Reviewer’s report

Title: An Easy Method to Differentiate Retinal Arteries from Veins by Spectral Domain Optical Coherence Tomography: Retrospective, Observational Case Series

Version: 2
Date: 30 January 2014
Reviewer: Clemens Vass

Reviewer’s report:

Major Compulsory Revisions:

1) Abstract, page 3: "Additional 43 vessels (15 arteries and 28 veins) that IR failed to differentiate were correctly classified by SD-OCT". It remains unclear according to what they were correctly classified. In fact it appears that this refers to those 96 vessels that were determined by FA only. This however means that only 43 of 96 vessels were correctly classified, and in this light the findings are reported in a biased way.

2) The discussion is very lengthy and not well focused and should be compacted and better focused on the main findings.

3) Introduction, page 6, last paragraph: "...(as shown in figure 1 in our preliminary data)." Fig 1 does not show this, but hyperreflective boundaries of the retinal arteries.

4) Methods, page 7, Data collection, paragraph 1: "Eyes with relatively normal looking retinal structure ..." please specify the population more exactly.

5) Methods, page 7, Data collection, paragraph 1: "Written consent was given by the patients for their information to be stored in the hospital database and used for research." How was this done retrospectively? Were all patients contacted and asked to consent?

6) Methods, page 7, Grading methodology: "Vessels that did not share a common root with any other vessel at the intersection with the circle ..." This is difficult to understand. Please describe more clearly.

7) Methods, page 8, paragraph 2: had all patients also FA? If yes: why were they not used in all cases? If no: please specify exactly how many patients/vessels had both techniques, and how many had only IR or only FA

8) Methods, page 8, paragraph 2: "Vessel types were labelled as "Artery", "Vein" or "uncertain" by the maximum findings from IR and FA..." what does this mean?

9) Methods, page 9 and 10: terms like sensitivity, specificity, PPV, NPV, and the likelihood ratios are standard terms and need not to be explained within this manuscript. Please skip this part.

10) Methods, page 11, last paragraph: "...43 vessels (15 arteries and 28 veins) that IR failed to differentiate were correctly recognized by SD-OCT." was this the 96 vessels which were only identifiable by FA, as described above? If so, a
correct classification of 43 vessels out of 96 implies that possibly 53 were wrongly classified (maybe this number is lower, since some of the vessels may not have been classified by the SD-OCT.

11) Table 3 is not referenced within the manuscript. This has to be changed. However within this table there is redundant information which should be omitted: "Specificity" and "False positive rate", as well as "Classification Accuracy Rate" and "Classification Error Rate". These redundant parts should be omitted.

12) Discussion page 16, last paragraph: "Because arteries carry blood rich in oxygen, their inner part is brighter than their walls compared to veins, ..." This is reported as a proven fact, but is it so? At least the arguments should be presented.

13) Table 4, page 26: it would be interesting to see scatterplots of the vessel widths comparing OCT with IR or with IR+FA.

Minor Essential Revisions:
1) Reference 22 is incomplete and should be completed.
2) Figure legends, page 22, figure 1: "liner scanning", correct "line scanning"

Discretionary Revisions:
1) Page 6, paragraph 1: "For example, retinal vessel blood flow, instead of retinal vessel diameter or AVR, could be obtained with this method, which makes the result not easily comparable with many other publications. In addition, both Doppler FD-OCT system and the trained expert to interpret and validate the results are needed; which limits its application." This part of the introduction should be omitted.

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.