Introduction

- Randomized control trials (RCT’s) have shown that checkpoint inhibitors successfully treat metastatic renal cell carcinoma (RCC).\(^1\)\(^,\)\(^2\)

- However, little data exists for the specific role that checkpoint inhibitors play in the management of RCC metastasis to the spine (RCC SM).\(^3\)\(^,\)\(^4\)

- Additionally, it remains unclear as to when a spine surgeon should be surgically aggressive with RCC SM.\(^5\)\(^,\)\(^6\)

- Aim #1: Determine the impact of more aggressive multimodal treatment regimens in RCC SM.

- Aim #2: Determine the role of checkpoint inhibitors, nivolumab and ipilimumab, in RCC SM.

Methods

- Patients with RCC
  - N = 100

- Patients with spine metastasis
  - N = 116

- Multifaceted therapy
  - N = 114

- Table 1: Various characteristics of 116 RCC Patients with Spine Metastasis.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Description</th>
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<tr>
<td>Total RCC Patients (%)</td>
<td>116 (97.7%)</td>
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<tr>
<td>Male, n(%)</td>
<td>83 (71.6%)</td>
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<td>Mean age at RCC diagnosis, years (SD)</td>
<td>58 (10.1)</td>
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<tr>
<td>Mean age at SM diagnosis, years (SD)</td>
<td>61 (10.2)</td>
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<td>Histology: ccRCC, n(%)</td>
<td>107 (92.2%)</td>
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<td>Tokuhashi Score (0-15), n(%)</td>
<td>0-8 (Lew) 29 (25.0%), 9-11 (Intermediate) 76 (65.5%), 12-15 (High) 0 (0.0%)</td>
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<tr>
<td>No score available</td>
<td>11 (9.5%)</td>
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<tr>
<td>Site of Initial Metastasis, n(%)</td>
<td>Spine 4 (3.4%), Brain 9 (7.8%), Lung 38 (32.8%), Extremal Bone 29 (25.0%), Multiple 23 (21.6%), Other 5 (4.3%), None 6 (5.2%)</td>
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<td>Overall Treatment Characteristics</td>
<td>Systemic therapy, n(%) 113 (97.4%), Radiotherapy to SM, n(%) 75 (64.7%), Rejection of SM, n(%) 33 (28.5%), Received immunotherapy, n(%) 34 (29.3%)</td>
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<td>RCC: renal cell carcinoma; SM: spine metastasis; ccRCC: clear cell renal cell carcinoma.</td>
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Results

- Overall survival from RCC diagnosis (OS\(_{RCC}\)) for the whole cohort of 1194 patients was 56.2 (95%CI 20.1-31.6) months.

- Overall survival from SM diagnosis (OS\(_{SM}\)) for the 116 SM patients was 25.9 (95%CI 20.1-31.6) months.

- Aim #1:
  - OS\(_{RCC}\) was not significantly different between those receiving ST, ST+RT, and ST+RT+S.
  - OS\(_{SM}\) in patients that received ST+RT & ST+RT+S was significantly increased relative to those treated with ST (p = 0.002, 0.001, respectively); however, OS\(_{SM}\) did not differ between ST+RT & ST+RT+S (p = 0.886).

- Aim #2:
  - OS\(_{RCC}\) was increased in patients that received checkpoint inhibitor therapy compared to targeted therapy (n=54, 82.7 months vs n=80, 46.0 months, p=0.001), with 1-, 2-, and 5-year survival of 97.0%, 82.3%, and 60.6%, respectively.

- OS\(_{SM}\) was lengthened in patients that received checkpoint inhibitor therapy compared to targeted therapy (n=54, 35.6 months vs n=80, 21.5 months, respectively, p=0.016).

Conclusions

- Multifaceted therapy including systemic therapy with either radiotherapy or radiotherapy + surgery increases OS\(_{RCC}\) relative to systemic therapy alone.

- However, no difference was observed between groups treated with systemic therapy + radiotherapy vs. systemic therapy + radiotherapy + surgery.

- These data suggest that surgical intervention in addition to targeted radiotherapy may not offer a survival benefit in RCC SM.

- Checkpoint inhibitor therapy use may lengthen survival in RCC SM patients after both RCC and SM diagnosis.

- Prospective clinical trials are needed to elucidate the role of checkpoint inhibitor and multimodal treatment combinations in RCC SM.

References