

عنوان مقاله:

Numerical study of the use of high intensity focused ultrasound in Trmo-Ablation of liver tumors in a multilayer tissue model

محل انتشار:

مجله مکانیک کاربردی محاسباتی، دوره 54، شماره 3 (سال: 1402)

تعداد صفحات اصل مقاله: 15

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خلاصه مقاله:

The high intensity focused ultrasound (HIFU) has been proved to be effective in local tumor ablation. Although HIFU utilization in ablation of liver cancer with single layer simulation is studied before, the procedure multi-layer numerical simulation, to the best of author knowledge, has not been conducted. In the present study, computational modeling of the HIFU with multi-layer simulation was carried out to determine the treatment effectiveness. The homogeneous Westervelt equation and bio-heat Pennes equation are solved by COMSOL software to determine the acoustic pressure and temperature distribution respectively. The results show that increasing the transducer frequency by keeping other parameters constant would increase the maximum acoustic pressure and the pressure increase depends on the square of the frequency increase. Also, the maximum tissue temperature increases intensely with respect to the frequency increase. The effect of changing the amplitude of the ultrasonic transducer, the duration of the wave radiation and considering multi-layer tissue were investigated. Amplitude change directly changes the .maximum pressure and the maximum temperature increase depends on the square of the amplitude increase

کلمات کلیدی:

HIFU, Tumor ablation, Liver cancer, Multilayer simulation, Westervelt equation

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