

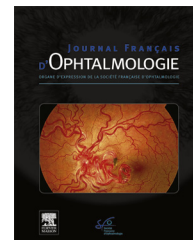


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LETTER TO THE EDITOR

Early OCT-angiography findings lead to prompt intravenous thrombolysis and good visual recovery in central retinal artery occlusion: A case report



Manifestations précoces à l'OCT-angiographie d'une occlusion de l'artère centrale de la rétine menant à une thrombolyse intraveineuse rapide et à une bonne récupération visuelle : à propos d'un cas

Introduction

The central retinal artery occlusion (CRAO) is a rare vascular condition analogous to ischemic stroke, and its management is still controversial [1]. A recent consensus statement for management of acute CRAO recommends thrombolysis within the 4.5 hours of onset in the absence of contraindications [1]. Only few data are available for treatment beyond this delay or for "awakening CRAO".

We report the case of a patient presenting with acute CRAO with painless vision loss on awakening, associated with ischemic inner retinal features on the OCT despite a

normal fundus appearance, suggesting the very recent onset and the better prognosis in case of intravenous thrombolysis. The OCT-angiography (OCT-A) confirmed the diagnosis. The patient indeed fully recovered his vision in the 24 hours following intravenous tissue plasminogen activator (tPA).

Observation

A 62-year-old man presented at the emergency room for a sudden unilateral painless visual loss of the right eye on awakening. His best-corrected visual acuity was hand movement for the right eye with relative afferent pupillary defect and 20/20 for left eye. Slit-lamp examination of the anterior segment and the eye fundus seemed unremarkable on both sides.

The macular OCT was normal on the left eye (Fig. 1b) but accurate analysis of the right eye OCT revealed subtle inner retinal layers hyperreflectivity (Fig. 1a). On the right eye, the OCT-A showed a markedly reduced capillary network perfusion in the macular region (Fig. 2a). In contrast, on the left eye, the macular area was normally perfused (Fig. 2b).

CRAO was diagnosed in the right eye and the patient underwent the acute stroke protocol from Cliniques universitaires Saint-Luc. Biology was irrelevant with normal

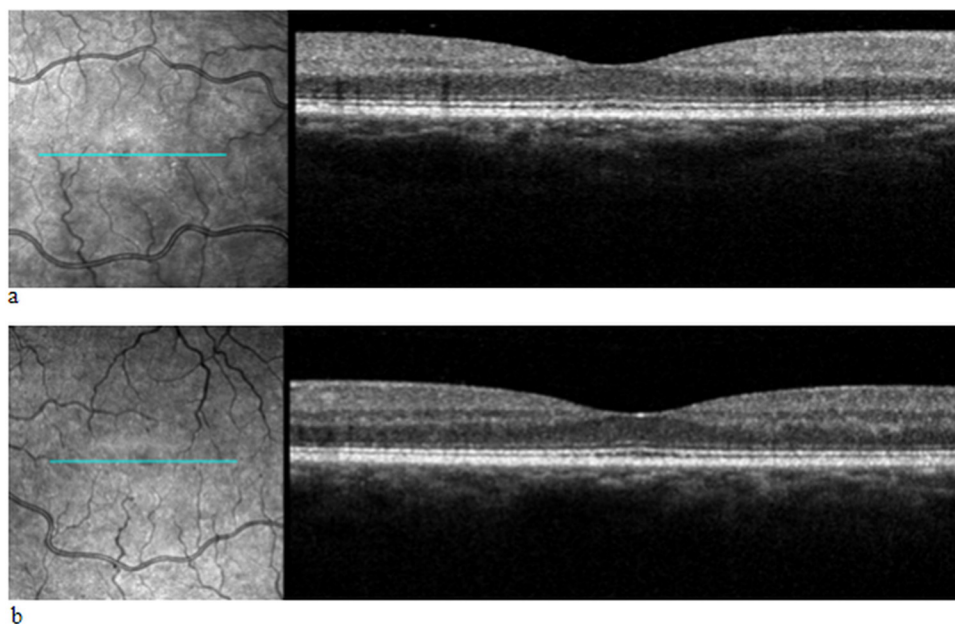


Figure 1. a, b: macular OCT of the right eye (a) at presentation, showing some areas with discrete hyperreflectivity of the inner retinal layers compared to left eye (b).

