Abstracts

Evaluation of Pulsed Microwave Influence on Isolated Hearts

M. Abbate, G. Tine and L. Zanforlin. "Evaluation of Pulsed Microwave Influence on Isolated Hearts." 1996 Transactions on Microwave Theory and Techniques 44.10 (Oct. 1996, Part II [T-MTT] (Special Issue on Medical Application and Biological Effects of RF/Microwaves)): 1935-1941.

Long-term effects of 2.45 GHz pulsed microwaves on the electrical activity of chick embryo isolated hearts were analyzed. A new analysis procedure, derived in part from deterministic chaos studies, was carried out in order to point out dragging and regularization phenomena of the cardiac frequency, induced by pulsed microwaves. When dragging phenomena occur, results show that cardiac frequency shift on the average towards pulse's repetition rate; this means that the heartbeat maintains its statistical characteristic of frequency distribution and thus, it keeps its natural beating behavior typical of a healthy heart. Moreover in case of arrhythmia, when the regularization is reached, the heart recovers its statistical characteristic of frequency distribution that last even after the end of the irradiation. Dragging effects were confirmed by means of a mathematical model simulating the electrical activity of the sinus-atrial cardiac cells that allowed to suggest an interaction mechanism.

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