Abstracts

Development of Ferrite Core Applicator System for Deep-Induction Hyperthermia

Y. Kotsuka, E. Hankui and Y. Shigematsu. "Development of Ferrite Core Applicator System for Deep-Induction Hyperthermia." 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)): 1803-1810.

To achieve deep-induction hyperthermia, a ferrite core applicator system has been developed. The clinical goal is to produce a temperature rise of 7.5° C at 10 cm tissue depth. Deep heating becomes possible by introducing an auxiliary electrode to control an eddy current. The auxiliary electrode has been designed to optimize the eddy current with respect to the magnetic flux density. The optimization was performed by solving the fundamental equation using the finite element method (FEM). A flexible auxiliary electrode, which can be used for clinical treatments, has been manufactured. Heating tests have been conducted with the new applicator system, which operates at 4.0 MHz. The experimental results demonstrate that the system is capable of producing a temperature rise of 7.5° C at 10 cm depth, without heating an overlaying fat layer.

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