Optos widefield imaging compared to fundus examination for VHL retinal screening

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Background/Aims – Von Hippel Lindau (VHL) disease is an autosomal dominant multisystem disorder caused by germline mutations in the VHL genes 3p25-26. Retinal manifestations include capillary haemangiomas which develop in up to 80% of gene carriers. Lifelong retinal surveillance involves yearly assessment usually by fundoscopy. Optos widefield retinal imaging is now becoming more widely used in virtual retinal screening clinics. We aimed to assess discrepancies in pick up rate of angioma and angiomatous associated disease between slit-lamp fundoscopy and Optos widefield imaging.

Methods – 49 patients had both Optos widefield retinal imaging and slit-lamp fundoscopy over a 16-month period from VHL retinal surveillance clinics at the John Radcliffe Hospital, Oxford. Optos images were analysed for image quality and presence of angioma by a Consultant Ophthalmologist who was masked to the fundoscopy findings. The pick-up rate was compared between slit lamp fundoscopy and optos imaging.

Results – In total, data on 94 eyes were collected. 12.8% of Optos retinal images were positive for angiomas compared to 11.7% from slit-lamp examination. There was a discrepancy of 1.1% (one value) where the Optos image analysis suggested a possible angioma which on slit-lamp examination was found to be absent. Optos imaging identified all angiomas in this cohort.

Conclusions – Optos imaging was non inferior to slit-lamp examination in this sample of 94 eyes. In the current COVID climate, reducing clinician-patient interaction is paramount. This prospective pilot study suggests that remote virtual clinics are a good alternative to yearly slit-lamp fundus examination, when screening for VHL angiomas.

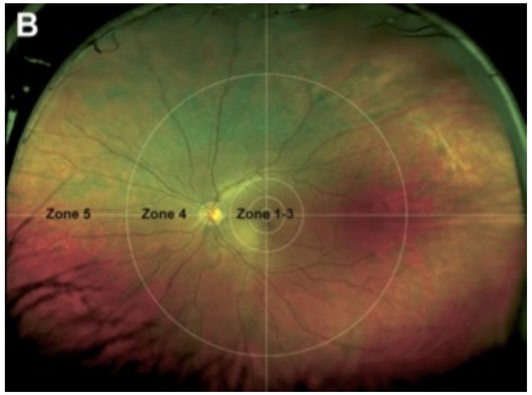


Figure 1 – Classification of zones for image quality analysis (adapted with permission from Lengyel et al, A population based ultra-widefield digital image grading study for ARMD-like lesions at the peripheral retina)

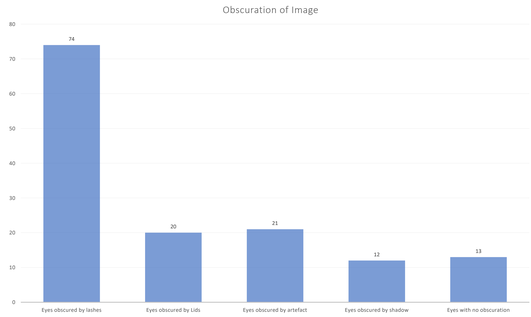


Figure 2 – Features obscuring Optos Images

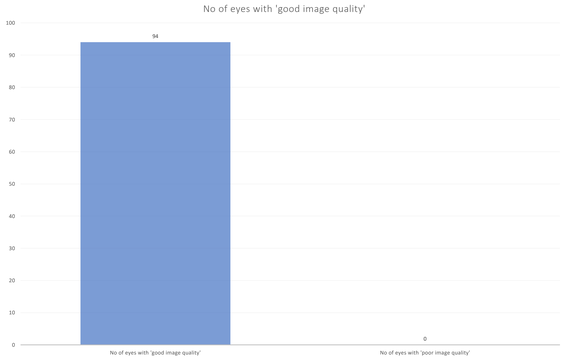


Figure 3 – Image quality of Optos images

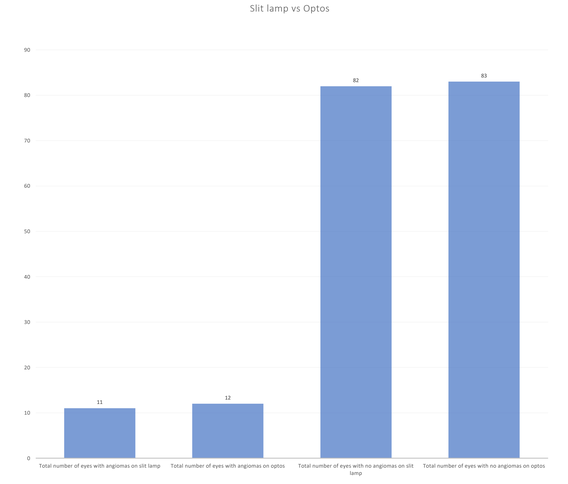


Figure 4 – Slit lamp examination findings verses Optos widefield image remote analysis

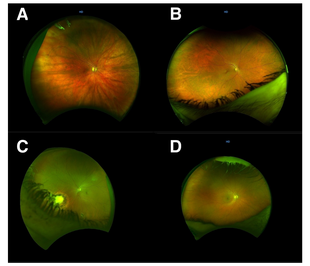


Figure 5 – Images taken using Optos widefield imaging. A – Right eye with obscuration score 0/12; nil lesions. B – R eye with obscuration score 4/12; obscured by lids lashes and shadow; nil lesions. C – Left eye showing nasal scar and inferior angioma; obscuration score 2/12; obscured by lashes. D – Left eye, obscuration score 2/12; obscured by lids.

Score	No of Eyes
0	13
1	10
2	26
3	33
4	8
5	1
6	1
7	0
8	0
9	0
10	0
11	1
12	1
Sum	94

Table 1 – Analysis of Optos wide-field image quality. Score represents proportion of image obscured. Image divided into 12 segments as per Figure 1. Score of 12 represents complete obscuration. **Mean score is 2.4.** Nature of obstruction described in Figure 2.