Use of Novel GluCEST Imaging technique in lateralizing foci in Temporal Lobe Epilepsy patients

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Peter Hadar
Epilepsy

- Partial-Simple/Complex, Generalized
- Nearly 60 million people globally affected or 2.5 million Americans, with 200,000 new cases being diagnosed each year
- Temporal Lobe Epilepsy (TLE) makes up 60% of focal-onset cases and about 1/3 of TLE patients undergo surgery to remove the epileptogenic foci
  - 53% of temporal lobe epilepsy surgeries with normal clinical MRI do not result in long-term seizure freedom
GluCEST

- Glutamate Chemical Exchange Saturating Transfer
- $^1$H MR Spectroscopy
- 3T MRI v. 7T MRI
Objectives

• Comparing quantitative GluCEST imaging to $^1$H-MRS of glutamate in the DLPFC (dorsolateral prefrontal cortex) of refractory TLE patients

• Lateralize epileptic foci in TLE patients based on quantitative difference in glutamate on GluCEST imaging
Study

- Ongoing recruitment
- Medically refractory pre-surgical TLE patients
- Prior EMU admission
- Normal controls
- 2x 1.5 hr scans- 10 additional patients (30 in all)
Post-TBI Epilepsy

• Conducting survey on long term TBI recovery in 24 patients
  – Glasgow Outcome Scale-Extended
  – Epilepsy and medications
• EEG Data
• MRI Data
Glasgow Outcome Scale-Extended

- 8 levels in the scale
- Minimum Score = 1; Maximum Score = 8
- Specific questions to determine upper or lower levels of disability are dictated by the structured interview

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Dead</td>
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<tr>
<td>2</td>
<td>Vegetative State</td>
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<tr>
<td>3</td>
<td>Low Severe Disability</td>
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<tr>
<td>4</td>
<td>Upper Severe Disability</td>
</tr>
<tr>
<td>5</td>
<td>Low Moderate Disability</td>
</tr>
<tr>
<td>6</td>
<td>Upper Moderate Disability</td>
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<tr>
<td>7</td>
<td>Low Good Recovery</td>
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<tr>
<td>8</td>
<td>Upper Good Recovery</td>
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EEG
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