# Is it IRMA?

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## What are Intraretinal Microvascular Abnormalities (IRMAs)?

• Ashton (British Ophthalmic Pathologist) in 1953 described them as 'new dilated channels situated midway between arteries and veins....'

Obliterated capillary bed



Ashton N, 1953. 'Arteriolar involvement in Diabetic Retinopathy'. BJO 1953, 37: 282-292

# IRMAs



IRMA, arrows. Obliterated capillaries, arrowheads

- They are found in areas of non-perfusion in diabetic retinopathy.
- Signify end-stage non-proliferative diabetic retinopathy.

## IRMA

- Location: intraretinal (not at disc)
- Appearance: Outline may be angulated with sharp corners. Do not cross over major retinal blood vessel
- Fluorescein angiography: Don't leak
- OCT: Don't breach the ILM

- Location: grow on top of the retina (often at disc)
- Appearance: Outline may be fan-like with dilated tips. Can cross over major retinal blood vessel
- Fluorescein angiography: Leak
- OCT: Breach the ILM



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## IRMA

## **New vessels**

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- Location: grow on top of the retina (often at disc)
- Appearance: Outline may be fan-like with dilated tips. Can cross over major retinal blood vessel
- Fluorescein angiography: Don't leak
- Fluorescein angiography: Leak

• OCT: Don't breach the ILM

• OCT: Breach the ILM

#### IRMA appearance: disorganised, angulated outline, do not cross over major vessels



New vessel appearance: rounded outline, fan or branch-like structure, sometimes crosses major vessel





## IRMA

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- OCT: Don't breach the ILM
- OCT: Breach the ILM

## Fluorescein angiography

#### • Normal



Abnormal – dye leaking from new vessels



# Fluorescein angiography

• IRMA – no leakage

NV – small bud leaking dye



Note NV below IRMA

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  - OCT: Don't breach the internal limiting membrane (ILM)

- Fluorescein angiography: Leak
- OCT: Breach the internal limiting membrane

OCT



#### Top row: IRMA, note ILM is smooth, continuous Bottom row: NV, note ILM breached and vessel buds projecting into vitreous

Lee C et al. 2015 'Re-evaluating the Definition of Intraretinal Microvascular Abnormalities and Neovascularization Elsewhere in Diabetic Retinopathy Using Optical Coherence Tomography and Fluorescein Angiography' AJO 2015, Volume 159, Issue 1, p 101-110

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## IRMA or new vessels?

Ask yourself:

- *Location:* Where are the vessels?
- Appearance: Outline: Are the vessels rounded or angulated? Destination: Do the vessels cross over a major vessel? Do they stop abruptly?

## Acknowledgements

- Slide 2: Ashton N, 1953. 'Arteriolar involvement in Diabetic Retinopathy'. BJO 1953, 37: 282-292
- Slide 3: W Richard Green MD, www.aao.org
- Slides 5, 6, 10: Ninewells Ophthalmic Imaging Department
- Slide 7, 8, 11: 'Retinal vascular diseases ' www.entokey.com
- Slide 13: Lee C et al. 'Re-evaluating the Definition of Intraretinal Microvascular Abnormalities and Neovascularization Elsewhere in Diabetic Retinopathy Using Optical Coherence Tomography and Fluorescein Angiography' *AJO* 2015, Volume 159, Issue 1, p 101-110