



Floating Sleeve Microwave Antenna for Tumor Ablation

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a novel microwave antenna that uses a floating sleeve to allow more energy to be delivered locally and evenly to a tumor while reducing the risk of detrimental backward heating.

Overview

In microwave ablation, a coaxial microwave antenna is inserted into tissue in or near a tumor to deliver microwave energy to the region and remove the tumor. The specific absorption rate (SAR) pattern of energy deposited into the tumor is a function of microwave power and antenna design.

Currently, single probe percutaneous microwave ablation can only treat relatively small lesions because microwave power to the antenna must be limited; otherwise, excessive backward heating, which could burn skin and damage healthy tissue, might occur due to backpropagation of energy along the antenna (generally referred to as the tail).

The Invention

UW-Madison researchers have developed a novel microwave antenna that uses a floating sleeve to suppress the tail of the SAR pattern, allowing more energy to be delivered locally and evenly to the tumor while reducing the risk of detrimental backward heating. The antenna consists of coaxial antenna conductors surrounded by a floating metal sleeve that is electrically isolated from the antenna by a Teflon layer. The metal sleeve promotes destructive interference of axial microwave energy passing inside and outside of the sleeve, thus suppressing the tail of the SAR pattern and minimizing damage to healthy tissue along the antenna tail.

Applications

- Microwave ablation of tumors

Key Benefits

- Minimally invasive
- Improves precision of SAR location
- Provides higher bandwidth and more stable performance than currently available coaxial antennas
- Delivers energy to ablate tumors at least an order of magnitude faster than conventional radiofrequency ablation
- Minimizes damage to normal tissue
- May be used with other techniques for reducing the heating tail
- Antenna is relatively small and suitable for percutaneous operations

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Stage of Development

OK



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Successfully tested in nontumorous liver tissue.

Tech Fields

- [Radiation Therapy : Ablation](#)

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