COMPARATIVE STUDY OF IMAGE QUALITY FOR MSCT AND CBCT SCANNERS FOR DENTOMAXILLOFACIAL RADIOLOGY APPLICATIONS

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The aim of this study was to investigate the image quality in the context of oral imaging applications for cone beam computed tomography (CBCT) compared to multi-slice computed tomography (MSCT). Four different CBCT scanners were evaluated: I-CAT (Imaging Sciences International, Hatfield, Pennsylvania, USA), NewTom 3G (Quantitative Radiology, Verona, Italy), MercuRay (Hitachi, Medico Technology Coorporation, Kashiwa, Japan), and Accuitomo 3D (Morita, Kyoto, Japan. The MSCT scanner that served as reference in our study was the Somatom Sensation VolumeZoom (Siemens, Erlangen, Germany).
The image quality was assessed by dedicated software which allows automated analysis of Contrast to Noise Ratio (Polymethylmethacrylaat (PMMA) to air, bone and aluminum), accuracy measurements and evaluation of metal artefacts on two image quality phantoms. The phantom for the evaluation of the metal artefacts contained aluminum structures.
Three of the four CBCT scanners had a smaller CNR for PMMA to air and all CBCT scanners had a higher CNR for PMMA to aluminum. Bone was segmented with sub-millimetre accuracy in all scanners. More metal artefacts were found in the MSCT-scanner

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