Perioperative Efficiency of Frame-based and Non-Invasive Mask-based Fixation Using the Leksell Gamma Knife® Icon™ Radiosurgery System

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Disclosures

• none
Background

• Patient flow is an important factor in operational efficiency in the perioperative setting.

• This study compares the perioperative efficiency of frame-based and frameless mask-based fixation using the Leksell Gamma Knife Icon Radiosurgery System.
Methods

• A retrospective cohort study was conducted to evaluate perioperative efficiency using Leksell Gamma Knife Icon System.

• Patients were immobilized in either a stereotactic head frame or a non-invasive thermoplastic mask with stereotactic infrared (IR) camera monitoring.

• Patients were organized into 3 groups: 1) frame fixation with planning MRI performed the same day as procedure, 2) frame fixation with planning MRI performed prior to day of procedure, 3) frameless mask fixation with planning MRI performed prior to day of procedure.

• Primary endpoints included frame placement time, MRI time, procedure time, recovery time, and total time.
Results

• Between June 2017-September 2017, 61 gamma knife procedures were performed.

• Average frame placement time was 12 mins.

• Average MRI time was 60.3 ± 14.5 mins.
Results

• The mask fixation group had a significantly lower recovery time compared to frame fixation groups, 25.8 ± 19.3 mins (group 3), 77.6± 40.7 mins (group 1), 74 ± 27.6 mins (group 2).

• Patients who had planning MRIs performed prior to the day of the procedure and significantly lower total times compared to patients with same day MRIs, 136.2 ± 34.4 mins (group 2), 111.4 ± 66.2 mins (group 3), 198.3 ± 57.2 mins (group 1).

• For patients with pre-procedure MRIs, using frame fixation vs mask fixation did not effect overall time.
## Results

<table>
<thead>
<tr>
<th>Group</th>
<th># of Procedures</th>
<th>Frame Time (min)</th>
<th>MRI (min)</th>
<th>Procedure (min)</th>
<th>Recovery Time (min)</th>
<th>Total Time (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same day</td>
<td>30</td>
<td>12</td>
<td>60.3 ± 14.5</td>
<td>60.0 ± 48.2</td>
<td>77.6 ± 40.7</td>
<td>198.3 ± 57.2</td>
</tr>
<tr>
<td>Pre-mri</td>
<td>19</td>
<td>12</td>
<td>59.8 ± 22.8</td>
<td>74 ± 27.6</td>
<td>136.2 ± 34.4</td>
<td></td>
</tr>
<tr>
<td>Frameless</td>
<td>12</td>
<td></td>
<td>73.5 ± 58.1</td>
<td>25.8 ± 19.3</td>
<td>111.4 ± 66.2</td>
<td></td>
</tr>
</tbody>
</table>
Conclusions

• Performing planning gamma knife MRIs prior to the day of the procedure significantly reduces total procedure time.

• Additionally, the use of frameless mask fixation reduces overall patient recovery times.

• Improvements in patient flow can lead to increased efficiency in the perioperative period.