Abstracts

A Dipole Antenna for Interstitial Microwave Hyperthermia (Short Papers)

W. Hurter, F. Reinhold and W.J. Lorenz. "A Dipole Antenna for Interstitial Microwave Hyperthermia (Short Papers)." 1991 Transactions on Microwave Theory and Techniques 39.6 (Jun. 1991 [T-MTT]): 1048-1054.

An improved interstitial microwave antenna design was investigated in static phantom experiments at 915 MHz, different insertion depths. Compared with conventional interstitial antennas, the dipole microwave antenna presented in this paper shows heating patterns which are concentrated on the dipole irrespective of the insertion depth. By analogy to interstitial radiotherapy, the microwave antenna we have developed thus allows a high concentration of energy in the target volume with as little damage as possible to the healthy surrounding tissue. The undesired heating of healthy tissue along the feeding line observed with conventional interstitial antennas is avoided. A lambda/4 sleeve on the feeding line (which does not radiate microwave energy itself to the surrounding tissue) transforms an open end, i.e., a high impedance at the generator end of the dipole antenna. The current flowing back along the outside of the outer conductor of the feeding line in the direction of the generator is 0 at this point. Both dipole sections thus have the same terminating impedance. Since the lambda/4 sleeve is mounted outside the antenna, its mechanical length is not restricted by the mechanical length of the antenna. It can hence be charged with dielectric materials of low dielectricity constants, e.g. PTFE.

❑ Return to main document.