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OCT Angiography in the diagnosis and follow-up of retinal arterial macro aneurysms

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Purpose

To describe Optical Coherence Tomography Angiography (OCTA) findings in retinal arterial macroaneurysm associated with macular edema and to correlate OCTA findings to conventional multimodal imaging (MMI).

Methods

The clinical course, conventional MMI findings including fundus color photography, spectral domain OCT (SD-OCT Spectralis, Heidelberg Engineering, Heidelberg, Germany), fluorescein angiography (FA, Heidelberg Engineering, Heidelberg, Germany) and OCTA (Optovue, Inc., Freemont, CA or PlexElite, Zeiss, Dublin, CA) findings at baseline and during the follow-up of 4 eyes (4 patients) with symptomatic RAM associated with macular edema were documented.

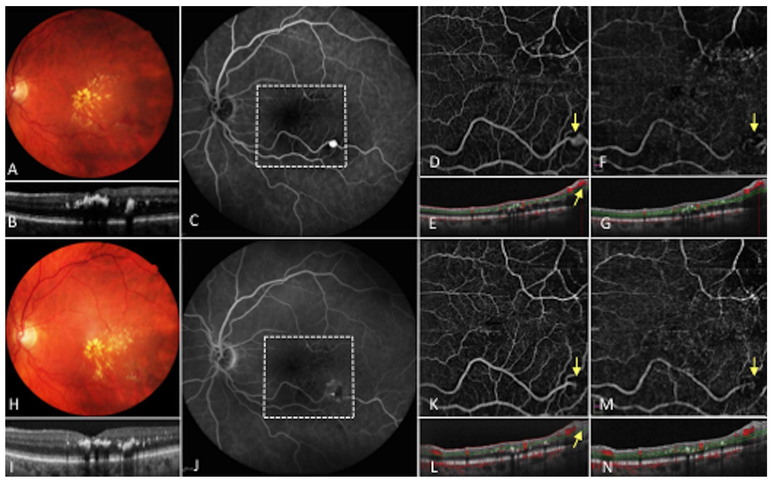

Figure 1. Retinal arterial macroaneurysm at baseline and one month after laser photocoagulation (Case 1).
Color fundus photography (Panel A) of the left eye of 82 year-old woman and the corresponding SD-OCT (Panel B) at baseline. Fluorescein Angiography (Panel C) shows the RAM as a localized arterial dilation. 6x6 mm OCTA **Optovue** spanning the RAM are shown in panels D (SCP) and F (DCP). Corresponding B-scans (Panels E and G) shows flow overlay corresponding to the SCP slab (arrow), while in the DCP no flow was detected, probably due to a mask effect. One month after laser **Argon** photocoagulation: color fundus photography (panel H) and its corresponding SD-OCT (I), FA shows a thrombosis of the RAM without arteriolar occlusion (J). OCTA 6x6 mm do not reveal high flow within the RAM (arrows) neither in the SCP nor in the DCP slabs (Panels K and M, respectively). This finding is confirmed on the corresponding B-scans by the lack of flow overlay corresponding to the RAM (arrow) (Panels L and N).

Results

Four eyes of 4 patients, all women, aged 82, 56, 62 and 46 years, which presented with progressive visual decline were included. On conventional MMI, exudative RAM with macular edema and lipid exudation were visible in included eyes. On OCTA, a flow was detecetd in 3 RAM at baseline and no flow in 1 RAM (case 4) consistent with FA findings in all cases. Case 1 and 2 were treated by focal laser photocoagulation. One month after treatment, FA showed RAM occlusion. SD-OCT showed a RAM and retinal thining and a decreased central foveal thickness, resulting in visual acuity improvement. On OCTA, no flow was detectable in the RAM at 1-month follow up. Case 3 was not treated at baseline. In this eye no flow was detected on OCTA at 2 months follow-up. This suggests a spontaneous occlusion during the follow-up, which was confirmed by FA. Case 4 did not presented flow at baseline corresponding to FA findings consistent with a spontaneous occlusion and was not treated.

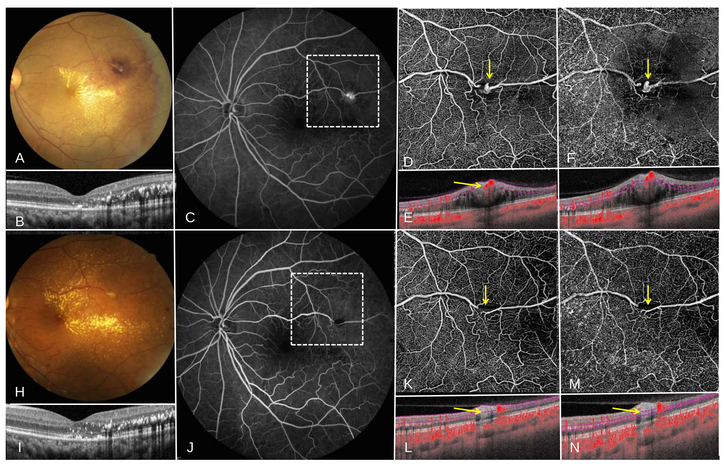

Figure 2. Retinal arterial macroaneurysm at baseline and one month after laser Navilas photocoagulation (Case 2).
Baseline color fundus photography (Panel A) and the corresponding SD-OCT (Panel B) of the eye left of a 56 year-old woman . Fluorescein Angiography (Panel C) shows the RAM as a localized arterial dilation. 6x6 mm OCTA **PlexElite** spanning the RAM are shown in panels D (SCP) and F (DCP). Corresponding B-scans (Panels E and G) shows flow overlay (arrow). One month after **Navilas** laser photocoagulation: color fundus photography (panel H) and its corresponding SD-OCT (I), FA shows a thrombosis of the RAM without arteriolar occlusion (J). OCTA 6x6 mm do not show high flow within the RAM (arrows) neither in the SCP nor in the DCP segmentation (Panels K and M, respectively). This finding is confirmed on the corresponding B-scans by the absence of flow overlay corresponding to the RAM (arrow) (Panels L and N).

Conclusion

OCTA is able to detect the presence or absence of flow signal within retinal arterial macroaneurysms, which may decrease the need for dye angiography in selected cases with exudative RAM and help in treatment decision making and follow-up.

References

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