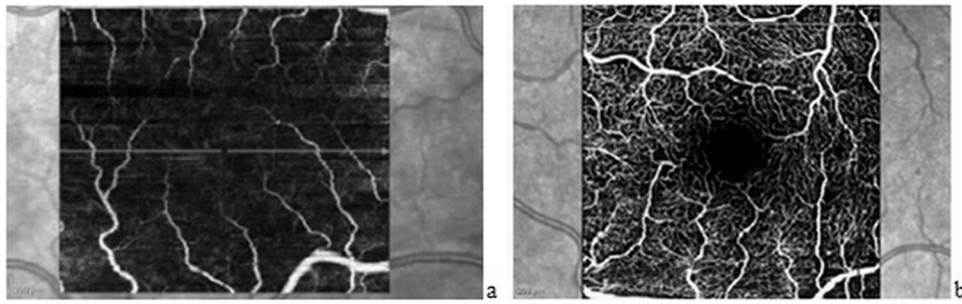


Figure 2. a, b: OCT angiography demonstrating markedly reduced capillary network perfusion in the right eye (a), compared with the normal vascularization of the left eye (b).

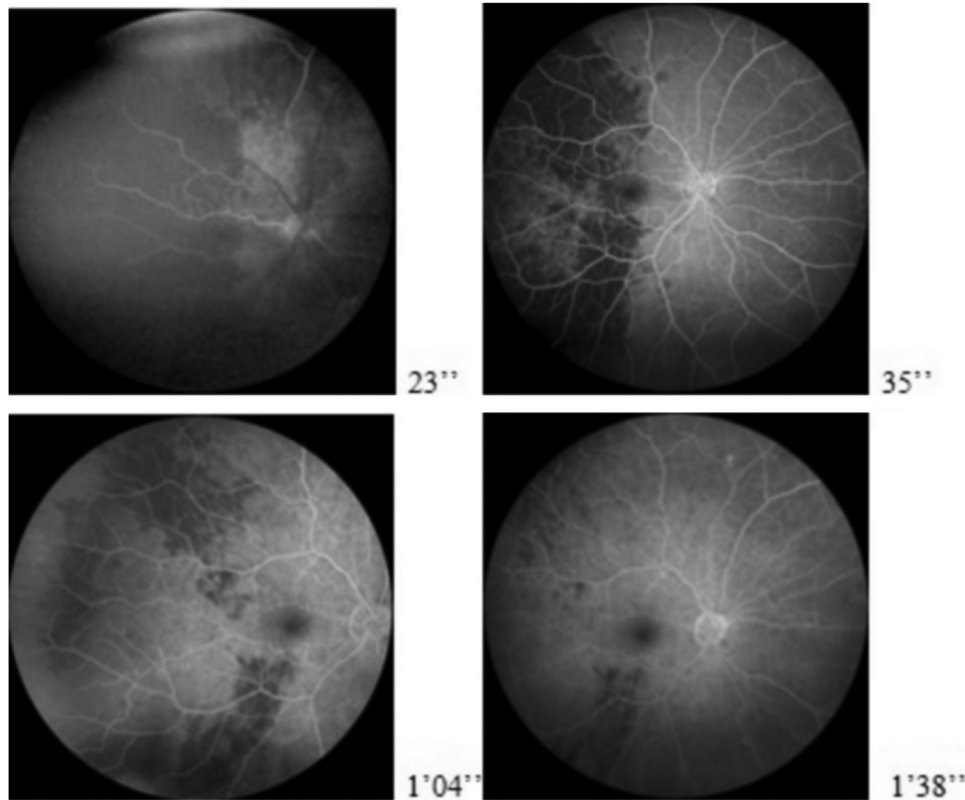


Figure 3. Fluorescein angiography 24 hours after presentation: prolonged arteriovenous transit time with delayed choroidal filling.

C-reactive protein. CT scan-angiography excluded intracerebral bleeding and revealed a complete occlusion of the right internal carotid artery from proximal to distal third portion with patency of the circle of Willis. After assessing the potential time since the onset of symptoms (between 3.8 and 5.5 hours), the patient was given intravenous thrombolysis treatment.

