Novel Imaging Techniques in Intraocular Tumours

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Disclaimer

The author does not have any financial affiliation with any organization that may have a direct or indirect connection to the content of this presentation.
I- Multispectral Imaging

Multispectral Imaging

- Uses a range of discrete monochromatic LED light sources (non laser).
- Creates a series of en face spectral slices throughout the retinal thickness.
- Variable absorption, reflectance and scatter spectra of melanin, haemoglobin, and lipofuscin.
- Enhanced visualization of retinal architecture including RPE and choroid.
Multispectral Imaging

Uses 12 wavelengths (520 – 900 nm), flashed in pairs, separated by milliseconds

Spectral dissection of retinal layers:

- **Greens**: superficial structures (Epiretinal membrane)
- **Yellows – Ambers**: Mid retinal structures (Retinal vessels)
- **Reds, Deep Reds, Infrareds**: Deep retinal structures (RPE)
- **Scleral illumination**: Choroidal structures
Choroidal Mode 2

Pilot Study: Multispectral imaging of 13 choroidal tumours

Yellow

Amber

Deep red

Near infrared

Infrared
1- Better definition of tumour edges

deep red

Infrared

1- Better definition of tumour edges

Yellow

Deep red
2- Visualization of Lipofuscin

3- Choroidal vessels near tumour base
(No dye injection)
3- Choroidal vessels near tumour base (No dye injection)

Multispectral imaging of choroidal tumours:

1- Improved delineation of tumour boundaries.
2- Enhanced visualization of orange pigment.
3- Imaging of choroidal vasculature without dye injection
II- Hyperspectral Imaging

Hyperspectral Imaging

• Employs a tuneable laser source.

• Generates extensive range of wavelengths, with 1 nm increment from 530 to 800 nm.

• Limitations:
  - Motion artefacts
  - Limited field of view
Analysis of the absorption spectra could enable objective identification of the “spectral signature” of each molecule, and differentiation between clinically similar deposits.

III- Retinal Perfusion after Radiotherapy
Onset of radiation retinopathy is highest at 18-24 months post radiotherapy

Retinal Blood Flow with Doppler SD-OCT

Principle:
D-OCT provides true velocity information, which can determine total volume flow.

Objective:
Non-invasive + earliest detection of radiation-induced ischemia prior to any clinical or angiographic evidence

Methods:
Pre- and Post brachytherapy assessment of 20 patients. Patients are followed for 2 years.
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