

Construction of Tomographic Head Model Using Sectioned Photographic Images of Cadaver

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Abstract

Tomographic models are currently the most complete, developed and realistic models of the human anatomy. They have been used to estimate organ doses for diagnostic radiation examination and radiotherapy treatment planning, and radiation protection. The quality of original anatomic images is a key factor to build a quality tomographic model. Computed tomography (CT) and magnetic resonance imaging (MRI) scan, from which most of current tomographic models are constructed, have their inherent shortcomings. In this study, a tomographic model of Korean adult male head was constructed by using serially sectioned photographs of cadaver. The cadaver was embedded, frozen, serially sectioned and photographed by high resolution digital camera at 0.2 mm interval. The contours of organs and tissues in photographs were segmented by several trained anatomists. The 120 segmented images of head at 2mm interval were converted into binary files and ported into Monte Carlo code to perform an example calculation of organ dose. Whole body tomographic model will be constructed by using the procedure developed in this study.