Abstracts

Swept Frequency Measurements of Microwave Antennas in Feline & Canine Brain

M. Salcman, G. Neuberth, R.W. Nudelman, F.T. Ferraro and M. Hartman. "Swept Frequency Measurements of Microwave Antennas in Feline & Canine Brain." 1986 MTT-S International Microwave Symposium Digest 86.1 (1986 [MWSYM]): 771-774.

Interstitial microwave hyperthermia may prove to be an important therapy for malignant brain tumors. For safety and efficiency, the size and number of intracranial microwave antennas needs to be limited. Low power swept frequency measurements of VSWR were carried out in the brains of anesthetized cats and dogs utilizing stereotactically placed monopole antennas. The coupling efficiency of antennas at any frequency was degraded (VSWR>2:1) if a length of antenna less than 2h (h = lambda/4 · /spl radic/e) was inserted or if a plastic catheter was utilized. Such measurements indicate that (h) can be shortened 25% from the resonant length without seriously degrading antenna performance. The total length can be halved if a catheter with a high dielectric is used. High power tests (2 -10w) of short antennnas at 915 MHz in a ceramic catheter (e = 10) at 45-50°C produce thermal fields approximately 2 cm in diameter in normal brain. It should be possible to efficiently and safely heat human brain tumors of average size utilizing these antennas and catheters at 915 MHz.

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