Original Article

Monte Carlo Simulation of Two 106Ru Eye Plaques in a New Mathematical Human Eye Model

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Abstract:

BEBIG Ruthenium-106 ophthalmic plaques have been used for treatment of uveal melanoma, retinoblastoma, melanoma of the iris and other special applications for many years. The plaques consist of a thin film of 106Ru, a beta emitter, encapsulated in pure silver. The present work proposes a new mathematical eye model for ophthalmic brachytherapy dosimetry. This new model includes detailed description of internal structures, allowing dose determination in different regions of the eye for a more adequate clinical analysis. In the present work, we have used MCNP4C code to calculate relative dose in a new human eye model. The isodose curves and dosimetric characteristics for two 106Ru eye applicators have been determined. Also, absorbed dose values due to both small CCA and CCB concave applicators were obtained for each one of the different structures which compose the eye model and can give relevant information in eventual clinical analyses.

Keywords:

TUMS ID: 12851

Full Text HTML   Full Text PDF   192 KB