Reviewer's report

Title: Peripheral capillary nonperfusion in asymptomatic Waldenstrom's macroglobulinemia

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Reviewer: Marcel Menke

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Koutsandrea et al present a case of peripheral retinal capillary non-perfusion associated with asymptomatic Waldenströms macroglobulinemia.

Here are my comments:

In the conclusion the authors state that main retinal findings of hyperviscosity syndrome (HVS) are central retinal hemorrhages and vein dilation. Based on our findings this is not true. Central changes are just more easily to observe since it requires only simple ophthalmoscopy. These changes represent the more/most severe findings, but not necessarily the main findings. Venous dilation seem to be the first signs of HVS followed by peripheral retinal hemorrhages, which can only be observed by indirect ophthalmoscopy with scleral depression. Only in advanced HVS one can find central venous dilation, increased tortuosity, central hemorrhages, disc edema, and venous sausaging.

In this particular case the authors state that WM was asymptomatic. It would be very interesting to know the serum viscosity levels in this patients (not stated). Right now, the reader does not know if the patient had in fact a HVS.

Retinal blood flow analysis of retinal macrocirculation has shown that autoregulation of the retinal blood flow leads to dilation of the retinal veins to maintain normal retinal blood flow over a wide range of IGM and serum viscosity levels. Only at extreme IGM and serum viscosity levels the autoregulation fails and blood flow decreases. Therefore the clinical appearance of vein occlusion is most of the times misleading. Even in severe cases, the retinal bloodflow can remain normal although it looks like an occlusion. Capillary nonperfusion, as shown in this case, would be suspected only at very high serum viscosity levels or if capillary dilation is not sufficient due to some other underlying pathologic conditions.

Therefore there is also the question if the high myopia in this patient makes the capillary meshwork more susceptible to damage/occlusion in HVS. From my own experience with this rare disease, capillary nonperfusion is in fact a very uncommon manifestation.

Based on the presented images the areas of nonperfusion are rather small. Since color images of the peripheral fundus are not presented, we can not even verify that these are areas of capillary nonperfusion and not just peripheral
hemorrhages blocking the background fluorescence. I strongly suggest to add color images of the peripheral retina in the area of assumed nonperfusion.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests