Case Report

White-centered retinal hemorrhage revealing acute leukemia: A case report

Nadia Ben Abdesslem a, b, Nesrine Zaafrane a, b, Atf Ben Abderazek a, b, *, Ahmed Jabri a, b, Anis Mahjoub a, b, Chiraz Ben Youssef a, b, Hachemi Mahjoub a, b, Fethi Krifa a, b, Ahmed Mahjoub a, b

a Department of Ophthalmology, Farhat Hached University Hospital, Sousse, Tunisia
b Faculty of Medicine of Sousse, University of Sousse, Sousse, Tunisia

ARTICLE INFO

Keywords:
Case report
Roth spots
White-centered hemorrhage
Acute myeloid leukemia

ABSTRACT

Retinal manifestations have been described as an inaugural manifestation of acute leukemia. Retinal hemorrhage, and in particular white-centered hemorrhages are among the most frequently observed signs. We report here the case of a 34-year-old Caucasian man with no medical history who presented to our emergency department with a decrease in visual acuity associated with asthenia. Ophthalmological examination revealed bilateral white-centered hemorrhages. The etiological assessment confirmed the diagnosis of acute myeloid leukemia. Whenever Roth spots are found in fundus examination, a complete ophthalmological examination along with a wide etiological investigation must be conducted.

1. Introduction and importance

Acute leukemia is a malignant hematological disease defined by intramedullary clonal proliferation of hematopoietic precursors. Ocular manifestations are either direct by orbito-ocular invasion or indirect by medullary insufficiency [1]. The retinal manifestations have been described as an inaugural manifestation of acute leukemia. Retinal hemorrhage, and in particular white-centered hemorrhages are among the most frequently observed signs [2] ranging from 11% to 50% [3].

We report here the case of a 34-year-old caucasian man with no medical history who presented with a decrease in visual acuity associated with asthenia. Ophthalmologic examination revealed bilateral white-centered hemorrhages. This case report has been reported in line with the SCARE criteria [4].

2. Case presentation

We report the case of a 34-year-old Caucasian man with no medical history who presented with a blurred vision in both eyes associated with asthenia, along with a low-grade fever which appeared for a week prior to the visit.

Ocular examination revealed that the patient’s best-corrected visual acuity (BCVA) was counting fingers at 2/10 for each eye. The funduscopy showed diffuse bilateral retinal and subhyaloidian hemorrhages with macular localization, associated with multiple hemorrhages with white centre, scattered throughout the retinas evoking Roth spots (Fig. 1).

Swept source OCT showed retinal and subhyaloidain haemorrhages in both eyes (Fig. 2).

Biochemical evaluation revealed pancytopenia with a hemoglobin level of 4.1 g/dl, a leukocyte count of 1500/mm and a platelet count of 4000/mm3.

with the presence of blasts. A bone marrow biopsy was performed showing a population of myeloblasts (75% of the total WBC count) with prominent nucleoli and heterochromatic nucleus, confirming the diagnosis of acute myeloid leukemia.

This case report has been reported in line with the SCARE criteria 4).
3. Clinical discussion

Roth’s spots are defined as retinal, white-centered, round, oval or flame-shaped hemorrhages. They are often located in the posterior pole and may extend to the sub-retinal and subhyaloidian space [5]. The decrease in visual acuity translates the damage to the macula.

Their physiopathology is explained by a rupture of the retinal capillaries, itself a consequence of endothelial dysfunction. Histologically, they are formed by fibrino-platelet clusters associated with an infiltrate of red cells resulting from capillary rupture [5].

Roth spots are associated with bone marrow aplasia [6], leukemia, anemia, hypertensive retinopathy, diabetic retinopathy and pre-eclampsia. A minimal biological evaluation consisting of a complete blood count with differential as well as fasting plasma glucose, CRP, and blood cultures should be performed [7].

The prevalence of retinal hemorrhage in newly diagnosed acute leukemia has reached 49% in some series. No significant correlation has been found between platelet count and white-centered hemorrhage [5].

4. Conclusion

Whenever Roth spots are found in fundus examination, a complete ophthalmological examination along with paraclinical exploration must be conducted. Leukemia remains one of the most life-threatening diagnoses that can be revealed by white-centered hemorrhages.

Provenance and peer review

Not commissioned, externally peer reviewed.
Patient consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Sources of funding

No funding or grant support.

Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

Guarantor

Atf ben abderrazek: atf.benabderrazek@gmail.com.

Declaration of competing interest

The following authors have no financial disclosures: (Nadia Ben Abdessalem, Nesrine Zaafrane, Atf Ben Abderrazek, Ahmed Jabri, Anis Mahjoub, Chiraz Ben Youssef, Hachemi Mahjoub, Fathi Krifa, Ahmed Mahjoub).

Acknowledgements

None.

References

[1] L. Chaabani, K. Doulami, White-centred retinal hemorrhage revealing acute leukemia, Tunis. Med. 97 (6) (2019 Jun) 822–825. PMID: 31872415.
[2] A. Chandra, U. Chakraborty, S. Ganai, A.K. Ray, Roth spots in acute myeloid leukaemia, BMJ Case Rep. 13 (9) (2020 Sep 2), e238133, https://doi.org/10.1136/bcr-2020-238133. PMID: 32878844; PMCID: PMC7470486.
[3] A.M. Abu el-Asrar, A.K. al-Momen, D. Kangave, M.S. Harakati, D.S. Ajarim, Correlation of fundus lesions and hematologic findings in leukemic retinopathy, Eur. J. Ophthalmol. 6 (2) (1996 Apr-Jun) 167–172. PMID: 8823591.
[4] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, for the SCARE Group, The SCARE 2020 guideline: updating consensus Surgical Case Report (SCARE) guidelines, Int. J. Surg. 84 (2020) 226–230.
[5] S.C. Reddy, N. Jackson, Retinopathy in acute leukaemia at initial diagnosis: correlation of fundus lesions and haematological parameters, Acta Ophthalmol. Scand. 82 (1) (2004 Feb) 81–85, https://doi.org/10.1046/j.1600-0420.2003.00197.x. PMID: 14738490.
[6] M. Ahmed, F. Olla, A. Aymen, B.A. Nadia, B.M. Syrine, M. Hachmi, Une hémorragie maculaire bilatérale révélant une aplasie médullaire (Bilatéral macular hemorrhage revealing bone marrow aplasia), French, J. Fr. Ophtalmol. 43 (3) (2020 Mar) 277–279, https://doi.org/10.1016/j.jfo.2019.07.028. Epub 2020 Feb 3. PMID: 32029289.
[7] C.-C. Chien, Y.-Y. Chen, Y.-H. Chen, S.-J. Pao, Roth spots in acute promyelocytic leukemia, QJM: Int. J. Med. 114 (11) (November 2021) 826–827, https://doi.org/10.1093/qjmed/hcaz238.