Interpretation of the OCT Image
(and some new developments)
Topics

• The OCT image
  — Normal retina and key retinal pathologies
    a. outer retina
    b. middle retina
    c. vitreo-retinal interface
  — New developments
Optical Coherence Tomography

This is what we wanted…
Optical Coherence Tomography

...this is what we got...
Interpretation of OCT images

Outer retina

- The OCT image is expanded in the axial direction
**Interpretation of OCT images**

*Outer retina*

- Inner HRL: junction between inner and outer photoreceptor segments
- Outer HRL: retinal pigment epithelium (probably with choriocapillaris)

- Fovea:
  - absence of inner retinal layers
  - increased thickness of the photoreceptor layer
Interpretation of OCT images

Outer retina
Key retinal pathologies – outer retina
Key retinal pathologies – outer retina
Key retinal pathologies – outer retina
choriocapillaris
retinal pigment epithelium
photoreceptor outer segments
photoreceptor inner segments
outer limiting membrane
outer nuclear layer
outer plexiform layer
inner nuclear layer
inner plexiform layer
ganglion cell layer
nerve fiber layer
internal limiting membrane
retinal pigment epithelium
choriocapillaris
Layers of the retina

- RPE and choriocapillaris
- Outer nuclear layer
- External limiting membrane
- Outer and inner photoreceptor segments
- Outer plexiform layer
- Inner nuclear layer
- Inner plexiform layer
- Ganglion cell layer
- Nerve fiber layer

Interpretation of OCT images
**Interpretation of OCT images**

**Layers of the retina**

- Nerve fiber layer
- Ganglion cell layer
- Inner plexiform layer
- Inner Nuclear layer
- Outer plexiform layer
- Outer nuclear layer
- External limiting membrane
- Inner/outer segment junction
- RPE
- Larger choroidal vessels
Key retinal pathologies – middle retina
Key retinal pathologies – middle retina
Key retinal pathologies – middle retina
Key retinal pathologies – vitreo-retinal interface

VA 20/40 following cataract surgery
Key retinal pathologies – vitreo-retinal interface
Key retinal pathologies – vitreo-retinal interface
Artefacts in OCT imaging

- Image of good quality
- Out of focus
- Vignetted image
- Fixation error
Kwalitative measurements

- Retinal thickness measurement
- Retinal nerve fiber layer thickness
- Optic nerve head analysis
New developments – Anterior segment OCT

Arows = epithelialized drainage channels
Arrowheads = non-epithelialized drainage slits
E = conjunctival epithelium
L = lamina propria conjunctivae
T = tenons layer
S = sclera

Myopia claw lens
New developments – Spectral (Fourier) Domain Analysis
New developments – Heidelbergs Spectralis

Geographic atrophy and drusen
Infrared and OCT

Occult CNV with PED
Fluorescein angiography and OCT

Dry AMD
Autofluorescence and OCT
New developments – Zeiss Cirrus
New developments – Zeiss Cirrus
The End