The following day, the ophthalmologic examination documented a visual acuity completely recovered to 20/20 in the right eye and a full reperfusion on the OCT-A. Fluorescein angiogram showed a prolonged arteriovenous transit time with delayed choroidal filling (Fig. 3), revealing a combined retinal and choroidal vascular involvement. The automated perimetry SITA standard 24.2 shows a diffuse loss of sensitivity, more pronounced in the superonasal and inferotemporal quadrants, with relative central sparing. We finally retained the diagnosis of CRAO associated with partial ciliary artery

occlusion of the right eye, secondary to an extensive occlusion of the homolateral internal carotid artery. This would be a precursor to ocular ischaemia syndrome (OIS). The patient was reviewed several times in the months that followed. At seven months after the occlusion, visual acuity was still 20/20, the Goldmann V4E visual field was within normal limits, and the examination of the fundus and the OCT-A remained normal.

Discussion

The management of CRAO is highly variable according to practitioners and institutions but current literature suggests the advantage of intravenous tissue plasminogen activator [1]. Although thrombolysis is not recommended by the last AAO guidelines [2], the statement of the American Heart Association [1] based on several studies has shown

the benefits of thrombolysis within 4.5 hours after the onset of symptoms.

In our case, patient reported normal visual acuity of the right eye when going back to sleep at 5:15 a.m. He noticed visual loss by waking up at 7:00 a.m. and eye examination was performed at 9:00 a.m. After neurologic examination and discussion for balance between benefits and risks, patient finally received IV tPA at 10:50 a.m., namely 3.8 to 5.5 hours after the vascular occlusion has occurred. The fundus appearance and the OCT presentation suggested an early stage of retinal ischemia, supporting the decision to perform thrombolysis, regardless of the precise time of onset of symptoms (before or after 4:30).

In the early stage of CRAO, when the eye fundus lacks ischemic signs, macular OCT should always be performed to highlight the pathognomonic inner retinal hyperreflectivity [1]. Moreover, if OCT-A is available to the physician, it may provide valuable information about the capillary retinal perfusion.

Early and certain diagnoses seems to be increasingly important as future RCTs for thrombolysis treatment of CRAO will soon emerge [1]. Further OCT and OCT-A biomarkers studies are needed to better invest the ischemic damages of the CRAO over time, in order to date the precise onset of the occlusion, akin to mismatch imaging in acute ischemic stroke with unknown onset [3]. Wenzel et al. found that relative retinal thickness increase (RRTI: calculated with the ratio of the affected eye to the fellow eye) with a cut-off of 24.5% allowed to distinguish between an occurrence of CRAO within or after 4:30 (sensitivity: 100%; specificity: 94.3%) [4]. Chen et al. also carried out a relevant study investigating the correlation of optical intensity on OCT with visual prognosis of CRAO. They concluded that optical intensity ratio of inner retinal layers to photoreceptors/retinal pigment epithelium was strongly correlated with final best-corrected visual acuity in eyes with acute CRAO. They postulated that this ratio could be used as a biomarker to predict functional outcomes after treatment. Nevertheless, standard treatment in this study included ocular massage, intraocular pressure-lowering agents and vascular dilation agent, but no thrombolysis was performed [5].

Conclusion

Early intravenous thrombolysis may be an effective treatment for acute non-arteritic CRAO. More studies are needed

to confirm the adequate management protocol of CRAO especially beyond 4.5 hours of onset or upon awakening. CRAO in very early stages may present with an apparently normal fundus and slight hyperreflectivity of the inner nuclear layer. OCT-angiography is an easy and fast way to evaluate retinal vascularization and could be part of the examination protocol for suspected CRAO.

Disclosure of interest

The authors declare that they have no competing interest.

References

- [1] Mac Grory B, Schrag M, Biousse V, et al. Management of central retinal artery occlusion: a scientific statement from the American Heart Association. *Eur Stroke J* 2021;52:e282–94.
- [2] Flaxel C, Adelman R, Bailey S, Fawzi A, Lim J, Vemulakonda A, et al. Retinal and ophthalmic artery occlusions preferred practice pattern. *Am J Ophthalmol* 2020;127:259–87.
- [3] Demeestere J, Wouters A, Christensen S, Lemm R, et al. Review of perfusion imaging in acute ischemic stroke: from time to tissue. *Eur Stroke J* 2020;51:1017–24.
- [4] Wenzel D, Kromer R, Poli S, et al. Optical coherence tomography-based determination of ischaemia onset - the temporal dynamics of retinal thickness increase in acute central retinal artery occlusion. *Acta Ophthalmol* 2020;99:247–52.
- [5] Chen H, Xia H, Qiu Z, Chen W, Chen X. Correlation of optical intensity on optical coherence tomography and visual outcome in central retinal artery occlusion. *Ophthalmol Retina* 2016;36:1964–70.

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