BACKGROUND

• Post-traumatic tremor is one of the most common movement disorders resulting from severe head trauma.

• Literature regarding successful DBS treatment is scarce, resulting in ambiguity regarding the optimal lead location.

• Most cases support the ventral intermediate nucleus (Vim), but there is evidence to defend DBS of the zona incerta (Zi), ventral oralis anterior/posterior (VOA/VOP), and/or a combination of these targets.

• We report five patients with disabling post-traumatic tremor treated with Vim DBS and DBS of the globus pallidus internus (GPI).

METHODS

• Retrospective analysis of all patients with post-traumatic tremor treated by DBS group in the past four years. All patients were referred to the Vanderbilt Movement Disorders Division.

• Work up included evaluation by a movement disorders neurologist and standardized tremor assessment with the Fahn-Tolosa-Marin (FTM) or WHIGET tremor rating scale.

• After assessment, surgical intervention was determined by a DBS Multidisciplinary Committee. Standard DBS procedure was followed.

RESULTS

• Patients 1-4 sustained severe diffuse axonal injuries.

• Patients 1-3 underwent unilateral Vim DBS for contralateral tremor, while Patient 4 underwent bilateral Vim DBS.

• Patient 3 had revision surgery to replace faulty extension wires and reposition his leads 21 months post-DBS.

• Patients 1-3 experienced good tremor reduction, while Patient 4 experienced moderate tremor reduction with some dystonic posturing of the hands.

• Patient 5 had dystonic posturing of the right upper extremity with tremor of the left upper extremity. He was treated with bilateral GPI DBS and showed good tremor reduction at 1 month follow-up.

CONCLUSIONS

• Unilateral or bilateral Vim DBS and bilateral GPI DBS are effective and safe treatment modalities for intractable post-traumatic tremor.

• Further studies are needed to clarify the optimal target for surgical treatment of post-traumatic tremor.

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age</th>
<th>Gender</th>
<th>Date of Surgery</th>
<th>DBS Target</th>
<th>Tremor Rating Scale</th>
<th>Pre-Op Score</th>
<th>Post-Op Score</th>
<th>Clinical Global Impression (CGI)</th>
<th>Tremor Reduction (%)</th>
<th>Recent Stimulator Settings Providing Greatest Relief</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>53</td>
<td>M</td>
<td>04/22/2008</td>
<td>Right Vim</td>
<td>FTM</td>
<td>01/30/2008</td>
<td>07/15/2011</td>
<td>Case+, 2–, rate 130, pulse width 90, amplitude 1.1</td>
<td>56.3%</td>
<td>Case+, 2–, rate 130, pulse width 90, amplitude 1.1</td>
</tr>
<tr>
<td>2</td>
<td>21</td>
<td>M</td>
<td>07/09/2008</td>
<td>Left Vim</td>
<td>FTM</td>
<td>02/04/2008</td>
<td>10/17/2011</td>
<td>Case+, 11–, 9–, rate 180, pulse width 90, amplitude 4.3</td>
<td>56.5%</td>
<td>Case+, 11–, 9–, rate 180, pulse width 90, amplitude 4.3</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>M</td>
<td>05/20/2009</td>
<td>Right Vim</td>
<td>FTM</td>
<td>02/04/2009</td>
<td>10/17/2011</td>
<td>Right: Case+, 4–, rate 180, pulse width 90, amplitude 1.7</td>
<td>56.5%</td>
<td>Right: Case+, 4–, rate 180, pulse width 90, amplitude 1.7</td>
</tr>
<tr>
<td>4</td>
<td>22</td>
<td>M</td>
<td>11/04/2008</td>
<td>Bilateral Vim</td>
<td>FTM</td>
<td>07/21/2008</td>
<td>12/08/2011</td>
<td>Right: Case+, 9–, rate 130, pulse width 90, amplitude 3.5</td>
<td>43%</td>
<td>Right: Case+, 9–, rate 130, pulse width 90, amplitude 3.5</td>
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<tr>
<td>5</td>
<td>39</td>
<td>M</td>
<td>05/11/2011</td>
<td>Bilateral GPI</td>
<td>WHIGET</td>
<td>01/01/2011</td>
<td>12/08/2011</td>
<td>Case+, 0–, 2–, 3–, rate 130, pulse width 90, amplitude 1.5</td>
<td>56%</td>
<td>Case+, 0–, 2–, 3–, rate 130, pulse width 90, amplitude 1.5</td>
</tr>
</tbody>
</table>

SELECTED REFERENCES


