Ultra-widefield Fluorescein Angiography in Retinal Vasculitis

Nicholas Jones
Anna Sala  Manchester Royal Eye Hospital
Paulo Stanga
Standard Fundus Imaging
“Full-fields” FFA
Cutting and pasting............
Building joined-up wide views
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Challenges for standard imaging

• Standard 9- or 7-field images give inadequate cover for potentially pan-fundal disease
• Extreme versions for poor peripheral views
• Missed lesions
• Time taken by photographer
• Non-simultaneous FFA in different fields
• Comparison of consecutive imaging often difficult
What is ultra-widefield imaging?

- **Standard imaging**
  - 30 degree field = 3% of retinal area

- **Wide-field imaging**
  - Heidelberg camera with Staurenghi contact lens
  - or non-contact lens
  - up to 150 degree field = 60% of retinal area

- **Ultra-widefield (UWF) imaging**
  - Optos scanning green/red laser camera
  - up to 200 degree field = 80% of retinal area
Optos UWF versus standard ETDRS fields
Optos UWF versus Heidelberg field
Advantages of UWF

- Accurate retinal topography
- Identification of peripheral vascular disease
- Vitreous opacification less intrusive
- Simultaneous “pan-fundus” sequential FFA
- Facilitates targeted laser treatment
- Laser image formation can show lesion contrasts better than standard optical image
- Comparing sequential FFAs facilitated
In retinal vasculitis, occlusion can progress in the apparent absence of active vessel wall staining or leakage or vitritis.

In retinal vasculitis, vascular sheathing can both simulate and hide vascular occlusion.
Behcet’s: severe vitritis
Extent of vasculitis not seen clinically
Behcet’s: capillaritis
PRV: neovascularisation despite PRA
PRV: peripheral closedown despite immunosuppression
Sarcoidosis: subclinical occlusive vasculitis
Sarcoidosis: macroaneurysms
TB: occlusive vasculitis, NVE, vitreous haemorrhage
TB: occlusive vasculitis
Comparing sequential images
Comparing sequential images
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83 patients with retinal vasculitis as prominent part of their intraocular inflammation underwent UWF FFA

- 24 primary retinal vasculitis
- 18 sarcoidosis-related
- 14 Behcet’s disease
- 10 tuberculosis-related
- 5 birdshot retinochoroidopathy
- 4 viral retinitis
- 2 syphilis
- 6 IRVAN, Susac, others
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83 patients with retinal vasculitis as prominent part of their intraocular inflammation underwent UWF FFA

- Peripheral pathology detected outside standard ETDRS views:
  - 11 (13%) subclinical vasculitis
  - 27 (32%) vascular occlusion
  - 4 (5%) peripheral neovascularisation

- Management change/initiation after single UWF FFA in 22 (26%)
Disadvantages of UWF

• Image quality inferior to high-grade optical photographs
• Intrusion of eyelashes, movement artefact, reflection artefact
• Accumulation of debris on mirrors/optics
• Poor at superior and inferior fundus: needs versions
Versions sometimes necessary
Opinion: Advantages of UWF

• UWF is better than an experienced ophthalmologist using both 90D and indirect ophthalmoscopy at:
  • 1. Ensuring that no lesions are missed
  • 2. Penetrating poor visibility
  • 3. Calculating danger to macula
  • 4. Targeting further examination

• Problem: de-skilling?
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Changed protocols after introduction of UWF imaging:

• All new patients with detectable posterior segment inflammation undergo UWF colour photography before seeing NPJ

• All patients with retinal vasculitis undergo UWF fluorescein angiography every 12-18 months