Optical Coherence Tomography (OCT) in Uveitis

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November, 1991

1994: A specialized test for retinal specialists

2013: A broad based tool for comprehensive ophthalmologists

OCT main features

- Similar principle to B-Scan ultrasonography
- Non-invasive, non-contact transpupillary imaging
- Can image retinal structures in vivo
- Resolution (longitudinal) of 5-17 microns (10 x superior to ultrasound B-Scan)
- The anatomic layers within the retina can be differentiated and retinal thickness can be measured.
- Difficulties with opacified media (cataract, corneal edema, band keratopathy...)
OCT Types

- Time domain

- Spectral domain

Why SD-OCT changes the view of Ophthalmology

OCT in evaluation of inflammatory involvement in uveitis

1. Exclusion of macular lesion
2. Confirmation of identified lesions
3. Essential information given by OCT
4. Therapeutic follow-up
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Can You differentiate it?

- Toxoplasmosis
  Guagnini et al: Graefe’s 2007; 245:158

- Lymphoma
  Courtesy Prof N Cassoux
OCT in evaluation of inflammatory involvement in uveitis

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Diagnosis

OCT in evaluation of inflammatory involvement in uveitis can help to detect:

1. Increased or decreased retinal thickness
2. Cystoid changes
3. Subretinal fluid
4. Vitreous traction
5. Epiretinal membrane
6. Choroidal exploration

<table>
<thead>
<tr>
<th>CFT (µm)</th>
<th>Baseline</th>
<th>3 Months</th>
<th>12 Months</th>
<th>Last follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>441.3</td>
<td>167.4</td>
<td>167.2</td>
<td>152.7</td>
</tr>
<tr>
<td>SD</td>
<td>46.5</td>
<td>12.8</td>
<td>14.3</td>
<td>5.6</td>
</tr>
</tbody>
</table>
Steroids+MMF+anti-VEGF

POHS

Failed surgical removal-1996

6 Days after

7-yr old

After steroids+MMF

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The Challenge

Exploring choroid by the OCT

- Enhanced depth imaging OCT
- Swept Source OCT

Enhanced depth imaging (EDI)-OCT

- Placing the objective lens of the Spectralis SD-OCT (SD-OCT) device closer to the eye so that an inverted image is obtained
- Deeper structures placed closer to the zero delay,
- Better visualization of the choroid

Could it be the answer?

Take the slice!
Prognosis

- Atrophy
- Fibrosis
- Loss of Layers

Limits

1. Opacified media:
   - AS anomalies (cataract, posterior synechiae, etc...)
   - Vitreous opacities
2. Scarce collaboration

Conclusions

• In patients with uveitis, optical coherence tomography (OCT) is a non-invasive method that gives additional accuracy in the assessment and follow-up of the disease
• In clinical studies, OCT is unavoidable as is it the case for all methods that give objective & quantifiable data
• The OCT technology is still undergoing gradual improvement of its performance and has not reached yet the limits of its possibilities ➔ higher resolution OCT, higher speed of acquisition, spectral domain OCT, swept source OCT

Conclusions

Combined with other methods such as indocyanine green angiography, laser flare photometry and UBM, OCT contributes to improve the diagnosis and management of uveitis.

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