Validating a new grading scheme for retinal vasculitis

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Introduction

Retinal vasculitis (RV), a presentation of posterior uveitis, causes macular oedema and retinal ischaemia, leading to visual loss. Wide-field fluorescein angiography (WFFA) is commonly used to assess RV. RV is manifest as vascular leakage and occlusion on WFFA, but no standardised grading scheme to assess severity is available, unlike other manifestations of uveitis.[1,2,3] We propose a novel grading scheme for RV.

Methods

- Recruit patients with RV and WFFA images sets, n = 50
- Image grader grades the images set twice (1-month difference)
- Independent graders (two consultants with expertise in uveitis, a senior trainee, image grader) grade the RV
- Calculate the intragrader and intergrader concordance of the grading scheme (Use Fleiss's kappa score for categorical data, and intra-class correlation coefficient (ICC) for numerical data)
- Find the association between clinical grading and visual acuity

Results

Intraobserver reliability for both leakage and occlusion scores was excellent. Interobserver reliability among 4 independent graders showed good agreement for leakage and excellent for occlusion scores.

Table1. Intra and interobserver reliability of RV grading from 4 independent graders.

	Leakage Score (ICC)	**Occlusion Score** (ICC)
Intraobserver reliability	**0.845** (95%CI 0.777-0.893)	**0.824** (95%CI 0.747-0.878)
Interobserver reliability	**0.655** (95%CI 0.491-0.769)	**0.750** (95%CI 0.679-0.813)

Increasing leakage score was significantly associated with worse visual acuity, concurrently (GLM, β=0.090, p<0.01) and at 1 year follow-up (GLM, β=0.063, p<0.01).

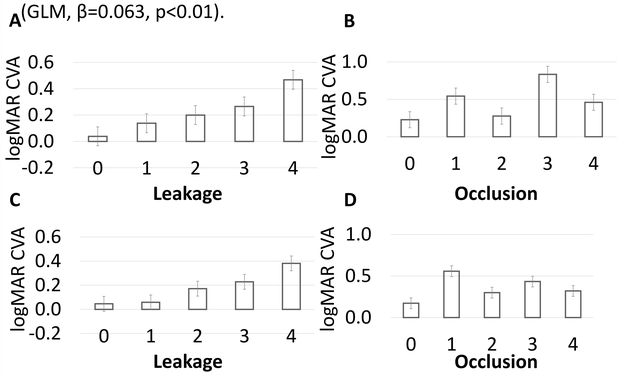


Figure1. Graph showing the relation between clinical grading and visual acuity (A) (B) concurrent visual acuity (C) (D) 1 year follow-up

RV grading scheme

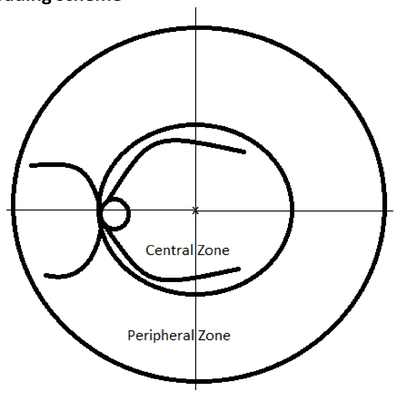


Figure2. New retina vasculitis grading scheme.

Zone description.
Central Zone - Circle centred on the central fovea with radius of central fovea to nasal disc edge
Peripheral Zone - Zone peripheral to Central Zone
Quadrants dividing peripheral and central zones meet at the fovea

Leakage Score - fluorescein leakage from retinal vessels
L0 - no leakage
L1 - leakage in Peripheral Zone (1-2 quadrants)
L2 - leakage in Peripheral Zone (3-4 quadrants)
L3 - leakage includes Central Zone (1-2 quadrants) (with/ without peripheral leakage)
L4 - leakage includes Central Zone (3-4 quadrants) (with/ without peripheral leakage)

Occlusion Score - occluded retinal vessels (arterioles, venules or capillaries) with resulting non-perfusion or ischaemia. May be static, long-term change in absence leakage
O0 - no occlusion
O1 - Area of retinal ischaemia only in Peripheral Zone <=3 disc area
O2 - Area of retinal ischaemia only in Peripheral Zone >3 disc area
O3 - Area of retinal ischaemia includes Central Zone (<=3 disc area) (with/ without peripheral ischemia)
O4 - Area of retinal ischaemia in Central Zone (>3 disc area) (with/ without peripheral ischemia)

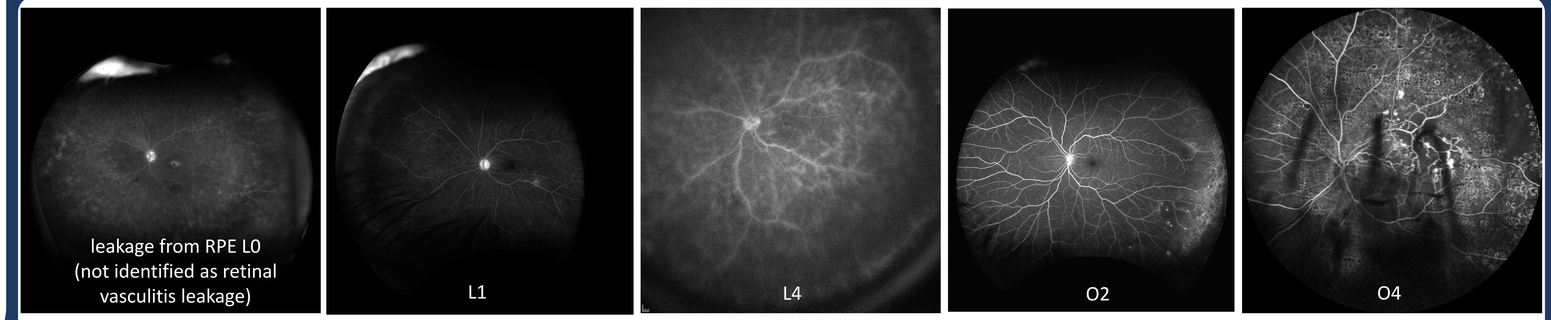


Figure3. Example images for leakage and occlusion score

Conclusion: Our new WFFA severity grading scheme focused on leakage and occlusion in RV. We found that this scheme has good intra and inter-observer reliability for leakage and occlusion for RV. Our leakage score is also associated with visual acuity. Further research is needed to validate the results in broader populations, and prospective clinical studies are needed to further investigate the association of this grading with visual function.

References: 1 Jabs DA et al. Am J Ophthalmol 2005; 140:509-516.
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