Morphometric analysis - Cone beam computed tomography to predict bone quality and quantity.

Abstract: Modified quantitative computed tomography is a method used to predict bone quality and quantify the bone mass of the jaw. The aim of this study was to determine whether bone quantity or quality was detected by cone beam computed tomography (CBCT) combined with image analysis. MATERIALS AND PROCEDURES: Different measurements recorded on two phantoms (Siemens phantom, Comac phantom) were evaluated on images taken with the Somatom VolumeZoom (Siemens Medical Solutions, Erlangen, Germany) and the NewTom 9000 (NIM s.r.l., Verona, Italy) in order to calculate a calibration curve. The spatial relationships of six sample cylinders and the repositioning from four pig skull halves relative to adjacent defined anatomical structures were assessed by means of three-dimensional visualization software. The calibration curves for computer tomography (CT) and cone beam computer tomography (CBCT) using the Siemens phantom showed linear correlation in both modalities between the Hounsfield Units (HU) and bone morphology. A correction factor for CBCT was calculated. Exact information about the micromorphology of the bone cylinders was only available using of micro computer tomography. Cone-beam computer tomography is a suitable choice for analysing bone mass, but, it does not give any information about bone quality.