ASSESSMENT OF EFFECTIVE RADIATION DOSE OF AN EXTREMITY CBCT, MSCT AND CONVENTIONAL X RAY FOR KNEE AREA USING MOSFET DOSEMETERS

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Abstract

The objective of this study was to assess and compare the organ and effective doses in the knee area resulting from different commercially available multislice computed tomography devices (MSCT), one cone beam computed tomography device (CBCT) and one conventional X-ray radiography device using MOSFET dosemeters and an anthropomorphic RANDO knee phantom. Measurements of the MSCT devices resulted in effective doses ranging between 27 and 48 μSv. The CBCT measurements resulted in an effective dose of 12.6 μSv. The effective doses attained using the conventional radiography device were 1.8 μSv for lateral and 1.2 μSv for anterior–posterior projections. The effective dose resulting from conventional radiography was considerably lower than those recorded for the CBCT and MSCT devices. The MSCT effective dose results were two to four times higher than those measured on the CBCT device. This study demonstrates that CBCT can be regarded as a potential low–dose 3D imaging technique for knee examinations.

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