



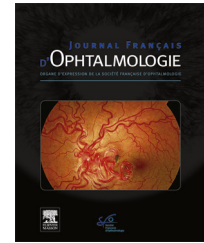
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ORIGINAL ARTICLE

Fundus autofluorescence in retinal artery occlusion: A more precise diagnosis

Intérêt de l'autofluorescence dans l'évaluation des emboles artériels rétiniens

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KEYWORDS

Emboli;
Retinal artery
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Fundus
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Lipofuscin;
Plaques

Summary

Importance. – Retinal artery occlusion (RAO) is a medical emergency associated with a high risk of cerebral vascular accident and other cardiovascular events. Among patients with non-arteritic RAO, a retinal embolus is observed in approximately 40% of cases. Fundus examination and retinography are not reliable to predict the nature of the emboli.

Observations. – We report three consecutive cases of central and branch RAO that were investigated with fundus autofluorescence, fluorescein angiography and color retinal photographs. All patients underwent complete neurological and cardiovascular workups, with brain imaging, cardiac Doppler ultrasound, carotid Dopplers and Holter ECG's, to determine the underlying mechanism of retinal embolism. In the three cases, aged 77.7 ± 4 years (2 women and 1 man), fundus autofluorescence demonstrated hyperautofluorescent emboli. In two cases, it allowed visualization of emboli that were not detected with fundus examination or retinography. The cardiovascular work-up demonstrated atheromatous carotid or aortic plaques in all patients. In one case, it permitted the diagnosis of RAO. Two of the three cases were considered to be of atherosclerotic origin and one of undefined origin.

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Conclusion and relevance. — Fundus autofluorescence may help to detect and characterize retinal emboli. Since lipofuscin, which is present in large quantity in atherosclerotic plaques, is the main fluorophore detected with fundus autofluorescence, this non-invasive and simple examination may give information about the underlying mechanism of retinal embolism, and thus impact the etiologic assessment of RAO. Additional studies are necessary to confirm this potential role of autofluorescence.

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MOTS CLÉS

Emboles ;
Occlusion artérielle ;
Autofluorescence ;
Lipofuscine ;
Athérome

Résumé

Introduction. — Les occlusions artérielles rétinienne (OAR) constituent des équivalents rétinien d'accident vasculaire cérébral (AVC). Les embolies artérielles rétinien ne sont pas toujours visibles au fond d'œil et leur aspect ne permet pas de préjuger de leur nature.

Observations. — Nous rapportons 3 cas consécutifs d'OAR ayant bénéficié d'un examen ophtalmologique complet avec cliché en autofluorescence, angiographie à la fluorescéine et rétinographie couleur. Ils bénéficiaient de plus d'un bilan cardiovasculaire et neurologique avec imagerie cérébrale, échographie-Doppler cardiaque et des troncs supra-aortiques et holter ECG. Les 3 patients âgés de $77,7 \pm 4$ ans (2 femmes et un homme) présentaient des embolies artérielles hyper autofluorescentes dont deux n'avaient pas été détectés au fond d'œil. Le bilan cardiovasculaire mettait en évidence des plaques athéromateuses carotidiennes ou aortiques chez tous les patients. Chez 2 patients, le diagnostic d'AVC rétinien d'origine athéromateuse était retenu. Chez la 3^e patiente, le diagnostic étiologique ne pouvait être retenu avec certitude.

Conclusion. — Au niveau rétinien, l'hyper-autofluorescence est habituellement associée à la présence de lipofuscine, qui est également présente en grande quantité dans les plaques athéromateuses. L'autofluorescence pourrait faciliter la détection des embolies rétinien. Des études supplémentaires sont nécessaires pour affirmer l'intérêt de l'autofluorescence pour établir la nature des embolies rétinien.

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Introduction

Retinal artery occlusion (RAO) is a medical emergency associated with a high risk of cerebral vascular accident and other cardiovascular events [1,2]. Among patients with nonarteritic RAO, a retinal embolus is observed in approximately 40% of case and can be of different nature, depending on the underlying mechanism [3]. Fibrinocruoric emboli may occur in embolic heart disease such as auricular fibrillation; calcic emboli usually originate from a calcified aortic valve and atherosclerotic emboli usually originate from an atheromatous plaque within the carotid arteries or the aorta [4,5]. Other types of emboli (tumoral, fatty) are much less frequent. Each type of embolism implies specific management and therefore, diagnosing the origin of arterial retinal emboli is of crucial importance. Unfortunately, fundoscopic examination and retinography are not reliable to determine the nature of the emboli [6]. Fundus autofluorescence imaging is a non invasive imaging method that allows visualization of lipofuscin in the retina as well as of other fluorophores that may occur with retinal diseases [7]. We herein report a case series of 3 patients with RAO in which fundus autofluorescence contributed to the diagnosis and/or the management. We discuss the interest of this particular finding, its

suspected underlying mechanisms, and how it may impact RAO assessment.

Case 1

A 77-year-old woman with multiple cardiovascular risk factors was referred for a sudden loss of vision of the left eye. The visual acuity was 20/200 OS. Slit lamp examination was normal except for a grade 2 corticonuclear cataract. The fundus examination revealed an inferior macular ischemic edema and 2 arteriolar retinal emboli along the inferotemporal arcade (Fig. 1A). She underwent a complete cardiovascular work-up, which revealed extensive aortic atherosclerotic plaques and a severe right carotid stenosis (Table 1). The 24-hour electrocardiogram and the echocardiogram were negative for cardiac cause of embolism. Laboratory investigations revealed a normal erythrocyte sedimentation rate and C-reactive protein, and a hypercholesterolemia. This retinal stroke was considered to be due to an atherosclerotic origin. After 15 days, she came back to perform a fluorescein angiography. Fundus autofluorescence revealed 3 hyperautofluorescent dots corresponding to the arteriolar emboli (Fig. 1C). A third embolus on the central retinal artery trunk, which had been overlooked on

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