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MICROWAVE ABLATION VERSUS PARTIAL NEPHRECTOMY FOR SMALL RENAL MASSES: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction

The incidence of small renal masses has increased, in part due to the increase in the use of abdominal imaging and incidental detection. While EAU guidelines recommend partial nephrectomy (PN) to treat these patients and reserve thermal-ablation (TA) to frail or comorbid patients, AUA guidelines state TA as a “reasonable alternate approach”, but refer only to radiofrequency ablation (RFA) and cryoablation. Therefore, we conducted a systematic review and meta-analysis evaluating the efficacy of microwave ablation (MWA) compared to PN in patients with small renal masses.

Methods

Pubmed, Embase, and Cochrane Library were searched in February 2024 for studies comparing MWA versus PN for small renal masses. Outcomes of interest were local recurrence, overall complications (Clavien-Dindo grade ≥ I), major complications (Clavien-Dindo grade ≥ 3) and length of stay. Statistical analysis was performed using Review Manager 5.4.1, applying a random-effects model.

Results

A total of seven studies and 1,297 patients were included. Of those, 587 (45%) underwent MWA. Mean age was 62.56 and 59.86 years in MWA and PN groups, respectively. Approximately 35% and 23% of the population were female in the MWA and PN groups, respectively. Mean tumor size was 2.48 cm in MWA and 2.59 cm in PN groups, respectively. There was no significant difference between groups in terms of local recurrence (OR 2.21; 95% CI 0.96–5.07; p = 0.06;) [Figure 1]. In terms of safety endpoints, overall complications were significantly lower in MWA group. (OR 0.34; 95% CI 0.21-0.54; p < 0.001) [Figure 2], but there was no significant difference in major complications (OR 0.52; 95% CI 0.21-1.31; p = 0.16) [Figure 3]. Finally, length of stay was significantly lower in MWA group (MD -4.53 days; 95% CI -6.42 to -2.64; p < 0.001) [Figure 4].

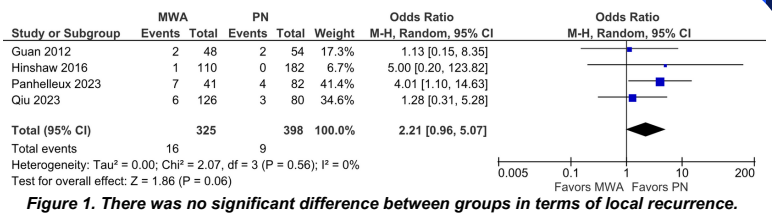

Figure 1. There was no significant difference between groups in terms of local recurrence.

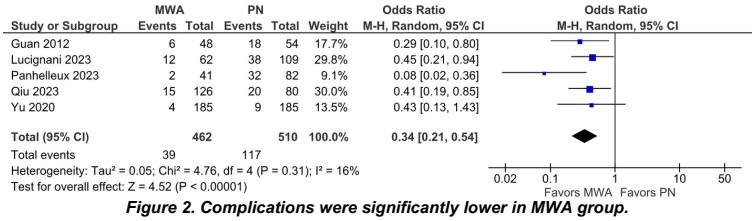

Figure 2. Complications were significantly lower in MWA group.

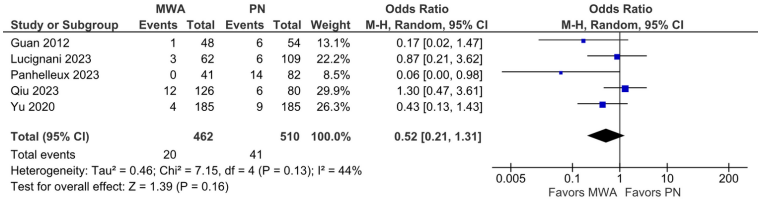

Figure 3. There was no significant difference in terms of major complications.

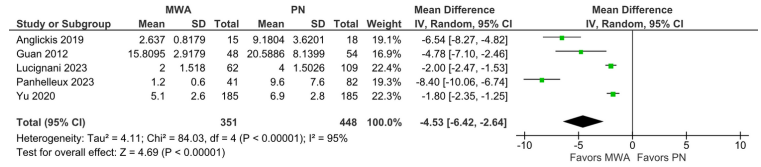

Figure 4. Length of stay was significantly lower in MWA group.

Conclusions

In this meta-analysis of patients with small renal masses, MWA decreased overall complications and length of stay, although no significant difference was found in local recurrence rate and major complication between groups.

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