Optical Coherence Tomography Visualization of Optic Nerve Head Structure Detects Acute Changes in the Intracranial Pressure

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Results

CSF Pressures and OCT Measurements
Pre- to Post-CSF Drainage

<table>
<thead>
<tr>
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<th>Pre-LP</th>
<th>Post-LP</th>
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<tbody>
<tr>
<td>ICP</td>
<td>31.6 ± 11.8</td>
<td>11.6 ± 3.3 cmH2O</td>
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<tr>
<td>RPE angle</td>
<td>5.8 ± 2.0 degrees</td>
<td>Decreased RPE angle</td>
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<tr>
<td>Papillary height</td>
<td>976 ± 274</td>
<td>938 ± 300 μm</td>
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<tr>
<td>Transverse canal diameter</td>
<td>1985 ± 559</td>
<td>1590 ± 228 μm</td>
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<tr>
<td>Retinal nerve fiber layer thickness</td>
<td>151 ± 71</td>
<td>129 ± 40 μm</td>
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Methods

- A pilot study in 5 female patients with idiopathic intracranial hypertension undergoing a clinically indicated lumbar puncture.
- The Cirrus HD-OCT was positioned sideways to acquire images in the lateral decubitus position.
- Optic disc cube 200x200 and HD5 Line Raster scans centered on the optic nerve head were obtained immediately before and after draining CSF while the patient remained in the left lateral decubitus position.
- Parameters measured:
  - Retinal nerve fiber layer (RNFL) thickness.
  - Peripapillary retinal pigment epithelium / Bruch’s membrane (RPE/BM) angulation.
  - Transverse diameter of neural canal at RPE/BM.
  - Highest vertical point of internal limiting membrane (ILM) from transverse diameter.

Conclusions

- In our pilot study, we observed acute changes in the optic nerve head anatomical structures associated with lowering of the intracranial pressure in idiopathic intracranial hypertension patients.
- A larger prospective study is needed to determine the utility of OCT as an objective measure to monitor changes in intracranial pressure.

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