Percutaneous Microwave Lung Tumor Ablation: A Single Center Mid-Term Experience

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Purpose
To evaluate overall survival, disease free progression, and tumor control following percutaneous microwave ablation of primary and metastatic lung tumors performed at a single institution.

Methods
• Under IRB exemption, our institution’s MW ablation database was retrospectively reviewed for all percutaneous microwave lung ablations performed between August 2011 and August 2016.
• All ablations performed using a high-powered gas-cooled microwave system (Newue Medical, Madison WI).
• Patients divided into two study groups for further analysis: a) primary lung tumors and b) lung metastases.
• Tumor and ablation parameters were recorded and follow-up imaging was reviewed for local and distant tumor progression.
• Complications were recorded and categorized according to the SIR classification system.
• Overall (OS) and progression-free survival (PFS) were calculated via a Kaplan-Meyer analysis.

Demographics
47 tumors*
21 primary lung malig.
26 lung metastases

Tumor size
Primary: 1.5±0.7 cm
Met: 1.2±0.7 cm

*In 30 pts over 38 sessions
17M:13F; mean age 66 years

Primary Lung
Squamous Cell Co 4
Adenocarcinome 4
NSCLC (NO/other) 13

Table 1: Tumor size and Demographics

Results

Procedural Details
• Median number of ablation probes used: 1
• Mean treatment power: 63 W
• Mean ablation time: 7 minutes
• Technical success rate: 100%

Complications
• The most commonly encountered complication was pneumothorax, occurring in 76% (29/38) of sessions. However, of that group, chest tubes were only required in 17% (5/29) of cases, for an overall rate of 13% (5/38) in all patients undergoing lung MW.
• There were only two major complications: a single case of recurrent pleural effusion requiring serial thoracenteses, and a single case of aspergilloma development within an ablation cavity requiring oral antifungal therapy in a radiation failure patient.
• No broncho-pleural fistulas in this study.

Follow-up
• Median imaging follow-up: 23 months in metastatic group
• 17 months in primary lung group

Overall Survival

Figure 1: Overall Survival at 12-, 24-, and 36-mo is: 90.9% (at all points) for primary tumors and 90.4%, 76.7%, 76.7% for metastases.

Progression Free Survival

Figure 2: Progression Free Survival at 12-, 24-, and 36-mo is: 85.7%, 68.1%, and 38.7% for primary tumors and 76.4%, 67.9%, 58.2% for metastases.

Conclusions
• Use of microwave ablation in the lung is a developing technique, which has raised concerns over its safety and efficacy.
• We report our experience as safe with few major complications and efficacious with a low local recurrence rate and favorable survival profile.

References