

REGULATORY MODEL OF HARDWARE-SOFTWARE COMPLEX OF LASER SURGERY ON THE CARDIAC CONDUCTION SYSTEM

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Wolff-Parkinson-White syndrome (WPW) is the most common of the congenital pathologies of the cardiac conduction system, occurs in all age groups and is diagnosed in 1 - 30 of 10 000 people.

When WPW syndrome, besides the normal conduction system of the heart, there are additional pathological conduction pathways between the atria and ventricles. The spread of excitation on them can cause serious arrhythmias and sudden death.

With the ineffectiveness of drug therapy, surgical technique is used, which involves the intersection of accessory pathways by various physical methods [1].

Based on the analysis of the dependence of the optical and thermal properties of the tissue type, the statistical data on complications during laser surgery and in the postoperative period we developed optimal modes during operation by the criterion: the value of the radiation dose on the myocardium and the formation of the coagulation zone of specified sizes in the wall of the myocardium.

We developed a mathematical model of the thermal effect of laser radiation on the myocardium, which allows to calculate the required dose of laser action in accordance with the data obtained at the stage of diagnosis. [3, 4].

Verification of the mathematical model agrees with the experimental data within the data error [2].

We developed the regulatory model of hardware-software complex of laser surgery on the cardiac conduction system.

References

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