Predictors of Local Control of Brain Metastasis Treated with LITT

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Disclosures

• No disclosures
Introduction

• LITT is a percutaneous minimally invasive procedure
• Used to treat brain metastasis after failure of stereotactic radiosurgery or radiation necrosis
• Newly diagnosed brain metastasis have also been treated
• Analyze predictive factors for local recurrence after LITT
Methods

• Single institution retrospective study with consecutive patients with brain metastasis treated with LITT
• Clinical and radiological data electronically acquired
• Primary endpoint was local recurrence
Results

• 63 patients, 82 lesions

Lesion Type
- Recurrence 45%
- RN 34%
- Unknown 15%
- New 6%

Primary Histology
- Breast 28%
- Melanoma 19%
- NSCLC 26%
- RCC 12%
- Other 15%
- Unknown 15%

Primary Histology
- Yes 27%
- No 73%

Complete Ablation
- Yes 65%
- No 35%

Tumor Volume
- <6cm³ 71%
- >6cm³ 29%

Tumor Recurrence
- Yes 34%
- No 66%
Results

<table>
<thead>
<tr>
<th>Complete Ablation</th>
<th>Median PFS (months)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>19 (95% CI 17-21)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>No</td>
<td>6 (95% CI 1.7-10)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dural Based</th>
<th>Median PFS (months)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>18 (95% CI 15-20)</td>
<td>0.001</td>
</tr>
<tr>
<td>No</td>
<td>6 (95% CI 1-11)</td>
<td></td>
</tr>
</tbody>
</table>
Results

<table>
<thead>
<tr>
<th>Lesion Type</th>
<th>Median PFS (months)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>RN</td>
<td>20 (95% CI 16-23)</td>
<td>0.017</td>
</tr>
<tr>
<td>Recurrence</td>
<td>13 (95% CI 11-16)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tumor Volume</th>
<th>Median PFS (months)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;6cm³</td>
<td>17 (95% CI 14-19)</td>
<td>0.033</td>
</tr>
<tr>
<td>&gt;6cm³</td>
<td>9 (95% CI 1.1-10)</td>
<td></td>
</tr>
</tbody>
</table>
Logistic Regression

Logistic Regression for Progression

• Using a forward LR with P<0.10 for entrance into the model, residual tumor, dural based, LITT indication, complete ablation, and tumor volume were entered into the model.

<table>
<thead>
<tr>
<th>Variable</th>
<th>OR (95% CI)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dural Based Tumor</td>
<td>6.50 (1.54-27.49)</td>
<td>0.011</td>
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<tr>
<td>Incomplete Ablation</td>
<td>7.82 (2.04-30.02)</td>
<td>0.003</td>
</tr>
<tr>
<td>Lesion Type=Recurrence</td>
<td>10.13 (2.17-47.39)</td>
<td>0.003</td>
</tr>
</tbody>
</table>

Association with complete ablation

• Using a forward LR with p<0.10 for entrance into the model, variables (including tumor volume, dural based, LITT indication) were assessed for their association with a complete ablation. Tumor volume >6 cm was associated with a significantly reduced chance of complete ablation (OR 0.055, 95% CI 0.015-0.20, P<0.0001).
Discussion

• Largest published series on brain metastasis treated with LITT

• The indication for LITT (tumor vs RN) was an important predictive factor for local recurrence, as well as extent of ablation and dural based lesion

• Larger lesions were associated with incomplete ablation but were not predictive of local recurrence in the multivariate analysis
Summary Points

• Tumors larger than 6cc were associated with incomplete ablation
• Dural based, incomplete ablated and tumoral lesions were associated with a higher risk of progression and are the major factors predicting local recurrence
• In order to prevent local recurrence, complete ablation extending beyond the tumor margins is advisable when it can be safely performed