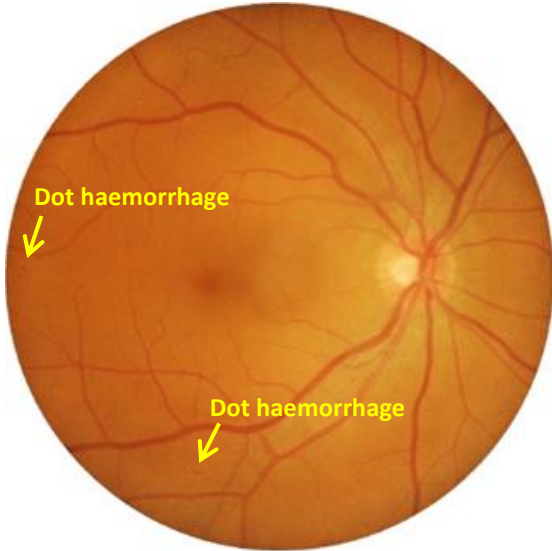


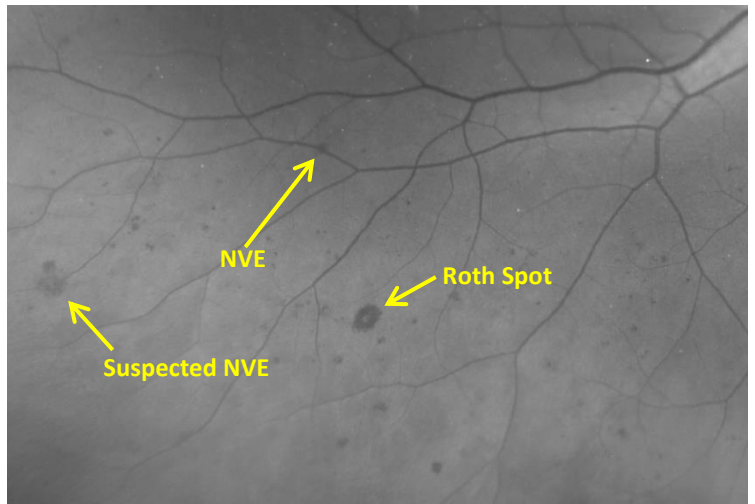
Case report by Paula Katalinic

A 49 year old Caucasian female with Type 1 diabetes for 28 years was referred to CFEH for a diabetic retinopathy (DR) assessment. She was asymptomatic. Ocular history was unremarkable with no DR reportedly present at an examination with an ophthalmologist 2 years earlier. She was a current smoker at the time of the examination and her medications for diabetes included insulin (NovoRapid and Levemir) and Lyrica.

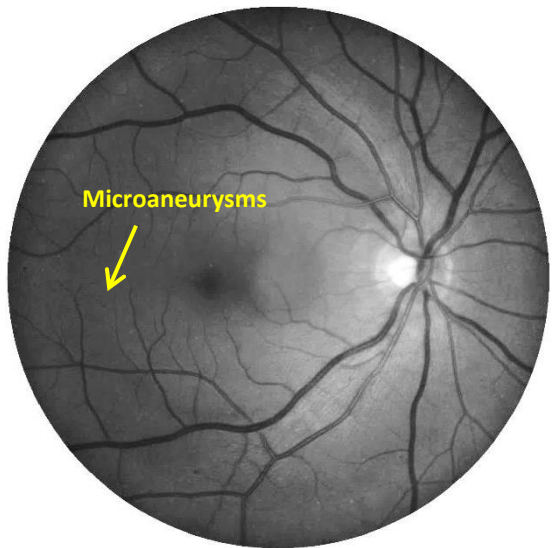
	OD	OS
Entering aided acuities	6/6-2	6/7.6-2
Intraocular pressure (ICARE) at 11.00am	15mmHg	14mmHg



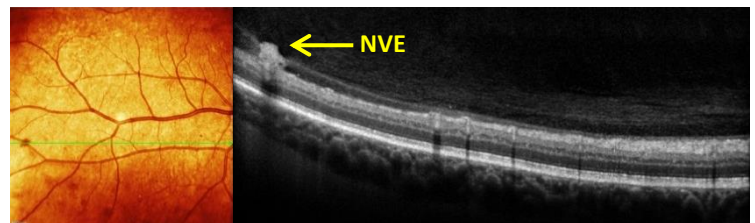
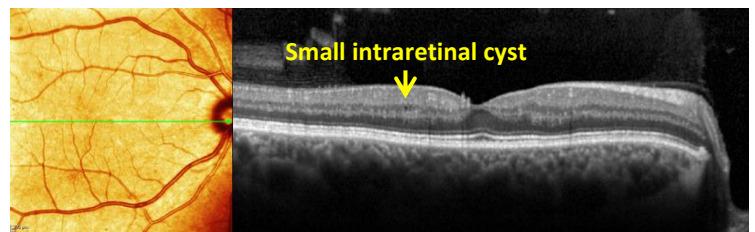
Colour photography showed several dot haemorrhages in the posterior pole of the right eye.



