Introduction and Objectives

- Percutaneous thermal ablation is an established treatment for renal cell carcinoma (RCC).
- Thermal ablation is a recommended alternative to surgery for T1b RCC (4.5 cm).
- High-powered microwave (MW) ablation is promising modality for T1b RCC.
- Thermal ablation is an option for T1b RCC (4.1-7 cm) in patients who are unfit for surgery.
- However, very little data exists regarding the durable oncologic efficacy of MW ablation of T1b RCC.
- Our purpose is to evaluate the effect of tumor size and complexity on early and midterm treatment efficacy and rate of complications for 33 consecutive biopsy-proven T1b RCC treated with MW ablation.

Methods

- 32 consecutive patients with 33 biopsy-proven T1b RCC treated with percutaneous MW ablation between 2012 and 2017.
- Curative intent.
- No staged ablations.
- Patient and procedural data evaluated:
  - Maximum tumor diameter
  - Renal nephrometry score
  - Stratifies renal mass complexity based on cross-sectional imaging.
- Charlson Comorbidity Index (CCI)
  - Predicts 10-year survival
- Local tumor progression
- Successful re-ablation
- eGFR pre/post MW
- Median imaging follow-up
- Median clinical follow-up
- Defined as a successfully completed ablation as planned.

Results

Patient and tumor characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>18 M, 14 F</td>
</tr>
<tr>
<td>Median age</td>
<td>67 ± 10 years</td>
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<tr>
<td>Median BMI</td>
<td>39 (IQR: 31-39)</td>
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<tr>
<td>Median CCI</td>
<td>5.6 (IQR: 3.6-6.0)</td>
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<tr>
<td>Predicted 10-year survival of cohort</td>
<td>23%</td>
</tr>
<tr>
<td>Median tumor diameter</td>
<td>4.5 cm (IQR: 4.2-5.3)</td>
</tr>
<tr>
<td>Median nephrometry score</td>
<td>8.0 (IQR 8.0-9.0)</td>
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</tbody>
</table>

Tumor subtype

- Clear cell: 29/33 (88%)
- Papillary: 3/33 (9%)
- Chromophobe: 3/33 (9%)

Technical success

- 33/33 (100%)
- Primary efficacy: 30/33 (91%)
- Secondary efficacy: 3/33 (100%)

Size of 3 residual tumors: 6.7 cm, 6.4 cm, 4.1 cm

Local tumor progression: 1/33 patients (3%)

Successfully re-ablated: 6/33 (18%)

eGFR pre/post MW: No change

Median imaging follow-up: 13 months (range 0-53)

Median clinical follow-up: 20 months (range 0-57)

High-grade Complications

- Tumor size
- Unravelling, organ, and arterial: 4.3 cm
- Palliation with ICG admission
- Retropertoneal hematoma following same-day reinitiating anticoagulation: 6.2 cm
- Renal hematoma following same-day reinitation of anticoagulation: 4.1 cm
- Cardiopulmonary arrest from aspiration event with immediate resuscitation: 6.5 cm

Results continued

FIG. 1. Kaplan-Meier Survival Curve

- 3-year Overall Survival: 0/32 (0%) patients died of RCC
- 0/32 (0%) patients developed metastatic RCC

Conclusions

MW ablation of localized T1b renal cell carcinoma (4.1-7 cm):

- Favorable safety profile
  - Despite an obese and highly comorbid cohort
  - Promising early and midterm oncologic control
    - 91% primary efficacy
    - 100% secondary efficacy
    - 3% local tumor progression
    - Successfully re-ablated

- Local tumor or complication

- No staged ablations

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- Clavien-Dindo III-IV classification

Illustration of ablation zone monitoring using ultrasound. Prognostic parameter formation in the renal region with minimal coverage of the left kidney with monitoring parameters.