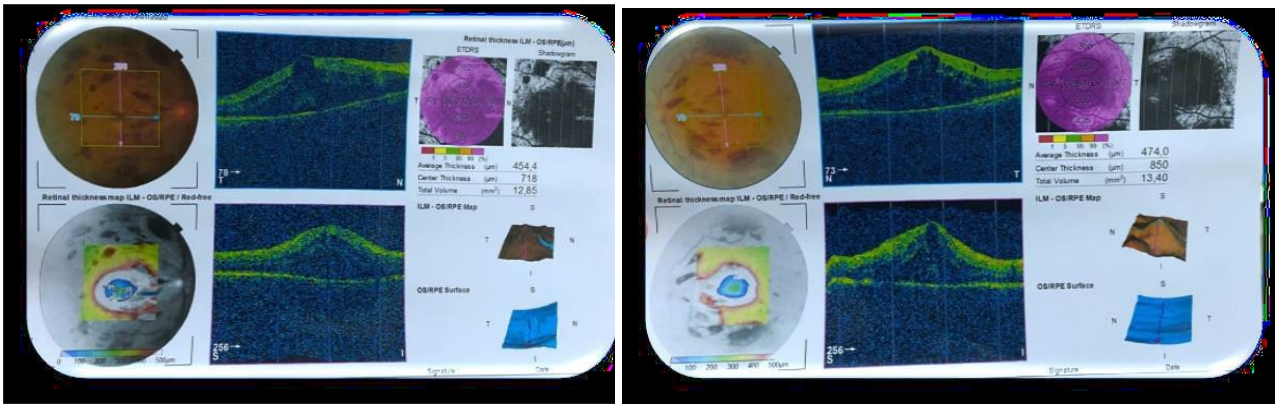

Figure 3: OCT confirmed bilateral macular edema

DISCUSSION

The prevalence of ocular involvement during acute leukemia varies depending on the variant series, between 9 and 90% of cases [1-3]. This prevalence is clearly decreasing thanks to chemotherapy and systematic preventive treatment of central nervous system locations [2]. All oculo-orbital structures can be affected: the orbit, the anterior segment, the optic nerve, the retina and the choroid [4]. The posterior segment is most often affected [3]. Blastic infiltration of the retina manifests itself in the form of retinal hemorrhages often at the posterior pole. These hemorrhages sometimes have a white center due to cellular debris, capillary emboli or leukemic infiltrates [4]. Other lesions are part of leukemic retinopathy such as irregular dilations of the retinal veins, cotton wool nodules, localized foci of

ischemic degeneration of retinal fibers, or even central retinal vein occlusion (CRVO), rarely reported [5].

Damage to the choroid and pigmented epithelium can result from several physiopathological mechanisms: anemia, blood hyperviscosity, thrombocytopenia, or parietal invasion by blast cells [4]. This damage is not very expressive clinically.

Factors leading to exudative retinal detachment are choroidal ischemia and secondary retinal pigment epithelial dysfunction.

Impairment of the optic nerve, sometimes bilateral, but most often asymmetric, is typically manifested by infiltration of the entire papillary region by a tumor mass, accompanied by exudates and hemorrhages and cottony infiltrates and protruding into the vitreous cavity. Cottony infiltrates, decreased vision, asymmetrical involvement, absence of signs of intracranial hypertension and blastic meningitis are signs allowing differentiation of stasis papilledema linked to intracranial hypertension from blastic infiltration of the optic nerve.

MRI angiography can provide evidence in favor of invasion by blast cells, by highlighting subclinical infiltration of the optic nerve [2]. Indeed, the infiltration of leukemic cells or hematological disturbances can lead to partial occlusion of the choriocapillaris and a delay in secondary choroidal circulation. This is a therapeutic emergency which requires intrathecal chemotherapy (international protocol) associated with corticosteroids and possibly irradiation of the central nervous system. Oculo-orbital infiltration by blast cells is considered and treated as an attack on the central nervous system, it is therefore essential to make the diagnosis in order to guide treatment [2].

The presence of specific ocular lesions of leukemia indicates a progressive course of the disease: on the one hand increases the risk of recurrences and on the other hand worsens the vital prognosis of the leukemic disease.

CONCLUSION

Ophthalmic signs can precede systemic leukemic involvement and can thus help in the early diagnosis of acute leukemia.

These ocular manifestations are polymorphic. Oculo-orbital localization is the equivalent of manifestation to the central nervous system and must be treated as such.

The asymptomatic nature of ophthalmological damage requires an ophthalmological examination in all leukemia patients.

Conflict of Interest: No conflict of interest was declared by the authors.

REFERENCE

1. Lowenberg, B., Downing, J. R., & Burnett, A. (1999). Acute myeloid leukemia. *New England Journal of Medicine*, *341*(14), 1051-1062.
2. Skarsgård, L. S., Andersson, M. K., Persson, M., Larsen, A. C., Coupland, S. E., Stenman, G., & Heegaard, S. (2019). Clinical and genomic features of adult and paediatric acute leukaemias with ophthalmic manifestations. *BMJ open ophthalmology*, *4*(1), e000362.
3. Soman, S., Kasturi, N., Srinivasan, R., & Vinod, K. V. (2018). Ocular manifestations in leukemias and their correlation with hematologic parameters at a tertiary care setting in South India. *Ophthalmology Retina*, *2*(1), 17-23.
4. Dhasmana, R., Prakash, A., Gupta, N., & Verma, S. K. (2016). Ocular manifestations in leukemia and myeloproliferative disorders and their association with hematological parameters. *Annals of African Medicine*, *15*(3), 97-103.
5. Reddy, S. C., Jackson, N., & Menon, B. S. (2003). Ocular involvement in leukemia–a study of 288 cases. *Ophthalmologica*, *217*(6), 441-445.
6. Eze, B. I., Ibegbulam, G. O., & Ocheni, S. (2010). Ophthalmic manifestations of leukemia in a tertiary hospital population of adult Nigerian Africans. *Middle East African journal of ophthalmology*, *17*(4), 325-329.
7. Ohkoshi, K., & Tsiaras, W. G. (1992). Prognostic importance of ophthalmic manifestations in childhood leukaemia. *British journal of ophthalmology*, *76*(11), 651-655. doi:10.1136/bjo.76.11.651
8. Ridgway, E. W., Jaffe, N., & Walton, D. S. (1976). Leukemic ophthalmopathy in children. *Cancer*, *38*(4), 1744-1749. doi:10.1002/1097-0142(197610)
9. Cavdar, A. O., Babacan, E., Gözdaşoğ; lu, S., Kilicturgay, K., Arcasoy, A., Cin, Ş., ... & Erten, J. (1989). High risk subgroup of acute myelomonocytic leukemia (AMML) with orbito-ocular granulocytic sarcoma (OOGS) in Turkish children: retrospective analysis of clinical, hematological, ultrastructural and therapeutical findings of thirty-three OOGS. *Acta haematologica*, *81*(2), 80-85.
10. Lo Curto, M., Zingone, A., Acquaviva, A., Bagnulo, S., Calculli, L., Cristiani, L., ... & Zanesco, L. (1989). Leukemic infiltration of the eye: results of therapy in a retrospective multicentric study. *Medical and pediatric oncology*, *17*(2), 134-139.