Optomap ultrawide field imaging red-free view showed numerous dot/blot haemorrhages and microaneurysms in the inferotemporal retinal mid-periphery of the right eye. In addition, a Roth spot and several areas of early neovascularisation (NV) were identified.



Red free analysis highlighted a greater number of microaneurysms and dot haemorrhages in the posterior pole than were visible in the colour photographs.



OCT imaging through the central macula showed a small cystic space adjacent to a microaneurysm located temporal to the fovea. OCT imaging of a hazy lesion within the inferotemporal vascular arcade confirmed the presence of early NVE.

Summary: There was proliferative DR (PDR) in the right eye however only mild non-proliferative DR (NPDR) was visible in the central 45 degree field.

Management plan: Refer the patient to an ophthalmologist urgently, as per the NHMRC Guidelines for the Management of Diabetic Retinopathy. Advise the patient to stop smoking.

Clinical implications

- **It is important to examine the retinal periphery in patients with diabetes as retinal neovascularisation (NV) can occur outside the posterior pole**

The Early Treatment Diabetic Retinopathy Study (ETDRS) introduced 7-standard field photography as the gold standard for evaluating DR. This method is technically cumbersome and includes stereoscopic images of seven overlapping 30° fields encompassing a total of approximately 30% of the retinal surface (see Figure 1). Recently, with the introduction of ultrawide field scanning laser ophthalmoscopy (UWF) devices such as Optomap, several research groups have evaluated the frequency and distribution of DR lesions lying outside the region of the ETDRS 7-standard fields or posterior pole. A UK study evaluated 1562 consecutive, treatment-naïve eyes in 781 patients with more than mild NPDR referred from a national DR screening service (Talks, 2015). 102 eyes (6.5%) were found to have proliferative DR and 24% of neovascularisation (NV) was found outside the area seen in colour fundus photography involving two 45° images centred on the optic disc and macula. A US study (Silva, 2013) also showed a similar result with regards to the location of DR lesions. It found that that approximately one-third of haemorrhages and microaneurysms (H/Mas), intraretinal microvascular abnormalities (IRMA) and NV elsewhere (NVE) were located outside the 7-standard fields. These findings highlight the importance of dilated examination of both the posterior pole and retinal periphery in all patients with diabetes.

- **Peripheral DR lesions confer a greater risk of progression**

A US study evaluated DR lesions at baseline using both 7-standard field photography and UWF imaging and determined rate of progression of DR at a four-year follow-up. DR lesions falling outside the region of the 7-standard fields were referred to as predominantly peripheral lesions (PPLs). The presence of PPLs was found to increase the risk of a 2-step or more progression (e.g. mild to severe NPDR) by 3.2 times as well as increasing the risk of progression to PDR by 4.7 times. The findings remained statistically significant after controlling for gender, diabetes (DM) type, DM duration, haemoglobin A1c levels, and baseline DR severity. A greater number of retinal fields with PPLs further increased the risk of progression, especially with less severe DR in the posterior pole at baseline. The most common PPLs were H/Mas in 44.6% and a further 37.5% had both H/Mas and IRMA. The findings of this study highlight the need for detailed peripheral retinal evaluation to completely assess the risk of DR progression.

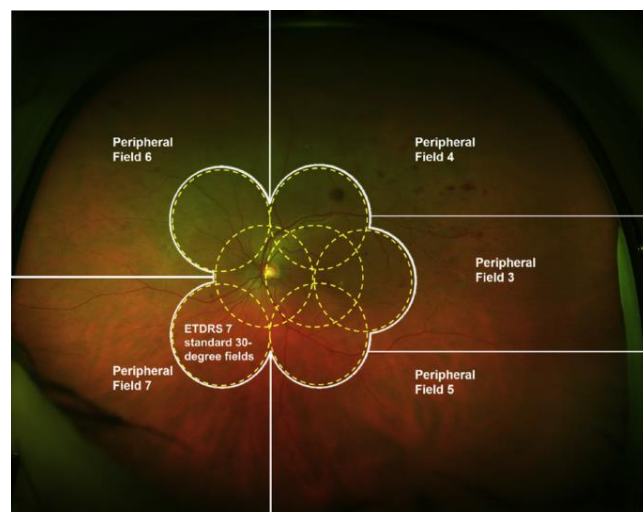


Figure 1. Predominantly peripheral lesions (PPL) are defined as DR lying outside the 7-standard fields (Silva, 2013)

References

- Silva PS, Cavallerano JD, Haddad NM, Kwak H, Dyer KH, Omar AF, et al. Peripheral Lesions Identified on Ultrawide Field Imaging Predict Increased Risk of Diabetic Retinopathy Progression over 4 Years. *Ophthalmology*. 2015;122(5):949-56.
- Silva PS, Cavallerano JD, Sun JK, et al. Peripheral lesions identified by mydriatic ultrawide field imaging: distribution and potential impact on diabetic retinopathy severity. *Ophthalmology* 2013;120:2587–95.
- Talks SJ, Manjunath V, Steel DHW, Peto T, Taylor R. New vessels detected on wide-field imaging compared to two-field and seven-field imaging: implications for diabetic retinopathy screening image analysis. *Br J Ophthalmol* 2015;99:1606–1609